BEYOND SOLAR: UNCOVERING POST-IRA TAX EQUITY OPPORTUNITIES IN CLEAN ENERGY TECHNOLOGIES

A DISCUSSION WITH FOSS & COMPANY AND WOOD MACKENZIE.

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TAX CREDIT SPECIALISTS
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Wood Mackenzie

It's not hyperbole to say that the investment tax credit (ITC) and production tax credit (PTC) have provided the financial resources necessary for the rapid growth of wind, solar, and more recently, energy storage across America.

There are myriad reasons why tax credits and the equity financing they enable have emerged to take such a central role in the transition to a decarbonized electric power system. Renewable energy developers building capital intensive projects lack the tax liability to monetize the tax credits their projects generate. Tax equity partnerships, however, have allowed clean energy developers to team up with large financial institutions and a growing list of corporations and other investors to provide the necessary upfront investment clean energy projects require.

In exchange, investors can use a project's tax credits to reduce their tax liability. There are other benefits investors can reap beyond reduced tax bills. Entering a tax equity partnership may also allow the financier to claim the project's depreciation benefits, scope 2 emission reductions when an investor is using a project's electricity, and renewable energy credits (RECs). Perhaps most importantly, tax equity financing of renewable energy projects has delivered stable and attractive profits to investors.

THE IRA INFLECTION POINT

Many observers of the clean energy transition in the U.S. have rightly pointed to the 2022 passage of the Inflation Reduction Act (IRA) as an important inflection point. Among other measures, the IRA provides long-term investment certainty by extending both the ITC and the PTC. In the past, short-term and last-minute extensions of clean energy tax credits have introduced risk and uncertainty that limited investments.

But the IRA did far more than just provide confidence that tax credits will be available for years to come. The IRA also expanded the types of clean energy technologies that can access tax credits and introduced greater flexibility around how the credits can be used.

Combined with increasingly favorable economics, state policies incentivizing clean energy, and corporate decarbonization commitments, the IRA's generous incentives are forecast to massively expand U.S. clean energy deployments. Indeed, according to analysis by Wood Mackenzie (WoodMac) the U.S. will see nearly 600 gigawatts of renewable capacity additions over the next decade, including 48 gigawatts of renewables to power green hydrogen.

While this dramatic post-IRA expansion of renewable energy capacity is a positive development in reducing U.S. greenhouse gas emissions, it also raises important questions about the future role of tax equity financing. For example, it is unclear whether there will be enough tax equity financing to meet the huge demand, which is now driven by traditional solar, wind, and energy storage projects as well as a growing menu of eligible technologies like carbon capture, utilization, and storage (CCUS) and hydrogen.

In fact, WoodMac forecasts that the demand for renewable tax equity financing will double by 2029. In 2023 renewable and green hydrogen demand for tax equity financing was about $18.6 billion. By 2032, however, WoodMac forecasts that annual demand for tax equity financing will reach $45 billion. Over the next decade, the total supply of tax equity financing is expected to be in the range of $342.6 billion and $497.4 billion. While WoodMac's analysis finds that this supply would be sufficient to meet rising demand from the energy sector, stiff competition for tax equity financing is also coming from domestic renewable energy manufacturers and the developers of low-income housing.

WOODMAC FORECASTS THAT ANNUAL DEMAND FOR TAX EQUITY FINANCING WILL REACH

$45 BILLION

THE TRANSFORMATIVE IMPACT

IRA'S TAX CREDIT TRANSFERABILITY PROVISIONS

Even before the passage of the IRA, the supply of tax equity financing for renewable energy projects was mostly limited to sophisticated tax equity investors, constraining access to a small pool of well-capitalized entities. The question now is whether the supply and demand imbalance will be exacerbated by the IRA's expansion of tax credit availability. Indeed, the ability to leverage the ITC or PTC along with domestic content adders and the Energy Community Tax Credit Bonus can make once uneconomical projects financially viable, thereby increasing demand for tax equity financing. Nonetheless, changes to how tax credits can be monetized may be sufficient to increase supply to meet growing demand.

Understanding how this supply and demand balance may evolve requires grasping the IRA's tax credit transferability provisions. Before the IRA's passage, tax equity partnerships were the primary tool for investors to finance renewable energy projects of all sizes. Those who held the tax credits were largely barred from transferring or selling them. This lack of flexibility in monetizing tax credits created enough friction to limit their use.

The IRA's transferability rules significantly simplify accounting and make it possible for renewable energy developers to monetize their tax credits in a low-cost and simple manner. According to WoodMac, the transferability rules introduced by the IRA will increase the tax credit financing supply by 119% over the next 10 years. Transferability is projected to add nearly $260 million in capital to the market and is enough to exceed demand in the energy sector by $13 billion annually through 2032.

The rapid emergence of the transferability market is driven by multiple factors. For instance, corporations of all sizes have made ambitious environmental, social, and governance (ESG) pledges, including greenhouse gas emissions and net-zero goals. Transferability can help companies achieve their ESG goals in a relatively straightforward way.

It is not inconceivable that the tax credit transferability market will surpass the market for tax equity partnerships, although it's likely that many future transactions will involve both a partnership and a tax credit transfer (more about innovative tax equity structures to follow). WoodMac forecasts that tax equity partnerships and tax credit transferability together will provide more than enough financing to meet the demand from renewables and green hydrogen over the next decade. The forecast, however, comes with the caveat that demand for tax equity financing from other sectors will continue to be fierce.

The clearest indication of the transformative nature of tax credit transferability is how quickly transaction volumes ramped up after the Internal Revenue Service (IRS) issued its guidance about their use in 2023. The fourth quarter of 2023 saw large numbers of corporations scrambling to purchase tax credits to reduce their estimated tax liabilities. WoodMac's forecast of continuing long-term growth in the tax credit transferability market underlines how foundational this IRA provision is for renewable energy financing.

INNOVATIVE TAX EQUITY STRUCTURES

A GUIDE FOR NEW INVESTORS

As important as tax equity partnerships have been in the growth of renewable energy in the U.S., they were never going to be sufficient to fully finance America's energy transition. Tax equity innovation was always going to be necessary to incentivize and scale investor participation.

The IRA's transferability provisions are an important step in that direction, though not a silver bullet. In fact, while transferability simplifies accounting, it also comes with new risks, lower returns, and a due diligence process as comprehensive as tax equity partnerships.

Which is why continuing innovation to develop tax equity structures that can meet the massive financing demands of the energy transition is critical. One example of an innovative tax equity structure in the post-IRA era are transferability flip, or t-flip, transactions. At their most basic level, t-flip transactions are a hybrid approach that combines the simplicity of tax credit transfers with the profit incentive of tax equity partnerships in a way that uniquely benefits both institutional investors and project developers.

A partnership still exists in a t-flip. But instead of having the tax credits allocated based on the project's ownership, they are instead transferred to a third-party buyer. The partnership allows the developer to both monetize the depreciation benefits and establish a step-up in the tax credit eligible cost basis to fair market value. This is an appealing transaction for both investors and developers. Developers benefit from depreciation and a step-up while investors gain access to simple transfer credits without having to navigate the full-blown complexity of a tax equity partnership.

One of the first uses of a t-flip transaction occurred in early 2024, to finance the standalone Longbow Battery Energy Standalone Storage (BESS) project near Houston, Texas. Tokyo Gas America, Clean Capital Partners, and Foss & Company teamed up to be tax equity partners for the 174-megawatt/384 megawatt-hour battery storage project, which aims to leverage energy storage's unique arbitrage potential in the Electric Reliability Council of Texas (ERCOT) market. The project is owned by Tokyo Gas America, which is a wholly owned subsidiary of Tokyo Gas Co. Ltd.

An objective of the IRA's transferability provisions is to encourage more corporations to fund renewable energy projects. It's also likely that the simplicity of tax credit transferability will provide the exposure and confidence corporate investors need to consider future tax equity partnerships and hybrid structures.

ONE EXAMPLE OF AN INNOVATIVE TAX EQUITY STRUCTURE IN THE POST-IRA ERA ARE TRANSFERABILITY FLIP, OR

T-FLIP TRANSACTIONS

A GROWING MENU OF TAX CREDIT GENERATING PROJECTS

Current and potential investors also need to understand more about the types of clean energy projects that generate tax credits. The market landscape for tax credit generating projects has expanded since the passage of the IRA. The following are summaries of the technologies and the market dynamics for projects eligible for tax credits:

SOLAR

The most salient fact to understand about the U.S. solar market is that it is growing fast. But that growth is uneven, and several challenges still need to be overcome for the market to reach its full potential. For example, according to WoodMac, the second quarter of 2024 saw the most-ever capacity additions for a Q2 in U.S. history, with 9.4 gigawatts of installations.

Overall, solar accounted for nearly 70% of all new electricity generation capacity in the first half of 2024. But the success of solar in the U.S. in 2024 is due almost exclusively to utility-scale projects. About 7.6 gigawatts of utility-scale projects were installed in the second quarter, an uptick of about 60% compared to the previous year. While the utility-scale market has been robust, residential and commercial installations have registered recent declines.

Between 2024 and 2029, WoodMac expects the U.S. to install over 250 gigawatts of new solar capacity, a growth rate of about 4%. Tax credit transferability is one tool that can help the solar market surpass those expectations and contribute even more to achieving emissions reduction goals. In the past, solar projects opted exclusively for tax equity partnerships using the ITC and tax equity investments were dominated by a handful of large banks. Thanks to the IRA, solar projects can now qualify for the PTC, and a small number are taking advantage of that option.

According to WoodMac's analysis of the first half of 2024, tax credit transferability is ramping up as a financing tool faster than many observers expected. This is particularly true in commercial solar, where transferability deals of all sizes are increasingly being administered. WoodMac expects the transferability market to grow, and not just for small and medium sized solar projects. Cost of capital has been a significant concern for utility-scale solar developers, with high interest rates and rising debt costs challenging project economics. Transferability agreements with non-traditional tax equity partners is an opportunity to efficiently deploy capital and accelerate the momentum of utility-scale solar deployment.

SOLAR ACCOUNTED FOR NEARLY 70% OF ALL NEW ELECTRICITY GENERATION CAPACITY IN THE FIRST HALF OF 2024.

ENERGY STORAGE

Energy storage projects were growing at a rapid pace even before they became eligible for the ITC. Now that the IRA allows storage projects to access the ITC, their growth has accelerated even faster. According to WoodMac, 4,236 megawatts of energy storage were added in the fourth quarter of 2023, an increase of 100% compared to the third quarter and 358% above the fourth quarter of 2022. Unlike wind and solar projects, which typically have long-term contracts and predictable cashflows, energy storage deals are more complicated and include a mix of contracts, energy arbitrage, and the provision of ancillary services. This complexity lends itself to tax credit transferability and t-flip transactions.

Grid congestion, the slow pace of new transmission grid infrastructure, the retirement of conventional energy power plants and the ongoing influx of renewables will all drive the growth of energy storage. Over the next ten years, for example, WoodMac forecasts new capacity additions of over 152 gigawatts. Over the short-term, those additions will be concentrated in California and Texas, which together will account for nearly 70% of grid-scale storage in 2024.

But as the decade progresses, there will be more geographic diversity in the location of new storage projects. In fact, by 2033 Texas and California's share of grid-scale storage additions will fall to around 15%. Without regulatory changes in new state markets, however, projects will be more dependent on the ITC and falling system costs because their revenue earning potential will not be the same as in storage-friendly California and Texas.

In the best-case scenario, energy storage growth in the U.S. will speed up thanks to interconnection and permitting reforms, including progress by independent system operators (ISOs) to clear out their project backlogs and the Federal Energy Regulatory Commission's (FERC) Order 2023 having a rapid positive impact speeding interconnection. Plentiful tax equity will also be foundational to maximizing energy storage deployments. This will depend both on more corporations embracing tax equity investments and a maturing and financially attractive transferability market. Already, there are encouraging indications that transferability is being embraced. According to WoodMac, transferable tax credit transactions for all technologies grew 45% between 2022 and 2023.

4,236 MEGAWATTS OF ENERGY STORAGE WERE ADDED IN THE FOURTH QUARTER OF 2023, AN INCREASE OF 100% COMPARED TO THE THIRD QUARTER AND 358% ABOVE THE FOURTH QUARTER OF 2022.

CARBON CAPTURE, UTILIZATION, AND STORAGE (CCUS)

WoodMac estimates there are about 900 CCUS projects either in pre-development or already operational globally. North America currently dominates CCUS, with 65% of the world's operational capacity. In the U.S. CCUS activity is concentrated in the Gulf Coast states and the Midwest, thanks in large part to the regions' existing pipeline and storage infrastructure and proximity to industrial polluters whose greenhouse gas emissions are hard to abate, like cement, ammonia, fertilizer, and steel manufacturing.

The pace of CCUS deployment is driven by regulation and policy support, which helps explain why the U.S. is a leading market. For example, both the IRA and the Bipartisan Infrastructure Law provide incentives and funding for CCUS projects. The Bipartisan Infrastructure Law made over $11 billion in funding available for everything from demonstration and pilot projects to regional direct air capture (DAC) hubs to carbon dioxide transportation loan support. For its part, the IRA is expected to underpin more than $26 billion in capture projects, with the U.S. reaching about 250 Mtpa capacity by 2034.

The IRA enhanced the 45Q tax credit to incentivize CCUS growth. Starting in 2023, the 45Q tax credit provides varying incentive levels depending on the type of project. They are:

- $85 per ton for capture and dedicated storage
- $60 per ton for capture and enhanced oil recovery (EOR)/utilization
- $180 per ton for DAC and dedicated storage
- $130 per ton for DAC and EOR/utilization

The IRA allows projects to claim 45Q credits for 12 years of operation if they begin construction before 2033. Though the IRA has put the U.S. at the forefront of CCUS development, projects still proceed at a slow pace and face a range of challenges, including years-long permitting processes for Class VI wells where carbon dioxide is injected. The lack of a national carbon pricing scheme – California, the Pacific Northwest, and Northeastern states have their own programs – also creates uncertainty in the investment structure for CCUS projects.

In the current investment and development environment, certain CCUS projects have a greater likelihood of getting built than others. Those that are directly connected to facilities that produce significant greenhouse gas emissions, for example, have the potential to be developed and built more rapidly.

IRA IS EXPECTED TO UNDERPIN MORE THAN $26 BILLION IN CAPTURE PROJECTS, WITH THE U.S. REACHING ABOUT 250 MTPA CAPACITY BY 2034.

ADVANCED MANUFACTURING

The effort to "re-shore" manufacturing in the U.S. has spurred momentum across the country to build new manufacturing facilities and add jobs in the field. The shift towards localizing supply chains and diversifying sources of production has increased since supply chain shortages during the global pandemic. While the trend began prior to the passage of the IRA, the incentives from the bill along with Made in North America provisions have increased the buildout and announcement of new manufacturing facilities nationwide.

The IRA introduced the advanced manufacturing production tax credit (45X). This credit applies to each eligible component produced in the U.S. and sold by a manufacturer to an unrelated person. An eligible component is broadly defined to include solar energy components, wind energy components, inverters, or qualified battery components.

The amount of the credit varies between the eligible components and is based on the capacity/unit produced. For example, the credit for thin film photovoltaic cell equals $0.04 multiplied by its capacity, while a photovoltaic cell wafter is $12 per square meter. As most tax credits in the IRA, 45X credits are transferable. And unlike ITCs, PTCs are generated after a unit of eligible good has been created and are ineligible to recapture, lowering the risk profile.

Depending on where the advanced manufacturing facility sources its subcomponents, the product may help a renewable energy project qualify for the domestic content adder offered under the renewable energy ITC and PTC. The domestic content requirement is satisfied if certain percentages of the total components are mined, produced or manufactured in the United States. The required percentage amount increases annually up to 55% for construction beginning after 2027. In early 2024, the IRS provided guidance to aid developers and manufacturers in proving this requirement based on average costs of subcomponents for clean energy systems.

Following the passage of the IRA, over 300 clean energy facilities have been announced in 40 states and Puerto Rico. Facilities specialize in the production of solar panels, hydrogen, electric vehicles and semiconductors. It is estimated that this has created over 100,000 jobs and over $120 billion in capital investment. For corporations with special interest in aiding in job creation and the localization of the supply chain, 45X credits are most appealing.

OVER 300 CLEAN ENERGY FACILITIES HAVE BEEN ANNOUNCED IN 40 STATES AND PUERTO RICO. FACILITIES SPECIALIZE IN THE PRODUCTION OF SOLAR PANELS, HYDROGEN, ELECTRIC VEHICLES AND SEMICONDUCTORS.

HYDROGEN

WoodMac analysis found that the U.S. needs between 50 and 80 mmtpa of low-carbon hydrogen to reach net-zero by 2050. The IRA's 45V production tax credit (PTC) is designed to accelerate green hydrogen growth. 45V incentivizes green hydrogen by offering up to $3 per kilogram of hydrogen produced, although the total value of the PTC depends on the emissions intensity of the hydrogen.

And while WoodMac's analysis found that 45V has the potential to accelerate green hydrogen and put the levelized cost of green hydrogen on par with blue hydrogen and other fuels, current Treasury Department guidelines make green hydrogen economics, adoption, and deployment challenging. Currently, incentive uncertainty has largely stalled development of green hydrogen. Draft guidelines for the 45V PTC were released by Treasury and the Internal Revenue Service (IRS) at the end of 2023.

Many companies involved in green hydrogen projects used the comment period after the draft guidelines were released to express frustration that the rules were overly strict and would limit eligibility and market growth.

Green hydrogen project announcements have slowed significantly as stakeholders await final guidance on 45V. In fact, in the second quarter of 2024, only 4 mmpta of capacity was announced globally (13% of which were in the U.S.), the smallest amount since the fourth quarter of 2020. WoodMac expects that clarity around 45V could quickly spur significant project activity by the end of 2024. But time is of the essence. If final guidance is delayed, the U.S. could lose its position as an early leader in the sector.

WOODMAC EXPECTS THAT CLARITY AROUND 45V COULD QUICKLY SPUR SIGNIFICANT PROJECT ACTIVITY BY THE END OF 2024.

SMALL MODULE REACTORS (SMR)

One of the main outcomes of last year's COP28 conference in the United Arab Emirates (UAE) was a pledge to triple nuclear capacity by 2050. The emphasis on expanding nuclear makes sense on several levels. In the U.S., for instance, nuclear already provides about half of the carbon-free electricity and is viewed as an important resource to meet increasing demand for clean power from data centers and as a source of firm power to complement increasing deployments of intermittent renewables.

Small modular reactors, or SMRs, are under 300 megawatts and have attracted significant attention and investment for their flexibility and potential to avoid the project delays and cost overruns that have challenged larger, traditional nuclear power plants. In WoodMac's net-zero scenario, SMRs represent 30% of the nuclear fleet globally by 2050.

In the first quarter of 2024, the SMR pipeline in the U.S. was about 6 gigawatts. An array of incentives and regulatory activity is directed at both helping projects already in the development pipeline get built and kickstart new developments. For example, the IRA created:

- A 30% ITC for zero-emission advanced nuclear power plants placed in operation in 2025 or afterwards. SMRs can also take advantage of a technology-neutral PTC of $25 per megawatt-hour for the first decade of plant operation. The ITC also includes a 10% adder for domestic content and a 10% boost for building an SMR on the site of a retired coal plant. WoodMac estimates that the ITC can lower the costs of SMR by over 50% and that most developers will utilize the ITC because of the high capital costs of projects.
- The Infrastructure Investment and Jobs Act allocated $6 billion the Civil Nuclear Credit Program, which would provide a production credit for four years to eligible projects.
- In July of 2024, President Biden signed the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act. The act is designed to incentivize SMR projects by streamlining regulatory reviews by the Nuclear Regulatory Commission (NRC). The law requires the NRC issue a final environmental statement or assessment no later than 18 months after it accepts an application. Additionally, the NRC must also make final licensing decisions within 25 months of an application's submission.

While there is significant momentum behind SMR development in the U.S., developers still must overcome some of the struggles that led to the cancellation of an SMR project by NuScale in Idaho in 2023. Inflation and high interest rates caused the project price tag to spike. Clarity on cost and the successful development of the first SMR in America will be important for the market to build momentum.

FUEL CELLS

One of the primary barriers to power sector decarbonization in the U.S. is clogged interconnection queues. According to a report released by the Lawrence Berkeley National Laboratory (LBNL), 2,600 gigawatts of new generation and storage capacity is waiting to connect to America's transmission grids – the vast majority of which is solar, wind, and battery storage. LBNL also found that the interconnection backlog increased by 30% in 2023.

Microgrids that combine renewables and stationary fuel cells are increasingly seen as a solution to both integrate more renewables as interconnection reforms move ahead and to provide reliable electricity to communities and businesses concerned about grid outages. In fact, WoodMac estimates that about 10% of renewables installed in the U.S. over the past 5 years were in microgrids and forecasts that the market potential for fuel cell microgrids in America will reach $4.4 billion by 2028. As of the first quarter of 2024, there were over 566 megawatts of stationary fuel cells installed in the U.S., primarily at mission-critical facilities like hospitals and data centers that require continuous power.

Stationary fuel cells that provide long-duration energy storage have applications beyond microgrids and backup power, including district power or heat and as a solution to decarbonize hard to abate industries. High costs and lack of availability of green hydrogen mean that in the short-term fuel cells will be powered by natural gas.

But federal and state incentives can help drive market growth of zero-carbon fuel cells. For example, the IRA allows fuel cells constructed before January 2025 to be eligible for the 30% ITC. Fuel cells that operate with zero-carbon fuels like hydrogen, renewable natural gas (RNG), and ammonia can utilize the technology-neutral ITC or PTC after 2024. State renewable portfolio standards (RPS) can also help bolster demand for fuel cells, as can steady cost reductions. The DOE has targeted ambitious cost reductions for stationary fuel cells. The DOE seeks to lower the unit cost of fuel cells from between $1,200 and $2,500 per kilowatt in 2023 to $1,000 by 2030 and $750 over the long-term.

WOODMAC FORECASTS THAT THE MARKET POTENTIAL FOR FUEL CELL MICROGRIDS IN AMERICA WILL REACH $4.4 BILLION BY 2028.

WIND

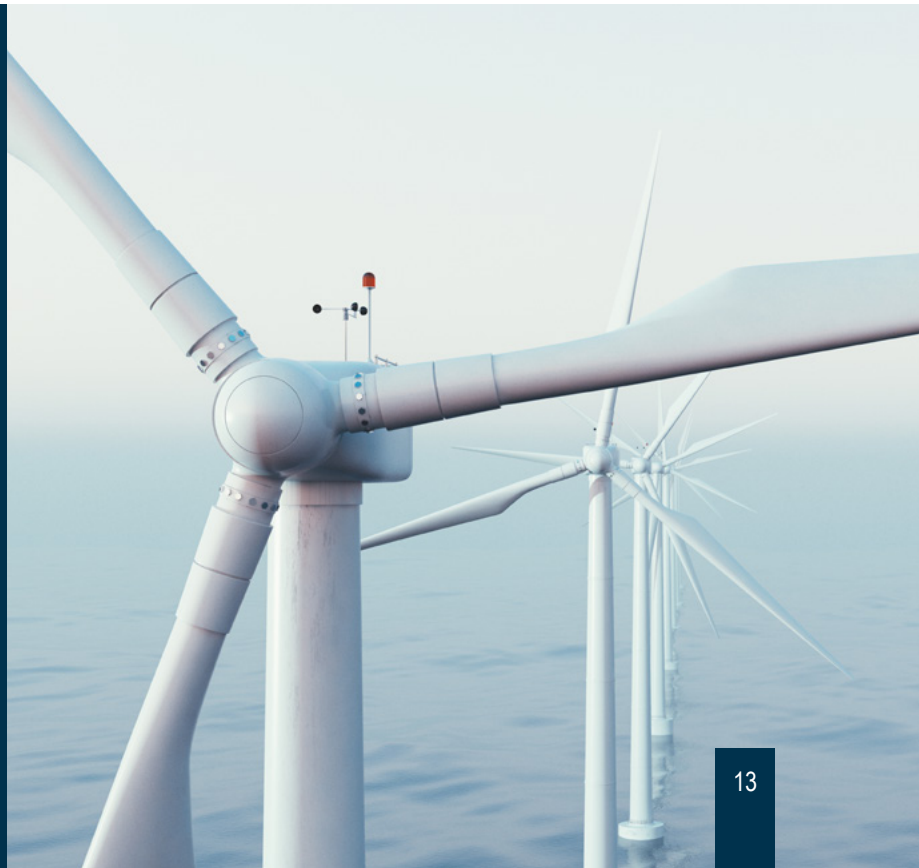
Supply chain constraints, interconnection delays, inflation, elevated interest rates and financing costs, and other challenges help explain why 2023 saw the lowest deployment of onshore wind in the U.S. since 2017. According to WoodMac, 2024 installations of 6.6 gigawatts of both onshore and offshore wind will come in even lower than the 7 gigawatts added in 2023.

But this two-year slump for the wind industry shouldn't obscure positive signs for more robust future growth. For example, 2024 saw the commissioning of the first-ever utility-scale offshore wind development in the U.S., Orsted's South Fork project. In April of 2024, the Bureau of Ocean Energy Management (BOEM) announced a five-year schedule of offshore lease sales, including new auctions for waters off of Maine, California, and in the Gulf of Mexico. This should provide long-term confidence to offshore wind developers and encourage deployments of lower-cost floating technology.

Like other clean energy technologies, wind also received a big boost from the IRA. Over the short-term, the IRA extended and expanded the ITC and PTC wind projects that began construction before January 1, 2025. Over the longer term, wind projects can take advantage of the technology-neutral ITC and PTC that are set to expire in 2032, or when power sector emissions decline 25% of 2022 levels. Utility-scale wind projects can also receive bonus credits for the use of domestic content or for locating their developments in designated energy communities. Recent guidance about domestic content makes it possible for projects using only U.S.-made nacelles to qualify for the bonus if they begin construction before January 1, 2026.

Load growth to meet energy demands from data centers and manufacturing offer new opportunities for wind. Between 2024 and 2028 WoodMac forecasts that the U.S. will add 64 gigawatts of new wind capacity, including 7 gigawatts of offshore wind. While WoodMac analysis finds that PTC and ITC availability are short, medium, and long-term drivers of wind development, tax equity availability becomes an increasing barrier to market growth in the medium and long-term. At the same time, WoodMac expects tax credit transferability to become an increasingly powerful driver for wind installations, especially between 2027 and 2032.

BETWEEN 2024 AND 2028 WOODMAC FORECASTS THAT THE U.S. WILL ADD 64 GIGAWATTS OF NEW WIND CAPACITY, INCLUDING 7 GIGAWATTS OF OFFSHORE WIND.



BIOMETHANE/RENEWABLE NATURAL GAS (RNG)

Anaerobic digestion turns organic matter like food waste, agricultural and farming waste, crops and municipal waste into biogas that is then processed further into biomethane, which is also known as renewable natural gas (RNG). Biomethane/RNG's similarity to fossil gas means that it can be distributed throughout the existing gas grid and used for the same applications albeit with a carbon intensity five times lower than fossil gas.

Though RNG accounts for less than 0.5% of North America's RNG market, investments by large energy companies like Shell and BP, along with government incentives, could drive a tenfold expansion by 2050. Federal incentives include the U.S. Environmental Protection Agency's (EPA) Renewable Fuel Standard, which promotes RNG in transportation.

The IRA has significantly expanded federal support for biomethane/RNG by expanding eligibility for both the ITC and PTC, including for biogas production. The rules for accessing tax credits to support biomethane/RNG vary depending on their use and the timing of projects. For example, projects that begin construction before 2025 can take advantage of an ITC that the IRA expanded to support biomethane production. Credits and adders for meeting domestic content, wage and apprenticeship, and energy community requirements can result in an ITC equaling 50% of a project's costs.

The calculation changes in 2025. Starting next year, biomethane projects that produce electricity will be eligible for the technology-neutral Clean Electricity Production Credit. The credits will be phased out in 2032, or when the carbon intensity of the U.S. electricity grid drops to 25% of 2022 levels. While the tax credits available vary depending on the type of project and its timing, WoodMac analysis is clear that one of the biggest impacts of the IRA is that credit transferability and direct pay options boost the optimization and maximization of the value of tax credits.

STARTING NEXT YEAR, BIOMETHANE PROJECTS THAT PRODUCE ELECTRICITY WILL BE ELIGIBLE FOR THE TECHNOLOGY-NEUTRAL CLEAN ELECTRICITY PRODUCTION CREDIT.

SUSTAINABLE AVIATION FUEL

The aviation industry is responsible for about two% of global greenhouse gas emissions. Commercial aviation is expanding rapidly and the International Energy Agency (IEA) says the industry is not on track to achieve net-zero emissions by 2050.

Significant investment and public policy support in the U.S. and around the globe is being devoted to increasing the production of sustainable aviation fuel (SAF), which power jets with fewer greenhouse gas emissions. According to WoodMac, supplies of SAF are expected to grow rapidly this decade, commanding over 2% of the global market by 2030.

Growth in the U.S. is being spurred by tax credit incentives, including the SAF credit created as part of the IRA. The SAF credit provides $1.25 per gallon for fuels that achieve a minimum lifecycle greenhouse gas emissions reduction of 50%. An additional credit of one cent per gallon is available for each percentage of greenhouse gas reduction beyond 50%. By 2030, the global SAF market is expected to reach $25 billion and North America is forecast to provide about 44% of the 10 billion liters produced worldwide.

ACCORDING TO WOODMAC, SUPPLIES OF SAF ARE EXPECTED TO GROW RAPIDLY THIS DECADE, COMMANDING OVER 2% OF THE GLOBAL MARKET BY 2030.

CONCLUSION

Long-term observers of the solar industry are familiar with the term "solar coaster," which describes the bumpy policy and market conditions that have long characterized it. That same description applies to all the technologies that are driving the energy transition.

But what's also true across clean energy technologies is that short-term obstacles and challenges tend to obscure meaningful long-term progress. One reason the overall trajectory of clean energy is so positive is because innovation has been constant, be it in technology development, policy, or business models. Tax credit transferability and innovative tax equity structures, like t-flips, are examples of the fundamental innovations that are helping scale a wide range of clean energy technologies. By making the menu of technologies wider and the investments simpler and more financially attractive to a growing pool of corporations and investors, tax equity and transferability will help supply the capital the energy transition requires to scale and grow.

With over 40 years of tax credit expertise and more than $9 billion of tax equity deployed in projects across the U.S., Foss & Company is the leading full-service advisor to institutional clients seeking investment solutions to meet their strategic tax planning needs. Foss & Company provides expert guidance to clients seeking to maximize the opportunity presented by transferable tax credits. To learn more, please visit https://fossandco.com.

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