U.S. Senator Maria Cantwell

Speech on the Senate Floor on *The Endless Frontier Act*

6:04 PM ET, May 27, 2021

CANTWELL: Mr. President, I come to follow my colleague from Texas to talk about the very issue that he brought up, which is where is America going with semiconductor manufacturing, design, and development. And on this last point, I'm pretty sure we see things differently. I'm pretty sure that the majority or probably all of the Democrats will be enthusiastic about supporting both manufacturing in the United States, as well as making sure that if federal dollars are used, prevailing wage should be applied. So, I'm sure we'll differ on that point.

But I think that we are, at least on our side of the aisle, supportive of this concept that chip fabrication, chip manufacturing in the United States of America is an important sector and that we're facing a chip shortage and that we should do something about it. If you think about it, semiconductors are like the oil of the 21st century. They have become an essential aspect. They can be found in children's toys, in appliances, in computers, in cell phones, our telecommunications networks, advanced national security technology, as my colleague was mentioning. They enable health care, artificial intelligence applications, financial services, certainly in the area of defense. They have transformed how we communicate, how we learn, how we socialize, and yet they are so complex, the manufacturing so expensive, it can cost anywhere from $5 billion to almost $20 billion -- I think $20 billion is one number I have heard -- just to build these facilities. This is why this issue has become so important.

The United States has had strong leadership in the semiconductor area but massive investment from other nations puts us at a disadvantage when it comes to manufacturing. They are subsidizing and getting tax benefits up to 40% to build in Korea than in the United States of America. So, the endless frontiers act tries to address that because it really is a national security and telecommunications policy. In the 1990's, the U.S. produced over 37% of the global chip supply. As you know, here in the United States, we have 48% of the world's aircraft production, but now these challenges as we look at the chip supply, they are down to 12%.

So I noticed in "The Wall Street journal," they said why do we care? They basically are saying that chips in fabrication have become a commodity and that we don't have to worry about it anymore. As long as we're winning on the design side, we don't care where it's manufactured. Well, if you ask me, that's so 1980's.

The idea that you could design a product here and then have it manufactured somewhere else. I mean, maybe that works with shoes or outdoor clothing, but it doesn't work with something as sophisticated, changing as a high-tech innovation product like semiconductors. In fact, I would say, you know, if you really think that that thinking is the type of thinking that works, look at what happened -- it's really pre-COVID thinking. I mean, we thought we could have the design done here and basically some of these devices that we use here like ventilators, and we'll just produce them overseas. What could possibly go wrong? Well, we figured out what could go

wrong. If we're not manufacturing ventilators here in the United States, something could go wrong, and it did.

So the question is what's going to go wrong if we don't manufacture chips in the United States of America? So the thing I don't think that the Wall Street Journal quite got right is that they don't understand that in today's innovation cycle, having a cluster of design, of manufacturing, of supply chain, of customers, of everybody working together is the new way to have an economic advantage.

In fact, a recent study done by a Chicago research organization -- I'm going to read from this report -- basically it's all about clusters and why clusters are so important. Quote: "An industrial cluster is a group of firms, stakeholders, supportive institutions that gain productive advantage from being geographically close to each other and related economies of scale." It continues by saying, "As groups and related industries grow and develop, clustering helps lower business costs, increase the extent of benefits of specialization, deeper labor pools, better access to customers, suppliers, knowledge spills over. These and other advantages derive from an environment where balance, competition, and collaboration…"

I could go on and I will submit it for the record. That is what is happening with semiconductors. The Asian market is basically now become the epicenter for this level of production, and the question is are we just going to forgo that and end up basically -- with not 12% of market share here but 6% of market share. And then, our suppliers are going to continue to go where the investments and the energy and the ideas are. So, that is why in the United States of America, where we still have clusters in various parts of the United States -- my colleague from Texas knows this well because he has a cluster in Texas. My colleague from Oregon who was out here earlier, he knows because they have a cluster there. There are clusters in places like Arizona. So this is about whether the United States of America is going to continue to make this investment ourselves.

Chips are essential to our national security and to telecommunications. In 1990, we produced over 37% of global chip supply. We need to continue to make sure that we are going to be an investor in chip fabrication today. Today, as I said, we're at an inflection point because of what's happening on a global basis. But according to Goldman Sachs, 69 industries in the U.S. have products with embedded semiconductors, and there will be a 20% shortfall of components needed for those products.

Last month, Caterpillar, headquartered in Illinois, said it anticipated chip shortage impairing its ability to meet growing demand of construction and mining equipment. So, we're not just talking about kids' gaming consoles or computers, we are talking about many sectors of our economy that depend on this. National security experts agree that if there were a greater trade war or military conflict, the United States would not be able to fill its demand for chips for national security and critical infrastructure. So, that means people like car manufacturers and appliances, you think about 5G and new technology, the post-pandemic economy won't be able to keep moving forward.

The shortage also forced the auto sector to cut 27,000 jobs in April alone. Earlier this year, General Motors temporarily shut down three North American plants due to the shortage. Ford cut back Michigan production of F-150's and the popular Explorer and Dodge is reducing workers' schedules in a Nevada plant producing Jeep Grand Cherokee and Dodge Durango.

So these are having real-life impacts on us today. The question is, we had a ripple of this just because of COVID. What if we had a ripple of this because somebody decided not to supply things to us? And these are things that we have to worry about just from a national security perspective. You have to worry whether we are going to get a supply chain that we can depend on. So we really are at an inflection point. We're at an inflection point where we need to do something about this sector.

So one of the issues, the chip fabrication and private R&D, they make huge investments. What we're talking about here represents a very small R&D investment partnership with the private sector as it relates to this. But what we are talking about is trying to get more manufacturing jobs here in the United States.

So my colleague was just discussing this sector overall, and one of the things that people should think about, and I'm pretty sure people at home won't be able to see this, but these jobs in production and in various aspects of design and various, even on some of the other aspects, even in management, computer, these are all well-paying jobs. These are jobs that literally are the types of jobs we want to be producing in the United States. I heard this story about Idaho Micron, a big company that used to be major in chip fabrication. But the number of jobs in Boise, Idaho, has fallen off, probably in the thousands, because this production has gone to other places. And now we're replacing them with call center jobs. So the question is whether we're going to make this investment in a key technology critical to our national security, critical to a lot of applications of the technology future, whether it's 5G or AI, or various things, and whether we're going to be a competitor in this area of a supply chain and cluster that continues to innovate.

Well, we know for a fact that semiconductor jobs in the production area are literally $94,000 a year. That's why we're fighting for this, because it's a sector in just the production end that are high-paying jobs. So we're going to spend time letting things go overseas and basically, okay, will allow us to have call centers, or are we going to fight for these high-paying jobs in the semiconductor space that we know will help us maintain our expertise and skill in the United States?

So I ask my colleagues to just think about the fact that this notion that we design something here and we ship it overseas for cheap production, does not fit this bill. That is not what we need to do to maintain a competitiveness in the information age on something as important as semiconductors. I think our history is rich with people like Thomas Edison and the Edison Park in what we established in New Jersey, or Menlo Park, or now what exists in Seattle, or various places. People get that innovation happens in clusters. So if we're going to innovate, we have to make sure the United States is attracting this investment. We have to make sure that we are doing this here on our shores with the expertise and support.

Now a lot of my colleagues might say, well, you know what, let's just have the private sector do this R&D. As I said, the private sector spends a lot on R&D. In fact, we think about $377 billion a year the private sector spends on R&D. But as we know, R&D isn't just done by the private sector for their specific interests. Basic science, advanced research, and applied science is done by the United States. That's why this bill is plussing up this number here from the National Science Foundation. We had discussions here about plussing up the number from the Department of Energy. Obviously, we had a vote in the Senate even increasing the Defense Advanced Research Program Agency and their dollars. So what works about the United States of America is that we're an ecosystem. We're not top-down. It's not like we basically are the government saying this is what's going to be done. We create an ecosystem that's really based on American know-how, our ingenuity, and how to get things done. And what we're asking for as it relates to not only NSF funding to continue the work of R&D as it relates to semiconductors, but also to make sure that we're going to continue the focus of manufacturing and design, and R&D, and development, and clustering, and supply chain, and companies working together.

I know how important this is because in the Seattle area, in Washington State, we are a leader in aerospace technology. We're 49% in the United States of aerospace manufacturing. If you don't keep manufacturing, do you think the supply chain would stay in Seattle? Do you think the supply chain would stay there in Seattle forever, all those companies? We have hundreds of companies that make product for Boeing. Do you think they would stay there if they weren't there? They will end up moving where the manufacturing is.

That is what the information age is about, and it's certainly about that when it comes to technology products. The technology products are developed faster, quicker, with the innovation and the input from their customers. That's why if you look at these centers around the United States, they are also the places where you will find the biggest users of this technology. They're there and they're there because they want to be close to their customers. They want to understand their customer needs. They want to have interaction. They want to have collaboration. And that is what innovation is today. Innovation is doing design and manufacturing close together. That is how we win. And that is why we need to pass this legislation as it relates to an investment in chip design and manufacturing R&D, and to continue to attract manufacturing in the United States.

Now back to my colleague from Texas who I know agrees with this principle in an underlying way, when the federal government wants to make an investment in actual construction, we say that we should apply prevailing wage. And I've talked to many of these people in the semiconductor manufacturing design space. They say do you see how expensive it is to do these plants? Do you see how expensive the equipment is? It's very expensive. So we need the best workforce. So guess what? We pay prevailing wage. So we're saying because we are putting federal dollars on the table, we should pay prevailing wage. They think we should also pay prevailing wage. I'm not speaking for them, but in general, they feel like that is when they get their best product.

So I ask our colleagues, because I'm sure I know where my side of the aisle is, we're going to be here to make an investment in this particular sector. We are going to figure out how to be competitive against Asia in semiconductor manufacturing. We are going to continue, as Andy

Grove said, to be paranoid because we know that this is a changing landscape. And we are going to follow our colleagues who made these decisions and make an investment for the future.

So I ask our colleagues to turn down the motion to strike the underlying bill. The underlying bill already has this provision in it. To turn that down and let's get about this business of budget point of order, waiving it, and deciding to make the investment that we need to make to be competitive in a key sector of the U.S. Economy. And if we do that, I guarantee you, we will be well positioned to continue to move forward and our national security will be more secure because we've made this decision. I thank the President, and I yield the floor.

U.S. Senator Maria Cantwell

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9:58 PM ET, May 27, 2021

CANTWELL: Madam President, I wanted to commend and thank the Senator from Mississippi for his hard work. I have the great pleasure of working with him on the Commerce Committee, and I can tell you we are here tonight not at this very moment at 10:00, but the advent of getting to this moment where we can proceed on such important legislation, thanks to him and his great work as the ranking member on the Commerce Committee. So I want to personally thank him for that, because I think the Senator described the actual process pretty well. We have two colleagues who had a lot of foresight and thought about this issue. Senator Schumer, who for a long time has discussed America's competitiveness and what we need to do about it, particularly as it relates to shifting change and demographics on a lot of foreign policy issues, and our colleague from Indiana who has also in the last two years put a lot of work into thinking about the future of AI, competitiveness, manufacturing, and what we need to do to be competitive in the United States of America.

So the Schumer-Young proposal is not new to this Congress, it was proposed before. So this has worked for many, many months. I do think as Senator Wicker stated we should thank them for their foresight. I think depending on what part of America you're from you have a perspective about the economy of the future. For me, I'm very blessed to represent the State of Washington with much innovation and really a long time work to get to the point where we are today. I guess that's one thing I would like to depart, that we didn't get to the Northwest economy overnight. A lot of thought went into the education system, the workforce training issues. Sometimes I just say we're blessed to have people there who stayed and innovated with the companies that they innovated in. And where we are today represents decades and decades of work.

But it also gives you a little bit of foresight into the importance of research and development. The University of Washington being a leader in research and development with NSF, with predecessors here in the Senate who, Warren Magnuson, specifically focusing on both NIH and NSF Dollars, and a size of an institution with 40,000 students, but also a premier research institution. So that has given us a good footing for the future, the work that they've done, and the advent of Microsoft and so many companies with executives who then also put more into the

University of Washington so we could grow our skill-set and keep investing. It's a long-term investment.

Our colleague from Indiana and our colleague from New York basically challenged us to think about what is that R&D investment for the United States of America, and are we competing? Senator Wicker knows this is something the Commerce Committee twice before it considered, in 2007 and 2010. We said by God, we're going to double the R&D budget and we're going to compete. Believe it or not, it was George Bush. George Bush as President first said America needs to have a more aggressive competitiveness policy, probably looking to Asia and seeing what was happening, and saying we need to do more.

The advent of that is we started down the right road. We tried to make a commitment. We didn't completely follow through because of the downturn of the economy and so instead of doubling that R&D budget in a short period of time, five to seven years, and then we thought 11 years. Well, it's turned into like 22 years and we really haven't quite done the job. So our two colleagues, I thank them. I thank the Senator from Indiana, and I certainly thank the Senator from New York because I think without his continued heft behind this issue, saying that it's a priority, I told him he must have read Andy Grow's book, *Only The Paranoid Survive*, because he clearly has adopted that attitude as it relates to America's competitiveness and making sure that we make investments in the semiconductor area, an area he knows well, that he really does believe needs the R&D investment and focus.

I applaud him because without his major push, I don't think we would be here on the Senate floor tonight. So as my colleague, Senator Wicker, said this bill includes a massive investment in the NSF budget and in a DOE budget, which is kind of tandem. That's what happened every time we've had this discussion. NSF and DOE, the Department of Energy, and the National Science Foundation, have been our key tools for research and development in key areas that keep manufacturing competitive, keep our energy sector competitive, keep our technology competitive. So it's been major investments. The challenge that we faced is that we also were asking ourselves besides trying to double our investment in these areas, we also said we want to get more out of the investment we have today. We want to basically get more out of the technology that we're creating and get it translated into more innovation right away.

So this legislation does that by creating a new tech directorate at the National Science Foundation to, if you will, we have basic research, applied research, to have translational research to more quickly aid in the adoption of technologies that will help our economy grow. That was a pretty big step in the legislation. And of course Senator Wicker and I believe that investing in the workforce we need with STEM education was also a priority, so a pretty big boost in science, technology, engineering and math in this underlying bill, including, saying women and minorities in the sciences have to be a priority and we have to do more to encourage that.

But I want to thank Senator Wicker especially for his insistence on a key provision that I think is also important. Part of this is saying we need to be competitive and increase the R&D budget. Part of it is saying we need to have more translational science, get more out of the universities, have them protect their intellectual property better. This is also about having all of America

better prepared for the economy of the future and better compete. Senator Wicker said I want 20% of this bill and this legislation, the R&D dollars, to go to states that are called EPSCoR qualifying states. They are regions of the country we have identified we need to strengthen our research capacity. The 25 states that are qualified as EPSCoR states, they know. It's a program that has been built around strengthening their research and development, and Senator Wicker's insistence on this provision will help those states grow their research muscle for the future, their research ecosystem, strengthen their universities, and strengthen the dollars that go to them. So I applaud him for that dedication.

The head of NSF, the National Science Foundation, will tell you that our motto for this bill overall, or our goal as a nation is to be for innovation everywhere, connected to opportunities everywhere, connected to universities. And by the provision that Senator Wicker proposed, we literally are taking another step towards building that infrastructure everywhere. So if you're in Fairbanks, Alaska, or you're in Mississippi, or some other part of the country, those institutions will get an extra focus and push to get more research, development, and I like to say, you never know what's going to come out of that. You never know what's going to come out of one individual at one institution with a great idea that really charges forward in a new area.

So I think it's a great, it's a great provision of the legislation. So we have, I think, with the other provisions our colleagues worked on, Senator Warner and Senator Cornyn, on trying to in the last NDAA bill, make us crisply focused on the immense competition that we face in the semiconductor industry, we really have, I think, before us, the shape of the debate about America's competition. We're not afraid to put research dollars on the table as a country. Our nation believes in that more than other nations. Our people believe that that is what's made our nation great, and they know that if we keep making that investment, we're going to grow jobs and the economy. So we've made that commitment in this legislation. We've made the commitment to diversify our research, to get more out of our research and translate that faster, and we've made a commitment to skill and educate a workforce not only the diversity we like to see in science, but the geographic diversity we'd like to see as well.

Now we didn't spend a lot of time talking about what's in here for the department of energy. It's not specific as to what the Department of Energy will do for this, but it's safe to say the Department of Energy's innovation program and ARPA-E basically trying to help us with the next generation of energy technology but also includes carbon sequestration and a whole variety of other areas, nuclear power and a whole translation of various energy sciences. I really believe we'll be working together. I believe DOE, NSF, our National Laboratories, our universities, the collaboration that we heard about in Committee will be the kind of growth that comes out of this legislative effort. So many Americans at home, all I can say is we're making another investment in American know-how, the ability to use our scientific skills to help create the next generation of work and effort.

So I too want to thank our staffs. I certainly want, on my side, to thank our Staff Director, David Strickland and Melissa Porter, Richard-Duane Chambers, Mary Guenther, and Stacey Baird. I too want to thank the Senator’s staff, John Keast, and Cheri Pasco, and James Mazol, because they have been a great team to work with. I want to thank, on Senator Schumer's staff, Mike Kuiken and John Cardinal because they have been a constant source on all of this. And of course

all the floor team that has been out here working on this. I know there's other people from Senator Wicker's staff, Crystal Tully, and Steven Wall. I should say on my staff, Jonathan Hale, and David Martin, and Amit Ronen worked on a lot of the energy stuff that were a part of this underlying staff.

I'm sure we'll have more to thank later. This is a wish by Senator Wicker that this would be the wrap-up. I know we're not quite at the wrap-up, but we're hoping that we will have hot lined a manager's proposal. I hope our colleagues will look at that. I hope our colleagues will allow us to move forward on that. If they're not going to let us move forward on that, I wish they'd come to the floor and tell us that. It's time to move forward on getting the rest of this legislation through the Senate and move to whatever discussions we're going to have with the House. But its safe to say this represents a lot of work by a lot of people in committee. I think we processed, before we even got to the legislation, something like 52 amendments prior to the actual day.

The substitute, I think we processed another 40 or 50 amendments. I think we had dozens of roll call votes and that's all in Committee. Out here, we've processed lots of legislation to be part of the manager's amendment. It’s safe to say, practically every member of the United States Senate has had some part or discussion or legislative suggestions that are a part of this bill. So it is, as Senator Wicker said, a very regular order process, albeit quick at times. But I think we have a lot to do.

We've been very challenged as a congress to deal with a lot of issues, COVID specifically. But the competition is not waiting. And the competition has different tools. We have a different government, and we believe in collaboration, and collaboration, yes, takes a little more time. But I think it's going to strengthen us in our ability to compete because we're going to be on the same page about what we need to get done. So I hope our colleagues will indulge us to move ahead. I hope that we can get this next managers' amendment and other things voted on very soon. So I thank the president. I yield the floor.