

Alternative Energy Market Update – Q3'22

Summer 2022



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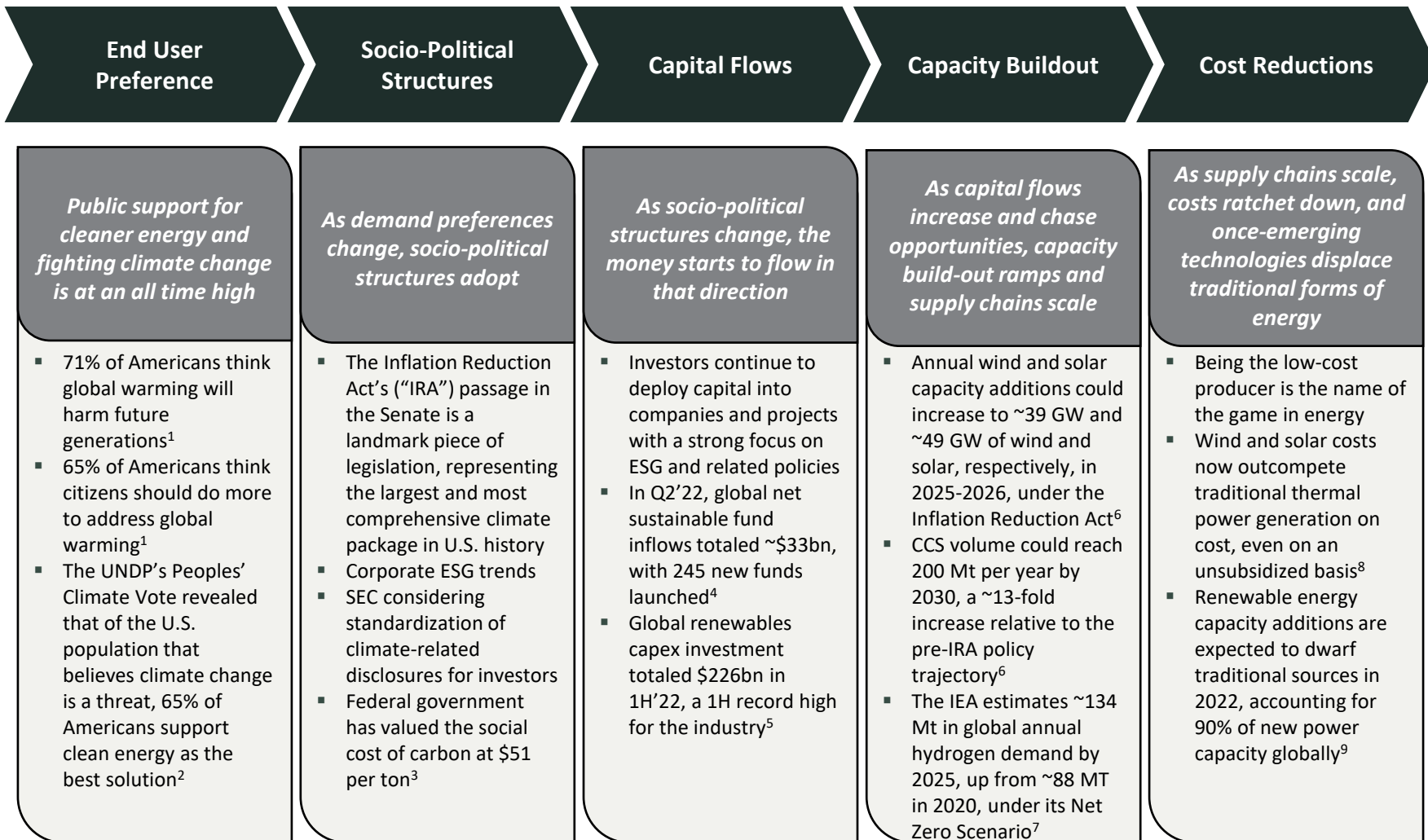
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Alternative Energy | Long-Term Conceptual Framework






The dynamic growth in Alternative Energy and Cleantech is underpinned by a generational trend of individuals' increasing preference for cleaner energy



¹Yale Climate Opinion Maps; ²United Nations Development Programme; ³Whitehouse; ⁴Morningstar; ⁵BNEF; ⁶American Gas Foundation; ⁷Zero Lab; ⁸IEA; ⁹IEA Renewable Energy Market Update 2021

Alternative Energy | Short-Term Developments

Recent legislative tailwinds serve as a “shot in the arm” for Alternative Energy and Cleantech

Activity	Market Impact	Commentary
Inflation Reduction Act		<ul style="list-style-type: none"> On August 7, the Senate passed the \$739 billion Inflation Reduction Act, which carves out \$369 billion for “Energy Security and Climate Change” While not final, the landmark legislation would broadly enhance support for clean energy initiatives ranging from wind and solar to nuclear and electric vehicles, and more
SEC Disclosure Requirements		<ul style="list-style-type: none"> The recent SEC-proposed rule requiring public companies to disclose standardized climate-related information appears challenged by precedents set by the Supreme Court’s June 30 ruling effectively restricting the EPA’s authority to mandate carbon emissions reductions
Fund Flows		<ul style="list-style-type: none"> Q2’22 net sustainable fund inflows decreased by ~13% from Q1’22, marking two consecutive quarterly declines. Comparatively, overall fund inflows decreased by ~15% over the same period¹ Despite the short-term decrease in fund inflows, \$226 billion was deployed into project capex, globally, in 1H’22, an all-time high for the respective calendar period²
Capital Markets		<ul style="list-style-type: none"> Public Cleantech companies lost ~25% of their value from the beginning of the year leading up to the announcement of the Inflation Reduction Act, largely tracking the Nasdaq over the same period³ As of August 8, public Cleantech equities have since recouped ~20% of the lost value following positive market sentiment driven by the new legislation
Executive Order Staying Auxin Tariffs		<ul style="list-style-type: none"> On June 6, The Biden Administration issued a two-year moratorium on new tariffs for imported solar modules, injecting much needed certainty into module shipments and supply chains broadly As module shipments resume, adverse effects brought on by the petition will likely linger in supply chains for the near- to medium-term

Source: ¹ Morningstar, ² BNEF, ³ EIP Climate Tech Index

Alternative Energy | Legislative Picture Turns Positive

The Inflation Reduction Act, pending House approval, would provide significant benefits to nearly every corner of the renewables industry

Noteworthy Legislation	Commentary
Reinstatement and extension of 30% solar ITC	<i>Most solar projects offered today are only eligible for 26% ITC and the industry had been planning for a further phase-down to 22%</i>
Reinstatement and extension of full wind PTC	<i>Most wind projects offered today are only eligible for 60% of the original PTC; the reinstatement to 100% will allow wind to compete with (or outcompete) solar in many areas</i>
New 30% ITC for standalone storage	<i>Previously, storage only received an ITC if it was paired with a renewable generation source receiving an ITC</i>
Domestic Content provision tax incentive adder	<i>Up to 40% ITC available when certain steel, iron, or manufactured product components of the facility are produced in the United States. The wind PTC increases from 100% to 110% of the original PTC when Domestic Content provisions are met. GreenFront's initial view is that, in most solar cases, the increased tax incentives more than pay for increased EPC costs. This thesis is less clear with the wind PTC</i>
Hydrogen PTC of \$3.00/kg	<i>Requires less than a 4:1 CO₂:H₂ tonnage production ratio. Amount paid on a sliding scale based on carbon intensity. 30% ITC option available if certain criteria are met</i>
Extension and increase of 45Q Carbon Capture tax credit from \$50 to \$85/ton	<i>The previous \$50/ton credit made only the most advantaged CCS projects financially viable. The \$85 credit should catalyze a massive expansion in development</i>
Clean Fuels Production Credit	<i>\$1.00/gallon for biodiesel and similar fuels</i>
Advanced Manufacturing Production Credit	<i>Available to certain solar, wind, inverter, battery, or mineral components manufactured in the U.S.</i>

Alternative Energy | Public Market Overview

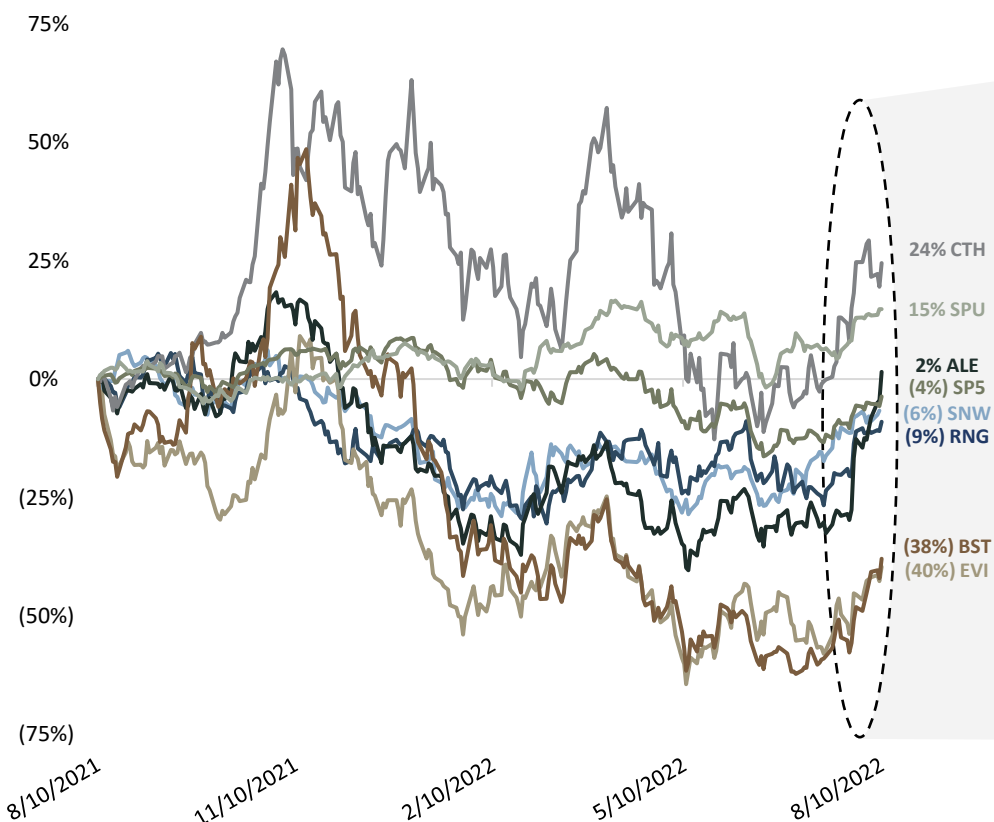
Company	Ticker	Price 8/10/2022	Market Cap (\$mm)	Enterprise Value (\$mm)	YTD Total Returns (%)	Valuation		Debt / Total Cap (%)	Credit	S&P Credit Rating
						2022E EV / EBITDA (x)	2023E EV / EBITDA (x)		2022E Net Debt / EBITDA (x)	
Alternative Energy										
Array Technologies	ARRY	\$23.58	\$3,545	\$4,633	50.3%	31.7x	14.6x	70.1%	5.6x	B
Brookfield Renewable Corporation	BEPC	42.21	15,272	38,617	17.8%	17.9x	16.5x	50.3%	9.9x	BBB+
First Solar	FSLR	114.51	12,206	10,593	31.4%	50.5x	18.1x	3.8%	0.0x	NA
Hannon Armstrong	HASI	45.71	3,999	6,573	(12.4%)	40.4x	32.2x	63.9%	4.3x	BB+
Ormat Technologies	ORA	91.75	5,132	7,104	16.1%	16.0x	13.3x	51.1%	4.3x	NA
Sunnova Energy International	NOVA	29.46	3,378	7,812	5.5%	59.0x	36.7x	70.1%	38.0x	B-
SunPower Corporation	SPWR	26.53	4,619	4,704	27.1%	48.9x	27.2x	58.0%	0.0x	NA
Sunrun	RUN	37.02	7,852	16,775	7.9%	NA	NA	50.5%	0.0x	NA
Cleantech										
Bloom Energy Corporation	BE	\$29.30	\$5,248	\$6,340	33.6%	162.5x	34.9x	94.5%	0.0x	NA
Enphase Energy	ENPH	303.25	41,077	41,136	65.8%	60.5x	45.9x	74.3%	0.0x	NA
FuelCell Energy	FCEL	4.89	1,891	1,590	(6.0%)	NA	NA	11.4%	0.0x	NA
Plug Power	PLUG	28.78	16,655	14,371	1.9%	NA	462.1x	15.9%	0.0x	NA
SolarEdge Technologies	SEDG	323.74	18,011	17,134	15.4%	37.2x	23.1x	26.4%	0.0x	NA
Tesla	TSLA	883.07	922,358	911,390	(16.4%)	43.4x	29.6x	15.0%	0.0x	BB+
Solar / Wind IPP										
Clearway Energy	CWENA	\$35.26	\$4,347	\$12,874	7.7%	10.8x	10.9x	64.4%	5.6x	BB
EDF	EDF	12.30	45,938	57,888	24.3%	NA	3.0x	52.1%	0.0x	BBB
EDP Renováveis	EDPR	27.07	26,000	34,076	19.9%	16.2x	15.4x	41.7%	2.5x	BBB
NextEra Energy Partners	NEP	83.81	7,032	20,893	2.3%	11.8x	10.9x	30.5%	2.8x	BB
Ørsted	ORSTED	118.53	49,802	54,752	3.6%	13.4x	15.7x	43.0%	1.0x	BBB+
Alternative Fuels / RNG										
Ameresco	AMRC	\$70.65	\$3,662	\$5,141	(13.2%)	24.9x	23.0x	64.1%	NA	NA
Archaea	LFG	18.49	1,487	2,662	1.1%	18.4x	10.4x	30.1%	5.0x	NA
Clean Energy Fuels Corp.	CLNE	7.90	1,756	1,654	28.9%	29.9x	16.3x	9.7%	1.3x	NA
Darling Ingredients	DAR	73.98	11,949	14,968	6.8%	9.5x	7.8x	46.4%	2.0x	BB+
Montauk Renewables	MNTK	15.45	2,183	2,188	50.7%	20.3x	18.1x	27.4%	0.0x	NA
Neste	NESTE	50.10	38,480	39,937	12.7%	12.0x	12.2x	25.1%	0.4x	NA
OPAL Fuels	OPAL	10.86	273	530	8.8%	8.3x	2.4x	66.9%	0.0x	NA
Electric Vehicle Infrastructure										
ChargePoint Holdings	CHPT	\$16.44	\$5,540	\$5,317	(13.7%)	NA	NA	40.6%	0.0x	NA
Evgo, Inc	EVGO	10.61	732	1,569	6.7%	NA	NA	5.5%	0.0x	NA
TPG Pace Beneficial Finance (EVBox)	TPGY	9.97	436	432	1.6%	NA	NA	NA	0.0x	NA
Volta	VLTA	2.59	434	352	(64.7%)	NA	NA	32.9%	0.0x	NA
Battery Storage										
Enovix Corporation	ENVX	\$16.15	\$2,533	\$2,134	(40.8%)	NA	NA	2.2%	0.0x	NA
Eos Energy Enterprises	EOSE	2.68	166	260	(64.4%)	NA	NA	211.0%	0.0x	NA
Fluence	FLNC	17.43	1,983	1,815	(51.0%)	NA	NA	NA	0.0x	NA
Li-Cycle	LICY	7.45	1,301	915	(25.2%)	NA	NA	19.9%	0.0x	NA
QuantumScape Corporation	QS	12.67	5,482	4,323	(42.9%)	NA	NA	6.8%	0.0x	NA
Stem Inc.	STEM	15.01	2,315	2,523	(20.9%)	NA	138.7x	47.3%	0.0x	NA

Source: S&P CapIQ Pro. Note: Prices as of 8/10/2022

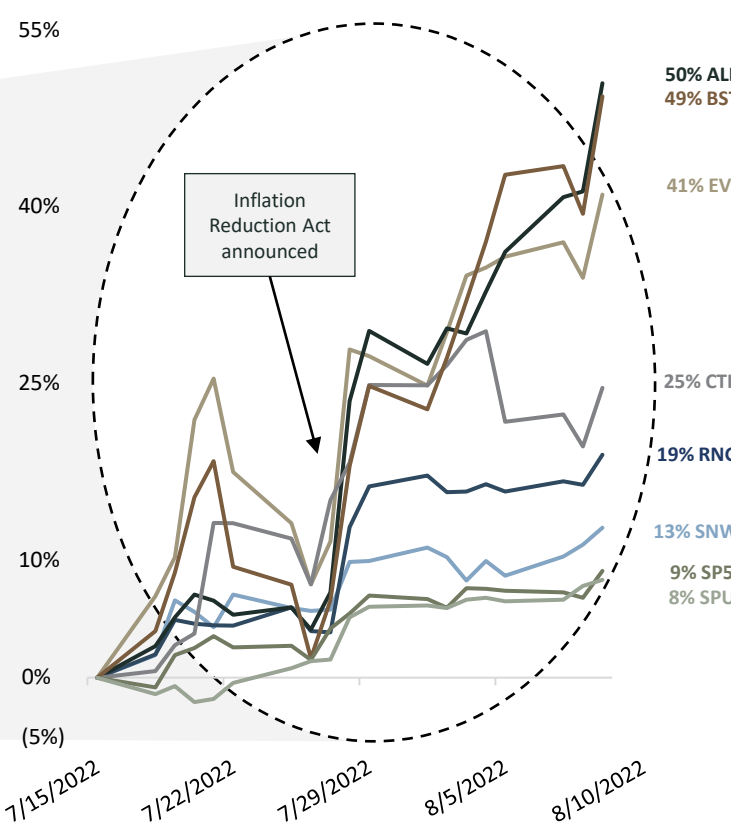
Alternative Energy | Stock Market Performance

Alternative Energy (ALE)		Cleantech (CTH)		Solar/Wind (SNW)		Renewable Fuels/RNG (RNG)		EV Infrastructure (EVI)		Battery Storage (BST)		S&P Utilities Index (SPU)	S&P 500 (SP5)
ARRY	ORA	BE	PLUG	CWENA	NEP	AMRC	MNTK	CHPT	TPGY	ENVX	LICY		
BEPC	NOVA	ENPH	SEDG	EDF	ORSTED	LFG	NESTE	EVGO	VLTA	EOSE	QS		
FSLR	SPWR	FCEL	TSLA	EDPR		CLNE	OPAL			FLNC	STEM		
HASI	RUN					DAR							

Indices Total Return (LTM)



Senate Inflation Reduction Act (from 7/15/22)



Source: S&P CapIQ Pro. Note: Prices as of 8/10/2022

Alternative Energy | U.S. Solar, Wind, & Storage Landscape

The market is repricing the value of conventional renewables to account for widespread benefits from the IRA

Solar

- Extension and expansion of ITC and PTC should counterbalance inflationary pressures driving the rise in PPA prices
- Supply chain and interconnection challenges continue to govern utility-scale growth
- Heavy investment in IPPs continues, several IOUs currently in the market or evaluating sale of competitive renewables businesses

Wind

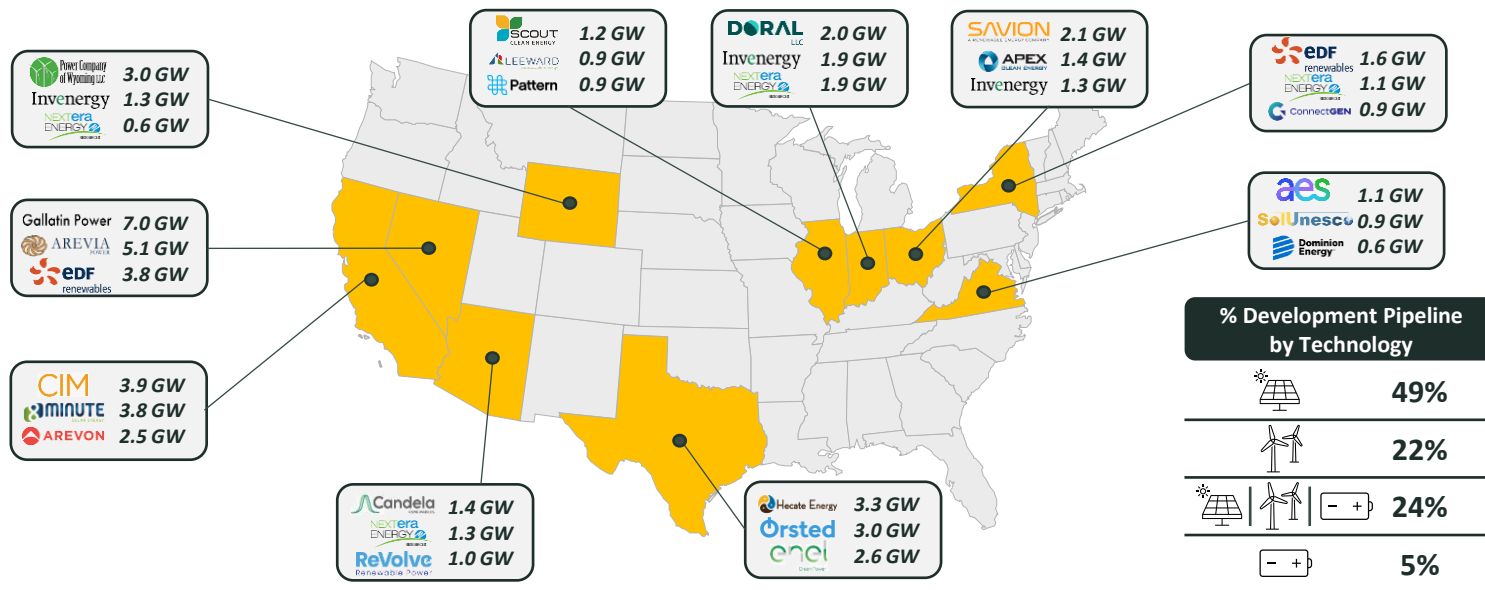
- Proposed increase to the wind PTC provides owners with additional ~\$10/MWh tax credit for the first 10-years of project life
- Dominion won state approval for its offshore wind project, a major milestone for the first U.S. project owned by an electric utility
- Supply chain and labor markets are IRA beneficiaries but remain major uncertainties

Battery Storage

- Only segment to experience installation growth during 1H'22, dominated by hybrid installations (+90%)
- ITC for stand-alone, combined with greater diversity of use cases, should result in major growth beyond hybrid projects
- Capital markets opened up for developers with many notable deals announced (pg 11)

Largest U.S. Development Pipelines by Market¹

Top 3 pipelines in each of the top 10 markets, ranked by pre-operational generating capacity²



Source: ¹ Project pipeline data sourced from NPM Market Data, excludes Offshore Wind. ² Pipeline capacity data sourced from NPM curated intelligence and publicly available sources

Alternative Energy | Utility-Scale Solar Transactions














Deal flow picked up meaningfully this summer and is expected to accelerate as institutional interest remains high and valuations benefit from favorable tax policy

Date	Investor	Target	Commentary
Aug'22			New Energy Solar has entered exclusivity with MN8 Energy, formerly Goldman Sachs Renewable Power, to sell its 14-project, 442 MW U.S. portfolio mostly located in CA and NC
Jul'22			Longroad Energy announced a \$500mm investment led by MEAG, who invested \$300mm to acquire a 12% stake. Existing investors Infratil and NZ Super Fund invested another \$100mm apiece and their equity stakes were reduced to 37% from 40%. The remaining 14% is owned by Longroad management
Jul'22			Galehead has reached an investment agreement with Macquarie's Green Investment Group to further Galehead's 6 GW pipeline of early to mid-stage projects, enter new markets, and explore new commercial applications for its LandCommand platform
Jul'22			Birch Creek announced it has increased its existing credit facility with debt financing provider Fundamental Renewables to \$250mm to pursue its 5 GW solar pipeline in the U.S. and support its module procurement strategy
Jul'22			Scottish-based renewables developer Renewco Power expanded its platform in the U.S. acquiring a 1.5 GW pipeline of early-stage utility-scale solar projects, alongside 500 MW of battery storage projects from Beaufort Rosemary
Jul'22			Onward Energy, an independent power generator, announced a binding agreement to acquire an 11-project, 1,171 MW operating solar portfolio that spans 8 states from Global Atlantic
Jul'22			CleanCapital announced the acquisition of New York-based brownfield renewable energy developer, BQ Energy, which has a 700 MW pipeline ranging from community solar, small-scale C&I, and utility-scale projects
Jun'22			DESRI secured \$400mm in capital from funds managed by Harbert Infrastructure. The transactions will support DESRI's 4,232 MW of operational and in-construction projects and 2,077 MW of contracted pre-construction projects
May'22			ECP has agreed to acquire Borrego, the U.S. development subsidiary of Walsin Lihwa Corporation, for an estimated \$567mm, which implies a \$0.038/Watt _{dc} multiple for 8.4 GW of solar and 6.4 GW of energy storage
May'22			Generate Capital has acquired a 12.5% preferred equity position in Pine Gate Renewables. The transaction calls for Generate to provide a \$200mm equity investment and an additional \$300mm commitment to long-term asset partnership for solar financing. The two parties will then co-own assets on a long-term basis

Source: Company Press Releases

Alternative Energy | Distributed Generation Solar Transactions

Recent transactions include a mix of platform investments and short/medium-term financing arrangements for development capital

Date	Investor	Target	Commentary
Aug'22	 Brookfield Renewable	N/A	Brookfield Renewable agreed to acquire a DG developer for \$700mm. The target company has approximately 500 MW of operating and under construction assets primarily located in the Northeast, and a 1.8 GW development pipeline
Jul'22	 APOLLO	 SUMMIT RIDGE ENERGY	Apollo announced a \$175mm strategic investment in Summit Ridge, a leading owner-operator of community solar assets, but did not disclose the size of Apollo's stake in the Arlington, Virginia-based company
Jun '22	 FIFTH THIRD BANK LACUNA SUSTAINABLE INVESTMENTS	 infiniti	Infiniti Energy closed on an \$87mm sale leaseback tax equity package and a \$30mm construction facility with Fifth Third Bank, both earmarked to finance up to 34 MW of commercial solar in NJ. Infiniti also closed on a \$10mm bridge facility with Lacuna Sustainable Investments to support the same portfolio
Jun '22	 BOSTON SOLAR		SinglePoint subsidiary, The Boston Solar Company, acquired clean energy financing company Ecodaptive with plans to expand the firm's distributed solar financing efforts. The parties crafted a framework for a \$100mm asset finance facility to grow the SunRAYS distributed rooftop solar program
Jun '22	 LEYLINE RENEWABLE CAPITAL	 SOLTERRA	Leyline has agreed to provide \$10mm in early-stage growth and development capital to support Solterra Energy's development of up to 1 GW of DG and utility-scale solar energy projects across the eastern U.S.
Jun '22	 longroad ENERGY	 Valta Energy	Longroad Energy announced a strategic investment in Valta Energy, a Dana Point, CA-based developer, owner, and operator of DG projects nationwide, but with operating assets primarily in CA, MA, and HI
Jun '22	 HANNON ARMSTRONG	 FOREFRONT POWER	ForeFront Power, a wholly-owned subsidiary of Mitsui & Co., has agreed to an equity transaction to share the ownership of a 10-state, 131 MW portfolio of distributed generation and solar-plus-storage projects with Hannon Armstrong
June '22	 Greenbacker CAPITAL	 SDG Sunrock Distributed Generation	Greenbacker Capital has made an investment in Sunrock Distributed Generation, a financing and asset aggregation platform for commercial and industrial solar and energy storage projects across the country
May '22	 AXIUM INFRASTRUCTURE	 BLUEWAVE	Axiom Infrastructure acquired BlueWave, a Boston-based community solar developer, to support pipeline execution and transition towards a long-term asset ownership model
May '22	 CARVAL INVESTORS	 VEROGY	CarVal Investors acquired a minority stake in Verogy, a vertically integrated solar developer specialized in serving the commercial, industrial, and small utility-scale segments for the Connecticut market and throughout New England

Source: Company Press Releases

Alternative Energy | Battery Storage Transactions

Several noteworthy transactions were announced for battery storage developers after a relatively quiet 1H'22

Date	Investor	Target	Commentary
Aug'22	 HULL STREET ENERGY	 FLATIRON ENERGY PARTNERS	Hull Street Energy has made a strategic investment in Flatiron Energy, a pending certified B Corp focused on developing, owning, and operating utility-scale energy storage
Jul'22	 UBS Global Asset Management	 BLACK MOUNTAIN ENERGY STORAGE	UBS Asset Management has acquired five standalone, development-stage energy storage projects in Texas from Black Mountain Energy Storage. The ERCOT-located projects total 700 MW and will reach COD in 2024
Jul'22	 spearmint energy	 conEdison	Spearmint Energy acquired the 150 MW Revolution battery energy storage project in ERCOT from Con Edison Development. The project is located adjacent to the King Mountain Wind Farm in the Lower Colorado River Authority Territory and is Spearmint's first project acquisition
Jul'22	 CYPRESS CREEK RENEWABLES	 BLACK MOUNTAIN ENERGY STORAGE	Cypress Creek has added 400 MW/ 600 MWh to its storage portfolio after acquiring four Texas standalone energy storage projects from Black Mountain Energy Storage. The projects are 100 MW each, located throughout ERCOT, and are currently under construction
Jul'22	 GENERATE	 esVOLTA	Generate Capital acquired battery storage developer esVolta, a CA-based company with a portfolio of more than 900 MWh of operational and utility-contracted projects in the U.S. and Canada, that has a portfolio of projects in active development in TX, AZ, MT, CA, WA, and NM
Jul'22	 Vitol	 FLEXGEN	FlexGen Power Systems, an integration services and software technology provider for energy storage facilities, has completed a \$100mm investment round to support pipeline growth across multiple regions. The Series C raise was led by Vitol in partnership with existing investors
Jul'22	 GIC Trilantic NORTH AMERICA	 POWIN	Powin raised \$135mm in a growth equity round led by GIC and including Trilantic North America and Energy Impact Partners. The funds will be used to continue to build out its 10 GWh energy storage business
Jul'22	 equinor	 EAST POINT ENERGY	Equinor announced a 100% stake in Charlottesville, Virginia-based battery storage developer East Point Energy. East Point has a 4.1 GW pipeline of early to mid-stage storage projects focused on the U.S. East Coast
Jun '22	 TPG RISE CLIMATE Trilantic NORTH AMERICA	 Intersect Power	Intersect Power raised \$750mm in growth equity from TPG Rise, CAI Investments and Trilantic North America to accelerate the build-out of Intersect's clean energy platform from today's 2.4 GW portfolio to 8 GW+ of renewable generation storage, and hydrogen production
Jun '22	 CARVAL INVESTORS	 AGILITAS ENERGY	Agilitas Energy, an integrated developer, builder, owner, and operator of distributed energy storage and solar photovoltaic systems in the northeastern U.S., announced it raised \$350mm of equity in a two-tiered investment from funds managed by CarVal Investors

Source: Company Press Releases

Alternative Energy | Fleet Electrification

Cost reductions and innovation, complemented with broad legislative support, is enhancing the fleet electrification value proposition and driving robust market activity

Market Commentary

Battery and EV technology advancements and cost reductions are creating a compelling value proposition for fleet electrification, driving widespread adoption of EVs and corresponding charging infrastructure

Declining Battery and EV Costs



Battery costs, the largest capex component for EVs, have declined dramatically over the past decade. Average lithium-ion battery pack prices have fallen ~89% since 2010¹



Rising Commodity Prices Enhance Value Proposition

As gasoline prices reach 20-year highs, EV avoided cost benefits and price stability become increasingly compelling to fleet owners



Widespread EV Adoption

BloombergNEF's Electric Vehicle Outlook 2022 forecasts an ~600% increase in global electric bus, van, and truck fleet size between 2020 and 2025



EV Charging Infrastructure Lags Behind

Despite the factors above, U.S. charging infrastructure severely lags EV deployment with just ~0.15x electric vehicle supply equipment ports per EV across the U.S. on average²

Recent Noteworthy Activity



Aug. '22: EQT infrastructure launched Voltera, an electric vehicle infrastructure platform that will build, own, and operate EV charging facilities



Jun. '22: Blink, a public EV charging equipment and services company, agreed to acquire SemaConnect, an EV infrastructure solutions company, for \$200mm



May '22: Inspiration Mobility, an ArcLight-backed fleet electrification and charging company, raised \$215mm from Macquarie Asset Management and Ferrovial



Mar. '22: Evercharge, an Oakland, CA-based EV charging equipment manufacturer, developer, owner, and operator, was acquired by SK E&S. Since its founding in 2013, EverCharge has installed and is operating ~4,600 EV chargers across N. America

Legislative Tailwinds

Medium- and heavy-duty EV fleet owners stand to benefit from the Inflation Reduction Act, which includes tax credits for qualified clean commercial vehicles and charging stations

Commercial EVs

Tax credit equal to the lesser of:
 1) 15% of the purchase price;
 2) incremental cost relative to comparable vehicle;
 3) \$40,000 for vehicles > 14k lbs

Charging Stations

Extends tax credit eligibility through December 31, 2032, and provides up to \$100,000 in tax credits per charger

Source: ¹BloombergNEF; ²Evercore ISI

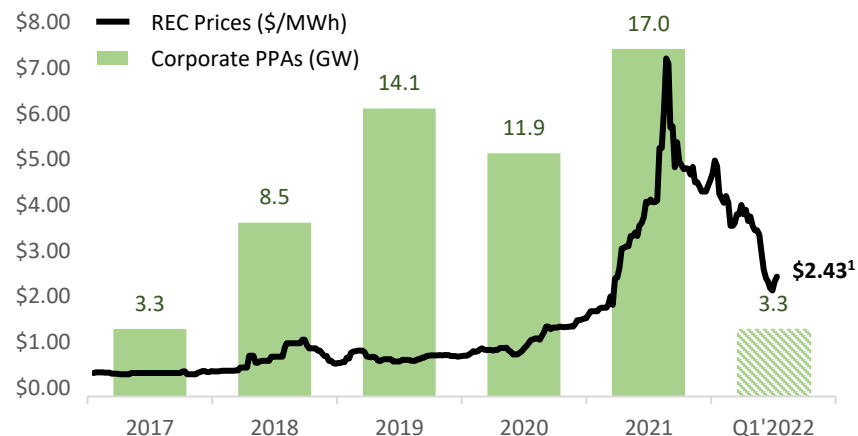
Alternative Energy | Corporate PPA Market Overview

Macro commodity and supply chain inflationary pressures persist; however, interconnection reform and legislative action is likely to relieve some pressure for developers

Recent Renewable Development Factors

- On 8/7/22, the U.S. Senate passed the Inflation Reduction Act (IRA), a \$739 billion legislative package with \$369 billion earmarked for “Energy Security and Climate Change”. While not final, the legislation would broadly enhance support for a wide range of clean energy initiatives
- All-in EPC prices for both wind and solar are up 15% YoY**, as steel, copper, polysilicon, concrete, labor, and transportation costs all soar, due to supply chain and broader inflationary pressures
- Interconnection queues** are growing in size and duration. In June 2022, PJM filed proposed interconnection process rules with FERC. Historically, PJM’s interconnection process followed a first-come/first-served basis, which has led to backlogs spanning up to 4 years for new projects entering the queue and large disparities on network upgrade responsibilities. Both PJM and FERC have proposed to move to a first-ready/first-served cluster study process, similar to what is utilized in MISO and CAISO, to help relieve PJM’s current backlog
- Corporate and utility demand** continue to climb, putting upward pressure on PPA prices as these two buyer-classes compete for a scarce number of shovel-ready projects. Corporate demand is being driven by investors, customers, and employees, and utility demand stems from a mix of legislative mandates and economic price signals
- A flood of corporate demand, paired with more stringent RPS guidelines in certain jurisdictions, led to a steady climb in the market price for unbundled RECs, spiking in 2021 at a high of over \$7.00
 - Despite trending downward through 1H’22, unbundled REC pricing remains high relative to pre-2021 levels
 - A somewhat liquid REC hedge market only exists for 3 to 5 years on most REC trading platforms, though a few jurisdictions have longer-dated visibility for out-years

U.S. Corporate PPA Volume (FY’19 – Q1’22)



Recent Noteworthy PPA Deals

Corporate	Seller	Size (MW)	Fuel Source	Location
Meta	Greenbacker CAPITAL	104	Solar	WECC
PNC	DORAL LLC	78	Solar	PJM
meijer	NEXTera ENERGY	228	Wind	ERCOT
KraftHeinz	BHE RENEWABLES	158	Wind	ERCOT
amazon	aes	450	Solar	CAISO
CLOROX	enel Green Power	47	Wind	SPP

Source: ¹S&P Platts (as of 8/5/2022), BloombergNEF, S&P Market Intelligence, REBA, PFR, GreenBiz, Gibson Dunn

Alternative Energy | Carbon Capture Sequestration (CCS)

CCS is an essential part of the all-of-the-above solution for reaching mid-century decarbonization goals, yet its value chain requires a delicate balancing act among multiple stakeholders

Regulatory



- Potential 45Q tax credit enhancement via the Inflation Reduction Act
- LCFS pricing softness

Emitters



- Overcoming reluctance from emitters to sign long-term take-or-pay contracts required for project finance

Midstream



- Significant CapEx for distances between point source emissions & sequestration sites
- Landowner and NIMBY hurdles

Injection



- Subsurface expertise required; leakage concern
- Expensive stratigraphic tests required for Class VI well permits, with a binary risk profile

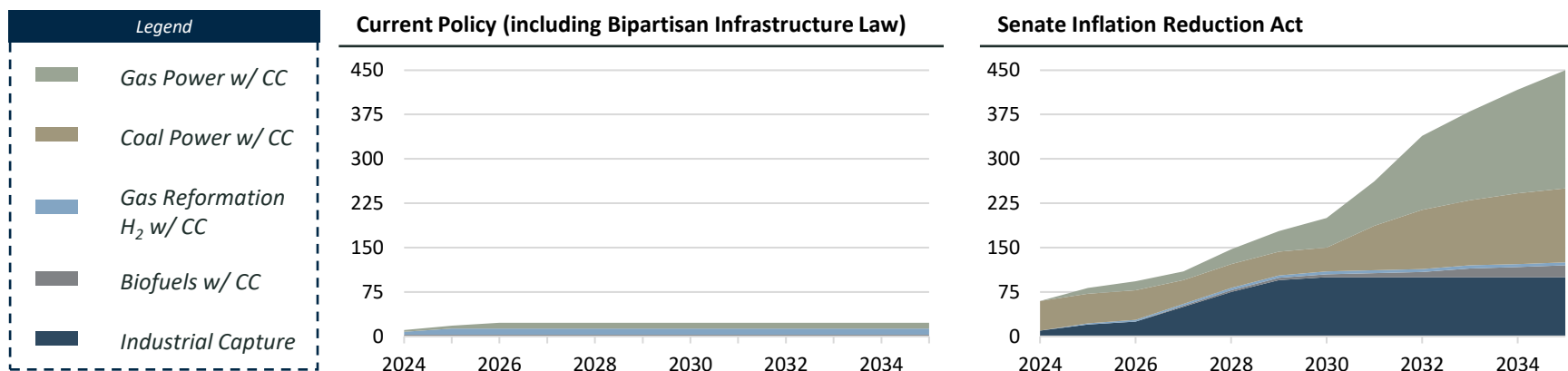
Financing



- Only one 45Q tax equity capital markets deal that GreenFront is aware of to-date

By increasing the 45Q tax credit to \$85/tonne for sequestration and \$60/tonne for utilization, the Inflation Reduction Act makes the coordination of the above variables much more economically compelling

Forecasted Annual CO₂ Captured for Transport and Geologic Storage (Million Tons Per Year)



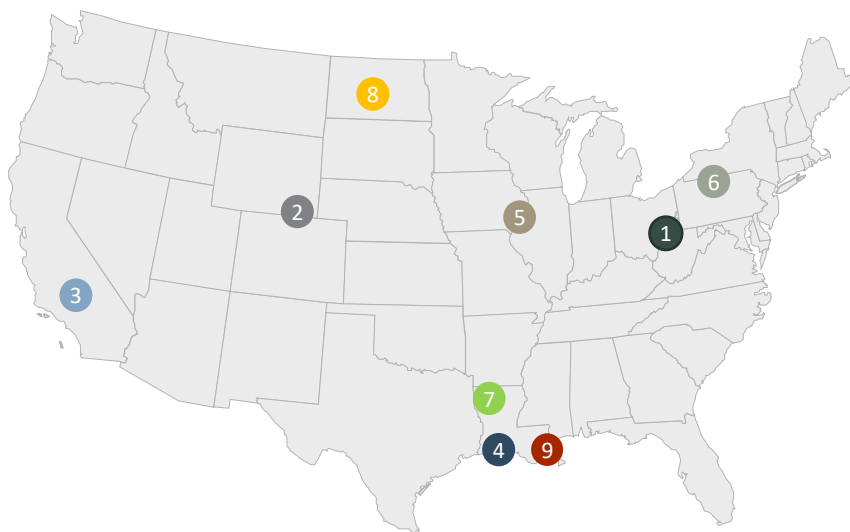
Source: Princeton University Zero Lab

Alternative Energy | Noteworthy CCS Activity

Carbon Capture Sequestration projects are poised to make significant headway through 2030

Market Commentary

- Inflation Reduction Act is a massive game-changer
 - Makes carbon capture a viable economic option for most heavily emitting industries
 - Market constraints are no longer financial in nature (driven by scale, carbon stream purity, or location considerations), but rather capacity of storage basins
- Traditional energy players from E&P and Midstream are now highly committed to developing carbon capture projects
- Because of the multi-faceted operations involved (capture, transport, sequester), there is a strategic preference for pursuing partnerships


















Noteworthy Activity

Developer(s)	Project
<p>1</p>	<ul style="list-style-type: none"> ▪ Newlight Technologies has entered into a 15-year agreement to capture waste methane from CNX Resources' industrial facilities ▪ The captured methane will be used to produce a carbon-negative, biodegradable plastic substitute at a Hannibal, OH-based manufacturing facility
<p>2</p>	<ul style="list-style-type: none"> ▪ Tallgrass announced an agreement with Archer Daniels Midland to capture CO₂ from ADM's Columbus, NE-based corn-processing facility as part of Tallgrass' Wyoming CCS facility in development
<p>3</p>	<ul style="list-style-type: none"> ▪ Brookfield Renewable has committed an initial \$500mm to a CCS joint venture with California Resource Corporation. The joint venture is targeting injecting 5 MMTpa and 200 MMT of total CO₂ storage development
<p>4</p>	<ul style="list-style-type: none"> ▪ LNG company Venture Global plans to develop CCS capabilities at two of its existing LA LNG facilities with the capacity to capture and store up to 500,000 MTPa of CO₂
<p>5</p>	<ul style="list-style-type: none"> ▪ Navigator CO₂ Ventures reached an agreement to process 1 MMTpa of CO₂ from three bioethanol production facilities in Iowa and Illinois
<p>6</p>	<ul style="list-style-type: none"> ▪ OGCI Climate Investments announced an investment in KeyState Natural Gas Synthesis, a ProjectCo developing the first CCS facility in PA ▪ The project is expected to permanently store >300k tons of industrial CO₂ per year
<p>7</p>	<ul style="list-style-type: none"> ▪ CapturePoint Solutions and Energy Transfer have signed a LOI that will use CPS' Central Louisiana Regional Carbon Storage Hub to store carbon emissions from Energy Transfer's Haynesville, Louisiana shale natural gas production facilities
<p>8</p>	<ul style="list-style-type: none"> ▪ Summit Carbon Solutions and Minnkota Power Cooperative entered an agreement to jointly develop additional carbon storage resources around Minnkota's already permitted CO₂ storage site in Center, North Dakota
<p>9</p>	<ul style="list-style-type: none"> ▪ Honeywell and Enlink Midstream have agreed to jointly develop and provide carbon capture solutions to industrial-scale CO₂ emitters within the U.S. Gulf Coast area

Source: Company data

Alternative Energy | RNG – Recent North American Announcements & Transactions








Increasing focus on methane has spurred significant strategic activity in the Renewable Natural Gas space

Date	Category	Involved Parties	Commentary
Aug '22	Project Investment	 	Chevron and Brightmark's RNG joint venture has commenced production at its Athena manure-to-RNG project in South Dakota. The project consists of three agricultural operations and is expected to produce 56 million gallons of manure each year for methane refinement and pipeline injection
July '22	Project Investment		Archaea will use anaerobic digesters to convert up to 130,000 gallons per day of food waste and sewage biosolids into biogas at a wastewater facility in Highland, CA. The biogas will generate 3 MW of renewable electricity, enough to cover the facility's energy needs, and still add renewable power to the electric grid
July '22	Noteworthy Announcement		WEC Energy has obtained Wisconsin PSC approval for a \$75mm pilot program to build a pipeline network to transport biogas derived from agricultural waste into the utility's natural gas supply
July '22	Noteworthy Announcement		Novilla Investment subsidiary Three Petals RNG has commenced construction of its first dairy waste-to-RNG project in Berlin, WI. The project is anticipated to COD the spring of 2023 and produce ~375,000 gallons of gasoline equivalent RNG per year to be used in CNG vehicles
July '22	Noteworthy Announcement	 	ArcLight SPAC shareholders have approved the merger with OPAL Fuels and to become an exchange-listed business on the NASDAQ in a transaction expected to provide gross proceeds of ~\$536mm to OPAL Fuels
July '22	Platform Investment	 	BlackRock has acquired Vanguard Renewables from Vision Ridge Partners for ~\$700mm and BlackRock plans to partner with Vanguard to commission more than 100 anaerobic digesters across the country by 2026
July '22	Platform Investment	 	EverGen has completed the acquisition of a 67% stake in RNG developer Grow the Energy Circle for \$1.6mm in cash considerations, issuance of 600,000 common shares of EverGen, and potential for additional cash considerations if operational milestones are achieved
July '22	Strategic Agreement		Archaea amended and upsized its total credit facility to \$1.1bn. The proceeds will fund its acquisition of NextGen Power and fund its portion of the Lightning Renewable JV with Republic Services, which aims to develop 39 RNG projects at Republic Services landfills across the U.S.
June '22	Project Investment	 	ORIX Corporation has made an equity investment in three Dynamic Renewables dairy waste-to-renewable natural gas projects co-located in Iowa and South Dakota that are collectively anticipated to remove 691,000 mmbtu of methane each year
June '22	Platform Investment	 	Viridi Energy, a full-service renewable natural gas platform, announced an ~\$320mm line of equity commitment led by Warburg Pincus, which will allow Viridi to scale and focus on developing RNG sourced from landfill, dairy, and food waste feedstocks

Source: Company Press Releases

Alternative Energy | Hydrogen – Clean H₂ Pathways Are Taking Shape

Clean H₂ investment and partnership announcements have accelerated

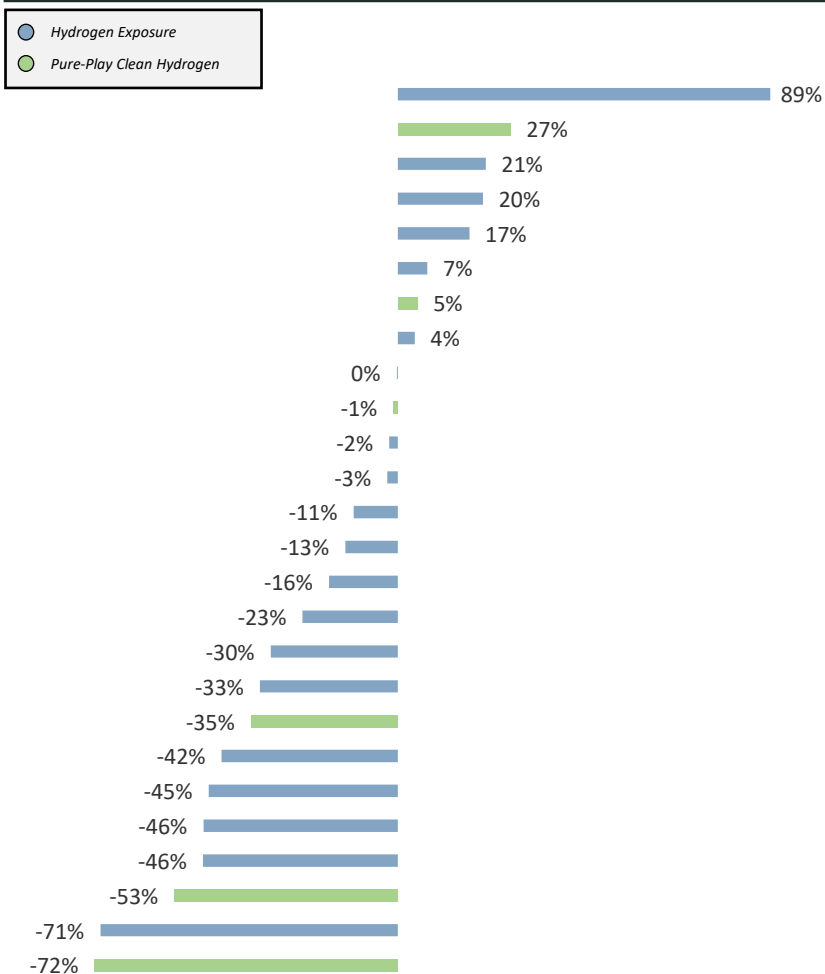
H ₂ Profile	Date	Company	Noteworthy Activity
Blue	July '22	 BayoTech ON-SITE HYDROGEN	Bayotech, a full-service localized hydrogen supplier, announced it has partnered with CarbonFree Chemicals, a private company focused on carbon capture. The companies plan to develop a pilot hydrogen production site, integrating Bayotech's steam methane reformers with CarbonFree's carbon capture technology
	May '22	 Linde  bp	Linde and BP announced plans to advance a major carbon capture and storage project in Texas that will enable low carbon hydrogen production at Linde's existing facilities. With the potential to start-up by 2026, the project will store up to 15 MMT of CO ₂ per year in multiple states. The blue hydrogen will be sold to customers along Linde's hydrogen pipeline network under long-term contracts
Green	July '22	 HYSTOR ENERGY	Hy Stor Energy's \$3bn "Mississippi Clean Hydrogen Hub" has obtained an agreement to supply Mississippi's Port Bienville Industrial Park and Stennis International Airport with an estimated 350 MT per day of renewable H ₂ and store more than 71,000 tons of H ₂ in underground salt caverns. The project plans to be operational in 2025 and be powered by hundreds of acres of solar electricity
	June '22	 ELECTRIC HYDROGEN	Electric Hydrogen announced a \$198mm Series B equity and venture debt round led by Fifth Wall Climate Tech. The funding will support the scale-up of Electric Hydrogen's throughput electrolyzer technology, which run on 100% clean energy, and the manufacturing and deployment of demonstration projects for industrial and infrastructure applications
Turquoise	July '22	 monolith	Monolith, a hydrogen and carbon black producer using methane pyrolysis without carbon capture, raised over \$300mm in an investment round led by TPG Rise Climate and Decarbonization Partners, a partnership between BlackRock and Temasek. The funding round will support further technological development that will offer next generation product capabilities and corporate-level expansion
	June '22	 C ZERO	C-Zero, a company commercializing a process for transforming natural gas into clean hydrogen and solid carbon co-product, announced the close of a \$34mm financing round led by SK Gas. The funding will be used to build C-Zero's first pilot plant, which is expected to be online in Q1 2023 and produce up to 400kg of H ₂ per day

Source: Company Press Releases

Alternative Energy | Hydrogen Related Stocks Basket

The table below includes pure-play hydrogen companies and companies that have exposure to hydrogen through offerings of equipment, products and services

LTM Total Return %



LTM Trading Table

Ticker	Listing	Company	Market Cap (\$mm)
NFE (NASDAQ)	U.S.	New Fortress Energy Inc.	11,671
BE (NYSE)	U.S.	Bloom Energy Corporation	5,248
GTLS (NYSE)	U.S.	Chart Industries, Inc.	7,526
FTI (NYSE)	U.S.	TechnipFMC plc	3,848
BKR (NASDAQ)	U.S.	Baker Hughes Company	24,636
ACC (OB)	Norway	Aker Carbon Capture ASA	1,497
NEL (OB)	Norway	Nel ASA	2,654
LIN (NYSE)	U.S.	Linde plc	153,913
PCELL (OM)	Sweden	PowerCell Sweden AB (publ)	956
PLUG (NASDAQ)	U.S.	Plug Power Inc.	16,655
APD (NYSE)	U.S.	Air Products and Chemicals, Inc.	58,916
CMI (NYSE)	U.S.	Cummins Inc.	31,285
3407 (TSE)	Japan	Asahi Kasei Corporation	10,669
MCPHY (ENXTPA)	France	McPhy Energy S.A.	414
8088 (TSE)	Japan	Iwatani Corporation	2,336
JMAT (LSE)	United Kingdom	Johnson Matthey Plc	5,003
A336260 (KOSE)	Korea	Doosan Fuel Cell Co., Ltd.	1,773
NKLA (NASDAQ)	U.S.	Nikola Corporation	3,030
FCEL (NASDAQ)	U.S.	FuelCell Energy, Inc.	1,891
CWR (AIM)	United Kingdom	Ceres Power Holdings plc	1,447
BLDP (TSX)	Canada	Ballard Power Systems Inc.	2,661
ITM (AIM)	United Kingdom	ITM Power Plc	1,661
HYSR (OTCPK)	U.S.	SunHydrogen, Inc.	167
HTOO (NASDAQ)	U.S.	Fusion Fuel Green PLC	92
HYZN (NASDAQ)	U.S.	Hyzon Motors Inc.	580
NXH (TSX)	Canada	Next Hydrogen Solutions Inc.	29

Source: S&P Market Intelligence. Market Cap and LTM prices as of 8/10/2022

GreenFront Energy Partners - Overview



GreenFront Energy Partners | Founding Partners and Service Offering

Track record of execution for developers, investors, and corporate clients

GreenFront Founding Partners



Robert Birdsey – Managing Director

- Head of GFEP renewable fuels group
- Head of BB&T Energy Investment Banking 2013-2020
- VP in J.P. Morgan’s Energy Investment Banking group prior to joining BB&T
- MBA, University of Virginia; BA, Sewanee



Adam Hahn – Managing Director

- Head of GFEP corporate advisory group
- Led BB&T’s Utility Investment Banking coverage 2015-2020
- Prior to BB&T, worked in the CFO’s group at Dominion Energy
- MBA, University of Richmond; BBA, James Madison University



Whit Wall – Managing Director

- Head of GFEP traditional renewables group
- Led BB&T’s Infrastructure Investment Banking coverage 2015-2020
- Environmental consultant for JJ Blake & Associates prior to BB&T
- MBA, University of Virginia; BS, James Madison University

Service Offering – Exclusively Focused on Renewable Energy



Capital Formation

Raising capital for projects and platform growth initiatives



M&A Advisory

Advising on purchase/sale of alternative energy assets + equity



ESG / PPA Advisory

Representing corporates in renewable energy procurement efforts

GreenFront Energy Partners | Coverage Universe

GreenFront's go-to market strategy enables significant synergies

Closely-Linked Coverage Universe



Traditional Renewables

Solar, Wind, Storage



Renewable Fuels

Renewable Natural Gas, Carbon Capture, Hydrogen



Corporate Advisory

Corporate procurement of renewable energy & products

GreenFront Differentiation

- **Regional Market Intelligence:** Our experience negotiating PPAs gives us on-the-ground information specific to different RTO/ISOs across the country
- **Corporate Finance:** As solar/wind/storage move from alternatives to incumbent resources, financing structures are evolving. GreenFront's deep experience in traditional corporate finance helps our clients evolve beyond project financing strategies

GreenFront Differentiation

- **Experience:** Prior O&G background has enabled GreenFront to already transact in very early-stage markets (RNG, CCUS, H₂, LFG, GTL)
- **Environmental Attributes:** Deep knowledge around revenue pathways for LCFS, 45Q, voluntary CO₂ credits
- **Corporate Network:** PPA advisory assignments keep us in regular dialogue with corporate sustainability decision-makers

GreenFront Differentiation

- **Risk Management:** GreenFront has an exclusive partnership with SunAirio®, enabling us to provide clients with proprietary analytics around correlation/covariance between weather, resource production, and market pricing
- **Negotiating Edge:** GreenFront builds project models to understand seller economics, identifying leverage points that benefit our corporate clients. We know where developers can bend on certain terms and where they can't

GreenFront Energy Partners | Credentials

Prolific deal execution with robust pipeline of active transactions

RNG Developer (Undisclosed)

Has closed on a funding commitment to develop and construct a dairy-to-RNG project portfolio across the Midwest U.S.

Placement Agent

2022



ENERGY ASSURANCE

Has been acquired by



Sell-side M&A Advisor

2022



Has secured a structured equity private placement from



Placement Agent

2021



Has secured a \$25 million equity commitment from

Hartz Capital

Placement Agent

2021



Has signed a wind PPA totaling 100 MW of procurement with



PPA Advisor

2021



Has secured a private placement for development capital with



Placement Agent

2021

Fortune 500 Corporate

Has signed an exclusive solar PPA totaling 250 MW of procurement with



PPA Advisor

2021



Has signed an exclusive solar PPA totaling 250 MW of procurement with



PPA Advisor

2020

Advisor to national RNG developer on 5-state on-site solar portfolio



PPA Advisor

Pending

Financial advisor to hydrogen technology company in a private placement transaction



Private Placement

Pending

Advisor to a large public corporate to offset 100% of North American Consumption



40 MW PPA

Pending

Advisor to a large public corporate in vPPA transaction in PJM

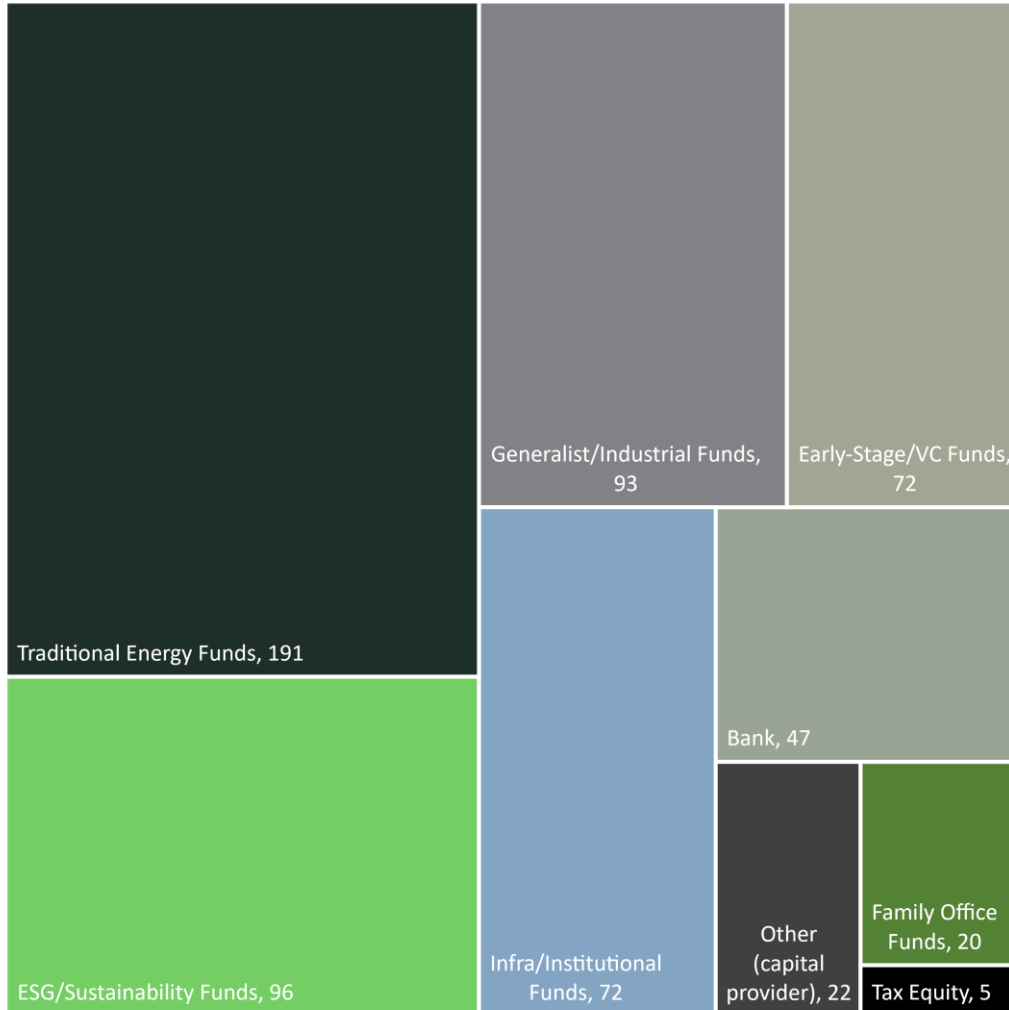


200 MW PPA

Pending

GreenFront Energy Partners | Investor Network

GreenFront covers a broad network of contacts with unmatched efficiency, while also having the requisite market knowledge to narrow down the list in a solicitation and quickly identify the most highly motivated parties



GreenFront tracks over **2,000** corporate relationships through its Salesforce CRM software, including...

618 Capital Providers, segmented by capital type & strategy (see left), and appetite within the Alternative Energy Universe

381 Developers, segmented by focus area (i.e. Solar/Wind, Storage, RNG, Carbon Capture, Hydrogen, etc.)

563 Corporates pursuing different ESG strategies

140 Traditional Energy Firms from the Oil & Gas, Power/Utility, and LDC space