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AMERICAN MADE: GROWING U.S. MANUFACTURING THROUGH THE TAX CODE

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BEFORE THE

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CONTENTS

OPENING STATEMENTS

WITNESSES

ALPHABETICAL LISTING AND APPENDIX MATERIAL

COMMUNICATIONS

AMERICAN MADE: GROWING U.S. MANUFACTURING THROUGH THE TAX CODE

TUESDAY, MARCH 12, 2024

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 10:05 a.m., in Room SD–215, Dirksen Senate Office Building, Hon. Ron Wyden (chairman of the committee) presiding.

Present: Senators Stabenow, Cantwell, Carper, Brown, Bennet, Casey, Hassan, Cortez Masto, Warren, Crapo, Lankford, Daines, Young, Barrasso, Johnson, Tillis, and Blackburn.

Also present: Democratic staff: Kimberly Arndt, Tax Counsel; Ursula Clausing, Tax Policy Analyst; Jonathan Goldman, Senior Tax Counsel International; Alice Lin, Senior Tax Policy Advisor; and Joshua Sheinkman, Staff Director. Republican staff: Courtney Connell, Chief Tax Counsel; Kate Lindsey, Tax Policy Advisor; Gregg Richard, Staff Director; and Don Snyder, Senior Tax Counsel.

OPENING STATEMENT OF HON. RON WYDEN, A U.S. SENATOR FROM OREGON, CHAIRMAN, COMMITTEE ON FINANCE

The CHAIRMAN. There's a lot for the committee to discuss on the topic of manufacturing, and I want to start off with a little bit of recent history of key manufacturing issues. On infrastructure—and we know that you cannot have big league manufacturing with little league infrastructure—it was a running joke during the Trump administration that every week was infrastructure week. The big infrastructure bill was just a few days away. It was kind of like the marquee at the old movie house, where it always said "coming soon," but it just never actually got there. It was the Biden administration that finally got a major infrastructure bill passed.

Now there are shovels in the ground all over the country working on rebuilding our roads and bridges, highways, ports, and airports. On energy, former President Trump talked, again, a big game on energy independence. Had he wanted, he could have pushed for big investments in batteries, wind and solar, and electric vehicles. He passed on that one too.

Democrats got that done in the Inflation Reduction Act. The United States now produces more energy than ever before, and we have achieved a greater level of energy independence than we have had since the days when millions of Americans had big piles of coal shoveled into their basements. Consumers are saving money. Putin and OPEC have a whole lot less influence over our energy prices

than they did when former President Trump was in the White House.

On semiconductors—these are the chips that Americans interact with from the time they wake up in the morning and check their cellphones, to the time they go to bed at night setting an alarm. Once again, Donald Trump was on the sidelines. He could have pushed for more chips investment to bring a vital high-tech manufacturing industry back home, giving us a better and stronger competitive edge with China. Once again, it did not get done.

The CHIPS and Science Act passed on a bipartisan basis under the Biden administration; they are getting it done. Nobody would blame Americans for having grown tired and frustrated after years of empty political promises about bringing manufacturing and employment back home. Every shuttered factory, every job shipped overseas was a painful wound to those who were left behind in communities that took pride and found identity in the things they made with their labor.

Donald Trump talked an awful lot about bringing manufacturing jobs home. Once again, failure to deliver. In fact, the manufacturing sector went into a recession in 2019 after his tax law went into effect and before the pandemic clobbered our economy.

So let's look at what is happening now. The cycle of empty promises is ended. The U.S. is in a manufacturing boom, thanks in large part to this landmark legislation passed under the Biden administration, much of which came from this committee. Manufacturing investment in clean energy in 2023 was triple the level from before Congress passed the IRA. The running total of clean energy and chips investments announced in the last few years is now more than $350 billion. That is more than a quarter-million jobs created. That was an effort that Democrats pushed vigorously with a private-sector, market-oriented, no mandates, technology-neutral system that finally broke the gridlock on climate, and is producing big investments in the private sector for cleaner energy.

The CHIPS Act and the IRA went further than any laws in recent memory. The Buy American Act countered dependence on China. That is a big reason why so many foreign governments come to town and talk about how upset they are after Democrats passed the IRA. My response to them is, "Why don't you all go do what we did in your country? I think you will find it works." With one single piece of legislation, the U.S. lapped the pack in terms of investment in clean energy and clean transportation.

So that is all solid news about the state of manufacturing in America. Here is the big concern. Former President Trump wants the IRA repealed. House Republicans voted to gut nearly the entire IRA energy package. It is not because they have a better idea for energy or manufacturing; it is because they wanted to score a political win no matter the cost. And in this case, the cost would be hundreds of thousands of jobs in America. It would be higher costs for consumers; greater dependence on foreign oil; and surrendering to China and other countries when it comes to clean energy, innovation, and jobs.

We have to make sure that does not happen. For the first time in a long time, the future of manufacturing in America and manu-

facturing jobs looks bright. Congress has to do everything it can do to build on this progress.

On that topic, the Senate is in the middle of a debate that pairs tax cuts for businesses, including research and development expenses, with an expansion of the Child Tax Credit. I proposed this bill with Chairman Jason Smith of the House Ways and Means Committee several months ago. The House passed it 6 weeks ago with 357 votes in favor. I think it would be fair to say you cannot get 357 members of the House of Representatives to agree that 1 plus 1 equals 2.

That is an extraordinary vote: both sides of the aisle almost unanimous in saying that we want to be there for 16 million kids of modest incomes, who right now are discriminated against if they come from a large family. And then they said we want to be there for our small businesses that desperately need that research and development money to make payroll.

The Senate has to get this done. I have said it now for weeks and weeks. I will talk to anybody who wants to work in good faith to move this forward quickly, because right now, folks, let's make sure everybody understands what's going on.

Right now, thousands of small businesses, millions of families, they are all waiting. They are waiting to see if the U.S. Congress is going to be there for them. Seems like the Congress can be there for lots of other causes. Now let us make sure they are there for those scores and scores of small businesses, and those millions of families that are waiting.

I have heard from the small business owners that if the Senate sits on this issue until 2025, a lot of them are not going to be around to talk about that. They just will not be here. They will not make it. So the time to act is now, and I continue to be open to all sides who want to work in good faith to get this done.

Some of my colleagues understand the urgency here, and let's understand that this set of policies is not going to be on the table in 2025 if this bill stalls out. So it is my hope, and I think we will hear today that the American people again—another important group of Americans—want the Senate to move soon.

Senator Crapo?

[The prepared statement of Chairman Wyden appears in the appendix.]

OPENING STATEMENT OF HON. MIKE CRAPO, A U.S. SENATOR FROM IDAHO

Senator CRAPO. Thank you, Mr. Chairman.

During last Thursday's State of the Union address, using fair share rhetoric, President Biden laid out his plans for making American manufacturers more competitive: tax them more—a lot more. President Biden's proposed 28-percent corporate rate and about 32 percent when including State taxes, would leave the U.S. with one of the highest rates in the developed world.

It gets worse. Biden would also hike the Democrats' book minimum tax, a fundamentally flawed proposal which harms American manufacturers, by 40 percent, to 21 percent. Contrast that vision with what the Republicans actually did in 2017. Prior to the Tax

Cuts and Jobs Act, the U.S. had one of the highest corporate income tax rates among developed countries.

In 2017, Republicans lowered the rate and broadened the base, putting a stop to corporate inversions. It led to one of the strongest economies in generations prior to the pandemic. Unemployment dropped to a 50-year low. Economic gains flowed to all demographic groups and all income levels, and American businesses reported record R&D investment.

In the words of former President Obama's economic advisor Jason Furman, "taxes do actually matter." In response to a recent study on the impact of the TCJA's policy changes on domestic investment, Furman stated, "These are the most convincing estimates of the response of investment to corporate tax rates that I had ever seen."

I agree—tax rates actually do matter. A competitive tax system is instrumental in manufacturers' decisions of where to invest. Reducing business tax rates paired with good progrowth policies like immediate expensing of capital investments, drove historic growth in the manufacturing sector.

According to the National Association of Manufacturers, in 2018, the year immediately following the TCJA's enactment, manufacturing had the best year for job creation in 21 years. Manufacturing wages grew at the highest level in 15 years. Manufacturing capital investment grew by 4.5 percent, and manufacturing production grew 2.7 percent, with December 2018 being the best month for manufacturing output since May 2008.

Stability of tax policy is also key to maintaining strong manufacturing in the United States. We must protect the TCJA's progrowth tax policies, and seek to make them permanent before they expire in 2025. We should also look to improve and build on those policies to ensure that U.S. companies and workers can continue to compete globally.

Another area of continued bipartisan interest is bolstering the domestic supply chain of semiconductors. American semiconductor manufacturers, represented here today by onsemi, are operating in an increasingly competitive market. While we must be circumspect when considering industry-specific tax incentives, bolstering domestic manufacturing of semiconductors is vital to safeguarding our national security.

Chairman Wyden and I have worked closely over the years on proposals to strengthen the U.S. semiconductor supply chain. The Advanced Manufacturing Investment Credit, the AMIC, is the result of that bipartisan effort and has already led to increased investment across the United States.

In my home State of Idaho, Micron announced that it will construct a new memory chip plant, the first new semiconductor memory manufacturing fab built in the U.S. in the last 20 years. This expansion ensures the semiconductor industry will continue to innovate and develop new technologies that keep Idaho and the country on the leading edge for research and development.

In contrast to this bipartisan effort, the costs of the Inflation Reduction Act and the energy incentives contained in it have quickly mushroomed from the original JCT score of $270 billion over 10 years to a June 2023 estimate of $663 billion. One of our witnesses

today will discuss his experience with how the administration is proposing to implement these incentives in a way that bolsters China and foreign manufacturing.

Unfortunately, he is not alone. Hundreds of domestic stakeholders have provided formal comments to various proposed energy incentive rulemakings, which express significant concerns with the implementation of those energy incentives, including two other witnesses here today.

Congress should closely scrutinize a law that both costs much more than promised, and also fails to achieve key goals like making the U.S. less reliant on our adversaries. I look forward to discussing how we can continue to encourage domestic manufacturing activity, including addressing the global semiconductor shortages and supply chain issues.

Thank you, Mr. Chairman, and I yield back.

[The prepared statement of Senator Crapo appears in the appendix.]

The CHAIRMAN. All right. Let's introduce our witnesses now.

Mark Widmar is the CEO of First Solar. I know my colleague, Senator Brown, very much wanted to be here to introduce you. He is chairing a hearing in the Banking Committee this morning and will be here later.

Anna Fendley is the United States Steelworkers director of regulatory and State policy. We welcome her.

Shannon Janis is vice president of global tax for onsemi.

Courtney Silver is president and owner of Ketchie, Inc.

Our final witness is Peter Huntsman, the chairman, president, and CEO of Huntsman Corporation.

I want to at this time also publicly acknowledge all the work that Mr. Huntsman has been doing for years in mental health. We understand, in the Huntsman family and the Wyden family, that this takes an enormous toll on millions of Americans. It is not the topic of conversation today, but we just want you to know we are very appreciative of the efforts that you have made working with me specifically, and I look forward to continuing that work.

All right. Let's go and begin with you, Mr. Widmar.

STATEMENT OF MARK R. WIDMAR, CHIEF EXECUTIVE OFFICER, FIRST SOLAR, INC., TEMPE, AZ

Mr. WIDMAR. All right. Good morning, Chairman Wyden, Ranking Member Crapo, and distinguished members of the committee. My name is Mark Widmar, and I am the chief executive officer of First Solar, the Western Hemisphere's largest solar manufacturer. We have over 6 gigawatts of operational capacity in Ohio, with new factories under construction in Alabama and Louisiana that are expected to take us to 14 gigawatts of capacity in the U.S. and 25 gigawatts cumulative global capacity by 2026.

Our proprietary, uniquely American thin film solar technology was developed here in the U.S., and is manufactured in fully vertically integrated factories that produce thin film solar wafers, cells, and modules in a single process entirely under our factory's roof.

First Solar is enabled by thousands of hardworking people across the country: soda ash miners in Wyoming; silicon miners in Michi-

gan; copper miners in Utah; steelworkers in Alabama, Louisiana, and Ohio; glassworkers in Illinois, Ohio, and Pennsylvania; woodworkers in Indiana; and a nationwide network of truckers, rail workers, and many more.

Given this context, it is an honor to represent First Solar today, and I thank the committee for convening this hearing on how tax policies impact domestic manufacturing in the U.S. We applaud the IRA and believe it represents America's first durable solar industrial strategy. Implementation of the IRA—consistent with its legislative intent and the establishment of restrictions to prevent companies controlled or owned by the Chinese Government from receiving American taxpayer dollars, together with effective enforcement of trade law—gives the potential to dismantle China's near-complete control of the solar supply chain and enable the United States to secure its clean energy manufacturing base while capturing economic value and creating good-paying, enduring jobs.

Not only did the IRA provide CapEx-based grants to enable the setup of onshore manufacturing, but through supply driven advanced manufacturing tax credits, the IRA took on the complex challenge of incentivizing the operational side of manufacturing in strategic clean energy sectors. This provides solar, wind, battery storage, and other manufacturers the momentum needed to scale domestically, drive down cost, and spur cycles of innovation to maintain American technology leadership. The IRA also created a crucial parallel demand-side driver to incentivize purchasing the output of these American factories, by introducing a bonus to the investment or production tax credit, accessed by solar generation asset owners if projects procure domestically made content, including solar panels.

While regulations to implement this aspect of the IRA remain pending, the domestic content bonus is expected to create a durable market pull for solar produced via high-value domestic manufacturing. It is difficult to overstate the IRA's economic potential, and First Solar provides a case in point. Analysis shows that First Solar's U.S.-based footprint alone will support an estimated 30,000 direct, indirect, and induced jobs in 2026, representing approximately $2.8 billion in annual labor income, while generating over $10 billion in economic output in 2026 alone.

While we are not the only American solar manufacturer to come into existence at the end of the last century, the grim reality is that we are the only one of scale to remain today. It is therefore imperative that America's response to China's dominance of the solar industry is not a one-horse race.

Consider this: solar is already the lowest-cost form of new electricity generation, and the IRA offers a catalyst for unprecedented growth in high-value domestic solar manufacturing. And yet the solar manufacturing industry remains in a precarious position today. Less than a third of the 35 gigawatts of new solar installed in 2023 in the U.S. were produced here. None, not one of the crystalline silicon panels installed, was assembled with American-made solar cells.

The relentless Chinese anticompetitive behavior has caused a significant collapse in cell and module pricing. This dynamic goes well beyond just a risk to our company. It threatens the viability

of all aspiring U.S.-based manufacturers, who may never be able to finance the startup or growth of their operations.

The U.S. tax code, through legislation such as the IRA, has the power to incentivize domestic investment, but for those investments to endure, they must be supported by corresponding strong and consistent enforcement of trade. And there should be no doubt: we invite competition and free trade. All we ask is that this competition and trade are practiced on a level playing field.

On behalf of First Solar, I am pleased to participate in this important discussion. I thank you, and I will be happy to answer any questions you may have.

[The prepared statement of Mr. Widmar appears in the appendix.]

The CHAIRMAN. Thank you very much, Mr. Widmar.

Ms. Fendley?

STATEMENT OF ANNA FENDLEY, DIRECTOR OF REGULATORY AND STATE POLICY, UNITED STEELWORKERS (USW), PITTSBURGH, PA

Ms. FENDLEY. Good morning. On behalf of the members of the United Steelworkers Union, I would like to thank Chairman Wyden, Ranking Member Crapo, and the members of the committee for holding this hearing and for the invitation to testify. Our members manufacture a wide array of products in some of the most advanced facilities in the world. Their jobs are the sort that built the middle class. We appreciate that this committee has spent many years considering, developing, and overseeing initiatives to grow U.S. manufacturing.

Through the infrastructure law, the CHIPS Act, and the Inflation Reduction Act, Congress has enacted a once-in-a-generation investment in industry, and these efforts have already led to a boom in spending on manufacturing construction.

While I will only discuss a few tax credits in my testimony, they are part of an interlocking series of policies necessary for manufacturing workers. The first provision I would like to highlight is the section 45X Advanced Manufacturing Production Credit. Our union was particularly supportive of efforts to create this tax credit to reshore solar manufacturing capacity after the majority of it was lost to China, to ensure that a new domestic offshore wind industry is supplied by U.S.-made components, and to boost the production of critical minerals for batteries in this country.

We are grateful for careful work being done by the Internal Revenue Service to implement this provision so far, including efforts to solicit public input on certain key questions. The implementation of this credit is an iterative, as yet incomplete process, and our union has offered supportive comments on some provisions and suggestions to the agency on others in the recent comment period. However, we are very excited about the prospect of this credit to help build U.S. supply chains for clean technologies.

The second credit to discuss is the section 48C Qualifying Advanced Energy Project Credit. Our union supported 48C when it was originally enacted in 2009. The revival and expansion of 48C will advance decarbonization efforts through the domestic manufacture of energy technologies and in direct efforts to decarbonize in-

dustrial processes. We applaud the expanded list of technologies that Congress included in the credit this time. We also applaud Congress's direction to allot 40 percent of the funding to designated energy communities, which will ensure that the benefits accrue to those communities and workers that may suffer the most harm from the loss of fossil fuel jobs.

As expected, the appetite for this credit has been huge, with the first round of applications for $4 billion in credit availability attracting concept papers seeking $42 billion in funding. This is not a surprise, given how over-subscribed 48C was in 2010. Because awarding of the 48C credit functions more like a grant process than a typical tax credit, I would be remiss not to mention the important role that the Department of Energy is playing. Our union strongly supports the work that DOE has done to include Community Benefits Plans into these funding criteria. This process requiring labor engagement has helped drive very productive conversations between our members and their employers, and I am sure I join most in this room in looking forward to learning which projects are selected in this first tranche of funding.

These two credits are both supply-side drivers. They will help producers make things. But in order to be fully effective, producers need certainty. Even with a tax credit, these projects are not free, and undertaking them entails risk. That risk can be mitigated by demand-side drivers that give producers confidence that there will be a stable market for their products. These are somewhat new to the tax code. The Inflation Reduction Act included a bonus credit for clean energy projects that use American iron, steel, and manufactured goods, and the section 30D tax credit now includes requirements for vehicle assembly, and provisions around critical mineral and battery production. We strongly support these provisions.

Additionally, we must have strong trade enforcement, a topic also under this committee's jurisdiction. This is an exciting time for American manufacturing. The transition to a clean energy economy will result in lots of jobs somewhere in the world, and we want them to be jobs for American workers.

Still, there is a lot of work before us. Implementation of the credits is not yet complete, and arguably more could be done to engage small and mid-size manufacturers to ensure that this opportunity is broadly shared. We look forward to continued work with you, the administration, our employer partners, and others on these matters.

Thank you for your interest in our union's perspective, and for the opportunity to testify today.

[The prepared statement of Ms. Fendley appears in the appendix.]

The CHAIRMAN. Thank you, Ms. Fendley. And not a week goes by when Senator Casey and Senator Brown make some of the very same points that you have made today, and we are going to stay at it until those hopes for steelworkers and manufacturing communities are realized. Thank you.

Okay. We are now going to hear from Ms. Janis.

STATEMENT OF SHANNON M. JANIS, VICE PRESIDENT OF GLOBAL TAX, ONSEMI, SCOTTSDALE, AZ

Ms. JANIS. Chairman Wyden, Ranking Member Crapo, and members of the committee, thank you for the invitation to testify today. My name is Shannon Janis, vice president of global tax at onsemi. I am here today to share what we do at onsemi and discuss how U.S. tax policy shapes our decisions regarding domestic manufacturing.

onsemi is a Fortune 500 semiconductor company with over 4,000 employees in the U.S. We specialize in delivering industry-leading intelligent power and sensing solutions that greatly improve the safety, sustainability, and power efficiency of end products in the automotive and industrial markets. We operate 19 manufacturing sites across eight countries worldwide. These sites consist of front-end materials and wafer fabrication facilities known as fabs, as well as back-end assembly and test site facilities. In the U.S., our materials and fab operations are located in five States: Oregon, Idaho, Pennsylvania, New York, and New Hampshire.

Each of these sites is an integral part of onsemi's global manufacturing network. Our wafer fab in Gresham, OR is onsemi's third largest fab globally. The Gresham fab employs over 600 people. Over 50 percent of Gresham's volume supports the automotive market, with over 35 different technologies manufactured at the site. Our wafer fab in Nampa, ID employs over 260 people, and supports the image sensor business. Image sensors are a key component in machine vision cameras, including digital and security cameras. Our Mountain Top, PA fab employs over 240 people making power semiconductors, and is the only union fab in the U.S. Our East Fishkill, NY fab is onsemi's largest manufacturing facility in the U.S., employing over 1,000 people, and it is the only 12-inch power discrete and image sensor fab in the U.S. And our Hudson, NH facility is the cornerstone of onsemi's silicon carbide products.

Today, onsemi is the only U.S.-based company that has fully integrated end-to-end silicon carbide manufacturing. Why is this important? Silicon carbide semiconductors play a pivotal role in enabling the transition to electric vehicles and renewable energy systems. Manufacturing silicon carbide semiconductors is more complex than traditional semiconductors, due to higher temperatures, specialized equipment, and unique expertise. We are proud that our New Hampshire site enables our network of factories to deliver the end-to-end silicon carbide power solutions necessary for EVs, hybrid vehicles, and renewable energy.

As this committee is aware, the steady decline in the United States' share of worldwide semiconductor manufacturing capacity poses a risk to America's supply chains and our national security. This decline has been decades in the making, and it will require persistent attention to achieve a sustainable reversal. A key contributing factor to this decline has largely been due to the substantial manufacturing incentives offered by the governments of our global competitors, placing the U.S. at a competitive disadvantage. Additionally, Federal investments in semiconductor research have historically been flat as a share of GDP.

While other countries have prioritized investments in R&D initiatives to strengthen their own semiconductor capabilities, our U.S. R&D tax incentives have lagged behind those of other countries. Although the U.S. has taken the initial steps to curb this decline, other countries, both within the European Union as well as countries such as South Korea, Japan, and China, are significantly increasing their investments in the semiconductor industry and its workforce. Many of these countries have legislation similar to the CHIPS Act to support their domestic companies, as well as incentivizing other companies to invest in their regions. The CHIPS Act, and in particular the section 48D Advanced Manufacturing Tax Credit, have played a critical role in enhancing the global competitiveness of the U.S. The enactment of the CHIPS and Science Act was a landmark step toward reinvigorating domestic semiconductor manufacturing and innovation.

The mission is clear. Establishing a leadership role is vital for the U.S. to win the global technology race in the semiconductor industry. Ongoing support from the CHIPS Act, with its section 48D Advanced Manufacturing Tax Credit, will enable companies like onsemi to continue to invest in the U.S., compete with companies that are located offshore, and strengthen the resiliency of critical supply chains.

Mr. Chairman, I appreciate your calling for this hearing and this committee's support of the U.S. semiconductor industry. Thank you for the opportunity to testify at today's hearing.

[The prepared statement of Ms. Janis appears in the appendix.]

The CHAIRMAN. Ms. Janis, thank you very much, and good to hear about chips manufacturing going on in Gresham, OR. That is the right place to have it. Thank you.

Okay; Ms. Silver?

STATEMENT OF COURTNEY SILVER, PRESIDENT AND OWNER, KETCHIE, INC., CONCORD, NC

Ms. SILVER. Good morning, Chairman Wyden, Ranking Member Crapo, and distinguished members of the committee. Thank you for holding today's important hearing on how the U.S. tax code impacts manufacturing in America. My name is Courtney Silver, and I am the president and owner of Ketchie. Following my husband's passing, I was honored to take over Ketchie, a third-generation, full-service, precision machine shop located in Concord, NC.

Ketchie was established in 1947 to fill the gap of the local textile industry after World War II. We have been a pillar in Concord for nearly 80 years, providing strong manufacturing jobs and giving back to our community. Our mission is to support the U.S. manufacturing supply chain by delivering reliable, high-quality machine parts to our customers. We invest in equipment, technology, and most importantly people, to make it easy for our customers to focus on what they do best and have confidence in their manufacturing supply chain. My testimony will focus around one main theme today, and I hope if members take away anything from me, it is this.

Manufacturing is a team sport. A team can only reach greatness if every player is operating at their full potential. If not, the team falls apart. At the core of any sport are clear, sensible rules that

do not unfairly handicap any players. The rules must be consistent, rather than constantly changing, so that the game does not devolve into chaos.

In this context, the rules of the game are the U.S. tax code. The 2017 Tax Cuts and Jobs Act was revolutionary for the manufacturing sector. After it was signed into law, Ketchie experienced its best year in our 7-decade history. I know others further up in my supply chain were booming as well. I clearly remember our typically organized shop floor covered in pallets of material in every available space to keep up with our customers' demands. We were able to invest more than $1 million in capital and equipment and create several new jobs within Ketchie in 2018.

While Ketchie experienced a significant increase in sales, every day is a battle. When we want to win, the only choice is to pour profits back into your team. We made major investments in capital equipment. We were able to purchase advanced robotics. We invested in new HVAC systems for our facilities, and in new security systems for our team members. What I am most proud of is that we were able to provide 100 percent of our Ketchie team with pay raises and quarterly bonuses in the years following TCJA. Our team members were buying their families' first homes and first cars. We were making a true difference in the lives of those who had dedicated themselves to our mission.

Of course, our growth trajectory was disrupted during the COVID–19 pandemic, like the rest of the world. However, thanks to TCJA's impact in 2018 and 2019, we were able to withstand the shutdowns and supply disruptions in 2020. Even as some of our customers went out of business and others were unable to pay open invoices, we were able to survive.

Ketchie might not be here today if we did not have the economic boom provided by tax reform in the years prior to the pandemic. Unfortunately, beginning in 2022, the rules of the game began to change, making it more difficult for manufacturers to thrive in America. Crucial policies began to expire, such as immediate R&D expensing, enhanced interest deductibility, and full expensing. These tax policies were a game-changer for the manufacturing industry. They certainly were for Ketchie. Manufacturers need members of this committee to restore these policies and ensure small manufacturers can compete here and in the global economy.

More tax increases are on the way. Other critical provisions expire at the end of 2025, which will have a direct impact on the manufacturing sector. Ketchie will be directly harmed by the loss of the pass-through deduction, the increase in our tax rates, and the reduced protection from the estate tax. If Congress does not act both now and in 2025, manufacturers will be competing with one hand tied behind our back for the foreseeable future.

Manufacturers across the country made a promise to take tax reform's progrowth provisions and ensure they had a direct, positive impact on American lives. We have kept our promise, and I hope Congress will allow us to continue to do so even more. Manufacturing truly is a team sport, and you all are on our team. Small companies like mine are depending upon you to play with us rather than against us, and to ensure our U.S. tax code does the same.

Thank you.

[The prepared statement of Ms. Silver appears in the appendix.]

The CHAIRMAN. Well said. We are going to be playing with you very hard over the next few weeks to get done what we can get done now, and then we will have a big debate in 2025. Thank you.

Mr. Huntsman, again welcome, and we will talk mental health another time.

STATEMENT OF PETER R. HUNTSMAN, CHAIRMAN, PRESIDENT, AND CHIEF EXECUTIVE OFFICER, HUNTSMAN CORPORATION, THE WOODLANDS, TX

Mr. HUNTSMAN. Thank you very much, Chairman Wyden. And I know my father greatly appreciated his work with you, particularly his friendship with you.

Ranking Member Crapo, members of the committee, my name is Peter Huntsman, and I'm chairman, president, and chief executive officer of Huntsman Corporation. Over 40 years ago, I worked as a Senate intern for Orrin Hatch. The idea that I am testifying before his former committee is nearly inconceivable to me. If there is one conclusion I would like members of this committee to come away with from my testimony, it is this: American manufacturing dominance, prosperity, security, and power are based predominantly on access to cheap, abundant, and reliable energy, primarily in the form of hydrocarbons. Without it, our way of life is simply not possible.

My father started his life in an Idaho home with no indoor plumbing. He founded Huntsman and built a global chemical company with billions in revenue, operations in dozens of countries, and thousands of associates. He is a quintessential American story. I started my career as a truck driver. Over my life, I have witnessed boom and bust business cycles, multiple iterations of peak oil and the collapse of the Soviet Union, the reunification of Europe, the rise of China, the growth of the Internet, and the transformational impact of hydraulic fracturing, among other things. I have also observed the tax policy and regulatory environment around the chemical sector as it has ebbed and flowed across Democratic and Republican administrations and Congresses. Our company and the chemical industry have played a role in it all.

In the chemical industry, we take atoms and molecules, we break them apart and put them back together to make the building blocks of virtually everything you see and touch in modern life: automobiles and trucks, airplanes, mineral refining, batteries, building and insulation materials, pharmaceuticals, semiconductors and computers, solar panels, wind turbines, clean drinking water, to just name a few. The most utilized starting atoms, or "feedstocks," for chemical manufacturing are hydrocarbons derived from natural gas and petroleum. Without abundant access to these fossil fuel feedstocks, we cannot make chemicals. We know the biggest threat to American manufacturing is the belief that we can choose not to extract our natural resources.

Even if we could transition tomorrow to a fossil fuel-free energy grid, we cannot transition away from fossil fuels as a feedstock for chemical and manufacturing production. It is the chemical sector that develops the molecules that allow us to lower our emissions. If the goal of government and business is to reduce greenhouse gas

emissions, tax policy should be calibrated to increase production of the very chemicals and materials needed to reduce energy consumption.

MDI made by Huntsman is a great example of this. MDI is used to make spray foam insulation. This building material reduces energy consumption by as much as 50 percent. Huntsman was pleased to work with Senators Hassan and Collins on legislation that updated the Energy Efficient Home Improvement Tax Credit to be sure we capture the energy conservation benefits of spray foam.

Increased adoption of EVs in the United States will increase our Nation's dependence on China, unless the U.S. Government enables a massive domestic expansion of mining and chemical refining. For most parts of the EV battery supply chain, China is the dominant global producer. American companies have little hope of competing against lower-cost Chinese labor, Chinese coal-based manufacturing, and Chinese pricing. Huntsman has experienced this phenomenon firsthand. Huntsman is the only North American producer of ethylene carbonate, a chemical that is so critical to the production of electrolytes that you cannot make an EV battery without it.

In 2021, Huntsman made the decision to invest $50 million to increase our U.S. production capacity by 530 percent to meet the projected needs of the U.S. EV battery business. However, following passage of the IRA, Chinese producers slashed their price for EC, ethylene carbonate, by 75 percent, a level far below Huntsman's cost of production. Huntsman simply cannot compete with the Chinese under these circumstances, and I recently made the painful decision to suspend work on this expansion.

Reductions in energy consumption, a robust manufacturing industry, and secure supply chains in the U.S. can be achieved only if America has a thriving chemical industry. America needs policies that recognize and promote our industry.

I look forward to your questions. Thank you.

[The prepared statement of Mr. Huntsman appears in the appendix.]

The CHAIRMAN. Thanks very much, Mr. Huntsman. All of you have been very helpful, and I am going to start with taxes.

Now the tax bill that is being considered is a bill that was written by the House Republican Chair of the Ways and Means Committee, Jason Smith, and myself. So, this Smith-Wyden bill had a number of key provisions, helping 16 million kids trying to figure out how they were going to get shoes and school clothes and all that kind of thing, and then it was going to be paired with the important business incentives. Right at the center of that was the research and development tax break.

It was the feeling of members that to compete with China, which gives such generous incentives for research and development, we could not walk away from research ourselves. But that was what was done in the Republican tax bill in 2017: that research and development incentive was stripped. Ever since then, I can tell our panel, I have heard virtually every Senator and most members of Congress, whether they are Democrats or Republicans, say, "I am going to get that fixed at the first possible opportunity." That first

possible opportunity has now arrived. Three hundred fifty-seven members of the House of Representatives have voted for that, 16 million kids getting help, important assistance for housing, and we are pulling out all the stops to get that done here.

So my question to our witnesses today—you really sort of started it, Ms. Silver—is what the effect of postponing this tax bill would mean for all of you. Mr. Widmar, what kind of damage would be done to domestic manufacturers if the Senate punts on the passage of the provisions in the Smith-Wyden tax bill?

Mr. WIDMAR. Yes. First and foremost, we are somewhat on an island of our own. We are a U.S. company that has to go up against China, Inc. All of our competition is outside of the U.S. and headquartered in China. We need to out-innovate. So, the only way we are going to be successful is by being a technology leader.

We are in the process right now of making a $400-million investment in a research and development center in Ohio. We will be spending about $200 to $250 million a year on R&D. If we are not able to out-innovate, we will not be able to survive the onslaught that we are facing today.

This bill is critical from that standpoint, as it relates to R&D and the opportunity for expensing the R&D versus deferring R&D. But it is also very critical to the bonus depreciation that is enabling a lot of the factory expansions that we are making right now.

So, outside of the R&D centers, we are putting another 2-plus million dollars into new factories here in the U.S. So this bill is critical, that this gets addressed.

The CHAIRMAN. And putting everything off just generates more uncertainty and delay?

Mr. WIDMAR. Delay and loss of thousands of jobs.

The CHAIRMAN. Thousands of jobs—thousands of jobs being on the line with getting this done now. Thank you.

Ms. Fendley?

Ms. FENDLEY. First, I would like to acknowledge the work that you have done to negotiate that. The ability of manufacturers to innovate, as Mr. Widmar said, is so important to global competitiveness, and our fear is that, without appropriate tax incentives to do that, companies will stand still for too long, and that harms their global competitiveness.

I also just want to mention the importance of the Child Tax Credit for working families. This is a really critical piece of this legislation. Our union would support a bolstering to what was included in the American Rescue Plan, but we do strongly encourage the Senate to begin debate on this.

The CHAIRMAN. You are absolutely right. And Chairman Smith, to his credit, as we worked in a bipartisan way—a Republican and a Democrat—also made the point that having those opportunities for the kids puts them in a better position to be healthy and become the workers that you are all talking about here today. So there really is a link between healthy kids and a healthy job base.

Ms. Janis?

Ms. JANIS. Right now, the OECD says that the U.S. now ranks 30 out of 37 for research and development incentives among the advanced world economies. If the R&D tax deduction is not restored quickly, R&D will shift to elsewhere in Europe, Asia, and even the

other USMCA nations. I recognize that budgets are tight; however, restoration of this immediate expensing is imperative to innovation. I would encourage the committee to advance this legislation, the 174 immediate expensing, and if I may also request, to go for its permanency, in order to provide assurance to businesses and stabilization.

The CHAIRMAN. That may be too logical for everybody in Congress right now, but I am glad to hear that is the voice of Oregon. Thank you, and well said.

Ms. Silver?

Ms. SILVER. Not taking action now has a huge impact on Ketchie and the entire manufacturing sector. In fact, I am delaying an investment in capital equipment and technology because of it, and it means less job creation.

The CHAIRMAN. Tell me a little bit about the project you are delaying on right now with the uncertainty.

Ms. SILVER. Sure. Well, due to the change in bonus depreciation dropping to 60 percent, it is actually something I think about every day when I walk on my shop floor. I have a very large area on my shop floor that is empty, and I have a crane there, I have air, I have electrical. I know the piece of machining technology that I would like to invest in. This piece of machining equipment and technology would decrease our lead times. It would increase our productivity. It would get us into new markets that we are not currently in, and it would create jobs—highly skilled, highly paid jobs in machining.

So, due to the bonus depreciation dropping to 60 percent, that changes my return-on-investment calculation, and it feels like an irresponsible business decision, and it feels too risky. It is honestly an awful feeling. It is a roadblock to achieving our mission.

My customers are large manufacturers all across our country, and they need to have confidence in their domestic supply chain so they can focus on what they do best. In order for them to have that, I have to be able to invest in machines. I have to be able to invest in our people and invest in processes.

The CHAIRMAN. Mr. Huntsman—and I am over my time.

Mr. HUNTSMAN. Chairman Wyden, I will not repeat what has already been said here. I would just note the company spends roughly $150 million a year. We do not invest 1 year at a time. We invest over a horizon of 20–30 years at a time when we build facilities.

So, what Ms. Janis said earlier about making this permanent would be incredibly helpful. It would also be very helpful if the government and the regulatory body, particularly around the EPA—and the Senate worked very hard to pass TSCA, which gives the EPA 90 days to approve all the work that comes out of our R&D facilities. We are now waiting in some cases up to 3 to 4 years to have our technical innovation, and the progress that we make in chemistry, approved so that we can manufacture. So it would be great if we could make it permanent; it would be great if the regulatory bodies could also be supporting us as well.

The CHAIRMAN. All right.

Senator Crapo?

Senator CRAPO. Well, thank you very much, and let me at the outset say I agree completely with—in fact, I do not know that

there is a stronger advocate in Congress for extending and making permanent the three expired or expiring TCJA provisions that have been referred to here: the R&D tax credit, the bonus depreciation, and the interest deduction. My hope is that we can get there sooner rather than later. There are, as everybody knows, some concerns on the Republican Senate side with regard to other provisions in the bill. And my hope is that the Republican Senate can have its voice, we will be able to deal with it, and get something resolved quickly.

It is a difficult time, and as with almost every single issue in this Congress today, there are difficult battles to deal with. That being said, I do not disagree with the testimony of any one of you. In fact, you are all giving great examples of why those three provisions of the TCJA are so critical.

I would like to go to you first with my question, Mr. Huntsman. I understand, as the example you gave, your need in your company to delay the opening of a new chemical facility because of how the IRA is being implemented. Tell me if I have this right. I understand that you were basically undercut by Chinese price fixing, if you will, by the Chinese market, in your effort to develop this new chemical—its name I cannot repeat right now—and that the ability of the Chinese to simply underbid you in the market caused you to have to stop the production.

Is that a very first grade level of explaining what happened?

Mr. HUNTSMAN. Yes. Well, this product, ethylene carbonate, is one of the raw materials on a chain. Look, there were positive things in the IRA, obviously, that came out. One of the areas of concern with us is that the Treasury Department recently came out and said that a number of products that China produces will be exempt when we talk about things that are made in America.

I think if you would write down this rule right here, we would all agree that when it says "made in America" that ought to be the entire supply chain too. It ought not just be a bunch of products that come in from around the world and the final assembly is made in America, but that entire supply chain is made in America. With a product like ethylene carbonate, that was a product that we were hoping the Treasury Department would define that way and look at as a product that should be made in America. When there are other products like graphite and so forth—we do not make any of that in the United States, but we need to build those industries; we need to be given incentives. So this is a product that we hope the Treasury Department, hopefully in due course, will see fit that we ought to have as a domestic component. And when the Chinese undercut prices like this—this is usually just on a temporary basis—this discouraged hundreds of millions of dollars of future investment not just by Huntsman, but other producers as well, for other companies to come in and eventually produce these products.

Senator CRAPO. So, thank you. You have explained it very well, and I want to be sure that we make this point. The solution to stopping your particular crisis with the Chinese undercutting your prices could be fixed regulatorily by the United States Treasury Department in its regulatory actions. Am I correct?

Mr. HUNTSMAN. Yes, sir.

Senator CRAPO. So this is a situation in which our interpretation of, or our implementation of, the IRA has not been effective enough to get us to the point where our American producers can have a balanced playing field against the Chinese?

Mr. HUNTSMAN. As it pertains to this product, yes, sir.

Senator CRAPO. Yes; and I assume that there are a lot of other products that are on that same list, that would like to be getting into the designation of being an American-made product?

Mr. HUNTSMAN. Assuming that we are allowed to produce those products on a competitive playing field, yes, sir.

Senator CRAPO. All right. Thank you very much.

The CHAIRMAN. Senator Lankford, you are next.

Senator LANKFORD. Mr. Chairman, thank you. Thanks for the hearing and pulling this topic together. You all, thanks for the testimony as well, and to be able to bring these things together.

We do need to get permanency in the tax code. What we are discussing currently right now is a temporary fix, but we need to get some permanency to our tax code, so it is predictable. I heard a number of you say basically, get the tax code set and leave it alone. Make it business-friendly so we can actually hire people, buy equipment, do those things and be able to set it.

I have the ALIGN Act that deals with the bonus depreciation, to try to make this permanent so it is predictable. This has been bipartisan in the past. Every year since 2000, we have had some kind of bonus depreciation except for 2007. This has not been a partisan issue for us. It is a basic progrowth policy in our tax policy, and I would like to be able to get it set and to be able to leave it there.

Ms. Silver, you mentioned a lot about this bonus depreciation piece and some of the investment—obviously, a big gap in your shop floor right now waiting on a piece of equipment to be able to come. Talk about the difference between if we—60 percent now, as you mentioned before, but just scratch that. If we just set it and just leave it alone—obviously north of 60 percent, because that is not the tax piece that you need at this point—what is it on the permanency that makes a difference? Because there is some conversation to say the bonus depreciation should just come in in times of economic downturn, and not be normal, standard policy.

Should this just be made permanent, or is it better when it is just in an economic downturn, to turn it on and off?

Ms. SILVER. Definitely permanent. Planning, taking risks, innovating, wanting to be here for the next 80 years, requires a permanent, stable, consistent, common-sense tax code.

Senator LANKFORD. Great. It's what we all expected to be able to hear, and it is what I think we need to have. And obviously next year, as we sit down and talk through a lot of the tax issues as well, we've got to find a way to be able to move this from, over the next 2 years it has this, to as far as the eye can see, to be able to get this set so that we know what policy we are actually going toward and where we are headed on this.

Some of the challenges that we have had have been on hydrocarbons, Mr. Huntsman, as you have brought up as well. It is remarkable to me to be able to sit in this room at times and to be able to hear a conversation about ending drilling or ending hydro-

carbons, and I sit in this room and think "the carpet is made of hydrocarbons." That little sign right there is made of hydrocarbons. This chair is made of hydrocarbons. This bottle is made of hydrocarbons, and the belief that at some point we are going to just turn all that off and that is going to work out well for our economy is just factually not true, based on what is happening both in chemical production and in energy production, trying to keep the costs down.

What we have seen is a rise in cost in hydrocarbons right now that is unnecessary in some ways. And the IRA, when it came out, specifically targeted oil and gas production, to be able to target them, to raise their taxes significantly. Every one of you can deduct your everyday expenses. Every one of you can deduct your everyday expenses, unless you are an oil and gas producer. And now you cannot do that anymore. So that particular type of manufacturing was pulled out and punished in the tax code, in the IRA, and the result that we have seen is higher prices now for oil and gas. It means higher prices for manufacturing, higher prices for the consumers.

So the challenge that we have is how to be able to actually protect those mid-size businesses, so that they do not have to deal with higher tax burdens as well. The Protecting Domestic Energy Act is an act that I have on this.

I have a letter, Mr. Chairman, I would like to be able to enter into the record. This comes in from the American Exploration and Production Council and Domestic Energy Production Alliance, what we know affectionately as AXPC and DEPA. Those organizations are saying, hey, we need to find some way to be able to not just deal with the tax code for this manufacturer, but for all manufacturers, and actually have fairness in the tax code as well, so that they are not specifically targeted.

The CHAIRMAN. Without objection.

[The letter appears in the appendix beginning on p. 90.]

Senator LANKFORD. So my question on this is, when we start dealing with the issue of hydrocarbons and start to deal with all of the challenges that you have dealing with China, and what Senator Crapo was saying as well, all the issues about antidumping—and I want to drill down a little bit on that with you, Mr. Huntsman.

How difficult is it to make a charge on dumping on a trade charge, as far as the legal fees, the challenges of it—to say not only is our own Treasury allowing an exception for a Chinese company which drives American manufacturing out, but if you wanted to make an antidumping charge on China, how technically difficult is that, and is that something this committee, which also has a responsibility for trade, needs to take on?

Mr. HUNTSMAN. In the 30 years that I have been president of this company, I do not think we have ever initiated an antidumping charge, not because it does not occur. It is just too long, too complicated, and you rarely ever see it through to fruition. It would be great if we could somehow just streamline that process and come to a conclusion quicker. We are not asking that justice be more on our side or anybody else's side; just make it where you can come to a conclusion quicker.

Senator LANKFORD. Yes. I have heard that over and over again; steel, for instance, and all kinds of manufacturing to say, we know the dumping is happening, but it is too complicated, too expensive, takes too long to be able to do it, so we just shut down manufacturing rather than actually charge antidumping. And the American consumer and American businesses and jobs continue to get hurt.

Mr. Chairman, I know this is a tax conversation, but this issue on trade is exceptionally important for this committee to take on as well.

The CHAIRMAN. You got me at "hello" on the whole issue of streamlining the dumping rules, because we hear this in sector after sector. So, message sent.

All right. Let's see. Senator Casey, you are here by your lonesome. We are glad you are here, Mr. Manufacturing.

Senator CASEY. Mr. Chairman, thanks very much, and thanks for calling this hearing. I want to thank you and the ranking member. I want to thank our witnesses for being here. I will direct my questions probably to only two of our witnesses.

But I wanted to start with the recent record. It is really a remarkable record of job creation, especially manufacturing job creation. The years 2021, 2022, 2023 each had more job growth than any year since the 1990s. According to the Federal Reserve, private companies are currently investing a record $225 billion to build and refit new manufacturing plants.

That is three times the manufacturing investment we saw before the pandemic. So that is why we are glad to be with the manufacturers in front of us here, as well as the Steelworkers, to talk about what you are investing in America and also expanding America's productive capacity.

Mr. Widmar, I will start with you. You testified about First Solar's "uniquely domestic supply chain." Can you tell us what are the advantages of having an American supply chain?

Mr. WIDMAR. Yes. For me, it all comes back down to certainty and integrity of your counterparties, to deliver against obligations and commitments. We are making investments that are multiyear investments that go out really toward the end of this decade. And I need to have counterparties and partners who can grow and can scale with me, that I know are going to be there at the time that I start to ramp up a new factory.

My supply chain is just instrumental to the success of our company long-term. Trying to have a supply chain for our manufacturing operations in the U.S. that is offshore or in Southeast Asia or even China just opens you up to too much risk and exposure.

We saw that through the pandemic and the disruption in ocean freight, the cost associated with it, and we have seen it more recently with what is going on in the Red Sea. I make a product that comes off a production line about every 1 second somewhere in the world, most of that being here in the U.S.

I produce 24–7, 365. I need a supply chain that can be there with us to grow. If my glass supplier does not meet their delivery commitment, I cannot run my factory. If my junction box supplier does not meet their commitment, I cannot run my factory.

So, having a supply chain that is close, that we can rely on, have certainty around, has been instrumental to our long-term success,

and it translates into success in our relationship with our customers. We have a very unique approach compared to our competition, which we refer to as "responsible solder."

We have a circular economy approach to what we do. We recycle everything that we make. Over 90-plus percent of the content is recycled and reused, and having supply chain partners that can work with you to evolve your value proposition into the marketplace has been very important for us, and we have been very successful with selling out multiple years of demand right now.

Senator CASEY. Well, that is good news, and I think a lot of what you said is what we were contemplating when we were putting together the Inflation Reduction Act. In that legislation, I sponsored a domestic content bonus tax credit, which rewards companies that have American supply chains. That means that they manufacture their product in America, with American materials and American workers, from start to finish. In fact, First Solar will be buying, I am told, $2.6 billion worth of high-tech glass from a Pennsylvania manufacturer, a manufacturer that has locations in both Meadville and Carlisle.

And I wanted to ask you—or if you can tell me about the effect that my domestic content bonus credit has had on your business and your suppliers in Pennsylvania.

Mr. WIDMAR. So right now, with the current guidelines that are out on domestic content, we started a journey in about 2018–2019 to localize our supply chain. Timing was obviously very good, given how things have moved forward. But it was a strategic thread along the lines that I referenced before, and why we wanted a domestic supply chain.

In today's market right now, we are the only company under the current guidelines that qualifies to have a domestic product here in the U.S. All of the components that are required in order to meet the requirements for domestic content are sourced in the U.S. and are manufactured here in the U.S.

So, it translates directly into our ability to sell through to our end customers, to give them the world's leading, best technology, and for us then to contract to have multiyear investments in contracts that go out now through 2028 and 2029.

Senator CASEY. That's great.

Mr. Chairman, thanks. I will have questions for the record for Ms. Fendley; but thank you.

The CHAIRMAN. Thank you, and thank you in particular, Senator Casey, for all your contributions on the IRA, because I know that was a difficult and challenging issue for many of your communities, and I think we are getting it right. Those are communities I have in timber and natural resources. So I am glad to be in line with you on that, and thank you for your work.

Okay. Senator Blackburn, you are next.

Senator BLACKBURN. Thank you, Mr. Chairman, and thank you for the hearing on this. I want to talk a bit about competitiveness, and as we have gone through the hearing this morning, you have heard a little bit about that.

When I talk to Tennessee companies, this is what they talk with me about, whether they are competitive domestically, competitive in a global market. They talk about the inputs and the cost of those

inputs, the importance of taxes and tariffs and how that plays into their pricing and therefore their competitiveness. And let us go to Ms. Silver and Mr. Huntsman—Ms. Silver first and then Mr. Huntsman—because I do want to talk about the Tax Cuts and Jobs Act.

When I talk to Tennesseans, they talk about how they benefited from that, and cutting that tax rate from 35 to 21 percent, and basically saying to businesses this is a good place to invest and to grow your business. And then we hear the President yesterday talk about hiking that corporate tax rate to 28 percent, and then increasing the book minimum tax from 15 to 21 percent, which—as you can imagine, I heard immediately from some of our manufacturers.

So, Ms. Silver first, and then Mr. Huntsman. Talk to me about how the TCJA helped you to grow your business, how it influenced the decisions that you make, and what would be the consequences for raising that tax rate? Ms. Silver first.

Ms. SILVER. Thank you for the question, Senator. So TCJA provisions were—they were rocket fuel for us. We were able to invest over a million dollars in capital equipment to create jobs, give our team members quarterly bonuses, raises. It gave us confidence, and not only confidence, but it gave us cash flow. It gave us liquidity, which has especially proved to be critical going into the unexpected years of the pandemic.

And a quick example of even just some of these tax provisions that you mentioned: because of those TCJA tax provisions, we were able to, a couple of years ago, invest in our first collaborative robot. So this robot allows us to run a machine during the day and after shift, with no one there.

And so, it decreases our lead time. It increases our productivity, so much so I was able to pass along a cost savings. I was able to reduce my customers' price on these particular precision machine parts. This customer is a large customer in the fluid motion control industry. So, we were able to invest in our company due to good progrowth tax policies, passing along these savings to our customers. They are able to reduce their cost of goods sold, and then I still am making a very healthy profit. So this is—it is a win-win for the entire manufacturing supply chain.

Senator BLACKBURN. Good.

Mr. Huntsman?

Mr. HUNTSMAN. Thank you very much. We were able to bring over a billion dollars from offshore businesses back into the United States. At least half of that went into projects over the course of the last 5 years, capital projects to expand production, to bring manufacturing into the domestic market share. And for us, that has bolstered our R&D, where we have been able to develop new technologies in the field of chemistry to reduce waste, better recyclability, and so forth. So, as we look at that entire supply chain for us, it has made the United States now one of the most competitive areas in which we can invest.

Senator BLACKBURN. Excellent.

Thank you, Mr. Chairman.

The CHAIRMAN. I thank my colleague.

Senator Warren is next; no, let me see. Senator Warren, Senator Barrasso was here first, so Senator Barrasso is next, then Senator Warren. And colleagues ought to know that we are getting ready to wrap up.

Senator Barrasso?

Senator BARRASSO. Thanks so much, Mr. Chairman. Mr. Huntsman, good to see you again, and good to be with you. Thank you, Mr. Chairman, for pulling all these folks together.

You know, conventional energy is at the heart of U.S. manufacturing. Petrochemicals derived from oil and natural gas help our Nation manufacture thousands of the everyday products and the high-tech devices that people use every day. These include plastics, clothing, digital devices, medical equipment, pharmaceuticals, detergents, towels, and fertilizers to grow our food.

So ironically, solar panels and wind turbines rely heavily on oil and gas production. President Biden and many Democrat colleagues in the Senate want to move us away from these resources. They use the tax code as both a carrot and a stick to make that happen. They throw up regulatory roadblocks to stifle traditional energy production and refining, and you mentioned this in your testimony. But I just don't think we can hear it enough right now. What would it mean for U.S. manufacturing if we continue to move away from oil, gas, coal production, and is manufacturing even possible without the production of those fossil fuels?

Mr. HUNTSMAN. Thank you very much, Senator Barrasso. It is very nice to see you as well.

Look, I have no problem moving away from fossil fuel, so long as you can move me to something else, and the problem is, there simply is no replacement, as I said in my prepared remarks. Even if you were to go to a complete fossil-free energy grid system, if we were to go to 100-percent nuclear, you would still need these basic building blocks to produce all the products that you have just said.

And then we talked about one of the greatest inflationary pressures on society, particularly for those of low income. It is the inflation that we see in these basic raw materials. We simply pass these through. I should not say "simply," because we are still having to compete against foreign entities and so forth.

But these higher costs—whether it is in taxation or whether it is in raw materials—are just pass-throughs that go on down, and they put the inflationary pressures, as we saw in this morning's numbers. These are stubborn things to turn around.

Senator BARRASSO. Energy prices are certainly up, but also food, groceries. I mean, the thing I hear about in Wyoming is the cost of going to a grocery store, and it is much, much higher than it was 3 years ago when this administration took over.

Mr. HUNTSMAN. Well, your cost of manufacturing food, protecting food, cold storage of food, packaging of food, transportation of food, that is all part of our supply chain, where we produce the supply.

Senator BARRASSO. I wanted to get to China if I could. As we find opportunities to grow U.S. manufacturing, I think we have to look at ways to limit China's influence in the United States in terms of manufacturing, the impact on supply chains.

You know, the so-called Inflation Reduction Act, with the help of the administration, I think favorably opened the door for U.S. tax

dollars to go to entities controlled by China. Our energy and green manufacturing sectors are flooded with expensive tax credits, and this tax and spending bill is pushing us away from the fuels and the technologies that America dominates.

Instead of pushing us toward the minerals and technologies controlled by China, I think we ought to be focusing more on what we do here in the United States. So, "American Made" is the title of this hearing, but the products and technologies that the Democrats are subsidizing are going to be put in with components and materials that say on them "Made in China."

So my question to you is, what are some of the ways that China benefits from this so-called Inflation Reduction Act, and isn't that hurting us?

Mr. HUNTSMAN. Well, many of the products that go into the supply chain, the battery components and so forth, are exempt or we do not have to say that they are made in China. We can just say we do not produce them here, and they are going to be part of that.

So, you look at Ford's recent earnings, and I do not have the exact numbers—I think maybe somewhere between $50,000 and $60,000 per car, per EV they produce. I can assure you that China does not lose money on the battery components that they are selling into that EV, everything from the cadmium to the lithium to the cobalt and so forth, the manganese products that we can be producing here domestically, ethylene carbonates and so forth.

Those products are of great profit, and they continue to be subsidized by Chinese coal and government subsidies. So, there is that balancing where we either need to commit to that production and those supply chains ourselves, incentivize and admit that we need to get in there, or we need to let the Chinese do it if we are going to have an EV fleet.

Senator BARRASSO. And from what I have read from the economists, for most traditional vehicles—you ask the average person what percentage of the entire cost of the vehicle is the battery. For electric vehicles, about half of the cost is the batteries. Is that consistent with your findings?

Mr. HUNTSMAN. Well, it certainly is the most technically oriented and the part with the fewest raw material suppliers. You do not go out and find 20 different suppliers of cobalt. Usually you have one or two Chinese producers in these areas. This is not something you go scour and you get in 15 different suppliers around the world.

Senator BARRASSO. Thank you.

Thank you, Mr. Chairman. My time has expired.

The CHAIRMAN. I thank my colleague. Senator Stabenow is next, and I appreciate all my colleagues being patient. We have people coming and going, and it is a little hectic, but I think we can get to everybody.

Senator Stabenow's next.

Senator STABENOW. Well, thank you so much, Mr. Chairman. I am glad I got in at the end of this conversation a little bit. It is interesting to me as we transition, as a person who has authored the Made in America Office that we now have and the robust incentives for Buy America. We know that we do not yet produce everything here; that's why we are scrambling so hard to be able to

get that done. When we passed the CHIPS Act, we did not say you cannot—manufacturers or technology companies and so on—buy any more chips overseas, you've got to wait 5 years until we get these fabrication plants up and going in the United States.

We did not say that. We did not say that. It would have been pretty dumb to say that, and instead what we are doing is building the capacity here so we can bring those jobs home as we continue. Now, the reason this is such a big fight is because it is oil and gas on one side, who are frantically trying to slow down EVs.

And so, that is the undercurrent that I see happening all the time on this, as we transition to the technology and batteries and other kinds of technology that are needed for electrification of vehicles. And we will get there. In fact, in the past 3 years under President Biden we have made incredible progress in a whole range of clean energy areas, $649 billion—with a "b"—in new private-sector investment announcements across an array of industries.

There is more to come, and we know we have nearly 15 million new jobs, including 800,000 new manufacturing jobs and counting. We have about 350,000 new jobs in Michigan that we are very excited about. When you make things, you say "Michigan," and so we are very excited about that as well.

But this could not have come at a more important time, because we are on the knife's edge of ceding an insurmountable lead to China on advanced manufacturing. We know that, which is why the strategy has been put in place with the infrastructure law and CHIPS and Science, and most notably the Inflation Reduction Act. That is what is going to allow us to make that transition to own this technology. There is no reason we cannot do that. We have smart businesses, smart workers creating the technology, and we are in a position to retake our position as global leaders.

And so, when we look at this—I mean, we are hearing people talk about a domestic manufacturing renaissance, and I think we are starting it. But it is a transition, just like any other transitions to new technology.

Unfortunately, there are huge, very, very big wealthy forces on the other side that do not want this to happen and will continue to put out, what I view as disingenuous and many times just plain false information, to try to slow this down as much as possible.

Questions: one provision that is going to play a particularly important role in putting America in the driver's seat will be the clean energy manufacturing tax credit, 48C. I first authored this in the 2009 Recovery Act. We have now brought it back in our focus on this, and I think this is going to be an important part of this.

Miss Fendley, I wanted, first of all, to thank you for the United Steelworkers' support for this provision. You have been very steadfast in supporting this and making things in America and bringing jobs home. So I appreciate that. As we allocate the decisions for the first round for 48C, Ms. Fendley, what sort of impacts do you foresee this credit having in communities across the country?

Ms. FENDLEY. Thank you for the question, and we are also very glad that you have brought this credit back. Congress allocated a tremendous amount of money to catalyze investment in manufacturing jobs in communities across the country.

I think one of the most important things that Congress did is allocate a portion of the funding directly to coal or energy communities, where there is potential or already job loss that has happened, so that we are reinvesting in these communities through 48C and hopefully through follow-on private investment, to really rebuild some of those local economies.

Senator STABENOW. Great. Thank you very much, and let me ask a question on the domestic content bonus. Solar is one area where we have a lot of catching up to do in the United States as a global leader. As it stands right now, Chinese-headquartered companies now make up 99 percent of the world's solar wafer and 80 percent of the world's polysilicon production to core components that make up half the cost of solar panels. But we also are in a position to be able to take that back. So I sent a letter along with many colleagues, asking Treasury to ensure that solar polysilicon and wafer manufacturing are both counted in the IRA's domestic content bonus rules.

Mr. Widmar, if you could—I know I am out of time here, but how important is it that the administration get the implementation of this right as we go forward?

Mr. WIDMAR. I think it is absolutely critical, and I obviously applaud you and some of the other Senators for proposing the legislation that would actually require the wafer to be included in as part of the definition of domestic content. The intent of the IRA, as well as for the domestic content, was to enable a domestic industry, a domestic value chain.

You have to then associate value to those various components, and where there is technology differentiation or there is high value-added manufacturing, to simply allocate domestic content criteria benefits to module assembly does nothing for us. I think Mr. Huntsman made a very similar comment about that earlier on as well.

We need to enable cycles of innovation and technology here in the U.S. It is no secret—and it should not surprise anyone here—China does not want the U.S. to have its own domestic capabilities. We not only manufacture here in the U.S., we actually manufacture in other markets internationally, such as India. India has put in similar policies, and China is trying to disrupt that.

That is why there is such a global oversupply right now. They are trying to usurp the opportunities that countries like the U.S. are trying to create with domestic capabilities. We have to avoid that at all costs, and we have to make sure there is value created to the technology, and the domestic content has to be associated with that.

Senator STABENOW. Thank you.

And as I close, Mr. Chairman, I just want to put in a plug—you already talked about the Wyden-Smith tax bill. The research in there is so important, the R&D tax credit is so, so important to this discussion. Thank you.

The CHAIRMAN. Thank you.

Senator Carper is next.

Senator CARPER. Thanks. Thanks, Mr. Chairman. Thanks for putting this together. To each of our witnesses, good morning.

Thanks for joining us today and for sharing your thoughts and responding to our questions.

Manufacturing is one of the largest sectors in Delaware's economy. We are big in tourism, big in agriculture, big in biopharmaceuticals. We are also a growing presence in manufacturing jobs, which is a good thing. We are a small State, but just, I think, the last couple of years we added about 2,000 new manufacturing jobs, all of them welcome, and we are excited about that.

In Delaware and across our country, clean energy has been at the forefront of the manufacturing boom, as you know. As we know, without the right incentives to help American companies scale their production, demand for these clean energy technologies will go to the lowest-cost producers in China.

I have a question for Mr. Widmar. We do not mean to pick on you, but you showed up, so we are going to take this opportunity. But can you just explain for us how the Inflation Reduction Act has provided certainty for your business and strengthened domestic supply chains in the solar industry?

Mr. WIDMAR. Yes. I think this is what is so important about the Inflation Reduction Act, that it is the first time it actually gave a view of a runway, a certainty around a policy environment that would go out 10 years effectively, right, to the early 2030s. It also created an opportunity to enable and create a value to all participants in the industry. So, whether you are the developer of a project, whether you are the manufacturer of the technology, whether you are the owner of the generated asset, there is value for everyone that we all could align to.

It was the first time there has ever been that type of industry approach and overall alignment so that we can now work collectively and collaboratively together for success. So it created a long-term vision, it created the alignment, and then it enabled the investments that needed to be made. So, if you think about it, one of the key opportunities on policy has to be around industrial policy, which the IRA did. It gave us a very strong industrial policy and gave us a very strong demand profile. So the manufacturing tax credit was very enabling of an industrial policy, and a production tax credit with bonus adders for domestic content and the like addresses the demand side of the equation, which were two fundamental enablers of a policy environment that people could move forward to.

And then we have added—a lot of new capacity has come into the U.S. We personally have doubled our manufacturing here in the U.S. because of the IRA. We have a local supply chain, so 100 percent of our materials are sourced locally. So we actually then enabled our suppliers in turn to grow.

And as we indicated in our prepared remarks, if you go through and you look at the economic impact of what we as one company are doing as the result of IRA, it is creating 30,000 direct, indirect, and induced jobs here in the U.S. That will be about $2.8 billion of annual payroll. I do not know of any other policy that can have that direct of an impact around U.S. manufacturing, innovation, and jobs.

Senator CARPER. Thanks for your comments. As we know, there are a lot of factors that determine whether or not businesses are

going to be successful or not. One of the things that is most important is certainly predictability, and I am reminded of that almost every day in the work that we do here.

Over, I think the last 15 or so years, Delaware has positioned itself as a leader in our country's hydrogen and fuel cell manufacturing economy. We are not alone in that regard. In order to sustain this growing industry, we need to extend the traditional fuel cell investment tax credit until green hydrogen is available at scale. I have introduced bipartisan, bicameral legislation to do just that, and I wanted to thank and express my appreciation to our fellow committee members, Senator Brown and Senator Tillis, for joining me, and my lead sponsor, Senator Lindsey Graham.

We look forward to continue working with Chairman Wyden. We look forward to working with Ranking Member Crapo and the rest of our colleagues to find a path forward to extend this critical tax credit.

With that, I thank you, and bid you "adieu."

The CHAIRMAN. I thank my colleague.

Senator Tillis is next.

Senator TILLIS. Sorry, Mr. Chair. I thought it was Senator Johnson.

Senator JOHNSON. That's what I thought too.

The CHAIRMAN. You know something? You are right. Senator Johnson is next. My apologies.

Senator JOHNSON. Thank you, Mr. Chairman. You know, I just came from a Budget hearing where the President is presenting a $7.3-trillion-a-year budget. This is $3 trillion more than the $4.4 trillion we spent in 2019. Astounding. There is not 1 year, projecting out 10 years, where the deficit is less than $1.5 trillion.

So, we are talking about the tax code, and a quick question for all the witnesses, just a quick "yes" or "no." Do you think our current tax code is simple and rational? Mr. Widmar?

Mr. WIDMAR. That is a dangerous question, but I will say "no."

Senator JOHNSON. Ms. Fendley?

Ms. FENDLEY. I would agree. It is challenging.

Senator JOHNSON. Ms. Janis?

Ms. JANIS. I would have to agree. It is extremely complex.

Senator JOHNSON. Ms. Silver?

Ms. SILVER. No.

Senator JOHNSON. Mr. Huntsman?

Mr. HUNTSMAN. No.

Senator JOHNSON. So I ran a manufacturing plant for 30 years. I have made investment decisions and invested millions of dollars in plant and equipment, and from my standpoint the thing that was most annoying, other than the regulation—overregulation—was the complexity of the tax code. I never made an investment decision based on tax treatment, quite honestly. I mean, when you get right down to the nub, I suppose you can take a look at the ROI and determine, well, if I get this deduction now, it is going to put me over that limit. But generally, I was responding to supply and demand, and looking ahead.

As a student, I took accounting and got an accounting degree. And I remember a tax course where one of the tax principles was wherewithal to pay. So I guess the point I am trying to make in

this questioning is, rather than arguing over these different treatments economically engineered through the tax code—I think we do a terrible job of it, because it comes and goes, it creates a high level of uncertainty.

What I am proposing is, why don't we, rather than reform our tax code—all change is not progress, all movement is not forward—why aren't we talking about simplifying and rationalizing it? Wouldn't that be a better way to approach this thing, to take a look at this goal: what is a simple way of taxing American business?

I would suggest a really simple way would be to consider cash income taxable income. Then you would not have all these issues of R&D tax credits and accelerated depreciation. And by the way, it would just be a timing difference, correct? Mr. Huntsman, you obviously operate on a global scale. Don't you think that would be a rational approach here: simplify the tax code, let us tax cash income, and get rid of all this crap? I would just like your comment on it.

Mr. HUNTSMAN. You are getting me kind of just a little bit off kilter here. It sounds—it sounds reasonable. Yes, it does.

Senator JOHNSON. Oh, it is very reasonable.

Mr. HUNTSMAN. Okay. I, without having studied——

Senator JOHNSON. It is also very doable.

Mr. HUNTSMAN. Without having studied it, yes. Yes, sir.

Senator JOHNSON. But we don't do it because all of a sudden you don't have lobbyists coming here every year and having to lobby for this tax treatment or the other tax treatment. You know, I think it is remarkable—and again, I was not a really big fan of the tax act in 2017, 2018. I had to dig my heels in, because all we were going to do was cut income taxes for the top 5 percent of C corps. You know, great for the C corps. Really bad for pass-throughs who have to compete with that. So I dug my heels in. In the end, I voted for it.

But what is not widely known is—because we did not know it at the time—what the effective tax rate of C corps was in 2017 and 2018. It was 21 percent, for both large and small C corps. Now, after the tax act, for large corporations the effective rate is 10 percent. For small corporations, C corps, it is 14 percent. So in that act, we actually created disparity between large corporations and small corporations. I do not like that fact. Plus, with the pass-through provisions expiring in 2026, now we are going to have an enormous disparity between the top 5 percent of C corps versus the other 95 percent of businesses.

So I guess my appeal to this committee is, let's take a look at what we need to do in 2026. Let's simplify and rationalize our tax code. You know, income is income. You need wherewithal to pay. So let's just tax cash income, and then we do not have to worry about all these provisions. We will not have all these lobbyists coming in here begging for a continuation and totally screwing up their business models.

Yes, I completely agree with the fact that with all these things being temporary, it is very hard to make business decisions if you do not know what your tax treatment is going to be. So that is basically my pitch. I would like all of you to consider it, and I would

certainly like the chairman and the ranking member to consider what I have been proposing.

Thank you.

The CHAIRMAN. Thank you.

Senator Bennet, you are next.

Senator BENNET. Thank you. Thank you, Mr. Chairman. I would like to thank the panel for being here, and thank you for holding this hearing.

My first question is for Anna Fendley and for Mark Widmar. Thank you for being here. With the IRA, we passed the most significant climate legislation that any country on the planet has passed, and because of that bill, the United States is better positioned than any country in the world, I think, to lead the global transition in energy. The IRA incentives will help us deploy a lot more solar, a lot more wind and battery projects, and help us add three times the amount of clean energy to the grid by 2030. That is all good news from Colorado's perspective. Those incentives were also designed to help us ensure clean energy supply chains so we can begin to wean ourselves off products from China and other countries around the world, something the American people want us to do.

Last summer, I visited Pueblo, CO, which was once the steel capital of the West, and it powered our State; it powered our country for decades. That community has long felt ignored by Washington for good reason. It felt stymied by our inability to actually invest at home in our own industries until now. In Pueblo, I visited CS Wind, which is now the world's largest wind tower production facility. The facility is expanding to double its input, and the chairman of CS Wind told us that this expansion, Mr. Chairman, would not have happened without the tax credits that we passed in the IRA. As a result, the company will create 850 new jobs in Pueblo, jobs that pay a good wage—a really good wage—and equip workers with the skills for the 21st-century economy.

Because of the legislation we passed, for the first time in a long time, we are actually outcompeting the rest of the world. We are showing the world what it looks like when America actually invests in America again.

So, Ms. Fendley and Mr. Widmar, could you speak a little bit about how these clean energy manufacturing tax credits, not only for wind but for solar and for batteries, will continue to drive clean energy deployment, create good-paying jobs, and spur new investments in communities around the economy? How are these provisions in the IRA helping us to compete with China? You can fight it out. No, I was just kidding.

Ms. FENDLEY. Well, I will pick up on your question about China. It has been a conversation by most of the witnesses here today, and I think China has had a long-term industrial strategy on many of these technologies that you are talking about. The Inflation Reduction Act, along with the CHIPS bill, along with pieces of the Bipartisan Infrastructure Law, are industrial policy for the U.S. They are providing some long-term policies that manufacturers can take some certainty from, that will help us build and deploy here in the U.S. and, hopefully, export to the rest of the world.

Mr. WIDMAR. Yes. As it relates to growth and adoption of solar, it has been a significant catalyst. You know, some of us were meeting with a handful of customers a week or so ago, and one of our key partners, who is developing about 10 gigawatts of solar across the U.S., said he had no issue right now with, he referred to it as "customer acquisition."

There is a tremendous amount of demand right now. It is a matter of how to best serve that, or what are the constraints that we are dealing with right now in order to address the underlying market demand? There are issues like grid capacity or transformers. Certain equipment today is a little bit more challenging in order to meet the requirements of the build schedules that we are starting to see, so those are becoming some challenges.

So, the catalyst in the market is strong. The other challenge, I would say, is just certainty. With the onslaught of the collapse in global pricing for solar modules right now, with the excess supply that China has dumped into the international markets that have been heavily subsidized by their domestic industry and then exported into international markets, it is creating some concern right now in terms of the ability to deliver against the vision that a lot of people have set out to accomplish.

So that is something that needs to be addressed. And when you lack certainty, you lack ability to move investments forward through investment committees. And lack of understanding of announcements that were made here in the U.S. for new manufacturers—you know, First Solar is unique in our technology, right? So our technology is thin film. I do not have the same constraints of the supply chain that my competition does.

But we all do one thing. We take photons, and we make electrons with a semiconductor that is sitting between two sheets of glass. That is what we do, and the world of electrification cannot happen unless somebody's making photons and changing them into electrons, at least enabled through solar. So we need the innovation and the capabilities here in the U.S. market, to really aspire to accomplish the vision.

Senator BENNET. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. We have a vote on, and we are going to try and get everybody in.

Senator Tillis is next.

Senator TILLIS. Thank you, Mr. Chairman. I will be brief. First, I want to welcome everybody here to the committee, but I also have to favor Ms. Silver, who happens to represent a North Carolina manufacturer that is only about 25 minutes from my house. So thank you all for being here.

I am glad that we are having a hearing about how tax policy can basically improve economic circumstances for everybody. I think we proved that in 2017 when we passed the Tax Cuts and Jobs Act. There is no question, by any reasonable measure, that the economy had an immediate response to it. In fact, I am so glad that we did it. It was a partisan maneuver made through reconciliation, but thank goodness that the economic activity was where it was before we encountered the pandemic.

Can you imagine if our economic activity had been at the rate that it was in 2016? I think it would have been devastating, and quite honestly, we would not have had the resources, or at least the optimism about future resources, to commit the trillions of dollars that we did without paying for it when we were passing those bills. We did it solely on the basis of the need to address something that no Congress had had to deal with for 100 years.

So, Mr. Chairman—I really appreciate the chair's leadership. We have a difference of opinion about how we get some of these tax provisions done this year, but I appreciate his leadership. In fact, I like him so much I try to coordinate my wardrobe to look like yours on hearing day, Mr. Chairman. [Laughter.]

But we have an honest disagreement about timing and packaging. I have had several CEOs call me since I stated my concerns with the Wyden-Smith bill as it currently stands, and they would be CEOs of companies that you all would recognize. I let them build the case for me supporting the bill, and I went on to say I would consider you to be guilty of malpractice if you did not make this phone call, because your job and your fiduciary responsibility to your investors, to your employers is to maximize your business performance.

My job is to do the same for the U.S. Government, and so, while I understand—and none of these CEOs, incidentally, have an opinion on the Child Tax Credit, the $34-trillion, 3-year program that arguably, I think, should be scored at $600 billion over 10 years. They are not taking a position on that. They are taking a position on the tax provisions. I have the unfortunate circumstance of having to take a position on both, and then judging the measure on the whole. On the whole, I think that we are making a mistake to move it forward in its current form, and I hope that Senator Crapo and Senator Wyden get to a point where I do not have to take this position.

We have a number of bipartisan bills that have been filed—supported by Democrats and Republicans—on the tax provisions that are in this package. It is a bipartisan package. What we do not have is bipartisan agreement on a number of the tax provisions that we need to extend next year. I think we have to have a fulsome discussion about the entirety of the tax measures that need to be in place for us to continue to move, I think, to a positive place in terms of economic performance. Without that, it is very difficult for me to support the package as it is. I think we have to have a discussion about whether or not we're setting a precedent on future tax provisions, having a payfor. We have not normally done that, but we have done that in this bill to the tune of about $34 billion.

So what does that mean next year when we are having a debate about $2 or $3 trillion to extend the tax provisions from the Tax Cuts and Jobs Act? Do we get opposition from my Democrat colleagues because we do not have a payfor, because most of us believe dynamic scoring will prove, as it did in 2017, you create economic activity and cover it.

So, the reason I do not have a question for any of you is, what I wanted to do is come here and explain why if you want an argument, you've got to pick another subject on the tax provisions. But I alone do not have the luxury of only considering the tax provi-

sions. I have to consider Child Tax Credit policy, and I want to provide help to people who are struggling. I am not sure that this is the best way to do it. I am not sure if 91 percent of it being fully refundable is the smartest way to do it to create a sustainable policy for people who need help.

I look forward to working with the chair, because I consider him a good chair, and the ranking member, to hopefully get to a good place on this bill. Thank you, Mr. Chairman.

The CHAIRMAN. I thank my colleague. Too much for me to respond to, and we've got a lot of colleagues waiting.

Next in order of appearance would be Senator Warren.

Senator WARREN. Thank you, Mr. Chairman.

So, under President Biden, the U.S. economy has added 80,000 manufacturing jobs, partly because of tax incentives for semiconductor and clean energy manufacturing. But some tax breaks do not actually incentivize job creation. They are just corporate handouts.

Right now, Congress is considering a bipartisan tax package that includes two big pieces: number one, tax breaks for giant corporations championed by Republicans; number two, a boost to the Child Tax Credit to help the poorest families buy diapers and school shoes, which Democrats are fighting for.

Let's take just one of the corporate tax breaks that Republicans are demanding: a more generous deduction for research and experimentation, or R&E. This break goes mainly to the largest corporations, subsidizing investments they would make anyway, and here is the kicker: Republicans want to make this break retroactive, subsidizing decisions that giant corporations made years ago.

Ms. Fendley, you represent the United Steelworkers, who know a thing or two about American manufacturing. Is there any evidence that giving giant corporations billions in retroactive tax breaks for investments made years ago will incentivize investment and create jobs?

Ms. FENDLEY. I am not aware of any.

Senator WARREN. Yes. Well, they do not have a time machine, so it is pretty hard to figure out how this would change things.

So let's take a look at how these tax giveaways—who is really being benefited here. Ms. Fendley, which companies would be the largest benefactors of this tax break, and how much would they receive from the R&E investments that they made back in 2022?

Ms. FENDLEY. My understanding is that the tech industry would largely be the benefactors, in the order of billions of dollars. I do want to underscore, for manufacturers, the importance of some of these business credits, right? The innovation the steel industry has been able to do to make lighter, stronger, more formable steel has been really helpful to people. But that is separate from what I think you are talking about.

Senator WARREN. Well, all I am talking about is, as I look at the numbers now, it is two companies that would receive $13 billion—that is billion with a "b"—in terms of tax breaks here in 1 year, and that is more than we spend in the entire year on all Federal child-care funding for the entire country.

At the same time that Republicans push for retroactive corporate handouts, some are fighting against a modest expansion of the CTC

called "the lookback," and that would ensure that when a working family has a temporary drop in income, their CTC benefit does not also drop at the same time.

So, Ms. Fendley, let me ask you about this. Could this happen to a steelworker, that they or their spouse could lose their job or have to cut back on hours—and the ultimate question is, should a family get less help when their income has gone down, which is what this proposal would do?

Ms. FENDLEY. I think the short answer is "no," right? When a family is going through a hard time, maybe the hardest time, they should not get less help. I think for our union, getting it right on the Child Tax Credit is incredibly important, and we strongly urge the Senate to do its work here.

Senator WARREN. I appreciate that, and I agree with you. We do need to do our work. You know, I think we need to be clear about what is going on here. Republicans are outraged about modest help for our most vulnerable children, at the same time that they are shamelessly fighting for billions of dollars in retroactive tax breaks for a handful of giant corporations. I believe that is wrong, and we should not let it happen.

Thank you, Mr. Chairman.

The CHAIRMAN. I thank my colleague.

Senator Hassan?

Senator HASSAN. Thank you very much, Mr. Chairman, and thanks to our witnesses for being here. I want to thank the chair and Ranking Member Crapo for holding this important hearing today. It is very well-timed.

In January, the House overwhelmingly passed, on a 357 to 70 vote, a bipartisan tax package that would boost U.S. manufacturing through the tax code. This bipartisan package would restore full and immediate deductions for R&D investments, an effort I have long worked on with Senator Young, among other major tax priorities for our manufacturers and our small businesses. In addition to supporting our domestic manufacturing sector, the bipartisan tax package would also cut taxes for hardworking families through the Child Tax Credit.

The package is a bipartisan win-win, and the Senate needs to pass it as soon as possible, before we reach the end of the tax filing season in April. So I urge my colleagues to come together to clearly identify a path forward for this bill that is so important to small businesses—and I will emphasize that point: thousands of small businesses across the country, and families all across the country.

So I am grateful to our witnesses today, because each brings to the table a unique understanding of the importance of passing this bipartisan package. I am going to start with a question to you, Ms. Silver, because you are a small business owner, as I understand it.

In your opening statement, you spoke about how incentives for research and development can help small and mid-size manufacturers like your business. So, just following up a bit on what Senator Wyden was asking you questions about, can you explain, from your perspective, how the bipartisan tax package would help small manufacturers invest in their communities and create jobs?

Ms. SILVER. Sure. Thank you for the question. So, specifically about R&D—I have an example of that. I have been doing business

with a software company that provides software solutions for the manufacturing industry. They have a business in Texas. I have been doing business with them for 17 years, and it is what we run our entire company on.

And they were dramatically affected with the change in the R&D tax provisions expiring. They created less jobs, they had less liquidity in their company to grow, to innovate, and therefore the product that I use every day to run my business was affected. So, like I said in my testimony, manufacturing is a team sport, and so it does not matter the size, the structure—if you are a C corporation, a pass-through entity like mine—we are all affected by these tax provisions. And when my large manufacturing customers do well, we do well.

Senator HASSAN. Gotcha. Thank you very much.

To Ms. Janis, first of all, just a "thank you" to onsemi for having a wonderful facility in Hudson, NH. We are very proud of the work you do and grateful for the jobs that you all have created there.

You discussed in your opening statement how other countries are starting to outpace the United States in R&D. China, for example, offers Chinese businesses a super-deduction of up to 200 percent of their R&D costs. Again, following up on Senator Wyden's question, how would passing the bipartisan tax package help U.S. manufacturers outcompete their counterparts in China?

Ms. JANIS. You are correct, Senator Hassan. China, along with other nations, provides a 200-percent deduction for R&D expenses. So, this means that Chinese companies can deduct $200 for every $100 spent on innovation. U.S. companies face capitalization rules that hinder immediate expensing for R&D, especially R&D salaries and wages. To enhance U.S. competitiveness, as I recommended before, I strongly recommend that Congress make immediate R&D expensing permanent, to provide businesses with the clarity and assurance with the associated costs on R&D projects.

Senator HASSAN. Thank you.

And finally, to Ms. Fendley: the bipartisan tax package would not only boost U.S. manufacturing as we have just been talking about, it also cuts taxes for working families through the Child Tax Credit, and helps increase affordable housing through the Low-Income Housing Tax Credit.

Could you please talk about how the bipartisan tax bill would benefit both businesses and hardworking families?

Ms. FENDLEY. Sure. Thank you for the question. We have talked a lot about how it would impact businesses, which obviously creates long-term stability for working families. But of course the Child Tax Credit is so important to working families, particularly those at the margins. I think it is incredibly important that we look at the most expansive version of that that we can, to help lift many, many children out of poverty.

Senator HASSAN. Understood, and this is a good compromise bill. Thank you very much.

The CHAIRMAN. I thank my colleague. I am looking around the room, and I see four champs of the research and development tax provision. I cannot just call a vote among the five of us, but I can dream.

Senator Cortez Masto?

Senator CORTEZ MASTO. Thank you, Mr. Chairman. Thank you for this great discussion. I appreciate all the panel members and the comments, and the written comments.

Ms. Fendley, let me start with you, and thank you for recognizing the importance of the 45X manufacturing tax credit in your testimony. Congress's intent with this credit was to provide incentives for businesses to build domestic manufacturing capacity for energy components to reduce reliance on China, Russia, and other hostile nations. That's why it's key that we included critical minerals in 45X. As we all know, China dominates the market for many minerals essential for defense and energy.

I know my home State of Nevada has the capacity to mine and process many of the critical minerals that we need, and that is why I have been concerned with Treasury's proposed rule for 45X, which excludes mineral extraction as a credible cost. Now, I know USW has also raised the same concern. Would you please expand upon this a little bit more, and explain to maybe some of my colleagues and those who are watching, why this is so important?

Ms. FENDLEY. Sure. I appreciate the question. Mining is going to be critically important to this Nation as we move forward in our energy economy. And as the largest mining union in the U.S., we want to make sure that we are passing policies that will enable that.

You are right that we sent some more comments to Treasury that extraction materials cost should be part of 45X. That really has to do with the high cost of standing up a mine or a processing facility and the threats that you outlined from China. There is so much potential for the mining industry at this point, not only because of what we have in the ground, but also because of the potential for innovation. We are seeing all kinds of minerals being extracted from waste for the first time. So I think that this is a really exciting space, and I appreciate you highlighting it.

Senator CORTEZ MASTO. Thank you, and thank you for your comments. Mr. Chairman, I would like to submit for the record my comment letter on 45X, signed by eight other Senators, as well as two industry comment letters on the same subject.

The CHAIRMAN. Without objection, so ordered.

[The letters appear in the appendix beginning on p. 64.]

Senator CORTEZ MASTO. Thank you.

Ms. Janis, thanks so much for your testimony regarding the importance of the semiconductor industry to American security. Listen, whether we like it or not, China is enacting policies to dominate certain industries, and there has to be a response from the U.S. and our allies. I am proud Congress came together to help ensure that the U.S. maintains its advantage in chips. But there is another area which has not gotten as much attention, and that is rare earth magnets. These are essential components of our defense systems, and yet China has a near monopoly on magnet manufacturing.

Now, I have a bipartisan bill with Senator Mullin to provide tax incentives for domestic magnet manufacturing, and the bill was included as a bipartisan recommendation from the House Select Committee on China. Ms. Janis, can you speak to how important it is to see an incentive in these key industries when you are com-

peting with China, which is providing massive subsidies and other forms of support?

Ms. JANIS. Yes, yes, the importance of having tax incentives in the area of semiconductors is extremely important. We need to drive all of that production that went offshore, we need to drive it home onshore in order to create supply chain resiliency, as well as give our customers assurance on and consistency on their products.

Senator CORTEZ MASTO. Thank you, and let me add—and I just so appreciate this conversation. There is more to be done, and let me ask all of you. As we are looking at these tax incentives to drive industry in a certain direction, to clean energy, to build out, bring manufacturing back here, one of the things is, we do not want to go backward. We do not want to repeal what we have already done.

But where are the things that we should continue to focus on? Are there gaps in that supply chain? Are there gaps somewhere that we are not thinking about that we need to incentivize? To me, I am hearing about critical components that are necessary for this clean energy economy if we want to bring the manufacturing here. But that is just not happening yet because there is no incentive to build out.

I am curious of your thoughts, if anybody has any thoughts on that.

Mr. HUNTSMAN. Senator, thank you very much. I do not believe that we are being at all realistic. We do not make chips in this country. We do not mine in this country without the chemical industry. You eventually dig a hole in the ground, but you've got to process these chemicals. You've got to do something with them, and you do not do that without chemistry, and you do not do that without new chemistry, without cleaner chemistry that can eliminate waste in the byproducts and so forth.

And while we sit and we wait for years and years for the EPA to get approval on this chemistry, our chips and our mining industries, they can go overseas and build these facilities and do it cheaper. And so it is not just the end product and it is not just the beginning, but it is the entire supply chain that we need to be focused on. How do we do it efficiently, how do we do it cleanly, and how do we do it profitably?

Senator CORTEZ MASTO. Thank you. I know my time is up.

Thank you, Mr. Chairman.

The CHAIRMAN. I thank my colleague.

Next is Senator Brown.

Senator BROWN. Mr. Chairman, thank you, and I know we have a vote coming up, and I know Senator Daines is next. I thank you for a really, really, really important hearing. This really matters; welcome very much. Thanks for being here.

Mr. Widmar, I want to first start with you, and then I want to move to the Steelworkers and what they are doing.

First Solar was founded 25 years ago in the glass city, Toledo. Much of the development of glass in this country was in Toledo. Toledo still leads; the University of Toledo took that science and made it even better. And what you have done with First Solar—I think that is the reason for your location there. Twenty-five years ago, founded; now with three factories in Ohio.

They have made panel wafer cell modules under one roof during the company's entire existence. They have grown and innovated in the face of Chinese competitors, who receive massive state subsidies, who engage in the theft of intellectual property, who wantonly—and I think wantonly is the right adverb—violate our Nation's trade laws.

First Solar's manufacturing activity in Ohio, along with its national supply chain, as you all know, supported 16,000 jobs, created $1.6 billion with a "b" in labor income. Mr. Chairman, I would like to enter into the record a recent report demonstrating First Solar's tremendous economic impact in my State and all over the country.

The CHAIRMAN. Without objection, so ordered.

[The report appears in the appendix beginning on p. 45.]

Senator BROWN. Thank you, Mr. Chairman.

The Inflation Reduction Act, as you know, included new tax incentives to support American manufacturing and the development of genuine domestic—underscore domestic—supply chains for growing industries like yours. Tell us about the importance, Mr. Widmar, of the 45X Advanced Manufacturing Credit.

Mr. WIDMAR. Yes. It is going to be transformational to enable crystalline silicon innovation that we largely have been without for most of those 25 years. First Solar has innovated in new technology that we were able to get to scale, and innovate in a way that creates an advantaged technology in the marketplace that is going to enable the world of electrification that we all envision in front of us.

The world of electrification, as I alluded to in a prior comment, starts by taking photons and making electrons. It cannot be a one-horse race. We need to have capabilities here in the U.S. that have other types of technology, whether it is existing crystalline silicon technology or evolution toward new technologies that could evolve over the next several years. The manufacturing tax credit is going to be an enabler of doing that. That is going to allow companies to make investments, allow them to scale, and allow them to compete, right?

We still need to focus on how to ensure a level playing field, but it is clearly going to allow them to compete and to scale, and by the time, if the IRA runs its course, I think we are going to have a thriving domestic industry, and we will be a technology leader here in the U.S.

Senator BROWN. Thank you, and thanks for the conciseness of that answer.

Our tax code is supposed to support American manufacturing in building out the domestic supply chain that should not be exploited by the Chinese Communist Party. I am working with colleagues, as you know, on both sides of the aisle, to tighten the restrictions of the 45X credit to ensure that taxpayer money is not going to Chinese companies and other Foreign Entities of Concern. We have passed restrictions on Federal support going to Foreign Entities of Concern on a bipartisan basis. Would you support adding these so-called FEOC restrictions on the 45X credit?

Mr. WIDMAR. Absolutely, yes. I think it is nonsensical for an industry that is heavily subsidized domestically then to benefit from

U.S. taxpayer dollars to fund incentives here in the U.S. It does not make any sense to me.

Senator BROWN. And how do those restrictions—how will that help specifically?

Mr. WIDMAR. So, what I am most concerned about right now is that the decisions that are being made right now on the manufacturing that is coming into the U.S., I think are temporary in nature. It is basically module assembly. It is not bringing any real technology advancements that we need here into the U.S., and it is done in such a way that all the tools that are being sent from China, the construction in some cases, are just leased buildings, they are not investing in the building site. It is something that can easily be turned down and walked away from were the IRA to expire.

And by doing something that is enduring, that says now we are going to invest in U.S. companies—we will make those capital investments with a view of making this enduring and sustainable—I think will help us achieve the intent of what the IRA was set out to do, which is to make us, as a Nation, a technology leader in renewable energy.

Senator BROWN. Thank you.

I will shift in my last minute to Ms. Fendley of USW. Your testimony points out the importance of a comprehensive tax and trade agenda. You know in February the International Trade Commission ruled against an antidumping and countervailing duty case brought jointly by the United Steelworkers and by Cleveland-Cliffs, which makes the cleanest steel in the world—and I would add, tinplate products produced at the facility in Weirton, WV. Talk about why we need stronger trade enforcement as a critical piece of our domestic economy strategy in the last few seconds. Thank you.

Ms. FENDLEY. Sure. I will just say that none of these policies live by themselves. They are all interlocked, and no other organization has been a supporter or party to as many antidumping cases as we have. We know that trade has been an important factor here. We would urge Congress to update our trade enforcement laws with the Leveling the Playing Field 2.0 Act.

The other factor here for our members in Weirton, who are going through possibly the worst time in their lives, is they need Trade Adjustment Assistance, which Congress has yet to reauthorize.

The CHAIRMAN. Thank you, Senator Brown. Very important points.

Senator Daines?

Senator DAINES. Mr. Chairman, thank you.

I will tell you, as somebody who has spent most of my career in the private sector, the foundation of businesses back in Montana is pass-through businesses. These pass-through businesses in Montana are 95 percent of all businesses. They employ the majority of workers in our country. In Montana, just in terms of employment, not just entities, 75 percent of private-sector employees come through pass-throughs. Back in 2017, we placed these businesses on more equal footing with their C corp counterparts by providing them a 20-percent tax deduction on qualified business income.

These businesses are absolutely critical to our communities. If you look at data in terms of when you come out of a recession, it

is the pass-throughs that typically take the lead on rehiring and growing and so forth faster than the C corps. That is why I am proud to be leading the bill that would make this deduction permanent. The Main Street Tax Certainty Act protects tens of millions of small businesses, allowing them to keep more of their profits, create more jobs, and strengthen the economy. The thing is, the core word in capitalism is "capital." This allows these businesses to have more capital to invest, to let these businesses decide in the free market society where to make these capital investments, versus the government taking more of those dollars and allocating them in this city called Washington, DC—and most voters understand we are not the best stewards of those resources.

If we do not act to make this provision permanent, these businesses are facing an immediate 20-percent tax hike at the end of 2025. That is coming very soon. President Biden made it clear in his State of the Union address that he wants to increase taxes on Americans to further his agenda. In fact, just yesterday President Biden released a reckless budget riddled with tax hikes, including an increase in taxes on pass-through businesses. Under this administration, small businesses have already fought record levels of inflation and economic uncertainty. The last thing we need to do is create more uncertainty with the sunsetting of the 2017 tax as it relates to pass-throughs, and an increased tax burden of more than 20 percent.

Ms. Silver, in your testimony you shared that you benefit from that 199A deduction. Could you provide some of the ways that your company reinvests the money it saves from this deduction?

Ms. SILVER. Thank you for the question, Senator. So that is one of my favorite things to do, to reinvest in the company, because that is what it is all about. And I talked earlier about investing in machining technology and equipment, advanced robotics, passing along those savings to a customer.

But I would like to highlight another story. Another example is, a couple of years ago, we were able to take our profits and create and launch a high school internship program. We call it "Opportunity Knocks." It is a partnership with our local high school. Seventy percent of the students there are minority; 100 percent are in economically disadvantaged situations, and these students have never been exposed to manufacturing before.

They come over for 4 days a week. They are on the shop floor with their mentors. They are job shadowing. The fourth day, they are in our conference room, more of a classroom setting, where they go through the "craftsman with character" curriculum, where we discuss things: virtuous skills, things like leadership, team work, communication. And that has been absolutely impactful, not only for them—it has been a tipping point for recruitment and retainment in our machining skilled trade, but it has also just been so impactful to watch men and women who have been in manufacturing for 30 years be able to pour into these students. And then also for the students to try on manufacturing, see if it is something they like.

I have a student right now who is going to graduate in May; very bright. His parents immigrated here from Mexico, his dad is a bricklayer, and he loves machining, and he is going to continue on

with us and stay full-time. I have another student who graduated last year who is now in our certified apprenticeship program.

So in addition to that, I went out and bought a piece of capital equipment last year because I realized, how am I going to do training and job shadowing without a piece of equipment to train on? So we actually bought a piece of expensive capital equipment to not have that in our production schedule, so we can actually train on it as well.

Senator DAINES. And so, what you have just demonstrated too is a problem we are trying to solve in this country, in terms of more manufacturing here in America. Check that box. And second, workforce development, check that box as well, because you had this additional capital to invest. It works. Thank you for those comments.

I want to, as I am wrapping up here, talk about the Federal estate tax. I think it is one of the most immoral taxes in America. Look at the OECD. So from a private-sector career, I spent a lot of time managing operations around the world.

I think maybe sometimes it is a surprise when you realize that 40 percent of OECD countries do not have a death tax. I remember when I was in Australia doing business in Sydney—we had an office there selling American software. I remember I said, "We have this thing called a death tax in America," and they said, "What in the world is that? Is it something that Americans invented?"

Forty percent of OECDs do not have any estate tax. When someone loses a loved one, they should not have to worry about the family business too. In addition to placing more burdens on already grieving families, the death tax is a direct threat to agriculture, and that is our number one economic driver, the farms and ranches in my great State of Montana.

As lawmakers look to the expiration of the 2025 tax cliff, it is really important we avoid any changes that would introduce more uncertainty, because I will tell you, who benefits from all this are tax lawyers and estate planners trying to game out what is going to happen here in Washington, DC. Let's allow these families to continue to focus on their businesses and not having any of these elaborate estate plans because they do not know what is going to happen here in Washington, DC.

Ms. Silver, as a third-generation family-owned company, could you share what a change to the estate tax exemption would do to companies like your own? And I know we are about out of time, so I just need a quick answer from you.

Ms. SILVER. Okay. Just to talk from my personal life, so my husband passed away of brain cancer, and he was the sole shareholder/owner of Ketchie. So upon his passing, I became president and owner. Thinking back then, I do not know if it would have made sense. I don't know, even if it did make sense, and I had the risk tolerance for it, if I would have been able to pay a tax liability, because so much of our assets are not liquid. I run a very capital-intensive business, so the impact is huge, and other small manufacturers should not be faced with these decisions.

Senator DAINES. Yes; thank you. I am sorry for your loss as well. Thank you for your comments.

The CHAIRMAN. Yes. You can only imagine what it is like for a spouse to walk into a situation like that, where husband and wife

have been working on it together for years, and then suddenly their future is shattered. So we all think about that.

Now, under normal circumstances, I would either shoot baskets or something, in order to stall for Senator Young for a couple of minutes, or find some other diversion. But I have one other question, and then we will wait for Senator Young in all seriousness.

The House of Representatives actually voted to repeal the IRA altogether. What would be the impact on your work if that was to pass the Senate and it was to vanish? Maybe we start with you, Mr. Widmar, and you, Ms. Fendley, while we are waiting for Senator Young.

Mr. WIDMAR. So, from our standpoint, if the IRA were to be repealed in its entirety, it would basically bring us to a complete stop, because we would not have clarity on the policy environment and how to continue to operate and grow our business and continue to invest in R&D. We need that long-term vision and understanding to make informed decisions today.

The CHAIRMAN. Ms. Fendley?

Ms. FENDLEY. I completely agree. The IRA is part of our industrial policy. It provides both supply-side and demand-side levers to help manufacturers have certainty moving forward, making decisions moving forward. It would frankly be devastating if that was repealed, not only for manufacturing, but the IRA includes other important provisions like letting Medicare negotiate drug prices for the first time. That will really impact seniors' pocketbooks in a positive way. So you know, we would certainly fight back on a repeal effort.

The CHAIRMAN. We will also be looking at health care some more. I was codirector of the Oregon Gray Panthers for about 7 years, back when I had a full head of hair and rugged good looks, and we started talking about those kinds of drug policy reforms, and now we are finally reaping the fruits of it. We are seeing, for example—in this room, we drafted the provision that I call the price-gouging penalty, where if the companies raise their prices over inflation, they pay a penalty.

But he is worth waiting for. Senator Young is here, and I have appreciated all his leadership, particularly when you looked across the room and you saw Senator Young and Senator Hassan. They have been the bipartisan leadership here on R&D, and we appreciate it.

Senator Young?

Senator YOUNG. Well, I thank the good chairman for his leadership on this and other issues.

I know that some of my Republican colleagues have highlighted the impact of the 2017 Tax Cuts and Jobs Act. It has bolstered the U.S. economy. It has encouraged U.S. innovation, and as we have heard today, these progrowth tax policies have driven growth in not just the manufacturing sector, but in countless other sectors as well.

But today I want to focus on another important piece of legislation that has increased U.S. global competitiveness and benefited the U.S. economy, and there is pretty significant bipartisan support here in Congress but also back home, and it is called the CHIPS and Science Act. It is a piece of legislation that Senator Schumer

and I saw through the congressional process. It was signed into law. It authorized $53 billion worth of incentives for private companies investing in semiconductor manufacturing, R&D, and workforce development. Since the bill was passed in 2022, the semiconductor industry has announced over $240 billion in private-sector investment.

Now, almost none of the public money has even flowed, and we have seen $240 billion unlocked in the production of both foundational and leading-edge microchips. The CHIPS Act, as we call it, also established the Microelectronics Commons program, under which my home State of Indiana has been designated the leader of Silicon Crossroads Microelectronics Commons Hub. This regional partnership was designed to accelerate the prototyping of advanced microchips. The Hub will bolster private investments that will secure our country's advantage in leading-edge semiconductor design—of course, very important to our national security. This and other partnerships have already drawn more than $2 billion in publicly announced investments into the State of Indiana alone. So, great things are being made in Indiana, thanks to the passage of the CHIPS Act.

And I would like to use that lead-in to ask Ms. Janis to start. Can you please share how you've seen the CHIPS and Science Act empower chip manufacturers, like onsemi, to invest in emerging technologies in the United States?

Ms. JANIS. Thank you, Senator Young. onsemi is investing in the next-generation development of image sensors and analog mixed-signal semiconductors at our domestic manufacturing facility in East Fishkill, NY. We plan to qualify and manufacture at this facility starting in 2025. Remaining cost-competitive is key in delivering these onshore production capabilities. This will provide supply assurance to onsemi's customers, who currently depend on foreign production sites, and will enable automotive and industrial-grade products with increased performance in automation technology.

Senator YOUNG. Thank you for that, Ms. Janis. And for those who are in the semiconductor design and production business like onsemi, you know that we cannot develop and strengthen our domestic chips production without a prepared and ready workforce. Indiana's esteemed colleges and universities are ensuring that not only are great technological advancements made in Indiana, but the innovators and leaders of tomorrow are made there too.

As Secretary of State Blinken said when he came and visited the State of Indiana not too long ago, we have a talent fab in Purdue University, and in Ivy Tech Community College. Purdue in fact has established its Semiconductor Degrees Leadership Board to solicit input and guidance from industry leaders, to ensure that Purdue graduates have the skills they need to succeed in their careers, and onsemi is a member of that board. So thank you, Ms. Janis.

Ms. Janis, can you please explain how university-industry partnerships like the Semiconductor Degrees Leadership Board at Purdue improve worker readiness and allow companies like onsemi to continue innovating?

Ms. JANIS. Absolutely. To onsemi, workforce development is critically important. onsemi actively recruits top talent, of course, wher-

ever it can be found. We have an active college recruiting program with 11 preferred schools including Purdue. This consortium includes Penn State, Texas A&M, as well as Prairie View A&M University and Howard University, two HBCUs.

onsemi has committed more than $8.5 million to university programs, and is actively working with universities in the U.S. on workforce development. Last year in STEM education grants, onsemi awarded over $1.3 million to help students in underserved communities, focusing on semiconductor awareness at middle schools.

Senator YOUNG. Thank you, Ms. Janis, to you and to onsemi for that testimony today. Thanks again to our witnesses.

I see I am out of time. Before I pass it back to the chairman, I would just like to go on record, once again, and indicate the importance from my eyes that we restore businesses' ability to fully and immediately deduct the expense for research and development costs under section 174 of the tax code.

I know the chairman has helped negotiate a deal that would include that provision, and I will submit questions for the record on this for the benefit of our witness.

The CHAIRMAN. Well, I thank my colleague. And before you go, I think, Senator Young, your name is now synonymous with innovation. If you look at your agenda and what you have done with chips and competition with China with respect to AI, I just so appreciate it, because I think that, as we look at tax policy, tax policy is really about innovation and fairness.

Those are the two most important kind of ideas, and I am just going to say, as I close today, that I want to touch on a couple of points with respect to what we are about to vote on, and put in the record some nonpolitical material.

The Joint Committee on Taxation is the group that we use around here to do objective, nonpolitical analysis. And we wanted them particularly to look at this issue of what our work is going to mean for work generally, because some of those who have criticized this say it is going to discourage work, that it is somehow going to cause people to walk out on the workforce and just see if they can get $1,000 or $1,500 or something, and then maybe they will jump back into the workforce some other time.

The Joint Committee on Taxation rejects this argument that our bill will discourage work. They say, and I quote, "The proposed expansion of the Child Tax Credit on net increases labor supply." That is the view of people who are not trying to grind a political axe and are not saying, well, we are Democrats or Republicans. That is what they are saying, and I am going to ask unanimous consent to put the entire document into the record.

[The report appears in the appendix beginning on p. 106.]

They go on to talk about whether the sample size is the right size and the like. But they have been specific with respect to—they do not believe that this will discourage work.

And what I take out of here, because I listened to everybody, haven't budged for 2 hours like you—thank you very much, every one of you—is witnesses representing communities across the country have said specifically—because I asked you, and other colleagues did as well—you said it would be bad for your businesses

and your workers to postpone this legislation, the Tax Relief for American Families and Workers Act.

There was no ambiguity in that. You all said it would be a mistake, a mistake for workers and businesses. The reality is, we know we are going to have a big, big tax debate in 2025. Senator Young and I have talked about it, and everybody is going to go at it, and that is what our system of government is all about.

But the question becomes, are we going to harm businesses and families and workers like yours when we have a bipartisan bill that got so many votes in the House of Representatives, that when people read it initially, Senator Young, they thought they had read the wrong number. They thought that maybe there was a mistake in the number. You do not get 357 votes for getting a soda at this point.

So you have really, I think, been a very important contributor to this debate, and as long as I am in public service, I am going to try to work as hard as I can with Senators like Todd Young of Indiana, because I think if you are innovating and you are working to try to find common ground, that is what public service is all about.

So, thank you all for giving us a chance to get this input, get it on the record as we move to the final efforts to try to get this passed and passed quickly, a bipartisan piece of legislation. Everybody gives speeches about being bipartisan, gives speeches about research, and competing with China. We are going to give them a chance to have that opportunity.

With that, I thank you. We are adjourned.

[Whereupon, at 12:31 p.m., the hearing was concluded.]

APPENDIX

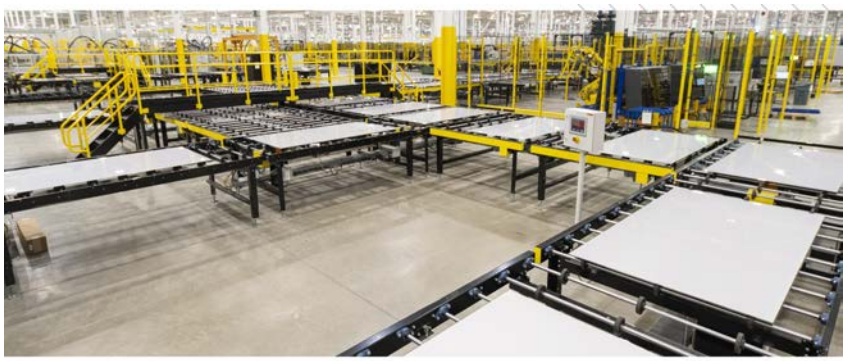
ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

SUBMITTED BY HON. SHERROD BROWN,
A U.S. SENATOR FROM OHIO

FIRST SOLAR: US ECONOMIC IMPACT

The Value of American Vertically Integrated Solar Manufacturing at Scale

INTRODUCTION FROM MARK WIDMAR



Since our founding 25 years ago, First Solar has invested in America, building our first manufacturing facility in Perrysburg, Ohio in 1999 and setting ourselves on the path to achieving 14 gigawatts of annual nameplate vertically integrated manufacturing capacity across the United States by 2026.

Today, First Solar is unique among the world's largest solar manufacturers for being the only US-headquartered company and for competitively producing advanced thin film photovoltaic (PV) solar panels at a scale unparalleled anywhere in the world. Our proprietary—and uniquely American—thin film solar technology was developed and has evolved in labs in California, Colorado, and Ohio. It is the world's second-most common PV semiconductor after crystalline silicon and is a significant enabler of the utility-scale solar fleet in the United States.

Each of our factories manufactures advanced thin film solar panels using a process that integrates the production of wafers and cells in a single process that transforms a sheet of glass into a fully functional solar panel in approximately 4 hours and under one roof.

We are expanding our American footprint to an unprecedented level. Between 2016 and 2026, we expect to have invested approximately $4 billion in manufacturing and research and development facilities in the United States. Between 2024 and 2026, we anticipate that our three operating factories in Ohio will be joined by new facilities in Alabama and Louisiana to make up a 14 GW American manufacturing footprint.

Later this year, we plan to commission the largest PV research and development innovation center outside of China, which will form part of our Ohio campus and accelerate the cycles of innovation needed to ensure that American innovation drives the energy transition not just here at home but globally.

And we are not just innovating and manufacturing in America. We are sourcing our raw materials from across the country. In 2019, we put into place a strategy that would see us localize our value chains, setting into motion the changes that allowed us to source materials and services from large, medium, and small businesses across the US.

Today, our American-made solar panels are produced with American-made glass and steel. The steel value chain that serves our Ohio manufacturing footprint is located within a 100-mile radius of our factories, and we are one of the largest buyers of American-made float glass, consuming approximately 15% of the country's capacity.

Every day, we go to work making solar panels to support America's energy security and cleantech supply chain resilience, helping ensure that our country's energy future is not dependent on China.

And we are enabled by thousands of hardworking people across the country: soda ash miners in Wyoming, silica miners in Michigan, copper miners in Utah, steelworkers in Alabama, Louisiana, and Ohio, glassworkers in Illinois, Ohio, and Pennsylvania, woodworkers in Indiana, truckers, railroad workers, and many more. With these indirect and induced jobs forecasted to pay an estimated average salary of over $83,000 per year in 2026, our investments are providing American workers with an opportunity to earn happiness.

This is the real value of solar technology that is made in America, and not simply assembled here using imported components. This is the real value of American Solar.

And while we know that our investments are enabling jobs and prosperity in places such as Lawrence County, Alabama, Iberia Parish, Louisiana, and Crawford County, Pennsylvania, we recognize the need to quantify the real extent of our contribution to the US economy.

This comprehensive analysis, conducted by the Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana, Lafayette, maps First Solar's impact on America in meaningful terms: jobs, economic output, and value created in 2023 and forecasts for 2026 when we expect to achieve 14 GW of annual nameplate capacity across the US.

The data, unique to First Solar and a direct result of our operating model, which currently has no parallel in the solar manufacturing industry, creates yet another differentiator that further separates us from the competition.

It also confirms just why we have earned the right to call ourselves America's Solar Company.

Mark Widmar
Chief Executive Officer
First Solar, Inc.

EXECUTIVE SUMMARY

Founded in 1999, **First Solar is an American manufacturer of solar modules** that is unique within the industry as having both a headquarters and large-scale manufacturing based in the United States. The company employs a unique, fully vertically integrated manufacturing process, enabling the transformation of raw materials and components to a finished module in approximately 4 hours.

First Solar's thin film photovoltaic semiconductor further differentiates it within the solar industry, which primarily utilizes crystalline silicon (c-Si) semiconductor material. While c-Si panel manufacturing can require three to four different factories and multiple days to produce and assemble, First Solar's entire process takes place under one roof in a matter of hours. These differentiating factors allow the company to offer greater transparency, traceability, and localization of its supply chain.

This study examines the economic benefits of the company's operations in 2023, which the company ended with over 6 GW of operational US capacity, and in 2026, by which time it expects to have 14 GW of annual nameplate capacity in the country. Additionally, the study also evaluates the impacts of constructing First Solar's facilities in investments in Ohio, Alabama, and Louisiana, in 2023.

All of First Solar's activities are considered new to the national economy because in the absence of First Solar, it is likely that demand for solar panels would be met by a foreign company given the concentration of solar manufacturing overseas, especially in China.

Key Findings:

- While First Solar is currently undergoing a rapid expansion, the company's 2023 operations are estimated to **support a total of 16,245 direct, indirect, and induced jobs and nearly $1.6 billion in labor income in the US economy.** The company's operations are also estimated to support a total of nearly **$2.8 billion in value added** and almost **$5.3 billion in total output** when including indirect and induced economic effects.
- After the ongoing expansions in Alabama, Louisiana, and Ohio are complete, annual operational impacts on the US **economy starting in 2026 are projected to grow to a total of more than 30,000 jobs and almost $2.8 billion in labor income.** Operating at that scale will **support nearly $5 billion in value added and over $10 billion in output to the US economy including direct, indirect, and induced economic effects.**
- First Solar's **construction activities** in 2023 are estimated to create a total of **5,765 jobs and $637.8 million in labor income nationally** including indirect and induced effects. These activities are also estimated to have **supported more than $900 million in value added and $1.9 billion in output,** or total sales, within the national economy.
- While the unique impacts of a specific industry, or company, can vary based on a wide range of factors, First Solar's impacts can be attributed at least in part to **longstanding efforts to cultivate a domestic supply chain,** which helps capture a larger portion of indirect and induced economic activities within the national economy.

	2023	2026 (Expected)
Annual US nameplate capacity	6GW+	14GW
Employment*	16,245	30,060
Labor Income*	$1.59B	$2.78B
Value Added*	$2.75B	$4.99B
Output*	$5.33B	$10.19B

**All values represent direct, indirect, and induced impacts, and exclude construction-related jobs and spending.*

Glossary of Terms

Capital Expenditure Impact: The economic effects resulting from the company's investments in capital assets or infrastructure. This includes the construction, main-

tenance, or improvement of long-term assets such as buildings, factories, equipment, machinery, or technology.

Direct Impact: The immediate effects generated by the company's activities, such as employment, salaries and wages, and direct spending on goods and services.

Employment Impact: The effect of the business's activities on job creation or loss, including both direct employment within the company and indirect employment in related industries.

Indirect Impact: The secondary effects resulting from the spending of businesses in the supply chain associated with the company, including supplier purchases and additional economic activity stimulated by the company's operations.

Induced Impact: The broader economic effects that arise from the spending of employees and other individuals who receive income directly or indirectly from the company, such as household spending.

Labor Income: The total wages and salaries of direct and indirect workers associated with the company, including the value of employment benefits.

Operational Expenditure Impact: The effects that a company's day-to-day operations and activities have on the economy, including production output, employment levels, and purchases of goods and services from suppliers to run the business.

Output: The total economic output generated by the company, encompassing the value of goods and services produced and sold by its operations.

Ratio or Multiplier Effect: The amplification of economic impact as money circulates throughout the economy, creating a ripple effect beyond the initial investment or spending.

Value Added: The contribution of the company to the economy, or GDP, measured by the difference between its total revenue and the cost of intermediate goods and services purchased.

FIRST SOLAR'S US ECONOMIC IMPACT.

2023
Operational Impacts

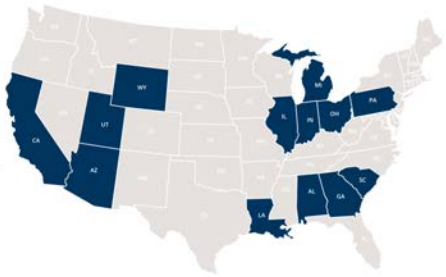
16,245 total jobs
includes direct, indirect, and induced jobs

6x jobs supported for every First Solar job

$2.8B value added to US economy

An American Value Chain

Alabama: Manufacturing, Steel, Construction
Arizona: Corporate HQ
California: R&D
Georgia: Factory Parts
Illinois: Glass
Indiana: Packaging
Louisiana: Manufacturing, Steel, Construction
Michigan: Silica
Ohio: Manufacturing, R&D, Steel, Glass, Construction, Distribution
Pennsylvania: Glass
South Carolina: Distribution
Utah: Tellurium
Wyoming: Soda Ash



2023 Construction Impacts

5,765 construction jobs
includes direct, indirect, and induced jobs

$900M construction value added US to economy

2026
Projected Operational Impacts

30,060 total jobs
includes direct, indirect, and induced jobs

7.3x jobs supported for every First Solar job

$4.9B value added to US economy

FIRST SOLAR'S SUSTAINED IMPACT ON THE US ECONOMY

2023

Operational Impacts

The long-term recurring impacts of First Solar's operations create a stable and lasting impact on the economy by creating long-term, good-paying jobs.

Table 1 shows estimated economic impacts of First Solar's 2023 operations on the US economy. In total, First Solar's 2023 operations include an estimated $2.1 billion in direct output, which combined with indirect and induced economic effects generates $5.3 billion total output. An important component of that output is the $485.7 million in direct labor income to support the 2,700 direct First Solar jobs.

First Solar embarked on a strategic diversification of its supply chain in 2019, and thanks to years of cultivating a domestic supply chain the direct First Solar activities generate large indirect effects including nearly 6,000 jobs and more than $1.6 billion in output.

Thanks to highly skilled induced jobs that generate substantial labor income, the average labor income associated with the 12,400 indirect and induced jobs created by First Solar operations is over $81,000 per year, well over the national median income.

First Solar supported over 16,000 direct, indirect, and induced jobs across the US economy with a total labor income of over $1.5 billion in 2023, or six jobs for every direct job it added.

By the Numbers
First Solar Operational Impacts: 2023 US

16,245
Estimated jobs supported

6x
Jobs supported for every First Solar job

$1.59 Billion
Estimated contribution to national labor income

$2.75 Billion
First Solar's estimated value added to the US economy

Note: All data includes direct, indirect, and induced effects.

Table 1: First Solar National Operational (US) Impacts 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	2,700	$485.7	$977.9	$2,133.9
Indirect	5,965	$608.4	$903.0	$1,649.3

Table 1: First Solar National Operational (US) Impacts 2023—Continued

Impact	Employment	Labor Income*	Value Added*	Output*
Induced	7,580	$497.8	$876.9	$1,545.2
Total	**16,245**	**$1,591.9**	**$2,757.8**	**$5,328.4**
Ratio	***6.0***	***3.3***	***2.8***	***2.5***

**Labor income, value added, and output are reported in millions of dollars.*

A Coast-to-Coast Value Chain

First Solar's uniquely American supply chain reflects the value it creates for the country. The company began a strategic pivot to a domestic supply chain in 2019, a business decision designed to reduce its exposure to overseas supply chains and risks to operational continuity. Given the current political appetite to buy American, this strategic shift gave First Solar a significant advantage over the competition, with its Series 7 module being manufactured with 100% US-made components identified in the current Inflation Reduction Act (IRA) domestic content guidance issued by the US Department of Treasury. The strategic shift also accounts for First Solar's impact on the US economy as its value chain spans the country from South Carolina in the East to California in the West, and covering states such as Alabama, Arizona, Georgia, Illinois, Indiana, Louisiana, Michigan, Ohio, Pennsylvania, Utah, and Wyoming.

Construction Impacts

Over 2022 and 2023, First Solar announced approximately $2.8 billion in investments in Alabama, Louisiana, and Ohio, including two new factories, the expansion of its current manufacturing footprint, and a new research and development center. These investments translate into a significant amount of construction activity spread across three states.

Table 2 shows the economic impacts of First Solar's 2023 construction activities on the US economy. The national economy is impacted by large investments in the new Ohio and Alabama manufacturing facilities. At the time this study was conducted, the company had yet to begin meaningful construction activity on its just-announced facility in Louisiana. These investments support 775 direct jobs as well as a large number of indirect and induced jobs created by First Solar's direct construction expenditures. In total, First Solar construction activities in 2023 create an estimated 5,765 jobs and a total of nearly $640 million in labor income including direct, indirect, and induced effects.

For every First Solar construction job in 2023 there are approximately 7.4 jobs created in the US economy, with an average of $110,600 in total annual labor income per job. First Solar's construction activities contribute $280.4 million in direct value added and direct output of $755.6 million, which generate a total of $907.1 million

in value added and more than $1.9 billion in total output in the US economy including indirect and induced economic effects.

Table 2: First Solar US Construction Impacts in 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	775	$273.8	$280.4	$755.6
Indirect	1,955	$164.9	$276.2	$550.2
Induced	3,035	$199.1	$350.4	$617.4
Total	**5,765**	**$637.8**	**$907.1**	**$1,923.2**
Ratio	***7.4***	***2.3***	***3.2***	***2.5***

**Labor income, value added, and output are reported in millions of dollars.*

FIRST SOLAR'S ECONOMIC IMPACT AND JOB CREATION IN OHIO

2023

First Solar's presence in Ohio dates to its founding in 1999 and the company has manufactured in the Buckeye State for over 2 decades. The Toledo area, with its deep ties to the glass industry, was a natural incubator in First Solar's early years and the company has continued to build an ecosystem of suppliers and service partners around its campus, currently the largest solar manufacturing footprint in the Western Hemisphere with over 6 GW of annual nameplate capacity at the end of 2023. As a result of First Solar's presence, the state can uniquely claim to be home to every aspect of the solar value chain, from R&D and manufacturing to recycling.

Given the longstanding presence and large concentration of First Solar operations in Ohio, state-level impacts were also analyzed in the state. Table 3 shows First Solar's Ohio operational impacts in 2023, a year of significant growth with the company's third manufacturing facility in the state coming online during the year.

From operations alone in 2023, First Solar employs 2,400 workers in the state and is estimated to have generated more than 10,000 total jobs including direct, indirect, and induced economic effects. In other words, every First Solar job created 4.4 total

jobs in the Ohio economy in 2023. Those jobs are estimated to have added more than $1 billion in labor income to the Ohio economy including more than $580 million in indirect and induced effects.

First Solar's direct economic output is estimated at more than $1.6 billion in the state including creating more than $563 million in value added in Ohio's economy. In total, First Solar's activities supported more than $3.2 billion in output including nearly $1.5 billion in value added within Ohio in 2023.

Table 3: First Solar Ohio Operational Impacts in 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	2,400	$450.5	$563.0	$1,663.0
Indirect	3,980	$353.7	$500.3	$896.9
Induced	4,125	$229.0	$415.6	$724.7
Total	**10,505**	**$1,033.2**	**$1,478.9**	**$3,284.6**
Ratio	***4.4***	***2.3***	***42.6***	***42.0***

**Labor income, value added, and output are reported in millions of dollars.*

Investing in an Ohio Value Chain

First Solar's strategic decision to develop a domestic supply chain in parallel with the expansion of its manufacturing footprint has spurred investment and job creation in the state. In response to the company's expansion plans, the NSG Group constructed its first new float glass plant in the US in 4 decades. The facility, which is in Luckey and started operations in 2020, represented a $380 million investment and created 150 new jobs. Similarly, Ice Industries invested $9 million and created 120 new jobs when it established a new facility in Bowling Green to produce steel back rails for First Solar's advanced thin film modules. Significantly, First Solar's steel value chain is located within a 100-mile radius of its Perrysburg campus, with the steel made in Cleveland, processed in Delta, and fabricated into back rails in Bowling Green.

Construction Impacts

Given the historical concentration of First Solar's US activity in Ohio, construction impacts are examined at the state level in Ohio as part of the more targeted assessment of economic impacts within the state.

Table 4 shows economic impacts of First Solar's 2023 construction activities in Ohio. The 275 construction workers directly engaged in constructing First Solar's third manufacturing facility earned $29.8 million in labor income, but also created an estimated 865 indirect and induced jobs, adding nearly $60 million in labor income to the total economic impact of construction activities within the state.

These construction activities are also estimated to have generated $136.6 million in total value added and $367.7 million in total output to the Ohio economy. Based on 2023 construction activities, the total economic impact of building First Solar's new facilities shows a jobs multiplier of more than four total jobs in Ohio for each job directly engaged in construction.

The average labor income per construction worker on a First Solar site in Ohio is $108,400 while the average labor income for the associated indirect and induced jobs is $66,500 illustrating the high pay for high-skilled workers needed to build the company's manufacturing and R&D facilities.

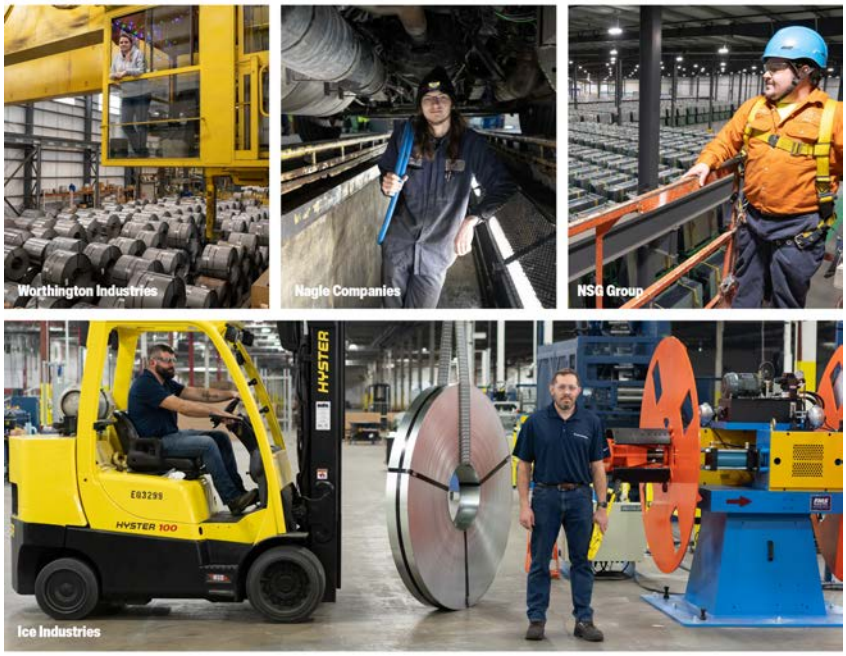


Table 4: First Solar Ohio Construction Impacts in 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	275	$29.8	$36.5	$178.2
Indirect	515	$38.1	$64.8	$128.0
Induced	350	$19.4	$35.3	$61.5
Total	**1,140**	**$87.3**	**$136.6**	**$367.7**
Ratio	***4.1***	***2.9***	***3.7***	***2.1***

**Labor income, value added, and output are reported in millions of dollars.*

A Decades-Long Partnership

Headquartered in Wallbridge, Ohio, the Rudolph Libbe Group (RLG) has constructed every First Solar facility in the state since the company's first manufacturing facility in 2002. Today, the partnership has expanded beyond Ohio as RLG constructs First Solar's new facilities in Alabama and Louisiana. By 2026, RLG will have completed approximately 9 million square feet of manufacturing and R&D infrastructure across the three states. The Ohio projects alone accounted for approximately 4.5 million square feet and were constructed by union tradespeople. In fact, the three facilities constructed by RLG for First Solar in Ohio since 2016 consumed an estimated 2.5 million union hours.

LOOKING FORWARD: PROJECTED US OPERATIONAL IMPACTS

2026

Catalyzed by the Inflation Reduction Act (IRA) of 2022, First Solar has embarked on an expansion plan that is expected to see it achieve 14 GW of annual nameplate capacity in the US across three states by 2026. Given that the company is expected to double its nameplate capacity between 2023 and 2026, this study examined its 2026 operational impacts on the national economy.

The company's national output nearly doubles in scale from 2023 to 2026, with indirect jobs growing at an even faster pace as domestic supply lines expand to support First Solar's operations.

Table 5 shows the expected annual economic impacts of First Solar's operations on the US economy by 2026. Once the expansions that are currently underway in Ohio, Alabama, and Louisiana are complete, First Solar expects its operations to create more than $1.5 billion in value added in the national economy, while generating a total added value 3.2 times larger after accounting for direct and induced economic impacts. The total output generated in the national economy is nearly $10.2 billion, which is 2.6 times larger than direct output.

The expansion of First Solar's impacts extends to job creation as the company expects to grow its US workforce from 2,700 in 2023 to 4,100 people in 2026. This increase in direct employment, in turn, allows First Solar to support a total of more than 30,000 jobs across the economy with nearly $2.8 billion in labor income. In other words, every person First Solar directly employs supports 7.3 direct, indirect, and induced jobs across the US.

Furthermore, First Solar's operations directly are expected to create more than $1.5 billion in value added in the national economy but generate total added value 3.2 times larger after accounting for direct and induced economic impacts. The total output generated in the national economy is forecasted to be nearly $10.2 billion, which is 2.6 times larger than direct output.

By the Numbers
First Solar Expected US Operational Impacts: 2026

30,060
Number of jobs supported

7.3x
Jobs supported for every First Solar job

$2.78 Billion
Estimated contribution to national labor income

$4.99 Billion
First Solar's estimated value added to the US economy

Note: All data includes direct, indirect, and induced effects.

Table 5: First Solar US Operational Impacts 2026

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	4,100	$622.9	$1,540.9	$3,979.6
Indirect	12,675	$1,291.9	$1,916.8	$3,499.7
Induced	13,285	$872.3	$1,536.4	$2,707.4
Total	**30,060**	**$2,787.1**	**$4,994.0**	**$10,186.7**
Ratio	***7.3***	***4.5***	***3.2***	***2.6***

**Labor income, value added, and output are reported in millions of dollars.*

Renewing American Communities

A glassmaking facility in Meadville, Pennsylvania, which had been operational since 1968, was forced to shut down in 2020 in response to slowing demand from the US automotive industry and the economic effects of the pandemic. In 2023, the facility was given a new lease on life as First Solar signed an agreement with its owner, Vitro Architectural Glass, to manufacture float glass for use in its American-made solar modules. In response, Vitro announced it would invest $93.6 million to rebuild and modernize the plant, creating approximately 130 new high-quality jobs, subsequently increasing its investment to approximately $180 million to adapt and upgrade its current facilities, effectively doubling the plant's output. The plant is expected to be operational in 2025, bringing the jobs, economic growth, and tax revenues that domestic manufacturing stimulates.

"The plant reopening was a surprise to all of us in town. They announced that they were going to be bringing the second line in their plant back online and hiring another hundred or so workers back. It's obviously a big plus for our community."

Kurt Dennis
Greenwood Township Supervisor

"I go to Westminster College where I'm studying biology. My brother Nathan works here and hopefully I can keep working here for the next eight years because I plan on going to dental school."

Hailey Maynard
Finishing | Vitro

Conclusion

Beyond the one-time boost created by large capital investments like construction of a new manufacturing facility, the long-term recurring impacts of a company's operations are often most valued because of their stable and lasting impact. For First Solar, those impacts were analyzed in 2023 to assess the company's current impact as it undergoes continued growth and expansion, but also in 2026 after the current expansions in Ohio, Alabama, and Louisiana will be complete and the company will be operating at a significantly larger scale.

In 2023, total national impacts include more than 16,000 jobs, nearly $1.6 billion in labor income and just over $5.3 billion in total economic output including indirect and induced effects. Notably, the total jobs created by First Solar's operations represent an effective economic impact multiplier of 6.0 meaning that for each of First Solar's 2,700 direct jobs, a total of 6 jobs are created in the US economy. Within Ohio, the total economic impacts include 10,505 jobs, over $1 billion in labor income, and nearly $3.3 billion in total economic impact.

First Solar's impacts can be attributed at least in part to longstanding efforts to cultivate a domestic supply chain, which helps capture a larger portion of indirect and induced economic activities within the national economy.

By 2026, First Solar's operations are expected to grow to include 4,100 direct employees and total direct output of nearly $4 billion nationally. The national economic impact of operating at that scale includes creation of more than 30,000 jobs, $2.8 billion in labor income, and $10 billion in total output including direct, indirect, and induced effects. In 2026, it is expected that First Solar's effective national jobs multiplier will reach 7.3, meaning that for every First Solar job, the company will create a total of 7.3 jobs in the national economy.

These results compare favorably to other industries such as highway construction, which has a jobs multiplier of 2.1; small electronics manufacturing, which has a jobs multiplier of 4.2; and even a high impact industry like oil and gas extraction, which has a jobs multiplier of 6.7.

While the unique impacts of a specific industry, or company, can vary based on a wide range of factors, First Solar's impacts can be attributed at least in part to long-standing efforts to cultivate a domestic supply chain, which helps capture a larger portion of indirect and induced economic activities within the national economy.

Learn more about First Solar's US value chain at *https://www.americassolarworkers.com/*.

CONTEXTS: A HIGHLY DIFFERENTIATED SOLAR MANUFACTURING AND TECHNOLOGY COMPANY

First Solar has consistently leaned into and leveraged its differentiators to deliver growth and navigate unprecedented change and industry volatility. The company is unique among the world's largest solar manufacturers for being the only US-headquartered company and for producing thin film solar panels that are not dependent on Chinese c-Si supply chains.

Moreover, First Solar's commitment to Responsible Solar and sustainability, its distributed manufacturing strategy, the strength of its localized supply chains, its technology advantage, and the strength of its balance sheet all drive value creation for its investors and for America. From 2016 to 2026, First Solar expects to have invested almost $4 billion in US manufacturing and R&D infrastructure, demonstrating its commitment to America.

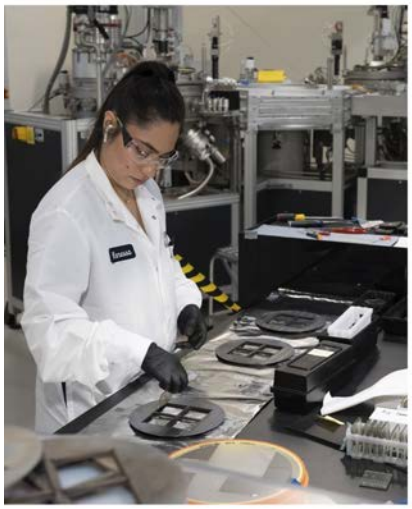
This section explains some of First Solar's key differentiators that help drive its impact on the US economy.

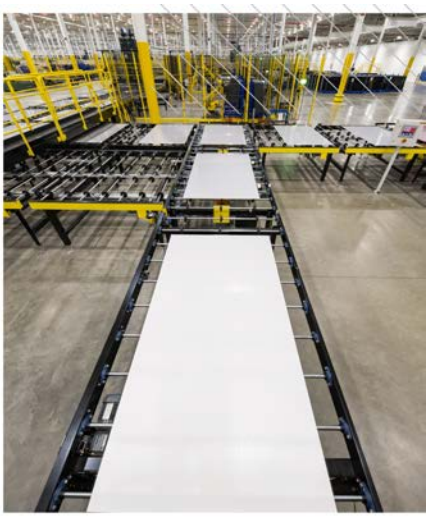
Uniquely American Solar Technology

The US is the global leader in cadmium telluride (CdTe) manufacturing [1] having developed the technology in the 1950s, although it was only commercialized by First Solar in 2002. Today, CdTe is the second most common PV semiconductor after c-Si, which is dominated by Chinese companies.

CdTe's qualities include lower cost, superior scalability, and a higher theoretical efficiency limit. Over time, and with almost $2 billion invested in research and development, First Solar has been able to harness other advantages that are unique to CdTe. Its strategic advantages include reduced dependence on China's crystalline silicon supply chains, supporting US energy security and supply chain continuity through rapid deployment of new manufacturing capacity.

The semiconductor uses two byproducts from zinc and copper mining waste streams, cadmium and tellurium, which are combined into a stable compound. Each First Solar module includes a layer of semiconductor that is only 3 percent the thickness of a human hair.





[1] Source: *https://www.nrel.gov/pv/cadmium-telluride-solar-cells.html.*

Fully Vertically Integrated Manufacturing Process

First Solar's fully vertically integrated manufacturing template, which was developed and operationalized in Ohio, is unique in its ability to integrate the manufacturing of thin film wafers and cells in its module manufacturing process. The semiconductor is deposited on sheets of glass in a high-tech process that has more in common with producing flat screen televisions than it does assembling a c-Si solar panel.

This streamlined process allows First Solar to convert a sheet of glass into a fully functional module under one roof in approximately 4 hours, compared to c-Si's batch processing approach, which has not fundamentally changed in the past 2 decades and requires three to four different factories, multiple companies, and multiple days to achieve the same result. Significantly, First Solar's manufacturing template has allowed it to deploy vertically integrated manufacturing at a location of its choosing in fewer than 24 months.

First Solar's factories exemplify America's manufacturing prowess, operating 24 hours a day, 7 days a week, 365 days a year, with the industry's highest utilization rates. The factories are believed to set the standard for capacity utilization and manufacturing cost, demonstrating how American manufacturing can effectively compete globally.

First Solar also stands apart from the competition for its early embrace of a distributed manufacturing strategy. Enabled by its easily replicable manufacturing template, the company took the decision to site new manufacturing capacity close to demand to accelerate the speed at which it could deliver solar panels to its customers without the risk of relying on transoceanic shipping.

Respect for People and the Planet

First Solar has long understood its responsibility towards the planet, the community, and its customers. The company places sustainability at the heart of everything it does, setting its sights on exceeding industry standards, not merely meeting them. Today, First Solar has a long history of establishing benchmarks in recycling, supply chain transparency, the carbon and water footprint of PV technology, and health and safety.

First Solar's solar technology has the lowest environmental footprint in the industry. Its Series 7 module has a carbon and water footprint that is nearly four times lower than conventional crystalline silicon modules manufactured in China and an energy payback time that is approximately five times faster.

The company pioneered recycling of solar panels and its proprietary process allows it to recover approximately 90% of materials from each processed module. In fact, a kilogram of CdTe can be recycled 41 times to produce electricity for 1,200 years before it stops being effective.

Crucially, First Solar has led the industry in taking a stance of zero tolerance for forced labor in solar supply chains. The company is one of the only solar manufac-

turers not to have any exposure to the Chinese province of Xinjiang, where state-sponsored forced labor is reportedly used to support elements of c-Si value chains, including the production of polysilicon.

METHODOLOGY

Approach and Assumptions

In addition to the direct expenditures and employment of a company, or other grouping of economic activities, economic impact assessments capture the broader set of economic activities generated by an initial infusion of new dollars into the economy. When new economic activity occurs, businesses will purchase additional inputs and workers will have additional dollars for purchasing goods and services. The total economic effect accounts for indirect spending by businesses and induced spending by workers benefiting from additional dollars.

In general, these studies focus on new dollars entering a regional (or national) economy. On a national scale, this framework would consider money paid by foreign customers or investments by foreign companies as new dollars entering the national economy. In the present context, all of First Solar's activities are considered new to the national economy because in the absence of First Solar, it is likely that demand for solar panels would be met by a foreign company given the concentration of solar manufacturing overseas, especially in China.

Economic impact analysis provides the tools to quantify the full impact of the indirect and induced effects within a regional economy due to an initial round of spending using jobs, earnings, value added, and output multipliers. This methodology is based on measuring inter-industry linkages across the economy and relies on the commonly used input-output method developed by Wassily Leontief. While input-output models have advanced considerably over time, the same fundamental principles apply.

To analyze the economic impact of First Solar's expected economic impact in 2023 and following the expansion currently underway, this report accounts for the one-time expenditures involved in the construction of new facilities in Ohio, Alabama, and Louisiana and the ongoing domestic operational expenditures across the company once the new facilities have been commissioned. The study includes an analysis of First Solar's economic multipliers compared to various industries across the United States and in the State of Ohio. These benchmarks provide a gauge as to how First Solar's economic activity truly impacts the economy in comparison to other common industries.

About the Study

The **Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana at Lafayette** serves as a hub for research and education on critical pol-

icy issues in Louisiana and beyond. Named after the state's first female governor, the center honors her legacy by addressing key challenges facing the region, including education, health care, and economic development. Through collaboration with policymakers, community leaders, and academics, the center aims to inform evidence-based policy solutions that promote the well-being and prosperity of Louisiana's citizens.

The Researchers

To lead and produce the study referenced in this report, First Solar commissioned **Dr. Stephen Barnes,** Executive Director of the Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana at Lafayette and an Associate Professor of economics in the B.I. Moody III College of Business Administration.

Dr. Barnes serves as the independent economist on the Louisiana Revenue Estimating Conference, a forecasting panel that sets income projections used to create the state budget. He has collaborated with federal and state agencies, industry partners and advocacy groups as well as scholars in more than a dozen disciplines on research addressing many aspects of the economy and population of Louisiana.

Dr. Barnes has publications spanning the economics of education, environmental risks, health and health care, and transportation. Dr. Barnes holds a bachelor's degree in economics from Louisiana State University and a master's and Ph.D. in economics from the University of Texas at Austin.

Dr. Barnes was assisted by **Andrez Joseph,** a Research Associate at the Kathleen Babineaux Blanco Public Policy Center. Joseph is originally from Roseau, Dominica, an island in the Caribbean, where he began his undergraduate studies in Mathematics and Physics prior to moving to the United States. Upon arrival in 2017, he completed his Bachelor of Science in Mathematics from the Louisiana State University at Alexandria and continued his education at the University of Louisiana at Lafayette where he attained a Master of Science in Applied Mathematics.

SUBMITTED BY HON. CATHERINE CORTEZ MASTO,
A U.S. SENATOR FROM NEVADA

National Mining Association

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Washington, DC 20001
Phone: 202–463–2600

February 9, 2024

Internal Revenue Service
CC:PA:01:PR (REG–107423–23)
Room 5203
PO Box 7604, Ben Franklin Station
Washington, DC 20044

Re: Comments on Proposed Regulations on Section 45X Advanced Manufacturing Production Credit.

The National Mining Association (NMA) appreciates the opportunity to comment on proposed regulations ("proposed regulations") for the Section 45X Advanced Manufacturing Production Credit (REG–107423–23). The NMA appreciated Congress' inclusion in the Inflation Reduction Act of 2022 of tax credits for certain critical minerals. The proposed Internal Revenue Service (IRS) rule, however, deviates from congressional intent by omitting availability of the credit for mining extraction costs.[1]

America's mining industry supplies the essential materials necessary for nearly every sector of our economy—from technology and healthcare to energy, transportation, infrastructure, and national security. Headquartered in Washington, DC, the NMA has a membership of more than 250 companies and organizations involved in every aspect of mining, from producers and equipment manufacturers to service providers.

The NMA is the only national trade organization that serves as the voice of the U.S. mining industry and the hundreds of thousands of American workers it employs be-

[1] 88 Fed. Reg. 86844 (Dec. 15, 2023).

fore Congress, the federal agencies, the judiciary and the media, advocating for public policies that will help America fully and responsibly utilize its vast natural resources. We work to ensure America has secure and reliable supply chains, abundant and affordable energy, and the American-sourced materials necessary for U.S. manufacturing, national security, and economic security, all delivered under world-leading environmental, safety and labor standards.

These comments focus on the aspects of the § 45X credits that will stimulate U.S. production, processing and availability of critical minerals as Congress intended. Congress has articulated a bipartisan interest in addressing our increasing mineral import reliance and fragile supply chains. The U.S. is currently at a strategic disadvantage. Over the years, the U.S. has watched as geopolitical rivals and close allies alike have taken the lead in minerals production. In 1995, the U.S. was 100 percent import reliant for only 8 minerals. Today, that number has nearly doubled to 15. Of the 50 critical mineral commodities the U.S. Geological Survey lists as essential for U.S. economic and national security, China is the top producer or top supplier for 30 of them.[2] Over the same period, the U.S. has seen the necessary processing and refining capabilities of minerals steadily drift overseas, with substantial processing now occurring in China.

The risks inherent with that growing vulnerability are masked when trade agreements are secure and global supply chains are working. But recent lockdowns and closed borders significantly and adversely impacted the global supply chain. The need for expanded sources of critical minerals was apparent when, on a July 2020 earnings call, Tesla CEO Elon Musk all but begged miners for more nickel, saying, "Tesla will give you a giant contract for a long period of time if you mine nickel efficiently and in an environmentally sensitive way."[3] The U.S. currently has only one nickel mine, with the mine's useful life ending as early as 2026; however, in September 2023, the Department of Defense awarded $20.6 million to developers of the proposed Talon nickel mine.[4]

Trade tensions and political instability also play a role. The U.S. and China have been in a state of flux for the last several years, with China using its minerals dominance to limit the world's rare earths supply as a significant bargaining chip. In 2018, the Democratic Republic of the Congo (DRC) nearly tripled the royalty rate on cobalt. And Indonesia, once the world's biggest nickel exporter, banned exports recently in the hopes of expanding its domestic smelting industry.

Section 45X, as added by the Inflation Reduction Act of 2022, provides a key incentive for U.S. domestic mineral production. Section 45X generally provides a tax credit for various types of "eligible components" produced by the taxpayer and sold to an unrelated person, but only if the production and sale is in a trade or business of the taxpayer and only if the eligible components are produced in the U.S. or in a U.S. possession.

For purposes of section 45X, eligible components include, among other items, "applicable critical minerals." The section 45X credits apply to eligible components produced and sold after December 31, 2022. Unlike other types of eligible components, applicable critical minerals are not subject to a credit phaseout for sales after 2029.

Section 45X provides the following list of 50 minerals that, when converted or purified to specified purities, are considered an "applicable critical mineral" for purposes of the § 45X credit: aluminum, antimony, arsenic, barite, beryllium, bismuth, cerium, cesium, chromium, cobalt, dysprosium, erbium, europium, fluorspar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lithium, lutetium, magnesium, manganese, neodymium, nickel, niobium, palladium, platinum, praseodymium, rhodium, rubidium, ruthenium, samarium, scandium, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, and zirconium. With respect to an applicable critical mineral, the section 45X credit is equal to 10 percent of the costs incurred by the taxpayer with respect to the production of such mineral.

Section 45X(d)(2) provides that the only sales taken into account under section 45X are for eligible components produced within the United States or a U.S. possession.

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[2] U.S. Geological Survey, Mineral Commodity Summaries, 2023, *https://www.usgs.gov/centers/national-minerals-information-center/mineral-commodity-summaries*.

[3] *Mining.com,* Elon Musk pledges "giant contract" for responsible nickel miners, July 2020, *https://www.mining.com/tesla-offers-giant-contract-to-responsible-nickel-miners/*.

[4] *See,* Associated Press, "Defense Department awards $20.6 million to support nickel prospecting in Minnesota and Michigan" (Sept. 12, 2023).

Under the proposed section 1.45X-4(3), the only critical mineral production costs eligible to be counted for purposes of the tax credit are those for chemical conversion and purification (*i.e.,* processing); *direct or indirect material costs or costs related to the extraction or acquisition of raw materials would not count*.[5] This limitation fails to implement the intent of Congress and is simply nonsensical since the cost to mine a listed critical mineral is often 50 percent or more of the total cost of producing the mineral in its ultimate purified state. And, of course, critical minerals cannot be produced in their purified form without first being extracted from the ground. By limiting the type of production costs eligible to be counted, the proposed regulations would deny the domestic mining industry the benefits of the section 45X tax credit and thus frustrate the Congressional goal of stimulating new and improved domestic mines and domestic supply chains for critical minerals.

The preamble to the proposed regulations apparently recognizes this crucial flaw and notes "that a wide range of costs are incurred in the production of applicable critical minerals." Rather than providing for these costs, the preamble asks for comments on "whether and how extraction and other similar value-added activities in the production of raw materials used in applicable critical minerals should be taken into account." The preamble says Treasury and the IRS are "considering" including extraction and similar costs in critical mineral production costs, but would do so only if the IRS could administer such an approach and it would not lead to multiple crediting of the same costs. *NMA believes the final regulations absolutely must include extraction and other raw material costs in creditable production costs under section 45X.* Congress tasked the IRS to implement the credit. Treasury and IRS have the authority and expertise to determine a path forward and have had more than a year to do so. They have promulgated similar rules with respect to section 30D and the bonus credits for domestic content. NMA would like to work with Treasury and the IRS to develop appropriate rules to take extraction and related costs into account under section 45X. One proposed methodology is described below.

The proposed regulations essentially say that only the processor of the critical minerals is eligible to claim the credit unless the processor is acting as a contract manufacturer and has a written agreement with the other contract parties as to who will claim the credit. This concept would not accommodate the vast majority of situations in which a miner extracts the minerals and then transfers them to another (likely unrelated) party who refines or further refines them. While there is unlikely to be multiple crediting of the same costs in a vertically integrated company, mining and refining activities are not typically vertically integrated or done in partnership between miners and refiners. *To make the section 45X credit work in the real world, it must permit each party in the U.S. supply chain from extraction through refining to claim a tax credit on the value-added costs the party incurs, provided the mineral ultimately reaches the requisite purity.*

NMA believes that parties incurring extraction costs can be made eligible for the section 45X tax credit without resulting in duplicate credit claims for the same costs. For example, a U.S. miner of critical mineral ore could use any reasonable method for tracing through the supply chain the minerals it extracted and could claim the tax credit in the year it receives a certification from the refiner that the minerals it originally extracted were refined to the requisite purity and sold to an unrelated party. The miner would claim the credit only for its extraction costs, while the refiner would claim the credit for the processing, transportation, and other costs it bears (but not the extraction/material costs). Refiners could be required to provide the necessary certification to their U.S. ore/raw material suppliers. Such certification process would require cooperation between otherwise unrelated miners and processors to take full advantage of the section 45X credit, which would also improve transparency.

As another example, a party extracting (or recycling) minerals and holding title to them throughout the entire extraction and refining process should be able to claim the section 45X tax credit on all its production costs, including extraction. In such a case, there would be no duplication of costs since no other party (including parties providing contracted refining services) would economically bear costs or be eligible to claim the tax credit. A contract manufacturer without title to the processed minerals would not legally be permitted to sell them to an unrelated party and, therefore, could not be an eligible credit claimant.

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[5] 88 Fed. Reg. at 86868.

The preamble to the proposed regulations asks for comment on whether "extraction" should be defined consistent with proposed regulation section 1.30D–3(c)(8). Under that section, "extraction"

> means the activities performed to extract or harvest minerals or natural resources from the ground or a body of water, including, but not limited to, by operating equipment to extract or harvest minerals or natural resources from mines and wells, or to extract minerals or natural resources from the waste or residue of prior extraction. Extraction concludes when activities are performed to convert raw mined or harvested products or raw well effluent to substances that can be readily transported or stored for direct use in critical mineral processing. Extraction includes the physical processes involved in refining. Extraction does not include the chemical and thermal processes involved in refining.

NMA believes proposed section 1.30D–3(c)(8) is a reasonable definition of extraction for use in permitting extraction costs to be counted under the section 45X tax credit.

The section 45X tax credit is intended to stimulate *domestic mining* and production of critical minerals. Accordingly, if the final regulations permit extraction costs to be taken into account, they should count only the costs of extraction that occurred in the United States (or in a U.S. possession). To do otherwise would support foreign production because U.S. processors would be able to claim the credit on their extraction costs when the raw materials are extracted overseas. *The section 45X tax credit for domestic production of critical minerals should not be available with respect to the costs of raw materials extracted in foreign countries or, in the case of recycling, sourced in foreign countries.*

The critical minerals production paradigm contemplated in the proposed regulations must be significantly modified to address real-world domestic mining and processing activities without forcing the creation of artificial business arrangements. **To stimulate new and improved domestic critical mineral supply chains, the section 45X tax credit should count all of the costs of domestic production and processing of critical minerals.**

Respectfully submitted,

Rich Nolan

United States Senate

WASHINGTON, DC 20510

February 14, 2024

The Honorable Janet Yellen
Secretary
U.S. Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, DC 20220

Dear Secretary Yellen,

We are writing in response to the notice of proposed rulemaking for the Section 45X Advanced Manufacturing Production Tax Credit. We request that the U.S. Department of the Treasury (Treasury) make revisions to the proposed rule to align the rule with the intent of Congress and to ensure the credit properly incentivizes the entirety of the domestic supply chain for applicable critical minerals and eligible components, including mineral extraction and electric vehicle battery production.

As you know, Congress passed the Inflation Reduction Act (IRA) in part to support the domestic extraction and production of critical minerals and materials, as well as the manufacturing of batteries and their components. Recognizing our increasing foreign dependence on these materials, often from hostile nations, the section 45X credit provides a credit for taxpayers who produce certain critical minerals as well as various energy related products.

We are concerned that Treasury's proposed rule for the 45X tax credit explicitly excludes direct and indirect material costs for taxpayers seeking to claim the credit. Treasury writes in the proposed rule that "Direct material costs as defined in § 1.263A–1(e)(2)(i)(A), or indirect material costs § 1.263A–1(e)(3)(ii)(E), and any costs related to the extraction or acquisition of raw materials" are not be included in pro-

duction costs. The proposed rule goes on to say ". . . the cost of acquiring the raw material used to produce the electrode active material, the cost of materials used for conversion, purification, or recycling of the raw material, and other material costs related to the production of the electrode active material would not be taken into account."

The clear purpose of section 45X was to encourage investment in the United States and to build a reliable and resilient domestic supply chain for critical minerals right here at home. The section 45X credit was designed to support responsible domestic mining and processing of these minerals. As members of the U.S. Senate we want to clarify that the blanket exclusion of materials costs is not consistent with the intent of Congress and should be expeditiously revised. Section 45X provides for a 10 percent credit for the production costs of applicable critical minerals, and raw materials costs were never intended to be excluded from this calculation. This exclusion is not aligned with the intent of Congress and significantly weakens the tax credit as the cost of extracting raw materials essential for renewable energy, battery technologies, and other critical materials are a significant portion of overall costs.

Additionally, this exclusion weakens the credit's intended goal to strengthen the New Clean Vehicle Credit, established under Section 30D of the tax code. The 30D credit is designed to counter influence by any "Foreign Entity of Concern" (FEOC) over clean vehicle supply chains. Key to the success of the 30D credit are the 45X credit's incentives for domestic mineral extraction and processing. A final rule that excludes materials costs will substantially impact critical minerals supply, increasing the challenges for vehicle producers looking to manufacture clean vehicles in the United States.

Private companies are ready and willing to invest in extraction and production of raw materials right here in the United States, and do so in a safe and responsible manner through developed environmental protection and labor standards. However, by excluding the majority of the production costs from the 45X credit, Treasury would *disincentivize* investment in the United States, and also increase our reliance on countries that do not share our democratic or geopolitical values. This result would be contrary to the intent of the legislation and detrimental to our national and energy security.

We appreciate Treasury's caution and intent, noted in the proposed rule, to mitigate the risk of double counting and fraud. However, as proposed, the credit eliminates the ability to even single count direct and indirect materials costs and extraction costs, which significantly weakens the credit's primary purpose of developing a domestic critical mineral supply chain. The risk of double counting production costs can be mitigated using similar basis reduction mechanics and documentation requirements Treasury and IRS require to calculate the value of investment tax credits under sections 48 and 48C. Similarly, IRS is well equipped with the experience and tools necessary to understand and administer the deduction of expenses related to extraction and can apply these to the 45X credit. Additionally, we believe the statute, which directs the credit to be claimed for components "produced by the taxpayer," provides flexibility for Treasury to establish other safeguards, such as audit and claw back measures, to prevent any type of fraudulent behavior.

We appreciate your attention to these matters and look forward to working with you as you implement the Inflation Reduction Act.

Sincerely,

Catherine Cortez Masto
United States Senator

Jacky Rosen
United States Senator

Mark Kelly
United States Senator

Kyrsten Sinema
United States Senator

Patty Murray
United States Senator

John Hickenlooper
United States Senator

Joe Manchin III
United States Senator

Laphonza Butler
United States Senator

Robert P. Casey, Jr.
United States Senator

February 5, 2024

The Honorable Janet Yellen
Secretary
U.S. Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, DC 20220

Dear Secretary Yellen,

We write to express our support for the renewed focus on securing America's economic competitiveness and national security by strengthening the domestic manufacturing sector for innovative energy technologies such as battery energy storage systems and electric vehicles (EVs). The onshoring of these critical industrial capabilities will not only benefit U.S. workers, their families, and communities but also comes at a vitally important time when more domestic investment is needed to remain competitive with our global adversaries.

The undersigned organizations collectively represent every step of the supply chain for battery storage and electric vehicle manufacturing. Our operations are significant economic contributors that create thousands of high-paying jobs, millions of dollars in state tax revenue to fund essential community services, and research and training that ensures the U.S. remains globally competitive.

We write today to urge the Department of the Treasury and the Internal Revenue Service to consider that **direct and indirect material costs and costs related to the domestic extraction of raw materials are value-added activities and should be eligible to claim the Section 45X Advanced Manufacturing Production Tax Credit (45X).**

Critical Mineral Production Under 45X

To date, the Biden-Harris Administration has worked to invest in America—from assessing our inherent vulnerability within mineral supply chains essential to modern renewable energy technologies to supporting domestic mine processing projects through once-in-a-generation public-private funding partnerships. Through these actions, a solid foundation for a new era of American manufacturing is being laid. The Inflation Reduction Act (IRA) of 2022 (Pub. L. 117–169) includes landmark programs essential to reducing our outsized reliance on imported minerals from countries that do not share our democratic values or align with the United States' globally leading environmental, labor, and safety standards.

In December 2023, the U.S. Department of the Treasury and the Internal Revenue Service (IRS) issued draft guidance (88 FR 86844) to implement 45X, a provision whose effective implementation underpins the success of the IRA and the clean energy transition.

Section 45X creates a new tax credit that provides $35 per kWh for each battery cell, $10 per kWh for each battery module, and covers 10 percent of the costs of production of the applicable critical materials, which will significantly drive down the costs of domestic clean energy manufacturing. Unlike other eligible components, applicable critical minerals are not subject to a credit phaseout after 2029, underscoring Congressional intent that the IRA incentivizes the onshoring of the critical minerals supply chain.

If implemented thoughtfully, the 45X credit will ensure the success of current American industrial policy over the next decade by facilitating the deployment of domestically produced clean energy technologies—particularly electric vehicles. However, the proposed guidance states that the only critical mineral production costs eligible to be counted toward the production tax credit are the downstream value-added activities that include chemical conversion and purification (*i.e.,* processing). This concept would not provide a tax credit for the costs of domestic extraction of critical minerals, a key part of onshoring the supply chain. Nor would it address situations in which an entity extracts the minerals and transfers them to another likely unrelated party who refines or chemically processes the raw mineral.

45X and Clean Vehicle Incentives

The Section 30D New Clean Vehicle Tax Credit (30D) was modified by the IRA and reduces the cost of new EVs by $7,500, provided the vehicle purchaser and manufacturer meet the necessary qualifications. For manufacturers, this means meeting increasingly stringent domestic content requirements that require sourcing battery components and critical minerals either domestically or from free trade agreement (FTA) countries. Because both requirements must be met for an EV to be eligible

for the 30D credit, significant investment will continue to be necessary to scale domestic battery manufacturing and critical mineral production capacity and maximize the impact of the 30D credit. Thoughtful implementation of the 45X credit recognizes its role as a key enabling tool to meet 30D sourcing requirements and is central to the success of broader U.S. industrial strategy.

The clean vehicle and manufacturing incentives in the IRA have two key policy objectives: to increase EV deployment and to counter foreign influence by building domestic clean energy supply chains. Designed to complement each other, the Section 30D New Clean Vehicle Tax Credit and the Section 45X Advanced Manufacturing Production Tax Credit will be the main drivers of these policy outcomes. As proposed, the 45X guidance will achieve neither and, in fact, could serve as a hindrance to the success of both credits. Without a robust, secure supply of domestic critical minerals and battery components, increasingly stringent sourcing requirements tied to 30D eligibility could make fewer vehicles eligible over time. The decision to deny the 45X credit for raw materials costs will curtail future domestic supply, worsening an increasing minerals bottleneck rather than alleviating it.

We appreciate Treasury and IRS's concerns about preventing double counting and reducing fraud, waste, and abuse and strongly support the need for upholding the integrity of the 45X credit. We also share Treasury and IRS's goals of ensuring the value of the credit is retained domestically. However, as proposed, 45X would eliminate the ability to even single count direct and indirect materials costs and extraction costs, amounting to a missed opportunity to incentivize the development of a domestic critical minerals supply chain.

Collectively, the undersigned organizations have serious concerns regarding the proposed guidance. As proposed, the impact of the 45X credit is significantly reduced. Further guidance must permit each party in the U.S. supply chain, including extraction and refining, to claim a tax credit on the value-added costs the party incurs, provided the mineral ultimately reaches the requisite purity.

Congress intended the 45X tax credit to work in tandem with the clean vehicle credit's sourcing requirements to stimulate domestic production of critical minerals and reduce the United States' reliance on imported minerals. To stimulate greater security of our domestic critical mineral supply chains and unlock the intended impact of the statute, the undersigned organizations urge the Department of the Treasury and the IRS to consider that **direct and indirect material costs and costs related to the domestic extraction of raw materials are value-added activities and should be eligible to claim the 45X credit.**

We appreciate your attention to this important issue and look forward to the agency's expeditious update to address the shortcomings in the draft guidance.

Sincerely,

Zero Emission Transportation Association (ZETA)
Alaska Miners Association
American Exploration & Mining Association
American Rare Earths Ltd.
Battery Materials & Technology Coalition (BMTC)
Colorado Mining Association
First Mode
General Motors
Idaho Mining Association
Jervois
Lithium Americas
Metallic Minerals Corporation
Montana Mining Association
Nevada Battery Coalition
NewRange Copper Nickel
Nyrstar
Piedmont Lithium
Rio Tinto
Society for Mining, Metallurgy, and Exploration
Talon Metals
TerraVolta
National Mining Association (NMA)
American Critical Minerals Association
American Lithium Corp.
Arizona Mining Association
Coeur Mining
Lundin Mining—Eagle Mine
GraphiteOne
Hecla Mining
Ioneer USA
Liebherr
Materion Natural Resources
Mining Minnesota
MP Materials
Nevada Mining Association
NioCorp
Perpetua Resources
Ramaco Resources
Sibanye Stillwater
South32
Teck Resources
Tesla

The Women's Mining Coalition
USA Rare Earth, LLC.
U.S. Battery Machine Builders Coalition
Utah Mining Association

CC:

U.S. House of Representatives Committee on Ways and Means
U.S. House of Representatives Committee on Natural Resources
U.S. Senate Committee on Energy and Natural Resources
U.S. Senate Committee on Finance

PREPARED STATEMENT OF HON. MIKE CRAPO,
A U.S. SENATOR FROM IDAHO

During last Thursday's State of the Union address, using "fair share" rhetoric, President Biden laid out his plans for making American manufacturers more competitive: tax them more. President Biden's proposed 28-percent corporate rate—about 32 percent when including State taxes—would leave the U.S. with one of the highest rates in the developed world.

It gets worse: Biden would also hike the Democrats' book minimum tax—a fundamentally flawed proposal which harms American manufacturers—by 40 percent to 21 percent. Contrast that vision with what Republicans actually did in 2017.

Prior to the Tax Cuts and Jobs Act (TCJA), the U.S. had one of the highest corporate income tax rates among developed countries. In 2017, Republicans lowered the rate and broadened the base, putting a stop to corporate inversions. It led to one of the strongest economies in generations prior to the pandemic: unemployment dropped to a 50-year low, economic gains flowed to all demographic groups and income levels, and American businesses reported record R&D investment.

In the words of former President Obama's economic advisor, Jason Furman, "taxes actually do matter." In response to a recent study on the impact of the TCJA's policy changes on domestic investment, Furman stated: "These are the most convincing estimates of the response of investment to corporate tax rates that I've ever seen."

I agree—tax rates actually do matter. A competitive tax system is instrumental in manufacturers' decision of where to invest. Reducing business tax rates, paired with progrowth policies like immediate expensing of capital investments, drove historic growth in the manufacturing sector. According to the National Association of Manufacturers, in 2018, the year immediately following TCJA's enactment, manufacturing had the best year for job creation in 21 years; manufacturing wages grew at the highest level in 15 years; manufacturing capital investment grew by 4.5 percent; and manufacturing production grew 2.7 percent, with December 2018 being the best month for manufacturing output since May 2008.

Stability of tax policy is also key to maintaining strong manufacturing in the United States. We must protect the TCJA's progrowth tax policies and seek to make them permanent before they expire in 2025. We should also look to improve and build on those policies to ensure U.S. companies and workers can continue to compete globally.

Another area of continued bipartisan interest is bolstering the domestic supply chain of semiconductors. American semiconductor manufacturers, represented here today by onsemi, are operating in an increasingly competitive market. While we must be circumspect when considering industry-specific tax incentives, bolstering domestic manufacturing of semiconductors is vital to safeguarding national security.

Chairman Wyden and I have worked closely over the years on proposals to strengthen the U.S. semiconductor supply chain. The Advanced Manufacturing Investment Credit (AMIC) is the result of that bipartisan effort and has already led to increased investment across the U.S. In my home State of Idaho, Micron announced that it will construct a new memory chip plant, the first new memory semiconductor manufacturing fab built in the U.S. in the last 20 years. This expansion ensures the semiconductor industry will continue to innovate and develop new technologies that keep Idaho on the leading edge for research and development.

In contrast to this bipartisan effort, the costs of the Inflation Reduction Act (IRA) energy incentives have quickly mushroomed from the original JCT score of $270 billion over 10 years to a June 2023 estimate of $663 billion. One of our witnesses today will discuss his experience with how the administration is proposing to implement these incentives in a way that bolsters China and foreign manufacturing.

Unfortunately, he is not alone: hundreds of domestic stakeholders have provided formal comments to various proposed energy incentive rulemakings which express significant concerns with the implementation of those energy incentives, including two other witnesses here today. Congress should closely scrutinize a law that both costs much more than promised and also fails to achieve key goals, like making the U.S. less reliant on our adversaries.

I look forward to discussing how we can continue to encourage domestic manufacturing activity, including addressing the global semiconductor shortage and supply chain issues.

PREPARED STATEMENT OF ANNA FENDLEY, DIRECTOR OF REGULATORY AND STATE POLICY, UNITED STEELWORKERS (USW)

On behalf of the members of the United Steelworkers (USW) union, I would like to thank Chairman Wyden, Ranking Member Crapo, and the members of the committee for holding this hearing today and for inviting me to testify.

My name is Anna Fendley, and I am the director of regulatory and State policy for USW, the largest manufacturing union in North America. Our members supply almost every sector of the economy and produce a wide array of products, including paper, glass, ceramics, cement, chemicals, aluminum, oil, rubber, and, of course, steel. They do so in some of the most advanced, most efficient, and most environmentally friendly facilities in the world, and their jobs are the sort of good, family-supporting jobs that built the middle class in this country. These are the jobs that must be retained and created if America is to maintain its position in the global economy.

We appreciate that this committee has spent many years considering, developing, and overseeing implementation of initiatives to grow U.S. manufacturing through the tax code. Over the last several years and through multiple pieces of legislation, Congress has enacted a once-in-a-generation investment in onshoring and growing the manufacturing base in this country using both supply- and demand-side drivers to incentivize growth. While I will only discuss a few of them in my testimony—those relevant to the tax code—they are only a handful of the interlocking series of policies all being simultaneously implemented by the Biden administration. USW is supportive of the work Congress has done—in a mostly bipartisan fashion—and is excited about the progress that has been made through executive action in implementation of the Bipartisan Infrastructure Law, the CHIPS and Science Act, and the Inflation Reduction Act (IRA).

The efforts by Congress have already led to a boom in spending on manufacturing construction, reaching approximately $225 billion in new spending in January.[1] U.S.-based companies like making investments in their facilities, such as Blue Bird Bus expanding capacity to allow USW-members to make up to 5,000 buses annually.[2] Notably, foreign companies are also now choosing to make massive investments in the United States. For example, about a year ago Q-Cells, owned by South Korean company Hanwha, announced plans to invest approximately $2.5 billion to expand its solar module manufacturing capacity in Georgia.[3]

We have worked hard with Congress, the administration, our employer partners, and other stakeholders to help develop and implement these policies and will continue to do so. This is an ongoing process, and the continued focus of the Finance Committee on ensuring success is very much appreciated, as is the committee's continued interest in the perspective of labor unions like USW.

SECTION 45X ADVANCED MANUFACTURING PRODUCTION CREDIT

The first provision I would like to highlight is the section 45X Advanced Manufacturing Production Credit that was enacted in the Inflation Reduction Act. Section 45X provides a tax credit for the domestic production and sale of certain clean energy products, components, and critical minerals. USW strongly supported, and con-

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[1] Federal Reserve Economic Data, "Total Construction Spending: Manufacturing in the United States," accessed March 7, 2024, *https://fred.stlouisfed.org/series/TLMFGCONS*.

[2] Electrive, "Blue Bird to Produce 5,000 Electric School Buses Per Year," May 26, 2023, *https://www.electrive.com/2023/05/26/blue-bird-lays-foundations-to-produce-5000-zev-school-buses-a-year/*.

[3] *https://www.georgia.org/press-release/qcells-more-double-production-georgia-create-2500-new-jobs.*

tinues to support, this provision because it presents huge potential to help build the critically needed stable and resilient domestic supply chains for an array of clean energy technologies that will allow American workers to rapidly scale the deployment of these technologies while protecting our energy security.

Our union was particularly supportive of congressional efforts to create this tax credit to reshore solar manufacturing capacity after the majority of it was lost to China over decades; to use tax incentives to ensure that a new domestic offshore wind industry is supplied by U.S.-made components; and to boost the production of critical minerals in this country. As the largest mining union, our members are particularly keen to see responsible mining and mineral processing grow in this country to ensure we are supplying our own needs.

We have provided input to the Department of the Treasury (Treasury) since the passage of the IRA in its ongoing regulatory process to implement section 45X. USW is grateful for the careful work being done by the Internal Revenue Service (IRS) to implement this provision so far, including the efforts by the agency to solicit public input on certain key questions in the notice of proposed rulemaking. Although like all iterative regulatory processes in an interim stage, there are certain outstanding and occasional new issues that arise that require more consideration before rulemaking is complete.

An example of what I mean is in the definition of aluminum under 45X, which is of great importance to USW, the primary union in the aluminum industry. USW was one of several stakeholders that sought clarification about the wording of the IRA statutory language that, if interpreted one way, could have inadvertently excluded most primary aluminum production from eligibility. In its proposed rule, the IRS both cleared up some of that confusion while, potentially, introducing a different bit of confusion. Clearly, the IRS had the correct goal in its guidance, which stated that the relevant definition of aluminum "should be interpreted in light of the dynamics of the aluminum industry and the role that critical materials like aluminum play in the renewable energy and energy storage industry." As such, it clarifies the intent of Congress that eligibility should encompass both aluminum oxide (*i.e.,* alumina) and commodity-grade aluminum.

This is a welcome clarification for USW members who work at the only remaining domestic alumina refinery in Gramercy, LA, and for the USW members who work at primary aluminum facilities owned by Alcoa and Century Aluminum in Kentucky, New York, and Indiana.[4] Although, even then, there are still anomalies. For example, the rule states both that "commodity-grade aluminum" means primary production of unwrought aluminum forms, and that it be "in a form sold on international commodity exchanges." This creates a different potential ambiguity because while commodity-grade aluminum is produced and sold in several unwrought forms (ingots, t-bars and sows, slab, billet, etc.), only one of those forms (P1020 ingot) is typically sold on the primary international commodity exchange for aluminum (the London Metal Exchange), so if read overly literally this could be restrictive in a way that neither the IRS, nor Congress, intended.

I raise this once again to note the fact that the implementation of this important credit is an iterative, as-yet-incomplete, process. USW is pleased that Treasury and the IRS seem to agree with our recommendation that the definition of primary aluminum include all unwrought primary aluminum smelted from aluminum oxide and that primary aluminum producers should be allowed to include all of their costs of production when calculating the credit.

Getting this right really matters to the domestic aluminum industry and USW members. This industry has struggled significantly in recent years due to low-cost imports, high costs of electricity, and other factors that have resulted in the loss of domestic capacity and jobs. This is not news, and governmental support for this critical industry has taken many forms. We continue to work on all of them, and are especially focused on helping the IRS and Treasury get it right with regard to 45X. This credit can be a huge help in re-growing this industry in the United States after decades of predatory trade practices, and other issues, have destroyed so much domestic capacity.

The example of aluminum is just one of several things that are going on in this rulemaking process, many of which USW has also commented on directly with the

[4] AL Circle, "Atlantic Alumina welcomes the advancement of 45X advanced manufacturing credits," January 23, 2024, *https://www.alcircle.com/press-release/atlantic-alumina-welcomes-the-advancement-of-45x-advanced-manufacturing-credits-105692*.

IRS and Treasury. We have urged Treasury to seek alignment with the Made in America office on methodology to develop clear and transparent origin requirements for the "produced in the United States" aspect of 45X. This is critically important for the credit to achieve the intent of Congress to build a domestic supply chain for these products, components, and minerals.

To that end, we applaud the definition that Treasury has proposed to ensure that eligible components are substantially transformed into a distinct component that will function differently from that, which would result from assembly or superficial modification. This will prevent credit for activities, such as simply painting blades for wind turbines or conducting other superficial work, that do not bring the bulk of the economic activity and job gains to U.S. workers.

However, we have also encouraged further clarification to ensure that there are not unintended consequences, such as improperly excluding critical mineral processors who constitute the bulk of the transformation, but send product to customers without completing the final step of refining.

We have also urged Treasury to consider incorporating direct and indirect material costs, as well as the costs related to critical mineral extraction and mining in the definition of production costs. This is important to achieving the goals of both Congress and our union's many members in mining, that this credit can grow responsible domestic extraction and recycling of critical minerals, and ensure competitiveness of the domestic industry in a global market.

Finally, we have urged Treasury to ensure that there are strong enforcement procedures. We have suggested a risk-based audit model to prevent abuse of this credit.

All this is to say, USW is very excited about the prospect of this credit to help build U.S. domestic manufacturing and supply chains for clean technologies. The transition to a clean energy economy will result in lots of jobs somewhere in the global economy, and we look forward to continuing to work with Congress and Treasury to ensure that these jobs are good, family-supporting, union jobs for American workers.

SECTION 48C QUALIFYING ADVANCED ENERGY PROJECT CREDIT

USW also strongly supported the revival of the section 48C Qualifying Advanced Energy Project Credit. We supported 48C when it was originally enacted in 2009 as part of the American Recovery and Reinvestment Act (ARRA), and like many others, were disappointed that it was not replenished when its initial tranche of funding ran out years ago.

The IRA's revival and expansion of 48C provides an exciting opportunity to advance decarbonization efforts through the domestic manufacture of an expanded list of energy technologies and their components, processing of critical minerals, and direct efforts to decarbonize industrial processes.

These efforts will both help build sustainable supply chains in the United States and promote the retention and growth of manufacturing jobs for American workers, although, again, the challenge is again in the implementation. We want these investments to achieve the greatest bang for the buck, which requires that applications outline technology, benefits, and risks that are clear, understandable, and predictable.

The appetite for this credit has been as huge as expected, and the first round of applications for the first $4 billion in credit availability attracted concept papers from applicants seeking $42 billion in funding across all the various categories of projects for which 48C can now apply. Needless to say, competition is fierce.

This is not a surprise given how oversubscribed 48C was in its original incarnation under ARRA. Since then, the demand for this credit has only grown and it already seems that the $10 billion authority for 48C in the IRA is not nearly enough.

The IRA's 48C helpfully directs 40 percent of the available funding to designated energy communities, which will ensure that the benefits of the transition to a clean energy economy accrue to those communities that may suffer the most harm from the loss of fossil-fuel-related jobs. Those communities are responding with $11 billion worth of projects in energy communities applied for the first $1.6 billion set aside for projects there. This is both due to the extensive outreach done by the administration in those communities and an increasing understanding that these communities are poised to lead the way into the clean energy economy with the right governmental support.

Because awarding of the 48C credit functions more like a grant process than a typical tax credit, I would be remiss not to mention the important role that the Department of Energy (DOE) to assist the IRS in managing the selection process. Our union strongly supports the work that DOE has done to include Community Benefits Plans into the scoring criteria for funding opportunities, including 48C. These plans are based on the following four elements to ensure that government support for a project is broadly shared: (1) engaging communities and labor; (2) investing in America's workers through quality jobs; (3) advancing diversity, equity, inclusion, and accessibility through recruitment and training; and (4) implementing Justice-40.[5]

The implementation of this scoring mechanism shows that there is widespread potential for projects that can catalyze clean energy manufacturing, critical minerals processing, and industrial decarbonization while simultaneously engaging with communities and labor organizations, putting quality jobs first, and helping communities that need assistance.

Our union was proud to support some project applications by USW-employers seeking to make significant investments in the long-term viability and efficiency of their facilities in the first round of applications for 48C funding. The process outlined by DOE helped drive productive conversations between our members and their employers on the shared goal of ensuring that their jobs are there for many decades to come.

Unfortunately, this hearing is being held prior to the announcement of selectees under the first tranche of $4 million of the 48C credit from the IRA. I wish we could collectively celebrate the selected projects specifically today, but that will have to wait to do that until a date in the future.

DEMAND-SIDE DRIVERS

The credits I have discussed, 45X and 48C, are both excellent examples of one aspect of how Congress can grow U.S. manufacturing through the tax code, but both work by driving the supply side of the equation. These will help producers build supply chains in clean energy, critical minerals, and drive industrial decarbonization, but in order to be fully effective, producers need certainty that making these investments will be worth it. Even with a tax credit, these projects are not free and undertaking them entails risk for producers.

That risk can be mitigated by ensuring strong demand-side drivers to give producers confidence that, if they make the necessary investments, they will be rewarded with a strong and stable market for their products. These demand-side drivers for American made products are somewhat new to the tax code, but there are a few already being enacted now. For example, the IRA also included a bonus credit for clean energy projects that use American iron, steel, and manufactured goods, and the section 30D tax credit now includes requirements for vehicle assembly in North America and provisions around critical mineral and battery production.

We strongly support these provisions, which are a critical piece of the puzzle that will unlock the potential for companies to take advantage of the supply-side tax credits and to garner private investment.

To illustrate the importance of demand-side drivers and a comprehensive tax and trade agenda, I'll reference back to testimony that USW member Joe Wrona gave before this committee almost exactly 3 years ago in a hearing titled, "Fighting Forced Labor: Closing Loopholes and Improving Customs Enforcement to Mandate Clean Supply Chains and Protect Workers."[6] In his testimony, Joe told this committee about the $35 million investments that his employer, Ferroglobe, planned to make in their Niagara Falls plant in 2009 to increase production of metal silicate, largely for polysilicon production for solar panels. They expected strong demand from the solar manufacturing industry that never materialized because the growth of China's industry undercut global prices and ultimately harmed workers, like Joe and his colleagues.

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[5] U.S. Department of Energy, "About Community Benefits Plans," accessed March 7, 2024, *https://www.energy.gov/infrastructure/about-community-benefits-plans.*

[6] U.S. Senate Finance Committee, "Fighting Forced Labor: Closing Loopholes and Improving Customs Enforcement to Mandate Clean Supply Chains and Protect Workers," March 18, 2021, *https://www.finance.senate.gov/hearings/fighting-forced-labor-closing-loopholes-and-improving-customs-enforcement-to-mandate-clean-supply-chains-and-protect-worker*.

The solutions to these problems require a range of policy actions under the Senate Finance Committee's jurisdiction from improved trade enforcement to manufacturing tax credits. We applaud this committee for hearing testimony like Joe's and ensuring that the legislation that followed both helps stand up production capacity and creates a demand for it. Measures such as these ensure that government dollars are not wasted and private investment is not lost.

PATH FORWARD

This is a very exciting time for American manufacturing, and tax policies are key drivers of that excitement. Still, there is a lot of work to be done.

These and other IRA provisions are not yet fully finalized and operational, and more outreach needs to be done in order to educate producers of their benefits and fully implement these credits. Small and mid-sized manufacturers, in particular, have not yet been fully brought into these programs as much as they can be. There needs to be a dedicated outreach strategy to those producers in particular.

The Senate Finance Committee, in its legislative role, should also build on these tax credits. Congress should continue to ensure that our tax code follows our values, like limiting foreign countries of concern use of tax credits, creating demand for American products, and guaranteeing American workers access to their federally guaranteed labor rights without employer interference. The union urges Congress to consider conditioning tax credits to ensure that credit dollars are not used to fight workers' choice to form a democratic union.

We look forward to continuing to work with Congress and the administration as they further the implementation of the IRA, build and expand these outreach efforts, and think about the next generation of policies that can grow American manufacturing, both through the tax code and otherwise. Again, thank you to the committee for allowing us to be a constructive partner in these efforts, and for inviting me to testify today.

QUESTIONS SUBMITTED FOR THE RECORD TO ANNA FENDLEY

QUESTION SUBMITTED BY HON. MIKE CRAPO

Question. The United Steelworkers recently provided comments on proposed rulemaking related to "foreign entities of concern" that three times called upon the administration to "strengthen" the proposed rule that "falls short" of key Inflation Reduction Act (IRA) goals.

What will the impact to U.S. manufacturing be if the administration fails to strengthen this proposed rule as you request?

Answer. The foreign entity of concern (FEOC) rule is an important piece of the industrial policy in the Inflation Reduction Act. Failing to strengthen the FEOC provisions from the proposal will result in vulnerabilities for U.S. manufacturers in relation to competition with China.

QUESTION SUBMITTED BY HON. BENJAMIN L. CARDIN

Question. As you may know, U.S. Wind won a major new Federal grant of $47.7 million to support a plan to establish an offshore wind and manufacturing hub called Sparrows Point Steel in Baltimore County. This grant was provided through the U.S. Maritime Administration's Port Infrastructure Development Program. The site was once the home of Bethlehem Steel when it was the largest steel production facility in the world. It is estimated that this project will produce around 500 Steelworker jobs, and a total labor income of $1,019,056,500 could be generated over 20 years.

U.S. Wind is a Baltimore-based offshore wind developer that holds the lease rights to a Federal lease area off the coast of Ocean City, MD. The lease area, about 80,000 acres in size, has the capacity to generate 1,800 megawatts (MW) of offshore wind energy, which is enough clean electricity to power more than half a million homes each year.

In 2021, U.S. Wind announced that it would be establishing an offshore wind manufacturing facility, Sparrows Point Steel, at Tradepoint Atlantic in Baltimore County. The site is almost 100 acres in size. Sparrows Point Steel will produce the

towers, foundations, and other steel components needed for U.S. Wind's first two Maryland offshore wind products—MarWin and Momentum Wind—and have the capabilities to service the entire U.S. offshore wind market on the east coast.

Could you speak about the importance of establishing Sparrows Point Steel in Maryland and what it means for the resurgence of the steel industry and the growth of the renewable energy market in Maryland? Additionally, could you speak on the relationship between an increase in good union jobs an increased investment in renewable energy manufacturing in the United States?

Answer. The historic unionized jobs at Bethlehem Steel in Sparrows Point built the middle class in that community. When the steel mill closed, that community suffered greatly, not just with the loss of jobs but also cuts to pensions for retirees. The siting of Sparrows Point Steel on the footprint of an iconic former steel mill demonstrates the opportunity of offshore wind to bring manufacturing jobs back to port communities.

The vast majority of jobs that will be created in offshore wind will be in manufacturing the many components for these projects, meaning that a core goal of renewable energy policy should be to capture those jobs for American workers. We applaud Congress for creating the 45X tax credit in the Inflation Reduction Act as a way to incentivize domestic manufacturing of offshore wind foundations and towers, like those that will be made at Sparrows Point Steel.

Importantly, these new clean energy manufacturing jobs should be union jobs due to the vast benefits that unions provide to workers and communities. Last year, the U.S. Treasury Department outlined many of those benefits including higher wages, higher job satisfaction, and more equity in the workplace.[1] Congress and the administration must work to ensure that companies, particularly those receiving Federal funding, respect workers' rights to organize and collectively bargain.

PREPARED STATEMENT OF PETER R. HUNTSMAN, CHAIRMAN, PRESIDENT, AND CHIEF EXECUTIVE OFFICER, HUNTSMAN CORPORATION

WHY I AM HERE TODAY

Chairman Wyden, Ranking Member Crapo, members of the committee, thank you for this opportunity to appear before the committee to testify on how to best calibrate the tax code to grow U.S. manufacturing. It is an honor. I take very seriously our First Amendment right to engage directly with elected officials and policymakers of both parties to help educate and inform them about how Huntsman Corporation and American chemical manufacturers manage risk, make capital decisions, grow our employee base, return capital to shareholders, and safely deliver the products that make modern life possible.

The primary reason I am here today is to share my observations on policy, political, business, and cultural forces that are shaping investment decisions by U.S. manufacturers, especially those that are energy intensive. I am not a tax expert; I rely heavily on our company finance and tax teams to help me understand the complexity of the tax code. However, after 4 decades in the chemical industry, I do understand how the tax code—and other inputs—incentivize or disincentive manufacturing investment decisions in the United States.

I hope members of the committee come away with the following conclusions from my testimony:

1. American manufacturing dominance, prosperity, security, and power are based predominantly on access to cheap, abundant, and reliable energy, primarily in the form of hydrocarbons.
2. The safe and environmentally secure extraction, processing, and transportation of hydrocarbons makes modern life possible. That is not hyperbole. It is physical, immutable reality.
3. Under existing technology, organizing the American economy and government to *entirely eliminate* greenhouse gas emissions will create scarcity of the chemical building blocks of modern life, increase the costs of all goods and services, inhibit U.S. economic growth, and weaken America in the world.

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[1] *https://home.treasury.gov/news/featured-stories/labor-unions-and-the-us-economy.*

4. To enable society to *reduce* greenhouse gas emissions, tax policy should be calibrated to *increase* U.S. natural resource extraction, material refining capacity, and chemical manufacturing more efficiently and productively here in the United States, where we have the strongest, risk-based environmental laws and regulation in the world. It is the chemical sector that develops the molecules that allow individuals and society collectively to lower their greenhouse gas emissions.
5. Long-term taxpayer subsidy of intermittent and unprofitable electricity production is already creating market distortions across the entire manufacturing value chain and supplanting reliable and profitable sources of energy.
6. Only when EVs become affordable and reliable to buyers and profitable for manufacturers will there be meaningful EV adoption.
7. If the threat of climate change is existential to humanity, the U.S. Congress should directly finance or incentivize the construction of emissions free nuclear energy facilities across the entire Nation.

THE HUNTSMAN STORY

The Huntsman story is the story of American manufacturing.

Through the vision and tenacity of my father, Jon Huntsman, Sr., and supported by tens of thousands of employees over a half century, Huntsman Corporation today is a New York Stock Exchange (NYSE) traded company headquartered in The Woodlands, TX with 2023 revenues of approximately $7 billion, 6,000 employees, and operations in 25 countries. My father's life began in 1937 in a Blackfoot, ID home with no indoor plumbing. By the end of his life in 2018, he had donated nearly $1 billion dollars to endow the Huntsman Cancer Institute (HCI) at the University of Utah in Salt Lake City. Today, HCI is the leading cancer hospital in the Mountain West region and has saved tens of thousands of lives through world leading cancer treatment.

After dropping out of college, I started my career in 1983 as a truck driver delivering oil across the Intermountain West. In 2000, I became president of the company and in 2017 chairman and CEO. As our company grew from a small California packaging company into a multinational chemical company, I have witnessed boom and bust business cycles, mergers and acquisitions, multiple iterations of "peak oil," the collapse of the Soviet Union, reunification of Europe, the rise of China, the creation of the Internet, and the transformational impact of hydraulic fracturing, among others. Today, I am eager watch how artificial intelligence changes the chemical industry and world. I have also observed the tax policy and regulatory environment impacting U.S. manufacturing ebb and flow across Democrat and Republican administrations and Congresses. Our company and the chemical industry have played a role in all of it.

RAW MATERIALS, FEEDSTOCKS, CHEMICAL MANUFACTURING, AND INNOVATION

I want to provide a basic primer on what chemical companies do because chemicals are the building blocks of all American manufacturing. In the most basic form, we take atoms and molecules, break them apart and then put them back together to make the building blocks of virtually everything you see and touch in modern life. Automobiles, passenger airplanes, solar panels, wind blades, smartphones, computers and televisions, residential and commercial buildings, pharmaceuticals, missiles, fighter planes, clothing, soap, shampoo, shoes, clean drinking water, and crop fertilizer are just a few examples of modern miracles made possible by chemical manufacturing.

The most utilized starting atoms, or "feedstocks," for chemical manufacturing are hydrocarbons derived from petroleum, natural gas, natural gas liquids and coal, otherwise known as fossil fuels. Without abundant access to fossil fuel feedstocks, we cannot manufacture chemicals. Without chemicals, virtually all U.S. manufacturing would cease.

The scientists and engineers in the American chemical sector go to work in laboratories across the country every day and work to improve existing molecules and develop new ones. When commercially viable, their laboratory innovations move to manufacturing plants and into the marketplace. While abstract to the average person, that molecular innovation ultimately manifests itself in our sustainable modern lives—lighter airplanes and cars, longer lasting clothes, stronger building materials, clean drinking water, new medicines and cancer treatments, and larger crop yields. Human lives are enriched and lengthened through chemical sector innovation and manufacturing.

LACK OF UNDERSTANDING OF HOW THINGS ARE MADE

I am increasingly concerned that many government and business leaders lack an understanding of how "things" are made. In the post-Cold War era of globalization, the United States underwent a low-level form of deindustrialization as the appeal of cheap labor and growth markets in Asia pushed supply chains out of North America. Two examples of this trend in the 1990s and 2000s were the Pennsylvania steel industry and textiles in North Carolina, among others. Wall Street became the highest paying sector in the 1990s and 2000s. It was then followed by Silicon Valley and the tech boom. Quite simply, "making things" went out of vogue because it was done "out of sight and out of mind."

Looking back with the benefit of hindsight, I believe the post-Cold War manufacturing exodus led many policymakers and business leaders to simply forget how things are manufactured at the most basic molecular level or, as we say in the chemical industry, "upstream." This trend is best encapsulated by Apple's famous "Designed in California Assembled in China" label on their products. To most people, the iPhone is a supercomputer we use every few seconds connecting us to the entire world. As a chemical industry leader, I see a device consisting of minerals and elements extracted from the Earth and refined thousands of times over into chemicals, plastic, glass, and materials brought to market via one of the most sophisticated supply chains ever developed. The same is true of millions of other products we use in our daily lives.

NATURAL RESOURCE EXTRACTION IS THE BASE OF AMERICAN MANUFACTURING AND THE AMERICAN WAY OF LIFE

One of the biggest threats to American manufacturing power, security, prosperity is the belief that we can choose *not* to extract our natural resources and convert them into the materials that enable our citizenry to thrive. Since the beginning of recorded history to the modern-day international system, human beings and nation-states have used natural resources to survive, prosper, trade, and project power. This has been an invariable part of human nature and will always be so.

In the current policy, political and business arenas, opposition to natural resource extraction manifests itself in the idea that American society—and the world—can somehow "transition" away from fossil fuels and their derivative materials, including chemicals, and somehow maintain our way of life. Until the advent of new technology or a massive expansion of nuclear power, this is simply untrue and not physically possible. To believe so is both naïve and dangerous. Serious countries and people understand this reality. On the issue of fossil fuel extraction, I fully align myself with J.P. Morgan Chase & Co. chairman and CEO Jamie Dimon when he testified in the U.S. House of Representatives in September 2022 that stopping capital investment in fossil fuel development would be "the road to hell for America."

Until relatively recently, the notion that we could eliminate fossil fuels while still sustaining modern society was mostly a fringe idea and dismissed by serious leaders in government and industry. Over the last 2 decades, as seemingly well-intentioned policy proposals developed to attempt to manage an ever-changing climate, anti-fossil-fuel-extraction policy has become normalized in Europe and, more recently, in the United States. Many governments have organized themselves around stopping natural resource extraction in the name of reducing greenhouse gas emissions to "net zero." In the business community, many companies have made "commitments" that may (or may not) come to reality in less than 3 decades.

"NET ZERO" AND GERMAN DEINDUSTRIALIZATION

The most notable example of the danger of "net zero" government policy is Germany. Through a series of government decisions over 2 decades and exacerbated by Russia's invasion of Ukraine, Germany finds itself a cold winter or supply chain disruption away from having to choose between allowing industry to operate or permitting its citizens to warm their homes. Without a policy course correction around energy and natural resource extraction, Germany may be on the cusp of a once-in-a-century deindustrialization that will have enormous global impacts, including in the United States.

Just 2 years ago, it would have been inconceivable that the birthplace of the chemical industry could be deindustrializing. Yet here we are, waiting to see whether one of the most advanced economies and societies in modern history will be able to provide cheap, reliable, and abundant heat and electricity to power its economy. I encourage all U.S. elected officials to study deeply the policy decisions Germany

made as it presents a real-life example of how *not* to organize manufacturing, natural resource, energy, and industrial policy.

THE CHEMICAL SECTOR ENABLES SOCIETY TO LOWER GREENHOUSE GAS EMISSIONS

If the goal of government and business is to reduce carbon dioxide emissions across society, U.S. Government tax policy should be calibrated to *increase* domestic natural resource extraction and chemical manufacturing more efficiently and productively. It is the chemical sector that develops the molecules that allow individuals and society collectively to lower their emissions. This is evident in almost every sector across the economy. In the aerospace sector, fossil fuel derived carbon composite airplanes fly longer distances using less fuel than their aluminum predecessors. Automobiles are constructed using carbon fiber material versus steel in years past. Modern homes include insulation materials that create a building envelope, securing the valuable hot and cold air inside the home. The world population recently reached 8 billion people and, for the most part, everyone has access to food. The mass starvation that we witnessed as recently as the mid-1980s in sub-Saharan Africa is virtually obsolete. This is a new phenomenon in human history and has been made possible only by chemical fertilizer and cold chain storage. Simply stated, a vibrant chemical industry means it is within our ability to lower emissions, grow the economy, and improve lives.

ENERGY EFFICIENCY AND MODERN BUILDING TECHNOLOGY

One product Huntsman manufactures is called methylene diphenyl diisocyanate (MDI), which is a hydrocarbon-based "polymer of prosperity." MDI has versatile uses, including as a component of spray foam insulation. Spray foam insulation is by far the most efficient and effective way to insulate a building and can reduce energy consumption by up to 50 percent.

We worked closely with Senators Maggie Hassan (D–NH), Susan Collins (R–ME) and other members of the committee on legislation that modernized and updated the standards and definitions in the Energy Efficient Home Improvement Tax Credit (25C). These updates were subsequently included in the Inflation Reduction Act of 2022 and help ensure that government support for energy efficiency will favor modern insulation technology versus outdated and less energy efficient technology.

ELECTRIFICATION OF THE U.S. TRANSPORTATION SECTOR AND THE BATTERY SUPPLY CHAIN

Huntsman Corporation manufactures products for automakers all around the world. We defer to automakers on whether consumers want to drive electric vehicles (EVs) or internal combustion engines (ICE) cars. We will manufacture the products needed by car companies to meet their market goals and technology specifications.

The IRA committed hundreds of billions of taxpayer dollars to incentivize American consumers to purchase electric vehicles with the goal of creating a U.S. EV supply chain. Simply put, a car battery is an amalgamation of refined elements, minerals, and chemicals. When developing the legislation, policymakers seemingly failed to consider that the global battery supply chain is almost totally controlled by China. As a result, the IRA directly subsidizes the extraction and refinement of battery materials and chemicals from China. Thus, any increased adoption of EVs in the United States will increase our Nation's dependence on China in the automotive industry.

Despite tens of billions of announced investments in battery assembly in the United States since the IRA passed, almost 100 percent of the battery raw materials we need will continue to be sourced from China for the foreseeable future. If the U.S. wants to ensure battery supply chain security and resilience, Federal, State and local governments must collectively enable a massive expansion of mining and chemical refining in the United States. These changes must come to pass if American companies are to have any hope competing against lower cost Chinese labor, Chinese coal based manufacturing and Chinese pricing actions in the global marketplace.

THWARTED HUNTSMAN INVESTMENT IN U.S. EV SUPPLY CHAIN

Huntsman is the only North American manufacturer of a EV battery input called ethylene carbonate (EC), a chemical that is central to the production of electrolyte for EV batteries. You simply cannot have an EV battery without an electrolyte, and you cannot have an electrolyte without EC.

Before the IRA became law, Huntsman made the decision to invest $50 million at our Conroe, TX manufacturing plant to increase our U.S. EC production capacity by 530 percent to supply the domestic EV battery supply chain. Almost immediately after the IRA passed, Chinese producers slashed prices of EC by 75 percent to a point far below Huntsman's cost of production in the United States. Unfortunately, I had to suspend this project expansion until prices stabilize and the investment makes economic sense for Huntsman shareholders to whom I owe a clear fiduciary duty.

TAX POLICY, PERMITTING, AND OVERREGULATION

U.S. tax policy can only incentivize capital investment and unleash American manufacturing if companies are also able to obtain permits to put shovels in the ground to build and regulatory approvals to sell what we make. In the chemical sector, it takes almost 3 years to get a new molecule approved by the U.S. Environmental Protection Agency (EPA) for sale in the marketplace based on bipartisan legislation passed in 2016.

For example, if Huntsman were to develop a new material or chemical that would enable the transportation sector to massively reduce the weight of trucks and cars and simultaneously lower tailpipe emissions, it would take at least 3 years to be approved by EPA. If it takes 3 years to get a new chemical approved by EPA, how can an American chemical company ever commit capital to increase large scale manufacturing of the product? What is the impact on greenhouse gas emissions while a new chemical awaits EPA approval?

AMERICAN MANUFACTURERS WELCOME STRONG, EFFECTIVE, AND RISK-BASED REGULATION

The United States has the strongest and most effective environmental laws governing clean air and water in the world. It was not always that way and industry has made mistakes. However, when you compare the environment in the developed world today to even 1980, the progress is staggering. The water in the Potomac River, the air in Los Angeles, and our rivers and streams throughout the United States are all cleaner. This is due to the combination of strong government regulation, corporations being held legally accountable for wrongdoing and because wealthy nations have the financial resources to prioritize the environment. The more prosperous a society becomes, the better it can manage the environment.

Every single day the chemical sector manufactures, handles, stores, transports, and sells hazardous materials across the world. To deliver the products that make modern life possible does incur risk. We spend billions of dollars on environmental, health, and safety of our employees and in the communities where we operate. Safety is a deeply ingrained value and our license to operate. In my 40 years in the industry, I can state unequivocally that we have greatly improved our safety record. As in all human endeavors, mistakes and failures occur. Our safety record demonstrates we constantly strive to learn and improve as a company and industry.

COMPLEX INDUSTRIAL SYSTEMS, "TRANSITIONS," AND POLICIES THAT DO NO HARM

The United States possesses the most sophisticated energy production and electricity delivery system in the world. It also has the world's best automotive manufacturing sector with an enormous supply chain supporting it, including the chemical sector. Every day, the energy system delivers electricity to 330 million people so they can power their businesses and lives. Every single American has on-demand access to refined petroleum products to fuel their automobiles. Together, the energy and automotive sectors employ millions of Americans and generate hundreds of billions of dollars in wealth for Americans.

They are two bedrocks of American manufacturing strength. They are also two of the most amazingly complex manufacturing systems in human history. They are the envy of every other nation in the world, and their processes have been refined over 150 years through efficiency and human innovation. Yet, we take them for granted and often fail to appreciate how easily they can be irreparably harmed by bad government policy and improperly incentivized business decisions.

I encourage the committee members to consider that, over the last decade, European and U.S. Governments have collectively committed trillions of taxpayer spending to "transition" away from energy sources that successfully power modern economies to energy sources that cannot do so. European and U.S. Governments have subsidized a "transition" to passenger vehicles for which no mass market demand exists and the electricity generation needed to fuel them is not possible. In both

cases—maybe for the first time in modern American history—we are investing a huge portion of American productive capacity into duplicative and parallel energy and transportation systems that will do very little to improve lives or lift people out of poverty. We already have the best energy system and automotive sectors in the world. Why are we spending trillions of dollars of public and private capital to try and replicate the exact same system?

Today, government and business leaders talk about "transitions" of the U.S. energy system and automotive sector as a forgone conclusion that will just happen without massive financial, human, and reliability costs. Complex systems that profitably mass produces materials society wants and needs are very hard to "transition" away from because they represent the essence of free market capitalism. An energy or automotive "transition" will only happen when new, undeveloped technology is scaled to meet mass market demand at a profit. No amount of government spending can supplant these systems without enormous damage to American manufacturing and American lives.

As committee members consider changes to the tax code to spur American manufacturing, I encourage you to examine what has worked consistently over time and "do no harm" when harnessing the power of government on large, complex industrial systems.

LOOKING AHEAD

I am highly optimistic about the future. The United States, with its combination of freedom, capitalism, scientific inquiry, deep capital markets, legal protection, and entrepreneurial spirit, possesses the power to solve humanity's problems. As the geopolitical tides churn and countries reassess their priorities in a more dangerous world, regionalized supply chains will take precedence.

Government policy around natural resources, self-sufficiency, and manufacturing have returned to the forefront of policymaking. Industrial policy, regulatory decisions, and capital expenditures made today by government and business leaders will impact America and the world for generations to come. We don't need to look far to see the damaging impact of bad public policy around taxes, natural resources, energy, chemicals, and material innovation.

History shows that such policy decisions determine the fate of nations and societies.

I look forward to your questions.

QUESTIONS SUBMITTED FOR THE RECORD TO PETER R. HUNTSMAN

QUESTION SUBMITTED BY HON. MIKE CRAPO

Question. President Biden recently released his budget, and he once again called for tax increases on America's job creators. Under President Biden's budget, the corporate tax rate would increase to 28 percent. When combined with State and local taxes, many companies would face an income tax rate far higher than China's and Europe's.

Would raising the corporate income tax rate make the U.S. a more or less competitive place to invest?

Answer. The reduction in the corporate rate enacted as part of TCJA helped to make the U.S. a more competitive market to invest in. Huntsman operates in a global market makes decisions on where to deploy capital across different countries. Tax rates are a factor in that analysis. Further, if Huntsman needs to pay higher taxes it will need to find that money somewhere. That means raising prices to our customers or cutting jobs or other costs or both.

QUESTION SUBMITTED BY HON. BILL CASSIDY

Question. Your company employs over 700 people in Geismar, LA, my home State. With innovative hydrogen technologies like those produced by Huntsman and Federal policy like the section 45V tax credit, cleaner energy sources are around the corner that will allow America to lead. Huntsman is the only company that produces carbon nanotubes and hydrogen at the same time. However, Biden's Treasury has proposed a 45V rule that is counter to unleashing these investments and instead

creates uncertainty in the market. The proposed section 45V clean hydrogen production tax credit from the Department of Treasury risks stifling innovation and impeding the success of critical Federal initiatives like the Regional Clean Hydrogen Hubs.

If a final rule is crafted properly and hydrogen investment is unleashed, what types of economic benefits will Huntsman bring to the South?

How is this delay in final rules impacting companies like yours?

How could the 45Q final rules create better certainty for CCUS and DAC project developers and help America lead the way in this industry?

On investment in carbon capture technologies, what specific provisions or clarifications do you hope to see in the final rules to provide greater clarity and incentives for project developers?

Considering the importance of the 45Q tax credit in fostering innovation and investment in carbon capture technologies, what specific provisions or clarifications do you hope to see in the final rules to provide greater clarity and incentives for project developers?

Answer. Huntsman supports the expansion of the scope of the 45Q tax credit to ensure that methane pyrolysis qualifies for the tax credit.

QUESTION SUBMITTED BY HON. JOHN THUNE

Question. Can you please speak to how your company has benefited from the 2017 tax reform bill and what provisions you believe are most important for Congress to make permanent, or at the very least extend, next year to give your business and other businesses in the chemical industry certainty?

Answer. The international tax reform included in TCJA enabled Huntsman to repatriate significant income from overseas back to the U.S. Huntsman was able to use some of this income to invest in our production operations in Louisiana. Additionally, Huntsman benefited from the 100-percent expensing provision in TCJA to also help enable these investments. Making the 100-percent expensing provision permanent is very important. When Huntsman makes investment decisions it does so over a 30- to 40-year time horizon. Permanently addressing these provisions will provide certainty and remove risks that would otherwise cause capital to sit on the sidelines. If that provision were permanent, Huntsman would have the certainty to make investments that will benefit its associates, customers, and the products we produce.

PREPARED STATEMENT OF SHANNON M. JANIS,
VICE PRESIDENT OF GLOBAL TAX, ONSEMI

Chairman Wyden, Ranking Member Crapo, and members of the committee, thank you for the invitation to testify today. My name is Shannon Janis, vice president of global tax at onsemi. I am here today to share what we do at onsemi and discuss how U.S. tax policy shapes our decisions regarding domestic manufacturing.

onsemi is a Fortune 500 semiconductor company with over 4,000 employees in the U.S. and 31,000 employees worldwide. We are headquartered in Scottsdale, AZ and specialize in delivering industry-leading intelligent power and sensing solutions that greatly improve the safety, sustainability, and power efficiency of end-products in the automotive and industrial markets.

In the automotive market, our products enable lighter and longer range EVs, increased gas mileage in traditional vehicles, deploy automatic emergency braking and pedestrian detection systems, and adaptive headlights to reduce blinding drivers in oncoming traffic, to name a few.

With respect to the industrial market, our products are used to enable highly efficient energy storage and renewable energy systems, EV charging infrastructure, industrial automation, smart cities and buildings, motor control and robotics, hearing health, and diagnostic therapy and monitoring for chronic disease such as diabetes.

We also manufacture products used in end-use applications related to computing, consumer networking and communications such as 5G base stations and smart phones.

To support these applications, we offer a robust portfolio of semiconductor products and technologies that include silicon carbide, image sensors, power modules, wireless connectivity, and more. These applications help our customers create cutting-edge products that solve challenging problems, enhance safety standards and support the transition to electrification for a more sustainable future.

MANUFACTURING AND SITE OPERATIONS AT ONSEMI

We operate 19 manufacturing sites across 8 countries worldwide—including the United States; these sites consist of front-end materials and wafer fabrication facilities (known as fabs) as well as back-end assembly and test site factories.

In the U.S., our materials and fab operations are located in five States; Oregon, Idaho, Pennsylvania, New York, and New Hampshire. Each of these factories are an integral part of onsemi's in-house global manufacturing network.

GRESHAM, OR

onsemi's Gresham wafer fab is the third largest fab globally, employing more than 600 people. Over 50 percent of Gresham's volume supports the automotive market with over 35 different technologies manufactured at this site. This fab has been accredited by the U.S. Defense Department as a Category 1A Trusted Foundry and is ITAR registered.

NAMPA, ID

The Nampa wafer fab employs over 260 people and supports our award winning and lifesaving image sensor business. Image sensors are a key component in machine vision cameras, including digital cameras and security cameras. Today, onsemi is a leading producer of image sensors, inductive and ultrasonic sensors used in advanced safety, Advanced Driver Assist Systems (ADAS), and Autonomous Vehicle (AV) technologies.

MOUNTAIN TOP, PA

Our Mountain Top fab employs over 240 people making power semiconductors for automotive and other applications and is the only union fab in the U.S.

EAST FISHKILL, NY (EFK)

EFK is onsemi's largest manufacturing facility in the U.S. employing over 1,000 people and it is the only 12-inch power discrete and image sensor fab in the U.S.

HUDSON, NH

Our Hudson facility is the cornerstone to onsemi's silicon carbide products. Through a rigorous proprietary process, crystals are converted to valuable silicon carbide boules which are further processed at other factories into silicon carbide power devices for use in high-power and high-efficiency applications. Today, onsemi is the only U.S.-based company that has fully integrated end-to-end silicon carbide manufacturing.

And Why Is This Important?

Silicon carbide semiconductors play a pivotal role in enabling the transition to electric vehicles and renewable energy systems. Manufacturing silicon carbide semiconductors is more complex than traditional silicon semiconductors due to higher temperatures, specialized equipment and unique expertise. We are proud that our New Hampshire site enables our network of factories to deliver the end-to-end silicon carbide power solutions from crystal growth to fully integrated power modules necessary for EVs, hybrid vehicles and renewable energy.

In addition to our fabs, we have Solution Engineering and Design Center operations in nine U.S. States that include Arizona, California, Idaho, New York, Oregon, Pennsylvania, Rhode Island, and Texas, as well as design centers located in 18 other countries.

WORKFORCE TALENT AT ONSEMI

The importance of hiring and retaining a skilled workforce in the semiconductor industry cannot be overemphasized. At onsemi we proactively seek new candidates and talented individuals to enrich our innovative, diverse and inclusive work environment. To achieve this, we developed an extensive U.S. workforce strategy that includes:

- **Outreach Programs:** We engage with high schools, community colleges, universities and other organizations, including our military.
- **Country-wide and Local Initiatives:** Our talent acquisition efforts extend beyond traditional channels. We operate both country-wide programs as well as local programs near our facilities.
- **University Collaboration:** We collaborate closely with university faculties, particularly those in semiconductor-related fields. Through workshops, capstone projects, and student events, we actively engage students and recruit graduating students through career fairs and online advertisements.
- **Investing in Education:** Recently, we announced a commitment to donate $500,000 over 10 years to Rochester Institute of Technology in New York. This investment supports semiconductor educational programming and research, benefiting both students and faculty with increased co-op opportunities and new research initiatives.[1]

IMPORTANCE OF THE CHIPS ACT AND ITS INCENTIVES FOR THE U.S.

As this committee is aware, the steady decline in United States-based semiconductor manufacturing capacity poses a risk to America's supply chain and national security. This decline has been decades in the making and will require persistent attention to achieve a sustainable reversal. A key contributing factor to the decline has largely been due to the substantial manufacturing incentives provided by the governments of our global competitors. These incentives have placed the U.S. at a competitive disadvantage in attracting new construction of semiconductor manufacturing facilities.[2]

Although the U.S. has taken the initial steps to curb this decline, other countries both within the European Union as well as countries such as South Korea, Japan, and China are significantly increasing their investments in the semiconductor industry and its workforce. Many of these countries have legislation similar to the CHIPS Act to support their domestic companies as well as incentivizing other companies to invest in their regions. The CHIPS Act, and in particular the section 48D advanced manufacturing tax credit has played a critical role in enhancing the global competitiveness of the U.S.

However, there is a noteworthy disparity: Federal investments in semiconductor research have historically remained flat as a share of GDP. While other country governments have prioritized investments in R&D initiatives to strengthen their semiconductor capabilities, our U.S. R&D tax incentives lag behind those of our international counterparts.

Semiconductor companies carefully evaluate multiple factors in making investment decisions. These include overall business conditions, regulatory environmental compliance, supplier networks, site availability, infrastructure, and the access to a skilled workforce. Given this, rebuilding the semiconductor supply chain in the U.S. is not an easy task. The complex technology, and advanced process of designing and manufacturing semiconductors requires high levels of sustained investment in people, fabs, and equipment due to the sophistication of the technology and the rigorous and exacting standards needed for construction, equipment, and infrastructure.

Additionally, the cost of a fab can range from $1 billion to $20 billion depending on the type and scale of the project plus it can take anywhere from 2 to 5 years to complete construction. Furthermore, fab construction requires a highly skilled workforce to build and install support systems and advanced structures that deliver high purity gases, ultra-pure water, and state-of-the-art air recirculation systems. With the U.S. workforce talent being more expensive than other low-cost countries, incentives are critically needed to help offset these costs and enable competitive pricing.

On another crucial front, the U.S. has set aggressive targets to reduce greenhouse gas emissions by 50 percent by 2030 and achieve net-zero economy-wide by 2050. Meeting these timelines will require the U.S. to make significant investments in

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[1] onsemi to donate $500,000 to RIT to further semiconductor educational initiatives, RIT, *https://www.rit.edu/engineering/news/onsemi-donate-500000-rit-further-semiconductor-educational-initiatives*.

[2] *See* "Government Incentives and US Competitiveness in Semiconductor Manufacturing," by Antonio Varas, Raj Varadarajan, Jimmy Goodrich, and Falan Yinug, September 2020, available at *https://www.semiconductors.org/wp-content/uploads/2020/09/Government-Incentives-and-US-Competitiveness-in-Semiconductor-Manufacturing-Sep-2020.pdf*.

clean energy and power efficiency—all dependent on semiconductors that go into the design of electronic applications. With the government's support, onsemi will continue to drive innovation across our portfolio of products and increase the energy-efficiency and reduce carbon emissions in key sectors that extend from electricity generation, transportation, industry and agriculture—which all play a pivotal role in helping the U.S. achieve these goals.

Preliminary reports appear to indicate that investments from the industry, facilitated by incentives under the CHIPS Act, are working to grow domestic semiconductor manufacturing and strengthen the resiliency of our supply chains. With the help of the U.S. CHIPS Act, the U.S. is expected to attract roughly one-quarter of total global semiconductor investment. But areas of vulnerability in the ecosystem remain and additional work is needed to maintain this momentum and further strengthen key areas of the chip supply chain. Policymakers in the United States and elsewhere should consider additional measures to maintain momentum in strengthening the semiconductor supply chain and ensuring increased resilience in the future.

IN CONCLUSION

As a U.S.-based company, onsemi welcomes the opportunity to expand and bring new domestic production onshore. We are committed to implementing projects that will keep onsemi competitive in the long term—which is a core responsibility to our shareholders, employees, suppliers, communities, and other stakeholders.

The enactment of the CHIPS and Science Act was a landmark step towards reinvigorating domestic semiconductor manufacturing and innovation. The mission is clear: establishing our leadership role is vital for the U.S. to win the global technology race in the semiconductor industry. Ongoing support from the CHIPS Act with its section 48D advanced manufacturing tax credit will enable companies like onsemi to continue to invest in the U.S., compete with companies that are located offshore, and strengthen the resiliency of our critical supply chains.

Mr. Chairman, I appreciate your calling for this hearing and this committee's support of the U.S. semiconductor industry. Thank you for the opportunity to testify at today's hearing.

QUESTIONS SUBMITTED FOR THE RECORD TO SHANNON M. JANIS

QUESTION SUBMITTED BY HON. MIKE CRAPO

Question. The Tax Cuts and Jobs Act (TCJA) sought to move away from industry-specific incentives in favor of a competitive domestic tax rate and broader progrowth tax policies to incentivize domestic manufacturing. However, there are certain situations that may call for a targeted tax incentive to put U.S. manufacturers on a more even playing field with their foreign competitors.

One example is strengthening the U.S. semiconductor supply chain, because it not only affects American jobs and workers but also impacts our economic and national security. The Advanced Manufacturing Investment Credit (AMIC) was enacted to bolster domestic investment in this vital industry.

Can you discuss how the AMIC has impacted onsemi's domestic investment decisions?

Answer. onsemi conducts a comprehensive cost and gap analysis when evaluating potential investment locations. This analysis compares costs across various jurisdictions to identify promising investment opportunities. While not the sole determinant, the gap cost analysis influences our decision-making process. The Advanced Manufacturing Investment Credit (AMIC) has played a pivotal role in narrowing the cost disparity between U.S. investments and those in other countries. Although U.S. companies prioritize domestic investment due to its robust technology infrastructure, intellectual property protections, and skilled workforce, cost disparities—especially related to labor, construction, and utilities—remain. The AMIC contributes to leveling the playing field among jurisdictions by addressing these cost disparities.

The AMIC is an important incentive that addresses key supply chain gaps and vulnerabilities for manufacturing semiconductors and semiconductor equipment. These facilities will require ongoing investments to remain competitive, and additional facilities will need to be built to further strengthen the semiconductor eco-

system in the U.S. Stability in the U.S. tax code is important for long-term investments. Extending the credit beyond 2026 will provide needed certainty and a competitive investment climate to sustain new U.S. manufacturing capacity.

QUESTIONS SUBMITTED BY HON. MARIA CANTWELL

Question. I worked closely with Senators Wyden and Cornyn, among others, to include their 25-percent semiconductor manufacturing tax credit in the final CHIPS and Science Act.

This tax credit will encourage companies to build and expand domestic semiconductor manufacturing facilities, which is incredibly important in the State of Washington and in the Pacific Northwest more broadly, a region which accounts for 15 percent of the Nation's semiconductor workforce.

The Department of Treasury guidance released last June would not include eligibility for the manufacturing of materials critical to the semiconductor ecosystem like polysilicon. I am concerned that as these companies look to reshore and strengthen domestic facilities, uncertainty around their eligibility is delaying investments and expansions.

Do you agree that in order to ensure our domestic semiconductor companies remain internationally competitive, we must make sure that companies from all parts of our ecosystem are confident in their ability to benefit from both the Department of Commerce manufacturing incentive programs and the tax incentive?

Answer. Ensuring confidence among ecosystem participants regarding access to benefits from the Department of Commerce manufacturing incentive programs and tax incentives is pivotal for our domestic semiconductor companies' global competitiveness. Moreover, maintaining certainty in these incentives, along with preserving the current benefit levels, is essential. When expanding the ecosystem eligible under the credit, we must also safeguard the effectiveness of these incentives to ensure a sustainable competitive edge for the U.S. semiconductor industry. Striking the right balance is crucial.

To ensure integral activities are covered under the advanced manufacturing investment credit, we encourage the Department of Treasury to revise the definition of "semiconductor manufacturing" by including (1) the production of semiconductor-grade polysilicon and compound semiconductor substances, such as silicon carbide (SiC), used in the production of wafers; and (2) the full range of steps in the process of manufacturing wafers, like crystal/boule growth. These highly complex manufacturing processes are integral to the semiconductor manufacturing process and comprise the first steps in manufacturing a semiconductor device. Put another way, the production of silicon carbide and similar substances are the "semiconductor" in the finished semiconductor device. Through crystal/boule growth, the ingot will be imbued with the final semiconductor parameters such as diameter, crystal orientation, resistivity, and supporting elements such as oxygen, nitrogen, and carbon, all of which are defining aspects of final chip performance.

Question. What will be the impact on fabrication facilities like yours if materials suppliers aren't able to fully take advantage of the CHIPS Act 48D tax credit?

Answer. The worldwide demand for silicon carbide materials is currently outpacing supply, with many suppliers investing heavily in low-cost regions such as China to develop lower-cost materials. The omission of these integral activities in the semiconductor manufacturing process from the definition of semiconductor manufacturing under section 48D of the Internal Revenue Code poses challenges. Specifically, excluding the production of silicon carbide and crystal/boule growth from being eligible for the 48D credit creates uncertainty for onsemi seeking to invest in domestic facilities. onsemi conducts a comprehensive cost and gap analysis when evaluating potential investment locations. This analysis compares costs across various jurisdictions to identify promising investment opportunities. While not the sole determinant, the gap cost analysis influences our decision-making process.

Our Hudson, NH facility is the cornerstone of onsemi's production of silicon carbide products. Through a rigorous proprietary process, crystals are converted to valuable silicon carbide boules which are further processed at other factories into silicon carbide power devices for use in high-power and high-efficiency applications. Silicon carbide is a fundamental material for advanced semiconductor production enabling the sustainability ecosystem including electrification, alternative energy

and factory automation. Silicon carbide reduces system cost while offering higher efficiency and simpler cooling mechanisms.

As the regulations are currently proposed, the activities at this facility may not be eligible for the credit. Excluding the production of silicon carbide from being eligible for the IRC 48D credit causes U.S.-based silicon carbide production to be uncompetitive to foreign locations, including China.

QUESTIONS SUBMITTED BY HON. TODD YOUNG

Question. As I mentioned during the hearing, restoring full and immediate expensing under section 174 of the Internal Revenue Code is critical to maintaining American competitiveness. As you know, the shift to amortization of research and development (R&D) investments comes at a time when countries across the globe are increasing the generosity of their R&D incentives. For example, companies conducting R&D in the United States are forced to amortize their R&D expenses over 5 years while companies conducting those same activities in China are receiving a 200-percent super-deduction.

Can you please explain the importance of R&D incentives in maintaining U.S. global competitiveness in the semiconductor industry?

Answer. Making the U.S. an attractive destination for semiconductor companies to grow their research and development (R&D) will spur economic activity and support U.S. national security, supply chain resilience, and technology leadership. U.S. semiconductor companies invest heavily to innovate and maintain technology leadership by on average reinvesting 20 percent of revenue into R&D—with $58.8 billion invested in 2023.

As the U.S. incentives for R&D fail to keep pace with global competitors, we risk our industry leadership. To remain a competitive place to conduct R&D, at a minimum, the U.S. must restore the full and immediate expensing of all R&D expenditures on a permanent basis. As you know, the shift to amortization of research and development investments comes at a time when countries across the globe are increasing the deductibility as well as providing increased funding of R&D initiatives in their jurisdictions. For example, companies conducting R&D in the United States are forced to amortize their R&D expenses over 5 years while companies conducting those same activities in China are receiving a 200 percent super deduction.

Question. How has the expiration of immediate R&D expensing impacted companies like onsemi?

Answer. For onsemi, a leader in semiconductor solutions focused on enabling the sustainability ecosystem, the immediate expensing of R&D is a catalyst for innovation. The ability to deduct expenses in the same tax year they were incurred allowed for increased cash flow to put towards capital and R&D investment activities. The expiration of this provision means that onsemi must now spread the deduction of these expenses over several years, reducing the funds available for reinvestment in R&D and slowing down the pace of innovation.

This also highlights a critical ripple effect of the expiration of immediate R&D expensing. The financial strain extends beyond primary companies like onsemi to our suppliers and the broader semiconductor ecosystem. This policy change has slowed the overall pace of innovation within the semiconductor industry. This interconnected impact underscores the urgency for policy measures that reinstate and make permanent immediate R&D expensing to bolster innovation and sustain the industry's growth.

Question. My Republican colleagues and I are closely tracking the Treasury Department's negotiations of the OECD's Global Anti-Base Erosion Model Rules ("Pillar 2"). We are concerned that the agreed-upon framework threatens U.S. domestic tax incentives championed by both Republicans and Democrats.

How have the current OECD Pillar 2 negotiations jeopardized the effectiveness of U.S. domestic research and development tax incentives?

Answer. It is important that the U.S. continues to engage at the OCED as these new international tax regimes are implemented.

While we are encouraged by the reports that the Treasury Department intends to provide relief for the nonrefundable R&D credit in the context of Pillar 2, as currently drafted, Pillar 2 presents a challenge to the efficacy of domestic research and

development tax incentives. Specifically, it negates the advantages of U.S. R&D credits if a taxpayer's effective tax rate, influenced by these credits, dips below the 15-percent global minimum set by Pillar 2. Furthermore, the Under-Taxed Payment/Profit Rule (UTPR) within Pillar 2 allows other nations to levy taxes on the benefits derived from U.S. R&D credits. So, under Pillar 2, an R&D credit received in the U.S. can be taxed by a foreign jurisdiction; the U.S. company and its affiliated companies would then lose additional capital that could be invested in research and development and undermines the intent of the U.S. tax code.

Pillar 2 poses a significant risk to U.S. research and development incentives because it will reduce the amount of tax revenue that the U.S. receives. This reduction in tax revenue will further limit the U.S.'s ability to offer R&D incentives (or support other important business and social programs). The approach taken by the OECD, as drafted, has negative consequences on the United States' interests. Under the rules devised by the OECD, Pillar 2 requires all countries to tax subsidiaries of all large multinational companies in their jurisdiction (these are the Qualified Domestic Minimum Top-up Taxes or QDMTTs), and then the OECD prioritized these QDMTTs even though this same income was being already taxed by the U.S. under its Global Intangible Low-Taxed Income regime ("GILTI"). The OECD could have developed rules consistent with or respecting the U.S. GILTI regime but chose not to. Rather, Pillar 2 is a direct override of U.S. taxing rules and taxing rights in a manner that the JCT estimates will give rise to a loss of greater than $100 billion in tax revenue over a 10-year period.[1]

Finally, Pillar 2 undercuts the effectiveness of U.S. domestic R&D incentives because it causes our incentives to become vastly inferior to the state subsidies and the qualified refundable tax credits (referred to collectively as "subsidies") generally provided by the People's Republic of China and the European Union. Pillar 2 imposes no penalties or limitations on these subsidies even though academic articles and analytical tools currently used by the U.S. and scores of other countries have shown that subsidies and U.S.-style incentives are economically equivalent.[2] The structural failure to treat subsidies and U.S. incentives as economically equivalent is a gaping hole in the logic of Pillar 2 and provides a competitive advantage to European countries and China that primarily support R&D through subsidies. In fact, publicly available information shows that some Chinese companies receive subsidies greater than their annual revenue, and yet the OECD seems preoccupied by nonrefundable U.S. R&D credits that decrease a U.S. company's rate below 15 percent. Ultimately, the inexplicable decisions of the OECD to punish U.S. incentives and ignore subsidies hollows out the effectiveness of U.S. R&D credits as it creates an obvious advantage to Europe and China to support R&D and related innovation in their countries.

Question. The CHIPS Act established a 25-percent Investment Tax Credit (ITC) for certain "qualified property" which includes advanced manufacturing facilities—for which the primary purpose is the manufacturing of semiconductors—or semiconductor manufacturing equipment. The purpose of the ITC is to incentivize investment in the United States, strengthen our global competitiveness, and bolster our national security.

The U.S. Department of Treasury and the Internal Revenue Service (IRS) published the first Notice of Proposed Rulemaking for the ITC on March 23, 2023, just shy of 1 year ago. Yet, Treasury and the IRS have not decided on what constitutes a "qualified property."

How has the administration's failure to provide timely guidance on the implementation of the ITC weakened U.S. global competitiveness in semiconductor manufacturing?

Answer. The lack of prompt guidance on the Investment Tax Credit (ITC) for semiconductor manufacturing has raised concerns about the United States' competitiveness in the global market. The absence of clear criteria and related recapture provisions has created uncertainty among investors and businesses, leading to hesitation in committing to advanced manufacturing facilities or semiconductor equip-

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[1] Joint Committee on Taxation, "Possible effects of adopting the OECD's Pillar Two, both worldwide and in the United States," June 2023.

[2] *See,* Noam Noked, "From Tax Competition to Subsidy Competition," University of Pennsylvania, Vol. 42:2, (2020); Mindy Herzfeld, "Who Wins Out in the Latest Pillar 2 Guidance?" *Tax Notes,* posted Feb. 13, 2023; Stephen Bonovich, "The U.S. as the Biggest Casualty of Pillar 2's Fatal Flaw—the Bias for State Subsidies," *Tax Notes International,* September 18, 2023; Alan Cole, The Fatal Flaw of Pillar Two, The Tax Foundation, posted February 27, 2024.

ment. This uncertainty is detrimental to investor confidence, as stability and predictability are key factors in investment decisions.

Moreover, semiconductors are vital to modern technology, and countries that offer well-defined incentives for their production are more likely to attract investment and drive innovation. The U.S. faces a competitive disadvantage due to the delay in defining "qualified property," risking its position in an industry that is critical to consumer electronics and national defense.

The global semiconductor supply chain is already under strain from shortages and geopolitical tensions. Strengthening domestic manufacturing is crucial for supply chain resilience. Timely ITC guidance would encourage investments in U.S. facilities, reducing dependence on foreign suppliers and enhancing national security.

In conclusion, the administration's delay in providing clear ITC guidelines has significant implications for U.S. competitiveness in semiconductor manufacturing. Establishing clear guidelines is imperative to attract investment, foster innovation, and maintain a strong position in the global semiconductor industry.

SUBMITTED BY HON. JAMES LANKFORD,
A U.S. SENATOR FROM OKLAHOMA

American Exploration and Production Council (AXPC) and the Domestic Energy Producers Alliance (DEPA)

March 12, 2024

The Honorable Ron Wyden
Chairman
U.S. Senate
Committee on Finance
Washington, DC 20510

The Honorable Mike Crapo
Ranking Member
U.S. Senate
Committee on Finance
Washington, DC 20510

RE: Support for S. 3381, the "Promoting Domestic Energy Production Act."

Dear Chairman Wyden and Ranking Member Crapo,

The American Exploration and Production Council (AXPC) and the Domestic Energy Producers Alliance (DEPA) are writing to highlight the critical role of the independent oil and natural gas exploration and production industry in ensuring the Nation's energy security and economic prosperity. We appreciate the committee's dedication to holding a hearing on domestic manufacturing, and urge your support for Senator Lankford's S. 3381, the "Promoting Domestic Energy Production Act."

AXPC is the voice of the leading independent energy producers and underscores the industry's pivotal contributions to the U.S. economy, including significant employment opportunities and technological advancements that enhance both energy efficiency and environmental stewardship. DEPA is a nationwide collaboration of 39 coalition associations—from California to West Virginia, Texas to Montana—representing individuals and companies engaged in domestic onshore oil and natural gas exploration and production.

Considering the recent enactment of the Corporate Alternative Minimum Tax (CAMT) as part of the Inflation Reduction Act, AXPC and DEPA seek to address a pressing issue that undermines the competitiveness of the domestic energy sector. Our concerns center around the unequal tax treatment of intangible drilling costs (IDCs), a key investment mechanism that underpins much of our industry's operations. For these reasons, **AXPC and DEPA strongly support S. 3381, the "Promoting Domestic Energy Production Act" which will ensure parity in the tax treatment for similarly situated taxpayers.**

IDCs represent a substantial portion of the capital expenditure in oil and gas exploration and production, crucial for maintaining and expanding domestic energy capabilities. Historically, the ability to deduct IDCs in the year incurred has facilitated rapid reinvestment in further development, a practice vital for sustaining energy production and innovation within the industry.

However, under the current CAMT framework, the lack of explicit provisions for IDC deductions parallels an unintentional discrepancy, disadvantaging energy producers compared to other capital-intensive industries. This disparity not only hampers our ability to invest in new projects but also contradicts the broader objectives of energy independence and economic growth.

Therefore, AXPC and DEPA respectfully urge the Senate Committee on Finance to consider the unique characteristics of the energy sector in the CAMT's implementation. Senator Lankford's legislation will address this issue. Additionally, we request guidance from the U.S. Department of the Treasury that aligns the treatment of IDCs under CAMT with their handling in traditional corporate income taxation, ensuring a level playing field across all sectors of the American economy.

Senator Lankford's legislation will support equitable tax policy which is essential for fostering continued investment in domestic energy production, which is paramount for achieving long-term economic resilience and environmental goals.

We appreciate your attention to this matter and look forward to engaging with the committee to find a solution that supports the Nation's energy producers and, by extension, the American people.

Sincerely,

Jerry R. Simmons
President & CEO
Domestic Energy Producers Alliance

Troy M. Lyons
Vice President, Government Affairs
American Exploration & Production Council

PREPARED STATEMENT OF COURTNEY SILVER,
PRESIDENT AND OWNER, KETCHIE, INC.

Chairman Wyden, Ranking Member Crapo, and distinguished members of the committee, thank you for holding today's important hearing focused on how the U.S. tax code impacts manufacturing in America.

My name is Courtney Silver, and I am president and owner of Ketchie, Inc. located in Concord, NC. Ketchie is a third-generation, full-service precision machine shop that was established in 1947. Our mission is to support the entire U.S. manufacturing supply chain by delivering competitively priced, high-quality machined parts on time. We invest in machining equipment and technology, people and processes to make it easy for our customers to focus on what they do best and to have confidence in their supply chain.

My testimony will focus around one main theme today, and I hope if members take away anything from me, it is this: **manufacturing is a team sport**.

Like any great sports franchise, a team can only excel if every player is operating at their peak. If not, the team falls apart. Similarly, the manufacturing supply chain is only as strong as its weakest link. At the core of any sport are clear, sensible rules that don't unfairly handicap any players in the game. These rules are consistent, rather than constantly changing, so that the game does not devolve into chaos. In this context, the rules of the game are the U.S. tax code. Our tax code needs to be simple, consistent, and progrowth so that it supports manufacturing and gives us all a chance to compete to our fullest potential.

The 2017 Tax Cuts and Jobs Act was revolutionary for the manufacturing sector. After the legislation was signed into law, Ketchie experienced the best year in our 7-decade history. I know others further up our supply chain were booming as well, because I can clearly remember our typically organized shop floor covered in pallets of materials in every available space to keep up with orders. My customers were able to plan facility expansions, introduce new product lines, invest in R&D and enter into long-term stocking agreements with Ketchie due to this industry boom. This was great for us too: our sales revenue increased 25 percent in that first year.

As a result, in 2018, we were able to invest more than $1 million into capital equipment, which helped us meet the surge of demand as our customers ramped up production. We expanded our shop floor workforce by 20 percent, developing our team at Ketchie to keep pace with the ever-evolving manufacturing industry.

When you want to succeed, the only choice is to use your profits productively and pour them back into your team. We made major investments in capital, such as new machining equipment and technology, advanced robotics, tooling, fixtures, HVAC systems for our facilities, and new security and safety systems for our team members. We were able to provide 100 percent of our team members, no matter how long they had been with the company, with pay raises and quarterly bonuses. We expanded our team members' benefits, including enhanced 401(k) matching. I was excited to see that because of these choices, our dedicated team members were buying their families their first homes and first cars. Ketchie was also able to do more to

support our community, grow our charitable giving and take on more volunteer opportunities.

Ketchie has made a commitment to focus our resources on bringing up the next generation of manufacturers. In 2023, I created "Opportunity Knocks," an internship program for high school students that allows them to shadow experienced machinists in our factory while earning school credit. The local high school we partnered with consists of 70 percent minority students, and almost 100 percent come from economically disadvantaged situations. I would not have been able to establish this program or invest in the machinery and the team members necessary to make it a success without the TCJA. Because we have been able to expand and invest in exciting technologies, students are learning valuable trade skills while also preparing for careers that will bring them fulfillment and pride.

Members of this committee must understand that small and medium-sized manufacturers operate on extremely slim profit margins, so all of these changes—higher wages, investments, increased charitable giving—were thanks to these progrowth tax reforms.

Of course, our growth trajectory was disrupted during the COVID–19 pandemic like the rest of the world. However, thanks to the TCJA policies having such an impact on Ketchie in 2018 and 2019, we were able to withstand the shutdowns and supply chain disruptions, even as some of our customers went out of business or were unable to pay tens of thousands of dollars in open invoices for the better part of 2020. This would not have been possible—and Ketchie might not be here today—if we didn't have an economic boom in the years prior to the pandemic.

Small manufacturers across the country realize how significant the job was for Congress to advance generational tax reform in 2017. The alterations made to our tax code allowed a small manufacturer like me to play on a global scale by making it an easier call for my customers to invest their dollars here rather than in a competitor overseas. Manufacturers are facing stiff competition around the globe from countries enticing companies to bring their business out of the United States. A strong domestic manufacturing sector directly correlates to increased national security and economic prosperity for all Americans.

Beginning in 2022, the rules of the game began to change making it much more difficult for manufacturers to thrive in America. Crucial policies enacted by the TCJA began expiring or phasing out, including the ability to immediately deduct research and development expenses, enhanced interest deductibility on business loans and the ability to deduct the cost of capital investments in the year acquired. These provisions, along with many others in the TCJA, gave us the confidence and stability we needed to invest and grow our operations. Manufacturers rely on stability from our tax code for assurance that we can make decisions in the short term, but also plan ahead and make investments that will pay off for decades to come.

Congress enacting progrowth and permanent tax policies allows us to do all of this and so much more.

A. THE TAX CODE MUST PROMOTE CERTAINTY FOR MANUFACTURERS

It is imperative that this committee recognizes the fact that all domestic businesses rely on predictability and stability within the tax code. Ketchie's experience with the benefits of tax reform was not an outlier. Following TCJA passage, the manufacturing sector experienced the best year for manufacturing job creation in the previous 21 years and the best year for manufacturing wage growth in the previous 15 years.[1] Manufacturing capital spending grew 4.5 percent and 5.7 percent in 2018 and 2019, respectively.[2]

Yet today, due to the uncertainty that Congress will address the expiration of Federal tax incentives related to R&D, interest deductibility and expensing for capital investments, 40 percent of manufacturers said they have already been forced to pull back on hiring and investing.[3] In the same survey, 94 percent of manufacturers said that it is important for the Federal tax code to help reduce manufacturers'

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[1] National Association of Manufacturers, "Competing to Win" (September 2022), *available at https://documents.nam.org/ctw22/competing%20to%20win%202022%20-%20tax.pdf*.

[2] *Id.*

[3] NAM Manufacturers' Outlook Survey, First Quarter 2024 (March 5, 2024), *available at https://nam.org/wp-content/uploads/2024/03/Outlook-Survey-March-2024-Q1.pdf*.

costs for conducting R&D, accessing capital via business loans and investing in capital equipment purchases.

Ketchie, like most manufacturers, is a capital-intensive business. In the years following the TCJA, I was able to make a higher level of investment because I knew our tax code was going to have a baseline of certainty. Today, however, I am unable to make these investments because of the uncertainty that Congress will address the expired TCJA provisions. This is not unique to Ketchie; I see my customers and fellow local manufacturers being forced to pull back on expansions or hiring opportunities due to the uncertainty.

I receive a daily reminder of this when I walk on my shop floor. I have a very large space on my floor reserved for my next significant machinery investment. This investment will allow Ketchie to operate in new industry markets, and to inspire and attract the next generation of top talent who want to work with the most cutting-edge technology possible.

This investment is *on hold* due to the phasing out of the accelerated depreciation levels from 100 percent in 2022 to 60 percent in 2024. Because I am unable to realize the full deduction of my investment within the year I purchase it, the investment seems too risky and irresponsible. Permanent full expensing allows me to invest, grow, compete and create highly skilled and high-paying jobs. These positions give people dignity and purpose and change their lives in our community. If accelerated depreciation is allowed to expire fully in 2027, I truly don't know how we will be able to purchase the equipment we need to continue to expand our business.

According to the Joint Committee on Taxation,[4] the manufacturing sector, and specifically small manufacturers, overwhelmingly utilize accelerated depreciation more than any other sector. I would like to thank Senator James Lankford and many members on this committee that joined him for introducing the Accelerate Long-Term Investment Growth Now Act, which would make 100-percent accelerated depreciation permanent. Legislation like this is what allows manufacturers to have tax-planning certainty for the future.

Additionally, at the beginning of 2022, the deduction for interest on business loans was reduced in a manner that disproportionately affects manufacturers. The maximum deduction allowed under section 163(j) of the tax code was narrowed from 30 percent of earnings before interest, tax, depreciation, and amortization (EBITDA) to 30 percent of earnings before interest and tax (EBIT). Excluding depreciation and amortization would reduce the amount of interest businesses can deduct, making it more expensive for manufacturers to finance capital equipment purchases.

Because we do not carry as much debt typically, Ketchie may not experience a direct impact of this tax policy change. However, our customers up the supply chain certainly do, which means the impact of this tax policy change makes its way downstream to us. The majority of my customers buy and sell large pieces of capital equipment that require debt financing, and their inability to deduct interest makes borrowing more expensive, threatening Ketchie's economic health and ability to grow.

Allowing this stricter limitation to continue greatly affects manufacturers' ability to compete globally. Among the 35 countries that have a rule that restricts tax deductibility based on a ratio of interest expense to some measure of earnings, the United States is the only country that has an EBIT-based rule. Generally, China does not limit *any* third-party interest deduction. According to a recent study, keeping the EBIT standard could cost the U.S. economy 467,000 jobs and reduce the U.S. GDP by $43.8 billion if Congress does not act.[5]

I would like to thank Senators Shelley Moore Capito and Kyrsten Sinema for introducing the American Investment in Manufacturing Act, which would reverse this harmful policy that disproportionately impacts manufacturers.

Ketchie delivers machining solutions to government and commercial customers in a wide range of industries, including rail, agriculture, textile, heavy machinery, industrial equipment, and many specialized original equipment manufacturers. Our ability to innovate is what keeps us in the game, and a large part of that for the manufacturing sector as a whole has been the ability to deduct R&D expenses.

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[4] Joint Committee on Taxation, "Tax Incentives for Domestic Manufacturing," JCX–15–21 (March 2021), *available at https://www.jct.gov/publications/2021/jcx-15-21/*.

[5] "Economic impact of a stricter 163(j) interest expense limitation," EY (September 2022), *available at https://documents.nam.org/tax/nam_interest_deductibility_study.pdf*.

For decades, taxpayers have been allowed to immediately deduct 100 percent of their R&D expenses in the year they incurred. In 2022, however, the tax code began requiring so-called "amortization" of these expenses, forcing manufacturers to recover only a small portion of their costs over several years.

Taxing manufacturers' investments in critical R&D expenditures means that we will have less funds to invest in workers and our future growth. The private sector accounts for more than 75 percent of total R&D spending,[6] with small businesses accounting for approximately $90 billion of all private-sector R&D investments.[7] This is not a new issue—the tax code has recognized the importance of R&D spending for more than 70 years, but with this recent change, Congress has now made the U.S. one of the two developed countries in the world who require the amortization of R&D expenses.

A new report from the European Union found that both the EU and China gained a significant advantage after the expiration of the TCJA R&D tax policies.[8] In 2022, the first full year after immediate expensing for R&D expired in the United States, EU R&D growth surpassed the U.S. for the first time in nearly a decade. Even more worrisome, China's R&D growth tripled that of the United States in 2022. Chinese companies enjoy a super-deduction on research spending, while American firms must now compete with weights strapped to their ankles following the expiration at home. China is not the only country offering better R&D incentives—17 countries now provide a deduction that is more than 100 percent of eligible R&D expenses, further making the United States a less attractive place to conduct R&D.

At Ketchie, we challenge ourselves to provide our customers with a good reason to spend their dollars here. At a time of increasingly fierce global competition for research dollars, Congress must act to ensure the next R&D dollar is spent in the United States to secure our global leadership in innovation and strengthen our Nation's economic and national security. I want to thank Senators Maggie Hassan and Todd Young for introducing the American Innovation and Jobs Act this Congress to support R&D investments by manufacturers.

Finally, our tax code should be simple. As a small manufacturer, hiring outside accountants and lawyers to understand and navigate every piece of the tax code is costly and time-consuming for me. Our tax system should not be so complicated that small manufacturers don't even have a chance because we are crushed by red tape and unnecessary bureaucracy. Congress should craft our tax code so that it enhances competitiveness and encourages industrial investment here in the United States.

At the time of this hearing, the Senate has the opportunity to address these three expired tax provisions. On January 31, 2024, the House of Representatives passed the Tax Relief for American Families and Workers Act, which would allow for the TCJA R&D, interest standard and full expensing provisions to be extended from their expiration until 2025. If the Senate fails to renew these business provisions, manufacturers will be playing with one hand tied behind their back for the foreseeable future. I urge every member of this committee to show their support for these business provisions so that Ketchie and manufacturers like us are able to continue the progress we made after 2017.

B. CONGRESS MUST PRESERVE PROGROWTH TAX POLICIES

As members of this committee are well aware, a number of other important tax policies enacted by the TCJA are set to expire at the end of 2025. These changes represent damaging tax increases for companies, like Ketchie, which will take effect if Congress does not act.

Ketchie is organized as an S corporation, and therefore is eligible for a 20-percent deduction on our business income thanks to the section 199A provision created by the TCJA. Pass-through owners see their business income reflected on their personal tax returns, and this deduction reduces the amount of pass-through income subject to tax, allowing us to reinvest. This provision, along with the income tax

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[6] National Center for Science and Engineering Statistics, National Science Foundation, National Patterns of R&D Resources: 2020–21 Data Update, NSF 23–321 (January 4, 2023), *available at https://ncses.nsf.gov/pubs/nsf23321*.

[7] National Center for Science and Engineering Statistics, National Science Foundation, InfoBrief, NSF 22–343 (October 4, 2022), *available at https://ncses.nsf.gov/pubs/nsf22343* and InfoBrief, NSF 23–305 (December 14, 2022), *available at https://ncses.nsf.gov/pubs/nsf23305*.

[8] "EU Industrial R&D Investment Scoreboard" (2023), *available at https://op.europa.eu/en/publication-detail/-/publication/1e5c204f-9da6-11ee-b164-01aa75ed71a1/language-en*.

rates for individuals, is set to expire at the end of 2025, dramatically increasing the tax burden on small manufacturers like Ketchie. This means we will have fewer resources to: create new jobs; create shadowing programs for our local high school; invest in capital equipment; improve our security systems and safety measures for our employees; provide increased health benefits and 401(k) plans; donate to local Boys and Girls Clubs; increase bonus and pay scales for our employees; and take chances on new innovations and technology to grow our business.

If Congress fails to preserve the 20-percent deduction, Ketchie will be unable to conduct these activities because funds will flow to the Federal Government instead of back to manufacturers so they can reinvest. I would like to thank Senator Steve Daines for introducing the Main Street Tax Certainty Act, which would make the 20-percent deduction permanent for small manufacturers like Ketchie.

Moreover, if not for the Federal estate tax exemption being increased in 2017, Ketchie might not be here today. I know firsthand the struggle that family-owned businesses face when a loved one passes away. When I lost my husband in 2014 to brain cancer, not only did I have to worry about keeping the business afloat, but I was so worried about a looming tax bill that might have forced us to halt production altogether.

We are a third-generation family-owned company, and we want to remain a linchpin in Concord for many generations to come. The estate tax has a significant impact on family-owned manufacturers' ability to continue to operate after the death of a loved one. The tax has a disproportionate impact on family-owned manufacturers because their companies consist largely of illiquid assets that would need to be sold or leveraged to satisfy the tax burden.

In 2017, the TCJA increased the exemption threshold for the estate tax, allowing more of a family-owned business's assets to be passed on to the next generation without incurring a tax burden. The increased exemption is set to expire in 2026, which will expose more of a family-owned business's assets to taxation, making it increasingly difficult for them to continue operating and supporting local jobs following the death of a loved one. Preserving the TCJA estate tax or outright repeal would instill the confidence in small manufacturers like Ketchie that we will be able to continue operating in the event of losing a loved one.

Additionally, I encourage members of the committee to fully preserve stepped-up basis, which prevents a business owner's heirs from being forced to pay a capital gains tax on the asset appreciation that occurred during the owner's lifetime. A recent study found that taxing these unrealized gains would cost the U.S. economy 80,000 jobs per year over the course of a decade and 100,000 jobs per year thereafter.[9]

Manufacturers fully realize the task ahead for Congress is monumental. As they say though, the proof is in the pudding. The business tax policies implemented by the TCJA were rocket fuel for the manufacturing industry, and policymakers must act to ensure the U.S. manufacturing sector remains a global leader. Members of this committee must address the expired business tax provisions and reinstitute them as quickly as possible. Manufacturers appreciate the focus of this hearing today, and I hope that members of this committee and every member of Congress will institute tax policies that support manufacturers and provide tax certainty in 2025.

I want to thank Chairman Wyden and Ranking Member Crapo for giving me the chance to testify today. Manufacturing truly is the backbone of our Nation, and I appreciate all members of the committee continuing to give our industry the attention it deserves. Through sound tax policy, we will continue to create jobs, innovate, compete globally, and provide a better future for young Americans.

Manufacturing truly is a team sport, and you are all on that team. Small companies like mine are counting on you to play with us rather than against us, and to ensure that our tax code does the same.

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[9] "Repealing step-up of basis on inherited assets: Macroeconomic impacts and effects on illustrative family businesses," EY (April 2021), *available at https://documents.nam.org/tax/ey-fbetc-stepupreport.pdf*.

QUESTIONS SUBMITTED FOR THE RECORD TO COURTNEY SILVER

QUESTIONS SUBMITTED BY HON. MIKE CRAPO

Question. Can you discuss which provisions of the Tax Cuts and Jobs Act (TCJA) you benefitted from the most, and what investments—both in your employees and your business in general—you were able to make as a result of those tax savings?

Answer. The 2017 Tax Cuts and Jobs Act was revolutionary for my business and the manufacturing sector as a whole. Following TCJA's passage, the manufacturing sector experienced the best year for manufacturing job creation in the previous 21 years and the best year for manufacturing wage growth in the previous 15 years.[1] Manufacturing capital spending grew 4.5 percent and 5.7 percent in 2018 and 2019, respectively.[2] After the legislation was signed into law, Ketchie experienced the best year in our 7-decade history.

Ketchie is organized as an S corporation, and therefore is eligible for a 20-percent deduction on our business income thanks to section 199A, which was created by the TCJA. Pass-through owners see their business income reflected on their personal tax returns, and this deduction reduces the amount of pass-through income subject to tax, allowing us to reinvest. This deduction gives smaller manufacturers the chance to take funds and put them right back to our employees and company.

Ketchie, like most manufacturers, is a capital-intensive business. In the years following the TCJA, I was able to make a higher level of investment in capital equipment thanks to the ability to deduct 100 percent of my capital investments in the year acquired (full expensing). We were able to invest more than $1 million into capital equipment, which helped us meet the surge of demand as our customers ramped up production as they utilized the TCJA provisions as well.

All of the TCJA provisions working in concert with each other allowed other customers and manufacturers in my supply chain to boom. The ability to immediately deduct R&D expenses, enhanced interest deductibility on business loans and full expensing, along with many other provisions in the TCJA like the pass-through deduction and the globally competitive corporate rate, allowed our industry to experience unprecedented growth. We expanded our shop floor workforce by 20 percent, developing our team at Ketchie to keep pace with the ever-evolving manufacturing industry. We created an internship program focused on manufacturing for our local high school, provided increased health benefits and 401(k) plans to our team, donated to the local Boys and Girls Clubs, increased bonus and pay scales for our employees, and increased security and safety measures in our facilities. None of these investments would have been possible without the TCJA.

Question. I expect tax legislation to be top of mind in 2025 as a number of important tax provisions expire. A top priority of mine is making TCJA's progrowth tax policies—such as full expensing and the pass-through deduction—permanent, as well as reinstating R&D expensing.

Can you describe how important certainty in the tax code is to your business and investment decisions? Would making these progrowth provisions permanent be helpful for business planning purposes?

Answer. It is imperative that Congress recognize the fact that domestic businesses rely on predictability and stability within the tax code. Even when Congress discusses tax changes, it forces small manufacturers to spend time trying to read the crystal ball on how to tax-plan for the next several years. Our tax code needs to be simple, consistent, and progrowth so that it supports manufacturing and gives us all a chance to compete to our fullest potential.

Due to the uncertainty over whether Congress will address the expiration of tax incentives related to R&D, interest deductibility and expensing for capital investments, 40 percent of manufacturers said they have already been forced to pull back on hiring and investing.[3] In the same survey, 94 percent of manufacturers said that it is important for the Federal tax code to help reduce manufacturers' costs for conducting R&D, accessing capital via business loans and investing in capital equipment purchases.

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[1] National Association of Manufacturers, "Competing to Win" (September 2022), *available at https://documents.nam.org/ctw22/competing%20to%20win%202022%20-%20tax.pdf.*

[2] *Id.*

[3] NAM Manufacturers' Outlook Survey, First Quarter 2024 (March 5, 2024), *available at https://nam.org/wp-content/uploads/2024/03/Outlook-Survey-March-2024-Q1.pdf.*

I receive a daily reminder of this when I walk on my shop floor. I have a very large space on my floor reserved for my next significant machinery investment. This investment will allow Ketchie to operate in new industry markets, and to inspire and attract the next generation of top talent who want to work with the most cutting-edge technology possible.

This investment is *on hold* due to the phasing out of the accelerated depreciation levels from 100 percent in 2022 to 60 percent in 2024. Because I am unable to realize a deduction for the full cost of my investment within the year I purchase it, the investment seems too risky and irresponsible. Permanent full expensing, on the other hand, would allow me to invest, grow, compete, and create highly skilled and high-paying jobs. These positions give people dignity and purpose and change their lives in our community. If accelerated depreciation is allowed to expire fully in 2027, I truly don't know how we will be able to purchase the equipment we need to continue to expand our business.

The pass-through deduction also needs to be a high priority for Congress next year. The pass-through deduction is set to expire at the end of 2025 at the same time that the income tax rates for individuals will increase, dramatically increasing the tax burden on small manufacturers like Ketchie. Preserving the pass-through deduction and preventing individual tax rates from increasing must be a priority for Congress to encouraging domestic manufacturing growth, as should preserving the TCJA's increased estate tax exemption threshold and reduced corporate rate.

QUESTION SUBMITTED BY HON. JOHN THUNE

Question. As you know, the Tax Cuts and Jobs Act doubled the estate tax exemption level, and your testimony spoke to the importance of either retaining the TCJA exemption level or repealing the estate tax in its entirety. I have long been an advocate for the permanent repeal of the estate tax, more commonly known as the death tax. Last year, I led 40 of my Senate Republican colleagues in reintroducing the Death Tax Repeal Act, which would put an end to this punitive tax that not only burdens and punishes family-run businesses when a death in the family occurs, but also through costly estate planning.

Could you please expand on the detrimental impact the death tax has on businesses like yours when a death in the family does unfortunately occur and its impact on the ongoing operation and longevity of the business itself?

Answer. Ketchie was established in 1947 to fill the gap of the local textile industry after World War II. Today, we are a third-generation family-owned company that has been a pillar in Concord, NC for nearly 80 years, providing strong manufacturing jobs and giving back to our community.

Following my husband's passing, I was honored to take over Ketchie and continue the family legacy. I know firsthand the struggle that family-owned businesses face when a loved one passes away. When I lost my husband, not only did I have to worry about keeping the business afloat, but I was so worried about a looming tax bill that might have forced us to halt production altogether.

In 2017, the TCJA increased the exemption threshold for the estate tax, allowing more of a family-owned business's assets to be passed on to the next generation without incurring a tax burden. The increased exemption is set to expire in 2026, which will expose more of a family-owned business's assets to taxation, making it increasingly difficult for them to continue operating and supporting local jobs following the death of a loved one. Small businesses should not be forced to spend countless hours and resources with outside tax planners and accountants just so we do not have to worry about losing our businesses due to a tragedy.

Preserving the TCJA estate tax exemption or outright estate tax repeal would instill the confidence in small manufacturers like Ketchie that we will be able to continue operating in the event of losing a loved one.

QUESTIONS SUBMITTED BY HON. TODD YOUNG

Question. During the hearing, I emphasized the importance of restoring full and immediate expensing under section 174 of the Internal Revenue Code and the critical role this provision plays in maintaining American competitiveness. In par-

ticular, amortization of research and development (R&D) expenses has had a serious impact on smaller manufacturers such as Ketchie.

How important is full and immediate expensing to companies like Ketchie?

Can you speak to the urgency of the need for Congress to fix section 174?

Answer. Ketchie delivers machining solutions to government and commercial customers in a wide range of industries, including rail, agriculture, textile, heavy machinery, industrial equipment, and many specialized original equipment manufacturers. Our ability to innovate is what keeps us in the game, and a large part of that for the manufacturing sector has been the ability to deduct R&D expenses.

For decades, taxpayers have been allowed to immediately deduct 100 percent of their R&D expenses in the year they are incurred. In 2022, however, the tax code began requiring so-called "amortization" of these expenses, forcing manufacturers to recover only a small portion of their costs over several years.

Taxing manufacturers' investments in critical R&D expenditures means that we will have less capital to invest in workers and our future growth. The private sector accounts for more than 75 percent of total R&D spending,[4] with small businesses accounting for approximately $90 billion of all private-sector R&D investments.[5] This is not a new issue—the tax code has recognized the importance of R&D spending for more than 70 years, but with this recent change, Congress has now made the U.S. one of the two developed countries in the world who require the amortization of R&D expenses.

Congress not only needs to reinstate immediate expensing under section 174, but manufacturers also need the provision to be retroactive to its TCJA expiration at the beginning of 2022. We need permanent and consistent tax policies so that manufacturers do not have to guess every other year what the tax code might look like. Every day that goes by and immediate expensing for R&D is not reinstated, we are losing dollars we could reinvest here in America and losing ground to our global competitors.

Question. The decrease in U.S. R&D incentives comes at a time when countries across the globe are increasing the generosity of their R&D incentives. As an example, while companies conducting R&D in the United States are forced to amortize their R&D expenses over 5 years, companies conducting those same activities in China are receiving a 200-percent super-deduction.

Since full and immediate expensing of R&D under the Internal Revenue Code expired at the end of 2021, can you speak to what has happened to R&D growth in places like the European Union and China compared to the United States?

Answer. At a time of increasingly fierce global competition for research dollars, Congress must act to ensure the next R&D dollar is spent in the United States and not overseas.

A new report from the European Union found that both the EU and China gained a significant advantage after the expiration of immediate R&D expensing.[6] In 2022, the first full year after immediate expensing for R&D expired in the United States, EU R&D growth surpassed the U.S. for the first time in nearly a decade. Even more worrisome, China's R&D growth tripled that of the United States in 2022. Chinese companies enjoy a super-deduction on research spending, while manufacturers in America must now compete with weights strapped to our ankles following the expiration at home. China is not the only country offering better R&D incentives—17 countries now provide a deduction that is more than 100 percent of eligible R&D expenses, further making the United States a less attractive place to conduct R&D.

Manufacturers are facing stiff competition around the globe from countries enticing companies to bring their business out of the United States. A strong domestic manufacturing sector directly correlates to increased national security and economic prosperity for all Americans.

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[4] National Center for Science and Engineering Statistics, National Science Foundation, National Patterns of R&D Resources: 2020–21 Data Update, NSF 23–321 (Jan. 4, 2023), *available at https://ncses.nsf.gov/pubs/nsf23321.*

[5] National Center for Science and Engineering Statistics, National Science Foundation, InfoBrief, NSF 22–343 (Oct. 4, 2022), *available at https://ncses.nsf.gov/pubs/nsf22343* and InfoBrief, NSF 23–305 (Dec. 14, 2022), *available at https://ncses.nsf.gov/pubs/nsf23305.*

[6] "EU Industrial R&D Investment Scoreboard" (2023), *available at https://op.europa.eu/en/publication-detail/-/publication/1e5c204f-9da6-11ee-b164-01aa75ed71a1/language-en.*

PREPARED STATEMENT OF MARK R. WIDMAR,
CHIEF EXECUTIVE OFFICER, FIRST SOLAR, INC.

Good morning, Chair Wyden, Ranking Member Crapo, and distinguished members of the committee. My name is Mark Widmar, and I am the chief executive officer of First Solar, the largest solar manufacturer in the Western Hemisphere. I have been with First Solar for 13 years, serving as the CEO since 2016 and as the chief financial officer before that.

Founded 25 years ago outside Toledo, OH, we operate the largest solar manufacturing footprint in the Western Hemisphere, with three existing factories in Ohio that produce thin film solar wafers, cells, and modules in a single process under one roof. We have two new manufacturing facilities under construction in Alabama and Louisiana that are expected to come online in 2024 and 2025, respectively. In addition, we are expanding our existing Ohio footprint and constructing a Research and Development (R&D) center as well as a technology development line intended to produce the next generation of thin film photovoltaic technology at our Ohio campus. Together, this represents over $4 billion in investment capital.

First Solar is proud to be America's solar company: we are the only company out of the world's largest solar module manufacturers to be headquartered in the United States, and we are on track to have 14 gigawatts (GW) of vertically integrated capacity to produce American-made solar panels with the support of a uniquely domestic supply chain.

I am honored to represent First Solar today and thank the committee for convening this hearing on how tax policy impacts domestic manufacturing in the United States. We believe the Inflation Reduction Act (IRA) represents America's first durable solar industrial strategy and, if implemented with a whole-of-government commitment to onshoring, together with strong and consistent enforcement of trade laws, it also has the potential to dismantle China's stranglehold of solar manufacturing value chains. Quite simply, the IRA paves a viable pathway for the U.S. to secure supply of critical clean energy technologies, enabling America's energy independence while capturing value for our economy and creating well-paying, enduring jobs.

It is difficult to overstate the economic potential that the IRA can deliver through job creation, labor income, and overall economic output. As First Solar continues to scale domestic production, we are proud to share the tangible benefits of onshoring U.S. solar under the IRA. We believe that the data that follows defines, in real terms, the value that domestic solar manufacturing delivers to the U.S. economy and should provide a basis for bipartisan support to establish and maintain the policies and trade measures necessary to enable a domestic solar supply chain and a level playing field.

- **American solar manufacturing creates steady, good-paying jobs.** By 2026, we expect to have more than 4,100 direct employees in the U.S., making us one of the largest employers in the sector. Each of our new factories is expected to employ upwards of 700 people, with an average manufacturing salary of $80,000 annually. We are transforming the role of the American solar factory worker—upleveling skills and focusing the scopes on systems and processes, with less focus on rote, routine steps.
- **American solar manufacturing delivers high-value economic impact.** We recently commissioned an analysis conducted by the University of Louisiana at Lafayette that measured the real economic impact of First Solar's domestic manufacturing.
    - The construction activity across our three expansions in Alabama, Louisiana, and Ohio supported an estimated 5,765 direct, indirect, and induced jobs in 2023; represented over $600 million in labor income; and is estimated to have added over $900 million in economic value to the country.
    - In 2026, when we expect to have 14 GW of annual U.S. capacity, the study projects that:
        - First Solar's direct employment of 4,100 people would support an estimated 30,060 direct, indirect, and induced jobs across the country.
        - Every First Solar job would support 7.3 jobs across the U.S., together representing an estimated annual labor income of $2.78 billion, including direct, indirect, and induced effects.
        - First Solar is estimated to add nearly $5 billion in value and $10.18 billion in economic output to the U.S. economy in 2026, based on its

14 GW of U.S. operations and the direct, indirect, and induced effects.

My testimony today will primarily focus on describing how the IRA is catalyzing First Solar's efforts to scale high-value American solar manufacturing, which, in turn, creates a vast economic impact from coast to coast. However, it is imperative that we establish that the U.S. solar industry cannot be a one-horse race.

While we were not the only American solar manufacturer to come into existence at the end of the last century, the grim reality is that we are the only one of scale to remain today. For the IRA to spur U.S. manufacturing to the scale our country requires to support its energy independence we must ensure that more companies that are aligned with U.S. ambitions and are committed to fair competition and innovation can scale, compete, and prosper. There should be no doubt: we invite competition, and we invite free trade; all we ask is that this competition and trade are practiced on a level playing field.

Solar is already the lowest cost form of new electricity generation capacity. However, less than a third of the 35 GW of new solar panels installed in 2023 in the U.S. were produced in America. Moreover, not even one of the crystalline silicon panels installed was assembled with American-made solar cells. There is no question, the U.S. solar manufacturing industry remains in a precarious position, despite the passage of the IRA.

For context, the U.S. exited 2023 with an estimated 30 to 40 GW of imported oversupply, the vast majority of which came into the country free of safeguard and Antidumping and Countervailing Duty tariffs. Nearly all this capacity was produced by China-headquartered companies.

Market conditions show no sign of slowing imports to the U.S. unless policy and trade law enforcement changes. The relentlessness of the Chinese subsidization and dumping strategy has caused a significant collapse in cell and module pricing and threatens the viability of many manufacturers who may never be able to get off the ground or have the ability to finance the start-up or growth of their operations.

This is true for those manufacturers serving the domestic utility-scale sector, as well as those exposed to the residential solar sector, which operates on a shorter sales cycle. At the same time, questions remain on how and when the IRA's regulations, particularly those related to the domestic content bonus, will be finalized. These factors contribute to painting a challenging investment thesis for new U.S. manufacturing capacity.

China's dominance of solar energy is well-known and intentional. The country's strategy to dominate solar supply chains dates to 1985, when photovoltaic (PV) solar was first mentioned in a Chinese Five-Year Plan, the recurring outline of its industrial strategy. Unchallenged, Chinese control of the solar supply chain arms an adversarial nation with significant geopolitical leverage. We need urgency, tax policy clarity, and strong and consistent trade enforcement to ensure the U.S. solar manufacturing sector can scale as Congress intended when drafting the IRA.

First Solar stands apart from most of the industry in a few important ways. Our proprietary—and uniquely American—thin film solar technology was invented and developed in the U.S. and has since evolved in labs across the country. This technology is a significant enabler of the operational U.S. utility-scale solar fleet. We manufacture our panels from start to finish in their entirety within our factory's walls. Each panel is produced in approximately 4 hours: from semiconductor to wafer to cell to completed, deployable module—fully vertically integrated and ready for installation in the field.

Crucially, our U.S. manufacturing capacity has no dependencies on Chinese crystalline silicon supply chains and is instead enabled by an American value chain. Our U.S. panels are produced with American-made glass and steel. The steel value chain that serves our 7 GW of Ohio production is located within a 100-mile radius of our factories; our glass is made from Michigan silica and Wyoming-mined soda ash.

By 2026, we expect to have 14 GW of fully vertically integrated U.S. solar manufacturing capacity capable of serving more than 40 percent of the country's projected utility-scale solar demand with American made solar, and a total of 25 GW globally.

We began investing in an American supply chain long before the IRA—our onshoring began shortly after we announced our second Ohio factory in 2018 in the wake of the solar safeguard measures introduced by the Trump administration. The

safeguard measures, though weakened substantially over time, gave a brief vision of what a level playing field can look like, and created a window for growth investment.

But trade tools alone are not enough to deliver clean energy independence: it is the anticipated durability and scale of the IRA that has the potential to truly deliver the reshoring of a resilient U.S. solar supply chain and the creation of an enduring American solar manufacturing job base. More simply stated: the U.S. tax code has the power to incentivize domestic investment in significantly growing this industry, but the ability of those investments to endure is enabled by a corresponding trade policy.

I would like to draw your attention to two specific sections within the IRA that set the legislation apart from all previous energy-focused efforts in a manner that, together, drive the policy punch that has the power to reshore manufacturing, create well-paying, lasting American jobs, and build the independent energy infrastructure we seek.

1. THE SECTION 45X ADVANCED MANUFACTURING TAX CREDIT

As a tax tool, manufacturing incentives have often focused on the capital expenditure side of setting up manufacturing, not the operational side of running manufacturing resiliently. This is the case with the 2009 American Recovery and Reinvestment Act, which invested $2 billion in clean energy manufacturing in the form of capital expenditure-based tax credits and loans, via the original section 48C and Department of Energy (DOE) loan program, respectively. Manufacturing is a capital-intensive sector, and CapEx-based tax credits certainly play a role in lowering the cost of entry for starting up a new facility.

Not only did the IRA resurrect section 48C with a larger $10 billion fund, but it took on the more complex challenge of incentivizing the operational side of manufacturing in strategic clean energy sectors like solar, wind, and battery storage. By focusing on the ongoing production, 45X creates a scaffolding of support that provides manufacturers the momentum needed to scale, to drive down costs, and to push innovation. For solar manufacturing, the more watts produced, the greater the overall tax credit. As designed, the law encourages competitiveness at scale.

Section 45X is equally innovative in its approach across the full value chain of each strategic sector, looking upstream of the final product. Thus, the tax policy incentivizes the onshoring of each critical stage of the solar manufacturing process: critical minerals, polysilicon, wafer, cell, and module assembly. As designed, 45X recognizes the criticality of onshoring upstream and downstream components, benefiting suppliers and OEMs alike.

2. THE SECTIONS 45 AND 48 DOMESTIC CONTENT BONUS

While 45X represents a critical supply-side driver, the IRA also created a crucial parallel demand-side driver by introducing a bonus to the investment or production tax credit accessed by solar generation asset owners if projects procure domestically made content, including solar panels. While regulations to implement this aspect of the IRA remain pending, the expectations are great that the domestic content bonus will create a durable market pull for solar produced via high-value domestic manufacturing.

I firmly believe the best form of American manufacturing is one in which the maximum value is captured and retained in the U.S., reinvested to spur cycles of innovation to maintain American technological leadership, and used to attract and retain a durable workforce.

It must be noted, however, that without a fix, there is great risk that the largest beneficiary of the IRA's solar energy tax credits may be China. While well-intended to incentivize every step of the solar panel value chain, there are no restrictions in place preventing companies controlled by, owned by, or subject to the jurisdiction of the Chinese Government from benefitting from, and receiving, significant amounts of American taxpayer dollars.

Moreover, Chinese solar companies already have come to dominate the solar supply chain in part through an opaque system of subsidies that is believed to include low-cost financing, highly subsidized coal electricity, free land and buildings, and, horrifyingly, access to forced labor in provinces like Xinjiang, an abomination Congress sought to address with its passage of the Uyghur Forced Labor Prevention Act (UFLPA). We must ensure that the IRA's 45X Advanced Manufacturing Tax Credits are not added to the list of benefits that enable China's mission to fully eviscerate

American solar manufacturing. Put simply: we cannot line China's pockets with U.S. taxpayer dollars.

When the tax code is structured to address such an unintended potential outcome and paired with proper trade enforcement, they can serve as a powerfully effective set of tools to achieve the twin aims of rebuilding American manufacturing able to compete on its own merits, and counter China's unfair dominance of critical supply chains.

First Solar is enabled by thousands of hardworking people across the country: soda ash miners in Wyoming; silica miners in Michigan; copper miners in Utah; steelworkers in Alabama, Louisiana, and Ohio; glassworkers in Illinois, Ohio, and Pennsylvania; woodworkers in Indiana; and a nationwide network of truckers, railroad workers, and many more. These are jobs that, in turn, are enabled by the tax incentives I noted earlier. We believe this demonstrates that the tax code can and is growing U.S. manufacturing, which in turn benefits American workers and helps catalyze our country's prosperity.

However, industrial-sized scaling of the solar industry in America remains at risk without guardrails applied to the tax code. As a recent article in *The New York Times* titled "How China Came to Dominate the World in Solar Energy" noted, "Chinese companies increasingly do the initial, high-value stages of solar panel manufacturing in China, and then ship the components to overseas factories for final assembly."

In recent years, these overseas factories have been located in "Belt and Road" member countries, primarily in Southeast Asia, some of which have recently been determined to be circumventing U.S. trade laws. As things stand, we are at risk of adding Ohio, Texas, Arizona, and other U.S. States to the list of locations that host China's overseas final assembly facilities, in many cases set to use imported components to assemble into modules in potentially temporary, leased facilities. It's not unrealistic that these facilities, and their associated jobs, will disappear once the 45X tax credits expire and American taxpayer dollars are extracted.

Congress must ensure that the U.S. does not become a de facto extension of China's Belt and Road initiative, serving as a mere assembly outpost for China's state-subsidized solar manufacturing industry, while paying for the privilege with U.S. taxpayer dollars.

We must respond to the challenge China poses with legislative solutions and final regulations aligned with our values and designed to shore up the commitment to creating a robust, resilient American solar manufacturing base across the supply chain. These solutions must account for the fact that China is a nimble rival that is quick to exploit opportunities, loopholes, and vulnerabilities.

With the right guard rails, the IRA can help ensure that our manufacturing sectors grow in a resilient and durable manner while allowing the United States to capture the economic value and expand American manufacturing jobs in the process.

I, on behalf of First Solar, am pleased to be here today to participate in these important discussions. We are proud of our American manufacturing capabilities and our past, current, and future contributions to the U.S. economy. We believe that the IRA will significantly advance efforts to grow our country's economy, create enduring jobs, and contribute to our Nation's energy security.

Thank you, and I would be happy to answer any questions you may have.

QUESTIONS SUBMITTED FOR THE RECORD TO MARK R. WIDMAR

QUESTION SUBMITTED BY HON. MIKE CRAPO

Question. I understand that your company has made several comments with respect to Inflation Reduction Act (IRA) implementation guidance, including some that express concerns with potential rules allowing foreign interests to benefit from the incentives.

Your comments also note the need to "address the inequalities associated with Chinese competition." My colleagues and I are likewise concerned that IRA incentives will further entrench anticompetitive foreign interests.

If the administration does not adopt robust rules to level the playing field with foreign competition, what will the impact be to the U.S. solar industry and your company?

Answer. As it relates to the IRA, and as I noted in my comments, the best form of American manufacturing is one in which the maximum value is captured and retained in the U.S., reinvested to spur cycles of innovation to maintain American technological leadership and used to attract and retain a durable workforce.

It is common knowledge that Chinese solar companies have come to dominate the solar supply chain, in part through an opaque system of subsidies that is believed to include low-cost financing, highly subsidized coal electricity, free land and buildings, superdeductions for research and development expenses, and, horrifyingly, access to forced labor in provinces like Xinjiang.

It would be a strategic misstep to add the IRA to the list of benefits and subsidies that Chinese companies already have access to. Not only would this allow them to unfairly benefit from American taxpayer dollars simply by establishing assembly outposts here, but it would defeat the fundamental thesis of reinvesting in American innovation and technological leadership and retaining value in the U.S. This is as much about the impact on the industry as it is on our country's ability to challenge China's dominance and lead the world in clean energy technology innovation and manufacturing.

There is no doubt in my mind that the IRA will significantly advance efforts to grow our country's economy, create enduring jobs, and contribute to our Nation's energy security. However, we need the proper guardrails to ensure that our manufacturing sectors grow in a resilient and durable manner while allowing the U.S. to capture long term economic value and expand American manufacturing jobs in the process.

More broadly speaking, we must think of government policy in the context of clean energy manufacturing in terms of a three-legged stool: the first leg is industrial policy, such as the 45X Advanced Manufacturing Tax Credit, which incentivizes investments in American manufacturing. The second leg is demand and demand-side drivers, such as the IRA's domestic content bonus, which incentivizes the procurement of domestically made content, including solar panels when made with domestically made components.

The third leg is a level playing field that addresses anticompetitive, market-distorting behavior such as dumping and circumvention. While industrial policy such as the IRA has the power to incentivize domestic investment in significantly growing this industry, the ability of those investments to endure is enabled by a corresponding trade policy. This level playing field ensures that domestic manufacturing investments, incentivized by American taxpayer dollars, are incubated as they scale.

Take away any one of the legs, and you render the whole apparatus unusable, undermining America's potential to lead the world in clean energy technology innovation and manufacturing.

QUESTIONS SUBMITTED BY HON. MARIA CANTWELL

Question. You have been an advocate for solar manufacturers to onshore every step of the supply chain, from polysilicon through modules. This would allow U.S. solar manufacturers to bring down costs and enable domestic innovation and supply chain control.

As you have said, a major part of your company's success is its independence from risky international supply chains. Congress passed the IRA's 45X Advanced Manufacturing Production Credit to address exactly this critical supply chain exposure.

Do you think the 45X credit has already begun to reinvigorate the domestic production of clean energy components, including REC Silicon and other companies in my state?

Do you agree that 45X and its "domestic content bonus" provision should be implemented to incentivize all levels of the domestic supply chain, including all components of solar panels, like polysilicon and wafers?

Answer. We have seen firsthand the benefits of operating an American supply chain. Every mile a raw material or component must travel from source to factory

represents risk. The further away your suppliers—and this is especially true in the case of international supply chains—the greater a manufacturer's exposure to the risk of disruption. Our focus on domestic supply chains has allowed us to offer our customers the certainty they value, while supporting tens of thousands of direct, indirect, and induced jobs across the country, and the creation of billions of dollars in economic value.

As it relates to your first question, there's no doubt in my mind that the 45X has been a much-needed catalyst for our industry to invest in growth. REC Silicon's decision to restart its Moses Lake facility was a tremendous achievement and an essential first step in breaking China's stranglehold over polysilicon supply chains.

That being said, China is already responding and allegedly dumping unprecedented volumes of solar panels in the U.S. at prices that are believed to be below the cost of production. Unfortunately, we are not yet in a position to proclaim success, and there is still work to be done to safeguard domestic manufacturing investments from China's use of anticompetitive, market-distorting behavior.

We must think of government policy in the context of clean energy manufacturing as a three-legged stool: the first leg is industrial policy, such as the 45X Advanced Manufacturing Tax Credit, which incentivizes investments in American manufacturing. The second leg is demand and demand-side drivers, such as the IRA's domestic content bonus, which incentivizes the procurement of domestically made content, including solar panels when made with domestically made components. The third leg is a level playing field that addresses the anti-competitive, market-distorting behavior I referenced earlier.

While industrial policy such as the IRA has the power to incentivize domestic investment in significantly growing this industry, a corresponding trade policy enables those investments to endure. This level playing field ensures that domestic manufacturing investments, incentivized by American taxpayer dollars, are incubated as they scale.

With regard to your second question, in an ideal scenario, we would see the entire crystalline silicon value chain reshored in the U.S. The reality, however, is different. As even lower-value investments, such as those in module assembly, falter in the face of China's use of economic warfare against the IRA, the more urgent need is to safeguard the non-Chinese investments catalyzed by 45X while maintaining the demand-side drivers for at least PV solar cells and modules in the form of the domestic content bonus without adding additional complexity.

QUESTION SUBMITTED BY HON. BILL CASSIDY

Question. Last year, First Solar broke ground on a new solar manufacturing plant in Iberia Parish in Louisiana that will become one of the largest solar factories in the U.S., with over 700 jobs. I have been a proud supporter of bringing high-quality manufacturing jobs to Louisiana.

Can you tell me about what led to your solar manufacturing expansion, and what role the tax code played in your expansion?

You call for consistent trade enforcement to ensure that the U.S. solar manufacturing sector can scale and compete internationally on a level playing field. Can you elaborate on how sound trade policies can complement the tax code to advance U.S. manufacturing internationally?

Answer. First Solar is proud to be investing in the State of Louisiana. The new $1.1-billion Louisiana facility, like its sister facilities in Ohio and Alabama, represents First Solar's investment in our country's future. Furthermore, solar manufacturing solidifies the Gulf Coast's position as America's energy production hub. It exemplifies the "all-of-the-above" approach to energy security while creating good-paying jobs and driving economic growth.

Our investments in expanding our domestic manufacturing footprint were driven by unprecedented customer demand for American-made products and catalyzed by the Inflation Reduction Act.

We think of government policy in the context of clean energy manufacturing in terms of a three-legged stool: the first leg is industrial policy, such as the 45X Advanced Manufacturing Tax Credit, which incentivizes investments in American manufacturing. The second leg is demand and demand-side drivers, such as the IRA's domestic content bonus, which incentivizes the procurement of domestically

made content, including solar panels when made with domestically made components. The third leg is a level playing field that addresses anticompetitive, market-distorting behavior such as dumping and circumvention. While industrial policy such as the IRA has the power to incentivize domestic investment in significantly growing this industry, the ability of those investments to endure is enabled by a corresponding trade policy. This level playing field ensures that domestic manufacturing investments, incentivized by American taxpayer dollars, are incubated as they scale.

Take away any one of the legs, and you render the whole apparatus is at risk of becoming unusable, undermining America's potential to lead the world in clean energy technology innovation and manufacturing.

PREPARED STATEMENT OF HON. RON WYDEN,
A U.S. SENATOR FROM OREGON

There's a lot for the Finance Committee to discuss on the topic of manufacturing this morning. I want to start off with a bit of recent history on key manufacturing priorities.

On infrastructure, it became a running joke during the Trump administration that every week was infrastructure week. The big infrastructure bill was always a few days away. But it never came. It was the Biden administration that finally got a major infrastructure bill passed. And now there are shovels in the ground all over the country working on rebuilding our roads and bridges, highways, ports, and airports.

On energy, Trump talked a big game on energy independence. If he wanted, he could have pushed for big investments in wind and solar and batteries and electric vehicles. He did not. Democrats got that done in the Inflation Reduction Act.

The United States is now producing more energy than ever before. We've reached a greater level of energy independence than we've had since the days when millions of Americans had big piles of coal shoveled into their basements. Consumers are saving money. Putin and OPEC have a whole lot less influence over our energy prices than they did when Donald Trump was in the White House.

On semiconductors—the chips that Americans interact with from the time they wake up in the morning and check their cell phones to the time they go to bed at night setting an alarm—once again, Donald Trump sat on the sidelines. He could have pushed for more chips investment to bring a vital high-tech manufacturing industry back home, giving us a greater competitive edge with China. He didn't get it done. The CHIPS and Science Act, passed on a bipartisan basis under this administration, is getting it done.

Nobody would blame Americans for having grown tired and frustrated after decades of empty political promises about bringing manufacturing jobs back to this country. Every shuttered factory, every job shipped overseas, was a wound to those who were left behind in communities that took pride and found identity in the things they made with their labor.

Donald Trump talked an awful lot about bringing back manufacturing jobs. He failed to deliver. In fact, the manufacturing sector went into a recession in 2019, after his tax law went into effect and before the pandemic clobbered our economy.

Well, the cycle of empty promises has ended. The U.S. is in a manufacturing boom, thanks in large part to this landmark legislation passed under the Biden administration, much of which came from this very committee.

Manufacturing investment in clean energy in 2023 was triple the level from before Congress passed the IRA. The running total of clean energy and chips investments announced in the last few years is now more than $350 billion. That's more than a quarter-million jobs created.

The CHIPS Act and the IRA also go farther than any laws in recent memory to buy American and cut our dependence on China. That's a big reason why so many foreign governments were upset after Democrats passed the IRA. With one single piece of legislation, the U.S. lapped the pack in terms of investment in clean energy and clean transportation.

So that's all great news about the state of manufacturing in America. Here's the big concern: Donald Trump wants the IRA repealed. House Republicans voted to gut

nearly the entire IRA energy package. It's not because they've got a better idea for energy or manufacturing in America. It's just because they want to score a political win, no matter the cost. And in this case, the cost would be hundreds of thousands of jobs in America. It would be higher costs for consumers, greater dependence on foreign oil, and surrendering to China and other countries when it comes to clean energy innovation and jobs.

That must not happen. For the first time in a long time, the future of manufacturing in America—and manufacturing jobs—looks bright. Congress absolutely must do everything it can to build on this progress.

On that topic, the Senate is in the middle of a debate on a bill that pairs tax cuts for businesses, including for R&D expenses, with an expansion of the Child Tax Credit. I introduced the bill with Chairman Smith of the House Ways and Means Committee 2 months ago. The House passed it 6 weeks ago with 357 votes in favor, and I don't think you can get 357 members of the House to agree that 1 plus 1 equals 2.

The Senate needs to get this done. As I've said for weeks and weeks, I will talk to anybody who wants to work in good faith to move this forward quickly, because 16 million low-income kids who stand to benefit shouldn't be forced to wait. And I've heard from small business owners that there will be real damage done if the Senate sits on this until 2025. A lot of innovative small businesses will fail if this bill doesn't pass.

Some of my colleagues understand the urgency here. And let's understand that this set of policies isn't going to be on the table in 2025 if this bill stalls out. So I hope the Senate is able to move soon.

MACROECONOMIC ANALYSIS OF H.R. 7024, THE "TAX RELIEF FOR AMERICAN FAMILIES AND WORKERS ACT OF 2024" AS ORDERED REPORTED BY THE COMMITTEE ON WAYS AND MEANS, ON JANUARY 19, 2024

Prepared by the Staff
of the
Joint Committee on Taxation

January 23, 2024
JCX–6–24

INTRODUCTION

Pursuant to House Rule XIII(8)(b), this document,[1] prepared by the staff of the Joint Committee on Taxation ("Joint Committee staff"), provides an analysis of the macroeconomic effects of H.R. 7024, the "Tax Relief for American Families and Workers Act of 2024," as ordered reported by the Committee on Ways and Means on January 19, 2024. The basis for this analysis is the projected change in tax revenues as estimated by the Joint Committee staff.[2]

MACROECONOMIC ANALYSIS OF H.R. 7024

This report provides an analysis of the macroeconomic effects of a proposal to reform the Internal Revenue Code ("Code"). Specifically, the proposal analyzed here is summarized in JCX–2–24, *Description of H.R. 7024, The "Tax Relief for American Families and Workers Act of 2024,"* as ordered reported by the Committee on Ways and Means on January 19, 2024.[3] The Joint Committee staff finds that it is imprac-

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[1] This document may be cited as follows: Joint Committee on Taxation, *Macroeconomic Analysis of H.R. 7024, the "Tax Relief for American Families and Workers Act of 2024" as ordered reported by the Committee on Ways and Means, on June 19, 2024* (JCX–6–24), January 23, 2024. This document can also be found on the Joint Committee on Taxation website at *www.jct.gov*.

[2] For projected changes in revenue by provision, *see* Joint Committee on Taxation, *Estimated Revenue Effects of the Chairman's Amendment in the Nature of a Substitute to H.R. 7024, the "Tax Relief for American Families and Workers Act of 2024," Scheduled for Markup by the Committee on Ways and Means on January 29, 2024* (JCX–5–24), January 18, 2024 at *www.jct.gov*.

[3] Joint Committee on Taxation, *Description of H.R. 7024, the "Tax Relief for American Families and Workers Act of 2024" Scheduled for Markup by The Committee on Ways and Means* (JCX–2–24), January 19, 2024; and Joint Committee on Taxation, *Description of The Chairman's*

ticable to report changes to Gross Domestic Product ("GDP") from this proposal because they are estimated to be so small relative to the size of the economy and the degree of uncertainty associated with the estimate as to be negligible over the 10-year budget window. As a result, the revenue feedback resulting from this proposal is also estimated to be negligible.

The following discussion describes the proposal and explains why the macroeconomic effects and revenue feedback that would result are estimated to be negligible. The Joint Committee Staff used three macroeconomic simulation models to analyze the effects of the proposal: (1) the Joint Committee staff's Macroeconomic Equilibrium Growth Model ("MEG");[4] (2) The Joint Committee staff's Overlapping Generations Model ("OLG");[5] and (3) the Joint Committee staff's Dynamic Stochastic General Equilibrium Model ("DSGE").[6] A brief description of the models appears in the Appendix to this document.

The Joint Committee staff estimates that H.R. 7024 will reduce Federal revenues by about $399 million over the budget window on a conventional basis, and that macroeconomic effects do not additionally increase or decrease this estimate.

Proposal

H.R. 7024 ("the bill") includes 13 provisions organized under six subtitles, which are briefly described in this section.

The first subtitle includes one provision that modifies the child tax credit in several ways, each of which expire at the end of calendar year 2025. First, the per-child calculation of the additional child tax credit phase-in is adjusted while the maximum amount of the additional child tax credit per qualifying child is increased to $1,800 and $1,900 in calendar years 2023 and 2024, and increased to the full amount of the child tax credit for 2025. Second, the $2,000 per-child amount of the child tax credit is temporarily indexed for inflation in 2024 and 2025. Lastly, taxpayers are temporarily allowed to elect to use earned income of the preceding year for purposes of calculating the credit, and there is a special rule for early-filed 2023 tax returns that may entitle the taxpayer to an additional credit or refund amount. Overall, these modifications have the effect of temporarily increasing the generosity of the child tax credit and the additional child tax credit. The Joint Committee staff estimates this provision will result in a $33.5 billion revenue loss over the budget window.

The second subtitle includes three provisions that temporarily increase business deductions through the end of calendar year 2025. The deduction for research and experimental expenditures for taxable years beginning after December 31, 2021 is temporarily modified by allowing taxpayers to immediately deduct amounts paid or incurred during the taxable year instead of capitalizing and amortizing such expenditures over a 5-year period.[7] A second provision temporarily extends the ability of taxpayers to compute adjusted taxable income for purposes of the section 163(j) interest limitation without regard to deductions allowable for depreciation, amortization, or depletion in taxable years beginning after December 31, 2022. This modification has the effect of increasing the deductible amount of business interest expense during the taxable year. A third provision temporarily extends the allowance

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Amendment in the Nature of a Substitute to H.R. 7024, the "Tax Relief for American Families and Workers Act of 2024" (JCX–4–24), January 18, 2024. These documents can also be found on the Joint Committee on Taxation website at *www.jct.gov*.

[4] A detailed description of the MEG model may be found in Joint Committee on Taxation, *Macroeconomic Analysis of Various Proposals to Provide $500 Billion in Tax Relief* (JCX–4–05), March 1, 2005, and Joint Committee on Taxation, *Overview of the Work of the Staff of the Joint Committee on Taxation to Model the Macroeconomic Effects of Proposes Tax Legislation to Comply with House Rule X.III.3(h)(2)* (JCX–105–03), December 22, 2003.

[5] A detailed description of the OLG model may be found in "Macroeconomic Implications of Modeling the Internal Revenue Code in a Heterogeneous-Agent Framework," *Economic Modelling*, vol. 87, April 2020, pp. 72–91, in Rachel Moore and Brandon Pecoraro, "A Tale of Two Bases: Progressive Income Taxation of Capital and Labor Income," *Public Finance Review,* vol. 49, no. 3, May 2021, pp. 335–391, and in Joint Committee on Taxation, *An Overview of a New Overlapping Generations Model with an Example Application in Policy Analysis* (JCX–22R–20), October 22, 2020.

[6] A description of an earlier version of the DSGE model may be found in: Joint Committee on Taxation, *Background Information about the Dynamic Stochastic General Equilibrium Model Used by the staff of the Joint Committee on Taxation in the Macroeconomic Analysis of Tax Policy,* JCX–52–d06, December 14, 2006. There is no description available for the current version of the DSGE model.

[7] For expenditures outside of the United States, the current law allows for a 15-year amortization period.

of a 100-percent bonus depreciation deduction for qualified property placed into service after December 31, 2022. Subtitle III also includes a fourth provision that permanently increases the limitation on expensing of depreciable assets. The Joint Committee staff estimates that these provisions will result in a $32.8 billion revenue loss over the budget window.

The third subtitle entitles qualified residents of Taiwan to receive certain benefits with respect to U.S. source income. The Joint Committee staff estimates this provision to have no revenue effect.

The fourth subtitle includes three provisions that provide assistance for disaster-impacted communities. First, certain disaster-related personal casualty losses attributable to major disasters beginning any time after the date of enactment of Division EE of Public Law 116–260, the Taxpayer Certainty and Disaster Tax Relief Act of 2020 (the "2020 Disaster Act") and through the date of enactment of the provision are provided the same treatment as qualified disaster-related personal casualty losses under the 2020 Disaster Act. The second provision provides an exclusion from gross income for amounts received as qualified wildfire relief payments, and is effective for payments received during taxable years beginning after December 31, 2019, and before January 1, 2026. The third provision treats East Palestine, OH train derailment payments as qualified disaster relief payments for purposes of section 139(b). As a consequence, the payments are excluded from gross income. The Joint Committee staff estimates the fourth subtitle to result in a $4.9 billion revenue loss over the budget window.

The fifth subtitle includes two provisions related to the low-income housing tax credit. The first increases the State housing credit ceiling for calendar years 2023 through 2025. The second temporarily lowers the 50-percent bond-financing threshold requirement for certain buildings placed in service after 2023. These two provisions are estimated to result in a $6.3 billion revenue loss over the budget window.

The last subtitle includes two provisions related to tax administration. The first increases the threshold for requiring information reporting, and results in an estimated revenue loss of $1.5 billion over the budget window. The second provision is related to the enforcement of rules applicable to the employee retention tax credit ("ERTC"), and allows penalties for certain misleading behavior related to ERTC claims. This provision also provides that no credit or refund of the ERTC shall be allowed or made after January 31, 2024, unless such claim for such refund or credit is filed on or before that date. This provision is estimated to result in a $78.6 billion revenue gain over the budget window.

As a result of the relative magnitude of revenue effects across subtitles, the macroeconomic effects resulting from the bill are primarily due to the provisions in the first two subtitles. Under the first subtitle, the increase in the rate at which the refundable additional child tax credit phases in with earned income decreases the effective marginal tax rate on labor income, particularly for low-income taxpayers, but increases the effective marginal rate for some others because of the shortened phase-in region. This causes competing labor supply incentives for different taxpayers. For all taxpayers affected by the overall increase in generosity of the credit, there will be a positive income effect that decreases desired labor supply.

The increase in the business deductions included in the second subtitle temporarily decreases the after-tax cost of capital investment for both corporations and pass-through businesses, resulting in a temporary increase in the after-tax rate of return on business investment. Because these provisions expire after calendar year 2025, there is an incentive for businesses to increase investment and shift the timing of already planned investment forward. In addition, while the retroactivity created by effective dates prior to the date of enactment increases businesses' current cash flow, it implies that some of the revenue loss has limited effect on incentives for new investment because the after-tax rate of return is not directly affected.

EFFECTS ON ECONOMIC ACTIVITY AND REVENUES

The estimates of the effects of this proposal on economic activity and revenues were produced using an average of those effects generated by the OLG, MEG, and DSGE models, each with equal weights. This weighting scheme was chosen because no model has a clear advantage over the other in terms of modeling the provisions included in the bill.

The estimated macroeconomic effects of the bill on GDP are so small relative to the size of the economy and the degree of uncertainty associated with the estimate as to be insignificant within the context of a model of the aggregate economy. While

the temporary business provisions in the second subtitle decrease the cost of capital and encourage investment in the first 3 years after enactment, some of this increased investment reflects a forward timing shift of planned investment rather than additional investment that would only occur upon enactment of the bill. In addition, the retroactive component of these provisions only has an inframarginal effect on business activity. After these provisions sunset at the end of calendar year 2025, the after-tax rate of return to investment returns to its present-law value. The Joint Committee staff estimates that while the bill would increase the aggregate stock of capital relative to the baseline forecast over the first half of the budget window, the size of the effect is too small to be significant over that period as well as on average over the budget window.

While the increase in productive capital increases labor demand over the first half of the budget window under the bill, and the proposed expansion of the Child Tax Credit on net increases labor supply, the increase in after-tax household income has a small, offsetting income effect that reduces labor supply. Therefore, the Joint Committee staff estimates that the increase in aggregate effective labor supply [8] relative to the baseline forecast is too small to be significant. Similarly, while household income is estimated to increase slightly and temporarily because of an increase in after-tax wages and returns on investment during the first half of the budget window, the Joint Committee staff estimates no significant effect on consumption in any part of the budget window.

The estimated macroeconomic revenue feedback is related to the degree of productive capital response in each model. However, because the estimated changes in aggregate variables are impracticably small to report, the overall estimated revenue feedback effect is estimated to be so small as to be negligible over the 10-year budget window.

Second and third decade effects

Because the major provisions of the bill expire at the end of calendar year 2025, any macroeconomic and revenue effects projected beyond the first decade are too small to estimate with a reasonable degree of certainty.

APPENDIX: DATA, MODELS, AND ASSUMPTIONS USED IN THE ANALYSIS

The Joint Committee staff analyzed the proposal using the Joint Committee staff MEG, DSGE, and OLG models. While the models are based on economic data from the National Income and Product Accounts, taxable income in the models is adjusted to reflect taxable income as measured and reported on tax returns. All three models start with the standard, neoclassical production framework in which the amount of output is determined by the quantity of labor and capital used by firms, and the productivity of those factors of production. Both individuals and firms are assumed to make decisions based on observed characteristics of the economy, including wages, prices, interest rates, tax rates, and government spending levels. In particular, labor supply is determined by individuals' preferences and expectations, as well as current and future after-tax income and wealth. Similarly, the capital stock is determined by investors' expectations (or knowledge if perfect foresight) of after-tax returns to capital, which depend on anticipated gross receipts, costs of factor inputs, and tax rates that affect those factors. The underlying structure of the MEG model relies more on reduced-form behavioral response equations, while the OLG and DSGE models are built on theoretical microeconomic foundations.

The degree to which the Joint Committee staff relies more heavily on the results of one model versus the others depends on the specifics of the proposal being analyzed. The MEG model aggregates four separate types of labor, using separate marginal and average tax rates for all major individual and business income tax sources. The availability of investment capital to firms is determined by individuals' savings decisions, which depend on the after-tax rate of return on investment as well as on foreign capital flows. Monetary policy conducted by the Federal Reserve Board is explicitly modeled, with delayed price adjustments to changes in economic conditions allowing for the economy to be temporarily out of equilibrium in response to fiscal and monetary policy. The myopic expectation framework in the MEG model represents the extreme case of the degree of foresight individuals have about future economic conditions, in which individuals assume in each period that current economic conditions will persist permanently.

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[8] Effective labor supply is aggregate productivity-weighted equilibrium labor employed, and does not directly correspond to a standard measure of labor hours.

At the other end of the foresight spectrum, in the OLG model, individuals are assumed to make consumption, labor supply, and residential decisions to maximize their expected lifetime well-being given the resources they can foresee will be available to them. They are assumed to have complete information, or "perfect foresight," about economic conditions, such as wages, prices, interest rates, tax policy, and government spending, while they have uncertainty over their length of life. The OLG model represents a class of models with "micro-foundations" and life-cycle effects modeled separately for 76 "generations," each with two household types (married or single), eight labor productivity types, and 10 wealth endowment types. Individuals in each household optimally choose their labor supply from a discrete set of options—unemployed, part time, or full time. For married households, that labor supply decision is made jointly by primary and secondary earners. This indivisible labor assumption implies that the aggregate labor supply elasticity is endogenous and depends on the distribution of reservation wages[9] across households. Tax liability on household income is determined by an internal tax calculator that incorporates key aspects of income tax law. The OLG model includes a business sector with distinct corporate and non-corporate entities that produce output at profit maximizing levels under perfect foresight by choosing the optimal amount of labor and private capital to be used in production. The OLG model is a large open-economy model where foreign entities purchase a portion of new debt issued by the Federal Government, thereby reducing the crowding-out effect relative to that of a closed-economy model. Although debt may be held abroad, there is no additional income or investment shifting beyond what is estimated conventionally.

The DSGE model has a stochastic feature that captures some of the effects of uncertainty about future fiscal policy on the modeling outcome, representing a less extreme foresight assumption than either of the other models. In any given period agents within the model are assumed to know policy variables 4 years into the future, and believe policy variables will slowly return to their steady state values thereafter. In the DSGE model, there are two types of households who make decisions about labor supply, "savers" and "non-savers," where only the former has the ability to make investment decisions. As in the OLG model, these two types of households make consumption and labor supply decisions to maximize their discounted present value of lifetime well-being. Labor supplied by each household type differs in productivity, but is substitutable in the production process. As with the MEG model, the DSGE model incorporates a monetary policy reaction function, which responds to deviations in output and inflation from their long-run values. It also features nominal rigidities in goods prices, allowing for the equilibrium quantity of goods purchased to be relatively more demand-determined in the short run than in a flexible price model.

In the OLG and DSGE models, the ability of agents to foresee changes in fiscal conditions means that the agents in the models will be unable to make optimal economic decisions if they can foresee a permanently unstable economic future, thus preventing the models from "solving"—or completing their simulations. This problem arises in a situation where deficits or surpluses are expected to indefinitely increase faster than the rate of growth of GDP, which is a characteristic under present law as well as the bill. Thus, it is necessary to make counter-factual "fiscal balance" assumptions about the expected path of debt for these models. In the MEG model, however, agents are assumed not to foresee that eventually the growing government debt-to-GDP ratio under present law will become so large that it becomes unsustainable, and the model can generate forecasts up until that point.

For models that require a fiscal balance assumption, imposing the fiscal balance assumption outside the budget window can have effects inside the window, because agents can foresee that it will occur. This "anticipation effect" is stronger the closer in time it is to agents' decision-making. In recent years, developmental work on the OLG model has allowed the fiscal balance assumption to be made decades after the budget window, thus reducing the effect of this assumption on behavior inside the budget window.[10] For purposes of the simulations in this report, fiscal balance is achieved in the OLG model by allowing government consumption to adjust in 2057 as necessary to stabilize the debt-to-GDP ratio. Fiscal balance is achieved in the DSGE model by allowing government consumption to slowly begin adjusting in 2043 to eventually stabilize the debt-to-GDP ratio in the long run.

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[9] A "reservation wage" is the lowest after-tax wage at which an individual is willing to work.

[10] *See* Rachel Moore and Brandon Pecoraro, "Dynamic Scoring: An Assessment of Fiscal Closing Assumptions," *Public Finance Review,* vol. 48, no. 3, April 2020, pp. 340–353.

The estimate of the impact of the growth effects from this proposal on its budget effects was produced using an average of those effects generated by the MEG, OLG, and DSGE models with equal weights. As described above, each model provides a somewhat different perspective on savings/investment and labor responses. The MEG model allows simulation of the proposal as drafted, with no offsetting fiscal balance assumption, and it models cross-border capital flows that can partially offset the effects of a growing deficit on interest rates. The OLG model provides detailed focus on household heterogeneity and allows for the purchase of domestic government debt by foreign entities. The DSGE model, which does not model cross-border capital flows, captures the variation in behavioral responses by savers and non-savers. It also adds imperfect foresight to the analysis, an assumption sitting between the perfect foresight assumption of the OLG model and the myopic foresight in the MEG model.

Each major tax bill potentially presents a unique combination of changes in the definition of the taxable base for different sources of income, as well as changes in tax rates on different sources of income. Because the Joint Committee staff uses these models to facilitate analysis of tax policy, and to estimate the revenue consequences of the macroeconomic effects of tax policy, the Joint Committee staff has devoted a considerable amount of time and attention to modeling the specific types of income flows affected by proposals, to the extent allowed by other sets of assumptions within each macroeconomic model. Information about the effects of the proposal on average tax rates and effective marginal tax rates on each source of income, and on after-tax returns to capital and labor, is obtained from various Joint Committee staff tax models [11] (used in the production of conventional revenue estimates) to characterize the effects of the bill within the each of the models.

Table 1. Key Parameters in the MEG Model

Household		Income	Substitution
Labor Supply Elasticities			
Low income primary		−0.1	0.2
Other primary		−0.1	0.1
Low income secondary		−0.3	0.8
Other secondary		−0.2	0.6
Wage-weighted population average		−0.1	0.2
Annual rate of time preference	0.015		
Intertemporal elasticity of substitution	0.350		
Production			
Business Capital share	0.412		

Table 2. Key Parameters in the OLG Model

Household	
Annual rate of time preference	0.060
Aggregate leisure share of time endowment	0.309
Intratemporal elasticity of substitution (consumption and housing)	0.487
Production	
Private Capital share	0.355
Public Capital share	0.078

[11] Descriptions of the Joint Committee staff's conventional estimating models may be found in JCX–46–11, *Testimony of the Staff of the Joint Committee on Taxation before the House Committee on Ways and Means Regarding Economic Modeling,* September 21, 2011, JCX–75–15, *Estimating Changes in the Federal Individual Income Tax: Description of the Individual Tax Model,* April 24, 2015, and other documents at *www.jct.gov* under "Estimating Methodology."

Table 3. Key Parameters in the DSGE Model

Household	
Annual rate of time preference	0.030
Intertemporal elasticity of substitution	0.500
Frisch elasticity of labor supply	0.400
Fraction of non-Ricardians	0.233
Production	
Capital share	0.360
Intermediate firm markup	0.111

COMMUNICATIONS

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American Made: Growing U.S. Manufacturing Through the Tax Code

Honorable Senator Wyden:

I am writing to express my strong appreciation for the hearing conducted to highlight the importance of U.S. manufacturing and the ability to impact its growth through the tax code. While many provisions of the tax code were discussed, including the new tax credits under Section 45, comments made by the witnesses highlighted the critical importance of returning full expensing of Section 174 costs and providing support to families in need through the Child Tax Credit (CTC).

Throughout the hearing, it was noted that the witnesses had a broad and deep view of the impact of tax incentives for their respective industries and the disruption caused by temporary incentives that expire. In particular, the difficulty presented when making long-term investment decisions and needing a clearer picture of how investments will be impacted positively or negatively by tax law changes.

As noted by Ms. Courtney Silver, the impact of the capitalization of research expenditures on small businesses has been incredibly detrimental to their ability to grow and invest in their business and customers. Manufacturing is a team sport, as Ms. Silver pointed out, and the impact of capitalizing R&D expenditures not only impacted her business negatively but also the company she uses for software to run her company. As Ms. Silver pointed out, the change in the accounting treatment of R&D expenses reduced the ability of the company to improve its software with new functionality and strained its cash flow.

I would like to add a real-life example of the catastrophic impact of capitalizing R&D expenditures on small businesses.

Example: ABC Company

Facts: ABC Company is a designer and manufacturer of capital equipment based in Arizona. As a small business, ABC Co. generated $1.4 million in revenue in 2022 and has a taxable income of $75,000. As with most capital equipment manufacturing companies, a substantial portion of the company's operating expenses are the materials used to develop and build prototypes for testing. In 2022, the qualified R&D expenses for the company were $850,000 of the operating costs or 61% of the revenue.

In addition to these expenses, Section 174 requires that payments incurred "in connection with" the R&D activities must be included in the total expenses of Section 174 to be capitalized. Under current IRS guidance, other expenses to be included are payroll taxes, benefits, rent, utilities, and other ancillary expenses. For this example, we will assume that 15% of the direct expenses for the additional payroll taxes, benefits, and other expenses must be included. Section 174 expenses under this example would total $977,500 ($850,000 x 115%).

Capitalizing the R&D Expenditures

Under the capitalization requirements, the taxpayer must capitalize the Section 174 expenses and amortize them over 60 months. In the initial year, the amortization is determined using a half-year convention, meaning only half of a full year's amortization is allowed (10% rather than a full-year 20% of the total expenses capitalized).

Returning to our example, our taxpayer, ABC Company, had gross receipts of **$1,400,000** and taxable income of **$75,000** before the requirement to capitalize R&D expenditures under Section 174. The result of this accounting change is to increase taxable income by **$879,750** ($977,500–$97,750 year-one amortization).

ABC Company's taxable income is now **$954,750**.

From a cash flow perspective, ABC Company has already paid **$977,500** for these expenses and will now pay the tax on **$954,750**. The amount of tax due will now vary depending on whether ABC Company is organized as a pass-through entity or C-Corporation.

The Small Business Innovation Penalty

Most small businesses like ABC Company are organized as pass-through entities. This means the entity does not pay federal income tax; the income or loss from the business (as well as credits and other tax items) passes through the entity to the company's owners. The tax is paid at the shareholder or partner (individual) level rather than at the corporate level. Pass-through entities are typically organized as S Corporations, LLCs (Limited Liability Corporations), or partnerships.

Publicly traded companies cannot be organized as pass-through entities; instead, they pay a corporate-level tax as a C corporation.

The top individual tax rate in 2023 is 37%, while the top corporate tax rate for a C Corporation is 21%.

The tax due from ABC Company as a pass-through entity would be significant. With the capitalization of the R&D expenses, *taxable income would rise to* **$954,750** (Original Taxable Income of $75,000 + $977,500 of capitalized expenses − $97,750 first-year amortization). The tax due would be **$353,257** ($954,750 × 37%). As a reminder, ABC Company's *cash outlay for operating expenses is $1,325,000* ($1,400,000 revenue less $75,000 taxable income). When adding in the tax due from the capitalization of R&D expenses, **the total cash required for operations and taxes becomes $1,678,257, *resulting in a negative cash flow of $278,257.***

If ABC Company is a C Corporation, the tax due would be **$200,497** ($954,750 × 21%). The total cash outlay for operations and taxes for ABC Company as a C Corporation would be **$1,525,497, *resulting in a negative cash flow of $125,497.***

In either case, the risk of conducting R&D activities results in an unsustainable business model.

The Credit for Increasing Research and Development Activities

Under Internal Revenue Code Section 41, qualifying R&D activities generate a federal tax credit to reduce the tax due by the company conducting the activities. These are typically the same activities that result in the capitalized expenses discussed above under Code Section 174.

Let's return to our example and see how the R&D tax credit impacts the overall tax due and cash flow for ABC Company.

The direct R&D expenditures totaled $850,000 (wages, supplies, and contract research expenses). Please note that under Section 41, only direct expenses can be included in the tax credit calculation formula. Expenditures "in connection with" are not included in the calculation. The R&D tax credit would be calculated in our example to be $85,000 (the credit is a 20% credit but is limited to 50% of the qualified expenses).

As a pass-through entity, ABC Company's additional tax due to capitalization was $353,257. Subtracting the R&D credit of $85,000 would bring the taxes due down to $268,257. The total cash required (after taking into account the R&D tax credit) would be $1,593,257 ($1,325,000 operating expenses plus $268,257), resulting in a **negative cash flow of $193,257.**

As a C-corporation, ABC Company's additional tax due to capitalization was $200,497. Subtracting the R&D credit of $85,000 would bring the taxes due down to $115,497. The total cash required (after taking into account the R&D tax credit) would be $1,440,497 ($1,325,000 plus $115,497), resulting in a **negative cash flow of $40,497.**

The Impact of the federal R&D tax credit does not mitigate the damage.

The Capitalization of R&D Expenditures Is Not a Timing Difference

One of the factors proponents lean on when discussing the impact of R&D expenditure capitalization is that the taxpayer will recoup the expenses over 60 months. As we have discussed, the initial year of expenditure results in only 10% of the expenditures being amortized into taxable income. This means the negative impact is spread over 6 years rather than 5 years. Additionally, if the taxpayer continues to grow their revenue (which would be expected), the expenses related to R&D activities would also grow. While the incremental amount capitalized would decrease (each year would include 20% of the prior year as amortization, reducing the overall amount capitalized), the amount capitalized on the balance sheet would continue to increase rather than decrease over time.

The taxpayer would not "catch up" until they halted R&D activities, assuming they grew at greater than 10% yearly. This creates a no-win scenario for taxpayers to spend capital to improve, innovate, or develop new products, software, techniques, formulas, or inventions.

Congress has made it impossible for U.S. businesses to compete globally.

This real-life example is typical of small manufacturing companies that rely on innovation to compete in a global market.

Full expensing of R&D costs encourages companies to invest in innovation, leading to the development of new products, processes, and technologies that drive economic growth and enhance our global competitiveness. By allowing businesses to deduct these expenses immediately, we can stimulate investment in R&D, spur job creation, and fuel productivity gains across industries.

The Inherent Connection

I also want to underscore the importance of the CTC and its inherent link to the business provisions in the Tax Relief for American Families and Workers Act. The CTC is a critical component of our tax policy that supports families that need assistance. The fewer families that need the CTC, the stronger our economy is.

Our goal as a nation is less reliance on the federal government for programs such as the CTC and more accountability on the private sector to provide employment.

As manufacturing, technology, and other industries grow, they provide more opportunities for employment and career growth. As more jobs are created, fewer families will need the support of the CTC. However, handcuffing American innovation with current tax policies that drain cash flow will not provide the growth and job creation needed to support our economy.

Therefore, please prioritize the bipartisan discussion and successful resolution of the Tax Relief for American Families and Workers Act. By doing so, we can unleash the innovative potential of American businesses, strengthen our economy, and secure a brighter future for generations to come.

Thank you for your attention to this critical issue. I stand ready to support efforts to promote policies that encourage innovation, drive economic growth, and create opportunities for all.

Sincerely,

Randall M. Eickhoff, C.P.A.
Founder & Head Coach

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March 13, 2024

Senator Elizabeth Warren
309 Hart Senate Office Building
Washington, DC 20510

Dear Senator Warren,

Subject: Section 174—2017 changes disincentivize research, H.R. 7024 (title II) helps.

Although you are not my Senator, I've been a fan—until yesterday's Finance Committee hearing.

As a former scientist at GE's R&D facility in Niskayuna, NY, I appreciate your concern about retroactively giving R&D tax "breaks" to just a few large corporations.

However, that scenario misrepresents the situation of small companies, particularly those that work at the behest of the Federal Government. We cannot claim tax credits for funded research, and now we cannot immediately deduct specified research or experimental (SRE) expenses.

In 2018, I organized a LLC dedicated to developing a specific medical device. Acoustic Range Estimates, LLC won SBIR funding. Last year, ARE had gross income of $732,000 and incurred over $500,000 of SRE costs. Because we can only expense 10% of that $500,000 I'll jump to the highest tax bracket and owe approximately $180,000 which is $30,000 more than my/ARE's net income. Amortizing over 5+ years stinks when project duration is only 2–3 years.

Right now, I see only two ways to cover my 2023 tax bill: accept angel/impact investment which will dilute my ownership stake *or* incur capital gains taxes to pay income taxes. Owners who don't have these options will be forced out of business, further exacerbating wealth gaps in US society. Losing small businesses that develop technology for the Department of Defense will weaken national security.

Please work to stimulate research and development, rather than stifle it. If you cannot support HR 7024 as written, please get to work to propose an alternative.

Sincerely,

Sarah K. Patch, Ph.D.

Cc: All members of the US Senate Finance Committee

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March 25, 2024

The Honorable Ron Wyden
Chairman
Committee on Finance
United States Senate
219 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Mike Crapo
Ranking Member
Committee on Finance
United States Senate
219 Dirksen Senate Office Building
Washington, DC 2051

Re: Comments on Senate Finance Committee Hearing American Made: Growing U.S. Manufacturing Through the Tax Code

Dear Chairman Wyden and Ranking Member Crapo:

The American Chemistry Council (ACC) represents the leading companies engaged in the multibillion-dollar business of chemistry. ACC members apply the science of chemistry to make innovative products, technologies and services that make people's lives better, healthier and safer.

ACC appreciates the opportunity to submit comments in response to the Committee's hearing on March 12, 2024, on growing U.S. manufacturing through the tax code. What follows are some of the key tax provisions that matter to ACC members given their impact to U.S. manufacturing.

Tax Relief for American Families and Workers Act

U.S. economic growth requires sound tax policies that incentivize capital investment, job creation and global competitiveness of U.S. businesses. Immediate R&D expensing, the pre-2022 Section 163(j) interest expense deduction limitation, and

full expensing of capital equipment purchases are all tax policies that allow U.S. businesses to thrive, create jobs, and strengthen the U.S. economy.

As we have been advocating for years, ACC urges Congress to take action now to restore immediate R&D expensing, revert to pre-2022 Section 163(j) interest deduction limitation based on EBIDTA and extend the full expensing provision. Taking such action through passage of the Tax Relief for American Families and Workers Act has bipartisan support and has the support of U.S. manufacturers including ACC members.

Similarly, the proposals outlined by the Administration as part of the FY 2025 budget have ACC members very concerned. Raising the corporate tax rate, increasing the CAMT rate and many other proposals that raise taxes indiscriminately *(e.g.,* the repeal of foreign derived intangible income and changes to the interest limitation rules) choke U.S. manufacturers, diverting dollars for investment and workers.

Superfund Tax

The Infrastructure Investment and Jobs Act reinstated the Superfund Tax, imposing an excise tax on the sale or use of taxable chemicals and taxable substances. The U.S. chemical industry supports a vast supply chain, and with $639 billion worth of shipments in 2022, accounts for 11% of the worlds chemical production.

The U.S. chemical industry, which is already facing supply chain challenges, foreign competition and slim margins, opposed the reinstatement of the Superfund Tax given its negative impact. The Superfund Tax increases the costs of U.S. chemical manufacturers and their customers that will, in turn, lead to a decline in U.S. manufacturing activities. For these reasons we urge repeal of this tax.

Inflation Reduction Act Incentives

ACC is seeing increased interest in establishing and expanding U.S. manufacturing as a result of the tax credits included in the Inflation Reduction Act (IRA), in particular manufacturing to support the production of clean hydrogen (Section 45V), clean vehicles (Section 30D), and to domestically produce critical minerals and electrode active material (Section 45X). Unfortunately, while the statute was designed to onshore U.S. manufacturing and end reliance on foreign sourcing, the guidance implementing the IRA has created barriers to this goal.

For example, recently the U.S. Department of the Treasury (Treasury) and the Internal Revenue Service (IRS) issued proposed regulations under Section 45X, the Advanced Manufacturing Production Tax Credit. The statute provides the tax credit shall be "10 percent of the costs incurred by the taxpayer with respect to production." Notwithstanding this unambiguous statutory language, the proposed regulations excluded from the calculation direct and indirect material costs and any costs related to the extraction, production, or acquisition of raw materials. Such a limited interpretation significantly impacts the value of the anticipated tax credit.

Unfortunately, this narrow reading has already caused some companies to change course and pause their investment activities in the U.S. It is likely that this "pause" will transition to a termination of investments if materials costs (including raw materials) remain excluded from the calculation of the credit. ACC will continue to work with the Treasury and the IRS in an effort to revise the guidance, but urges Congress to continue to monitor implementation to ensure congressional intent is being met.

In addition ACC is very concerned over the proposed regulations issued under Section 45V, the Clean Production Tax Credit. Similar to the Section 45X proposed regulations, and as outlined in our comment letter to the U.S. Department Treasury, the Section 45V proposed regulations have created impossible barriers for the nascent hydrogen industry. Further stifling the hydrogen industry is the narrow proposed guidance under Section 48, the Production Tax Credit, under which hydrogen storage only qualifies if used as fuel. Like the previous examples, such a requirement is not contained in statute. In addition, we have provided comments under Section 30D, the Clean Vehicle Tax Credit regarding the foreign entity of concern rules and the non-traceability proposals. Section 30D, as proposed, would allow for the domestic battery supply chain to be vulnerable to foreign producers, especially from foreign entities of concern. Unless the loopholes are closed in the final rule, U.S. investment in the domestic battery supply chain will be at significant risk. Under all of these examples, Congress has provided the framework to encourage U.S. manufacturing, but implementation has had negative impacts on such manufacturing.

Finally although part of the CHIPS Act rather than the IRA, ACC waits in anticipation of the final regulations under Section 48D, and has urged that the final regulations harmonize the tax credit with the U.S. Department of Commerce interpretation such that it includes facilities whose primary purpose is producing materials integral and essential to manufacturing of semiconductors.

We thank you for conducting a hearing on such an important topic and appreciate the opportunity to provide these comments.

Very truly yours,

Robert B. Flagg
Senior Director, Federal Affairs

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This statement is respectfully submitted on behalf of the American Clean Power Association (ACP). ACP is the leading voice of today's multi-tech clean energy industry, representing over 800 energy storage, wind, utility-scale solar, clean hydrogen and transmission companies. ACP appreciates the opportunity to comment on this hearing, entitled "American Made: Growing U.S. Manufacturing Through the Tax Code."

The U.S. generates 16% of its electricity from solar and wind. 33.8 gigawatts (GW) of the cumulative 262 GW of that clean power came online in 2023 and much of this growth was fueled by the clean energy tax incentives included in the Inflation Reduction Act (IRA). This comprehensive tax package—comprised of investment and production tax credits for solar, wind, hydrogen, storage and advanced manufacturing—is helping to increase investment in domestic clean energy, keep up with the increasing electricity demand, and keep prices affordable for American families. Bonus credits for investments in energy communities and projects using domestic content help to ensure that we are re-investing in our communities.

These investments are spurring economic development across the country. Over the last 18 months alone, we have seen announcements for:

- $455 billion in private investment—equivalent to over 15 years' worth of American clean energy investment;
- $4.5 billion in customer savings; and
- 42,000 new U.S. manufacturing jobs.

To achieve the full potential of these federal incentives, ACP estimates that the clean energy industry will need to hire 550,000 Americans by 2030.

Manufacturing

The clean energy industry, through the use of the advanced manufacturing production tax credit (45X), is revitalizing American manufacturing and shifting supply chains. One hundred twenty-eight new or expanded domestic manufacturing facilities have been announced, 78 of which will support the utility-scale solar industry. This translates to 42,000 new jobs and $26 billion in new manufacturing investments.

When these announcements reach operation, ACP estimates a nearly 16-fold increase in domestic solar module production and more than 15-fold increase in domestic grid-scale battery storage production, along with significant increases in production output for solar cells, polysilicon, ingots, and wafers, and wind turbine blades, towers, and nacelles. These investments are critical for the U.S. to secure its energy independence and global leadership in the clean energy future.

Supply Chain

Supply chains are shifting, and the change is happening in real-time. As we build our domestic supply chain and "friend-shore" other components, it is essential that we do not impact the ability of the existing clean energy industry to operate, build U.S. projects and factories, and raise the capital necessary to continue its investment trajectory.

Developers are finding ways to support more manufacturing, for example, signing long-term purchase commitments to assist the financing of new production capacity. These developers, however, need continued certainty on planned projects in order

to pay for these new manufacturing investments. As domestic production capacity is still ramping up, project developers and downstream manufacturers need to continue importing components until they can be sourced in America.

Legislative changes to the implementation of the clean energy tax incentives could cancel or delay existing and planned projects, severely impacting the industry's ability to deploy more domestic clean energy, meet our country's growing electricity demand and continue to finance new domestic manufacturing.

The reliance of critical aspects of the U.S. economy on Chinese manufacturing is a problem that has been years in the making. It began over 20 years ago with the bipartisan passage of permanent normalization of trade relations with China. Today that reliance is not sustainable and requires a whole of government and private sector response across multiple industries. The clean power sector is committed to play a leading role in this process and looks to Congress for partnership to develop real solutions that will accelerate domestic energy and national security imperatives while not crippling the U.S. economy.

Moving supply chains to the U.S. and to jurisdictions which share U.S. values does not happen overnight—it is a complex and time-consuming process involving thousands of individual suppliers. Many parts of the U.S. economy are wrestling with the question of how to lessen our dependence on foreign sources of production. This is clearly the case for the solar supply chain. While domestic solar cell production is now being rebuilt, all domestic solar manufacturers currently import solar cells to make their modules in the United States. Solar modules likely come first followed by other critical upstream components such as cells. If those solar manufacturers cannot source the components they need in the near term, they will likely close or never open—and the future investments needed to stand up a fully integrated domestic solar supply chain won't happen.

We hope that these comments are useful to the Committee as members further consider how to grow U.S. manufacturing capacity by using policy levers in the U.S. tax code.

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https://ararental.org/

Recent global events have highlighted the need to stimulate domestic manufacturing in the United States. The Inflation Reduction Act of 2022 (IRA) contains policies that take significant steps to boost domestic manufacturing of clean commercial vehicles. Specifically, the IRA enacted a new section 45W that provides tax credits that are meant to provide incentives for the manufacture and purchase of mobile machinery that meets the definition of a clean commercial vehicle.

This statement is in reference to the Internal Revenue Service's Clean Vehicle Team's current position with regard to equipment eligible for the Section 45W credits authorized by the IRA. The American Rental Association (ARA) represents the equipment and event rental industry. ARA members buy equipment that is used in construction and industrial applications. ARA members currently have the cleanest fleets of diesel-powered equipment in the United States because almost all of that equipment has been manufactured under the Environmental Protection Agency's Tier 4 requirements.

One of the clear goals of the IRA is to spur the adoption and deployment of electric-powered commercial vehicles and equipment. Indeed, Section 45W(c) Qualified Clean Commercial Vehicle states:

For purposes of this section, the term "qualified commercial clean vehicle"[1] means any vehicle which—

(1) meets the requirements of section 30D(d)(1)(C) and is acquired for use or lease by the taxpayer and not for resale,

(2) either—

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[1] *https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=26-USC-862960381-1197399893&term_occur=999&term_src=title:26:subtitle:A:chapter:1:subchapter:A:part:IV:subpart:D:section:45W.*

(A) meets the requirements of subparagraph (D) of section 30D(d)(1) and is manufactured primarily for use on public streets, roads, and highways (not including a vehicle operated exclusively on a rail or rails), or

(B) is mobile machinery, as defined in section 4053(8) (including vehicles that are not designed to perform a function of transporting a load over the public highways),

(3) either—

(A) is propelled to a significant extent by an electric motor which draws electricity from a battery which has a capacity of not less than 15 kilowatt hours (or, in the case of a vehicle which has a gross vehicle weight rating of less than 14,000 pounds, (7 kilowatt hours) and is capable of being recharged from an external source of electricity, or

(B) is a motor vehicle which satisfies the requirements under subparagraphs (A) and (B) of section 30B(b)(3), and

(4) is of a character subject to the allowance for depreciation.

Moreover, a colloquy between Senator Van Hollen and Chairman Wyden which reads in part: *Mobile machinery is a vehicle that is unrelated to transportation, such as a forklift or bulldozer. The qualified clean vehicle credit utilizes an existing statutory definition of mobile machinery, the purpose of which is to provide for an exemption from the excise tax on heavy trucks that is deposited into the highway trust fund. I ask the chairman of the Finance Committee whether commercial lawn mowers can fit the criteria of mobile machinery and, therefore, qualify for the qualified commercial clean vehicle credit, provided that the vehicle meets the other criteria for the credit (Congressional Record S4167, August 6, 2022).* Chairman Wyden's affirmative response to Senator Van Hollen's question clearly suggests Congressional intent that classifies construction and industrial equipment that is manufactured in accordance with the provisions set forth in the IRA as eligible for the 45W credits.

In our view, many domestic manufacturers of the equipment ARA members purchase annually are meeting the requirements of Section 45W. However, the IRS Clean Vehicle Team appears to have a different interpretation of Section 45W which has been expressed through denials of these manufactures applications to be certified as qualified manufacturers of qualified commercial clean vehicles. We know this to be the case because several ARA members have been in direct contact with their vendors about their applications as qualified manufacturers and been told that IRS is denying their applications.

ARA members are not manufacturers; however, they are some of the entities that will be using the credit when they buy qualified commercial clean vehicles. From conversations and correspondence by the IRS to manufacturers that we have reviewed, it appears that the IRS Clean Vehicle Team does not believe that any electric-powered construction or industrial equipment should be classified as qualified commercial clean vehicles. If this truly represents the position of the IRS Clean Vehicle Team, we believe it is in direct conflict with Congressional intent.

ARA members are positioned to be in the vanguard of companies that will purchase and deploy electric-powered equipment over the next decade. Utilizing the section 45W credits will give these companies the means to significantly increase the amount of electric-powered equipment they purchase and deploy.

Respectfully submitted,

John W. McClelland Ph.D.

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Chairman Wyden, Ranking Member Crapo, and distinguished members of the committee, thank you for convening this important hearing and for the opportunity to submit a written statement. We also extend our gratitude to Senator Carper who, like yourself, believes the U.S. tax code can help solidify the United States as the world's leader in clean energy technology. The reasons set forth in this statement explain how this Committee and Congress can take a giant step in this direction while bolstering our national security and energy resilience by passing Senator Car-

per and Senator Graham's legislation to extend the Investment Tax Credit for fuel cells.

Bloom's Origin

Bloom Energy is honored to represent a clean energy sector that is already dominated by the United States—solid oxide fuel cells (SOFCs) and solid oxide electrolyzer cells (SOECs). In the 1990s, our Founder, Chairman, and CEO, Dr. KR Sridhar, and a NASA team developed a fuel cell that could split Martian water into oxygen for breathing and hydrogen for use as fuel for vehicles. When NASA's project ended in 2001, Sridhar's team shifted focus to develop this technology in reverse—to create electricity from oxygen and fuel.

American Innovation—American Jobs

Bloom's SOFCs generate clean electricity through a non-combustion/electrochemical process that produces no Nitrogen Dioxide (NO_2) or Sulfur Oxide (SO_X). The result is clean electricity—Bloom's patented SOFCs produce fewer non-baseload CO_2 emissions than any "e-grid" subregion in the United States. When storms hit, Bloom's distributed "always-on" platform provides more "energy security" than traditional grid power and more reliability than other forms of clean energy, which are often susceptible to changing weather patterns. With 1 Gigawatt and over 1,000 installations deployed worldwide, Bloom is helping drive the energy transition.

Bloom Energy proudly manufactures its SOFCs and SOECs in the United States, sourcing from nearly1,000 U.S. suppliers and vendors. The ITC for fuel cells has been a key driver in this success. According to the National Fuel Cell Research Center, the fuel cell industry supports over 10,000 American jobs across the supply chain. By manufacturing domestically, Bloom Energy is not only creating jobs and cultivating a strong supply chain to counter inferior and cheaper Chinese goods, but also reducing the carbon footprint associated with transportation and logistics.

National Security—Energy Security

SOFCs provide the resiliency and reliability required to answer some of our most pressing national security challenges. Unlike traditional, centralized power generation, which has long been a primary target of military operations, Bloom's distributed energy platforms are more difficult for enemy combatants to find and disable. Moreover, fuel cells provide on-site power generation that is far more reliable, and the ability to "island" power generation for in-theater operations allows the military to set up bases and rapidly deploy personnel and materials in more strategic and remote locations. As the Department of Defense noted in their energy report one year ago: *"the Department will need to assess the readiness of hydrogen and related fuel cells for deployment across different platforms, as well as the logistical requirements needed to support widespread use of hydrogen in the battlefield."*

Some of our most advanced research on these technologies is being conducted through a close partnership between Bloom and the Idaho National Laboratory (INL). The INL is the nation's premier center for nuclear energy research and development and is charged with defending our resources and infrastructure from physical and cyber threats, unauthorized intrusions and disruptions. The Lab is also a leading research facility that is developing cutting-edge hydrogen fuel technologies. INL's deep relationship with Bloom is leading us toward a future where civilians and the military will benefit from hydrogen generated from nuclear power.

As stated by INL Director, John Wagner, "Pairing the research and development capabilities of a national laboratory with innovative and forward-thinking organizations like Bloom Energy is how we make rapidly reducing the costs of clean hydrogen a reality and a real step toward changing the world's energy future."

Extending the ITC for fuel cells will help ensure that our country does not cede the development and manufacture of this technology to others. Relying on foreign countries—some of whom are increasingly taking an adversarial position to the United States—would jeopardize the critical research being performed by the INL and, by extension, the future energy security of the United States.

Future Yet to Be Defined

Several market forecasts show a bright future for SOFCs, with some sources projecting an annual growth rate of over 20 percent, and others even exceeding 30 percent. Along with contributing to the country's energy security, this expansion will bring a significant number of jobs. According to McKinsey, by 2030, the broader fuel cell and hydrogen industry could support 700,000 American jobs.

However, a future of booming exports, a dominant market position, and strong employment is not a given. The ITC for fuel cells—which has long been a bipartisan priority—is set to expire at the end of this year. As part of the IRA, Congress extended the traditional ITC but at the beginning of 2025, the credit transitions to a "tech-neutral" approach, a policy still in need of Treasury implementing guidance. Under the new regime, a fuel cell would only qualify if it produces electricity in a manner that results in zero greenhouse gas emissions, regardless of its fuel source. Today, fuel cells run 24/7, 365 days a year and are fueled primarily by natural gas, biogas (which both contain hydrogen), or pure hydrogen.

For fuel cells that rely on hydrogen or are hydrogen-ready to qualify for the tech-neutral ITC, a robust hydrogen industry will be needed to provide access to the fuel source across the nation. We anticipate that that goal will be driven heavily by the final guidance for the section 45V hydrogen production tax credit (PTC), which, in turn, will inform the guidance for the upcoming tech-neutral ITC under section 48E.

The issues with respect to the section 45V clean hydrogen credit are far from settled, with the comment period for the proposed regulations having just closed last month. Moreover, significant uncertainty persists as to when the Treasury Department will be able to issue final regulations, which effectively suspends many hydrogen production projects and delays the much needed wide-scale availability of hydrogen for zero-emissions fuel cells.

Furthermore, the lack of implementing guidance for the tech-neutral ITC leaves many unanswered questions regarding fuel cell technologies like Bloom's, such as how the credit will apply to technology that neither combusts or gasifies, but rather uses alternative methods like an on-site, non-combustion, electro-chemical process to separate hydrogen from feedstocks like natural gas.

Without clear, final rules for clean hydrogen and absent Treasury guidance on the tech-neutral ITC for fuel cells, the expiration of the current section 48 ITC will lead fuel cell manufacturers to look overseas to locate their factories in order to remain price competitive. In effect, failing to extend this fuel-cell tax incentive will open the door for the Chinese to take advantage of the IRA and bring U.S. manufacturing of U.S. green technologies with U.S. job to China.

China, however, will not be the only example. Without an extension, other countries will surely swoop in to lure investment and production in an industry that one market analyst has earmarked "for exponential growth." Countries like Japan, South Korea, and Germany have already implemented strong support mechanisms for fuel cell technology, recognizing its potential to drive economic growth and reduce emissions. It is in our national interest to ensure that the fuel-cell industry, which originated in this country, stays in this country.

A Crossroads for Maintaining American Leadership

The Finance Committee and this Congress have an opportunity to fulfill the purpose of this hearing by sustaining the incentive for the production of a technology that was developed by Americans and iscurrently being manufactured by Americans. Solid Oxide Fuel Cells are poised to play a major role in answering two of the world's most urgent challenges—increasing electricity generation and reducing carbon emissions. All of this can be done through the efforts of innovative thinkers and hardworking middle-class Americans.

We urge Congress to pass the Carper-Graham bill that extends the section 48 Investment Tax Credit for fuel cells for all of the compelling reasons outlined above—providing the long-term certainty needed to support domestic manufacturing, driving and keeping American innovation at home, creating high-quality domestic jobs, strengthening our national security and enhancing energy security for the world. By doing so, the United States can maintain its leadership position in this critical clean energy technology and secure a more sustainable and prosperous future for all Americans.

Thank you for your consideration.

STATEMENT SUBMITTED BY JOHN LEE
https://www.taxsimplecenter.net/index.html

Chairman Wyden, Ranking Member Crapo and members of the Committee:

I appreciate your calling for this hearing. Good tax code policy can help U.S. manufacturers and businesses to grow. Business tax rate is one of major factors for our domestic manufacturing.

I am a tax researcher and business owner. We have 15 tax research publications of federal and state tax simplification research (A and B).

Federal business tax system had 8 tax brackets such as 15%, 25%. . . , and 35% before reforming to a flat tax rate at 21% in 2018 (C). The 8 tax brackets were too complex. A flat tax rate (21%) is too simple, rough and unreasonable. Small businesses have increased their tax rate from such as 15%–18% to 21%. President Biden has proposed to increase 21% to 28% (D). High tax rates affect many people to reconsider to start new businesses or not.

A good business tax plan is to have a relatively low bottom tax rate, which can encourage more people to start businesses. Small businesses hire many employees to meet people, social, and economic needs. Then middle and large businesses are more stable to pay relatively higher tax rates. Two brackets/formulas for federal corporate tax calculation system are suggested with 2 tax rate ranges such as 15%–20%–25% or 15%–21%–28% (A).

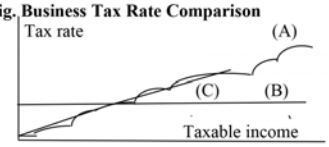
A flat tax rate can reduce for people to start new businesses, which affect our existing and future economic situations. 15% is increased to 21% to increase tax by 40% (6%/15%) or to 28% to increase tax by 86% (13%/15%). Two tax rate ranges such as 15%–20%–25% or 15%–21%–28% are suggested. Tax revenue change is very minor. Small businesses have good potential for business development. Middle and large businesses have strong ability to pay relatively higher tax rates than small businesses. When more small businesses survive and develop, more middle and large businesses may be produced.

(A) The prior 8 tax brackets from 15% to 35%

(B) Flat tax rate at 21% (or 28%)

(C) Two brackets/ranges (15%-20%-25%)

Fig. Business Tax Rate Comparison



Tax rate and tax are summarized with two simple formulas, which can be calculated and repeated by such as Excel or a program after inputting related tax information.

Table Federal Corporate Tax Calculation Simplification

	Option #1 (15%–20%–25%)		Option #2 (15%–21%–28%)	
Taxable income (TI)	Tax rate and tax	Tax rate range	Tax rate and tax	Tax rate range
Not over $120,000	(YTI÷2,400,000+0.15)×TI	15%–20%	(YTI÷2,000,000+0.15)×TI	15%–21%
Over $120,000	(0.25 − 6,000÷YTI)×TI	20%–25%	(0.28 − 8,400÷YTI)×TI	21%–28%

YTI is yearly taxable income, which is equal to TI − F. TI is taxable income. F is filing period (1, 2, 4, 12, 24, 26, 52 or 365 on yearly, semi-yearly, quarterly, monthly, semi-monthly, bi-weekly, weekly or daily basis). When F=1, YTI=TI for yearly withholding taxes and tax returns.

Besides a good business tax system, **individual income tax system simplification** is also important for businesses to reduce costs to do withholding taxes for their employees. Existing federal individual income tax system has 7 tax brackets, 224 (7×4×8) formulas, 21-page Withholding Tables, 28 taxable income ranges, and 12-page Tax Table. These formulas, tables, and rates are very complex. During the past 150 years, we have struggled about tax systems with different tax brackets (1–56), formulas (up to 224), and tables (A). There are two income tax calculation systems. One is for employers to calculate withholding taxes (E). Another is for people to do tax returns (F). Taxable income ranges, marginal and effective tax rates, and

tax numbers in the 21-page Withholding Tables, and 12-page Tax Table are often changed. When businesses do not need to use existing complex Withholding Tables and 224 formulas, then businesses (including manufacturers) and Internal Revenue Service (IRS) can save related time and costs.

We have done our federal individual income tax simplification (A and B). The 7–56 tax brackets can be matched and reduced to 3. The 21-page Withholding Tables and 224 formulas can be eliminated to simplify our federal tax system with simple two linear formulas and one existing formula by 98% (1–3⁄224) deduction. Detail explanation is available by our research paper (A), which may save more than $10 billion per year. Tax revenue can have almost no change. If you have any questions and comments, let me know. Thank you.

Website link:

A. *www.academicstar.us/UploadFile/Picture/2023-5/20235518550488.pdf*

B. *https://taxsimplecenter.net/publication.html* (tax simplification research)

C. *https://www.taxsimplecenter.net/businesstaxsimplification.html*

D. *https://www.pwc.com/us/en/services/tax/library/president-biden-fy2024-budget-renews-call-for-corporate-rate-increase.html*

E. *https://www.irs.gov/pub/irs-pdf/p15t.pdf*

F. *https://www.irs.gov/pub/irs-pdf/i1040gi.pdf*

G. *https://www.taxsimplecenter.net/uploads/8/3/3/9/83395216/wf_tax_bill_draft11.pdf*

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March 12, 2024

United States Senate
Committee on Finance
219 Dirksen Senate Office Building
Washington, DC 20510

To the Senate Committee on Finance,

I am writing to express my appreciation for the hearing held on the importance of U.S. manufacturing and the impacts of the tax code on its growth. As a small business owner, I support the statements made regarding returning the full expensing of Section 174 costs. I would like to share our experience as a small business and the extremely damaging effect Tax Section 174 had on the business in 2022.

The requirement for small businesses to amortize research and development (R&D) expenses over a five-year period instead of deducting them in the year they were incurred has forced us to take on unexpected and severe personal and business tax burdens that threaten our personal welfare as an LLC partnership and the viability of our small business.

Our small business is working to advance technologies that are part of the national space program through NASA and the National Science Foundation (NSF)'s SBIR programs as well as providing testing resources for a wide array of private space organizations, research institutes, government agencies, and universities. We most recently received an NSF Phase II SBIR grant to expand our capabilities for recreating the icy soils found in extreme locations like the lunar south pole where the congressionally supported Artemis missions will be exploring for water ice and other volatiles.

We are providing services to the government and closing strategic knowledge or technology gaps that have been identified as priorities by NASA and NSF. In return, our small business is being punished with unreasonable tax burdens. Most of the R&D funds counted as taxable income were used to pay our employees or buy supplies and materials from the vital vendors who make our grant work possible.

Due to these rules, we showed a 10-fold increase in our net income in 2022 compared to without this amortization rules. This resulted in us owing significantly more than anticipated in taxes, which was *more than double our actual profit.* Instead of showing positive cash flow in 2022, this lead to negative cash flow for our

business. As an LLC partnership, this extra tax payment fell to us as small business owners.

The snowball effect of these rules creates an added burden beyond just the extra taxes owed. Because the business showed an inflated net profit, it also inflated our income as the owners. One ramification has been tripled student loan payments as a result of being pushed into a higher income bracket.

These amortization rules strain all R&D businesses, but especially small businesses and their owners. As a small business, we do not have the ability to reallocate resources across departments to offset R&D "income." Performing R&D activities is becoming more of a liability than a benefit.

Many space companies playing a vital role in the burgeoning space economy are small businesses with an R&D focus. They are taking the United States to literal new heights and creating technologies that will revolutionize space and terrestrial industries. Policies that burden R&D activities will stifle innovation and harm businesses. Countries, like companies, that do not innovate will not be competitive.

Please urge congress to immediately correct this harmful tax section and allow the full deduction of R&D costs in the year that the costs are incurred. It is critical that this correction be made retroactively to 2022 when it took effect to reverse as many of the harmful and compounding consequences as possible. Please reach out with any questions.

Sincerely,

Melissa Roth and Vincent Roux
Co-Founders and Co-Owners

ONE VOICE FOR MANUFACTURING
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March 11, 2024

The Honorable Ron Wyden
Chairman
United States Senate
Committee on Finance
219 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Mike Crapo
Ranking Member
United States Senate
Committee on Finance
219 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Wyden and Ranking Member Crapo:

On behalf of One Voice, the joint effort between the National Tooling and Machining Association (NTMA) and the Precision Metalforming Association (PMA), and our nearly 3,000 metalworking member companies, thank you for your efforts to help support the growth of American manufacturing. The most efficient and effective way to generate growth among small businesses manufacturing in America is to pass the bipartisan Tax Relief for American Families and Workers Act of 2024, H.R. 7024.

Federal tax policy has a significant impact on our members' businesses. When a manufacturer has more resources available to reinvest back into the business, they will purchase more equipment, add more customers, and hire and train more employees. However, the loss of full expensing and the requirement to amortize R&D expenses have caused increased tax bills for small and medium-sized manufacturers, which many still struggle to cover. This drastic change in the tax treatment of small business investments in research and innovation reduces incentives to invest in R&D and reduces the cash flow of manufacturers making it harder to invest in and grow our businesses.

A recent NTMA/PMA survey conducted in January 2024, showed that taxes are the number one issue for One Voice members. Tax provisions such as R&D expensing, Bonus Depreciation, Section 163(j), Section 179, Section 199a and the estate tax have a significant impact on small and medium-sized manufacturers, like our members. The survey showed that due to the loss of full expensing of R&D, 33% of One Voice members had to reduce their R&D activities while 37% of members reduced their capital expenditures due to the drop to 80% expensing for Bonus Depreciation.

Our member companies rely on these vital tax provisions to help invest in their employees and facilities. The Senate should immediately pass the bipartisan Tax Relief

for American Families and Workers Act of 2024, H.R. 7024, as the most effective pathway to level the playing field for small manufacturers.

Thank you for your support on this issue and your efforts on behalf of the metalworking industry.

Sincerely,

David Klotz
PMA President

Roger Atkins
NTMA President

SMART MATERIAL SOLUTIONS, INC.
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Smart Material Solutions, Inc. is a small nanomanufacturing company with four full-time and four part-time employees in Raleigh, North Carolina. Our patented process, invented at North Carolina State University, enables industrial-scale manufacturing of nanopatterns that improve technologies ranging from solar panels to advanced camouflage. We have ongoing projects with the U.S. Army, NASA, and industrial partners on clean energy, infrared metamaterials, and dust-mitigating surfaces for Lunar applications.

As an early-stage company developing new technologies, we are particularly hard hit by the inability to expense research costs. Despite posting a $90,000 loss in 2022, our taxable profit was approximately $1 million because we could only deduct 10% of our 2022 research costs. As an S Corp owned by our employees, we had to pass this phantom profit through to our employees as personal income. Some of our employees were forced to pay more in taxes than their annual salaries—clearly a deterrent for working since we pay more in taxes than we earn every day we continue our otherwise successful business. This is not a great way to treat middle-class STEM entrepreneurs who thought starting a company, serving the national interest, and building the American manufacturing base might be more fulfilling than, for example, a career in big tech.

We—companies with fewer than 10 employees—spend an average of 43% of our revenue on research, making us particularly vulnerable if research costs cannot be expensed. We also lack the cash flow and savings of larger corporations, so it is much more difficult for us to pay large tax bills when we have little to no profit. We know we are not the intended target for taxation, and the tax revenue we generate is a tiny fraction of the current tax bill, since we constitute only 1% of U.S. research spending. However, small manufactures like us will be the collateral damage without swift action to pass the Tax Relief for American Families and Workers Act (H.R. 7024).

We hope the Senate Finance Committee understands the dire consequence of not *retroactively* restoring research expensing. From 1954 to 2021, American companies could expense research costs, encouraging development of new technologies and giving the United States its reputation for innovation. Both large corporations and small businesses were advised that congress would fix this harmful tax change due to its bipartisan support, so we continued doing business as if we could expense research costs. Unfortunately, in 2022 the rules changed to require amortization of research costs, risking both small businesses and American innovation. Restoring research expensing by passing H.R. 7024 *now* is vital to the survival of many small businesses, will help the United States keep up with countries like China (which allows companies to deduct 200% of their research costs), and will save an estimated 169,400 American jobs and $14.4 billion in American income per year according to a recent Earnst and Young study.

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March 12, 2024

Honorable Senator Wyden,

I want to express my appreciation for the hearing conducted to highlight the importance of U.S. manufacturing and how it can be impacted through the tax code. I want to highlight the importance of returning the full expensing of Section 174 costs (Research & Development costs).

Ms. Courtney Silver pointed out that the change in accounting treatment for these costs has strained cash flow. Strained cash flow is just the tip of the iceberg. I would like to add a real-life example of the truly catastrophic impact that capitalizing R&D expense is currently having on small businesses.

I have one small business client who contracts with NASA and NSF to provide research and development services to further their work. In 2022, they had a net income (*i.e.,* profit) of $17,200.

However, after their research and development costs were capitalized according to the existing tax law, they owed tax on $175,800 of income. This increased their tax bill by over $40,000—more than double their actual profit in their business.

These folks are working day in and day out to further the mission of the federal government through work for NASA and NSF and they are being punished for it through the current tax law.

This is just one of many similar stories. Crippling tax bills, people taking out loans just to pay their taxes—and all on phantom income because they cannot deduct their R&D expenses in the year they paid for them.

I am a CPA in Bellingham, WA. I work with local small business owners to help them with their tax planning and compliance. I was raised by small business owners, am a small business owner, and am passionate about serving small business owners. I believe small business is the backbone of our economy.

Unfortunately, we are seeing a very special group of small business owners being punished by the current tax law for doing exactly what is desired for our economy and country—research & development and manufacturing.

The Tax Cuts and Jobs Act instituted a new tax law that took effect 1/1/22. It required that all research and development costs be capitalized and deducted over a 5 year amortization period. This means that when businesses invest in research and development, they are not able to deduct those costs in the year they spend the funds. This is true even for normal business expenses like wages, supplies, insurance, and more.

The tax law allows for a federal tax credit for R&D activities. This could a valuable incentive to promote R&D activities to further our country's competitive positioning in the global economy. However, this tax credit is dwarfed by the tax impact of the current R&D cost capitalization and amortization rules.

In other words, the current capitalization rules create a much larger tax burden than the credit provides a benefit. It is very quickly turning off small businesses from having any motivation to engage in R&D activities.

I am writing to request that you prioritize the bipartisan discussion and successful solution of the Tax Relief for American Families and Workers Act. By doing so we can end this punishing tax law for businesses engaged in R&D and manufacturing activities and once again reinstate the support for these activities.

Sincerely,

B. Siobhan Q Murphy, CPA

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As the Committee on Finance explores the topic of federal tax incentives for U.S. manufacturing, the U.S. Tire Manufacturers Association (USTMA) respectfully submits for the record of the hearing background on the job creation, sustainability, and supply chain security benefits of federal incentives for retreading U.S. truck fleet tires.

BACKGROUND

The retreading of commercial truck tires is a prime example of the economic and environmental benefits of effective product recycling. Each retreaded tire creates and supports local jobs, reinforces U.S. supply chain security, and reduces energy consumption, carbon dioxide emissions, raw material use, and tire disposal challenges.

The U.S. Government has recognized the benefits of retreaded tires dating back to 1988, when the Environmental Protection Agency (EPA) issued guidelines for purchasing retreaded tires, with the purpose of "using the stimulus of government procurement to increase the use of retread tires within both the government and private sectors." Further, in 1991, the EPA recommended federal agencies "(1) obtain retreading services for their used tires and (2) purchase retread tires."

While this federal directive established a process for tire retreading and its benefits, over the last 25 years, commercial truck tire retreading has declined in the United States. Which this decline is attributed to the availability of cheap alternative tires, often sourced from China and elsewhere in Southeast Asia, which are 65% less likely to be retreaded because of their design and construction. In the last 20 years, the number of retread facilities in the United States has declined by 50% due to the rise in disposable truck tires.

There is an urgent need for the federal government to further incentivize the purchase of retreaded truck tires in the United States, to mitigate the economic, environmental and supply chain costs associated with the escalation of low-quality imports unfit for retreading. One viable incentive is a short-term tax credit for U.S. purchasers of retreaded truck tires which would reinforce jobs and the sustainability benefits of U.S. retreaded truck tires while protecting U.S. supply chains.

BENEFITS OF RETREADING TRUCK FLEET TIRES

- *Job Creation:* U.S. truck tire retreading operations occur principally through localized retreading workshops that replace the worn treads from the casings of truck tires with new tire treads. Approximately 500 domestic retreading workshops directly support over 51,000 jobs in the United States.
- *Sustainability:* Compared to new truck tires, retreaded truck tires utilize substantially less fuel and materials, significantly reduce emissions of carbon dioxide and other air pollutants, reduce water consumption and remove over a billion pounds of material from the waste stream each year. Specifically, retreaded truck tires:
    - Use 15 gallons less oil and 90 pounds less total material per tire.
    - Save the U.S. and Canada approximately 217 million gallons of oil each year.
    - Reduce CO_2 emissions by 24% annually.
    - Reduce annual water consumption by 19% and overall air pollution by 21%.
    - Remove 1.4 billion pounds of material per year from the waste stream.
- *Supply Chain Security:* Increasing demand for truck tires retreaded in the United States will reduce U.S. dependency on imported "disposable" truck tires. These cheaper truck tires, unfit for reuse, are often sourced from China and elsewhere in Southeast Asia via supply chains that are more volatile and government subsidized. Reversing current purchase and use trends will stabilize and protect supply chains for U.S. retreaded truck tires.

NEED FOR FEDERAL INCENTIVES FOR TRUCK TIRE RETREADING

In recent years, the United States has seen an increase in the use of cheaper, imported truck tires that cannot be retreaded and therefore *must be disposed of after a single use.* Between 2011 and 2022, these imports increased from 2 million to over 4 million tires, driven by falling imported tire prices incentivized by heavy foreign

government subsidies. As an example, imported tire prices dropped from $128 to $102 per tire over the same period.

Fortunately, some in Congress have recognized the threat these imported tires pose to American jobs, sustainability and supply chain objectives and are considering federal support to reverse imported truck tire purchasing trends. One such proposal, which would fall within Senate Finance Committee jurisdiction, would:

- Provide for three years a $30 per tire tax credit for the purchase of qualified retreaded truck tires; and
- Direct federal agencies to utilize retreaded tires within federal truck fleets when possible.

USTMA members including Bridgestone Americas, Continental Tire the Americas, The Goodyear Tire & Rubber Company, and Michelin North America support this initiative, as do leading U.S. commercial truck fleet operators. Organized labor unions also support these proposed incentives.

USTMA is the national trade association for tire manufacturers that produce tires in the U.S. With an annual economic footprint of $170.6 billion, U.S. tire manufacturing is a critical part of the American economy. USTMA's 12 member companies collectively operate 57 tire-related manufacturing facilities in 17 states. The industry directly supports more than 291,000 U.S. jobs in manufacturing, distribution and retailing across every congressional district in the country. The industry also supports more than 510,000 additional U.S. jobs in supplier and induced activities, totaling more than 801,000 jobs nationwide.

USTMA advances a sustainable tire manufacturing industry through thought leadership and a commitment to science-based public policy advocacy. USTMA members are committed to sustainable practices across our industry essential to the responsibility we share of helping achieve a more sustainable society. From engineering innovations that reduce CO_2 emissions to enhancing tire safety and performance, driving workplace safety progress, and preserving the environment through the lifecycle of a tire.

In recent months we have met with Senators Blackburn, Brown, Scott, and Warner of the Senate Finance Committee, and we appreciate their interest in this issue and are hopeful they will soon introduce legislation.

Thank you for the opportunity to submit this written statement for the record. We would be happy to provide additional information.

The State of Retread Tires in the United States & Canada

2024 Addendum to the 2018 Report

Overview

Led by Professor John Woodrooffe, the 2018 publication of *The State of Retread Tires in the United States and Canada: An Analysis of the Economic & Environmental Benefits for Fleet Operators and the United States Government* was the result of industry-wide coordination with business leaders, experts, and scholars from the Duke Center for Sustainability & Commerce, N.C. State Supply Chain Resource Cooperative, and the University of Michigan Transportation Research Initiative.

With an eye on economic, environmental, and national security risks and opportunities, the following addendum seeks to provide lawmakers with a snapshot of the state of the American tire retreading industry in 2024.

About the Author

JOHN WOODROOFFE

Mr. John Woodrooffe is a Research Scientist, Director of the Commercial Vehicle Research and Policy Program, and Head of Vehicle Safety Analytics at the University of Michigan Transportation Research Institute. He has over 30 years of experience in vehicle-related research and is an international expert in large vehicle transport safety, efficiency, vehicle productivity, and progressive regulatory issues.

Retread in Focus: The Facts

America Depends on Retread

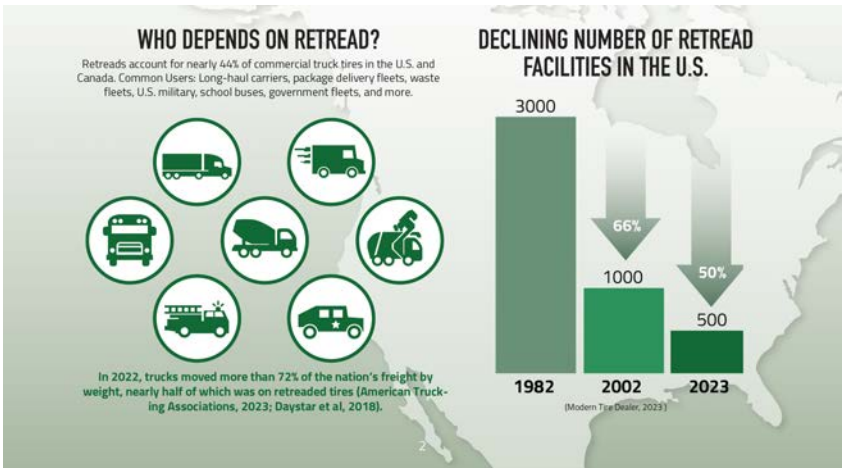
- Retread is the largest remanufacturing sector in the U.S., employing over 51,000 workers and supporting more than 268,000 jobs across the broader $28.4 billion U.S. tire industry (Daystar et al, 2018).
- Operating under franchise agreements with large tire companies (*e.g.,* Bridgestone, Continental, Goodyear, Michelin), retreads are a nearly 100% domestically produced product (with U.S. and foreign content) manufactured by small independent businesses, typically employing 10–60 workers.
- Approximately 15 million tires are retreaded annually in the U.S. (Modern Tire Dealer, 2023).
- U.S. truck and bus fleets are prolific users of retreads, retreading each tire 2–3 times on average.
- Nearly 90% of U.S. fleets with 100+ trucks rely on retreaded tires due to their financial, operational, and sustainability benefits (Daystar et al, 2018).
- Retreads are a vital economic and national security asset, helping keep America's trucks on the road during unprecedented supply chain and geopolitical disruptions.

Financial & Environmental Benefits of Retread

- Truck tires are commonly covered under a limited warranty and designed to be retreaded up to three times, extending a tire's life by 300% or more and keeping fleets on the road at a lower cost per mile. Bridge-stone, the largest producer and retreader of commercial tires in America, estimates that premium tires are retreaded an average of 2.1 times.
- Tires are the 3rd highest expenditure for fleets, behind people and fuel. Annually, retreading generates nearly $3 billion in cost savings.
- Retreading reduces energy use by 30%, and requires approximately 15 gallons less oil to produce one retread than manufacturing a new truck tire (NHTSA, 2008).
- A typical retread commercial tire saves (on average) 90–100 lbs. of material. Capable of being retreaded 3 times or more, a single premium tire can save upwards of 300 lbs. of materials versus non-retreadable tires.

The Threat of Low-Cost Imports to the U.S. Economy

- For every new premium tire sold in the U.S. and Canada, 1.1 retreads are produced, whereas less than 0.4 retreads are made for every new ultra-low-cost import (Day-star, 2018). The rise of ultra-low-cost tire imports has eroded the market and hastened the decline of the U.S. retread industry.
- The number of tire retreading facilities in the U.S. has dropped from over 3,000 in 1982 to an estimated 500 in 2023. The growth of low-cost import tires is accelerating this trend and increasing the likelihood of further plant closures (Modern Tire Dealer, 2023).
- Due to differences in quality, low-cost tire imports are often deemed unsuitable for retreading and, therefore, discarded after a single use. As they are typically not retreaded, low-cost imports account for a disproportionate share of the more than 270 million tires sent to U.S. scrap yards and landfills in 2021 (USTMA, 2022).



Retread Explained: Safety and Process

MODERN RETREADING includes a 10-step process* that requires multiple inspection points and highly automated advanced manufacturing technology.

1. INITIAL INSPECTION

The tire is visually examined using a 7-step rotation to fully analyze if the tire is capable of being retreaded and to identify if there are any repairs that are required.

2. ELECTRICAL INSPECTION

An electrical current is applied to the inner cavity of the tire. A sensor is used to detect any voltage that penetrates the tire, identifying penetrations that may be invisible to the naked eye.

3. SHEAROGRAPHY

In most modern retread facilities, a shearography machine is used to scan the tire from side to side. The machine generates detailed images that are used to identify any underlying damage.

4. BUFFING

The remaining tire tread is physically abraded to remove the rubber and to create a uniform surface upon which the retread will be applied.

5. SKIVING REPAIR

Repairs are made as needed, including to any damage uncovered during the buffing process.

6. APPLYING CUSHION

An extruder will apply a thin and uniform layer of specialized uncured rubber, called the cushion, over the crown of the casing. Once cured, this material is what secures the new tread to the casing.

7. BUILDING

During the "building" process the new tread is applied—most often by a computer-controlled machine—to the casing.

8. ENVELOPING

The tire and its new tread are encased in a flexible rubber envelope that will ensure uniform pressure across the surface of the tire, pressing the tread and casing together during the curing process.

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*Source: Bridgestone Bandag, LLC.

9. CURING

The tire tread is cured to the casing using a combination of temperature, pressure and time within a pressurized chamber.

10. FINAL INSPECTION

As a final check, the operator will examine the final product to ensure the quality of the retread. The operator will also verify that the customer specifications are met.

AS SAFE AND RELIABLE AS A NEW TIRE

*Leading manufacturers maintain the controls, licenses, and certifications (*e.g., *ISO 9001:2000) to help ensure the quality and safety of the retreading process and finished products. In addition, unlike new tires coming off the line that are subject only to visual inspection, retreads undergo rigorous visual and electronic analyses to ensure they adhere to strict standards. Studies conducted by the National Highway Transportation Safety Administration (NHTSA), the American Trucking Associations, and the states of Arizona and Virginia concluded that a well-maintained retreaded tireoffers equivalent reliability to a well-maintained new tire (Daystar et al, 2018).*

See State of Retread Tires in the United States and Canada 2018 page 11.

Stepping Up Quality and Safety: Innovation and Investment

Retread industry innovations enable fleet managers to follow their tires throughout the retreading process and equip them with data and insights to make more informed decisions. Most importantly, retread solutions ensure that the trucks and drivers who rely on retreaded tires operate safely and efficiently.

"In addition to advancing retreaded tire quality and safety, the retreading industry continues to explore and invest in automation and ergonomic manufacturing enhancements to improve worker health, safety, and productivity."

—Jason Roanhouse, Vice President of Operations, Bridgestone/Bandag

Retread's Value Proposition for America: Improved Security and Sustainability

The Economy

Directly employing 51,000+ workers and supporting more than 268,000 jobs across the broader tire industry, retreading is the largest remanufacturing sector in the U.S. In addition to its contribution to the American economy, retreading is a key differentiator for the premium domestic tire industry and a critical component of good fleet management; nearly 90% of fleets with more than 100 trucks across the U.S. and Canada run on retreaded tires because of their affordability and reliability.

"As a manageable and trackable asset, fleets invest in premium tires because they plan to extend and optimize via retreading. Lower-cost imports are typically used once and then discarded. Therefore, the retread and domestic tire industries should be seen as mutually reinforcing. When there is no way to get the tire retreaded, the odds of fleets investing in premium retreadable tires decrease dramatically."

—Executive, Pomp's Tire Service, Inc.

The Environment

In 2021, over 270 million tires were sent to U.S. scrap yards and landfills, many of which were low-cost, single-use imports (USTMA, 2022). Taking upwards of 50 to 80 years to decompose, once entering the waste stream, tires present a unique challenge with far-reaching environmental health and safety consequences.

As scrap tires break down, they release chemicals and heavy metals into the soil, polluting water sources and endangering nearby and downstream life. Incinerating tires releases hazardous compounds—gases, heavy metals, and oil. Notably, tackling intentional or uncontrolled tire fires is challenging, intensifying respiratory and environmental risks (U.S. EPA, 2016). Amid these issues, retreads show potential as a promising solution.

By reusing the existing casing and replacing only the worn-out tread rubber, retreading significantly reduces the amount of raw materials, energy, and emissions required. Commonly covered under a limited warranty and designed to be retreaded

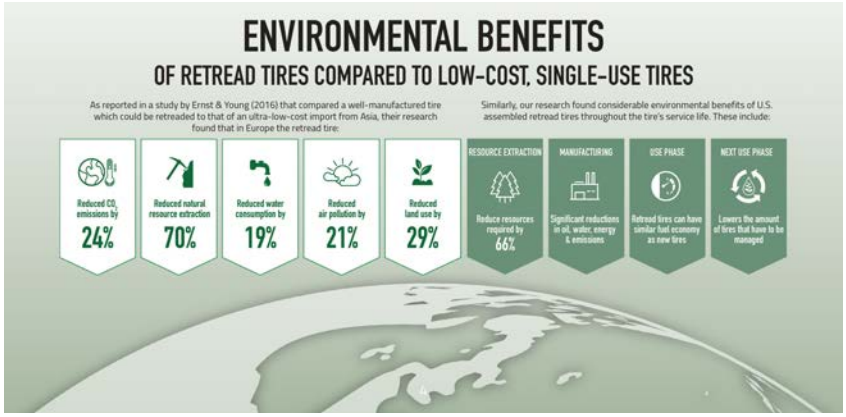
up to three times, retreading can extend a tire's life by 300% or more, helping keep tires out of the waste stream. With nearly half of all commercial trucks in the U.S. and Canada running on retreads, this translates to an estimated annual savings of 217.5 million gallons of oil and 1.4 billion pounds of waste (Bridgestone, 2018).

The retread industry is an excellent example of the circular economy in action, with most retreaders using recycled rubber and a growing number of facilities operating on solar power. In addition, as the largest remanufacturing sector in the US, the retread industry takes its role in environmental health and safety seriously, investing in research and innovation to eliminate the use of harmful chemicals and improve sourcing, manufacturing, use, and end-of-life.

With approximately 15 million commercial tires retreaded annually across the U.S., retreads are making a difference and proving its case as a safe, reliable, and more environmentally friendly alternative to lower-cost, single-use tire imports.

Opportunity to Tackle Waste and Improve Sustainability in Last Mile Delivery

Bridgestone estimates that last-mile delivery vehicles replace tires as often as every 3 to 4 months, meaning a single vehicle can use more than 30 sets of tires over its lifetime.* With less than 5% of last-mile delivery vehicles running on retreaded tires, the rapid electrification of LMD fleets, coupled with the burgeoning demand for LMD services, presents a tremendous opportunity for retread, a more environmentally friendly solution to the tire waste problem.



The Reality of Retread in 2023

Showing Weakness But Showcasing Value

Over the last 14 years, low-cost imports have grown at a staggering 7% compound annual growth rate (CAGR), surging to 11% between 2012 and 2022 (Panjiva, 2023). As retread industry strength is highly correlated to the volume and velocity of low-cost imports, this unprecedented growth has considerably impacted the demand for retreads, leading to a significant drop in U.S. retread manufacturing facilities from over 1,000 in 2002 to an estimated 500 in 2023 (Modern Tire Dealer, 2023).

Recent retread strength can be attributed to challenges faced by low-cost tire importers, namely tariffs imposed on Chinese truck and bus tires in 2019 and pandemic-induced supply chain disruptions in 2020 and 2021, reducing the flow, availability, and affordability of low-cost imports. Yet, amid these fluctuations, the proliferation of imported tire brands and the emergence of subsidiaries operating out of Thailand and Vietnam has created a new set of challenges for the industry in recent years.

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*Class 2–3 delivery vans. Per Bridgestone testing. Actual results may vary.

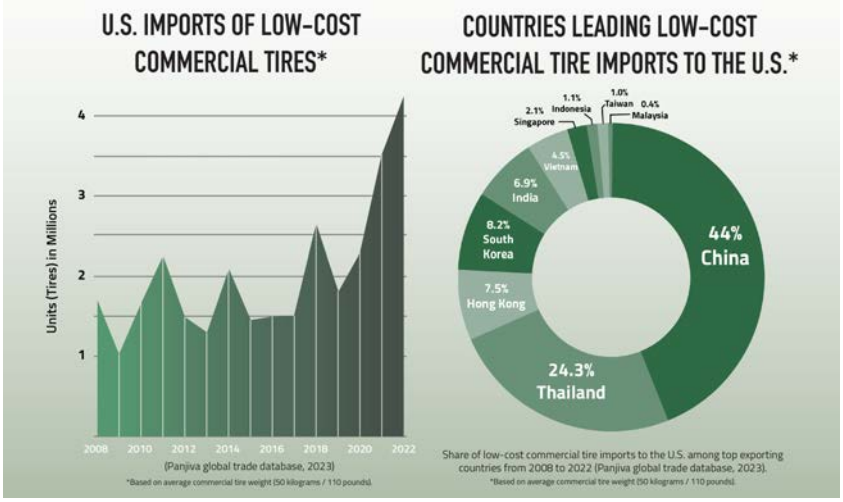
"It was simple—for several months, a significant portion of the market disappeared, and when domestic tire suppliers could not ramp up production quickly enough to keep up, retread was the only viable (and affordable) option. Were it not for retread shops, many trucks would have sat idle. It is time to include U.S. dependence on imported tires in the U.S. supply chain security discussion."

—Executive, Resley Tire Co. Inc.

Citing the rise of subsidiaries and the unprecedented flood of low-cost imports in 2021 and 2022 coupled with flat global demand, analysts forecast that market oversupply and exceptionally low pricing will accelerate retread's decline in 2024 and 2025.

These developments underscore the U.S. retread industry's challenges and the importance of legislation addressing the economic and environmental risks posed by low-cost tire imports.

Driven primarily by operators out of Southeast Asia, the post-COVID flood of low-cost tire imports to U.S. markets paved the way for 8 of the 10 largest exporting countries to post double-digit yearly increases in 2022 (Modern Tire Dealer, 2022; Tire Business, 2023).



In Support of Retread: A Call to Action

Important for the Economy, Environment, and National Security

Retreaded tires are a nearly 100% domestically produced product (with U.S. and foreign content) made by small businesses, collectively employing more than 51,000 workers. In use by almost half of all commercial trucks in the U.S. and Canada and credited with generating more than $3 billion in fleet cost savings and the avoidance of 1.4 billion lbs. of landfill waste annually, retreads are designed to be a safe, cost-effective, environmentally friendly, and sustainable choice to help keep fleets on the road, materials moving, and products affordable.

However, despite the economic and environmental benefits, over the last 20+ years, low-cost tire imports have eroded the share of retreaded tires and forced facilities to shutter, putting thousands of skilled laborers out of work.

Facing the combined pressures of increasing labor and energy costs with declining demand, retread business owners urge lawmakers to address the economic, environmental, and national security risks associated with America's increasing dependence on low-cost imports and ensure U.S. retread readiness in future crises.

Trouble Ahead: What You Need to Know

- Market Realities: Retread strength is highly correlated to the volume and velocity of low-cost imports, and their unprecedented growth has adversely impacted U.S. retread demand and manufacturing capacity.
- The Time to Act Is Now: Low-cost imports to the U.S. grew at a staggering 11% Compound Annual Growth Rate (CAGR) between 2012 and 2022. This unprecedented growth, coupled with the post-pandemic surge beginning in 2021, represents an existential threat that, if unaddressed, will have profound consequences for retreading in 2024 and beyond.

With the U.S. retread industry at risk, it is imperative that lawmakers support the industry with pro-retread policies, such as tax incentives for the purchase of retread tires. This measure will increase retread demand and protect American jobs and the environment.

The passage of this legislation will help secure U.S. supply chains, ensure economic stability, and preserve precious non-renewable natural resources.

References

Costello, B. (2023). Economics and industry data. American Trucking Associations. Retrieved June 25, 2023, from *https://www.trucking.org/economics-and-industry-data*.

Davis, B. (2022, April 11). Will commercial tire market growth peak in 2022? Tire Business, *https://www.tirebusiness.com/news/will-commercial-tire-market-growth-peak-2022*.

Davis, B. (2023, April 24). Special report: Commercial tire sector facing headwinds. Tire Business, *https://www.tirebusiness.com/news/commercial-tire-sector-facing-headwinds*.

Daystar, J., Golden, J., Handfield, R., & Woodrooffe, J. (2018). The State of Retread Tires in the United States and Canada: An Analysis of the Economic & Environmental Benefits for Fleet Operators and the United States Government. Bridgestone Bandag, Duke University, East Carolina University, North Carolina State University, University of Michigan, *https://www.bandag.com/content/dam/commercial/bandag/pdf/Retread-Tires-In-US-Canada-Report-Web-07-11-2018.pdf*.

Endeavor Business Media. (2023, January 29). MTD Facts Issue. Modern Tire Dealer, *https://issuu.com/10missionsmedia/docs/0123_digital_edition*.

Panjiva. (2023). U.S. Rubber Imports (TBR). U.S. Trade Intelligence. Retrieved October 6, 2023, from *https://panjiva.com*.

Tire Business. (2022, December 28). Bridgestone Bandag tire retread sales up in 2022, *https://www.tirebusiness.com/retreading/bridgestone-bandag-tire-retread-sales-2022*.

Tire Retread and Repair Information Bureau. (2022). A Look at the US Retread Industry and California Retread Contract, *https://bipaver.org/wp-content/uploads/2022/05/TRIB-A-look-at-the-US-retread-industry-and-california-retread-contract.pdf*.

Tire Retread and Repair Information Bureau. (n.d.). Featured Retreaders. Retrieved July 2, 2023, from *https://www.retread.org/featured-retreaders*.

U.S. Environmental Protection Agency. (2016, February 22). Wastes—Resource Conservation—Common Wastes & Materials—Scrap Tires. Archives, *https://archive.epa.gov/epawaste/conserve/materials/tires/web/html/basic.html*.

U.S. Tire Manufacturers Association. (2022, October 25). 2021 US Scrap Tire Management Summary, *https://www.ustires.org/sites/default/files/2022-10/21%20US%20Scrap%20Tire%20Management%20Report%20101722.pdf*.

Woodrooffe, J. F., Page, O., Blower, D., & Green, P. E. (2008). Commercial Medium Tire Debris Study (DOT HS 811 060). National Highway Traffic Safety Administration.

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On behalf of our 10,000+ employees, Vital & FHR North America LLC submits this statement with appreciation to Chairman Wyden, Ranking Member Crapo, and the other Members of the Senate Committee on Finance.

We are honored to present this statement for the hearing: "American Made: Growing U.S. Manufacturing Through the Tax Code." As a leading manufacturer of advanced materials and vacuum coating systems for a diverse range of applications including solar, fuel cells, display technologies, automotive, and more, we are deeply invested in the future of American manufacturing, particularly in the clean energy sector.

Our facility in Bowling Green, Ohio, is a testament to the power of innovation and partnership, supplying critical components to American made solid oxide fuel cells, a key technology in the clean energy landscape.

The Role of Tax Incentives in U.S. Clean Energy Leadership

Tax incentives and credits have been pivotal in establishing the United States as a leader in the clean energy sector. By all accounts, low-carbon energy sources have accounted for an increase in U.S. electricity generation over the past few years, with projections indicating significant growth as clean energy technologies become more prevalent. The investment tax credit (ITC) and production tax credit (PTC), for example, are spurring remarkable growth in fuel cell, solar and wind power capacity, largely driven by these policies.

In fuel cells alone, analyst projections show a tremendous increase in demand over the coming years. In one report released less than 2 months ago by Market.us, the global solid oxide fuel cell market size is expected to grow from $1.4 Billion in 2023 to $21.3 Billion by 2033, expanding at a compound annual growth rate (CAGR) of 31.3% during the forecast period from 2024 to 2033.

We believe the tax code is vital for helping position American manufacturers to capture most of this global market. Our competitors are actively working to lure investment, so the United States should respond accordingly.

Economic Impact and Job Creation

The clean energy sector is not only crucial for environmental sustainability but also for economic vitality and job creation. The Department of Energy estimates that clean energy tax incentives will create millions of American jobs over the next several years.

Unfortunately, according to the International Energy Agency, today the United States still lags behind other countries in many areas of clean energy manufacturing. However, in fuel cells the United States remains the world's leader in innovation and manufacturing employment. Our company employs hundreds of people who manufacture products for the domestic fuel cell industry.

Encouragingly, a McKinsey study found that by 2030 the broader fuel cell and hydrogen industry could support 700,000 American jobs. *To achieve these numbers, it is critical—for both fuel cell producers and their domestic suppliers like Vital & FHR—that S. 3027 be passed and the ITC for solid oxide fuel cells be extended.*

The Case for Sustained Support

To maintain American momentum and leadership, it is critical that we sustain and expand clean energy tax credits, including the ITC for fuel cells. These policies not only incentivize the adoption and production of clean energy but also support the entire supply chain, including manufacturers like Vital & FHR. They are essential for ensuring that the U.S. remains at the forefront of the global transition to a clean energy economy, driving innovation, creating jobs, and promoting sustainable growth.

In conclusion, the extension and expansion of clean energy tax incentives represent a strategic investment in America's economic and environmental future. By supporting these policies, we can continue to lead in the development and manufacturing of clean energy technologies, create high-quality American jobs, and compete effectively in the global market.

We appreciate the Committee's consideration of our perspective and stand ready to contribute to the development of policies that will ensure the continued growth and success of the U.S. manufacturing sector and the clean energy industry.

Thank you for the opportunity to participate in this important discussion.