

# Alternative Energy Market Update – Q4'22

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*Fall 2022*



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## Macro Environment | Short-Term Developments

*Despite a challenging macro environment, positive momentum persists on the heels of the Inflation Reduction Act*

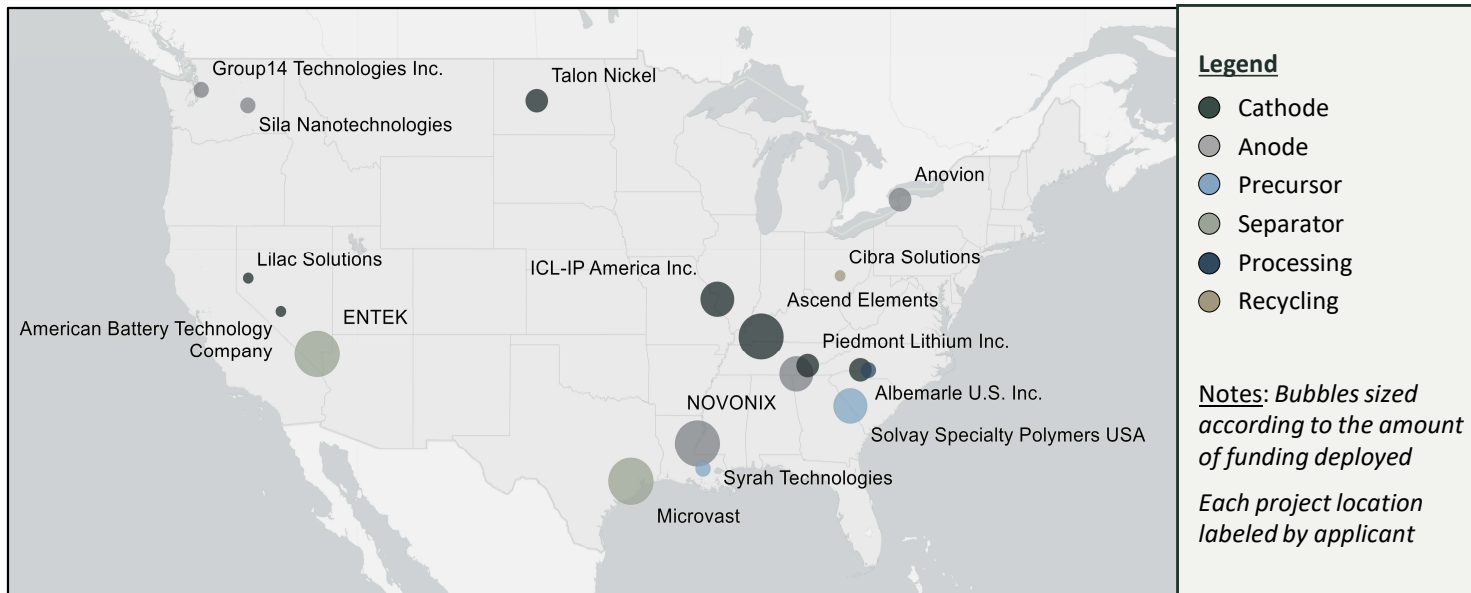
Activity	Market Impact	Commentary
<b><i>Inflation Reduction Act</i></b>		<ul style="list-style-type: none"> <li>On August 16, President Biden signed the \$739 billion Inflation Reduction Act into law, which carves out \$369 billion for “Energy Security and Climate Change”</li> <li>The landmark legislation broadly enhances support for clean energy initiatives ranging from wind and solar to nuclear and electric vehicles, and more</li> </ul>
<b><i>SEC Disclosure Requirements</i></b>		<ul style="list-style-type: none"> <li>The 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</li> </ul>
<b><i>Fund Flows</i></b>		<ul style="list-style-type: none"> <li>In 1H’22, \$226 billion was deployed into project capex globally, an all-time industry high for the respective calendar period<sup>2</sup></li> <li>Conversely, capital raised on behalf of infrastructure, renewables and energy transition funds in Q3’22 globally totaled ~\$12 billion, an ~81% decrease from Q2’22<sup>3</sup></li> </ul>
<b><i>Capital Markets</i></b>		<ul style="list-style-type: none"> <li>Having rebounded following the IRA passage from LTM near-lows, public Cleantech equities have since lost much of that value over the past ~2 months</li> <li>Alternative Fuels / RNG equities have generally fared better YTD compared to broader Alternative Energy, spurring notable capital markets activity including BP’s recently announced Archaea acquisition</li> </ul>
<b><i>Manchin’s Failed Permitting Bill</i></b>		<ul style="list-style-type: none"> <li>In exchange for voting for the Inflation Reduction Act, Senator Manchin struck a deal with Senate Majority Leader Schumer to include a comprehensive permitting reform package, for both clean energy and fossil fuel projects, to an interim funding measure</li> <li>After failing to rally support, the energy permitting proposals were removed from the bill</li> </ul>

Source: <sup>1</sup> Morningstar, <sup>2</sup> BNEF, <sup>3</sup> Infralogic

# Macro Environment | Infrastructure Investment and Jobs Act (IIJA) Funding Begins

The DOE selected initial battery manufacturing, processing, and recycling projects that will receive \$2.8 billion in total funding from the 2021 Infrastructure Law

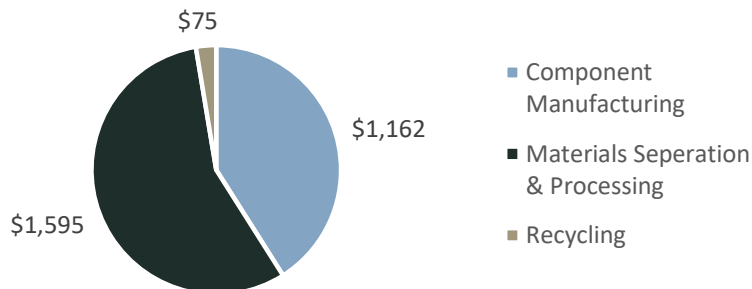
## Project Location Overview<sup>1</sup>



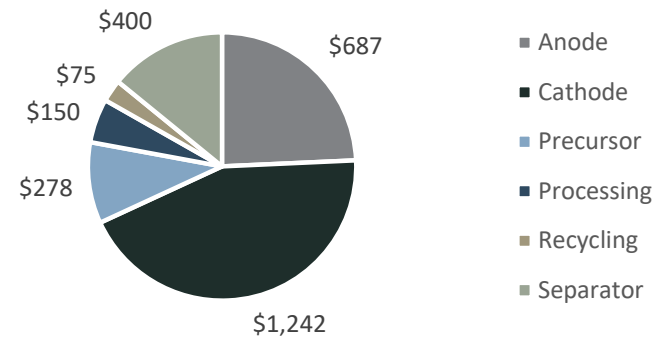
## Notable Projects

- Ascend Elements received the largest amount of funding at \$480mm for both cathode component manufacturing and materials separation and processing projects
- ENTEK and Microvast's were the only separator projects that received funding, \$350mm total
- Cibra was the only battery recycling project to receive funding securing a total of \$75mm

## Federal Funds Deployed by Supply Chain Segment (\$mm)



## Federal Funds Deployed by Battery Component (\$mm)



Sources: <sup>1</sup>U.S. DOE BIL: Battery Factsheet, S&P

# Macro Environment | Fossil Fuel Demand

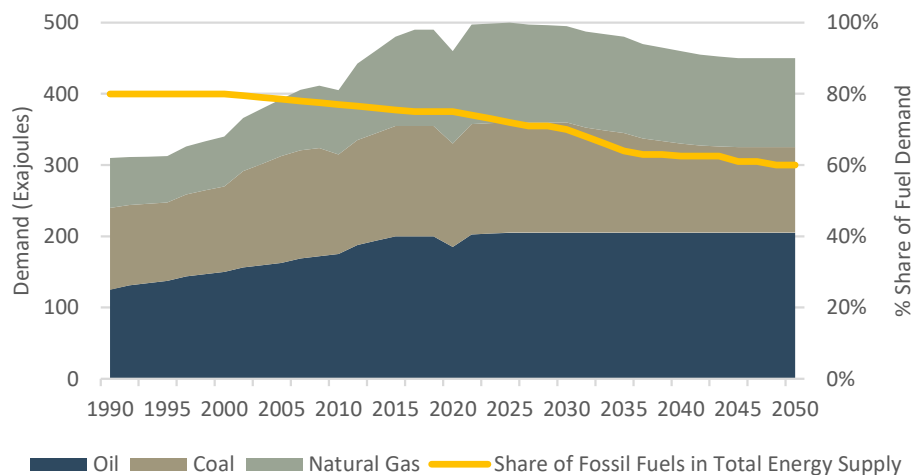
*Global fossil fuel demand expected to peak within the next decade*

## Declining Fossil Fuel Demand

- Even under the **most conservative scenario**, the IEA’s World Energy Outlook 2022 predicts that fossil fuel demand will peak in the mid-2020’s
- Notable prevailing policies driving demand reductions include the Inflation Reduction Act (US), RePowerEU and Fit for 55 (EU), Climate Change Bill (Australia), and CX Green Transformation (Japan)
- Key demand drivers:
  - Coal – power and industry sectors, use of modern bioenergy
  - Oil – electrification in transport and building sectors
  - Natural Gas – rising near-term prices, increasing renewables deployment, and faster uptake of other flexible options in the power sector

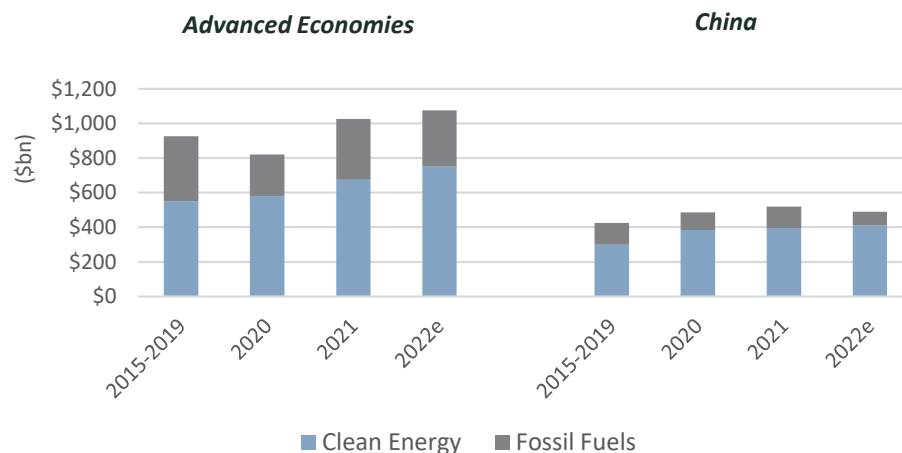
## Fossil Fuel Demand in the STEPS (1990 – 2050)

*Total fossil fuel use sees a definitive peak for the first time in this year’s STEPS. The share of fossil fuels in the energy mix falls to around 60% in 2050*



## Global Energy Investment by Region (\$bn, 2021)

*Periods of high fossil fuel prices have offered a strong incentive to move away from reliance on these fuels, reinforcing the momentum behind the Energy Transition*



Source: IEA World Energy Outlook 2022; STEPS = (IEA Stated Policies Scenario) - sector-by-sector assessment reflecting existing and announced government policies around the world

# Alternative Energy | U.S. Landscape

Developers,  
Utilities & IPP's

## **Market imbalance driving premium valuations for platforms and portfolios**

- The number of corporate-level M&A deals nearly doubled over the previous quarter
- Many IOUs/IPP's are stretching to meet aggressive capacity and pipeline goals
- Others have begun divesting large portfolios and business units to shore up balance sheets and focus on regulated investments



Engineering,  
Procurement &  
Construction

## **Despite legislative tailwinds, critical challenges remain to meet demand**

- Systemic labor shortages across the construction industry and lingering inflationary pressures present a challenge for solar EPCs to meet anticipated demand
- Solar module seizure by U.S. Customs due to Xinjiang forced labor remains a concern
- Reliable solar EPC businesses are in high demand and will only become more valuable as project volumes increase and the pool of skilled labor remains relatively small



Infrastructure  
& Private  
Capital

## **Some firms navigating challenges better than others**

- While overall fund flows into Infrastructure have declined YoY, blue chip firms continue to successfully close on new funds (e.g., KKR, Brookfield, Blackstone)
- Significant dry powder remains, looking to be deployed into Energy Transition opportunities
- Very heavy deal flow in May/June has returned to normal levels, with broader market volatility leading to generally more investor-friendly terms



Battery  
Storage

## **Battery storage is on track for record year despite cost inflation and supply chain disruptions**

- 3GW/8GWh of new capacity added YTD, ~2x the rate of 2021 installations over the same period
- ITC for stand-alone storage alleviates financing bottleneck going forward
- Lithium carbonate pricing, up 3x since the beginning of the year, is likely to temper growth expectations in the near-term, along with supply chain and other raw materials



RNG, CCS, and  
Renewable  
Fuels

## **Market excitement boosted by Inflation Reduction Act tax credits**

- Investors and operators are sharpening pencils on how to incorporate new 45Q, RNG ITC, and Clean Hydrogen tax credits
- Noteworthy RNG trades continue (BP/Archaea, Nextera/EPP) despite challenging project development environment and lower LCFS prices



Source: S&P Market Intelligence, WoodMac, CARB, EPA

# Alternative Energy | Public Market Overview

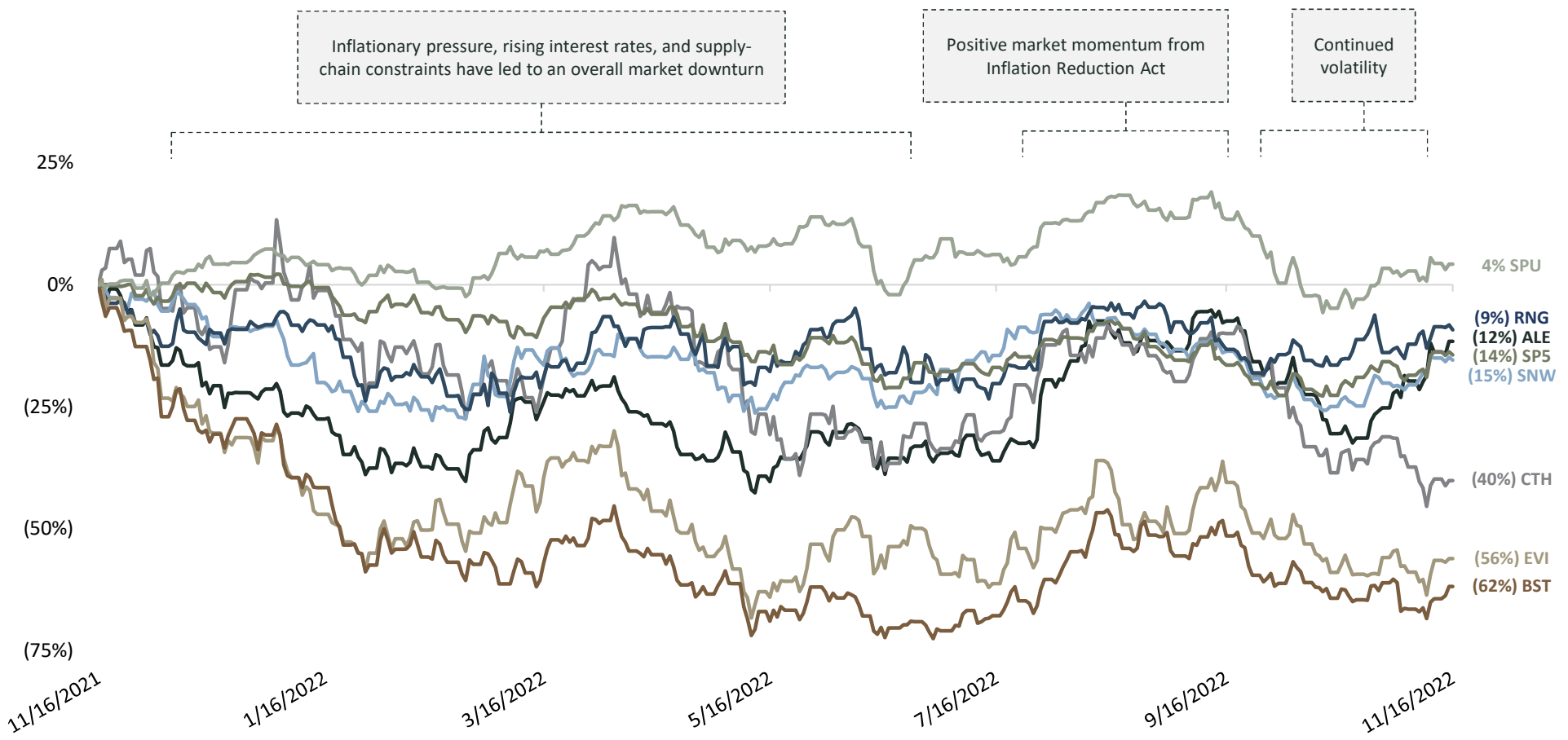
	Ticker	Price 11/16/2022	Market Cap (\$mm)	Enterprise Value (\$mm)	YTD Total Returns (%)	Valuation		Debt / Total Cap (%)	Credit	
						2023E EV / EBITDA (x)	2024E EV / EBITDA (x)		2022E Net Debt / EBITDA (x)	S&P Credit Rating
<b>Alternative Energy</b>										
Array Technologies	ARRY	\$20.66	\$3,109	\$4,121	31.7%	14.9x	11.5x	69.3%	5.7x	B
Brookfield Renewable Corporation	BEPC	32.19	11,645	34,150	(5.5%)	14.1x	13.0x	49.8%	6.1x	BBB+
First Solar	FSLR	158.58	16,906	15,292	83.1%	21.8x	11.1x	5.1%	NA	NA
Hannon Armstrong	HASI	31.04	2,758	5,248	(39.8%)	37.9x	30.0x	62.3%	20.5x	BB+
Ormat Technologies	ORA	100.21	5,617	7,653	27.1%	14.8x	13.2x	50.4%	4.3x	NA
Sunnova Energy International	NOVA	23.42	2,691	7,797	(16.1%)	35.3x	24.6x	74.1%	36.0x	B-
SunPower Corporation	SPWR	23.21	4,043	4,066	8.8%	24.0x	17.3x	49.2%	0.1x	NA
Sunrun	RUN	31.33	6,677	15,792	(8.6%)	NA	186.4x	50.9%	NA	NA
<b>Cleantech</b>										
Bloom Energy Corporation	BE	\$21.25	\$4,148	\$4,975	(3.1%)	33.8x	18.3x	72.5%	63.6x	NA
Enphase Energy	ENPH	305.18	41,481	41,373	66.8%	42.8x	33.6x	68.2%	NA	NA
FuelCell Energy	FCEL	3.63	1,472	1,186	(25.6%)	NA	NA	11.7%	5.0x	NA
Plug Power	PLUG	16.71	9,740	7,939	(37.8%)	NA	27.3x	17.5%	5.4x	NA
SolarEdge Technologies	SEDG	289.76	16,196	16,046	2.6%	22.2x	17.5x	26.3%	NA	NA
Tesla	TSLA	186.92	590,247	576,287	(44.8%)	20.0x	15.5x	12.5%	NA	BBB
<b>Solar / Wind IPP</b>										
Clearway Energy	CWEN.A	\$33.00	\$3,855	\$12,417	1.8%	10.6x	10.5x	64.7%	5.6x	BB
EDF	EDF	12.41	46,362	58,430	24.8%	3.1x	2.4x	52.1%	0.1x	BBB
EDP Renováveis	EDPR	22.85	21,953	30,019	0.7%	12.9x	12.0x	42.7%	2.9x	BBB
NextEra Energy Partners	NEP	78.65	6,806	20,569	(3.0%)	10.8x	9.6x	27.6%	2.7x	BB
Ørsted	ORSTED	90.36	37,965	44,285	(21.5%)	12.3x	11.4x	57.5%	1.4x	BBB+
<b>Alternative Fuels / RNG</b>										
Ameresco	AMRC	\$62.69	\$3,255	\$4,759	(23.0%)	22.2x	17.6x	64.4%	6.9x	NA
Archaea	LFG	25.83	3,094	4,686	41.3%	20.1x	14.5x	45.4%	4.5x	NA
Clean Energy Fuels Corp.	CLNE	7.25	1,613	1,564	18.3%	15.5x	6.7x	9.6%	NA	NA
Darling Ingredients	DAR	72.60	11,636	15,060	4.8%	7.4x	7.3x	48.5%	2.1x	BB+
Montauk Renewables	MNTK	11.92	1,673	1,650	19.1%	17.1x	13.0x	25.2%	NA	NA
Neste	NESTE	47.82	36,730	38,212	8.1%	11.3x	10.2x	24.6%	0.4x	NA
OPAL Fuels	OPAL	7.77	1,321	2,756	(20.1%)	15.1x	7.3x	41.0%	0.9x	NA
<b>Electric Vehicle Infrastructure</b>										
ChargePoint Holdings	CHPT	\$12.88	\$4,377	\$4,227	(32.4%)	NA	NA	45.0%	0.8x	NA
Evgo, Inc	EVGO	6.89	478	1,769	(30.7%)	NA	NA	7.7%	3.0x	NA
Volta	VLTA	0.70	118	221	(90.4%)	NA	NA	41.6%	NA	NA
<b>Battery Storage</b>										
Enovix Corporation	ENVX	\$13.68	\$2,149	\$1,809	(49.9%)	NA	NA	2.3%	4.3x	NA
Eos Energy Enterprises	EOSE	1.21	90	220	(83.9%)	NA	NA	209.3%	NA	NA
Fluence	FLNC	16.13	1,844	1,379	(53.7%)	NA	24.7x	NA	3.5x	NA
Li-Cycle	LICY	6.02	1,056	749	(39.6%)	NA	7.6x	39.5%	3.4x	NA
QuantumScape Corporation	QS	7.42	3,235	2,187	(66.6%)	NA	NA	7.1%	3.4x	NA
Stem Inc.	STEM	13.98	2,160	2,409	(26.3%)	372.8x	31.6x	48.5%	NA	NA

Source: S&P CapiQ Pro. Note: Prices as of 11/16/2022

# 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	CWEN.A	NEP	AMRC	MNTK	CHPT	VLTA	ENVX	LICY		
BEPC	NOVA	ENPH	SEDG	EDF	ORSTED	LFG	NESTE	EVGO		EOSE	QS		
FSLR	SPWR	FCEL	TSLA	EDPR		CLNE	OPAL			FLNC	STEM		
HASI	RUN					DAR							

## Indices Total Return (LTM)



Source: S&P CapiQ Pro. Note: Prices as of 11/16/2022



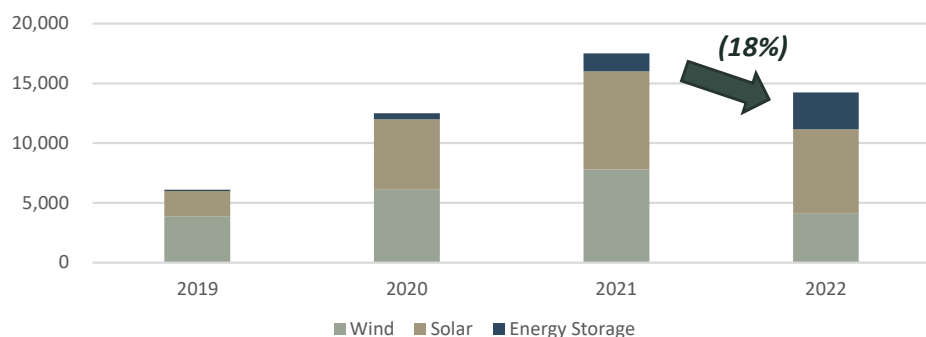
# Alternative Energy | Conventional Renewables - Development Market Overview

Private valuations remain high despite inflationary pressures and rising rates

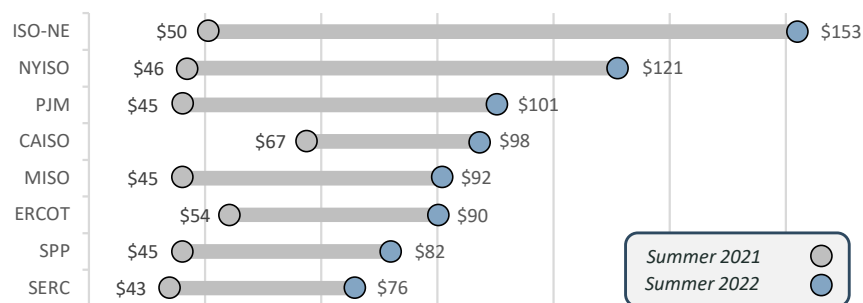
## It's a seller's market for developers with mature projects seeking offtake or sale

- New installed capacity through Q3 is down 18% YoY, mainly a result of wind and solar challenges with PTC phase-down, panel procurement, and supply chain. Battery storage is the bright spot with already 2x the capacity installed in 2021 over the same period
- Utilities and IPPs are competing with institutional capital to fulfill gigantic regulatory and investor-driven procurement goals
- Wholesale power prices are up, enabling developers to lock-in higher PPA prices, offtakers to justify the cost, and investors to underwrite to more aggressive merchant scenarios

**U.S. Annual Capacity Growth through Q3 (MW) <sup>(1)</sup>**



**Average Wholesale Electricity Price (\$/MWh) <sup>(2)</sup>**

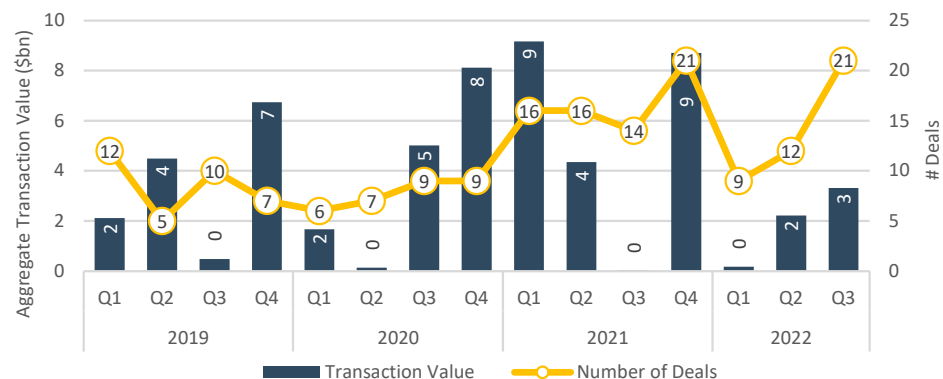


Price data represents monthly average LMP during on-peak hours

## Platform and pipeline transaction volume is up - IPPs and institutional capital consolidate development pipelines

- Corporate-level M&A deals nearly doubled QoQ and private market valuations remain high
- Developers with early-stage pipelines must weigh the cost/benefit of extended development periods and commercialization opportunities
- Institutional capital and IPPs can afford to play the long game when it comes to securing access to pipeline
- More volume to come with utilities in the market selling competitive renewables businesses in a pivot to focus on regulated investments


**U.S. Power Sector Deals since 2019 <sup>(3)</sup>**



Source: <sup>1</sup> American Clean Power, <sup>2</sup> EIA; <sup>3</sup> S&P Market Intelligence

## Alternative Energy | Utility-Scale Solar Transactions

















*Utility-scale platforms and portfolios continue to trade with several marquee deals announced this quarter*

Date	Investor	Target	Commentary
Oct'22			Orsted has closed a \$140mm transaction with Energy Capital Partners to divest a 50% ownership stake in a portfolio of three onshore windfarms and one solar farm in the US. The portfolio is diversified across four states (IL, NE, SD, and AL) and three markets (MISO, SPP North and TVA) and has a combined capacity of 862 MW
Oct'22	 		Doral Renewables announced that it has entered an agreement to sell up to \$500mm of convertible notes to funds managed by Apollo and Migdal Insurance. The notes are convertible to common equity interests at a pre-money valuation of \$1.5bn. Doral is developing a 10 GW wind, solar, and storage portfolio across 20 states and eight electricity markets
Oct'22			Wafra announced the acquisition of a controlling interest in Mission Clean Energy, a San Francisco-based utility-scale solar and storage developer. Founded in 2022, Mission has accumulated a 3GW development pipeline with a diverse N.A. geographic presence
Sept'22			Brookfield Renewable has agreed to acquire Scout Clean Energy for \$1bn with the potential to invest an additional \$350mm to support the business' development activities. Scout's development pipeline is over 22 GW of wind, solar and storage projects across 24 states
Sept'22			RWE announced it will acquire ConEd's Clean Energy Business (CEB) at a purchase price based on \$6.8bn enterprise value. The deal amounts to an 11x acquisition multiple based on \$600mm in year one EBITDA. CEB has a portfolio of 3 GW of operational contracted solar and a 7.3 GW development pipeline
Sept'22			ReneSola has completed the sale of a roughly 70 MW portfolio of three Pennsylvania solar projects to funds managed by AB CarVal Investors. The projects are located in the broader PJM transmissions territory and are being sold at NTP. AB CarVal will complete the construction and retain long-term ownership
Sept'22			Enbridge has acquired solar and onshore wind developer Tri Global Energy for \$270mm in cash and assumed debt, as well as up to \$50mm in additional payments contingent on TGE project portfolio completions. TGE has a development portfolio of 3.9 GW previously sold to operators and an additional 3 GW of late-stage wholly owned projects
Aug'22			Pathway Power announced a \$36mm strategic investment from Forest Road Renewables. Pathway will use the proceeds to continue expanding its portfolio of more than 2 GW across North America, targeting a balance of solar and storage opportunities in various markets

Source: Company Press Releases

## Alternative Energy | Distributed Generation Solar Transactions



*Recent transactions include a mix of corporate M&A, platform investments, and financing arrangements for development capital*

Date	Investor	Target	Commentary
Oct'22	 THE CARLYLE GROUP	 aspen POWER PARTNERS	Carlyle announced a \$350mm investment in distributed generation platform Aspen Power Partners. The investment will support Aspen's organic and acquisition-driven growth strategy targeting community, multi-family, and C&I solar markets
Oct'22	 Fundamental RENEWABLES	 Pivot Energy	Pivot Energy announced an agreement in which Fundamental Renewables will provide a \$100mm revolving development loan facility. The facility will allow Pivot to accelerate the development and initial construction of its commercial and community solar pipeline throughout the loan's three-year term
Oct'22	 Greenbacker CAPITAL	 NORWICH SOLAR	Greenbacker has purchased a 7.6 MW portfolio of pre-operational solar projects from Vermont-based Norwich Solar. The nine-project portfolio has long-term net metering agreements in place with more than 30 agricultural offtakers - primarily local farm and dairy. The projects are slated to COD between end of year 2022 through 1H23
Sept'22	 aspen POWER PARTNERS	 Safari Energy	PPL Corporation has reached an agreement to sell Safari Energy, a platform that acquires, develops, and manages C&I solar, to a subsidiary of Aspen Power Partners. PPL's decision to sell Safari reflects the company's strategic repositioning to focus on its core business - regulated utilities in the U.S.
Sept'22	 Brookfield Renewable	 STANDARD SOLAR	Brookfield Renewables announced the closing of its \$540mm acquisition of Standard Solar, which includes the potential to invest an additional \$160mm to support growth initiatives. The Rockville, Maryland-based company has approximately 500 MW of operating and under construction assets and a development pipeline of 2,000 MW
Sept'22	 NautilusSolar	 CIPRIANI ENERGY GROUP	Nautilus Solar acquired two portfolios of New York community solar projects from Cipriani Energy Group. Both parties will co-develop the projects which consist of eight facilities in six New York counties totaling 25 MW and in various stages of development. The first projects are expected to reach operation by 4Q23
Aug'22	 Pivot Energy	 SGC POWER	Pivot Energy acquired Maryland-based community solar developer SGC Power. Founded in 2008, SGC has been involved in over 285 solar projects, totaling over 2,845 MW of solar energy capacity in over 31 states and territories
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

Source: Company Press Releases

## Alternative Energy | Battery Storage Transactions

*Transaction volumes for battery storage remain high following a rapidly growing installed base and evolution of the asset management and optimization market*

Date	Investor	Target	Commentary
Nov'22	 <b>BlackRock</b>	 <b>Jupiter</b> POWER	BlackRock has agreed to acquire Jupiter Power from EnCap for an undisclosed amount. Jupiter focuses on developing large-scale, stand-alone energy storage projects. Jupiter has 655 MWh of operating assets and 340 MWh of new projects under construction or about to be built
Oct'22	 <b>LACUNA</b> SUSTAINABLE INVESTMENTS	 <b>SYSO</b> technologies	SYSO Technologies, a market operator for renewable energy and battery storage developers and asset owners, announced it closed a \$10 million Series A round led by Lacuna Sustainable Investments. SYSO plans to use the funding to expand into new markets and grow its team
Oct'22	 <b>engie</b>	 <b>BELLTOWNPOWER</b>	Engie announced it has acquired a 6 GW portfolio of solar and battery storage projects from Belltown Power. The transaction includes 33 projects comprising 2.7 GW of solar with 0.7 GW of paired storage and 2.6 GW of stand-alone battery storage. The portfolio is located across ERCOT, PJM, MISO, and WECC
Oct '22	 <b>GRIDSTOR</b>	<i>Upstream Energy Services</i>	Goldman Sachs-backed GridStor has acquired a portfolio of in-development battery storage projects in Los Angeles, CA, from Upstream Energy, totaling 500 MW / 2,000 MWh. The Portland-based grid-scale developer expects the projects to COD between 2024-2026
Oct'22	 <b>ENERGY SPECTRUM CAPITAL</b>	 <b>Nightpeak Energy</b>	Nightpeak, a new company, has been launched with an equity funding of up to \$200mm from Dallas-based Energy Spectrum Capital. The capital will allow Nightpeak to execute on its strategy of developing, owning, and operating utility-scale battery storage across the US
Oct'22	 <b>CCP INVESTMENTS LONGBOW CAPITAL PILOT COMPANY</b>	 <b>VoltaGrid</b>	VoltaGrid, an energy and storage management generation company serving industrial, utility, and distributed generation users, has raised \$150mm in equity capital commitments from CCP Investments, Longbow Capital, Pilot Company, and Walter Ventures
Oct'22	 <b>LEYLINE</b> RENEWABLE CAPITAL	 <b>NAVITAS</b> SYSTEMS	Leyline Renewable Capital announced a growth capital investment to accelerate Navitas Energy's development of 500 MW to 1,000 MW of stand-alone storage in the ERCOT market
Oct '22	 <b>TPG RISE</b> CLIMATE	 <b>Form energy</b>	Massachusetts-based Form Energy raised \$450mm in a series E financing round led by TPG Rise. Form is developing and commercializing an iron-air battery capable of storing electricity for 100 hours at system costs competitive with legacy power plants
Sept'22	 <b>SunGrid</b> Better energy for tomorrow	 <b>Black!</b> ELECTRIC INC.	Sungrid Holdings, a portfolio company of Hull Street Energy, has acquired Black Electric, an electrical contractor serving C&I, municipal, and resident customers throughout the Hudson Valley of New York. The acquisition will enable SunGrid, an energy storage EPC, to provide services to storage projects scaling from 1 MW to 200 MW
Aug'22	 <b>ON</b> ENERGY	 <b>SEEIT</b>	On.Energy obtained \$100mm in project financing from UK-based Sustainable Development Capital to accelerate the deployment of battery energy storage systems for C&I and utility customers across the US and Canada

Source: Company Press Releases

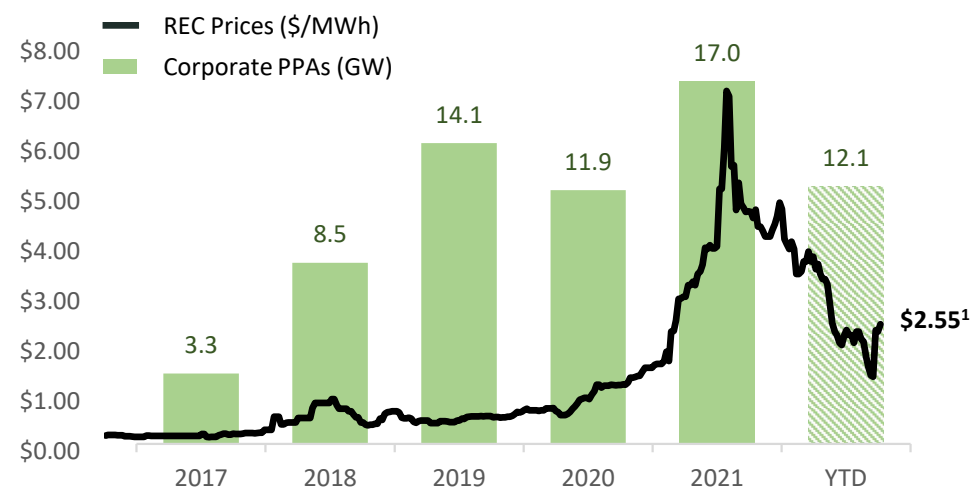
# Alternative Energy | Corporate PPA Market Overview

*PPA signings slow a bit on lack of mature project supply, while PPA prices continue to rise due to input costs and buyer demand inelasticity*

## PPA Market Dynamics

- Q3 PPA announcements were tepid at best, but 2022 is still on pace to be the second highest PPA signing year on record, behind 2021. Signings were dominated by solar, as wind (until the recent passage of the IRA) was disadvantaged from a tax credit perspective
- The supply-demand imbalance in the renewable PPA market continues to pressure PPA prices upward for corporates and utilities alike
- Struggling with higher input costs, the top two wind turbine manufacturers, Vestas and Siemens Gamesa, have pushed through price increases of 22% and 41% YOY, respectively
- Solar EPC costs continue to balloon, as the supply of skilled electrical labor is in short supply and companies rush to meet prevailing wage and apprenticeship requirements (GFEP views apprenticeship requirements as more costly and administratively burdensome in most areas)
- While the Inflation Reduction Act blunted some of these price pressures, it has done nothing to alleviate permitting and interconnection bottlenecks, which were supposed to be addressed in a subsequent Permitting Reform bill that has recently hit roadblocks
- In addition to interconnection and permitting issues, module supply continues to be a limiting factor. Earlier this year, supply was constrained by the pending anti-circumvention investigation by the Department of Commerce; now, developers are navigating U.S. Customs seizures of imported modules due to the Uyghur Forced Labor Prevention Act (UFLPA). Many developers are sincerely committed to responsible supply chains, but documentation by international supply chain partners has proven insufficient in many cases to-date

## U.S. Corporate PPA Volume (FY'17 – Q3'22)



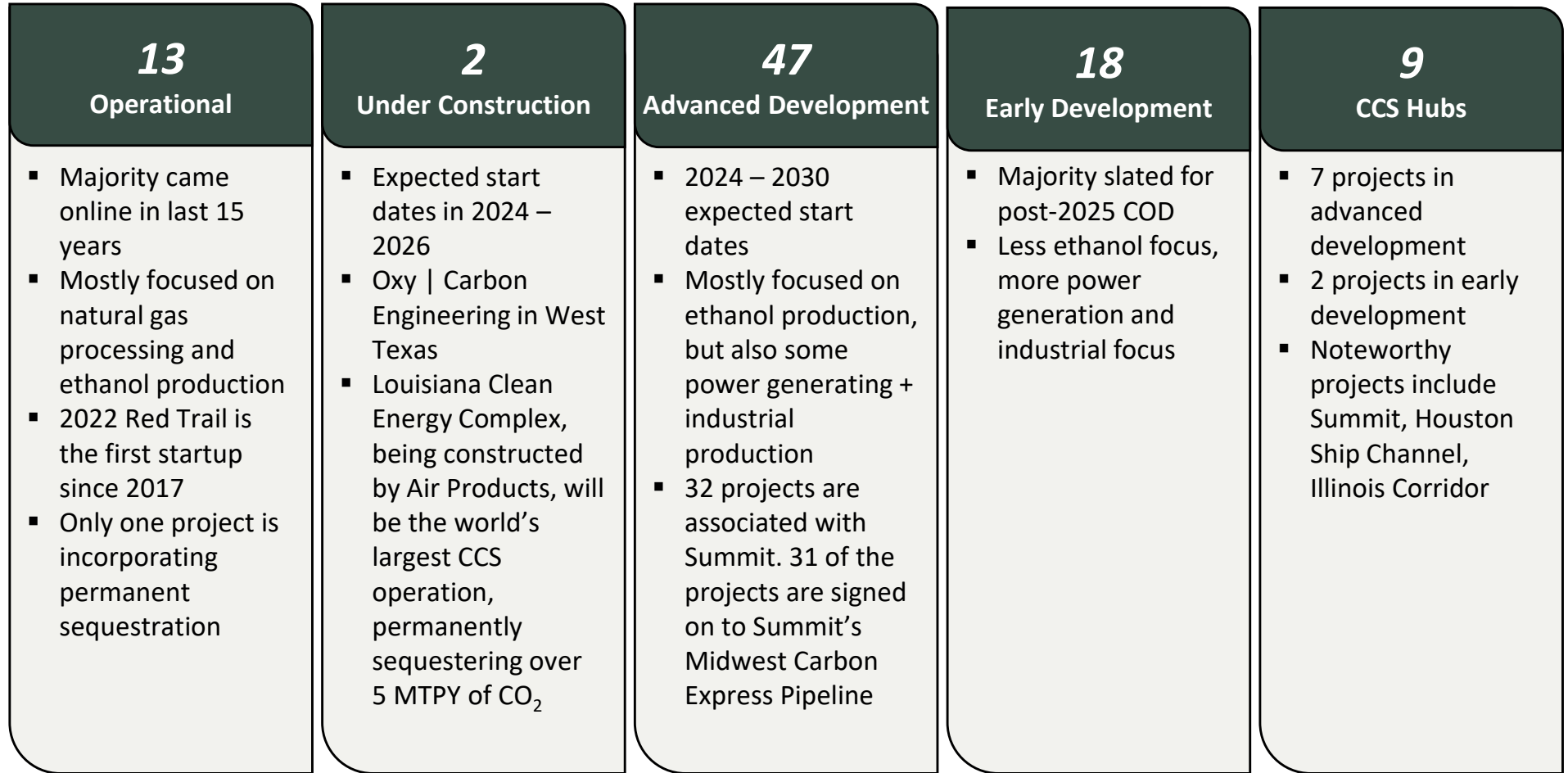
## Recent Noteworthy PPA Deals

Corporate	Seller	Size (MW)	Fuel Source	Location
Meta	APEX CLEAN ENERGY	224	Wind	MISO
PNC	DORAL LLC	78	Solar	PJM
McDonald's	EDF	255	Solar	ERCOT
Google	SB Energy	942	Solar	ERCOT
amazon	aes	450	Solar	CAISO
ThermoFisher SCIENTIFIC	enel Green Power	90	Wind	SPP

Source: <sup>1</sup>S&P Platts (as of 11/11/2022), American Clean Power, Infracore, S&P Market Intelligence

# Alternative Energy | U.S. Carbon Capture Development Pipeline

## Project Pipeline



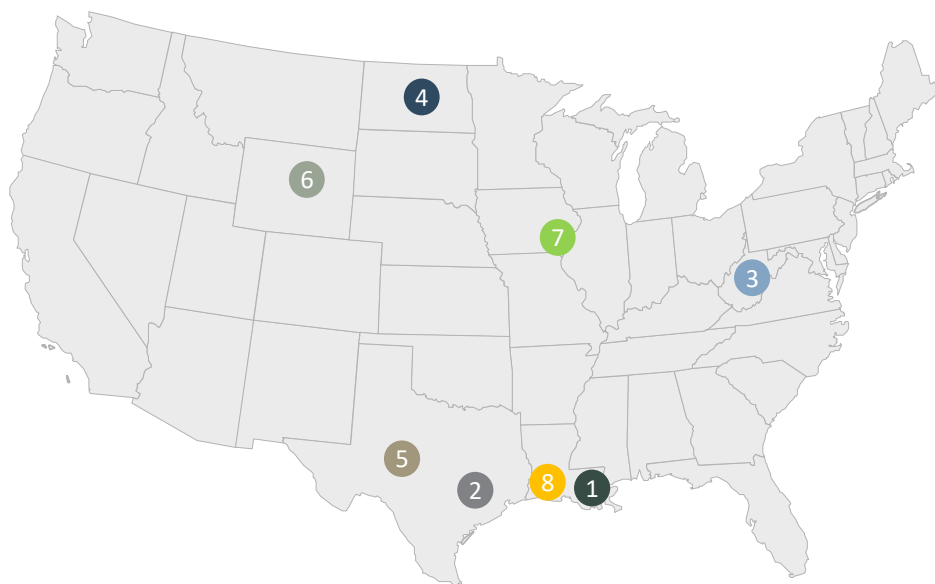
Source: Equity Research & CCS Institute

# 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 in the Last Three Months

Developer(s)	Project
<p>1</p>	<ul style="list-style-type: none"> <li>▪ CF Industries has reached an agreement with Exxon to transport and store up to 2 MMTpa of CO<sub>2</sub> from its Donaldsonville, Louisiana facility. As part of the project, Exxon has signed an agreement with EnLink Midstream to use EnLink's transportation network to deliver the CO<sub>2</sub> to permanent geological storage</li> </ul>
<p>2</p>	<ul style="list-style-type: none"> <li>▪ Occidental Petroleum and Western Midstream have entered a LOI to deploy carbon capture technologies to produce and market low-carbon intensity oil and gas products in Texas and Colorado</li> </ul>
<p>3</p>	<ul style="list-style-type: none"> <li>▪ Competitive Power Ventures plans to develop a roughly 1,800 MW natural gas-fired power plant in West Virginia that will employ CCS technology. The project already has started the regulatory approval process, and once finalized, a firm timeline for commercial operations will be announced</li> </ul>
<p>4</p>	<ul style="list-style-type: none"> <li>▪ Summit announced a major project milestone with North Dakota landowners for the Summit Midwest Carbon Express CO<sub>2</sub> pipeline. Summit has now signed easement agreements for more than 51% of the proposed pipeline route and 85% of the proposed sequestration area, a total of 130,000 acres</li> </ul>
<p>5</p>	<ul style="list-style-type: none"> <li>▪ Caddo Sustainable Timberlands, the largest private timberland owner in Texas, announced it has entered its first agreement for the evaluation and potential development of a CCS project on approximately 27,000 acres of CST's holdings in Texas</li> </ul>
<p>6</p>	<ul style="list-style-type: none"> <li>▪ CarbonCapture and Frontier Carbon Solutions have partnered to pursue a Wyoming project forecast to permanently remove 5 MMTpa of CO<sub>2</sub> by 2030. The facility is anticipated to COD in 2023 and continue development over multiple phases through 2030</li> </ul>
<p>7</p>	<ul style="list-style-type: none"> <li>▪ OCI has agreed to a long-term contract with Navigator to use the planned Heartland Greenway pipeline to sequester 450,000 kT per year of CO<sub>2</sub> from OCI's Weaver, Iowa fertilizer facility</li> </ul>
<p>8</p>	<ul style="list-style-type: none"> <li>▪ Denbury announced the execution of a 20-year definitive agreement to provide CO<sub>2</sub> transportation and storage services to Lake Charles Methanol (LCM), a planned blue methanol project in Louisiana. Approximately 1 MMTpa of CO<sub>2</sub> is expected to be captured from LCM and transported along the Denbury Green Pipeline for sequestration</li> </ul>

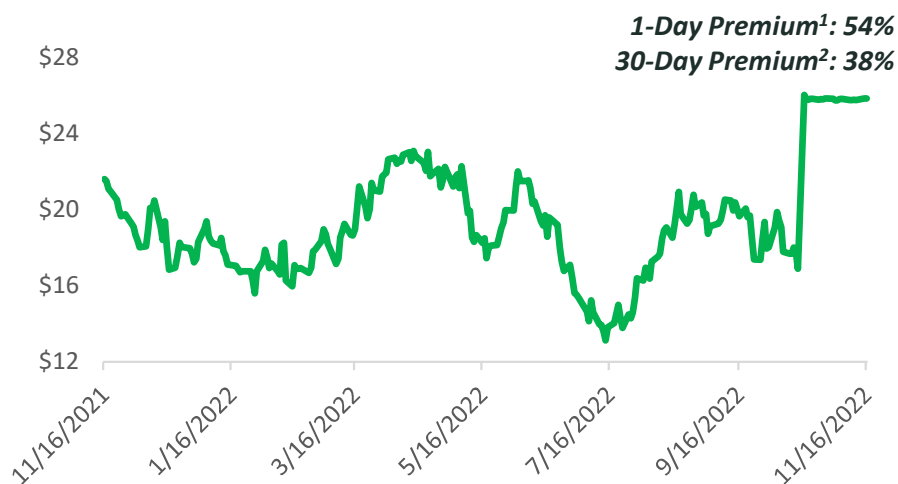
Source: Company Press Releases

## Transaction Overview

**October 17, 2022: bp announced the acquisition of Archaea Energy, accelerating bp's expansion into bioenergy**

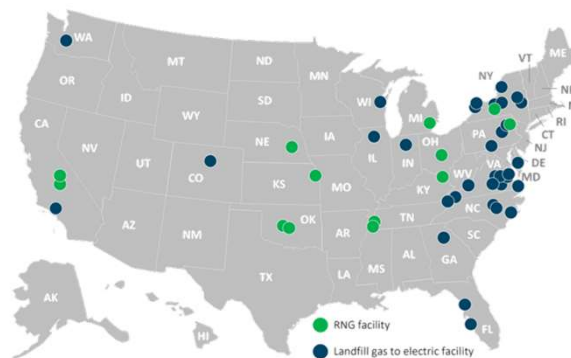
- Archaea Energy (NYSE: LFG), a leading US RNG producer, announced it has agreed to be acquired by bp (NYSE: BP) for approximately \$26 per Class A and Class B share in cash, or a total enterprise value of approximately \$4.1 billion, including roughly \$800 million of net debt
  - \$3.3bn cash acquisition; acquisition multiple ~4x 2027E EBITDA
  - The cash consideration represents an approximately 38% premium to Archaea's volume weighted average share price for the 30 days ending October 14, 2022
- Bioenergy is one of five strategic transition growth engines that bp intends to grow rapidly through this decade
  - bp expects investment into bioenergy to reach more than 40% of its total annual capital expenditure by 2025, aiming to grow this to around 50% by 2030

## LTM Stock Performance (LFG)



Source: Company Press Releases, CapIQ. <sup>1</sup>Based on deal price of \$26.00 relative to share price at 10/14/2022 close. <sup>2</sup>Volume weighted average share price for the 30 days ending 10/14/2022.

## Archaea Business Profile



**\$600 million**  
Estimated Long-Term Annual Earnings Power

**50 million MMBtu**  
Estimated Long-Term Annual RNG Production

**~4.0x**  
Estimated Build Multiple for Project Backlog

- Operates 50 RNG and landfill gas-to-energy facilities across the US, producing around 6,000 barrels of oil equivalent a day of RNG
- Development pipeline of more than 80 projects with potential for five-fold growth in RNG production by 2030
- Expected to deliver an EBITDA of \$140mm in 2022

















## Public Market Overview (LFG)

Overview	10/14/2022	Deal Terms
Price	\$16.88	\$26.00
Market Cap (\$mm)	2,022	3,114
Enterprise Value (\$mm)	2,989	4,081
YTD Total Returns (%)	(7.7%)	42.2%
EBITDA 2023E (\$mm)	249	249
EBITDA 2024E (\$mm)	337	337
<b>Valuation</b>		
2023E EV/EBITDA (x)	12.0x	16.4x
2024E EV/EBITDA (x)	8.9x	12.1x



## Alternative Energy | Renewable Fuels – Recent Announcements & Transactions

*Renewable Fuels sector has seen high velocity of deals and corporate collaborations*

Date	Category	Involved Parties	Commentary
Oct '22	M&A	 	NextEra has reached an agreement to acquire a portfolio of RNG facilities for \$1.1bn from Energy Power Partners. The deal includes roughly \$37mm in project finance debt, and NextEra plans to invest another \$400mm, net of tax credit benefits, into the project to increase production of RNG from the portfolio
Oct '22	Noteworthy Announcement	  	Martin-Brower of Canada, a logistics service provider for restaurant chains, is operating its first tractor trailer for McDonald's Canada food delivery on 100% RNG provided by FortisBC. Seven tractor trailers will undergo testing in British Columbia to assess the feasibility of using them to deliver to McDonalds across Canada
Oct '22	Noteworthy Announcement	 	SunGas Renewables announced an agreement with Arbor Renewable Gas to supply an equipment package for Arbor Gas' Spindletop Renewable Gasoline Project located in Beaumont, TX. The Spindletop Project will convert sustainably sourced woody biomass into renewable synthesis gas for the production of 345,000 barrels annually of renewable gasoline
Oct '22	Noteworthy Announcement		Waste Management has received Board of Supervisors approval to construct two 20,000 sqft. RNG facilities on a portion of the company's 47-acre Fairless Landfill complex in Bucks County, PA. The facility is expected to COD in 2024 and distribute enough RNG to serve the equivalent of 65,000 households each year
Oct '22	Noteworthy Announcement	 	Signature Aviation, a support services provider for private aviation terminals, announced it has expanded the availability of Neste sustainable aviation fuel (SAF) to all 10 of its locations in California. Under the partnership, Neste will deliver over 29 million gallons (89,000 tonnes) of blended SAF each year
Oct '22	Noteworthy Announcement	 	Tidewater Renewables announced that its majority owned subsidiary Rimrock Renewables has entered into a 20-year offtake agreement with FortisBC. Under the agreement, FortisBC expects to purchase up to 525,000 gigajoules of RNG annually from a facility located in Alberta
Oct '22	M&A	 	Archaea Energy announced that is has agreed to be acquired by bp for \$26 per Class A and Class B share in cash, or a total EV of approximately \$4.1bn, including approximately \$800mm of net debt. The acquisition enterprise value is 4.0x 2027E EBITDA and an approximate 38% premium to Archaea's volume weighted average share price for the 30 days preceding the transaction
Oct '22	Project Investment	  	TC Energy announced a \$29.3mm investment in a RNG production facility near the Jack Daniels Distillery in Lynchburg, TN. Once operational in 2024, a byproduct of the Jack Daniel's distilling process will be broken down to generate methane gases recovered as biogas. The project is being developed by 3 Rivers Energy

Source: Company Press Releases

## Alternative Energy | Hydrogen – Clean H<sub>2</sub> Pathways Are Taking Shape

*Clean H<sub>2</sub> investment and partnership announcements have accelerated*

H <sub>2</sub> Profile	Date	Company	Noteworthy Activity
Blue	Oct '22	   	Air Liquide, Chevron, LyondellBasell, and Uniper announced their intent to collaborate on a joint study that will evaluate a hydrogen and ammonia production facility along the U.S. Gulf Coast. The consortium will assess the potential for producing hydrogen using natural gas with CCS to supply end-use markets
	Sept '22	 	Equinor and Tallgrass have entered a MOU to pursue opportunities for the development of large-scale hydrogen and ammonia projects in North America paired with CCS technology. Tallgrass and Equinor have agreed to initial co-development activities, including the joint funding of a FEED study. The study will focus on incorporating the capture of a minimum of 95% of the CO <sub>2</sub> for permanent sequestration
	Sept '22		OCI plans to start building a blue ammonia facility in Beaumont, Texas. The \$450mm plant will have an initial production capacity of 1.1 MMTpa, but will include enough infrastructure capacity to double production to 2.2 MMTpa
Green	Oct '22	 	Sempra Infrastructure and Avangrid announced they have entered into a HOA for the potential joint development of U.S. green hydrogen and ammonia projects. The HOA provides a framework for the companies to identify, appraise, and potentially develop large-scale projects
	Oct '22		Air Products announced plans to invest approximately \$500mm to build, own, and operate a 35 MT per day facility to produce liquid green hydrogen at a greenfield site in Massena, New York. The facility will also have liquid hydrogen distribution and dispensing operations and is targeting a 2026-2027 COD
	Sept '22		Linde announced it will build a 35 MW PEM electrolyzer to produce green hydrogen in Niagara Falls, New York. Linde will build, own, and operate the electrolyzer and use hydroelectric power to produce green liquid hydrogen. The plant has an expected 2025 COD and will leverage existing infrastructure to supply customers
Turquoise	Oct '22		Etch, a Chevy Chase, Maryland-based methane pyrolysis company employing a new chemical cycle involving metal salt intermediates, has raised \$6.5mm from undisclosed investors. The funding will assist the design and construction of a demonstration unit and the build-out of the engineering team
	Oct '22		Molten Industries, an Oakland, California-based company developing a technology that eliminates reactor clogging involved in methane pyrolysis production, has raised \$2mm from a consortium of venture capital funds. Molten was also recently selected by Breakthrough Energy as part of their 2022 cohort

Source: Company Press Releases

# GreenFront Energy Partners - Overview

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# 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
- Head of BB&T Energy IB 2013-2020
- J.P. Morgan Energy IB 2007-2013
- MBA, University of Virginia; BA, Sewanee
- Board Member, Virginia Solar Energy Development & Battery Storage Authority



**Adam Hahn** – Managing Director

- Head of corporate renewable advisory
- 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
- 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



### Corporate Renewable 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 Renewable 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, H<sub>2</sub>, LFG, GTL)
- *Environmental Attributes:* Deep knowledge around revenue pathways for LCFS, 45Q, voluntary CO<sub>2</sub> credits
- *Corporate Network:* PPA advisory assignments keep us in regular dialogue with corporate sustainability decision-makers

### GreenFront Differentiation

- *Risk Management:* GreenFront provides 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 in the last 18 months*



*Has closed on a private placement to advance its biogas monitoring technology*

**Undisclosed**

Financial Advisor  
**2022**



*Has closed an equity investment to support its low-carbon hydrogen production technology*

**Undisclosed**

Financial Advisor  
**2022**



*Has closed on a JV and funding commitment from*



Placement Agent  
**2022**



ENERGY ASSURANCE

*Has been acquired by*



Sell-side M&A Advisor  
**2022**



*Has secured a structured equity private placement from*



Greenbacker  
CAPITAL

Placement Agent  
**2021**



*Has secured a \$50 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 large corporate on a 200 MW PJM Procurement*



PPA Advisor  
**Pending**

*Advisor to a large Public Corporate to offset 100% of North American Consumption*



40 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...

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

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

**571 Corporates** pursuing different ESG strategies

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