



## **A Time To Choose: How The U.S. And Allies Can Maintain Semiconductor Leadership**

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**TRANSCRIPT**

### **Featured Participants:**

**Admiral Dennis C. Blair**, Chairman, SAFE, Former Director of National Intelligence & Commander, U.S. Pacific Command

**The Hon. Wang Mei-hua**, Minister of Economic Affairs, Government of Taiwan

**Michael Splinter**, Chairman, U.S. – Taiwan Business Council and Chairman, Nasdaq, Inc.

**Senator John Cornyn**, United States Senator for Texas

**Jeffrey Jeb Nadaner**, Executive Vice President, SAFE, Government & Public Affairs

**Jon Hoganson**, Corporate Vice President of Government Relations, AMD

**W. Patrick Wilson**, Vice President of Government Affairs, MediaTek

**Senator Byron Dorgan (D-ND) (Ret.)**, former Chair of the Appropriations Committee

**James Rowland**, Director of International Government Relations, Ford Motor Company

**Robbie Diamond**, Founder, President and CEO, SAFE

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## **Dennis Blair:**

Good morning, everyone. I'm Dennis Blair, chairman of the board of SAFE and a member of the SAFE's Energy Security Leadership Council. It's my pleasure to welcome you to this webinar on the United States and allies maintaining semiconductor leadership. Our mission at SAFE is American national security and economic security.

The United States is the most powerful country in the world and the largest economy, but in key areas, the important sectors of energy, transportation, and manufacturing, we have developed serious dependencies on foreign countries that are hostile to our values, and do not share our interests. At SAFE, we do the economic, geopolitical, technical, business, and domestic political analysis to understand these dependencies, and then we find ways to eliminate or minimize them and educate both our government leaders and the public and advocate action to improve the American position.

Among the serious American vulnerabilities for which SAFE has proposed action are areas such as the dependence of our transportation sector on petroleum, the dependence of our growing electric vehicle industry on batteries, and the dependence of key future materials on rare earth metals.

In all these sectors, American and other international companies for very good business reasons have thinned and spread their supply chains around the world for more efficiency, but the net effect has been to create fragile dependencies that have the potential to undermine American economic and national security. This morning, our focus is on one such area, semiconductors, or chips as they are more colloquially named.

They are little computers that are in everything from the toys our kids play with up, to the most advanced quantum computers that are being built and conceived for the future. The fragility of the supply chain for chips has been brought into focus for Americans in recent months with delays in auto production due to shortages of chips. Although this is not a 1967 OPEC oil embargo moment, the events of recent months certainly should be a wake-up call to us to look more closely at and build greater resilience into our semiconductor supply chains, both for economic reasons and for national security reasons.

These semiconductor global supply chains and there are different supply chains for different kinds of chips, are complex, worldwide, and often thin and tight, and need to be beefed up. Geopolitics comes into play because chip supply chains run through China, which has both some of the manufacturing and is the largest market today for semiconductors. And they run through Taiwan, where most of the most advanced semiconductor fabs or fabrication plants are located. As a former commander in chief of the US Pacific Command, I have worked very closely with Taiwan for many years on both its defense capability and its economic well-being.

Taiwan is only 70 miles from China and it claims Taiwan as one of its provinces. For decades it has pressured Taiwan with every tool in its arsenal to bend to China's wishes. And the United States for its part is committed to ensuring a peaceful future for Taiwan and we both assist Taiwan and deploy our own military forces to make Chinese military aggression very high risk and dangerous, which is what it is today. But these military measures are not just for their own

sake, they have a purpose, to allow the free flow of international investment and trade. That flow has been the key factor in the astonishing prosperity which has come to the countries of East Asia in recent decades, including to China.

For our first panel today, we have two real authorities to discuss the U.S.-Taiwan relationship and what that means in terms of semiconductors and economic relations. The first is Mike Splinter, who is the chairman of the U.S.-Taiwan Business Council. He will be joined by Minister Wang Mei-hua, the Minister of Economic Affairs of Taiwan. For our second panel, we will widen our aperture to discuss the full range of semiconductor supply chains that run through the United States and on which we depend. The various links of those chains, which are located here in the United States, and those that are abroad, both those that run with our friends, and allies on whom we can count, and those that run with more questionable countries and our enemies who actively would use them against us.

Our objective for this conference is to understand what the U.S. must do to maintain its economic future in its own hands and to prevent the growth of dangerous vulnerabilities which our enemies can use against us, both against our economic security and against our national security. Let me turn it over to Mike Splinter.

**Michael Splinter:**

Thank you, Admiral Blair. It's a pleasure to be here this morning, and I am very fortunate to have with me, Minister Wang Mei-hua. I'll ask you a few questions and give you a chance to make some introductory remarks. I think everyone here understands the central role of Taiwan and the semiconductor industry. It's certainly come to light in these last 18 months as chip supplies and the supply chain has become more visible, because of shortages in many different industries, most notably in the auto industry. Today we are going to discuss those issues.

Minister Wang, Taiwan has had tremendous success in building a semiconductor industry over the last 40 years. That success has brought the semiconductor industry in Taiwan to the forefront of economic and political discussions; many concerns have been raised about this situation. How do you see the future of U.S.-Taiwan technology? How can Taiwan effectively utilize this centrality of the semiconductor industry for greater economic influence in the global economy?

**Wang Mei-hua:**

Thank you very much. Good morning, everyone. Taiwan-U.S. technology cooperation goes beyond the semiconductor industry, the Taiwan-U.S. technological cooperation in the ICT (Information and Communications Technology) industry is worth mentioning here. Over the last 30 years, Taiwan's ICT industry has had close cooperation with U.S. companies extending from the OEM (Original Equipment Manufacturer) to the ODM (Original Design Manufacturer) in the process of manufacturing personal computers, notebooks, and smartphones. Both sides have created a very solid and trusting partnership. And because of these strong partnerships, for example, HP and Dell have set up the laptop and server R&D center and Intel has also set up its laptop and 5G R&D center in Taiwan.

This highlights Taiwan as the first choice for U.S. technological cooperation. I think innovation has always been in Taiwan's DNA because we know that as a small country, we cannot compete

with the world without continuous innovation and progress. Based on such a good cooperative relationship, we can continue to create more cooperation areas in, for example, EV and 5G. Due to the rise of EVs, electric vehicles, Taiwan's strength in the ICT and semiconductor industry has made us a competitive partner.

We have abundant manufacturing and R&D capabilities in key electric systems, including electronic controls, motors, smart driver assistance systems, and the internet for vehicles. We have become a supply chain partner of Tesla, GM, Fiat Chrysler Automobile, and many other U.S. automakers. Regarding 5G, based on the future development trend of the 5G networks, Taiwan has already cooperated with the major U.S. Netcom companies such as Cisco. The U.S. and Taiwan can cooperate on a common cybersecurity standard to facilitate future 5G developments.

**Michael Splinter:**

Innovation takes many different parties, it takes trust among them, and it should also be noted how complex the semiconductor supply chain is. How do you see the future of U.S.-Taiwan technology cooperation evolving? More specifically, does it need to be all about semiconductors? Could it be significantly broader and deeper? In your opinion, maybe what are we getting right in this relationship, and what needs to be improved?

**Wang Mei-hua:**

I just mentioned how we can explore cooperation in EVs, 5G, and semiconductors. The combined semiconductor ICT and Taiwan's excellence in manufacturing. In these areas, we can continue our good cooperation.

**Michael Splinter:**

Certainly, during the last several years, the relationship between Taiwan and China has been changing. It's been quite dynamic. So what challenges is Taiwan experiencing in its economic relationship with China, and particularly in the technology supply chain? And if you could expand on what role U.S. sanctions are having in this arena?

**Wang Mei-hua:**

Yes, China is still Taiwan's largest export market so many people think that Taiwan relies on the Chinese market. However, Taiwanese OEM companies have set up the production base in China upon the request of the U.S. big brand companies. For example, Apple is the largest customer of Taiwan's semiconductor industry. TSMC is responsible for the manufacture of key chips to Apple, which is then sent to China for the assembly of the smartphone. Of course, Foxconn is the assembly company for Apple and is facing the U.S.-China trade friction.

So the Taiwanese companies have been moving part of their production base, either back to Taiwan or Southeast Asia and India from China. Our government has also been assisting businesses in diversifying their production base to reduce the risk of excessive concentration of their trade and investments. Taiwanese companies set up the (China) alternative production base in response to the U.S. companies' requests. Concerning the U.S. sanction measures, Taiwanese

semiconductor companies purchase equipment and key materials from the U.S. They are quite familiar with U.S. regulations and will certainly comply with the regulation.

We look forward to more extensive, smooth, and transparent communication with the U.S. so we can avoid a scenario that could catch our businesses off guard.

**Michael Splinter:**

That's great. Thank you so much. A topic that I've been especially interested in is a bilateral trade agreement. How does the U.S.-Taiwan semiconductor partnership strengthen the potential for a comprehensive bilateral trade agreement? What other steps are needed to make progress? you have a big influential audience here today. What would you say to them to help move this process along?

**Wang Mei-hua:**

In terms of the advanced semiconductor, the U.S. is TSMC's largest customer, accounting for 80% of their advanced semiconductor production. Semiconductor-related products enjoy zero tariffs under the WTO ITA agreements. As a result, even if the Taiwan-U.S. bilateral trade agreement is not concluded, the related trade will not be affected. The Taiwan-US industrial cooperation is broad, extending from semiconductors to 5G, AI, EV, and many traditional industries.

Consequently, some materials and components, and equipment involved in these fields are still subject to tariffs. Therefore, a role in these tariff barriers will enhance supply chain cooperation between industries in Taiwan and U.S. Hence, a Taiwan-U.S. bilateral trade agreement (BTA) would be a simple solution to this problem. A Taiwan-U.S. BTA could ensure a more stable investment environment and trade protection for our respective industries. You can further strengthen important rules for the development of the semiconductor ICT and 5G industry such as IP protection of trade secrets and other policies.

We understand that the Biden administration prioritizes domestic issues and it has not given the green light to negotiate trade agreements with partners. Therefore, we can gather support for a bottom up approach from our respective industry to demonstrate the demand for Taiwan-U.S. BTA. This will help to promote Taiwan-U.S. BTA. And that's why gaining support from participants today is very important. So we need your support, thank you.

**Michael Splinter:**

Thank you, Minister. We really enjoy your insights and certainly wish Taiwan continued economic success and a relationship continuing to broaden between the U.S. and Taiwan. I'm sure all the companies in Taiwan and the semiconductor industry are expanding capacity and working hard to alleviate the shortages that we've seen here in the last year. So again, thank you for your time. Thank you for your insights.

**Wang Mei-hua:**

Thank you. Thank you very much.

**Michael Splinter:**

Thank you. And back to you, Admiral Blair.

**Dennis Blair:**

Our next segment is a video message from Senator John Cornyn of Texas to be followed by our wider panel to discuss all aspects of the semiconductor supply chain.

**John Cornyn:**

Hi, I'm Texas Senator, John Cornyn. First I want to thank Admiral Blair and SAFE Commanding Heights for using today's discussion to shine a light on semiconductors and their importance to our national security and economic prosperity. As you all know, there's a clear and urgent need to reorient the way our country views and responds to manufacturing challenges from China. That's why I introduced my Chips for America Act with my friend Virginia Senator Mark Warner to ramp up semiconductor production here at home.

If you tried to make any big-ticket purchases recently, you know the kind of strain our supply chains are under and I'm hopeful that this law will help turn the tide. But the Chips Act is just one solution. I'm optimistic that with some of our brightest minds in attendance today, we'll see no shortage of other solutions to this pressing issue. Thanks for allowing me to join you and enjoy the rest of your event.

**Jeb Nadaner:**

I'm Jeb Nadaner, I'm the executive director of Commanding Heights at SAFE. Our focus is on advancing industrial capacity in high-tech supply chains, particularly related to transportation and energy for the U.S. and its allies. Those supply chains include batteries and semiconductors, of course. I want to thank Mike Splinter and I want to thank Minister Wang and Admiral Blair for an excellent discussion on the geopolitical and geo-economic aspects of this subject.

Right now, you heard Senator Cornyn's remarks. Senator Cornyn is a leader who reaches out across the aisle. He and Senator Warner, Senator Cotton, Rubio, and Senator Reid last year came together in the Senate along with house leaders, such as Adam Smith to pass what became known as the Chips legislation, a really remarkable bipartisan action. Every stripe and every faction within each of the parties came together. It's not something one hears the news about, but it did show a focus and an understanding that we live in a society that is a semiconductor civilization.

Semiconductors used to be largely things in computers. We depended on computers, you had large computers, and then eventually we all had our laptops. But today, semiconductors are in literally everything; they're in our cars, we all walk around with semiconductors with an iPhone all the time. The mind machine meld has already happened; they are in our refrigerators and microwaves. Our 21st-century civilization could not exist without the flow of semiconductors.

Today, we've got an excellent panel to do a dive into: what is the nature of semiconductors? Where do we get them from? What's the nature of the supply chains? And where are we going?

And what are some of the implications for US national security and our economic prosperity? So I'm pleased following Senator Cornyn's framing remarks to introduce our panel. On our panel today, we have from a leading design company AMD, John Hoganson. From another leading design company, which almost all of us have used their products over the last two decades, Media Tech's, Patrick Wilson. And then we have James Rowland from the Ford Motor Company, which has been at the leading edge for several decades in integrating semiconductors and has very important efforts underway for the future.

We also have Senator Byron Dorgan, retired, former chairman of the Senate Appropriations Committee, someone who's written, at least five books, several bestsellers, an extremely thoughtful national security figure, a Democrat from North Dakota, someone that has worked extensively across the aisle, and is part of our efforts here at SAFE on semiconductors. So I welcome each of the members of the panel and thank you for joining. I'm going to start with a very basic question and anyone can pick it up, but where do semiconductors come from?

**Jonathan Hoganson:**

Sure, I'll jump in. Thanks for having me here today. Semiconductors, in the simplest sense, come from sand. They've gone from this relatively simple substance to something incredibly complex, which is ubiquitous, as you say. We like to say that anything with an on-off switch is probably a semiconductor and it's even gone beyond that. We start to think about the technology and where it is.

There are three major steps to semiconductor production, which anybody can create, design, and build. So the first part is the research, the engineering that goes into making the chip, and the design space, which is where companies like AMD and Media Tech thrive. And it's an opportunity to take that research and put it into a useful product of the design. Then there's the manufacturing step, this is the fab side of things, which is we're manufacturing the wafer itself. These are the discs that are cut into chips overall, and then they're put into some sort of useful packaging.

There are different companies that specialize in different areas. But that's sort of the larger ecosystem: create, design, and build overall. We manufacture some semiconductors here in the U.S. All the leading-edge manufacturing, unfortunately, happens overseas at this point. In countries like Taiwan, Singapore, and increasingly, in places like China where we're seeing more and more manufacturing overall. The U.S. was a leader in manufacturing and now accounts for about 12% of the overall batch of semiconductors.

The U.S. has a large market share, about 50% of the overall, but it's not manufacturing today. So the question of where they come from, it's really a global industry. It's that ecosystem across the board. But increasingly, the supply into the U.S., at least, is coming from overseas.

**Patrick Wilson:**

Thank you, John, for that good introduction about the actual mechanics of the global supply chain and all the different inputs and intervention places. Jeb, the real answer to your question is that semiconductors are really engineers' effort to eliminate a tedious task. You look about the last 100 years, there were data entry clerks, hundreds of them, rooms full of them, just entering

numbers into ledgers. The idea of semiconductors was to create a code, a fast machine-readable code that could simplify really complicated, tedious tasks. And that's exactly what we see today is that engineers are using technology, semiconductor technology, to solve very complicated tasks and to make them simpler.

We see that the very highest expression of that today is in artificial intelligence, which is really the same sort of automation that we've been seeing over the entire industrial revolution, where you reduce the number of human interventions necessary. That's what a semiconductor chip does, it makes complicated tasks simpler. And then there's the physical part of it, where you create the device that does that.

**Byron Dorgan:**

Jeb, let me just make a couple of comments about this issue of the supply chain. First of all, concerning the who, the where, the what does it mean? The who is here in the United States. I visited Intel many years ago and heard exactly what they were doing: the invention, the capability, the design, the innovation of chips comes from the United States, but it is moved with respect to the development of a supply chain, elsewhere. I wrote a book, *Take This Job and Ship It*.

And so supply chains used to be, it was fairly new. The questions about supply chains: what does it mean to us? What does it mean to our security? We've just been through COVID and all of a sudden everybody in the country, I think i probably much of the world, understands the issue of supply chains as a result of COVID with masks, gowns, gloves, and so on. The supply chain with respect to semiconductors is very different in the sense that the question is, what does it mean to a country if you're not able to access the supplies that are being produced somewhere, and then shipped to you?

When we talk about supply chains, that doesn't mean that, for example, in China, or somewhere else, that's where all the suppliers are, it just means that that's where it's going to be produced, and has to do with cost and price. And so that's the development of these things. The CHIPS Act, Jeff, you were very involved in, I know, the CHIPS Act has been passed and now it's waiting for appropriations from Congress.

We'll see what all that means, but I think that it has the capability of substantially changing opportunities for the production of semiconductors here in the United States.

**Jeb Nadaner:**

I'd like to raise the issue of what is the CHIPS Act? Why is it important? And what are its prospects? We'll turn to Jonathan Hoganson from AMD.

**Jonathan Hoganson:**

The CHIPS Act was an effort to deal with the cost disparities between manufacturing in the U.S. and overseas. A couple of studies have been done and they've shown that the cost differential can be as much as 30% to manufacture in the U.S. as opposed to some of the other countries. There

are a number of reasons for that, there's a sort of deterioration of the ecosystem here around chip-building.

The CHIPS Act was meant to reinvigorate that and investment in manufacturing, and to some degree in research as well. It was part of the grant program that was created and attached to the National Defense Authorization Act. Overall, it was bipartisan legislation that passed overwhelmingly. Senator Dorgan pointed out it is awaiting funding by Congress at this point. The Senate, as part of the Competition Bill, allocated a little over \$53 billion in emergency funding as part of that. It passed a bipartisan majority of the 68 votes in late May.

Including for our friends at Ford Motor Company, making sure there is a focus on the automotive side as well. So in addition to leading-edge manufacturing, also focus on some of the legacy pieces, which is a big part of the chips crisis. It's awaiting action in the house at this point.

**Jeb Nadaner:**

I would like to turn to James Rowland from the Ford Motor Company on what's important about the CHIPS Act for a great American company. I have a few artifacts here, this is an advertisement from 1983 that shows the focus on semiconductor integration in vehicles. Ford has been a leader in this for a very long time. James, could you tell us what's at stake, not only for semiconductor production in the United States, but also the key product companies like Ford with the CHIPS Act?

**James Rowland**

Thanks, Jeb. I'd be remiss to start without thanking everybody on this panel, Admiral Blair, Robbie, and Jeb. Everybody on the panel here has been working to mitigate the impacts. At Ford, we're the largest assembler of vehicles in the United States, this has been devastating, and we're not through it. I just want to level set, the trend is not our friend. What I mean by that is while we've been managing as best we can, we're short parts and we're not building the parts and the vehicles that we need to build.

Jeb to your point, I wanted to provide that context that coming out of COVID, when we were down in the U.S. industry, about two million vehicles, the risk is that in the United States, we will not be able to build two million vehicles this year due to the shortage of those chips. To add some context, that's the equivalent of about eight assembly plants. Nobody would have signed up to say well I'll idle eight assembly plants. Those plants, of course, are spread across all the manufacturers and different shifts and whatnot.

We really appreciate you and want to give a full-throated thank you to everybody here who's working on this. We're not through it yet, and it's a big impact to the U.S. economy and the auto production that drives a lot of that. The CHIPS Act is critically important. We recognize that the global constraints are impacting a lot of companies, including the auto sector. And we also recognize the underlying, as the admiral pointed out in his opening, the importance of securing supply chains for the United States, and that includes reshoring, or adding the capacity to the United States.

Ford has been advocating for the CHIPS Act. As you correctly pointed out, we did add a request that some of the funds be allocated to those companies, who also will serve the production of the auto sector. So we're in this. As the largest assembler of vehicles in the United States, we think it's critically important this supply chain and administration's approach to securing supply chains in the United States is critically important. And we're fully supportive.

**Jeb Nadaner:**

Thank you James. I'd like to turn to Senator Dorgan and get his assessment, looking at the crystal ball, what are the prospects for the CHIPS Act and the FABS Act right now in the Congress in this extraordinary time?

**Byron Dorgan:**

Well, I think it will get done but I think there will be substantial appropriations. I think it'll get done because it's bipartisan. What has happened here in the Congress is there is this unbelievable focus, first on infrastructure, and then second on reconciliation, especially by the Democrats, and Democrats of course, control the House and the Senate. What has happened more recently, with respect to the supply chain issues, I think Jim talked about. There's (up to) 1000 chips in a car, I read recently. That's unbelievable.

This is about national security and it's also about economic security, both of which combined on this issue of semiconductors.

**Jeb Nadaner:**

Thank you, sir. Thank you for your assessment. A follow up question on the CHIPS Act I'd like to pose to Patrick Wilson is, since it's likely to get passed, what's the preparation that U.S. government departments and agencies should start doing now so they can implement when they get the funding and deal with this crisis?

**Patrick Wilson:**

Well, thanks Jeb and I'm excited actually to hear the senator's assessment that he thinks that this will get done this year. There is a lot of pressure on the budgetary process and trying to do something we shouldn't miss. This is an extraordinary change in U.S. policy to have a new federal grant program. And it goes to the point, Jeb, you were making about getting ready for it because never in our nation's history has there been such a complement to an economic development policy, like every state has.

Talk to any governor, or any politician that's been a governor, and they'll understand that states have economic development officers that do nothing but talk to international companies like ours, or companies like John's or Ford, and try to entice them to come to their state, that they've never had a federal partner before and so this is really a brand new task for the Commerce Department. The good news is they don't have to start from zero, right? Because they already have these incredible partners in the state economic development officers who already understand how do you vet projects? How do you rank them? How do you assess ones that are successful or likely to be successful from others?

And that's exactly what the Commerce Department and its new institutions they're building are going to have to create. How do you assess potential investment projects, whether they're in research or design or in manufacturing, which is so important. How do you assess what federal money should be coupled with state and local incentives to make a project happen? I know that Secretary Raimondo is already at work building some of this infrastructure inside the Commerce Department since the bill is already authorized. But of course, they can't take action until it's fully funded, and that's what folks like John and myself and James and others are all working on is to get that funding approved.

Something you said earlier, Jeb, comes back as a national security issue too, is we have to remember that our close allies are also not standing still, right? Everyone of our close allies, Japan, Korea, Taiwan, and the EU, they are also building simultaneously their own semiconductor incentive programs that are making their way through their respective legislatures. And that global competition for where capital will be invested is real and intense.

And if you're wondering, well, how does this make it into the top level of priorities for Congress? That's the reason, because it is about where capital will be deployed. I think it will be deployed in the places that are most advantageous. And the US government has to get in this game, because we at this point, are the only OECD country with existing semiconductor capacity that doesn't have a federal incentive program. So I think the pressure is just continuing to mount on the U.S. to get in the game and to help steer a lot of that capital that's being accumulated by this huge chip surge we're living through to get it deployed in the United States.

**Jeb Nadaner:**

Thank you Patrick, Jon, I'd like you to follow up because I know you've got a number of thoughts on this.

**Jonathan Hoganson:**

Yeah, thank you. I'd like to add I think that, we need to be thinking about the whole ecosystem. The CHIPS Act is a great step forward. It's really focused on manufacturing and like I said in the beginning, we're really focused on those three aspects that create, design, build of the semiconductor process. The reason that it's cheaper to manufacture in Taiwan or South Korea is part of location, but also because they're very good at what they do. It's been a twenty-plus year investment or longer to build that ecosystem around semiconductor manufacturing in those places.

The U.S. is under invested and we need to think about the CHIPS Act as the start of that. So when you think about implementation, we're hopeful that the administration and Congress will be thinking about this as the first step in building up that larger ecosystem. We need to be investing, not just in manufacturing, but also in the research side of things, the workforce components of this, and developing the next generation of technologies to maintain that leadership by onshoring a lot of this by building out that ecosystem.

Ultimately, those costs will come down and the U.S. can continue to maintain its leadership position overall. So it's really about building the entire ecosystem. Here in the U.S., CHIPS is a

great step forward in terms of manufacturing, but we need to be thinking longer-term and really thinking about it a longer stretch.

**Jeb Nadaner:**

Thank you, John. A way that I think about it is a little chart that we use. [Holds up Chart] In the upper left, you've got the issue of design companies like AMD, MediaTek, Marvel, Qualcomm, Excel, and in the upper right, you got fabrication, Intel, TSMC, Samsung and then in the lower center, you've got the companies that do the productization and integration. This is the companies like Ford, the companies like a Reva that build out our infrastructure and that all leads to the products.

So essentially, this triangle, This is an ecosystem that's got many dimensions, many aspects of supply chains. It's global. We would like to see more of it in the U.S. and allies. We don't want to see it all go to China. But it's also very intricate and it also it's powered by people at the end of the day, like where is the talent? Where is all the tradecraft resident? So, following up on the nature of the ecosystem and what the CHIPS Act can do to level the playing field. I want to ask James Rowland from Ford, what can we expect? What's the new frontier with cars? What can we expect over the next five or even 20 years? What is a vehicle going be like with all these semiconductors?

**James Rowland:**

Well, if you Google the future of the auto industry, Ford is there, but all the manufacturer there with really exciting developments. We talked about the billions of dollars to the race to electrify our fleet. But parallel to that is, AI and assisted driving to fully autonomous driving. All of that will be chip rich products and modules and it's going to provide the type of connection for consumers that we come to experience with our phones for example, when you get in a car. So all of that infotainment and increased reliance on electrification and automation drive a huge demand for chips and new innovative type of chip engineering in our vehicles.

That's the most exciting part of the work that's ongoing right now and we're also managing through this bit of a storm right now of trying build the vehicles we're trying to get out the door right now, which is a constraint for us. The future is bright and that points to again the conversation you had about economic security and domestic, shoring up our domestic supply chains for this work in the United States. I'll add one point that wasn't made by Patrick or Jon was, part of the CHIPS Act needs to be targeted to those companies that already are manufacturing in the United States.

There's a sense that the CHIPS Act will have a lot of Greenfield projects, it will, but we know for a fact that there's a lot of good companies out there that need to retool and they should be provided access to these incentives. Those are critically important, to your point, Jeb, earlier which is, anchoring those companies that are already here and doing a great job including for the auto industry.

**Jeb Nadaner:**

Thank you. We have Senator Dorgan back and, question I want to pose to him is, what is the national and economic security interest that we see between semiconductors at one level upstream, but downstream all these other industries in the United States that depend on semiconductors?

**Byron Dorgan:**

Well, obviously the economic issue and the national security issue that Dennis, James and others have talked about is so critical, and so important. The issue of where these things are made, when they're made, how they're made, how soon can you begin to ramp up manufacturing and so on. There's been a lot of discussion about that and not necessarily a significant agreement. I'd be curious as we about this as well, will this issue of semiconductor shortages, will it finally get through 2022 and perhaps be in our past? Or is it going to stretch into all of 2022? Is it going to stretch into 2022 and beyond?

My understanding about this is it takes a great deal of time, to produce a manufacturing plant that is significant and of consequence so we're not going to be able to see this resolved quickly. Even as we start talking about what is the economic security when you can't build automobiles? Or you can't find the semiconductors for the products that use telephones or laptops or you name it? The national security side is that, we need chips in fighter jets, we need chips in military equipment as well. So there is an economic and a international security interest that demands, literally demands our country to do something and that's what the CHIPS Act is designed to do.

It will. I should go back again and say, I believe it will get funded. Authorized and funded, but these things in most cases now become part of omnibus packages at the end of the year to provide funding right at the end of the year for the following years. It's the wrong way to do business, but unfortunately it's the way the Congress has begun doing business for the past decade.

**Jeb Nadaner:**

Patrick from MediaTek. Do you have some comments on the issue of how quickly do you develop capacity to meet a shortage? What can be done in reality?

**Patrick Wilson:**

Well, I mean I would correct one thing you said Jeb, which is we're living in a shortage and with apologies to Jim and Ford, yes there are shortages. But what we have to think about is, this is the greatest demand surge in human history for technology. It isn't that we have a limited supply, it's that companies are producing 50% more than they did last year and last year was the greatest year in the history of the semiconductor industry. So it's an incredible demand surge. Everybody getting online for school, everybody getting online for work, everywhere in the world, at the same time. It's really an extraordinary period. So there was undoubtedly going to be stresses in our supply chain because of this incredible growth.

Particularly, Jeb to your question about, what about the manufacturing or about capacity, for fabless companies like Jon's and mine, we're some of the largest fabless companies in the world, we care about that overall global picture of what manufacturing capacity is available. We use

Global Foundries, we use TSMC, we partner with these manufacturers and as they add factories and it takes us, as Senator Dorgan said, three or four years to bring on new capacity to respond to demand. It's really a challenge to see these surges in demand, and to get that capacity online.

There are no factories, no chip fabs really anywhere in the world that have spare capacity, they're working 24 hours a day at 95 or 98 percent capacity. That's just a reflection again, of that huge surge in demand. One of the things also that Senator Dorgan said that I think is important for us to remember is that from a national security perspective, our government, and their customers like DOD, they ride on the innovation that comes from the private sector.

Yes, we care about the F-35 and it's important, but those are not leading-edge chips. Those are mostly, maybe four or five-year-old chips. The cutting-edge chips are in commercial products and so, DOD really cares about where their next generation is going to come from. And that's the advice I give to every single, political official, any policy person is, anytime someone comes to you and pitches an idea, whether it's the CHIPS Act, or anything really, you have to ask yourself, will whatever you're asking for, is it going to make it more likely that innovation will happen here versus somewhere else?

And everybody has a favored policy, whatever it is. I wish politicians would ask, does that make it more likely innovation will happen here versus somewhere else that's more competitive? That applies on tax policy, regulatory policy, incentives like we're talking about from the CHIPS Act. It's really a binary choice. Where will innovation happen? Because rest assured really great companies, they're going to serve their customer. Count on it, count on them serving their customer. The only question for policy makers is from where will they serve their customer?

**Byron Dorgan:**

Can I just add one point quickly and that is China has the 23 year plan with respect to semiconductors. It's also the case I would say, Patrick that in China, the state-owned enterprises, SOEs, those SOEs are putting massive quantities of investment and money into these issues. And so we have companies competing against a country with state-owned enterprises. That is not the kind of competition most people believe represents fair competition. So you're correct that there are a lot of things that make a determination of where something is produced, but what is happening in China between now and 2030 with state-owned enterprises is quite remarkable and quite serious.

**Patrick Wilson:**

Yeah, I think that's a good point.

**James Rowland:**

Jeb, wanted to jump in. Just building on Patrick and Jon's point and also senator, to address your forecast, what we are stepping into now is the tension, or the present and the future. We've got to have one foot in the present and one in the future. The challenge we've got to level set is that in September, HIS, who tracks global production forecast, downgraded the global production forecast by another five million units for 2021, taking the risk to U.S. production up to about two million.

To the senator's question, they also didn't see a relief for auto production until the second half of 2023. I get the point that Patrick's making and we appreciate all the efforts, but something doesn't add up when we see the abundant flow through the supply chains and we are seeing some of that, but in critical parts, some of the legacy nodes, for example, the modules we've tested and used for years, we are not able to source those components.

I wanted to point to something else that the government is doing, why we applaud and fully supported the CHIPS Act, the secretary of commerce has launched request for information to gather those inputs both from the demand and the supply from the US industry to understand what the demand is, what we'd like to be building, and where that's coming from. We're fully supportive of this. This is a transparency initiative that we hope will shed some light on some of the constraints that we've got, because commerce is also focused on the here and the now. We are facing, if the risk of IHS plays out and we have a two million vehicle constraint for 2021, that's equivalent about eight assembly plant worth of output.

That's the here impact. That's the now impact to the U.S. economy in the sector that generates about 3% to GDP. So, there's a tension here. We fully support the future, but we have to have one eye on the here and the now. And if we're not going to be able to produce the vehicles that we've got schedule up until maybe the second half of 23, that's an impact to the economy that we can't ignore. I just wanted to make that point.

**Jeb Nadaner:**

I would just like to add, my own experience in industry on the product side, aerospace and defense, sometimes the legacy nodes, these are the older nodes, sometimes 10, 20, 30 plus years, the technology level, it's still amazing technology. It's enough to power a Boeing jet or to put a person on the moon. But a lot of the legacy foundries, one of the problems is they're smaller, because they're smaller, they don't have scale. They're costly to run. Sometimes they don't attract the talent that a massive foundry in Arizona that is producing exponentially more chips at the leading edge draws.

So the legacy foundries they're a real challenge in the country and sometimes we've not found the business model that quite makes it work as it should for a lot of industry, which is using a lot of those legacy nodes and really the government and U.S. military systems.

**James Rowland:**

And just to add to that, those legacy nodes often are the ones that have the durability and the safety testing that is required by law and the U.S. auto industry. I got your point, but there's sometimes is a reason why they're legacy they've had longer development time to be safety tested to meet U.S. safety laws. So that's one of the tensions here is those legacy components, to your point, I know Patrick's nodding and we've had this other conversation that they work really well, and we can't move off of those on a dime. We need some room to maneuver.

As you pointed out in those pictures, we can absolutely engineer and we are leading in the engineering for the development of the auto industry, but we can't be handcuffed and cripple the U.S. economy when we can't get those parts that we were asked to durability and safety test. So

there's a tension here, and I think that's one of the points that policy makers have to balance. There's the here and the future and we're trying to do both.

**Patrick Wilson:**

Jeb, I was going to say too, you think about companies like Ford Motor Company in the middle of the pandemic. I was in the Office of Secretary of Commerce and I feel for them. Jeb, there was a time that we were threatening to close them make ventilators. We were literally using the power of the government to close those factories. They canceled orders and got out of the queue as well and that really impacted the auto sector in a unique way because of a government intervention, but also its just hard to anticipate what consumer demand was going to change. Also to James point, I think about, the legacy chips.

Please don't forget in this, Jon mentioned this before, but if you came away from today's panel and didn't hear this again, I really think, listeners would be cheated and that is workforce is everything. All our companies in the semiconductor industry, we care about research and development. Ford cares about R&D because that makes engineers. If America doesn't produce more engineers, we are not going to be the focus, the sight of innovation. It all comes down to that. Those men and women who pursue scientific endeavor as a career, we all work for them. If as a policy, we don't support the development of those engineers, we're not going to be able to serve our customers from the U.S.

**Jonathan Hoganson:**

Hey, Jeb, if I could just in one last point here. This started around a conversation of the economic impact of semiconductors. Some folks making a state connection here, some people have noted that semiconductors are the new oil. I don't know if I'd go that far, but certainly they're strategically very important and they're economically very important. I think the U.S. is just starting, lawmakers and others, are just starting to wake up to the importance of this. It's an incredibly complex supply chain, incredibly complex thing to manufacture.

We're literally manipulating electrons and atoms and everything when we're making our products at the end of the day. There's a lot of work that needs to be happening here, but I think it all starts with these conversations and it's really a positive conversation to be able to have this and figure out what we need. We have a short-term problem in how we deal with the acute shortage of the auto sector and other areas, but it is a longer term problem of how we maintain the ecosystem around here so we can maintain US leadership going forward.

So I think this is exactly the right conversation. It's how do we make sure we keep this competitiveness going forward? In many ways, people didn't understand how important they were. In our pre-conversation, Patrick was talking about, we've been doing this a long time. We could light ourselves on fire, talking about semiconductors, and no one would notice 10 years ago. Now we're the hottest thing in town, if not globally. It's kind of cool. There's a lot of work that needs to happen here and that we need to focus.

**James Rowland:**

I would echo that John. I think this is a kudos to Robbie and the admiral for convening this panel. This is an important conversation how we manage this and kudos also to AIT in Taipei, the American Institute there, and Minister Wang and representative Chao here in DC who have been instrumental in that communication flow. I applaud SAFE for having the minister on this morning. We would definitely support future conversation like this and this is critically important. Again, the balance of the excitement of the future, but the constraints of the now. Those are the types of things that we know we can put our heads together and solve this. So we just need to have more of these conversations.

**Jeb Nadaner:**

Thank you.

**Patrick Wilson:**

You have to feel for members of Congress who are fighting out these priorities. Where to make room for this in the middle of these big fights on Capitol Hill right now about what the nation's priorities are. While we're giving thanks, we should certainly not forget, Congresswoman Doris Matsui and Congressman Mike McCall, our two really tireless house champions who are in there fighting it out, saying, "Yeah, we care about reconciliation. Yes, we care about infrastructure, but we have to keep a focus on winning this semiconductor fight." I know, we're all very grateful for the work that they have done to keep this on the radar of their colleagues.

**Jeb Nadaner:**

Thank you. I think this will be the first of several conversations we're going to have on semiconductors and microelectronics, because there are several important dimensions is the issue of, for say very important US military systems and critical infrastructure of the government, the difference in commercial and government practices. So we're going to do several of these over the next few months. I also want to note, we have a question from a Princeton University workshop that is doing a report for the Department of Commerce on the resilience of U.S. domestic semiconductor supply chains.

I'd like to pose it to our panelists and I think this is an important one, especially since we talk about, U.S. and allied capacity. And a lot of these allied companies I want to note, they've got production right here in the U.S. It's absolutely vital, cutting-edge, employing thousands of Americans. It's really wonderful cooperation. So the allied portions are important. I want to pose the question from the Princeton University workshop. What does the U.S. need to do to strengthen cooperation with our allies in the semiconductor supply chain and what's the right balance to be looking for in terms of, increasing domestic capacity and the use of these allied companies?

**Patrick Wilson:**

Well, I guess I'll jump in representing a company headquartered in a closely allied U.S. country, partner. So MediaTek is headquartered in Taiwan where right next door to TSMC, our manufacturing partner in Shinju, in Taiwan. But what I'll tell you is that first of all I'm doing something unusual. I'm a republican guy from the Trump Administration, but I'm going to

compliment the new administration. Actually, they have continued the policies we built around technology in a lot of good ways, but the important thing is they've put semiconductors on the multilateral discussion list.

We just had a great quad conversation. We had bilaterals with Korea, and with Japan. And semiconductors weren't just item number 11 on the list because we have lots of security challenges, lots of areas to cooperate, but semiconductors was placed, really the issue of semiconductor cooperation was really moved up to the top four or five national security issues. And I think that's really good news. Again, for close allies like Taiwan and our partners in Korea, Japan, and Europe, that's just a great thing that our diplomats are being empowered to raise semiconductor cooperation at that highest level, which is a good sign.

This is me sort of freelancing here, but I will say that you also have to get a really close alignment from our allies on why this is important, the urgency of having a uniform system that we all agree to because going it alone, the U.S. just trying to unilaterally control innovation it's just not possible, and it's not fruitful. It really disrupts the market. And we didn't talk about that on this call, but hopefully on a subsequent call, we can talk about it is that when government wades into these complicated supply chains, sometimes they can inadvertently make things worse rather than better.

And coordination across our allies to get a regulatory environment that is uniform, is focused on the right things. That is a really important part of reducing supply chain uncertainty, reducing capital uncertainty. Again, where are you going to deploy capital? Getting a uniform regulatory environment is really important to that and that's worthy of a whole seminar in of itself, but I'm glad to hear that that group at Princeton is focused that because getting everybody on the same page, all our close allies is an important priority. And it does look like this administration has made that a priority.

**Jeb Nadaner:**

Thank you.

**Byron Dorgan:**

Jeb, let me just say that this is a disruption. We have a panel discussion because of what I think is a very significant disruption and the question for every country, including especially ours in the United States is what does this mean for us? What does it mean in terms of our economic growth, both our national security and our economic security. And that's why I think in public policy, it's important for Congress to take a grip and look at all of this and decide what is it that we can do to respond to this disruption? Because the disruption now exists. And as James has indicated, will probably exist through all of next year and maybe beyond.

I think public policy here is very important. I think the commerce secretary and others reaching out to our allies is very, very important as well. And the issue of supply chain in this case is very, very important. It's not a supply chain like someone producing toothpicks or ear swabs. I mean, this is really important to our country's future and so we need to get this right.

**Jeb Nadaner:**

Thank you very much, Senator Dorgan. I think well said. I want to thank each of our panelists, Senator Dorgan, John Hoganson from AMD, James Roland from Ford, and Patrick Wilson from MediaTek. Really this has been a tremendous discussion. This will be the first of several that we do, and we've hit on a lot of subjects domestic and international. They're really vital to American prosperity and that of our allies. With that I'd like to now turn to SAFE CEO, Robbie Diamond.

**Robbie Diamond:**

Well, thank you so much, Jeb, and thanks to everyone who participated from Admiral Blair to the Minister, Mike Splinter, the panelists you all just saw and thanks to the staff who put this together. I would like to close by putting it into a little more context of the organization. SAFE in 2004 when we were founded really as Admiral Blair said, focused on oil and how we had this dependence on oil and couldn't live by our values of every major military issue. In the recent past or global war on terror, two hot wars, every major recession being preceded by an oil price spike and that we needed to do something about it.

So we brought together former four star admirals in generals and CEOs from major companies who could have advocate for how do we produce what we need in America with high environmental standards, use it as efficiently as possible and ultimately diversify to electric and other types of vehicles. But really at the core of our mission was how do we live up to our values? How do we make sure that supply constrains don't force us and force our hand in ways that we wouldn't want.

And really the expansion of SAFE in many ways to some of these questions is not a change of what we're doing, but rather the changing nature of technology, but getting to the core of what we wanted to do initially. When we're thinking about this, I like to now shorthand say, if it's in the F-35 and it's in a car, we should be for it. We should care about it, whether that be the minerals, as you heard from Admiral Blair, the batteries, semiconductors, or the aluminum, et cetera.

And yes, there'll be more advanced chips and less advanced chips, but in the end of the day, we need chips. It was said that they are the new oil. Others have said that they're the new bread basket of Rome. Paul Kennedy, the historian, and that if why did Rome fall, they'd lost their bread basket. And we can't do that. What's been so striking to me as we've been working on this, is really how it's not just about innovation, but innovation happens with manufacturing. And so you innovate where you build and these two things do need to come together at some point. We need to care about not only that we've got the most innovative chips, but also that we do build some of our chips, not just ourselves, but as we heard with Taiwan and our allies.

And I do think this ecosystem, and it's been a fundamental change. Jeb said that we'll be doing more of these. It's true. We are going to start a semiconductor center at SAFE. We've just started a critical mineral strategy center that has a tremendous amount of support at the moment. We have a private donor who would like to do the same with semiconductors, and we bring this unique voice. We're not just with think tank, but we care about the thoughtful work, but we also bring the greatest advocates to the table who aren't being paid to do this it's because they really care about our country, our values and our allies.

So we look forward to working with everyone on this call who participated in the panel, and hopefully people who are listening and allied countries around the world who want to make sure we have the appropriate ecosystem to keep the semiconductor supply chain flowing like oil. I mean, it's incredible that our cars had to stop because we didn't have the oil and now our cars are not going to be built because we don't have the semiconductors. And to me, that is why we're so passionate about not just this area, but also batteries and other minerals.

So thank you everyone for participating. It is the beginning of the CHIPS Act, and you're figuring out how to use the CHIPS Act money, first we got to get the money. And then ultimately this conversation is going to go on for a very long time and bringing both the military needs, but also the industry needs, and our commercial needs together is really going to put the United States and our allies in a strong position. So with that, I will end and go out there, call your Congress person, especially in the house and tell them that they need to add the CHIPS Act to whatever they get the get past this year. Thank you so much, everyone.