

#MoreWindNow

Scaling up the American wind industry



SIEMENS Gamesa
RENEWABLE ENERGY

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Step 1: Expedite sensible implementation of IRA policies

Executive summary

With the enactment of the Inflation Reduction Act (“IRA”) in August 2022, the United States signaled its commitment to reducing emissions in line with the Paris Climate Agreement. The IRA’s reach extends across industries and, in particular, across energy technologies. Its primary achievement in the energy and climate space is the unprecedented provision of public incentives for clean energy deployment and manufacturing capacity. These incentives provide the necessary long-term certainty required by wind industry stakeholders to make large capital investments in the U.S. market, which will in turn create jobs and economic opportunities for communities across the country.

New policy has put the U.S. on a path to reduce its net greenhouse gas emissions by approximately 40% to 42% by 2030. However, significant work remains to be done to build on the policy framework that is now in place.

An expanded U.S. wind market still faces several challenges, including:

- current uncertainty regarding the rules and eligibility requirements for new incentive programs, thereby limiting the ability for industry players to make significant investment decisions in the near term;
- the macroeconomic impacts on offshore wind projects that result from lengthy durations between wind energy procurement auctions and project construction;
- a growing gap between qualified workers and positions available in the domestic manufacturing of wind turbine components and the construction, operation, and servicing of wind-energy projects;
- long and unpredictable permitting processes that limit project viability and transmission infrastructure; and
- inadequately balanced risk-reward structures between developers and wind-turbine manufacturers.

These barriers must be cleared to scale up the American wind industry. Federal incentives alone will not solve the problem. Indeed, the wind industry must itself address several key challenges, but it is critical that the United States pursue additional

policies that enable industry to achieve ambitious deployment objectives, provide clean energy, and create American jobs.

Siemens Gamesa is asking U.S. policymakers to:

- provide expedient clarification on U.S. tax incentive programs that give developers and manufacturers the flexibility to become eligible and promote wind-energy deployment, consistent with statutory requirements and objectives;
- acknowledge the impacts of long durations between auction results and projects for offshore wind by including compensation mechanisms for costs that are subject to high inflation;
- connect communities across the country to employment opportunities in the wind industry;
- provide public support for workforce development programs that meet a common set of standards agreed upon by the wind industry and thereby maximize basic workplace safety and technical training;
- maximize clean-energy deployment over the next ten years by streamlining permitting processes for clean-energy projects and transmission infrastructure consistent with environmental law; and
- incentivize the construction of transmission infrastructure to bring new and pending wind-energy capacity online.



Wind must play a key role in the energy system of the future

Since its inception in the 1980s, the wind industry has established itself as a critical source of clean, renewable energy – a role it must maintain into the future. Going forward, the continued growth of the global wind industry will prove ever more important, with [DNV estimating that 5.6 terawatts of onshore wind energy and nearly three terawatts of offshore wind must be generated](#) to achieve a “pathway to net zero” scenario by 2050.

Wind energy also plays an important role in energy sovereignty and security. The global energy crisis resulting from Russia’s war of aggression against Ukraine has already displayed the negative impacts of energy systems reliant on fossil-fuel resources, as these are subject to unpredictable costs and the

volatility of geopolitical conflict and crisis. Countries around the world must diversify their energy resources and their economies with renewable energy to shield themselves from unforeseen disruptions to fossil-fuel supply.

Governments around the world have taken a growing interest in further expanding renewable capacity. Many have moved to bolster existing policies and implement new ones, but such policies must spur a dramatic increase in the deployment of both onshore and offshore wind energy. They must also bolster new domestic supply chains and create jobs, both in the manufacturing of wind turbine components and the construction, operation, and servicing of wind-energy projects.

An opportunity for global collaboration

The decarbonization of the United States energy market is critical to any realistic scenario in which global emission-reduction objectives are achieved. As a global wind-industry leader, Siemens Gamesa already offers existing onshore wind-component manufacturing capacity in the U.S. In 2021, it became the first original equipment manufacturer (OEM) to commit to the development of an offshore wind-blade facility on U.S. soil. Given ongoing supply chain constraints and inflationary pressures faced by wind turbine manufacturers, the IRA is critical to reinforce those investments and expand supply chain capacity.

At the same time, many countries and regions around the world are on the same journey to enable an energy transition that addresses global climate change and ensures energy

security. The scale of renewable deployment required to achieve our global objectives will open opportunities for – and in fact necessitates – collaboration among governments to create regional manufacturing capacities.

To that end, Siemens Gamesa encourages policy development on a global scale – one which:

- creates attractive financial conditions for investment in clean energy;
- establishes market frameworks that support wind turbine manufacturers and suppliers; and
- sets renewable procurement auction criteria that go beyond pricing and make sustainability and innovation fundamental requirements.



In 2021, Siemens Gamesa became the first original equipment manufacturer to commit to the development of an offshore wind-blade facility on U.S. soil.





Remaining policy and industry barriers must be addressed to capitalize on U.S. investment in clean energy.

The puzzle pieces are in place – now is the time to act

The long held promise and potential for widespread wind-energy deployment in the United States is now an achievable reality. With a policy framework in place to support the deployment of wind and other forms of renewable energy over the next decade, U.S. policymakers and industry now have a once-in-a-lifetime opportunity to build a future in which the United States reaches its climate goals.

The availability of durable federal support has created a favorable – and measurable – investment climate for clean energy technologies. According to a recent Wood Mackenzie report, [the U.S. now represents the second-largest market in the world for new renewable energy capacity through 2031](#). For wind, Rystad Energy estimates that [the U.S. may now deploy 280 gigawatts of new onshore wind capacity](#) (relative to 193 gigawatts projected prior to the IRA), resulting in an additional \$160 billion in new investment by 2030. Already, over \$40 billion of capital investment and [over 13 gigawatts of new clean energy capacity have been announced since August 2022](#), according to the latest American Clean Power (ACP) association report.

Federal incentives are not, however, a silver bullet, as the wind industry still faces headwinds that limit profitability and subject wind turbine manufacturers to risks exceeding those faced by manufacturers in other industries. Contributing

factors include persistent demand for wind turbines with higher capacity and output, technical issues resulting from demand pressures, and supply-chain bottlenecks caused by global events. These challenges limit wind turbine manufacturers' ability to invest in new technologies and manufacturing capacities that would deliver the green energy transition. But there is something that can be done to help offset the risk: rebalancing the existing risk-reward structures between developers and wind-turbine manufacturers.

The viability of wind-deployment and climate objectives is threatened so long as Western wind turbine manufacturers continue to struggle financially. Although there are issues the wind industry must itself address, government must also introduce additional policies that provide certainty, foster investment in innovative technologies, and reinforce the financial sustainability and resiliency of the industry. Only then will the United States fully capitalize on the public and private investments that are expected over the next ten years.

Remaining policy and industry barriers must be addressed to capitalize on federal investment

Clean energy in the United States is at an inflection point. As such, Siemens Gamesa encourages U.S. federal policymakers to further prioritize policies that strengthen the long-term viability of the U.S. wind industry.

Step 1: Expedite sensible implementation of IRA policies

The challenge: Federal incentive-structure and eligibility requirements need clarification

The IRA establishes federal incentives to support the deployment of renewable energy technologies and enable investments in domestic manufacturing. The law's statutory language, however, leaves it largely up to the U.S. Department of the Treasury ("Treasury") and the Internal Revenue Service ("IRS") to determine how the incentive programs will work in practice.

Understanding the specifics on how taxpayers can qualify for available incentives is critical for wind industry players to make significant investment decisions – for renewable energy projects as well as for manufacturing facilities. Making such decisions requires long-term certainty. For that, the wind industry needs a full accounting of eligibility requirements for various tax provisions, particularly for the production and investment tax credits for renewable electricity as well as the Advanced Manufacturing Production Credit for wind-energy components produced in the United States. Clarity on the rules surrounding these incentives would bolster U.S. supply chains.

The theoretical clock has already started ticking on the ten-year availability of federal incentives. The sooner Treasury and IRS provide clear guidance, the sooner wind industry players can finalize investments in new manufacturing and electric generating capacities. Time is of the essence, because as the window to receive federal incentives narrows, the less attractive projects become for investors. As such, Treasury and IRS must provide guidance without delay.

The solution: Provide long-term certainty on the rules of the road

Enabling U.S. supply-chain growth and sustainability requires expedient clarification on the rules related to prevailing wage and apprenticeship requirements, U.S. domestic content requirements, and U.S. wind-turbine manufacturing incentives. Siemens Gamesa also encourages Treasury and IRS to enable flexibility for project developers and manufacturers in achieving eligibility for federal incentive programs – flexibility that maximizes deployment while complying with the relevant rules to ensure domestic job growth and use of U.S. content.



Step 2: Acknowledge global macroeconomic impacts of inflation on offshore project construction

The challenge: Long durations between auctions and project construction leave projects vulnerable to dramatic cost increases in periods of high inflation

Offshore wind projects are typically contracted to supply electricity at an agreed-upon price four to seven years before projects are built. In periods of low inflation, this is of minimal concern. However, in periods of high inflation, longer durations for offshore wind-project construction expose developers and manufacturers to rising costs that can exceed projected revenues and reduce already limited margins for wind turbine manufacturers.

World events over the past several years, including both the pandemic and Russia's war of aggression against Ukraine, are prime examples of how unforeseen factors can strangle supply chains and negatively affect the sustainability of industries. In the wind industry, manufacturers have borne the brunt of these unforeseen costs. Although new federal incentives will help to address these concerns, they cannot mitigate them

entirely. As such a consistent state-by-state approach is also required to address inflationary impacts.

The solution: Provide inflation compensation mechanisms in offshore wind procurements

State procurement authorities purchasing electricity derived from offshore wind projects must acknowledge the impacts of high inflation periods between the time a project is bid out and the time that the project is ultimately constructed. Siemens Gamesa recommends that those entities include specific inflation-compensation mechanisms in contracts with offshore wind developers, including the indexing of material, transport, and labor costs. Several states have offered escalation mechanisms in prior procurements, and we encourage all U.S. states to adhere to a similar model in future procurements to ensure that offshore wind projects in the public interest remain profitable. Without indexation measures of this kind, developers may reduce their ambition as project costs outpace initial financial planning.



Step 3: Address the growing wind workforce gap

The challenge: More workers are needed for the U.S. wind market to grow

To bring about the clean energy transition, thousands of workers currently outside the wind industry or still enrolled in educational programs will need to be recruited and trained. Prior to the enactment of the IRA, BW Research Partnership estimated that wind turbine technicians would experience the greatest labor-supply gap over the next decade, with a need for 18,069 wind turbine service technicians compared to 5,860 technicians employed in 2020 – to say nothing of workers needed for manufacturing and construction. Furthermore, the expected deployment growth resulting from the IRA may only widen the expected workforce gap. What’s more, the nascent U.S. offshore wind industry is also estimated to require an average of between 15,000 and 58,000 full-time jobs each year from 2024 through 2030, according to the U.S. National Renewable Energy Laboratory.

The global wind industry, however, is struggling to attract the number of candidates necessary to match the expected growth of the industry. The United States is no different, as it too faces a growing shortage of available workers with the requisite education and training to fill positions in the onshore and offshore wind segments. The shortage affects positions in areas ranging from the manufacturing of wind-energy components to the construction and operation of onshore and offshore wind projects, as well as R&D. Moreover, within an already limited pool of workers, high rates of attrition between wind industry participants have exacerbated the issues that both developers and wind turbine manufacturers face in recruiting the necessary workforce.

This workforce gap represents an existential threat to the growth of the industry. Put simply, the deployment goals of the clean-energy transition are at jeopardy as long as the wind industry is unable to recruit the required workforce to construct and maintain projects.

The solution: Leverage government policy to connect workers to opportunities in the wind industry

The competition for workers between industry sectors is expected to persist well into the future. As such, the wind industry will need to do more to attract a diverse workforce of both blue- and white-collar talent. Policymakers can work in partnership with the industry to grow the available workforce in the following ways:

- provide federal funding for the training of wind industry workers that meets a common set of standards agreed upon by industry, and thereby maximize basic workplace safety and technical training that applies across publicly and privately funded training programs;
- provide federal funding for regional training centers with equipment and expertise provided by industry stakeholders; such training centers could further expand the pool of qualified workers available to wind industry stakeholders; and
- leverage existing federal policies and programs to provide training for veterans, underserved communities, and communities affected by the energy transition, and to attract workers across both blue- and white-collar job functions to the wind industry.



Step 4: Streamline permitting processes and transmission build-out

The challenge: Permitting uncertainty and insufficient transmission infrastructure threaten to undermine public and private investment in wind-energy deployment

In the United States, [renewable energy projects take an average of 4.5 years to receive the necessary permits to begin construction](#). This number can reach as high as eight to ten years for offshore wind projects. Project developers are also often subjected to delayed timelines with limited clarity on when the appropriate permits will be approved.

The uncertainty created by these delays has a cascading effect, as the wind industry requires a project pipeline with clarity on volumes, timelines, and budgets in order to be sustainable over long periods of time. For wind turbine manufacturers, uncertain permitting timelines can cause production delays at manufacturing facilities, risking local jobs and, in the case of inflationary effects, exposing manufacturers to higher procurement costs than originally anticipated.

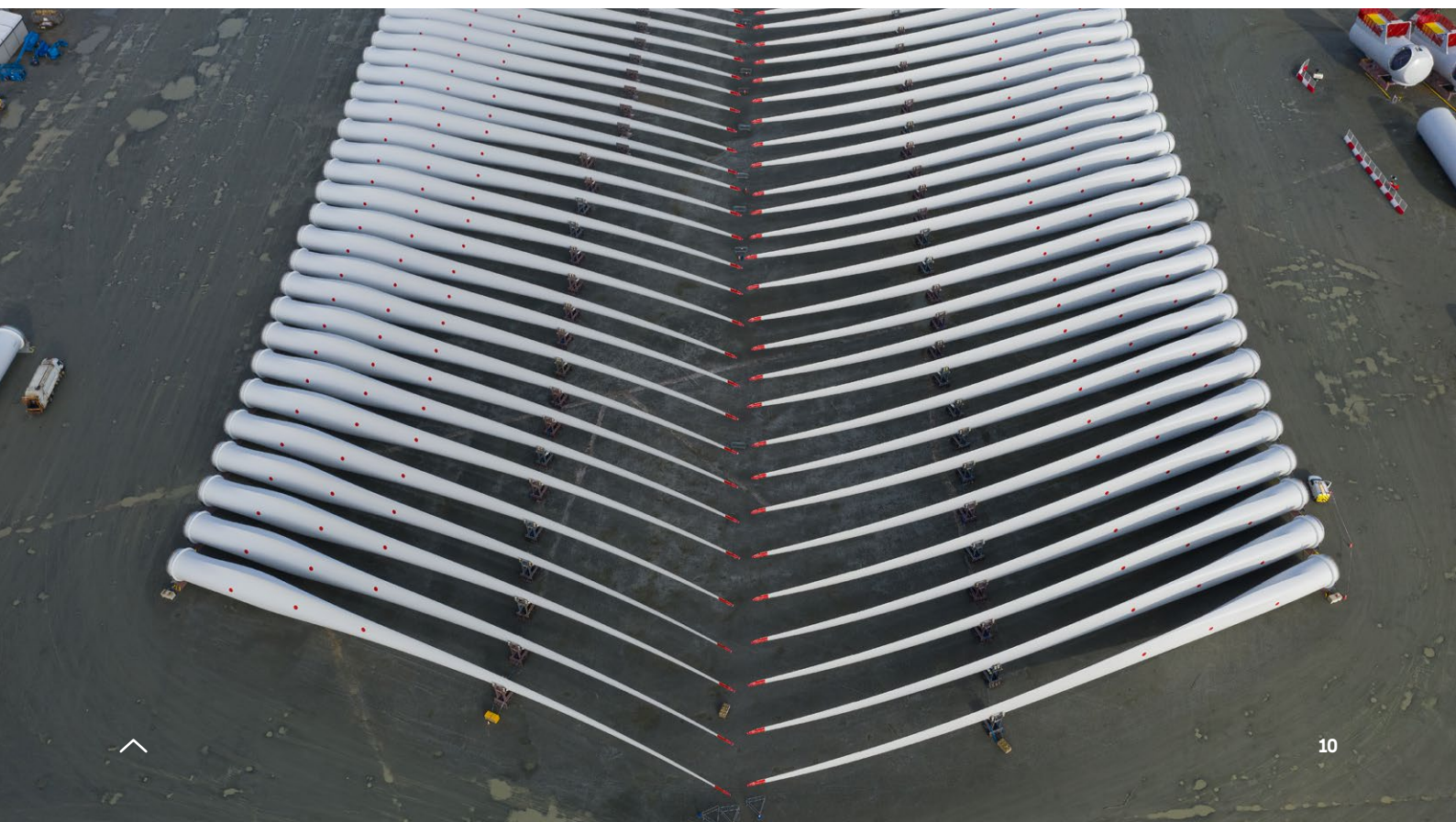
Once projects are permitted, action is also required to ensure that the necessary transmission infrastructure exists to transport renewable electricity from the project site to where it is ultimately used. The amount of electricity waiting in interconnection queues in the United States already exceeds the existing capacity of the entire power-generation fleet. This problem is exacerbated for renewable resources, including

wind, for which the Lawrence Berkley National Laboratory measured [231 gigawatts waiting in interconnection queues relative to only 132 gigawatts of existing capacity](#) as of 2021.

The solution: Create a streamlined process that recognizes the imperative to both deploy wind energy and uphold environmental principles

To maximize clean-energy deployment, there needs to be a build-out of new transmission infrastructure and clean energy projects at an unprecedented rate and scale. Furthermore, reforms need to be put in place that streamline the process and provide certainty for project developers on permitting timelines. By not taking additional action, [the United States could fall 100 gigawatts short of the projected growth of clean energy](#).

Examples of potential actions to expedite deployment include the codification of streamlined processes related to environmental review, instituting two-year maximum time limits for environmental reviews, increasing interagency coordination, and standardizing the review process to avoid time-consuming redundancies. Each of these actions can be taken without undermining bedrock environmental statutes that require a thorough review of new project construction and transmission projects.



The United States stands on the precipice of building a true clean energy economy

The path to achieving the United States' clean energy ambitions has never been clearer. The stage is set for a long-awaited transition to clean energy that will create hundreds of thousands of jobs, empower communities, and secure U.S. leadership on the global stage in the fight to mitigate the impacts of climate change. To make the most of this opportunity, U.S. policymakers must act decisively to cultivate a policy ecosystem that addresses the remaining barriers to clean-energy deployment.



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