

**RENEWABLE ENERGY TRANSITION: A CASE STUDY
OF HOW INTERNATIONAL COLLABORATION ON
OFFSHORE WIND TECHNOLOGY BENEFITS
AMERICAN WORKERS**

HEARING

BEFORE THE

SUBCOMMITTEE ON EUROPE, ENERGY, THE
ENVIRONMENT AND CYBER

OF THE

COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

July 29, 2021

Serial No. 117-72

Printed for the use of the Committee on Foreign Affairs



Available: <http://www.foreignaffairs.house.gov/>, <http://docs.house.gov>,
or <http://www.govinfo.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

45-495PDF

WASHINGTON : 2021

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**RENEWABLE ENERGY TRANSITION: A CASE
STUDY OF HOW INTERNATIONAL COLLABO-
RATION ON OFFSHORE WIND TECHNOLOGY
BENEFITS AMERICAN WORKERS**

Thursday, July 29, 2021

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON EUROPE, ENERGY, THE
ENVIRONMENT AND CYBER,
COMMITTEE ON FOREIGN AFFAIRS,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:09 p.m., via *Webex*, Hon. William R. Keating (chairman of the subcommittee) presiding.

Mr. KEATING. The House Foreign Affairs Committee will come to order. Without objection, the chair is authorized to declare a recess of the committee at any point, and all members will have 5 days to submit testimony and statements, extraneous materials, and questions for the record subject to the limitations of our rules. To insert something into the record, please have your staff email the previously mentioned address that we forwarded or contact the full committee staff. Please keep your video function on at all times, even when you are not recognized by the chair.

Members are responsible for muting and unmuting themselves, so please remember to mute yourselves after you have finished speaking. Consistent with House Resolution 965 and the accompanying regulations, staff will only mute members and witnesses, as appropriate, when they are not under recognition, to eliminate background noise.

I see that we have a quorum present, and I will recognize myself for an opening statement. Pursuant to notice, we are holding a hearing today entitled, “Renewable Energy Transition: A Case Study of How International Collaboration on Offshore Wind Technology Benefits American Workers.” I will now recognize myself for an opening statement.

On May 10th, in the 9th District of Massachusetts, we welcomed the long-awaited final Federal approval of Vineyard Wind 1, the Nation’s first commercial-scale offshore wind farm and a linchpin to offshore wind all down the eastern coast of the United States. The Biden administration’s announcement means that wind turbine construction can finally begin as soon as next year off the coast of Martha’s Vineyard, heralding a new era of wind energy across the United States.

I am incredibly proud to represent the district that is on the cusp of such technological innovation and work force innovation. It is this anticipation of a burgeoning, clean, and job-creating energy in-

dustry that inspired the organization of this hearing today where we will seek to better understand the current State of the United States and European offshore wind markets, as well as how we might cooperate and more work together more closely with our transatlantic allies to ensure that our citizens are able to make the most of the economic benefit of renewable energy transition.

Before I continue with my opening statement, I would like to offer my sincere thanks to Ranking Member Fitzpatrick for participating in this hearing. His presence here today underscores the bipartisan support of American work force—supports the American work force in the hope that we can continue to work together to highlight transatlantic cooperation as an avenue of support to our constituencies.

Now let me now turn to the topic we are all here to discuss today, the rapid growth of the American offshore wind industry and the lessons we can learn from the maturation of the European market. The Vineyard Wind project is crucial and it is the first step in the United States offshore wind, but I can confidently say it is only the beginning. In late March, the Biden administration announced a set of bold actions that will catalyze offshore wind energy, strengthen the domestic supply chain, and create good-paying union jobs.

Specifically, the administration set a goal to deploy 30 gigawatts of offshore wind in the United States by 2030. Meeting this target will trigger more than 12 billion per year in capital investment and create tens of thousands of good-paying union jobs with more than 44,000 workers employed in offshore wind by 2030, and nearly 33 additional jobs in communities supported by offshore wind activity that the administration hopes to generate enough power to meet the demand of more than ten million American homes for a year and avoid 78 metric tons of CO2 emissions.

The Biden administration's commitments to the offshore wind industry will support an already burgeoning market. There are currently 34 proposals for offshore wind development, which includes 27 projects in various stages of planning and development. The U.S. is set to see a huge growth in offshore wind which will help mature the industry and continue, importantly, to continue to drive costs down.

While I am incredibly optimistic about the potential growth in the U.S. market, we must not forget that this would not be possible had it not been for the monumental achievements of our European partners. The first European offshore wind farm was installed in 1991 in Denmark and since then, Europe has become the world leader in the industry. The European offshore wind sector attracted almost 32 billion dollars, U.S. dollars, of investment last year, a record amount, and today, roughly 77,000 Europeans have access to high-paying union jobs in the offshore wind industry alone.

Europe's offshore wind industry is expected to continue to grow, in part, because of the favorable governmental policies that exist there. The EU sees renewable energy in general, and offshore wind in particular, as key to meeting their greenhouse gas reduction targets and related goals.

Declining costs are also contributing to Europe's offshore wind growth. With that being said, as we consider Europe's progress in

the offshore wind industry, we must also explore how we here in Congress can facilitate our own nation's growth in this critical green energy sector by understanding lessons learned by our friends across the Atlantic.

As a proud representative of a coastal district pioneering technological innovation and renewable technologies, I want to do everything I can do to support the development of this industry. That is why I have introduced legislation that creates a Federal grant program to assist colleges and universities, State and local governments, unions and nonprofits, to advance an offshore wind work force.

We also have been able to secure appropriation funding for curriculum development at the Bristol Community College's National Offshore Wind Institute, as that is located in my district as well. And as the chair of this subcommittee, I am committed to exploring ways that the transatlantic alliance can help both Europe and the United States reach their climate goals and I hope to continue that exploration with today's hearing.

The question now is, how can the United States and Europe coordinate and cooperate to maximize the growth of this vitally important and the U.S. burgeoning industry? To answer this critical question, my colleagues and I have invited a group of incredibly knowledgeable experts with a diverse range of professional experiences. They include CEO of WindEurope, Giles Dickson; the American Clean Power Association's Heather Zichal; and Vineyard Wind's CEO Lars Pedersen.

As longstanding experts in this field, you will be able to give concrete recommendations on how the U.S. and the EU can bolster cooperation in areas such as supply chain development, foreign direct investments, and work force training. We thank you for being here and working through, you know, seven different roll calls occurring in the midst of this committee.

Transitioning to renewable energies presents yet another opportunity for the American economy to lead the world on innovation and job creation for the domestic and global work force as well. I am honored to be working on this issue and I welcome everyone's participation in the House Foreign Affairs Committee's first hearing ever, first hearing ever on offshore wind.

Now I trust we have been joined by the ranking member as he is trying to work around his scheduling. I believe he is here. I recognize Representative Fitzpatrick. If he is not here, we will take Representative Fitzpatrick as he arrives given the circumstances we are working with.

I will now introduce our witnesses, and I want to thank you again for being here. Giles Dickson is the CEO of WindEurope, the leading association and voice of the wind industry in Europe. Ms. Heather Zichal is the CEO of American Clean Power Association, the leading federation of renewable energy companies expediting the advancement of clean energy as a dominant power in America. Mr. Lars Pedersen is the CEO of Vineyard Wind, a leading developer of offshore wind projects on the outer continental shelf of the United States.

I will now recognize the witnesses for 5 minutes each. Without objection, you have prepared a written statement and that will be-

come part of the official record and your remarks can play off of that. Mr. Dickson, you will now be recognized for your opening statement.

STATEMENT OF GILES DICKSON, CEO, WINDEUROPE

Mr. DICKSON. Thank you very much, Chairman Keating, for the invitation to testify before your subcommittee and for the kind words that you have said about offshore wind in Europe. Offshore wind is now 3 percent of all of the electricity we consume in Europe. Europe has 120 operating offshore wind farms in total, 5-1/2 thousand offshore wind turbines. It is 26 gigawatts of operating capacity today. From that number we expect to rise by 2030 to 114 gigawatts. Beyond that the EU has set a target of 300 gigawatts by 2050.

Why is there so much interest in offshore wind in Europe? Of course, climate change is a key political driver, but there is a strong recognition among governments and society that offshore wind makes economic sense. As you have said, the costs have come down markedly. It is now cheaper to build new offshore wind in most of Europe than it is to build new coal, gas, or nuclear power plants.

There are wider economic benefits as well as falling energy bills for consumers. As you said, 77,000 jobs in Europe today. That number is rising, we expect, to 200,000 jobs by 2030. Every time we build an offshore wind turbine that generates, on average, 18 million dollars of economic activity. And as you have noted already, sir, last year, Europe invested 31 billion dollars, despite COVID, in new offshore wind farms.

The technology continues to develop. The average size of the turbine we are installing at the moment is around 8 megawatts. By 2030, it will be 15 megawatts. That means the turbines are more powerful, more efficient, generating now the capacity factors of new offshore wind farms are around 50 percent, so it is an increasingly stable form of electricity generation.

What are the lessons we have learned? What are the challenges we still face? And if you were to ask us what advice would we give to you, I have five quick observations. First, maritime spatial planning is very important. The 300 gigawatts that the EU wants by 2050 will take up 7 percent of all of the EU's sea space, so it is important that countries—in your case, States—take a very long-term approach to maritime spatial planning.

It is important also that we move away from the silo approach to maritime spatial planning. By the silo approach, I mean the approach whereby you do fishing activity in a certain area, the shipping lanes are somewhere else, military activity somewhere else, then environmental protection zones, and then energy in some other areas. There is scope for multiple use of the sea space between the different economic and societal interests. Two examples: fishing. It is possible to fish inside offshore wind farms provided it is passive or pelagic surface fishing.

A few wider observations about fishing communities, the offshore wind industry routinely consults fishermen about the location and layout of offshore wind farms. We pay compensation to them where necessary. In many countries of Europe, we, in fact, agree up front

with the fishing industry where we should be building offshore wind farms and how much we should be building.

We are also striving for happy coexistence with military activity. On offshore wind turbines there are many sensors and cameras, which are accumulating invaluable data and images, and in some countries in Europe, we are exploring with the military authorities how we can share this data and images with them.

My second main observation would be the importance of investments in electricity grids. If we look how much money do we need to spend over the coming years in Europe in offshore wind, actually we will be spending more money on the grids than on the offshore wind farms themselves. It is important not only to spend money on the offshore grids, but also the reinforcements of the onshore grids.

Third, it is so important that the permitting rules and procedures should be as simple as possible. We try and have one-stop shops in Europe wherever we can so the developer only needs to deal with one single authority. Of course, in the United States, there will always be a role for both Federal and State authorities. I think our advice to you would be always to ensure clear demarcation lines between their respective responsibilities in the permitting process.

Fourth, investment in the supply chain and support for the supply chain. The best support any administration can give to the offshore wind supply chain is clarity about how much you want to build in the future, and where and when the options of the leasing rounds will take place.

With that clarity, the industry then invests in new factories in the supply chain. And the supply chain is not just the companies building the offshore wind farms and the turbines, it is the shipping industry, it is the crane manufacturers; crucially, it is the ports as well. It is so important to invest in port infrastructure and, of course, to invest in skills development.

Fifth and final observation, a major challenge for us in Europe is coordinating the activity of the different national administrations; coordinating the investments they are making in new grid infrastructure; coordinating their rules and regulations, for example, on health and safety, certification of vessels, the lightings and the markings for aviation that you put on the turbines; and coordination also of when and where different national auctions are taking place. Thank you very much.

[The prepared statement of Mr. Dickson follows:]

“Renewable Energy Transition: A Case Study of How International Collaboration on Offshore Wind Technology Benefits American Workers”

Testimony of Giles Dickson

Chief Executive Officer at WindEurope

Foreign Affairs Committee, Subcommittee for Europe, Energy, the Environment and Cyber

July 29, 2021

The European Offshore Wind sector today and in the next decade

Today offshore wind provides 3% of Europe’s electricity consumption, with 26 GW of capacity (5,566 turbines grid-connected) across 120 offshore wind farms (EU 27 + UK). Government plans show that installed capacity will grow nearly fivefold to 114 GW by 2030.

Europe is home to 75% of global offshore wind capacity. The sector employs 77,000 people, contributing €7.5bn (\$8.8bn) annually to the EU’s GDP (2019). This means that on average, every new offshore wind turbine installed in Europe contributes €15m (\$17.7m) to the economy, in terms of jobs and economic activities such as construction, manufacturing, and maintenance. Offshore wind has helped to rejuvenate coastal communities which were once dependent on heavy manufacturing, shipping, and fishing.

There are more than 30 ports supporting the European offshore wind industry. They serve as hubs for manufacturing and assembling foundations, the production of large components, installation, and the operation and maintenance of wind farms. They play a key role in coordinating the offshore supply chain and support the production and export of renewable hydrogen, alternative fuels, and other energy vectors.

Despite the economic impacts of the COVID-19 pandemic, 2020 was a record year for offshore wind investments in Europe. There were €26.3bn (\$30.9bn) raised for the financing of new offshore wind farms, including €2.1bn (\$2.5bn) in offshore transmission infrastructure. 2020 was also a record year for new capacity financed with 7.1 GW, indicating an important shift in speed and volume across the European offshore wind sector.

Floating Offshore Wind is unlocking the potential of wind resources in deep waters. Today floating wind accounts for 75 MW globally, of which 62 MW are in Europe. There is a pipeline of projects for a further 300 MW by 2023 and at least 7 GW by 2030, with France, Norway and the UK forecasting the biggest increases.

Offshore wind is becoming a whole European story. By 2030, European Governments want 114 GW of offshore wind. Countries around sea basins have all drawn up their own ambitions for offshore wind. This also means a major increase in how much new offshore wind Europe installs annually: up from 3 GW a year today to 11 GW a year by 2030 and up to 18 GW a year by 2040.

Offshore wind by 2050

The IEA sees offshore wind becoming Europe's main source of electricity generation by the early 2040s. And the European Commission says the EU will need 300 GW by 2050.

Offshore wind will be at the heart of the European economy's drive to reach climate neutrality by 2050. Under the Green Deal, all 27 EU Member States have committed to turning the EU into the first climate-neutral continent by 2050. To get there, they have pledged to reduce emissions by at least 55% by 2030, compared to 1990 levels.

The European Commission has put forward several strategies to accelerate the energy transition e.g., the Offshore Renewable Energy Strategy (November 2019), the EU Industrial Strategy (March 2020; updated June 2021), and the Energy System Integration and Hydrogen Strategies (June 2020).

All of **these will require a huge expansion in wind energy**. The Commission's decarbonization scenarios see wind accounting for 50% of the EU's electricity production by 2050, up from 16% today. This means around 1,000 GW onshore (up from 165 GW today) and 300 GW offshore (up from 15 GW today) by 2050 (EU-27).

Adding in the UK and Norway, Europe will need 20 times its current capacity to reach climate neutrality, meaning up to 450 GW of offshore wind in Europe. Most of this capacity will be in the North Sea, Baltic Sea, and Atlantic Ocean. But recently interest is growing in other sea basins too, such as the Mediterranean Sea and the Black Sea.

The **Offshore Renewable Energy Strategy (ORES)** targets offshore renewables deployment over the next 10 years, and in preparation for the next 30 years. Actions include legislative proposals and other incentives, while recognizing the investments needed to deliver the ambitions – in terms of technologies, grids, and the supply chain. And it identifies the right policies that will drive those investments: industrial policy; state aid rules; and the correct mechanisms to ensure predictable revenues for offshore wind farm developers at the smallest cost to society.

Success factors

Today offshore wind is 75% cheaper than it was in 2014. The main driver for cost reduction is technological development but other factors have played a role, such as the cost of financing.

The bigger turbines get, the cheaper it will become to produce electricity. **The average capacity of a WT installed in 2020 is 8.2 MW.** This has doubled since the years 2012-2014. Consequently, capacity factors have increased too: the newest bottom fixed wind farms can reach 50%, and floating has gone above 55%. Other drivers for cost reduction include **efficiencies in project management, economies of scale, and appropriate revenue stabilization mechanisms**, which lower financing costs. Wind turbine (WTs) capacity is likely to double by 2030, when we can expect 15 MW WTs to be commercialized.

Wind farms require high upfront investments but have very low running costs. This makes financing a significant share of their overall cost. Having a predictable income from stable revenues is the most important way to minimize finance costs. **The two-sided contract for difference (CfD)** is the best model for providing stable revenues. Many Governments in Europe are now using it.

Adding to CfD, corporate sourcing of offshore renewables is rapidly growing following the American trend of solar PV and onshore wind. This provides another source of revenue stabilization, helping to cut the costs of electricity.

Lessons learned in Europe and our next immediate challenges

The European Offshore Wind sector has benefitted from sensible national and international policies and enjoys favorable political momentum today. But to support climate neutral ambitions, new approaches are needed to **allocate new areas for offshore wind and to develop offshore and onshore infrastructure**.

Rising activity in European waters has led to increased spatial demand and growing competition between sea users. To reach the goal of 300 GW by 2050 only around 7% of EU waters will be required. The European wind industry stresses the importance of **coexistence with other economic and societal interests** as a necessary condition for the expansion of wind energy. In particular:

- Collaboration with the **Defense sector** provides opportunities for joint trainings and simulations, unexploded ordnance (UXO) management, and security patrols and reactions. These require close coordination and can be done using mobile or fixed assets in partnership. In Europe, this is already happening both at an international and Member State level, with the European Defence Agency (EDA) and Ministries of Defence already engaging with policymakers and wind industry representatives.
- Engagement with **fishermen** is critical to the safe coexistence of fishing and wind farm operations. European Governments actively promote the involvement of fishermen in all stages of offshore wind development, from site selection to farm operation. Member States have also allocated funds and compensation schemes to address any disruption caused to fisheries at a regional or national level.
- **Biodiversity protection** is a primary consideration for offshore wind development. The European offshore wind industry has pioneered the research, development, and deployment of mitigation solutions. For example, developers can use bubble curtains to limit sound emissions generated from piling, helping to mitigate disturbances to marine life. The first long-term monitoring programs show that fish often return to wind farms in greater numbers as the wind farms act as artificial reefs¹. Each wind turbine can support up to four metric tons of shellfish that attract other marine wildlife². The sector is also looking at boosting positive effects. For example, it is involved in the eco-designs of mollusk cultures within wind farms, which actively improve seabed conditions, increase water quality, and boost local ecosystem services, including food production.³

In Europe the offshore wind industry, leading environmental NGOs and transmission system operators have set up a coalition (the Offshore Coalition for Energy and Nature, OCEaN) to coordinate efforts

¹ This has been proven by long-term monitoring programs, for example [in Denmark](#) and [in Belgium](#)

² [The large-scale impact of offshore wind farm structures on pelagic primary productivity in the southern North Sea](#)

³ Walles B. et al (2018) [Offshore Wind Farms as Potential Locations for Flat Oyster Restoration in the Dutch NS](#).

with the EU and national Governments to reach their climate goals all the while ensuring the success of their environmental protection and biodiversity strategies.

The development of offshore wind needs the **right electricity infrastructure** to be in place. It needs to anticipate the growth of offshore wind energy in order to get power output to the demand locations. Planning for the right amount of grid infrastructure is crucial to avoid delays or high deployment costs and curtailment rates. It can still take up to 10 years to ensure that onshore and offshore developments correctly transmit electricity from generation to the end-user.

In the future large offshore wind farms, or cluster of projects, will connect to multiple countries via interconnectors. These are called Offshore Hybrid projects and help to optimize space and grids. The **Kriegers Flak Combined Grid Solution** demonstrates that hybrid offshore wind projects are already underway – and there are more projects in the pipeline. But there are a number of legal issues which have yet to be fully addressed. The European Commission, Member States, and industry are working to assess the risks, costs, and benefits of investing in hybrid assets and to create a mechanism for countries to jointly develop such projects.

A robust electricity grid will support household and industrial consumers, providing affordable renewable electricity. The direct use of electricity is the most efficient method of electricity deployment. Therefore, a major component of the electricity infrastructure will be the grid itself. Complementing this, power-to-x can be used to decarbonize industry or transport, where direct electricity use is less efficient or not feasible.

Renewable hydrogen is a great opportunity for the offshore wind industry to increase its portfolio, offering advantageous business opportunities to reduce the emissions of various industries. This will lead to increased efficiency in the supply chain, improved environmental performance, and increased synergies with other activities and industries - contributing to their decarbonization.

Main recommendations based on European experience

By delivering on Federal and State ambitions, offshore wind will become an important asset for the US economy, by boosting imports and exports, and attracting significant international investments supporting economic growth.

Many businesses, directly or indirectly active in the offshore supply chain, will benefit from the sector expansion. The challenge in getting timely investments from key suppliers is that they need **confidence in the market for a duration** that will give a return on their investment. Having an attractive market proposition with a long-term strategy that guarantees sufficient volumes will send a strong signal to the manufacturing industry, resulting in local jobs and a positive trade balance. For example, **Europe's ports will need to invest €6.5bn between now and 2030** to support the expansion of offshore wind. This investment could be paid back in just five years and would bring significant savings to electricity consumers and society.

Due to the infrastructural challenges and costs associated with readying the supply chain for offshore sector growth, it is very important to provide long-term revenue certainty for exploiting these facilities through the right energy policies. **The American offshore wind industry will need clear timing and frequency of auction for offshore wind.** This would smoothen business cycles in the supply chain. And it would give developers sufficient time to prepare for bidding processes.

The Jones Act will have a clear impact on the cost of offshore wind deployment in the US in its early years. There is strong potential to establish a new market for US vessels, but the work needs to get underway now.

Investment in wind energy will create and sustain jobs. Europe for example will have to invest €267bn (\$314bn) to finance the offshore wind capacity envisioned in the 2030 national plans. Every €1bn (\$1.18bn) spent on delivering the wind volume targets set out in the NECPs sustains the existing 77,000 industry jobs and creates an additional 463 in the offshore wind sector. In 2030, 114 GW of offshore wind will employ 200,000 people in Europe.

In the US, job creation will require new educational programs to train the occupational profiles required for the offshore wind sector. But re-skilling will be important as well. For operations and maintenance at sea, for instance, health and safety skills are vitally important in preventing accidents; for these occupations, experience at sea is of greater relevance. Workers coming from other maritime sectors such as oil and gas or shipping would require upskilling or reskilling to adapt to the risks and dangers of the offshore working environment

To create a robust offshore wind industry in the United States, we recommend that competences and responsibilities between the States and the Federal Government should be clear from the beginning. This will facilitate the permit granting process, while also factoring in the need for coordination between the permitting processes for energy infrastructure and generation assets. Europe has addressed this by establishing one-stop shops for permitting projects based on successful operating models

In addition, regional cooperation between neighboring States will catalyze the deployment of offshore wind and encourage cross-border synergies, collaboration, and coordination. In Europe, regional **cooperation fora** have been established since 2010. These fora are co-chaired by the European Commission and European Member States bring together Energy Ministries of countries sharing the same sea basins to coordinate offshore wind and grid development. The North Sea Energy Cooperation (NSEC) is the most advanced, followed by the Baltic Electricity Market and Interconnection Plan (BEMIP), which recently established a dedicated workstream on offshore wind. Other European sea basins are expected to follow suit.

Regulatory coordination across States is needed for health and safety, environmental impact assessments, radar, and aviation interaction with wind turbines (including lighting and marking), site investigation, project certification and vessels, crew, and other technical requirements. But cross-state cooperation will also be needed for offshore space allocation - especially with projects being built further from shore - offshore and onshore grid development and for coordinating joint projects.

Mr. KEATING. Thank you for your remarks. Thank you for telling what an impressive level of achievement already, and the things that you outline we are—are issues we are dealing with here in the U.S.

I now recognize Heather Zichal for your opening statement. Thank you for being with us.

**STATEMENT OF HEATHER ZICHAL, CEO, AMERICAN CLEAN
POWER ASSOCIATION**

Ms. ZICHAL. Chairman Keating, Ranking Member Fitzpatrick, members of the House Foreign Affairs Subcommittee on Europe, Energy, the Environment and Cyber, thank you for the invitation to testify at today's hearing. My name is Heather Zichal and I am the CEO of the American Clean Power Association, the national renewable energy trade association that unites the power of offshore wind, land-based wind, solar storage, and transmission companies.

Today we released our first Clean Power Annual, which is a testament to the record growth in investment in the renewable energy sector. The data shows our industry employs more than 415,000 Americans and has invested more than \$334 billion in the U.S. economy since 2005. I appreciate the House Foreign Affairs Subcommittee's focus on the offshore wind industry.

Collaboration with Europe will allow domestic market participants to draw from lessons learned and best practices from a more mature European market. Smartly growing our domestic offshore wind market and supply chain will create hundreds of thousands of jobs in the American offshore wind industry and unlock billions of dollars of investment allowing to meet our climate and economic goals.

The American offshore wind industry is on the verge of becoming a substantial source of clean energy close to the largest population centers on the U.S. East and West Coasts. ACP members are committed to building a thriving, successful domestic offshore wind industry, but the American offshore wind industry is playing catch-up to Europe and Asia. At the end of 2020, there were over 24 thousand megawatts of installations in the Europe and the U.K., over 10 thousand megawatts in Asia-Pacific.

While there are just 42 megawatts of domestic offshore wind in operation today, the U.S. market has tremendous potential with over 14,000 megawatts of offshore wind currently in permitting and pre-construction phases. In addition to creating jobs, to date offshore wind companies have proposed investing at least 2.9 billion dollars across manufacturing, ports, vessels, work force development, and research areas.

States have encouraged some of this localization of jobs and economic benefits through the offshore wind energy procurement process. In fact, some States such as New York, New Jersey, Massachusetts, and Virginia are requiring offshore wind developers to detail how hiring and sourcing of goods and services locally would drive economic development, with an emphasis on disadvantaged communities. These investments will increase as more projects advance and as regulatory certainty continues to improve, bringing enormous economic benefits to communities across the country.

To realize these jobs and investments, Congress can help the offshore wind industry by fully resourcing permitting agencies, supporting work force training programs, and creating incentives to build a domestic supply chain and offshore wind vessels. Offshore wind investments and jobs depend, in part, on a timely and predictable Federal permitting process. Led by the Bureau of Ocean Energy Management, many different cooperating agencies participate in the permitting process.

Certainty around auction timing and volume of additional lease areas in Federal waters also provide developers and manufacturers with the necessary confidence to make long-term domestic supply chain decisions. To help create more market certainty, ACP asks that Congress increase funding for BOEM and other agencies that permit offshore wind projects, fully fund the Port Infrastructure Development Program, and reauthorize Title 41 of the Federal Permitting Improvement Steering Council that helps with interagency coordination.

Manufacturing of large offshore wind components and construction at sea requires a specialized work force. Bills such as the Offshore Wind Jobs and Opportunity Act, which creates a grant program to spur offshore wind work force training, can help expedite that process. Before the completion of a domestic supply chain and construction vessels, the American offshore wind industry will have to use foreign components and some specialized foreign-flagged construction vessels. There simply is not enough time to ramp up domestic capacity prior to an initial wave of offshore wind facilities being constructed. And, companies were understandably not willing to invest the billions of dollars to build vessels or a domestic supply chain, previously given the lack of certainty about whether offshore wind projects would ever successfully get through the Federal permitting process to establish a market to serve.

Additional policy levers can help drive an even greater degree of domestic manufacturing of offshore wind components and vessels on a more ambitious timeline. The size and cost to transport offshore wind components makes the U.S. an attractive market, but it will require capital-intensive manufacturing facilities and a substantial upgrade of American port infrastructure to accomplish.

Congress can help spur these investments by creating incentives for facilities, equipment, vessels, and domestic production, updating trade policy, leveraging complementary financing pathways, and funding research and development. Thank you for the opportunity to testify today during this historic time for the offshore wind industry and I look forward to answering your questions.

[The prepared statement of Ms. Zichal follows:]

House Committee on Foreign Affairs Subcommittee on Europe, Energy, the Environment, and Cyber

“Renewable Energy Transition: A Case Study of How International Collaboration on Offshore Wind Technology Benefits American Workers.”

July 29, 2021, 1:00pm

Oral Statement by Heather Zichal, CEO, American Clean Power Association

Chairman Keating, Ranking Member Fitzpatrick, members of the House Foreign Affairs Subcommittee on Europe, Energy, the Environment, and Cyber, thank you for the invitation to testify at today’s hearing. My name is Heather Zichal and I am the CEO of the American Clean Power Association, the national renewable energy trade association that unites the power of offshore wind, land-based wind, solar, storage and transmission companies. Today we released our first *Clean Power Annual* which is a testament to the record growth and investment in the renewable energy sector. The data shows our industry employs more than 415,000 Americans and has invested more than \$334 billion in the U.S. economy since 2005.

I appreciate the House Foreign Affairs Subcommittee’s focus on the offshore wind industry. Collaboration with Europe will allow domestic market participants to draw from lessons learned and best practices from a more mature European market. Smartly growing our domestic offshore wind market and supply chain will create hundreds of thousands of jobs in the American offshore wind industry and unlock billions of dollars of investment allowing us to meet our climate and economic goals.

The American offshore wind industry is on the verge of becoming a substantial source of clean energy close to the largest population centers on the U.S. East and West Coasts. ACP members are committed to building a thriving, successful domestic offshore wind industry. But the American offshore wind industry is playing catch-up to Europe and Asia. At the end of 2020, there were over 24 thousand megawatts of installations in Europe and the UK, over 10 thousand megawatts in Asia-Pacific. While there are just 42 megawatts of domestic offshore wind in operation today, the U.S. market has tremendous potential with over 14,000 megawatts of offshore wind currently in permitting and pre-construction phases.

In addition to creating jobs, to date, offshore wind companies have proposed investing at least 2.9 billion dollars across manufacturing, ports, vessels, workforce development and research areas. States have encouraged some of this localization of jobs and economic benefits through the offshore wind energy procurement process. In fact, some states such as New York, New Jersey, Massachusetts, and Virginia are requiring offshore wind developers to detail how hiring and sourcing of goods and services locally would drive economic development, with an emphasis on disadvantaged communities. These investments will increase as more projects advance and as regulatory certainty continues to improve, bringing enormous economic benefits to communities across America.

Mr. KEATING. Thank you very much. Great segue in between our witnesses. And now I am going to pass the chair to Representative Vice Chair Spanberger, who will recognize Representative Fitzpatrick now for his opening statement.

Ms. SPANBERGER [presiding]. I will now recognize Representative Fitzpatrick for his opening statement and then we will be continuing on with our witnesses. Thank you.

Mr. FITZPATRICK. Thank you, Madam Chairwoman and also to Chairman Keating. Thanks to our witnesses for joining us today to discuss ways to collaborate with our transatlantic partners on offshore wind technologies that we hope will provide sustainable energy resources and significant benefits to American workers in the future.

As was alluded to earlier, wind energy is not a new concept in the United States, but offshore wind energy is still very much in its infancy. And while European nations are undeniable leaders in offshore wind energy, the United States has a long history of advancing energy development and making significant technological strides, both individually and through partnerships, with our European allies.

The development of offshore wind technologies is no different, but it is vital that it not come at the expense of other energy industries and jobs. The United States has a strong interest in supporting research and development of offshore wind technology. The United States not only has tremendous wind energy potential, but it is also an important area which we need to be a leader in in order to effectively compete with the CCP and other entities around the world. We need to be upfront on this technological development, not fighting to keep up with our adversaries.

Investments in these technologies will establish the United States presence in the competitive landscape of sustainable energy and position us better to compete with the PRC moving forward. However, we must remember to keep the interests of the American workers and industries among our top priorities. We must ensure that we have the necessary vessels and infrastructure in place to safely and effectively develop and install offshore wind farms and we must also be sure that we are taking into account any potential implications on other industries like fishing and shipping.

To that end, we must carefully evaluate the effects of scaling this industry and the effects that it would have on our port infrastructure and the fisheries that may be impacted by these installations. It is my hope that our witnesses can detail what has been done and what can be done in the private sector to better prepare the United States and our European partners to develop these new technologies. Thanks for being here. I yield back.

Ms. SPANBERGER. Thank you. The chair now recognizes Mr. Pedersen for his opening remarks.

STATEMENT OF LARS PEDERSEN, CEO, VINEYARD WIND

Mr. PEDERSEN. Chairman Keating, Ranking Member Fitzpatrick, and members of the House Foreign Affairs Subcommittee on Europe, Energy, the Environment and Cyber, my name is Lars Thaaning Pedersen and I am the CEO of Vineyard Wind. I appre-

ciate the opportunity to testify today on how international collaboration on offshore wind benefits American workers.

I have been fortunate to work on commercializing offshore wind since the early days of this industry and have worked on more than 15 offshore wind projects in all stages throughout my career. In the mid-2000's, offshore wind was an expensive, niche technology in Europe and now it is the lowest cost, fastest expanding energy sector in much of northern Europe.

What we learned in those early days was in order to drive down costs we needed to scale up the industry in terms of project size and technology while ensuring that bottlenecks were addressed early on to create predictably and project delivery. Boom-bust cycles would negatively impact the ability for companies to make long-term investments in infrastructure as its supply chain and work force.

Scaling up is directly tied to technology and nowhere is this more evident than in offshore wind. Wind turbine generator size has increased by a factor of almost six over the last 15 years. Vineyard Wind 1 will be built with a 13-megawatt Haliade-X turbine from General Electric, the largest commercially available wind turbine in the world. Similarly, the liftboats have increased significantly in size, cables are deployed with higher electrical ratings, and foundation sizes have increased to be installed in deeper waters. Importantly, scaling up also means expanding the pool of highly skilled, dedicated workers engaged in developing and building safe projects, in addition to manufacturing the needed components.

While there is certainly much that should be learned from the experiences elsewhere, I want also to be clear that, in my opinion, the future of the U.S. offshore wind industry is poised to be thoroughly and uniquely American. A great example of this, our project labor agreement with the Southeastern Massachusetts Building Trades which was signed just 2 weeks ago in New Bedford, Mass. It will now set the benchmark for building offshore wind projects in the U.S. The PLA ensure us that 500 of the 1,000 construction jobs that will be created as a result of Vineyard Wind 1 will be good-paying, local union jobs.

The Agreement also includes aggressive targets for diversity, equity, and inclusion to ensure that the work force resembles the communities where we are building the project. Equally important to the many jobs in construction, a significant opportunity in the long term to maximize job creation in this industry remains in the supply chain, and for the first project we have sought to work with U.S.-based suppliers wherever possible. We have partnered with a company called Linxon, headquartered in North Carolina, to provide a substation that will connect our first project to the ISO-New England grid, and with Southwire, headquartered in Georgia, to manufacture and install the onshore cabling.

It is impossible to talk about offshore wind without mentioning the Jones Act. Vineyard Wind fully supports the Jones Act and will comply with its transport requirements; however, as was mentioned before, due to the infancy of the industry in the U.S., there are currently no U.S.-flagged jack-up installation vessels large enough to install the components for our first project.

For Vineyard Wind 1, we sought to turn these installation challenges into opportunity. We have worked with our international contractors to ensure that logistics other than the specialized transport and installation vessels will be provided by companies like FOSS Maritime, headquartered in Seattle. FOSS Maritime will also be using union labor that will ensure U.S. mariners get valuable experience working on the first large-scale wind project in the U.S.

Leaning on my personal experiences from Europe growing the industry, I see three areas where the Federal Government working with State and local stakeholders can make a significant impact on the future of this industry. The U.S. offshore industry will grow at a much faster rate than the European industry did in the early 2000's and, therefore, addressing these challenges early on will be key.

One, offshore wind is fundamentally a marine construction industry and the components being manufactured are such large dimensions that they can only be transported by sea. Currently, the eastern seaboard where most of the projects are located do not have a significant number of ports, sufficient number of ports with the right specifications, and significant investments are needed to bring these port developments forward in due time to be ready for project construction and not least to attract manufacturing. Similarly, significant investments in vessel capacity will also be needed which will provide opportunities for the yachts in the Mexican Gulf with experience from the oil and gas industry.

Two, the electrical grid needs to be redesigned for a significant inflow of power produced on the outer continental shelf so the power can get from the coastline to the load centers. Grid development is inherently complex to permit, timelines are long, and regulations are complex with State and Federal agencies overseeing permitting, access to interconnection points, and funding of which operates off the grid.

Three, educating and training a work force for this new industry is essential. Thousands of workers need to be trained for this industry in the coming years and it represents a significant opportunity to provide well-paying jobs for coastal communities that will eventually become lifelong careers.

The Vineyard Wind 1 project represents a giant step forward for the U.S. offshore wind industry but it is only the beginning. Thank you and I look forward to answering any questions.

[The prepared statement of Mr. Pedersen follows:]



VINEYARD WIND

**Testimony of Lars Thaaning Pedersen, CEO of Vineyard Wind Before the House Foreign Affairs
Subcommittee on Europe, Energy, the Environment and Cyber**

July 29, 2021

Chairman Keating, Ranking Member Fitzpatrick and members of the House Foreign Affairs Subcommittee on Europe, Energy, the Environment and Cyber, my name is Lars Thaaning Pedersen and I am the CEO of Vineyard Wind. I appreciate the opportunity to testify today on how international collaboration on offshore wind benefits American workers.

Vineyard Wind is an offshore wind development company headquartered in New Bedford, Massachusetts, that will build the first commercial-scale offshore wind energy project in the U.S. Our company is a joint venture, 50 percent owned by Copenhagen Infrastructure Partners (CIP) and 50 percent by Avangrid Renewables, a subsidiary of AVANGRID.

In 2018, our first project, an 800 MW wind farm located approximately 15 miles south of Martha's Vineyard known as Vineyard Wind 1, was selected by Massachusetts to power 400,000 homes.

We're also in the early stages of state and federal permitting for our Park City Wind project, which was selected by Connecticut in 2019 and will utilize Bridgeport for both staging and construction and eventually operations and maintenance.

Both projects will interconnect to the ISO-NE electricity grid in Barnstable, Massachusetts and together will power over 800,000 homes and businesses.

I have been fortunate to work on commercializing offshore wind since the early days of this industry and have worked on more than 15 offshore wind projects in all stages throughout my career – from planning and development to construction and operations.

In the mid-2000s, offshore wind was an expensive, niche technology in Europe. What we learned though in those early days was that in order to drive down cost, we needed to scale-up the industry.

Scaling up is directly tied to the technology, and indeed you are seeing that play out today. Wind Turbine Generator (WTG) size has increased by a factor of almost 6 over the last 15 years, lift boats have increased significantly in size, cables are receiving higher ratings and foundation sizes have increased to be installed in deeper waters.

But scaling up also means bringing larger projects on-line and most importantly, expanding the pool of a highly skilled, dedicated workforce engaged in developing and building safe projects in addition to manufacturing.

While Europe is certainly farther along in terms of steel in the water, the U.S. is launching this industry in many ways at the perfect time.

And while there is certainly much that should be learned from past experience in Europe, I want to be clear that the U.S. based offshore wind industry is poised to be thoroughly and uniquely American.

Engaging Stakeholders

Since acquiring our first lease area in 2015, Vineyard Wind sought to create a new course for offshore wind in the U.S. We know the tremendous potential this industry has when it comes to investment and job creation. But none of these benefits can come to fruition if the project doesn't have public support.

If there is one term that defines Vineyard Wind up to this point, it's stakeholder engagement.

The Vineyard Wind 1 project has been through an unprecedented and exhaustive public review process that generated more than 30,000 public comments, more than 90% of which supported the project. The Construction and Operations Plan (COP) was reviewed by more than two dozen federal, state, and local agencies over the course of more than three and a half years.

From the, globally unique, 1 x 1 nautical miles spacing to the significant mitigation measures we've put in place, stakeholders – from commercial fishing to scientists to local residents – have shaped a project in a way that has gotten us to the point where we are on the brink of launching this new U.S. industry.

Focus on Local Hiring, Diversity

Another great example of this community/stakeholder approach is our Project Labor Agreement (PLA) with the Southeast Massachusetts Building Trades. Just two weeks ago Vineyard Wind and the Southeastern Massachusetts Building Trades Council came together alongside federal and state policymakers, union members, and representatives from the Massachusetts Clean Energy Center to sign a project labor agreement that sets the standard for building offshore wind in the U.S. using a U.S. workforce.

Though it took a long time and countless hours of work, we never lost sight of our ultimate goal – hiring local people to work on the project. What we ended up with is an agreement that ensures that roughly 500 of the 1000 construction jobs that will be created as a result of Vineyard Wind 1 will be good paying union jobs. We have specifically targeted the four counties

located near our main base of operations – Bristol, Plymouth, Barnstable and Dukes – to provide the bulk of the local labor needed for construction and staging.

The agreement also includes aggressive targets for Diversity, Equity and Inclusion, with 10% of jobs set aside for women and 20% for people of color. To reach these goals, we have formed a committee with the different affiliate unions and our contractors that will analyze barriers for underserved communities and look to implement policies and programs that overcome these challenges.

I was particularly inspired by some of the stories that we heard at the signing ceremony we held on the 19th of this month.

We heard from Kristin Wozniak, a member of the International Brotherhood of Electrical Workers Local 223, who spoke passionately about the need for workers to represent the diverse communities where they come from and about her desire to take her skills to the front lines in the battle against climate change.

We also heard Josh Griggsby, a member of the Piledrivers Local 56, who got down to the heart of the matter and talked about how this job will help his family and how proud he was to tell his 5-year-old son that he was working on the project. Josh is currently going through the Global Wind Organization (GWO) training and will in all likelihood be working on the Vineyard Wind 1 project in the coming months.

Building Out the Supply Chain

Equally important to the many jobs in construction and operations, a significant opportunity in the long term to maximize job creation in this industry remains in the supply chain and for the first project, we have sought to work with U.S. based suppliers wherever possible. It's not in the interest of Vineyard Wind or any other developer to import components or labor from outside the U.S. compared to buying these components locally as importing components only increases costs and logistical concerns for what are already incredibly complex projects.

We have partnered with Linxon, headquartered in North Carolina, to provide a turnkey substation that will connect our first project to the ISO-NE grid. The substation work is going to utilize local union labor, with construction commencing later this year. The substation is expected to be commissioned in 2023 and will provide decades of local employment in operations and maintenance.

We've also partnered with Southwire, the company that will be leading the onshore cabling effort. The Vineyard Wind 1 project will require 32 miles of onshore cabling. As a result of our PLA, the installation of that work will be done by local union labor.

It's impossible to talk about our first project without mentioning the Jones Act. Vineyard Wind fully supports the Jones Act and will comply with its transport requirements. However, as we

look toward the immediate future, there are currently no US flagged jack-up installation vessels large enough to install the components for our first project.

For Vineyard Wind 1, we sought to turn these installation challenges into opportunity. We are working with DEME, one of the leading offshore wind construction companies in world to provide the large jack-up vessel we need to install the components of the project.

But in order to get components from the staging area at the Marine Commerce Terminal in New Bedford out to the DEME vessel, we've contracted with a U.S. based, union company called FOSS Maritime Company.

And like our other agreements, this is will likewise create good paying union jobs for American maritime workers and furthers our commitment maximizing American jobs in the industry.

Creating an Offshore Wind Ecosystem

We also recognize that it will take a thriving ecosystem of companies of all sizes if we are going to truly maximize the benefits of the industry, which is why we've also partnered with Greentown Labs, a startup incubator in Boston.

Through this partnership, we supported the Offshore Wind Challenge, a program designed to engage startups with promising technology to help us increase our ability to monitor and avoid marine mammals during all phases of the project.

Working with Massachusetts startups like SLCdrone and Rhode Island based Night Vision Technology Solutions, we've tested cutting edge technology that can significantly improve our ability to avoid endangered species.

Most importantly, the experience these companies now have will make them more competitive for work in the broader industry.

Potential Government Action

There are currently three bottlenecks that could slow the growth of this industry.

The first is port availability. Right now, there are only a handful of ports capable of serving as construction and staging areas for the OSW industry. Most ports are disqualified because they are obstructed by bridges, which prohibit access for jack-up vessels.

Industry and federal/state funds are needed for to improve port capacity, both for project construction AND manufacturing, if we are going to see the full deployment of offshore wind.

In our case, the Port of New Bedford, the only port in the U.S. specifically designed to support the infrastructure for offshore wind staging, has been supported by \$113 million in state

funding to build areas for offshore wind staging, create more room for other commercial vessels, and to remove contaminated materials.

In order to manufacture, pre-assemble and marshal for construction of these components you need ports with significant acreage and without overhead restrictions.

Unlike Europe and the Gulf of Mexico, the US Eastern Seaboard does not have a lot of these port facilities available, an aspect that will need to change if we are going to fully deliver the US jobs in this industry.

The good news is that there are many locations where ports could be built. The question becomes, WHO should do it. The lessons learned from Europe is that the most successful developments have been led by or involved public entities with a long-term view of maximizing the value beyond any one project.

Developers like Vineyard wind typically have a 3-5 year horizon when building a portfolio of projects and in my view ports are infrastructure in the same way as highways, bridges and airports. We need to take a similar approach to our ports as we do with other infrastructure projects and figure out how to maximize the value over 30-50 years.

The second challenge is the electrical grid. As the states and the federal government pursues a future with renewable generation significant investments are needed to transform the grid to be capable of handling increasing amounts of distributed generation, or in the case of offshore wind, enabling the grid to transport large amounts of power away from the coastline.

Development of new grid infrastructure is as complex as developing offshore wind projects and needs coordination and engagement from local, state and federal agencies as well as coordination across the agencies that oversee the electrical wholesale market such as FERC and regional Transmission operators.

A very important lesson learned from Europe has been that development of the grid infrastructure needs to run in parallel and sometimes ahead of a large-scale expansion of offshore wind generation. This is a significant challenge especially along the Eastern Seaboard and should in my own opinion be a key priority.

The third challenge is the significant need in recruiting and training a new workforce.

We need skilled workers developing the electrical grid on and offshore, scientists to study wildlife and plan projects so they have minimal environmental impact and engineers and scientists to design projects and components and operate them safely and effectively for 30 years.

Therefore, my message is that a significant effort across states and the federal government is needed to prepare a workforce that can work in this exciting new industry.

Furthermore, public investments are not about helping any one project or any one company. They're about helping an industry take root and keeping American workers working, building the next great energy infrastructure projects.

Conclusion

The Vineyard Wind 1 project represents a giant step forward for the US offshore wind industry, but it is only the beginning.

Over time, as workers gain experience in construction and operations and management, more jobs will go to local workers. And given the goals of both the Biden Administration and state governments up and down the East Coast, these are jobs that will endure for years and perhaps decades to come.

I look forward to the day when port cities that for too long have been left to die on the vine become thriving hubs of US construction and manufacturing, ones that hire locally and represent the people where these projects are being built.

We have the chance now to make this happen. We can't let the opportunity pass us by.

Thank you, and I look forward to answering any questions you may have.

Ms. SPANBERGER. Thank you very much, Mr. Pedersen. And I now turn the chair back to Chairman Keating.

Mr. KEATING. I would like to thank the vice chairman.

I will now recognize—and we are trying to do this to accommodate voting and since she hasn't voted on this yet, we will recognize—the chair recognizes Representative Titus, and we will check with Representative Schneider, where he is.

Representative Titus, you have 5 minutes for your questions.

Ms. TITUS. Thank you very much, Mr. Chairman, and thank you for holding this interesting hearing. I think we have a lot to learn from our European neighbors about how to develop this source of energy. We seem to be trying to move forward in renewable, but we seem to put most of our focus on solar. That is certainly true for Nevada. We have got lots of big, wide open spaces and we have wind, but the wind comes in short gusts. It is not this steady breeze that you find in some places where the industry is so successful.

First, I wonder if there are any companies or organizations or research and development that is looking at technology that will accommodate those kinds of weather conditions like we have in Nevada, and second, what can we do to partner and help countries like Kosovo, for example? I met with some people from there today. They are getting the political will to move off of coal and onto renewables, but they do not have the resources to do it. And we know if we are not there to help, China is only too willing to step in and build infrastructures. So if you could answer those two things, I would certainly appreciate it.

Anybody?

Ms. ZICHAL. Sure. I am happy to answer. I saw the chairman was speaking and I didn't want to speak over him.

Ms. TITUS. I am sorry. I didn't hear him.

Ms. ZICHAL. Yes. So let me answer your second question first, and your first, and we will go from there. You know, I think the point you make about partnering with other countries that are committed to pursue clean energy economies is something that is near and dear to our heart. In fact, we have opened a dialog with the Biden administration to look at what can they do through the international funding mechanisms, whether that is at the EXIM or DFC, how can we make sure to—how can we work together constructively to help other countries decarbonize.

So I think there is obviously the, you know, like our industries will do what we can as we have a global footprint to help countries deploy clean energy, but I also think there is an important opportunity to work with this administration and that is certainly something we have prioritized at ACP. And I think, you know, that those foreign dollars in investments can go a long way toward meeting our broader climate goals.

And, you know, for your question about technology, I mean the exciting thing about working in the renewable space is that there is just ongoing, whether it is storage, whether it is wind, solar, there is ongoing R&D, the technology continues to get better, and part of what we released in our report today was the significant decreases that we have seen in the costs of wind and solar, over 70 and 90 percent, respectively.

So we are going to continue on that trajectory, but to your point, we also know that we need to keep investing in research and development and our companies absolutely do that. I think, as I think about the challenge, the specific challenge in Nevada that you pose, you know, you are right that the wind doesn't always blow and the sun doesn't always shine, but I also think that is really what is exciting about the storage work that we are doing at our association, because those storage units and the projects that we can deploy with them can help create and store that energy so that you are evening out your ability to deploy the electrons when and where you need them.

So, you know, I would be happy to engage in a broader dialog with you, Congresswoman, but that is kind of where I see the big opportunity and the big play, frankly, coming down the pike.

Ms. TITUS. Great, thank you.

And was the chairman speaking? I didn't mean to speak over him.

[Inaudible.]

Ms. TITUS. Well, thank you then. I will yield back, Mr. Chairman.

Mr. KEATING. Thank you, Representative Titus. Just trying to determine if Representative Schneider has voted already in this series. Representative Schneider?

The chair recognizes then Representative Deutch for 5 minutes.

Mr. DEUTCH. Thanks very much, Mr. Chairman. I appreciate it. Thanks for calling this hearing and thanks also to the witnesses for your thoughtful and interesting testimony.

As the founder and co-chair of the bipartisan House Climate Solutions Caucus and a Member of Congress from south Florida, I know how, firsthand, how important it is that we embark on this transition to renewable energy with realism as much as with urgency. And I believe strongly—I believe strongly that pricing carbon will help us move forward along that path.

That is why I am proud to reintroduce the Energy Innovation and Carbon Dividend Act. By placing a price on carbon emissions, the U.S. can reach net zero carbon emissions by 2050 and turn a hundred percent of the net revenue back to American families. Legislation will help families afford any increase in energy costs. But the development of green technologies is also inextricably linked to energy security, so I am a strong supporter of clean, renewable offshore wind energy and I appreciated the witnesses' informative testimony.

I wanted, Ms. Zichal, I think, for you, I wanted to ask, given that a significant portion of clean energy technologies are manufactured using rare earth minerals, the market for that is monopolized by China. I am hopeful that the U.S. and EU can work to forge secure supply chains, recycling environmentally sound domestic development of these critical minerals. So I would ask, if I may, about the stance that EU-member countries in supply chain, with regard to supply chain monopolization of China and how the U.S. and EU can work together to secure supply chains and foster domestic development of rare earth minerals.

Ms. ZICHAL. Well, thank you for your leadership, Congressman, on the broader climate agenda. As head of a trade association that

thinks about energy and climate policy every day, we wouldn't be in the lucky place that we are without leadership from you and others on this subcommittee. Your question is obviously something that I wake up every day thinking about, which is how do we both address the challenge with China but also take advantage of this opportunity to create jobs. And I think there is a robust dialog happening with the administration about, you know, how do we—what is the set of incentives that we need to build a domestic supply chain.

And, you know, you are a thousand percent correct that, you know, critical mineral concerns are not going away overnight. So to that end, I think there is a couple things that we are doing. First and foremost, looking at creating domestic supply chains once the projects are permitted. So, you know, offshore wind companies are looking at this opportunity and saying, OK, how are we going to, you know, avoid the challenges that we have today in solar and wind and make sure that we are being really directive about our existing U.S. manufacturing presence.

And part of what is exciting to me is that there is this conversation happening in Congress and with the White House about those supply chain issues and I think we have a real opportunity with, you know, sort of some of the core elements in the bipartisan infrastructure framework as well as some of the components being considered for reconciliation, creating those incentives for facilities, equipment, and vessels, domestic production incentives; there is a suite of trade policies as well that we are working on with the administration.

And then funding in research and development. As you know well, you know, thinking about what are alternatives to these critical minerals, how do we invest in recycling, all of those pieces of the puzzle are things that our industry is investing on and obviously looking to leverage the important opportunity that we have sort of with the reconciliation package to make sure that the R&D piece of this as well as the domestic supply chain components are front and center as we are considering our priorities in the broader reconciliation package.

Mr. DEUTCH. Thanks very much. I appreciate the thoughtful answer. And this is, for all of the broad conversations we have about energy and renewables, this is a piece that we have to address as we go forward if we are going to do this in a really sustainable way.

So I appreciate the opportunity, Mr. Chairman, to engage in this conversation. This is a really important hearing. I am glad you are holding it. And I yield back.

Mr. KEATING. Thank you, Representative Deutch.

The chair will recognize Representative Cicilline for 5 minutes.

Mr. CICILLINE. Thank you very much, Chairman Keating, for calling this hearing. And as you all know, my home State of Rhode Island was home to the Nation's first offshore wind farm, helping to really diversify Rhode Island's energy grid and providing Rhode Islanders with clean and reliable electricity. So Rhode Island is really happy to be serving as a model with what offshore wind can mean for our future, a future free from fossil fuels, and I know it

will help inform work in other places like Massachusetts and all throughout our country.

And as I think you know, Mr. Chairman, we are really far behind our European counterparts in terms of installation and China not far behind them. In 2020, the U.S. had under 50 gigawatts generated from offshore wind, while the U.K. and China each had approximately 10,000. So we have to make real investments and a real commitment to renewable sources of energy and this is an opportunity, I think, for those of us in the Northeast, particularly, to really maintain a leadership position.

So I thank you, our witnesses. I mean Rhode Island, I think, has a great experience with respect to balancing this wonderful new energy source and the fishing industry. And I think we had a really good process that listened very carefully to the folks in the fishing industry, and I would love to know from you, Mr.—I am not sure of the best person to answer this. But, really, what has Europe done to work with commercial fishing interests to ensure that they can work responsibly while also expanding offshore wind installations, and are there things we have to be worried about beyond commercial fishing in terms of the broader impact to marine wildlife?

Mr. Dickson, you can—

Mr. DICKSON. Yes, indeed. Thank you very much, sir, for the question. So European offshore wind farm developers routinely consult the local fishing industries about the location and the layout of offshore wind farms. And there are examples of where we have changed the layout so that they can sail their fishing vessels between the rows of turbines to do passive and pelagic fishing. We talked to them also about compensation for any loss of catch that they might suffer.

But, in fact, our experience has been with offshore wind because there are so many mollusks growing on the turbines, there are four tons of shellfish on the foundations of each individual offshore wind turbine. Also the seabed is undisturbed because there is no bottom trawling, there is no dredging going on inside the offshore wind farm, so it is good for fish stocks, and many fishing communities end up welcoming the presence of an offshore wind farm.

What is crucial is that there should be, in the European case it is nationwide and perhaps in your case Statewide, agreements between the offshore wind industry and the fishing industry about how much offshore wind there is going to be, where it is going to be blocked, and what the deal will be for the fishermen. To give you one concrete example, the Dutch Government recently invited the Dutch fishing industry and the Dutch wind industry to a hotel on the coast of the Netherlands for 3 days, and they did not let them out until they had reached an agreement on the plan for offshore wind and its coexistence with the fishing industry for the next 10 years.

Mr. CICILLINE. Thank you. You know, I think one of the other things that has been remarkable is the support in the EU for offshore wind and for renewable energy products broadly comes really from all across the political spectrum. And I am wondering whether you have any advice for us, either you or Mr. Pedersen, on how we might be more successful at managing this kind of investment and

developing, really, nonpartisan support so that it doesn't become a partisan issue.

I mean it seems like one of the reasons the Europeans have been so successful is, you know, everyone understands the value of creating energy this way and we sure could use some advice how to make this more of a bipartisan issue.

Mr. DICKSON. Plugging the economic benefits especially on job creation and proactively engaging communities that are worried that they might be losing out from the energy transition, thinking people working in the oil and gas industry, coal miners, engaging those communities, re-skilling, retraining so they can work in wind and offshore wind. We are doing this actively in Poland, Romania, other countries in Europe. The oil and gas industry brings a natural set of skills and experience which serves very well in the offshore wind industry.

But it is through engaging communities, people who fear that they might miss out. In Europe we have this concept of the just energy transition where we go in, in the wind industry, to the shipbuilders in northern Poland, for example, to the coal miners in Poland, and say, "Look, you can come and work in our industry," and this is yielding success.

Mr. CICILLINE. Thank you.

And I know, Mr. Pedersen, that Vineyard Wind will have an opportunity to access some of the great talent in Rhode Island, particularly in the building trades, and we look forward to making sure your project is a success. And again, I hope you will be able to follow the example that Rhode Island set in the way to balance the importance of renewable energy and wind with protecting the rights of our fishing industry to continue to thrive. So I thank you again for being here.

And thank you, Mr. Keating, for calling this hearing and I yield back.

Mr. KEATING. Thank you, Representative. The chair recognizes Representative Pfluger for 5 minutes.

Mr. PFLUGER. Yes. In lieu of making everyone listen to my voice and the way that it sounds right now, I do have something to submit for the record. But I will say that I want to make a point that my district in West Texas has more wind energy in my congressional district than the entire State of California, yet the source, and I have talked to many European ambassadors, this source of energy is not always reliable.

Now that may not be the case when it comes to offshore, but onshore wind energy does not provide baseload capacity. Former Secretary of State Kerry said that in the hearing that we had with him recently when I asked him that question. And so I think it is important that as we develop an all-of-the-above approach to energy, in every European country that I talked to, especially those that are on the front lines of Russia, are very interested in affordable, reliable, consistent energy.

And so I appreciate this hearing, Mr. Chairman. I do have something to submit for the record, but I said that I would keep it short so I do not make it painful for people to listen to me. I feel much better than I sound. So again, thank you for holding this hearing. I do want to continue to focus on reliability, something that we

struggle with in this sector. So I will yield back at this time. Thank you.

Mr. KEATING. Thank you, Representative Pfluger. And as you are aware, you will have the ability to submit questions for the record in writing and get responses as well and that can be helpful and save your voice on this subcommittee, so I appreciate your effort.

The chair recognizes now Representative Phillips for 5 minutes.

Mr. PHILLIPS. Thank you, Mr. Chairman, and greetings to our witnesses. My home State of Minnesota is home to the Boundary Waters Canoe Area. Some of you may know it is the most visited wilderness area in the entire United States. And sulfide-ore copper mining is proposed for the wilderness's edge and it has the potential to flow directly into the heart of the Boundary Waters.

And while I am deeply concerned about the possible harm to habitats that support fish and game and thousands of jobs, I am equally concerned about the families that have relied on high-wage mining jobs for many generations. It is indeed a way of life in northern Minnesota. And I do not want to dismiss the threat that adoption of cleaner technologies poses to the economic livelihoods of residents in my State and in many parts of the country despite the importance of our migration to clean energy which I wholeheartedly support.

So my question to the witnesses is, in your respective experiences, how have you seen this change affect communities? What steps do you think our U.S. Congress can take along with private companies to ensure that communities who are displaced by climate initiatives, trade, and the transition to clean energy can be kept whole and actually prosperous in the future?

And whichever witness wants to start, I would welcome it.

Ms. ZICHAL. Well, Congressman, I actually worked in Babbitt, Minnesota for four summers.

Mr. PHILLIPS. Oh, wow.

Ms. ZICHAL. And know every 21-mile long shoreline of Birch Lake, so this issue is very near and dear to me and it is also something that I have a lot of respect for you on, right. I understand, you know, in northern Minnesota the challenges around identifying new job opportunities. But as I think about what we are doing in this country today by standing up offshore wind for the first time in this country, the kinds of the component parts, right, I mean if you just even think about the tens of thousands of pieces in an on-shore wind turbine, we know that pieces of those are fractured and manufactured in 48 States today.

And then you think about what the opportunity looks like for offshore wind and it is really exciting to me because it is not just the wind turbines. It is the fact that we are going to need to train an entire new work force to be able to go out to sea and build these turbines. And I think in that process we are going to have to figure—we are going to have to do things like the Offshore Wind Jobs and Opportunity Act so that we have the ability to train up and create those jobs and opportunities, whether that is, you know, in the middle of the country or on the coasts where these offshore wind turbines are going to be built.

Mr. PHILLIPS. Right.

Ms. ZICHAL. And that is what our industry is very focused on. I think, as I said previously, we have great opportunity with the conversation around the reconciliation package this year, and some of the incentives, tax policies as well as the training programs that are going to be so, so important as we are transitioning our work force.

And just as a random aside, I will be in your congressional district in approximately a week and a half, so—

Mr. PHILLIPS. Well, visit.

Ms. ZICHAL [continuing]. Looking forward to it.

Mr. PHILLIPS. We are supposed to be there too, but who knows at this stage.

Ms. ZICHAL. Exactly.

Mr. PHILLIPS. I appreciate your response and I couldn't feel—I feel exactly the same.

Mr. Dickson or Mr. Pedersen?

Mr. DICKSON. Yes. And thank you very much, sir. In Europe, on-shore wind farms pay taxes to the local municipal government so local communities are benefiting directly in a financial way. There are some models in some parts of Europe also whereby local citizens can take a financial share of the local wind farm. That works in some instances, not in all instances. But the key thing is to show the local communities as Heather has said that, you know, they benefit from this. It brings jobs. It brings investments. It brings revenues. And we like to think in Europe at least that there are not many industries that are investing in rural communities.

Mr. PHILLIPS. Yes.

Mr. DICKSON. Globalized industries tend to invest in the large metropolises.

Mr. PHILLIPS. Exactly.

Mr. DICKSON. And the wind industry is one of the few that is going out there into the often overlooked rural communities around Europe creating jobs and growth and that is very positive.

Mr. PHILLIPS. I appreciate it. And I see my time is running out, unfortunately, Mr. Pedersen. But I did want to raise that issue because I know that the miners and those who are being displaced do not want to work in call centers or work in the local supermarket. They want jobs of a similar dynamic and a similar interest, and I think we have a responsibility to elevate that and ensure that we provide those opportunities. With that I yield back, Mr. Chair.

Mr. KEATING. Thank you, Representative. I now turn the chair to our vice chairman, Ms. Spanberger.

Ms. SPANBERGER [presiding]. Thank you.

Thank you. The chair now recognizes Mr. Schneider for 5 minutes.

Mr. SCHNEIDER. Thank you. And I want to thank the chair and vice chair for holding this hearing and I want to thank our witnesses for joining us to share their experience in this important topic. And I just want to very briefly build on what others have already talked about and that is to make sure we are training our work force. The investment in wind energy has potential to create a very large number of quality jobs. We have to make sure that the right skills trained and the people in the right places.

And given your experience, and I will open it up to anyone on the panel, as Europe has gone through this process, what are some of the most important lessons we could learn as far as overcoming obstacles and clearing pathways for people to get the skills they need to succeed in the industry?

Mr. PEDERSEN. I can maybe offer just a few sort of observations from trying to put together the supply chain and the supplies from the first project. I think as Ms. Zichal also alluded to, I think the ecosystem of offshore wind supply chain is actually extremely diverse. Even for the first project, I think we have more than 50 American companies from 21 States responding to RFPs and delivering services and products to the first wind farm.

And I think once this industry becomes a truly American industry with manufacturing and engineers and scientists, et cetera, there is a lot of industries already that have similar and adjacent skill sets, but do not have the specific skill sets, so I think making sure that the projects move forward, making sure that manufacturing puts down roots in the U.S. is a key component in doing that. And then I think there needs to be a public-private partnership for a manufacturer of any component to make sure that they can get assistance and quickly getting a work force and getting a trained—I am sure Mr. Dickson can also speak to in Europe, which I also think will be replicated here.

We have seen a lot of ex-servicemen entering this industry because they are used to working in, you know, cross-disciplinary skills. They know electrical. They know electronics. They know mechanical. And you can then fit them into this industry because we need and then we can train them for the specifics of offshore. So I think No. 1 is getting the industry off and going and then the public-private partnerships to quickly transition, because a lot of the skill sets are here but we need to build on those and then make it specialized.

Mr. SCHNEIDER. OK, thank you.

Ms. Zichal or Mr. Dickson, any thoughts you want to expand on that?

Mr. DICKSON. If I could add to that, that it is very important that there are clear vocational qualifications frameworks for renewable energies and for the different industries within them. It is important that they should be designed with industry input and that the training and educational establishments should be following those frameworks. Yes, so that training people to have the skills that the industry needs.

I would echo what Mr. Pedersen has said, ex-servicemen and women or former coal miners make very good wind farm operatives. It takes us only 6 months in Europe to train a coal miner to be an onshore wind farm operative. Slightly longer for offshore wind. But we find with people who have come from the offshore oil and gas industry, they can be very effective in the offshore wind industry very quickly.

Mr. SCHNEIDER. Thank you. And I do not want to—Ms. Zichal, do you want to add something or?

Ms. ZICHAL. Well, the only thing that I would add quickly is that it is not, what we are seeing early days is it is not just the coal jobs that are transferable but, you know, for oil and gas workers

a lot of whether that is the construction of the actual Jones Act-compliant ships that are going to go and install these offshore turbines or the, you know, the opportunity that basically that there is a lot of skill overlap between the industries, and we very much as ACP are focused on engaging with labor unions to figure out like where can we find that sweet spot to partner together.

And I think the, you know, as things like establishing a grant program to spur offshore training, those kinds of policies as we are thinking about, you know, what we really need to do to stand up this wind industry is keeping in mind that it is a specialized work force but, you know, if we can build from what we have today, we are going to be better off.

Mr. SCHNEIDER. Great, thank you. I am out of time. I may submit some questions for the record, Mr. Chairman. But we talked about service members. We have a bill we are working on separately is Boots to Business, teaching service members to be entrepreneurs. One thing we would like to explore is the role of small businesses in developing Europe's offshore wind and if there is opportunities for U.S. small businesses to take advantage of that. And with that I yield back.

Ms. SPANBERGER. Thank you very much, Mr. Schneider.

The chair—

Mr. KEATING. Thanks, Madam Chairman. And as it happens, now I am going to send it back to you for your questioning, 5 minutes. Thank you for all the work you do in making this flow so smoothly, actually.

Ms. SPANBERGER. Thank you.

Thank you so much. OK, perfect. Thank you so much to our witnesses and to Chair Keating for arranging this important hearing. It is clear that offshore wind energy can be a job and clean energy creator and it presents a real opportunity for transatlantic cooperation. As we approach this issue, how we approach this issue will really shape American competitiveness on the world stage including any relations in China.

I am proud to represent Virginia's 7th congressional district, and while my district is not coastal, I am well aware of the opportunity offshore wind presents to my commonwealth. In June 2020, Virginia became the first State in the Nation to stand offshore wind turbines in Federal waters and our State is expected to be one of the Nation's leaders in terms of megawatts produced. Researchers also estimate that the offshore wind industry can create thousands of jobs in Virginia. These are high-paying jobs and the benefits will not only be felt on the coast.

So to followup on that point, Ms. Zichal, I was wondering if you could speak a bit to the fact that, you know, investment in offshore wind will certainly benefit coastal communities, but the potential economic benefit really can extend much farther beyond the coasts. How else can American workers and businesses benefit from the focus on offshore wind energy and could you briefly describe some of the downstream impacts that will be felt throughout the United States?

Ms. ZICHAL. Great. Thank you for your question. I also think it is—I want to thank you for acknowledging the important role that States like Virginia can play when it comes to not only solving for

clean energy but also creating new economic opportunities. That is obviously our sweet spot and something we focus on every day.

And, in fact, we as the American Clean Power Association did a recent analysis in looking at what if you were to deploy 30 gigawatts of offshore wind, you know, you have the opportunity to generate about 400,000 job-years over the next decade. And so you pair that with smart decarbonization policy and then kind of the investments we are talking about in worker training as well as support for, you know, manufacturing and development in our ports, then you can really think about the economic, those economic opportunities, you know, really taking a meaningful role in our port communities.

But we are also as some of the other witness mentioned, focus on what we can do to create jobs and focus on a just transition. You asked sort of how—what other benefits are there beyond economic benefits, and as I think about the ability to deploy clean energy, the ability to, you know, do that in a way that is not only looking at CO2 emissions, but in many instances our port communities have some of the most aggressive air quality challenges. So as I think about it, there is the economic piece of it, but then there is the public health and environmental aspect that I think are going to be a real win for Americans across the country.

Ms. SPANBERGER. Thank you so much.

OK, perfect. Thank you so very much.

Well, Mr. Zichal, it is too bad that Mr. Cicilline was not here to hear the wonderful shout-outs that you had for Virginia as he spoke so lovingly about his own State.

But I was wondering in the brief amount of time that we have left, if you could just be—you or Mr. Dickson could speak briefly to China's rapid growth in offshore wind and how we can ensure that the United States and Europe are best competing to ensure that the international market is diversified. Certainly, we see strides forward in wind energy as important, but I do want to ensure that we are watching potential international markets or some of the challenges that we might see with the rise of other powers in this space.

Ms. ZICHAL. Absolutely. And the United States should take a backseat to no one when it comes to the deployment of offshore wind energy. And, you know, but the fact of the matter is we are behind, which is why the decisions that are being made today are so important. Because if we want to build that domestic supply chain, if we want to be the leader we know America can be, we are going to have to get really clear and focused on what are the policies that we need in order to build that opportunity out.

But also equally important is the fact that we need certainty and predictability in the permitting process. We cannot wait 9 years to permit a single offshore wind proposal, right, like that is not a workable solution. So we want to focus on working with the administration as well to figure out how do we put in place like the permitting and leasing processes that are going to help us lay the strong foundation and create that certainty and predictability for this to be an attractive place for industry to invest and build out offshore wind.

Ms. SPANBERGER. Thank you very much.

Mr. Chairman, I yield back.

Mr. KEATING. Again, thank you for—this has actually gone through quite seamlessly. I put myself at the end trying to work this through in terms of questions, so I now recognize myself for some questions and I am glad I did. It gives me an opportunity sometimes that I do not always have.

I would like to try this and see if this helps. If there has been one common thread, particularly Mr. Dickson, Ms. Zichal, you emphasized time and time again today the need for certainty, predictability going forward. So what I would like to do, because I know these were tough waters to cross in our own domestic, you know, offshore wind project in Vineyard Wind, I know a lot of things happened. I mean you mentioned certainty of permitting. There is certainly a certainty in terms of some of the governmental tax credits and other things that are there to keep your capital investors together. Then unintended consequences, whether they be legislation or legal challenges that occur, it is very difficult.

So what I want to do is ask Mr. Pedersen, you have gone through this and continue to go through some of these challenges. Can you, you know, share with us some of the challenges in terms of certainty that we will fix? This is the first major project, commercial project, and we want to use it not to just get through but to learn from it. So if you could share with us some of the things you have had on your project or some of the things you encounter going forward to get to this point, and we have gone to a good point, and then I would like to ask Mr. Dickson and Ms. Zichal to react to the issues that you brought forward and maybe lessons learned.

So, first, I would like to ask Mr. Pedersen and then hopefully have Mr. Dickson and Ms. Zichal followup.

Mr. PEDERSEN. Thank you, Chairman Keating. Yes, it is true that especially the Vineyard Wind 1 project that has been through a challenge in making sure we got through the Federal permitting process, in particular. And I think as an example, and I think this is well-known that originally we were put into a Federal program that would yield an answer after 18 months and right before the finish line there was a decision to study a wider group of projects that then for this project meant that we ended up taking three and a half years.

And I think solutions need to be found that there is more predictability. No one can determine the outcome of a permitting process or stakeholders need to be consulted and/or voices need to be heard, but the timing is very key. And as an example, the Vineyard Wind project in the summer of 2019 was fully contracted. We had booked vessels because you need to do them ahead of time. We had bought raw materials as steel and contracted manufacturing slots. And of course that is a significant impact both in the financials of any project, but also for the confidence of the industry if there is not a predictable way of getting to a decision.

So I think permitting is absolutely key. I think great strides have been made in ensuring that the permitting is moving forward, but it is clear that with the growth of the industry, also stakeholder outreach, both the fishing community that has been raised here but I would also say other stakeholders living along the coastlines, thinking about how we can avoid that these stakeholders that may

not have as many resources as the companies like I am representing can be heard in a meaningful way and that hearings are not overly repetitive, but we can also ensure that we get a meaningful dialog across projects, across States. I think that is a key lesson as we scale up this industry.

Mr. DICKSON. One observation, Chairman, about China, if I may. China will build a lot of offshore wind and there is nothing we can do about that. That is what they want to do, fine. Good. The key thing is that we remain ahead of China in the quality of the technology and in the technology that we apply also to integrate wind power in the wider energy system.

And there has been much discussion about the question of reliability. Congressman Pfluger raised it. Congresswoman Titus raised it. The offshore wind turbines now have capacity factors of 50 percent or more so they are much more reliable than they used to be when wind energy started. In addition, we are investing in grid technology that helps us balance variable supply with variable demand. And the grid investments have a key role to play in managing the variability of wind power, whether offshore or onshore. The wind is always going to be blowing somewhere and the key thing is to ensure that the grid infrastructure allows us to transmit the wind where it is blowing to where it is needed by consumers, both household and industrial.

Mr. KEATING. Now before Ms. Zichal answers, it is just interesting to note to the importance of domestic supply and reliability there, because modification is necessary as certainly there was in the Vineyard Wind project. Modification is necessary and sometimes with China there is a history of not being that adaptable to that modification. And that is why I think one reason that is important to have a domestic supply is to have that potential too, because delays could be more costly in dealing with it. Particularly, as you were saying, Mr. Dickson, the interfacing with the grid and some of the other issues, it is not always a set program. So, Ms. Zichal, your thoughts?

Ms. ZICHAL. Well, I think, Mr. Chairman, you are a thousand percent spot on. As I think about what we need to do to stand up offshore wind in this country, there is sort of three legs. The first is supply chain incentives. How are we going to build the supply chain here in America and create those good jobs? The second is permitting and leasing. As I said, we need certainty and predictability. We need to make sure that the agencies are working together making timely decision and that those agencies are well-funded in order to deliver against that mandate. And then the last piece of it is that we need a trained work force. We do not have that today, so how are going to build that. What are the, you know, what is the role of Congress in identifying those new opportunities and, you know, looking at, you know the Offshore Wind Jobs and Opportunity Act and other programs like that.

So those are the three core components and, you know, I think that the challenge for us is whether we are in industry or in government, is trying to figure out like what are the collective solutions that we can bring to the table to make sure we do not miss this opportunity or that we outsource this opportunity to other countries like China. And that is what we are focused on and, you

know, we are really happy to have this conversation with you today because we are not going to fix this overnight and it is a complicated sort of 3D chess game, but something that we are as an industry really looking forward to working with you on going forward.

Mr. KEATING. And also, I mean that is an excellent way to summarize as we get near the end. But it also draws it into the importance of that kind of those three-legged stools are being in place, because I look at the Vineyard Wind project which I am most familiar with, and just in the course of that project technology changed and it changed dramatically. The size of the blades, they were able to adapt. So there is not reason to think the technology is not going to continue to change and make things more efficient. But that requires a support system in place as you are going through those changes.

So I mean you went through it, Mr. Pedersen, with the change in technology, and again Europe has been ahead of the U.S. in dealing with this and the technology changes that are there. But how important, what do we need for a basis knowing that technology is going to change as we go through? It is going to be changing in Europe too going forward, but it is going to be changing here. So what are some of the lessons learned there?

Mr. PEDERSEN. Technology development is a key component in maturing this technology and continues to drive down cost to the benefit of ratepayers, but also making sure that we utilize that valuable resource that is the outer continental shelf in the most efficient way. I mean I have worked in the European offshore wind industry and what I have seen in the U.S. over the last 5 years is all the skills are available, you know, there are some of the best universities in the world, some of the most high-tech companies' manufacturing capabilities are available, so I think if we can get a concerted effort on putting the pillars in, and I fully agree with what Ms. Zichal said, and then I would mention the ports, it is a marine construction industry. We are building very large, heavy, bulky components, and if we do not have those ports, we can't unlock the potential that this industry has for ratepayers and also for jobs and economic development.

So there is nothing that is missing. I am sure the technology will transfer because the market size is large enough and there will be a friendly competition with companies developing technologies on both sides of the Atlantic. And I think that is going to be the benefit of Europe and for the benefit of the U.S. in the long run.

Mr. KEATING. And I think that when you look at what has occurred in your project, in our project in New Bedford, one of the significant things, the Commonwealth of Massachusetts made a major investment too in that terminal on the port to be able to handle that ahead of time. So it shows how different levels of government working together are important. And you have had not just different levels of government in Europe, Mr. Dickson, you have also had different countries involved in cooperation in these areas. How important is that and what have you learned from your experience?

Mr. DICKSON. So one very small example, every country in Europe has different rules, different certificates for the health and

safety of workers involved in offshore wind. That is inefficient. It means that companies that are operating in several countries cannot deploy their workers in all of those countries. Each time they have to find local workers who have the relevant health and safety certificate. And we are working very hard with the national governments on this, "Please align your health and safety rules." Yes, it would save us a lot of money.

One other small observation on the permitting, it is so important that is always possible that the permitting rules always allow the most updated recent technology to be deployed, even if that is different from the technology that was specified in the original permit application. If the permit application has many years to go through, you may find yourself lumbered with an old technology that is much less efficient than the latest technology. You may even struggle to find manufacturers still making those turbines. So the permitting rules must allow that flexibility.

Mr. KEATING. That is a terrific point. And when you look at artificial intelligence and other changes that occur that is going to be a situation.

Just to followup and close the questioning with perhaps either Ms. Zichal or Mr. Pedersen reacting to what Mr. Dickson had just said in terms of any analogies to State or municipal governments and the importance of cooperation beyond the one I cited with the Commonwealth of Massachusetts making a major investment in that terminal in New Bedford.

Ms. ZICHAL. Yes, so I guess I almost, one big step back and say, you know, look at the history of the clean energy sector. We are a very nimble industry. Right now, today, we are putting projects on the books that are hybrid, you know, wind plus storage projects, and those wind turbines that technology continues to advance. Battery technology is changing like almost on a daily basis.

So, but what we have seen is, if we have got our, you know, Federal regulations and our State regulations aligned and we are able to, you know, let industry bloom because we are only going to continue to see cost decrease and technology improvements, it truly is about how do we take advantage of this opportunity across the board. How do we make sure we continue to create a nimble space for, you know, in the regulatory environment for new technology. Those are the things that are going to make or break us going forward.

And I guess I would just point to the very rich history of our being able as an industry to step up and to succeed in this space.

Mr. KEATING. Any closing thoughts, Mr. Pedersen, on that?

Mr. PEDERSEN. So, I mean I have hardly been part of any industry with as much excitement as the U.S. offshore wind industry is seeing right now. I think we see tremendous interest from global companies that want to work in this space and I think the opportunity is here and it is now. And I think if I take what Mr. Dickson says, I think really looking to those small things, trying to break down the barriers that have and can create massive inefficiencies both in terms of cost, but also in timing to move these forward and also while still allowing for the valuable input from all the stakeholders who will change to their ocean environment and a changed waterfront. I think if we can do that, I think U.S. offshore wind is

an industry with an extremely bright future. It is just one of the best places in the world to build offshore wind.

Mr. KEATING. Yes, part of my business school background is still relevant, as old as it may be, and that is the concept of project teams with different jurisdictions all sitting down together in the planning stage so that you are not having one regulatory agency or one jurisdiction make a decision and it is not sequential, you know, so that they are waiting for that to happen and then they are moving forward. If you can work as a project team going forward as I saw in some instances in Massachusetts where the State and the commonwealth was working with Federal officials and communication and timing things, it really could be, you know, a game changer in terms of giving more certainty.

So on that note, I want to thank you all. This is really, I must tell you the panel that we had just complement each other from different perspectives in giving advice is something I hope that we can call on in our committee in the future, the three of you, because I found through this hearing working through a challenging time of balancing other duties here on Capitol Hill, I found it extremely informative as to where we are, where to look in the future, what we can do to make things smoother going forward.

But I hope we can count on you too to continue to give this guidance. I think it will be extremely helpful. We have someone going through it in the U.S. right now, someone who has a U.S. perspective and an understanding of the Hill and politics as well, and someone in Europe that, you know, the trailblazers in this industry are in Europe and the similarities are there what we can learn from that experience and hopefully what we can cooperate together.

We mentioned at the outset, we will not have the ability, clearly do not have it now and will not have it in the near term of having a project, you know, having a production chain in personnel, trained educated personnel and in certain pieces of equipment available to us, so there is going to have to be cooperation across the Atlantic in this regard as we build our own production chain here in the U.S. on many of these things.

So there is great opportunities for jobs, great mutual benefit moving forward on this, and I know that it was important some of our members brought up the idea of China and a reminder to us, if we stand still they continue to go forward. And all those production chain issues that we might have seen through the COVID pandemic, all those port issues where they are trying to vertically integrate owning the ports, doing this, having greater control, we are going to face those problems if we do not move ourselves forward. And the greatest partners to have in this are our transatlantic partners. And if we work together on this, we will put ourselves, and when I say ourselves, I do not just mean the U.S., the U.S. and Europe in a much stronger position.

So I think that is one of the messages going forward as we look at things on an international sense. And I want to thank you. I want to thank the vice chair, if you have any closing remarks, you are welcome. But thank you for making this a seamless hearing, turning out much better. I even had members, by the way, on the floor as we tried this for the first time say, we should do this more

often. This is easier. So thank you so much for being a part of this and I hope we can count on your wisdom and experience going forward. With that this committee is adjourned.

[Whereupon, at 3:31 p.m., the subcommittee was adjourned.]

APPENDIX

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U.S. HOUSE OF REPRESENTATIVES
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Subcommittee on Europe, Energy, the Environment, and Cyber

William R. Keating (D-MA), Chair

July 29, 2021

TO: MEMBERS OF THE COMMITTEE ON FOREIGN AFFAIRS

You are respectfully requested to attend an OPEN hearing of the Committee on Foreign Affairs, to be held by the Subcommittee on Europe, Energy, the Environment, and Cyber via Cisco WebEx (and available by live webcast on the Committee website at <https://foreignaffairs.house.gov/>):

DATE: Thursday, July 29, 2021

TIME: 2:00 p.m., EDT

SUBJECT: Renewable Energy Transition: A Case Study of How International Collaboration on Offshore Wind Technology Benefits American Workers

WITNESS: Mr. Giles Dickson
CEO
WindEurope

Ms. Heather Zichal
CEO
American Clean Power Association

Mr. Lars Thaaning Pedersen
CEO
Vineyard Wind
Co-CEO
Copenhagen Offshore Partners

By Direction of the Chair

To fill out this form online: Either use the tab key to travel through each field or mouse click each line or within blue box. Type in information.

COMMITTEE ON FOREIGN AFFAIRS

Note: Red boxes with red type will NOT print.

MINUTES OF SUBCOMMITTEE ON Europe, Energy, the Environment, and Cyber HEARING

Day Thursday Date 07/29/2021 Room Cisco Webex

Starting Time 2:09pm Ending Time 3:31pm

Recesses ☐ (____ to ____) (____ to ____) (____ to ____) (____ to ____) (____ to ____) (____ to ____)

Presiding Member(s)

Chair William R. Keating
Rep. Abigail D. Spanberger, Vice Chair

Check all of the following that apply:

Open Session ☒

Executive (closed) Session ☐

Televised ☒

Electronically Recorded (taped) ☒

Stenographic Record ☒

To select a box, mouse click it, or tab to it and use the enter key to select. Another click on the same box will deselect it.

TITLE OF HEARING:

Renewable Energy Transition: A Case Study of How International Collaboration on Offshore Wind Technology Benefits American Workers

SUBCOMMITTEE MEMBERS PRESENT:

See Attached

NON-SUBCOMMITTEE MEMBERS PRESENT: (Mark with an * if they are not members of full committee.)

HEARING WITNESSES: Same as meeting notice attached? Yes ☒ No ☐

(If "no", please list below and include title, agency, department, or organization.)

STATEMENTS FOR THE RECORD: (List any statements submitted for the record.)

Mr. Giles Dickson's Testimony
Ms. Heather Zichal's Testimony
Mr. Lars Thaaning Pedersen's Testimony
Representative August Pfluger's Statement for the Record

TIME SCHEDULED TO RECONVENE _____

or

TIME ADJOURNED 3:31pm

Clear Form

Note: If listing additional witnesses not included on hearing notice, be sure to include title, agency, etc.

Benjamin Cooper
Subcommittee Staff Associate

WHEN COMPLETED: Please print for subcommittee staff director's signature and make at least one copy of the signed form. A signed copy is to be included with the hearing/markup transcript when ready for printing along with a copy of the final meeting notice (both will go into the appendix). The signed original, with a copy of the final meeting notice attached, goes to full committee. An electronic copy of this PDF file may be saved to your hearing folder, if desired.

HOUSE COMMITTEE ON FOREIGN AFFAIRS
EUROPE, ENERGY, THE ENVIRONMENT, AND CYBER SUBCOMMITTEE HEARING

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STATEMENT FOR THE RECORD

Congressman August Pfluger

Remarks

HFAC Europe, Energy, the Environment and Cyber Subcommittee

According to the IEA World Energy Outlook there are still currently 1 billion people in the world – 13% of the total population – with no access to electricity, mostly in Africa and Asia. In sub-Saharan Africa, it is estimated that approximately 600 million people live without electricity, against the 350 million people who lack access in Asia.

LNG will play the leading role in helping reach these folks and provide them with a clean, reliable, and affordable source of energy that will empowering developing nations. If we're serious about ending energy poverty and promoting economic prosperity is to embrace reliable and affordable energy sources.

Thankfully, our nation is blessed with an abundance of natural resources and a strong innovative spirit that encapsulates the American character. There is nowhere that is more evident than in the district I represent, the Permian Basin, where we lead the nation in affordable, reliable, and clean energy production that has revitalized our economy and fundamental changed the global energy landscape.

The hard work done by the men and women in the Permian and across the oil patch has helped lift a billion people out of poverty, provided the means to drive technological and scientific advancements, shored up our energy independence, provided our allies with dependable energy sources, and led the reduction in US emissions using natural gas by more than a billion tons.

Lifting people out of energy poverty and providing the stability of energy security is only feasible if those energy sources are reliable and affordable. We have that now.

How do you propose to address the disproportionate impact a renewable energy transition has on developing countries that do not have widespread energy access to begin with?

I am concerned with this administration and my colleagues' hellbent pursuit of policies that will not only harm our domestic production but jeopardize all of these things just mentioned.

Earlier this year the Biden Administration signed an executive order that would force our international development agencies to prioritize energy projects that better fit their narrative for climate at the expense of other cheaper, more affordable sources.

We have already seen impact in my home state of Texas earlier this year when you have an overreliance on intermittent and unaffordable energy sources, and we continue to see the impacts in states like California today.

In Europe, Germany receives approximately 37% of their electricity from wind/solar and have energy costs 3X US prices. Yet, the Germans are still advocating for the Nordstream II pipeline to be completed because renewable energy is too expensive and unreliable.

Clearly, the Europeans have identified that fossil fuels and LNG will continue to play a major part of their energy future for many years to come. So much so that some are willing to get it from thuggish regimes that coerce their neighbors, violate international agreements, spread discourse and discontent, and undermine democracies.

Not to mention that Russian gas produces substantially higher emissions.

At the same time, the Administration last week announced a deal on Nord Stream II that completely dismisses the energy and security needs of our most vulnerable allies and partners and ignores the reality of the facts on the ground.

While, among many things, signaling to Ukraine that some can have the reliability and affordability that LNG offers while others will have to rely on unreliable, expensive technologies that are decades away (if ever) from being a suitable replacement.

Furthermore, the Chinese Communist Party dominates large swaths of the renewable supply chains. As we prioritize these ideological energy sources over fossil fuels, we are driving further dominance and dependency on the PRC.

What are the real costs of increasing use of renewable energy? Is it more important than combatting energy poverty or stemming Russia or China's malign influence and market dominance?