

Standard**Carbon**

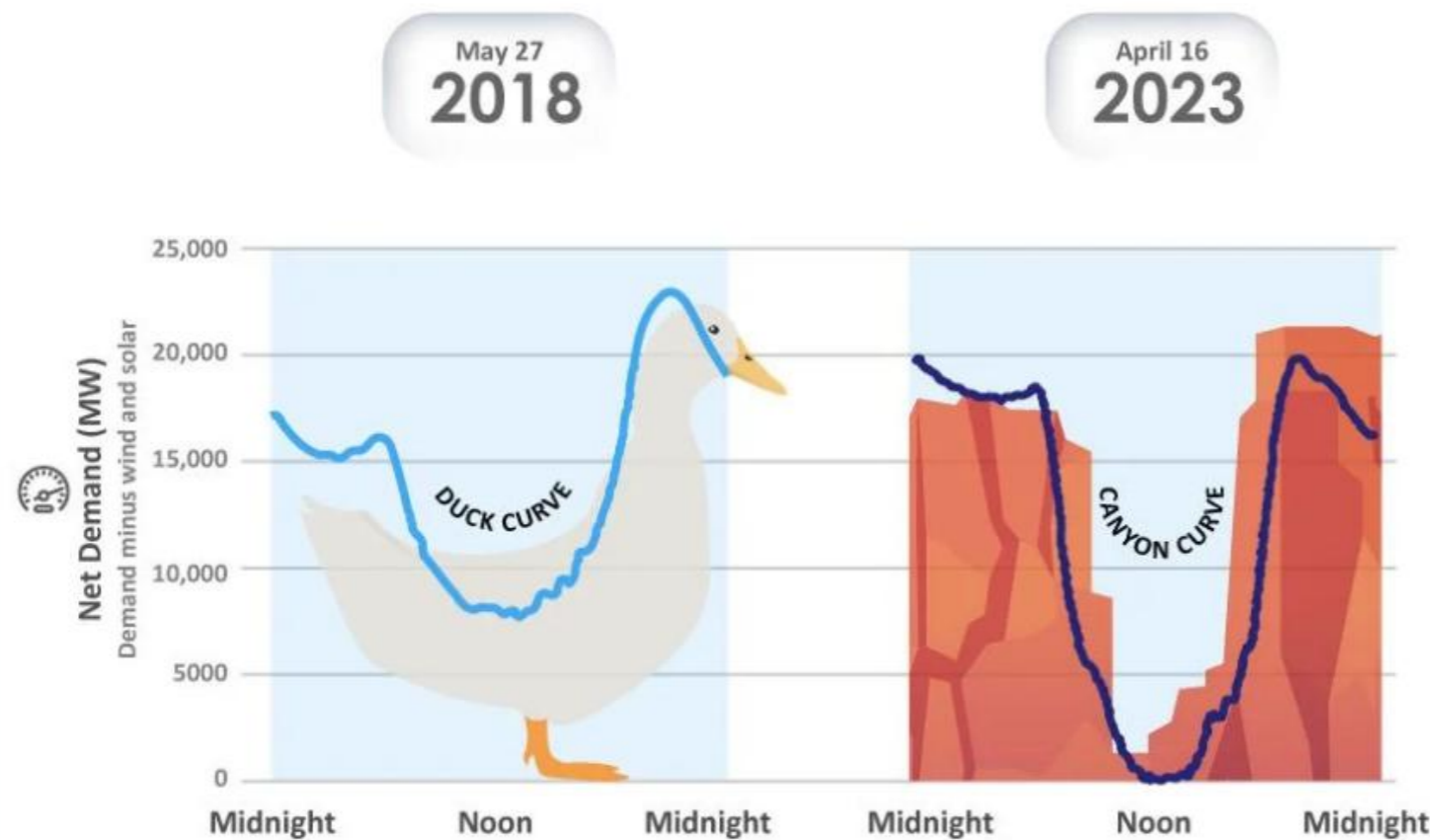
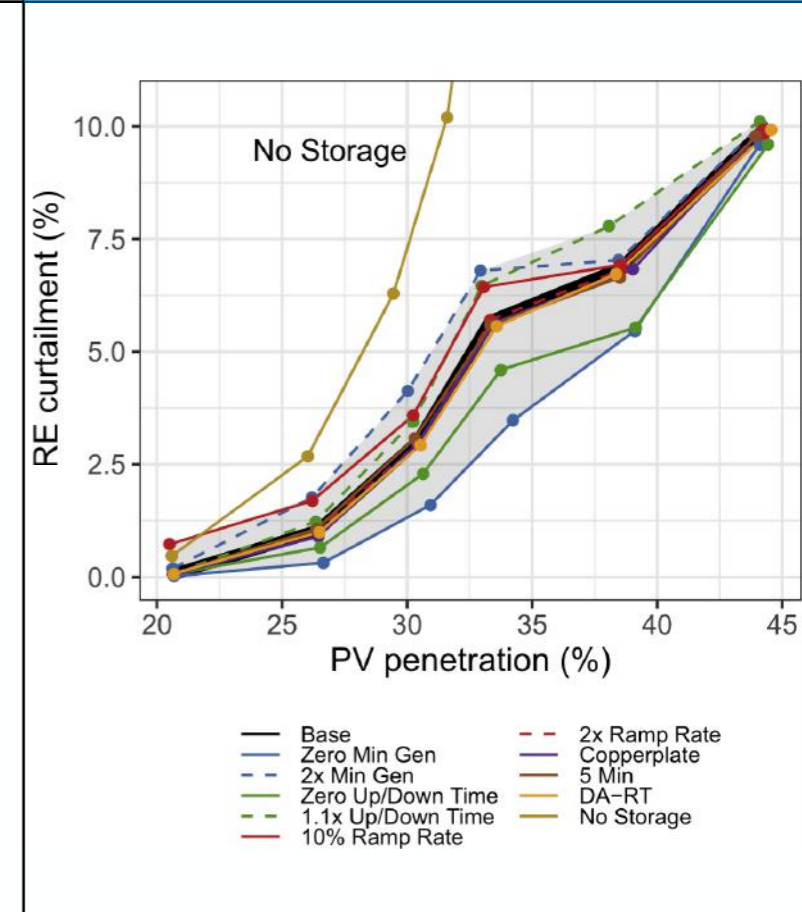
Renewable Energy Partners

Standard Carbon Improves Renewable Energy Assets and De-risks Renewable Energy Investments



StandardCarbon

Standard Carbon is a Delaware based LLC established in 2022. Our patented modular technology uses **wasted renewable electricity to recycle CO₂ emissions into renewable natural gas (RNG)** for synchronous generation.



- Increasing RE penetration into the power grid causes transmission congestion and [curtailment](#) of RE.
- Standard Carbon simplifies interconnection and connects RE projects to premium, dispatchable power markets.
- Standard Carbon technology **maximizes RE Buildout**, and avoids [trillions](#) of dollars lost in [stranded RE assets](#) and infrastructure upgrades.

Standard Carbon is a **Smarter Way to Net Zero**, by **converting stranded renewable energy into synchronous power** supply. The technology maximizes ROI for renewable assets and de-risks investment.

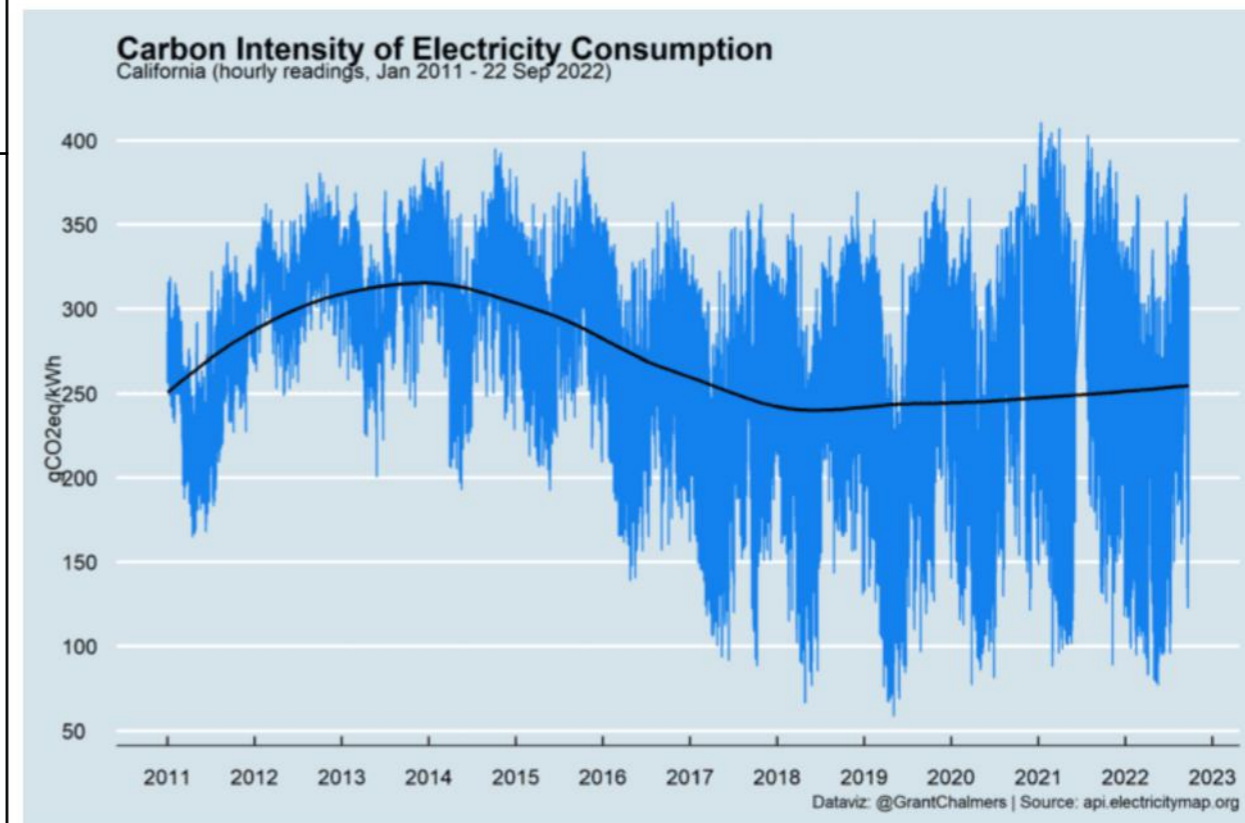
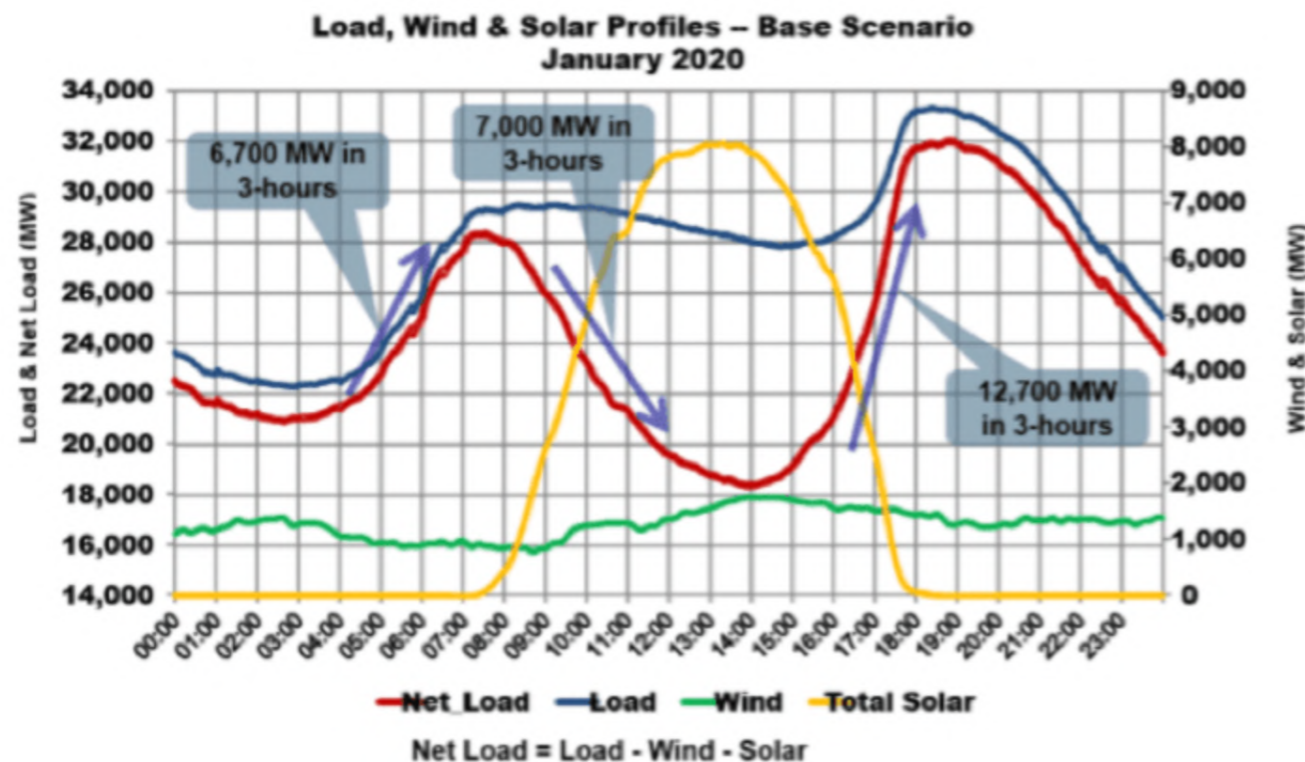
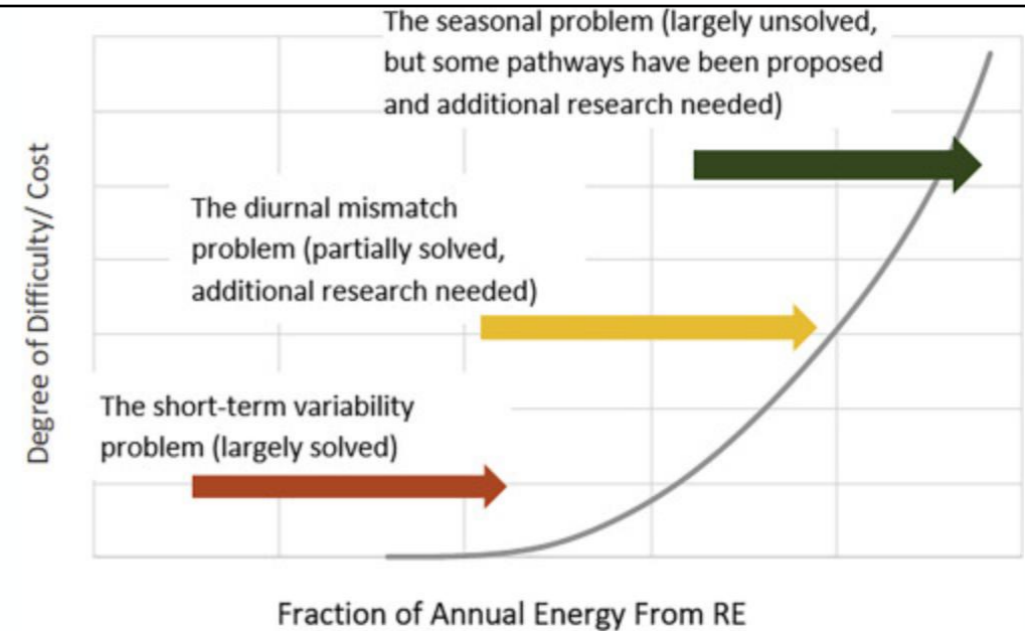
Governments, markets, and communities are committed to **decarbonization**.

Intermittent and diffuse Renewable Energy (RE) generation [doesn't match](#) with dynamic load (demand) that fluctuates hourly.

Capital Allocators are Looking for Smart RE Investments

Challenges with Renewable Generation Assets

- Mismatch between RE generation and peak load [reduces power capacity credit](#) considerably compared to fossil fuel operations. **Simply put: it's impossible to control amount and timing of RE generation.**
- Heavy RE penetration [increases net-load variance](#) which is difficult to manage. The result is over-generation risk, increased curtailment, and dependency on unprecedented ramping capacity.
- Long-Duration Renewable Energy Storage is an [unsolved challenge](#).
- **Inverter-based** RE generation projects create unique challenges that compromise grid-reliability, safety, and [Carbon Intensity of electricity](#).
- Challenges compound and lead to delayed RE interconnection, a growing interconnection queue, less-favorable economic outlook for RE, and increased reliance on conventional energy resources.



[POWER](#)

Standard Carbon Solves Inherent RE Generation Challenges at Scale

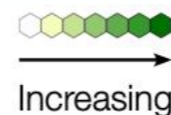
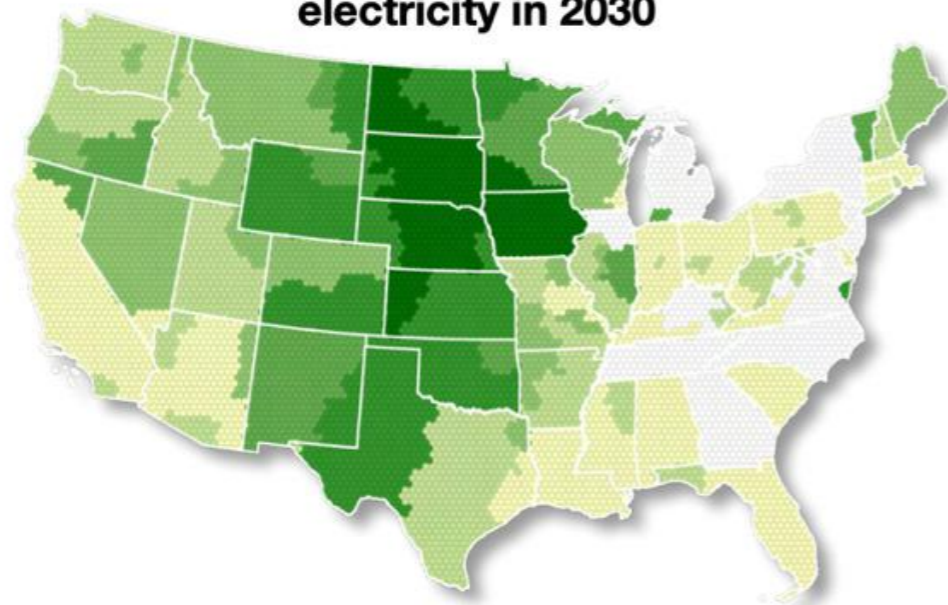
Standard Carbon Converts RE into Synchronous Power Generation

- Standard Carbon uses double patented **CO₂ Conversion Technology**
- Total annual energy conversion efficiency surpasses commercial battery storage technologies (internal un-published data).
- The equipment is compatible with most RE projects, locations and conditions.
- The result:
 - Utility-scale long-duration RE storage
 - Maximum RE capacity credit
 - Minimal net-load variance
 - Synchronous grid connection
 - Priority interconnection status

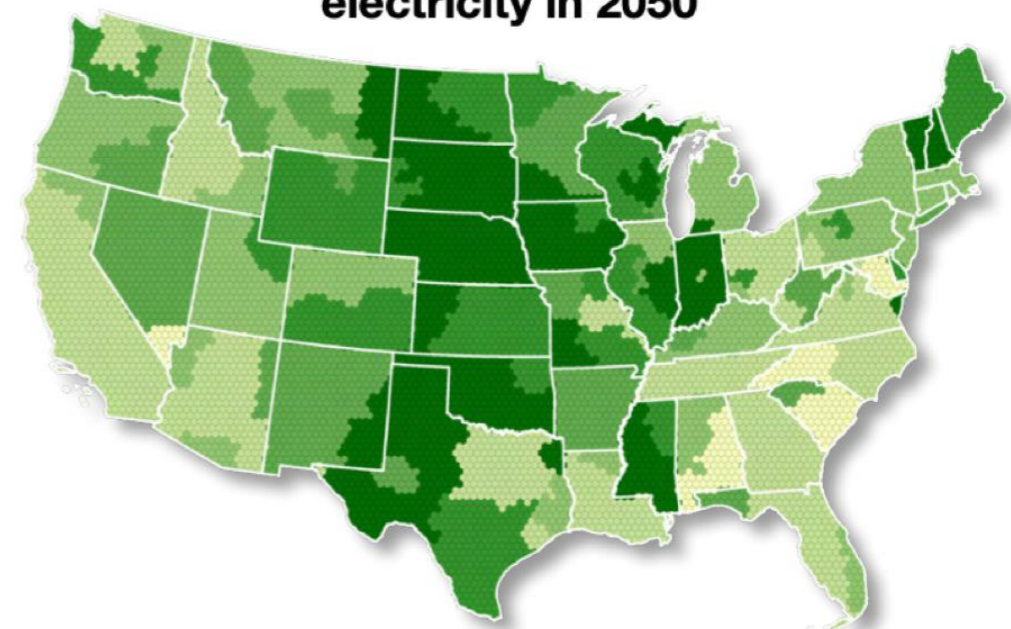
Rethinking the Grid

- Without Standard Carbon technology, [global power grids will need a \\$21 trillion investment by 2050](#) to safely and reliably transport and deliver renewable electricity.
- With Standard Carbon's technology RE is delivered through the existing grid, saving [RE transmission loss](#) and infrastructure costs.

Low-carbon electricity in 2030

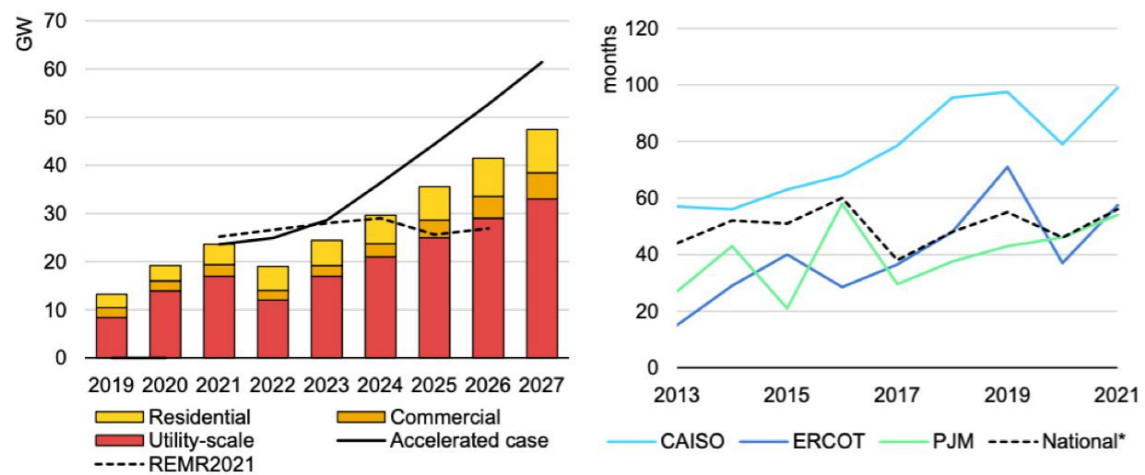


Low-carbon electricity in 2050



Interconnection Delays Create Stranded Renewable Energy Assets - 1 Terrawatt of Opportunity

Figure 1.13 United States solar PV capacity additions, 2019-2027 (left) and median time between solar PV interconnection request and plant commissioning for selected system operators, 2013-2021 (right)



Note: REMR2021 = Renewable energy market report 2021 (i.e. Renewables 2021).

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Longer Delays

- Average expected interconnection delays are exceeding 8 years in US locations with ambitious PV and wind generation construction.
- Interconnection will remain a stubborn issue on the aging US electrical grid even after changes to the bureaucratic processes reduce some delay.
- In 2022, optimum RE generation locations with few interconnection issues are hard to source and new projects face longer delays or building in less favorable locations for RE generation.

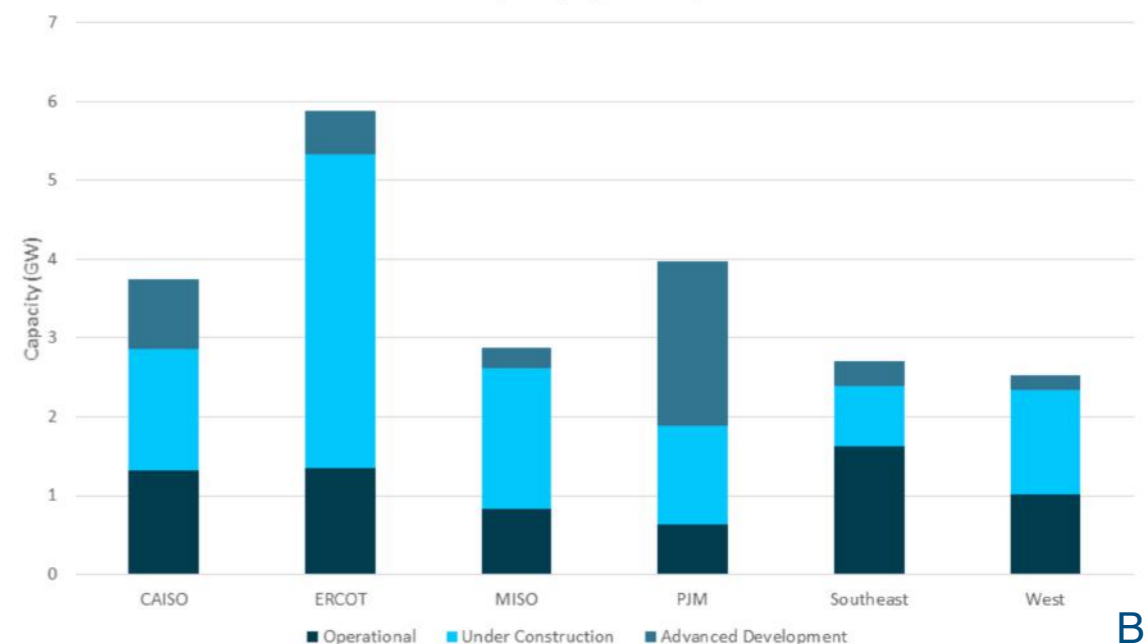
Higher Delay Volume

- By 2020 there was a backlog of over 5,500 RE generation and storage projects totaling **926 GW** that are attempting to finalize their interconnection with the grid.
- > 65% of projects in 2022 were delayed more than 3 months
- A centuries worth of capital investment to the grid deployed in the next 10 years is required to resolve the interconnection paralysis.
- Interconnection constraints create a growing stranded RE asset.

The Southeast is the only region in the US to currently have greater than 50% of their planned 2022 solar capacity come online, while PJM has 2.1 GW of planned 2022 capacity not even under construction yet

BTUAnalytics
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Planned 2022 Capacity by Development Phase



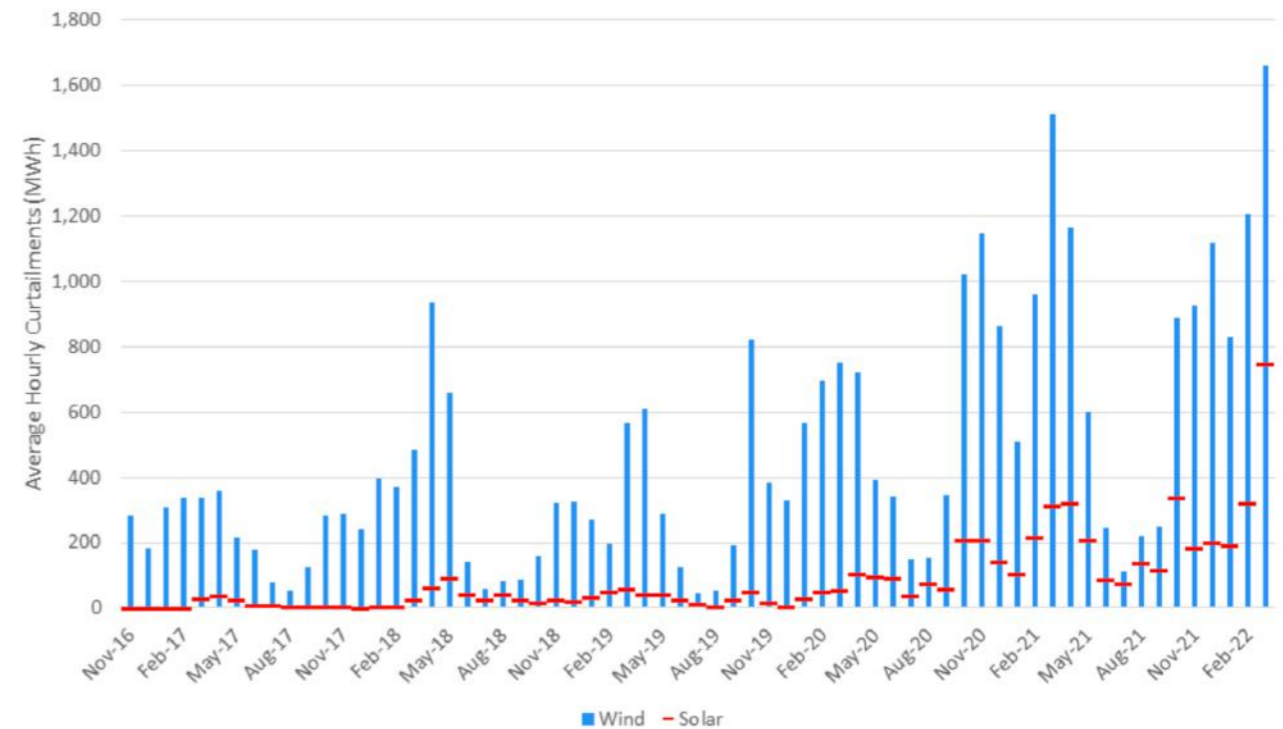
BTU

Curtailed Renewable Energy is Untapped Electricity

RE Curtailment is on the Rise

- Utility RE buildout (solar and wind) is causing a dramatic **increase in congestion events** across the aging US electricity grid.
- ISOs increasingly rely on RE curtailment strategies to prevent congestion events from causing catastrophic grid failures, and areas with the most ambitious RE generation build-out are experiencing disproportional increases of curtailed energy.
- ERCOT experienced an average **2,400 MWh** curtailment of wind and solar in February 2022. Assuming \$.10 per kWh retail, this curtailment is valued at **\$161,280,000**.

ERCOT Wind and Solar Average Hourly Curtailments



Congestion has become increasingly relevant within the Delmarva peninsula. The upward trend in event hours suggests that surplus generation during the summer months is unlikely to be delivered to the rest of PJM, leading to a depression of pricing to disincentivize generation.

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Percent of Hours with Congestion Events



BTU

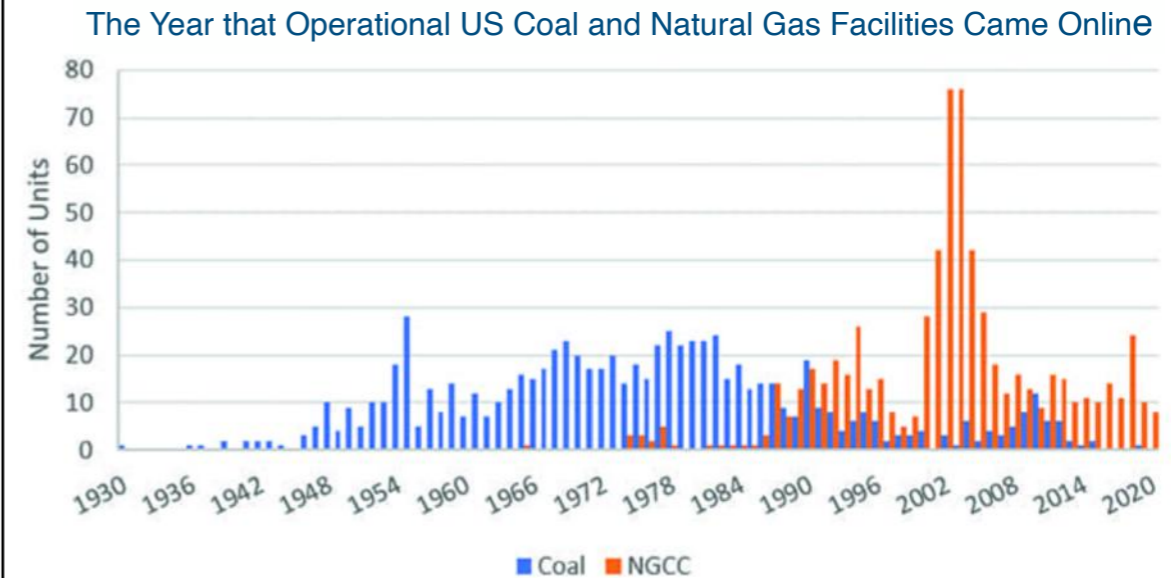
Summarizing Stranded Renewable Energy Assets

- Renewable Energy project developers accept >20% transmission loss for projects.
- Increasing grid congestion leads to **RE curtailment** causing loss of revenue for power providers.
- New RE projects are experiencing longer and higher volume **interconnection delays** due to supply constraints, regulatory issues and interconnection challenges.
- \$ Trillions in **grid upgrades** required for maximum RE interconnection.

Increased Forced-Outage Events and O&M Costs at Aging Coal and Natural Gas Power Facilities

Conventional and Renewable Power Mismatch

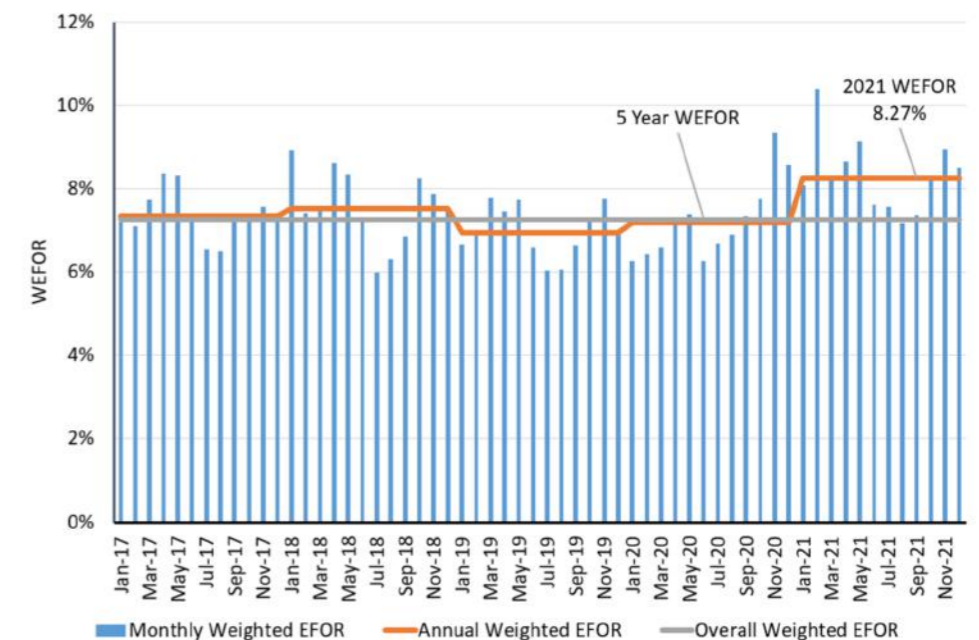
- Majority of US Coal and NG generation facilities were built before grid-scale RE penetration and not engineered to manage modern power fluctuations.
- RE penetration [stresses conventional power systems](#) and damages boilers, steam lines, turbines, and auxiliary components.
- Pushing fossil-fuel generation facilities beyond maximum flexibility [reduces efficiency and reliability](#) and creates a **loss of revenue for both the conventional and RE power generators.**
- The potential for forced outages ([measured by the WEFOR](#)) has increased above the 5-year average reflecting the challenges facing aging fossil-fired generation plants to adapt to increasing RE grid penetration.



Standard Carbon Marries Conventional and Renewable Power

- Fossil fuel retirement is [at risk of outpacing RE interconnection](#) at a time when the growth rate of electricity demand is increasing.
- This timing mismatch destabilizes power delivery, pricing, and compromises clean-energy transition efforts.
- Standard Carbon provides a solution for aging power generation facilities and increases their ability to operate in a flexible, carbon-neutral and cost-efficient manner while accommodating maximum RE penetration onto the grid.
- Standard Carbon couples RE projects with premium, dispatchable power systems, making the transition away from fossil-fuels technically and economically feasible for hydrocarbon dependent power systems. 7

General Availability Review (Weighted EFOR) Dashboard

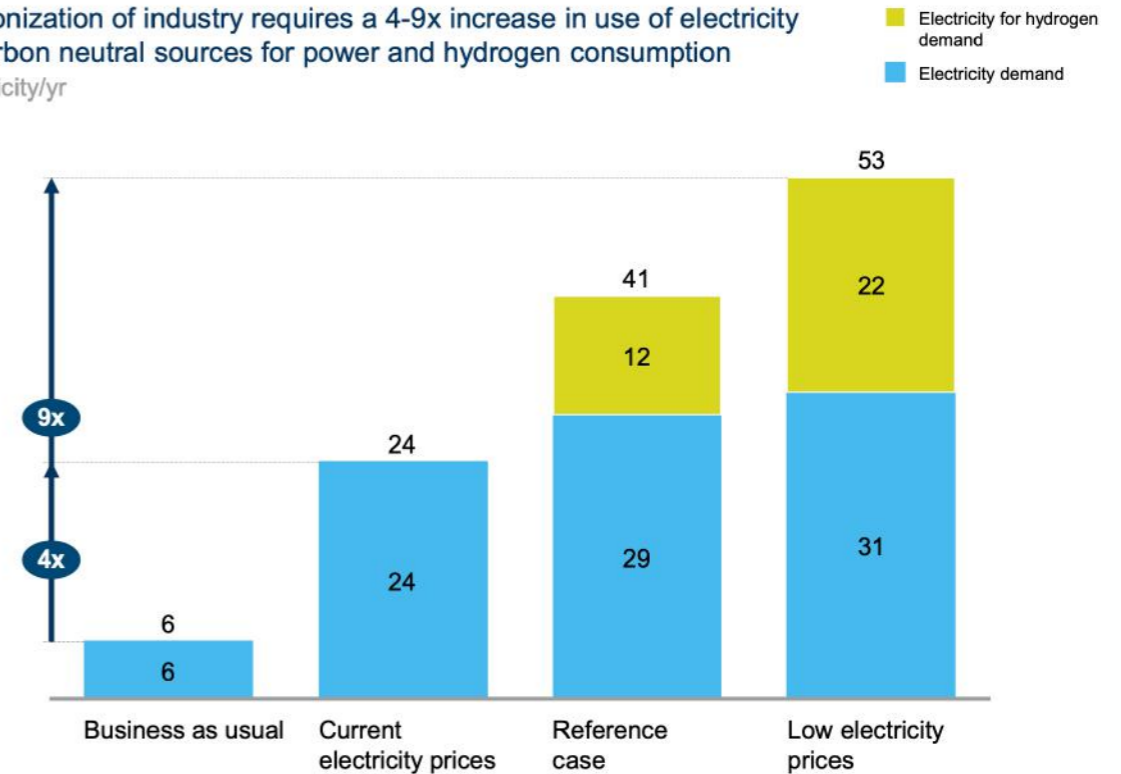


Standard Carbon's CO₂ Conversion Technology Produces Clean Hydrogen as an Intermediary Step

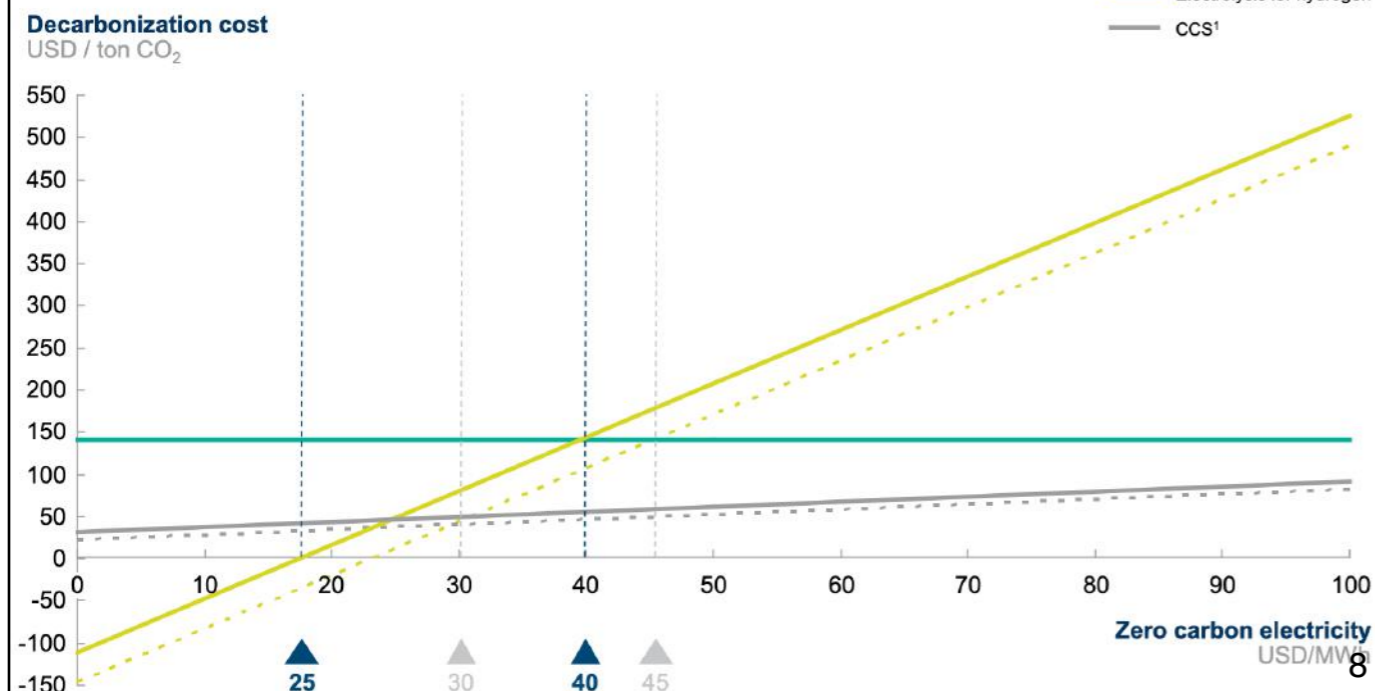
Clean Hydrogen is Crucial to a Low Carbon Energy Future

- Hydrogen is a [crucial for](#) critical industries:
 - Ammonia (Fertilizer)
 - Chemical Production
 - Methanol
 - Iron and Steel
- Clean Hydrogen production and use is expected to rise across industry in proportion to increased supply of affordable renewable electricity.
- Clean Hydrogen could account for **over 40% of total electricity demand.**

Decarbonization of industry requires a 4-9x increase in use of electricity from carbon neutral sources for power and hydrogen consumption
EJ electricity/yr



The attractiveness of capital intensive decarbonization options, such as electrolysis, decreases with higher capital costs
Greenfield ammonia production



Economics of Hydrogen Production

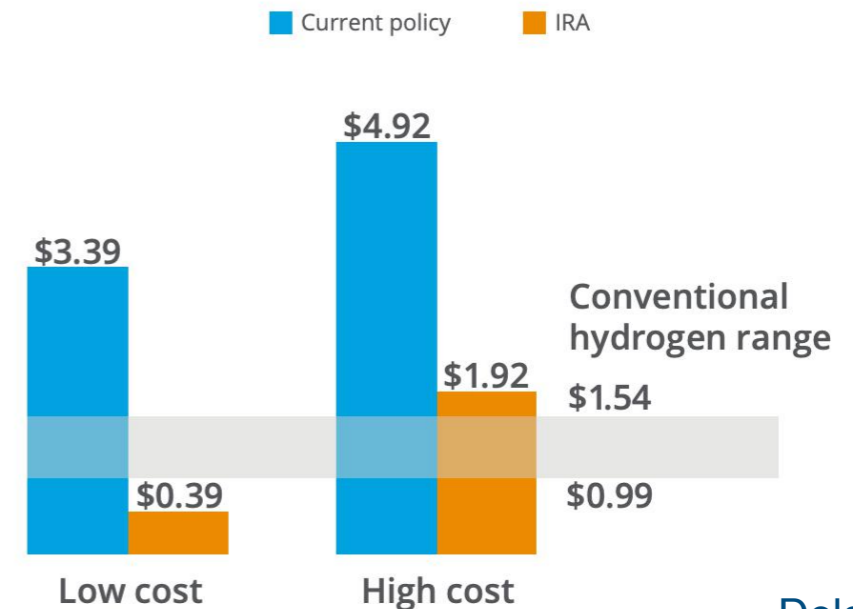
- Wide adoption of Clean Hydrogen solutions depends on high RE penetration costing [less than \\$40 MWh](#).
- Standard Carbon's R&D and patents use cost-competitive designs that reduce CAPEX and capture **stranded renewable electricity assets** for clean hydrogen production.
- The 2023 financial analysis for Standard Carbon's first pilot demonstrated clean hydrogen **production costs before federal subsidies**, on par with the most competitive [new electrolyzer technology costs](#).

Generous Regulations Incentivize Standard Carbon's Successful Deployment

United States

- The Inflation Reduction Act (IRA) is an ambitious plan to jump-start the clean hydrogen economy.
- Standard Carbon CO₂ Conversion Technology will qualify for the full 45V clean hydrogen production tax credit (supported by a tax memo from a top law firm and leader in this field).
- The 45V PTC awards \$3 per kg of qualifying clean H₂. Each 40 ft modular Standard Carbon unit has the capacity to accumulate over **\$800,000 in annual PTC's**.
- The 45V PTC shifts the economics of Standard Carbon to become the first **cash-flow positive** clean hydrogen technology.

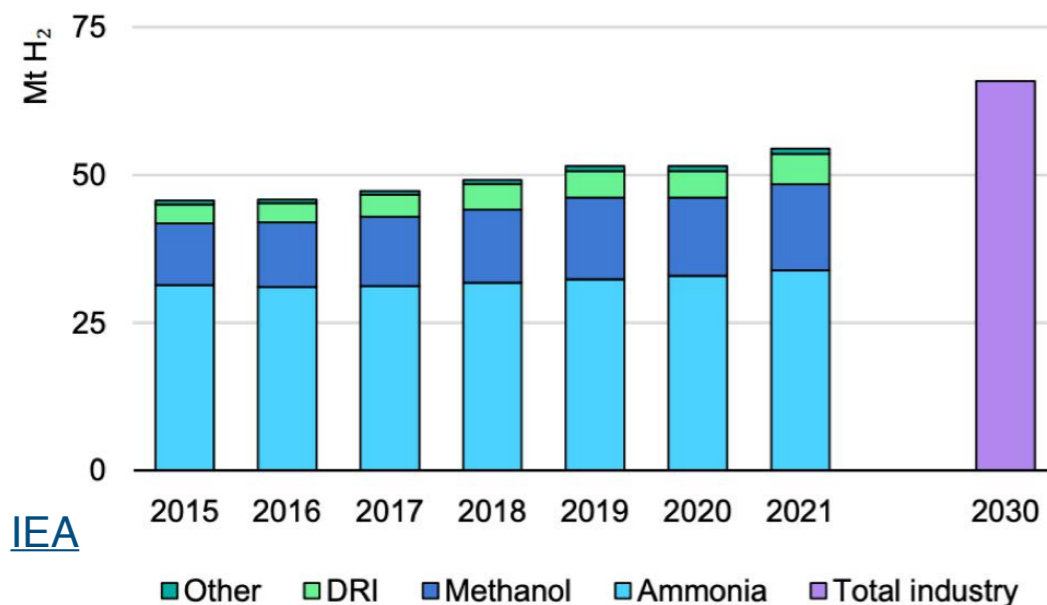
Green hydrogen prices, 2030
(US dollars per kilogram)



Deloitte

Note: Green hydrogen assumed to be produced with utility-scale solar.
Other zero-emitting electricity sources will lead to different costs.

Global hydrogen demand in industry, 2015-2030



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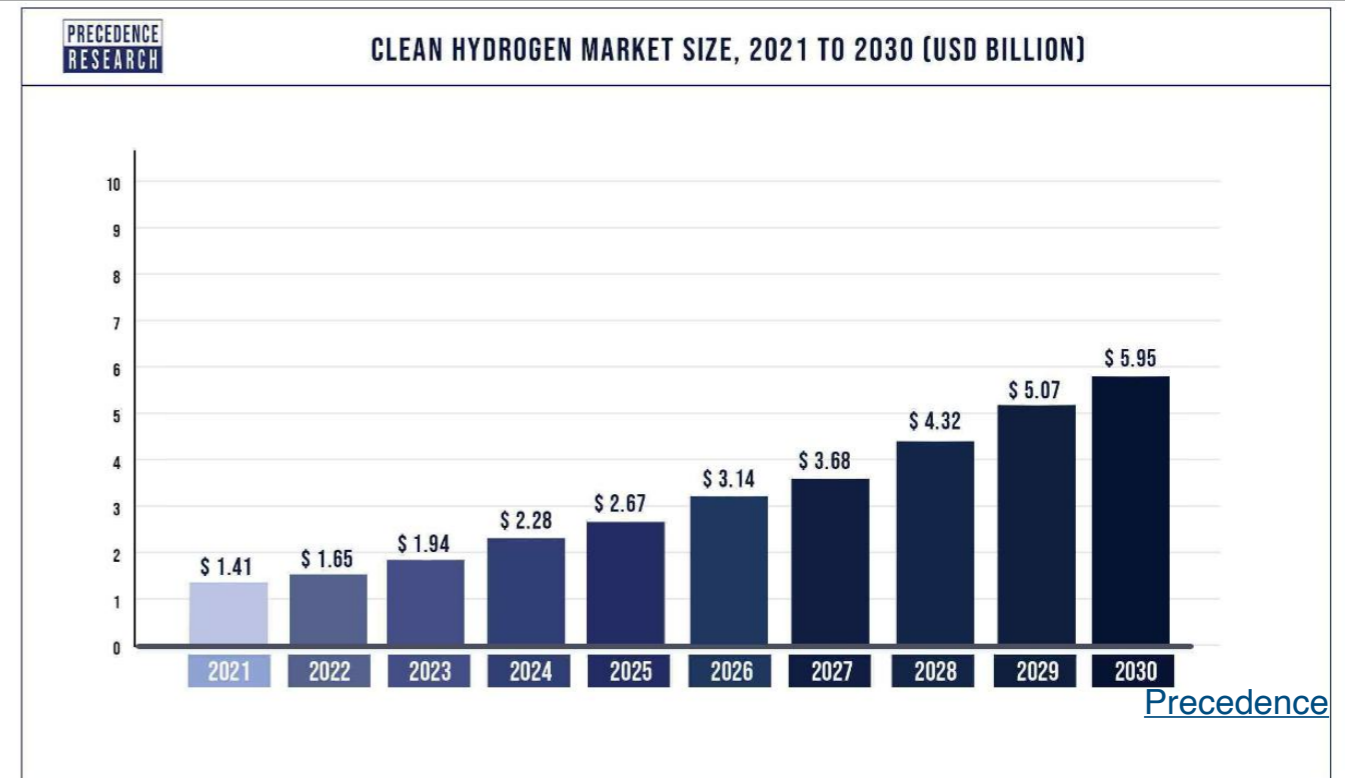
EU

- The [Green Deal Industrial Plan](#) is sweeping legislation that supports EU's ambitious decarbonization goals, and aims to secure the EU as a leader in innovation and production of net-zero technologies.
- Included is a commitment to integrate **20 million tonnes of clean H₂** by 2030 into the EU economy.
- [Express permitting and enhanced financing](#) will be awarded to "net-zero strategic projects" pending final legislation.

CO₂ Conversion Technology De-Risks Financial and Safety Liability of Clean H₂ by Blending it with Recycled CO₂

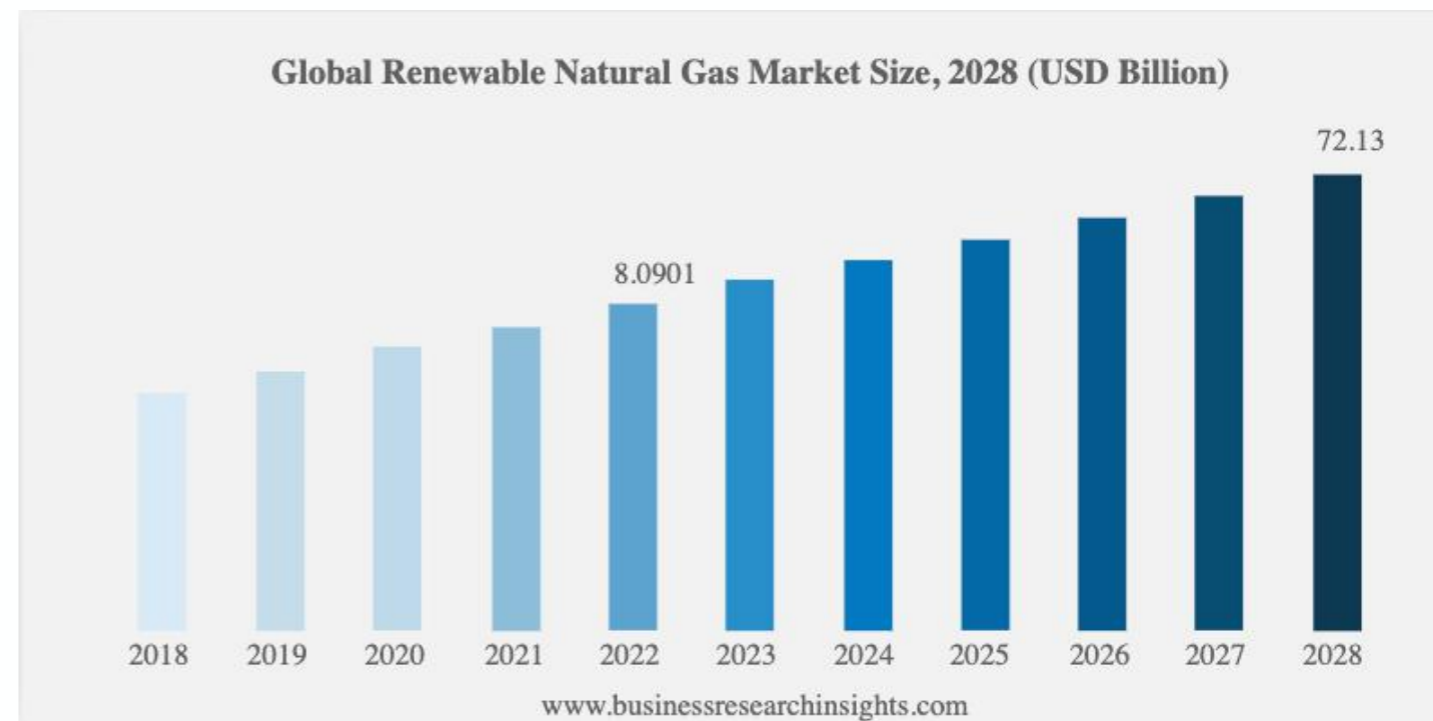
Pure Hydrogen Concerns

- Pure Hydrogen is technically difficult to transport and is not without significant safety concerns.
- Widespread adoption of hydrogen as a fuel will require massive overhauls to energy infrastructures and liability regulations.
- With large government subsidies flowing into clean hydrogen, rapid technology expansion will exceed demand in short time and may actually lead to increased grid CO₂ emissions.
- Total market size of **clean hydrogen is \$6B globally by 2030**.



Standard Carbon Benefits

- Standard Carbon's CO₂ conversion technology is a continuous process that blends clean hydrogen with captured CO₂ to produce Renewable Natural Gas
- The projected 10 year market size for **RNG is an order of magnitude larger** than clean hydrogen.
- Widespread adoption Standard Carbon will not require major infrastructure and regulation overhauls.
- The result is a scalable, net-zero energy solution that delays the financial, technical and safety hurdles of a pure hydrogen economy.



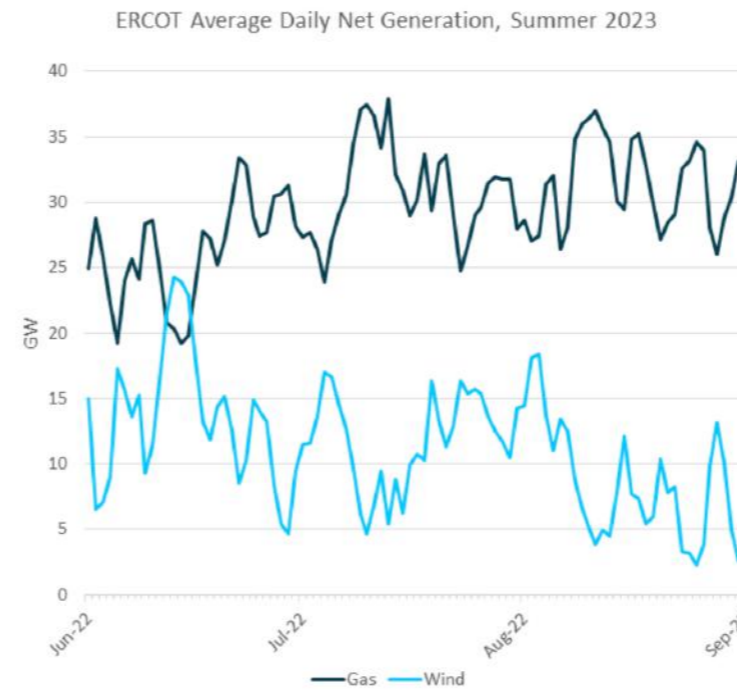
Natural Gas is Critical for Effective Long-Term Decarbonization

Rapid Coal Retirements Increase Natural Gas Dependence

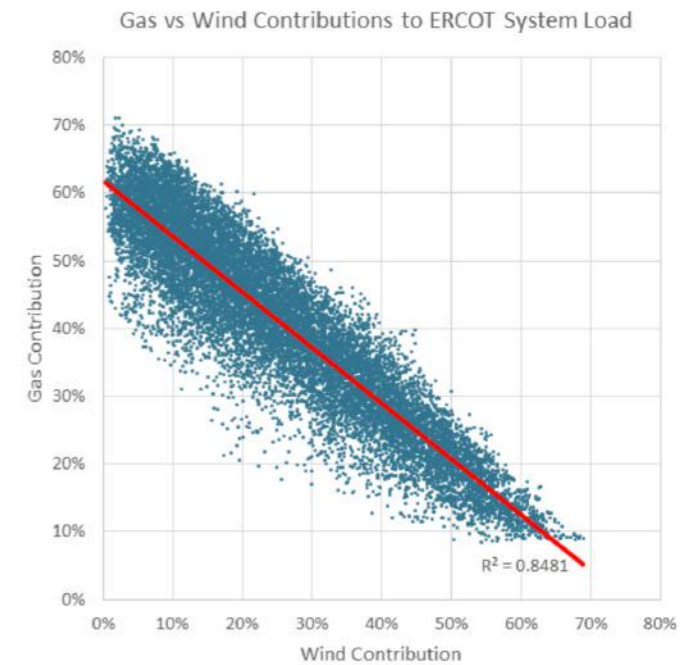
- Since 2005 in the US, coal-fired electricity generation has [decreased 50%](#), and [23% of the remaining 200 GW](#) coal-fired capacity retiring by 2030.
- Coal replaced with RE relies on Natural Gas generation facilities as a backstop, as they respond to RE power fluctuations.
- [Natural gas is an essential fuel](#) in the global energy transition, filling in the gaps of intermittent renewable electricity with clean, affordable and reliable power.

Gas-fired generation responds inversely to wind generation within ERCOT, which implies gas provides the primary backstop to wind's intermittency

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Source: BTU Analytics – a FactSet Company, EIA (Data Updated October 14, 2022)



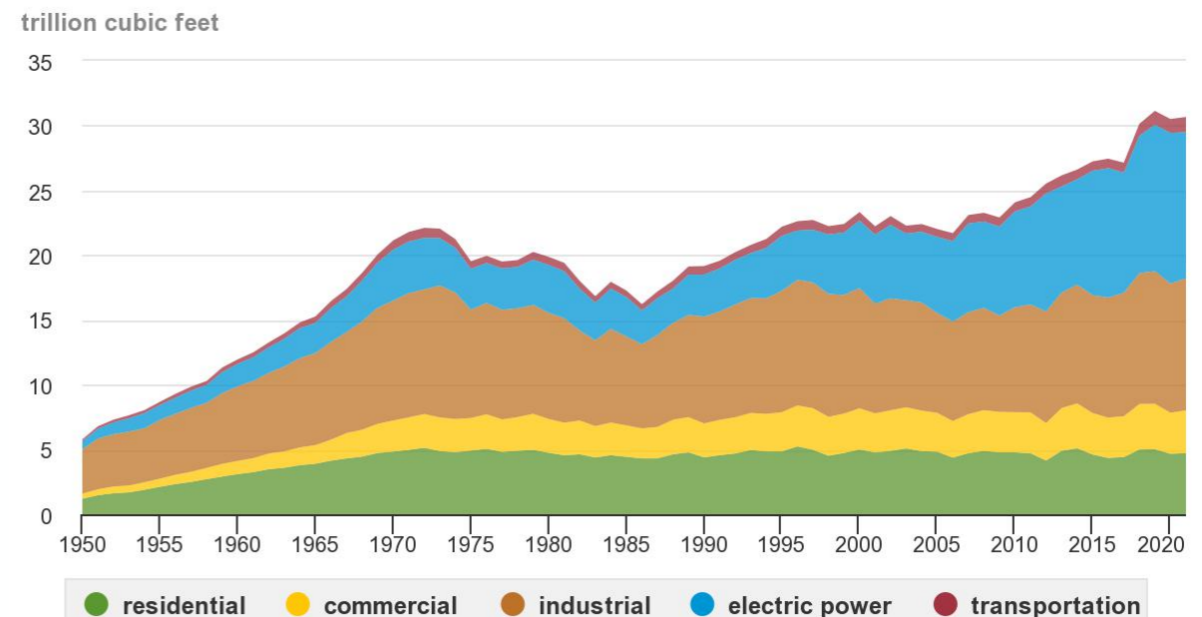
Note: Data inclusive of all hourly wind and gas-fired contributions to ERCOT system load since January 1, 2021
Source: BTU Analytics – a FactSet Company, EIA (Data Updated October 14, 2022)

BTU

Renewable Natural Gas

- RNG is **carbon-neutral natural gas**, with identical properties and use cases.
- RNG commodity premiums are 3-10x that of natural gas due to [marketable carbon attributes](#).
- America's power utilities and industries are committing to carbon-neutral quotas, and including RNG in their fuel mix at a pace which [far exceeds RNG supply](#).

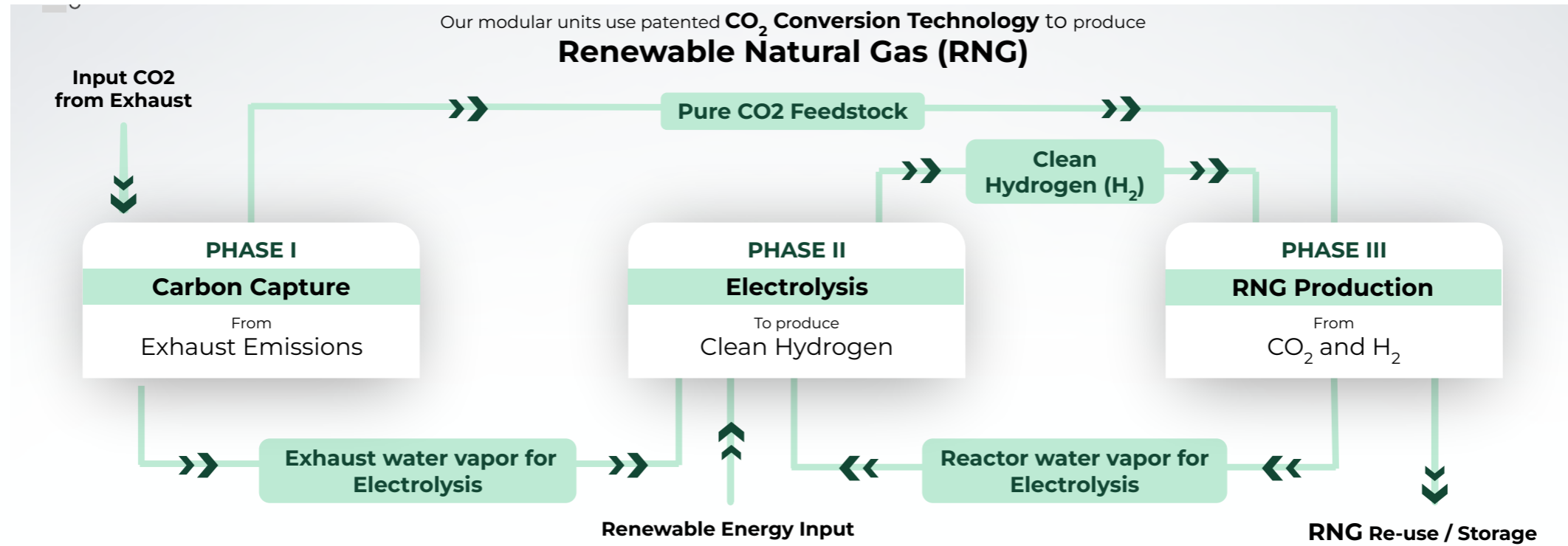
U.S. natural gas consumption by sector, 1950-2021



Standard Carbon is a Smart Solution that RE Investors and Power Managers are Seeking

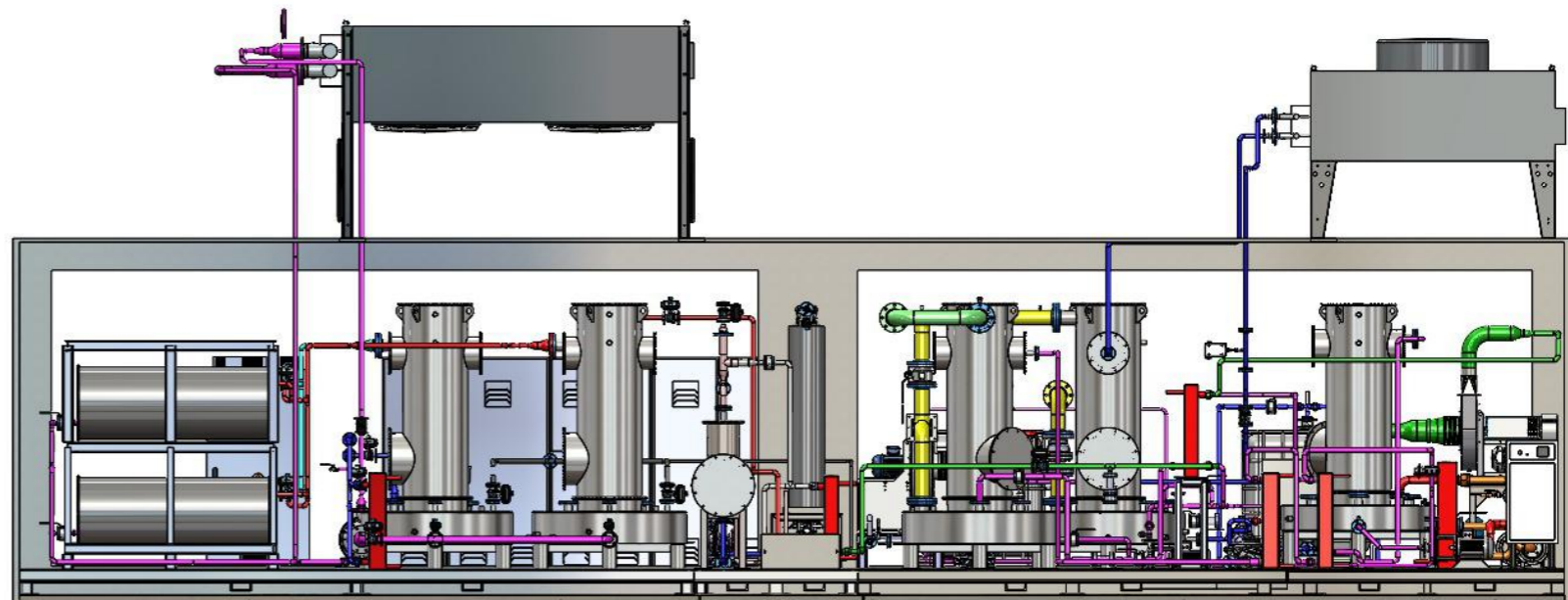
Background Thesis	<ul style="list-style-type: none"> ○ NYC Local Law 97 levels a \$268 carbon tax for every metric tonne of CO₂ emitted from buildings beyond the permitted threshold. ○ Local electricity grid dynamics cause massive electricity spot price variability with negative pricing 20% of the time in NYC. ○ An arbitrage opportunity exists between electricity and gas prices (which includes the \$268 carbon tax): Using low-cost electricity to power CO₂ Conversion Technology will have an all-in cost that is profitable over burning natural gas + carbon taxes. ○ Thermal and Renewable Utility Power and Industrial Facilities similarly can transform un-used renewable electricity into synchronous, dispatchable power and/or RNG and its valuable carbon attributes.
Vertically Integrated Solution	<ul style="list-style-type: none"> ○ Standard Carbon technology accesses multiple avenues of significant financial opportunity when integrated into normal energy operations ○ This enables Standard Carbon to pursue a solution-based business model where the customer can engage confidently with low risk-to-reward outcomes ○ Examples: <ul style="list-style-type: none"> • Produce RNG at scale for Utilities and Manufactures • Convert RE peak-power into synchronous, dispatchable power
Focus on Pain Points	<ul style="list-style-type: none"> ○ Engage customers and industries that are particularly vulnerable to profit loss or staged for financial gain due to complex issues surrounding energy transition policies and practices that result in both Conventional and Renewable stranded energy assets ○ Policy and Financial drivers include: IRA (Federal Subsidies), Decommissioning and/or write-down of “Conventional” Utilities, Volatile energy costs, Energy Curtailment, Grid Congestion, RE Generation Queue
Customizable Solution	<ul style="list-style-type: none"> ○ RE developers are interested in; solving for queued projects, demand/supply mismatch, peak/base loads, power inverters, synchronous generation, and PPAs ○ Utilities and manufacturers are interested in; solving for carbon mandates, stranded energy infrastructure, RNG, and stable energy pricing ○ Flexible capacity ensures accurate cost-to-benefit execution of every project

The Complete Standard Carbon Process is the Technology's Primary Innovative Feature



A Smarter Way

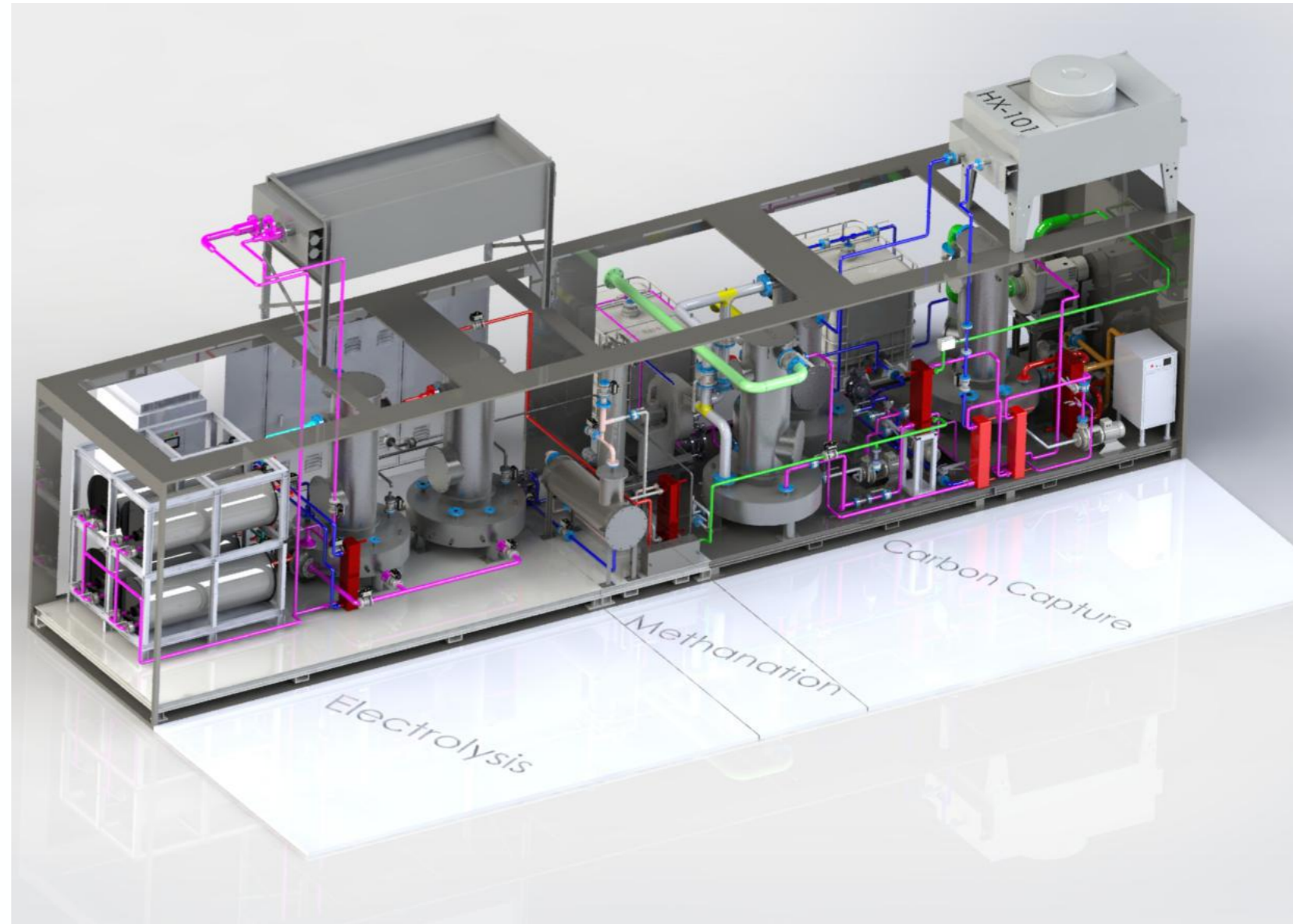
- Vertical Integration of multiple processes maximizes net performance that exceeds individual operation.
- Thoughtfully engineered with products and materials well established within the supply chain.
- Designed for compatibility with global combustion and electrical systems.
- Meets international safety standards.
- Modularity increases application diversity, production and delivery speed while closing the innovation-to-market lag.
- Equipped with integrated algorithmic controls that collect and processes operational data for global ESG and carbon credit reporting.



The Complete Standard Carbon Process is Patent-Protected

Patents, Future Patents, Trade Secrets, and Key Know-How

- Core process, controls and modularization is patent protected as well as heat-transfer and configuration which increase efficiency and scalability. Electrolyzer hardware and software is patent pending. All current and future patents are owned by Standard Carbon Technology LLC.
 - Patent does not limit to using specific hardware components, allowing for future integration of 3rd party innovations and technologies.
- **Awarded:** [US patent # 11,091,408](#) “Integration of Carbon Dioxide Absorption and Water Electrolysis into Methanation” covers process integration into one modular unit, heat transfer and synergism between performances to maximize efficiency.
- **Awarded:** [US patent # 17,528,587](#) - “Methanation and Recovery Method, System, and Apparatus” covers product geometry, algorithmic software controls and hardware configurations.
- **Future:** US patent for Short-Interval Alkaline Electrolyzer hardware, configuration, seals, stacks and software. Patent will protect the electrolyzer as a stand-alone unit for multiple applications.
 - Potential to patent other aspects of the technology including the methanation chamber, and liquid CO₂ storage system.



Standard Carbon Expects to Lead the RNG Industry in Total Production and Market Share

RNG Supply vs Demand

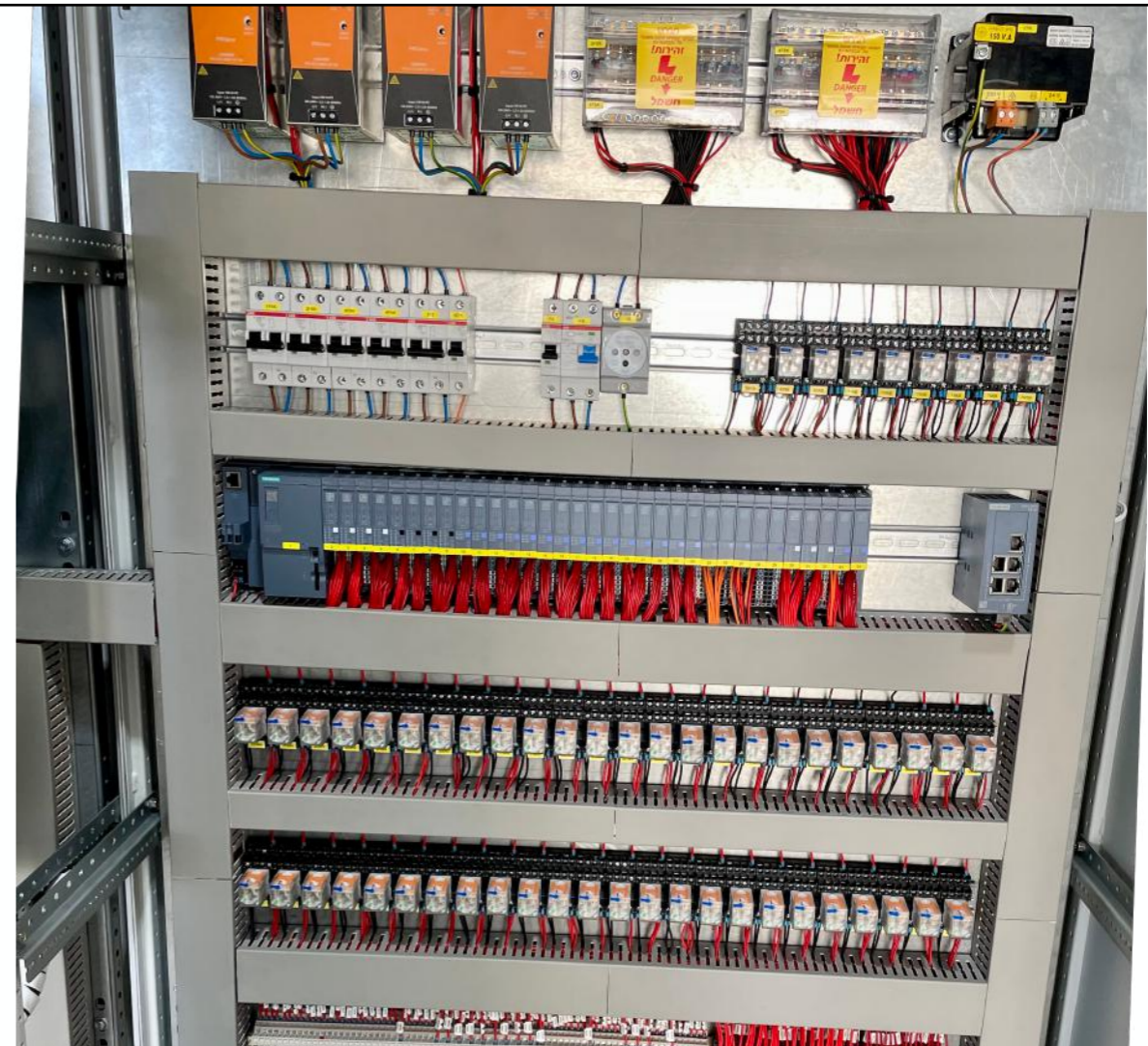
- RNG is in short supply. The NREL estimates that [maximum RNG production](#) from landfills, manure and wastewater treatment will meet **1.5% of US natural gas demand**.
- 2021 US Natural Gas demand is > 30B MMBtu.
- In 2021, **RNG supply was .25%** of total consumption.

	# Operational projects	Operational MMBTU/yr	% of Total RNG Production by Type
Food Waste	13	3,872,391	5.2%
Landfills	76	53,394,825	72.3%
Livestock, agriculture	115	14,457,908	19.6%
Water Treatment	26	2,125,823	2.9%
2021 Totals	230	73,850,947	
2020 Totals	157	59,488,530	
<i>Change 2021 vs. 2020</i>	<i>46.50%</i>	<i>24.14%</i>	

[ArgonneNL](#)

Maximum RNG Supply






- Standard Carbon technology is **scalable** to meet RNG demand.
- One 40ft unit has an annual 1420 MT CO₂ processing capacity yielding 27,000 MMBtu of RNG.
- In a commercial, scaled-up model processing 100,000 MT of CO₂ at a modest-sized combined cycle NG power facility; total annual MMBtu production capacity is 1,900,000 MMBtu.
- A large-scale power facility emits 500,000 MT CO₂ per year. Processing would yield 9,500,000 MMBtu equivalent to **13% of the current RNG market at one Standard Carbon facility**.



Standard Carbon is Making Rapid Progress

<p>Engineering</p>	<ul style="list-style-type: none"> ○ Scaling of process capacity over 100x: from under 10 MT CO₂ annual processing capacity to over 1000 MT CO₂ annually. ○ Expanded continuous run-time to over 150 hours, anticipating continuous duration data from commercial demonstration. ○ Multiple in-house designs of the system archived. ○ Hundreds of original in-house data sets to reference for future designs and configurations of the system. ○ Secured lead supplier for power supply, controls, pumps and heat exchangers. ○ Secured partnerships and obtained accounts for key suppliers of parts, materials, and construction services.
<p>Product</p>	<ul style="list-style-type: none"> ○ Signed LOI's with National Power Utility and International Corporations for commercial demonstrations in 2023/2024. <ul style="list-style-type: none"> • Leading global manufacturer of tires with \$34B revenue • The Israel National Electric Corporation which has super-majority control of the world's safest and most advanced electricity grid. • Large-scale coal refuse reclamation facility processing over 1,000,000 MT of waste coal per year. • An international transportation company with \$1.1B revenue.
<p>Marketing</p>	<ul style="list-style-type: none"> ○ New Website and branding launched in 2023. ○ Expanded Brand Awareness through events and awards <ul style="list-style-type: none"> • Jerusalem Venture Partners participant • Israeli Ministry of Science and Technology selection for presentation ○ Well-established inroads through personal outreach and relationship building <ul style="list-style-type: none"> • VCs • US Lawmakers • Global business leaders • Global technology and manufacturing experts
<p>Facilities</p>	<ul style="list-style-type: none"> ○ Pilot demonstration operational in Ariel, Israel since 2021. ○ First commercial-sized demonstration finishing Q3 2023 will provide: <ul style="list-style-type: none"> • Operation data • Validation of the scale-up process ○ First large US project with construction to commence upon term agreement. <ul style="list-style-type: none"> • Secure non-dilutive funding for this project • DOE and USDA grants for large commercial demonstration
<p>Human Resources</p>	<ul style="list-style-type: none"> ○ Standard Carbon funds a dedicated engineering and innovation team responsible for product development and construction. ○ Future key hires include: <ul style="list-style-type: none"> • Additional engineering specialists • Key business roles that assist with finance, project development and talent • Movement of key staff into business development, project management and chief of staff roles • Engaging with a talent partner to improve the recruitment process

Comparable Companies and Their Stages of Fundraising

Company	Technology	Round	Date	Amount (\$m)	Pre-Money Valuation (\$m)	Post-Money Valuation (\$m)	Notes on Drivers of Valuations
	Anaerobic Digestors	IPO	Jun -21	175		186	TSE: ANRG
		Multiple	2010	280			
	PEM Electrolysis	A	Jun - 21	24	45	69	Breakthrough Invested (A)
		B	May - 22	198	279	420	Breakthrough, Fifth Wall, Amazon (B)
	Alkaline electrolysis	A2	Mar - 21	22	120	142	Breakthrough Invested
		B	Jan - 22	75	170	245	
	Direct Air Capture and Synthetic Fuel Production	A	Jun - 20	12.5			BMW (A)
		B	Apr - 22	150		1.5b	BMW, Maersk, Y Combinator (B)
	Green Hydrogen Solutions	IPO	1999			6.6b	NASDAQ: PLUG
		Multiple	1997-2023	5.4b			

Strong Founding Team



Dell Perelman - CEO

- Over 3 decades of experience as General Counsel & Chief of Staff for the American Chemistry Council representing petrochemical interests
- JD & LLM in Environmental and Energy Law



Chief of Staff & General Counsel

American Chemistry Council
Apr 2003 - Jan 2020 · 16 yrs 10 mos
Washington DC



Boris Dvinsky - Vice President and Investor Relations

- Founder of Elaris Technologies: An algorithmic trading system managing \$150m AUM
- Managed a \$250m derivatives book at HSBC, NY
- Senior researcher at Millennium Partners
- MS in Financial Mathematics from University of Chicago

BORANA SOLUTIONS

Founder/CEO

Borana Solutions
2021 - Present · 2 yrs 3 mos



Founder/CEO

Elaris Technologies
2014 - Present · 9 yrs 3 mos



Managing Partner

Concentus Partners
2017 - Present · 6 yrs 3 mos



Benyamin Clayman - Vice President and Business Development

- Serial investor with multiple exits & strong history of sales and management of engineering teams & product
- Founder of Israel Center for Entrepreneurship
- US Army Reserve Officer
- BA from University of Chicago



Managing Partner

2711 Ventures
Feb 2016 - Present · 7 yrs 2 mos



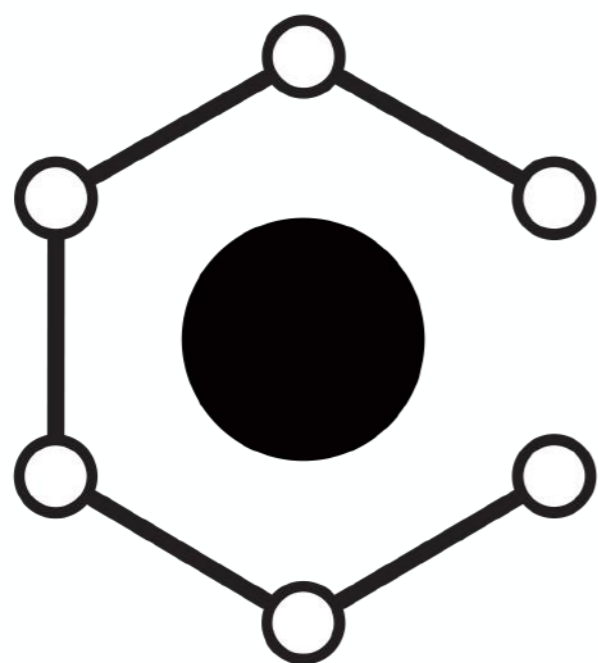
Founder

Israel Center for Entrepreneurship
Jan 2016 - Present · 7 yrs 3 mos



Chaplain

United States Army Reserve · Part-time
Jun 2020 - Jun 2022 · 2 yrs 1 mo



Standard**Carbon**