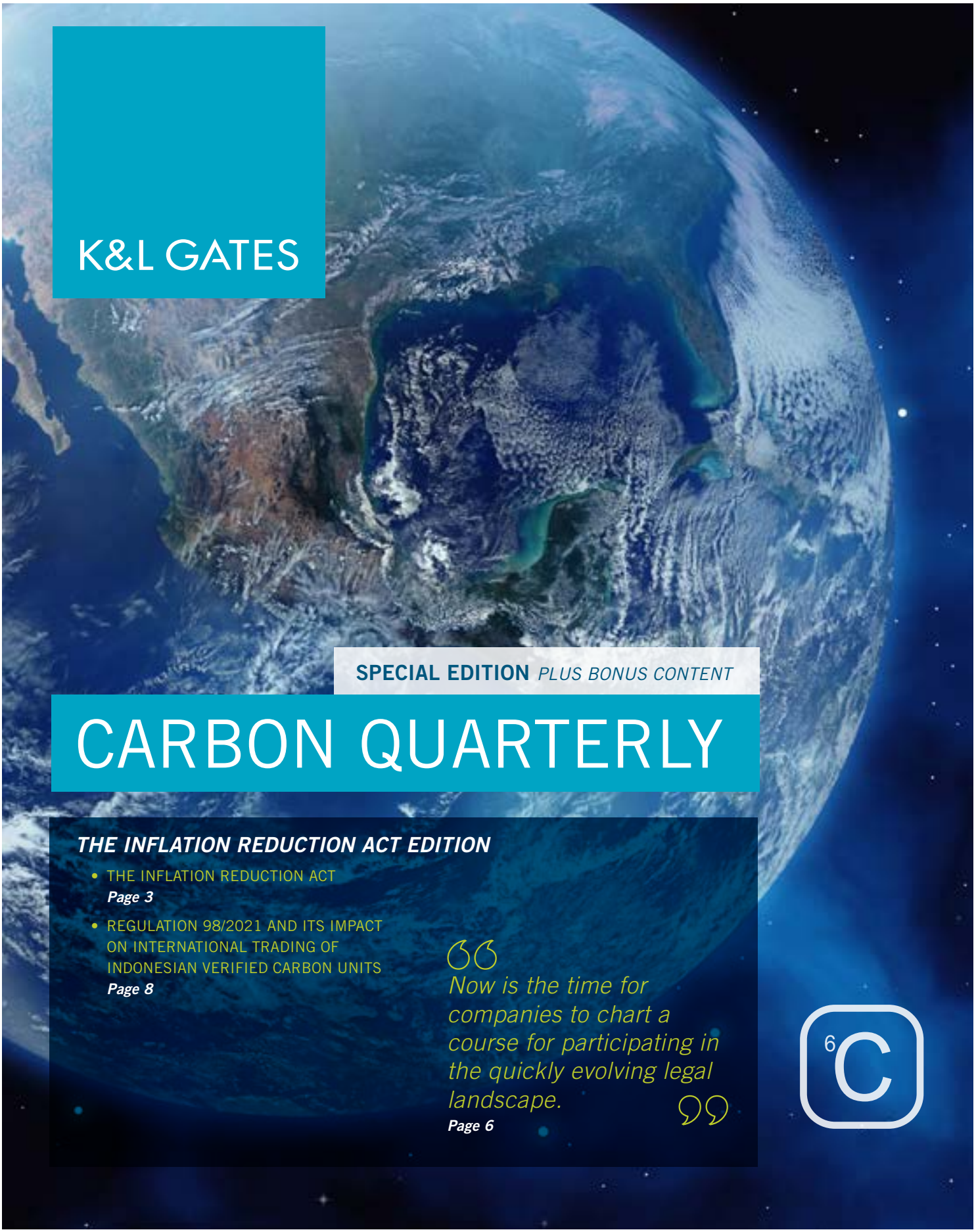

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SPECIAL EDITION *PLUS BONUS CONTENT*

CARBON QUARTERLY

THE INFLATION REDUCTION ACT EDITION

"Now is the time for companies to chart a course for participating in the quickly evolving legal landscape."
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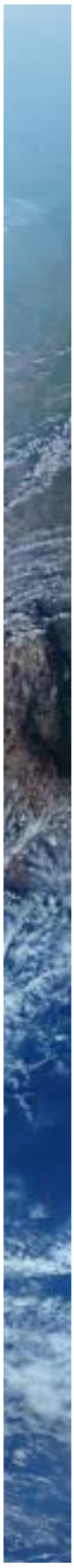

What's Inside

Carbon Quarterly is a newsletter covering developments in carbon policy, law, and innovation. No matter your views on climate change policy, there is no avoiding an increasing focus on carbon regulation, resiliency planning, and energy efficiency at nearly every level of government and business. Changes in carbon—and more broadly greenhouse gas—policies have the potential to broadly impact our lives and livelihoods.

This special edition of Carbon Quarterly includes a series of brief articles discussing several of the most noteworthy new climate and energy-focused provisions in the **INFLATION REDUCTION ACT (IRA),** including the following:

BONUS CONTENT

For our internationally focused readers, we conclude with:

The Inflation Reduction Act

On 16 August 2022, President Biden signed the IRA into law, after it passed the U.S. House and Senate with only Democratic support. The bill includes US$369 billion in funding for clean energy and climate programs, which the president has called the "single largest investment in climate and energy in American history." The federal government projects that the IRA will reduce U.S. greenhouse gas (GHG) emissions by 40% by 2030, compared to 2005 levels. In total, the IRA includes over US$30 billion in new tax credits and extensions, as well as modifications to existing tax credits, that are designed to incentivize activities that will drive reductions in carbon and other GHG emissions. In short, it is the most significant piece of climate legislation in U.S. history.

SECTION 45Q CREDIT FOR CARBON CAPTURE AND SEQUESTRATION

Among the IRA's myriad tax credit provisions are important changes to the Section 45Q Carbon Capture, Utilization, and Storage Credit.

Credit Amounts

For many clean-energy tax credits, including Section 45Q, the IRA creates a two-tiered structure with a modest base level that is increased five times if a project meets wage and apprenticeship requirements. Specifically, workers must receive the prevailing wage, and up to 10–15% of the workforce, depending on the year the construction begins on the project, must belong to a registered apprenticeship program. Additional information on wage and apprenticeship will be available after the U.S. Department of the Treasury (Treasury) provides guidance on these provisions. Base levels for Section 45Q are dependent on the type of capture and the use of the carbon. Below we outline the various Section 45Q base credit amounts, with the bonus credit amounts for meeting the wage and apprenticeship requirements in parentheses.

- For direct air capture facilities placed in service after 31 December 2022:
  - US$36 (US$180) per metric ton for qualified carbon oxide disposed of in secure geological storage.
  - US$26 (US$130) per metric ton for qualified carbon oxide used as a tertiary injectant or utilized.
  - Credits available in taxable years after 2026 will be annually increased to account for inflation after 2026.
- For electric generation facilities and other facilities, the following credit rates apply in 2017 and later:
  - US$17 (US$85) per metric ton for qualified carbon oxide disposed of in secure geological storage.
  - US$12 (US$60) per metric ton for qualified carbon oxide used as a tertiary injectant or utilized.
  - Credits available in taxable years after 2026 will be annually increased to account for inflation after 2026.

Direct Pay

For Section 45Q and other tax credits, the IRA provides an election for direct pay or collection of a check from the Treasury rather than claiming the tax credit against tax liability. Receipt of a credit as direct pay is generally available only to tax-exempt organizations, state government organizations, tribes, electricity cooperatives, and the Tennessee Valley Authority. At a high level, a taxpayer that is not any of these tax-exempt and government entities may elect to transfer tax credits by selling any of a long list of income tax credits to another taxpayer that is not related to the transferor for federal income tax purposes. This transferability option provides opportunities for taxable entities to reduce their tax burden by purchasing credits.

Eligibility

Under the IRA, eligibility for the Section 45Q tax credit is defined as follows:

- Direct air capture facilities must capture at least 1,000 metric tons of qualified carbon oxide during the taxable year.
- Carbon capture equipment installed on an electrical generation unit (not the entire facility) must:
  - Have a capture design capacity of not less than 75% of the carbon oxide production of that unit.
  - Capture at least 18,750 metric tons of qualified carbon oxide during the taxable year.
- Other facilities must capture at least 12,500 metric tons of qualified carbon oxide during the taxable year.

Timeline

The new facility qualification rules discussed above apply to facilities or equipment the construction of which begins after 16 August 2022. All other material amendments to Section 45Q apply to facilities and equipment placed in service after 31 December 2022. To qualify for the amended credit, construction of qualified carbon oxide capture facilities must begin on or before 31 December 2032. The credit remains available for 12 years after the date on which a qualified facility is placed in service.

WIND AND SOLAR TAX CREDITS UNDER THE IRA

The IRA also provides for extensions and amendments to existing income tax credits for renewable electricity, e.g., the Section 45 Production Tax Credit (PTC) and the Section 48 Investment Tax Credit (ITC). In general, these provisions are extended for projects that begin construction through 2024; the credit calculations change to a low base rate with bonuses for meeting wage, apprenticeship, and domestic content requirements, as well as locating the facility in certain geographic locations. Transitioning to the new program, it appears that facilities that begin construction prior to the date that is 60 days after the Treasury issues guidance interpreting the new rules will qualify under the current production and ITC rules.

Solar – Section 48 ITC

The IRA extended the Section 48 ITC for solar and added new provisions. The IRA makes no changes to the eligible property and sets a base rate of 6%. The new provisions establish that base rates are multiplied by five when wage and apprenticeship requirements are met. Bonus credits may be available when the secretary of the Treasury makes an allocation of "environmental justice solar and wind capacity limitation" to certain areas of the country. An Energy Community Bonus credit of 2% (or 10% if wage and apprenticeship requirements are met) is available for any facility located in an energy community. A Domestic Content Bonus credit of 2% (or 10% if wage and apprenticeship requirements are met) is available for any facility that meets certain domestic content requirements.

Most amendments apply to property placed in service after 31 December 2021. To qualify for the amended Section 48 ITC, construction of qualified solar energy property must begin on or before 31 December 2024.

Solar – Section 45 PTC

The PTC for solar was revived to include facilities the construction of which begins before 1 January 2025. This credit was previously available, but it expired several years ago. Eligible technology includes facilities using solar energy to generate electricity.

The credit amount is a base 0.3% per kilowatt-hour (kWh) of electricity generated by a qualified facility and sold to an unrelated party. The base rate is multiplied by five when wage and apprenticeship requirements are met. The credit amount otherwise available is increased by 10% when certain thresholds for domestically manufactured component parts are met. For facilities other than offshore wind, the threshold is 40% for manufactured products (based on the cost of all manufactured products included in the facility), but 100% for steel and iron. The credit amount otherwise available is increased by 10% when the facility is located in an energy community.

The credit will be available for 10 years from the date on which the qualified facility is placed in service. Most amendments apply to property placed in service after 31 December 2021. To qualify for the amended Section 45 PTC, the construction of a qualified facility must begin on or before 31 December 2024.

Onshore Wind – Section 45 PTC

The PTC for wind energy facilities used to generate electricity was revived to include facilities the construction of which begins before 1 January 2025. No changes were made to the eligible technology requirements. The credits for onshore wind energy are the same as those for solar energy described above.

Onshore Wind – Section 48 ITC

The ITC for wind facilities through an election under U.S. Code Section 48(a)(5) was revived to include facilities the construction of which begins before 1 January 2025. No changes were made to the eligible technology requirements. The credits for onshore energy are the same as those for solar energy described above.

Offshore Wind – Section 45 PTC

The PTC provisions do not single out offshore wind facilities, but they note that when a taxpayer utilizes the PTC for offshore wind, the Domestic Content Bonus described above in Solar – Section 45 PTC requires only 20% domestic content. No changes were made to the eligible technology requirements. In general, the credits for offshore wind energy are the same as those for onshore wind energy described above.

Offshore Wind – Section 48 ITC

The ITC remains available for offshore wind facilities. However, the IRA removed the current sunset period such that the Section 48 ITC is available for offshore wind facilities that begin construction at any time on or before 31 December 2024. No changes were made to the eligible technology requirements. In general, the credits for offshore wind energy are the same as those for onshore wind energy described above.

THE IRA'S ADVANCED INDUSTRIAL FACILITIES DEPLOYMENT PROGRAM

The IRA also established a new Advanced Industrial Facilities Deployment Program that is intended to support decarbonization of energy-intensive industries. It provides the U.S. Department of Energy (DOE) Office of Clean Energy Development (OCED) with US$5.82 billion in new funding to assist taxpayers in purchasing and installing or implementing technologies, or retrofitting and upgrading manufacturing processes, to reduce emissions for difficult to decarbonize sectors of the U.S. economy, such as iron, steel, cement, aluminum, chemicals, pulp, and paper. Reducing and, ultimately, eliminating emissions from these sectors has been a major priority for President Biden.

This will be a competitive program under which OCED will award grants, rebates, direct loans, or cooperative agreements to owners and operators of eligible facilities for retrofits, upgrades, or operational improvements at an eligible facility; installation or implementation of advanced industrial technology; or for engineering studies and other work needed to prepare an eligible facility for these actions.

An eligible facility is defined as a domestic, nonfederal, nonpower industrial, or manufacturing facility engaged in energy-intensive industrial processes, including production processes for iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, industrial ceramics, chemicals, and other energy-intensive industrial processes, as determined by the secretary of the DOE.

Advanced industrial technologies is defined as a technology directly involved in an industrial process that is designed to accelerate GHG reduction to net zero at an eligible facility, as determined by the secretary of the DOE. Eligible industrial production processes include technologies and processes that:

- Achieve emissions reduction in high-emissions industrial materials production processes, including production processes for iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, and industrial ceramics.
- Achieve emissions reduction in medium- and high-temperature heat generation, including:
  - Electrification of heating processes;
  - Renewable heat generation technology;
  - Combined heat and power; and
  - Switching to alternative fuels, including hydrogen and nuclear energy.
- Achieve emissions reduction in chemical production processes, including by incorporating, if appropriate and practicable, principles, practices, and methodologies of sustainable chemistry and engineering.
- Leverage smart manufacturing technologies and principles, digital manufacturing technologies, and advanced data analytics to develop advanced technologies and practices in information, automation, monitoring, computation, sensing, modeling, and networking to:
  - Model and simulate manufacturing production lines;
  - Monitor and communicate production line status;
  - Manage and optimize energy productivity and cost throughout production; and
  - Model, simulate, and optimize the energy efficiency of manufacturing processes.
- Leverage the principles of sustainable manufacturing to minimize the potential negative environmental impacts of manufacturing while conserving energy and resources, including:
  - Designing products that enable reuse, refurbishment, remanufacturing, and recycling;
  - Minimizing waste from industrial processes, including through waste energy recovery and combined heat and power (CHP); and
  - Increasing resource efficiency.
- Increase the energy efficiency of industrial processes, including:
  - Alternative materials that produce fewer emissions during production and result in fewer emissions during use, including:
    - > High-performance lightweight materials; and
    - > Substitutions for critical materials and minerals.
  - Development of net-zero emissions liquid and gaseous fuels, including:
    - > Emissions reduction in shipping, aviation, and long-distance transportation;
    - > Carbon capture technologies for industrial processes; and
    - > Other technologies that achieve net-zero emissions in nonpower industrial sectors, as determined by the secretary of DOE, in consultation with the director.

A NEW METHANE FEE FOR THE OIL AND GAS INDUSTRY

Looking beyond carbon, the IRA also includes a new Methane Emissions Reduction Program that will require owners and operators of oil and gas facilities that emit more than 25,000 metric tons CO_2 equivalent (CO_2e) of methane per year to pay an annual fee to the federal government.

The Methane Emissions Reduction Program is codified in a new Section 136 of the Clean Air Act. Beginning in 2024, owners and operators of oil and gas production, processing, gathering, boosting, transmission, storage, and import/export facilities will be required to pay a charge at a rate of US$900 per metric ton of methane emitted. The charge increases to US$1,200 in 2025 and to US$1,500 in 2026 and subsequent years. Natural gas distribution facilities are not subject to the charge.

The fee will not apply to all methane emissions from covered facilities; rather, it will only be assessed with respect to emissions that exceed specified percentages of the natural gas or oil sent to sale from or through each facility (e.g., 0.20% of the natural gas sent to sale from natural gas production sources). These thresholds provide an incentive for companies to reduce their emissions to below levels that would incur a charge.

Furthermore, the charge only applies to methane emissions that companies report to the U.S. Environmental Protection Agency (EPA) pursuant to subpart W of EPA's Greenhouse Gas Reporting Program (GHGRP).[1] Under the GHGRP, oil and gas operators estimate and report most emissions using equipment-based emission factors, rather than direct measurement, due to the inherent difficulty in accurately measuring emissions from the numerous and diffuse range of minor sources in the oil and gas sector. Therefore, under EPA's current GHGRP regime, the new methane charge would be more likely to incentivize the use of lower-emitting or fewer pieces of equipment, as opposed to actions designed to detect and repair unknown sources of fugitive emissions (i.e., equipment leaks) that are not subject to reporting obligations.[2] To address this issue, the IRA directs EPA to amend its GHGRP rules within the next two years to ensure reporting is based on empirical data that accurately reflect emissions from covered sources. During the course of this rule-making process, there will undoubtedly be a healthy debate between interested stakeholders regarding the feasibility of new reporting methodologies.

Just as importantly, the IRA exempts from the methane charge facilities that are subject to, and in compliance with, methane emission requirements that EPA promulgates pursuant to Section 111 of the Clean Air Act, provided EPA issues a determination that those requirements are (i) in effect in all states, and (ii) at least as stringent as those that EPA proposed in November 2021. EPA issued a supplemental rule-making proposal in November 2022 describing its current plans for regulating methane emissions from the oil and gas sector under Clean Air Act § 111. The new IRA methane charge may change the calculus for how certain operators approach this rule-making. Whereas, before the IRA, they might have preferred for their facilities to remain entirely outside the scope of EPA's methane rules, they may now prefer that those sources be covered—and thereby exempt from the IRA methane charge.

All told, the Congressional Budget Office estimates that the new methane fee will generate approximately US$850 million in net revenue in fiscal year 2026, with a peak of US$1.4 billion net revenue projected in fiscal year 2028.[3] Separately, the Methane Emissions Reduction Program, as outlined in the IRA, also will provide for US$850 million in methane reduction-related grant and loan funding, and US$700 million in additional funds specifically for methane emission reduction activities at marginal conventional wells.

In sum, stakeholders can expect a flurry of upcoming federal regulatory and policy activity that will determine the scope and scale of the U.S. oil and gas industry's future obligations with respect to methane emissions. Now is the time for companies to chart a course for participating in, and navigating, the quickly evolving legal landscape.

CARBON INTENSITY SCORING OF HYDROGEN UNDER THE IRA

The passage of the IRA in August 2022 shows that carbon intensity (CI) scoring continues to become a more refined mechanism for compliance and grant eligibility, particularly with regard to clean hydrogen technologies.

The IRA broadens the definition of clean hydrogen beyond electrolytic hydrogen produced from renewable energy. Relying instead on a lifecycle greenhouse gas emission (LGHG Emissions) metric, the IRA defines qualified clean hydrogen as hydrogen produced in a process that results in an LGHG Emission rate of not greater than 4 kilograms of CO_2 per kilogram of hydrogen.[4] Hydrogen that meets this CI is eligible for production tax credits (described further below).

The IRA's clean hydrogen definition contrasts with the Infrastructure Investment and Jobs Act (Jobs Act) signed into law by President Biden on 15 November 2021, which required that clean hydrogen have a CI equal to or less than 2 kilograms of CO_2e produced at the site of production per kilogram of hydrogen produced.[5] The Jobs Act authorized the DOE to appropriate US$8 billion to subsidize regional clean hydrogen hub programs under Section 813 of the Energy Policy Act.[6]

In developing an alternative benchmark, the IRA defined LGHG Emissions—also known as CI—to be consistent with the Clean Air Act, with one critical exception: Hydrogen LGHG Emissions are measured only through the point of production phase (i.e., well-to-gate), rather than to the point of combustion.[7] The Clean Air Act (and, to some extent, California's Low Carbon Fuel Standard, or LCFS) defines LGHG Emissions to include all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer (i.e., well-to-wheels).[8] By reducing the measurement of LGHG Emissions from well-to-wheels to well-to-gate, the IRA allows more hydrogen projects to qualify as qualified clean hydrogen.

The IRA requires that measuring hydrogen's well-to-gate production phase be completed through an application of the GHG, Regulated Emissions, and Energy Use in Transportation model (GREET Model) developed by the Argonne National Laboratory.[9] The GREET Model differs slightly from the California GREET Model used in implementing its LCFS. The key difference between the California GREET Model and the default Argonne GREET Model is that the California GREET Model adds different parameters to certain feedstock and fuel regions involved in producing California fuels and other California-specific features.

The IRA also created tiered subsidies to incentivize developers to produce lower CI hydrogen. For example, the IRA extended production tax credits to qualifying projects, allowing a base credit equal to US$0.60 multiplied by either (i) 20% for qualified clean hydrogen that has an LGHG Emission rate of 2.5–4 kilograms of CO_2e per kilogram of hydrogen; (ii) 25% for qualified clean hydrogen that has an LGHG Emission rate of 1.5–2.5 kilograms of CO_2e per kilogram of hydrogen; (iii) 33.4% for qualified clean hydrogen that has an LGHG Emission rate of 0.45–1.5 kilograms of CO_2e per kilogram of hydrogen; and (iv) 100% for qualified clean hydrogen that has an LGHG Emission rate of less than 0.45 kilograms of CO_2 per kilogram of hydrogen.[10]

Within the last 10 months, we have seen two ambitious federal laws incentivize the production of hydrogen and the development of hydrogen infrastructure in two different ways. Some of this is no doubt shaped by the politics of hydrogen, which can be sourced from fossil or renewable resources. In sum, however, federal grants and tax incentives will be most valuable to hydrogen with a low-carbon life cycle, measured at the point of production, and close to the end use.

Regulation 98/2021 and Its Impact on International Trading of Indonesian Verified Carbon Units

On 29 October 2021, Indonesia enacted Presidential Regulation No. 98 of 2021 on Carbon's Economic Value in Achievement of Nationally Determined Contribution Target and Greenhouse Gas Emission Control in National Development (Regulation 98/2021). Regulation 98/2021 was enacted as part of Indonesia's implementation of the Paris Agreement. Although Regulation 98/2021 has been enacted, it has not yet become fully effective, as it is pending the issuance of various implementing regulations.

The introduction of Regulation 98/2021 is undoubtedly a step in the right direction. However, the lack of clarity in Regulation 98/2021, coupled with delays to its full implementation, has brought about a great deal of legal uncertainty.

One hugely impacted area is the international trading of Verified Carbon Units (VCUs). Since Regulation 98/2021 has been enacted, corporations that are looking to enter into international sale of VCUs have been caught between a rock and a hard place. This is because many international transactions involve an international registry that issues tradable carbon credits to certified carbon reduction projects, and these transactions now have a risk of unenforceability.

Pursuant to Article 1(15) of Regulation 98/2021, a carbon entitlement must be recorded in the National Registry System on Climate Change Control (locally known as Sistem Registri Nasional Pengendalian Perubahan Iklim, or SRN PPI). Although priority is to be given to certificates generated by Indonesia's domestic certification process, Regulation 98/2021 does not preclude international certification processes as long as such processes adhere with International Organization for Standardization (ISO) 14064 and ISO 14065, and the competency of the certification scheme operator has been accredited by the Indonesian National Accreditation Committee.

While international registries may adhere to these ISO standards, the Indonesian government has not acknowledged such standards as an acceptable means of carbon certification, and, hence, those VCUs cannot be recorded in the SRN PPI as VCUs, much less being suitable for trading. To complicate matters further, the Ministry of Environment and Forestry has issued a statement through a press release, without providing the reasons, to the effect that the international registry standards are "noncompliant with the Indonesian laws and regulations."

The international registry has suspended the issuance of its VCUs to projects in Indonesia, as it continues to clarify the new regulation with the Indonesian government. The numerous transactions that necessitate the involvement of the international registry have not been able to materialize.

Companies continue to navigate this legal turbulence with difficulty. One school of thought that convinces companies to continue trading VCUs internationally is that since Regulation 98/2021 has not been fully implemented and does not stipulate retroactive effect, it would not be a violation of prevailing Indonesian law. There are presently no restrictions under prevailing laws on international carbon trading on a purely private contractual basis. However, those that belong in the conservative camp would err on the side of caution, as they think it would be unwise for parties to push ahead with their international transactions amidst the uncertainty. The lack of compliance and violation by a party of the reporting obligation may subject them to sanctions, including prohibition from trading their carbon credits.

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Endnotes

1 40 C.F.R. pt. 98, subpt. W.

2 See Congressional Budget Office, How CBO Analyzes the Effects of Charging the Oil and Gas Industry for Methane Emissions (Aug. 2022), **https://www.cbo.gov/publication/58444?source=email#footnote-030**.

3 See Congressional Research Service, Inflation Reduction Act Methane Emissions Chart: In Brief (Aug. 29, 2022), **https://crsreports.congress.gov/product/pdf/R/R47206**.

4 IRA, § 45V(c)(2)(A).

5 Jobs Act, § 822(b)(1)(B).

6 Id. §§ 813(d)–814; see also H.R. 3684 at 2532.

7 IRA, § 45V(c)(1)(B).

8 42 U.S.C. 7545(o)(1)(H).

9 IRA, § 45V(c)(1)(B).

10 Id. § 45V(b)(2)(A)–(D).

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