

Element Markets Carbon Market Overview

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Element Markets



Element Markets Carbon Overview

December 2021

Element Markets Business Lines: Carbon



Our Carbon team provides expert management of GHG mitigation, carbon neutral initiatives, and sustainability services on behalf of large commercial and industrial entities, municipalities, and universities.

- Active in all compliance and voluntary GHG markets
- Top-ranked supplier of compliance and voluntary carbon credits in the GHG marketplace with over 60 million tonnes transacted across all major carbon registries (CAR, ACR, Gold Standard, and Verra)
- Diversified portfolio of offsets from a wide variety of different projects (and geographies) to help align with client sustainability goals
- Leading GHG compliance manager in California and the Regional Greenhouse Gas Initiative (Northeast U.S.)
- Provide turnkey transaction service for the procurement, transfer, and retirement of offsets on behalf of company carbon neutrality goals

Defining the Carbon Market: Voluntary vs. Compliance

Pricing as of November 8, 2021	
Compliance Programs	
EU ETS	€80.00 / \$90.39
China National ETS	43 yuan / \$6.73
Australia Domestic Market	41.50 AUD / \$29.42
CA Cap and Trade CCAs	\$29.70
CA Cap and Trade DEB Golden CCOs	\$16.10
Regional Greenhouse Gas Initiative (RGGI)	\$12.95
Massachusetts (RGGI + Mass Program)	\$27.95
Low Carbon Fuel Standard (LCFS)	\$146.00
Alberta Offsets	\$30.00
British Columbia Carbon Tax	\$40.00
Voluntary Offset Program	
U.S. Landfill	\$7.50 – 8.50
U.S. Forestry	\$12.00 – 35.00
REDD (International Forestry)	\$9.00 – 14.00
Int. Renewables (S.America + Asia)	\$6.00 – 8.50
Cookstoves	\$6.50 – 10.00

Compliance Carbon

Market-based programs comprised **obligated compliance entities** trading and surrendering carbon allowances for emissions.

Program Examples:

- EU ETS: Cap-and-trade covering power stations, industrial plants, and airlines
- RGGI: Fossil fuel electric power entities generating >25 MW annually in the Northeast
- AB 32: All industries emitting >25,000 MT CO2 annually in CA and Quebec
- Waxman-Markey: Proposed Federal cap-and-trade during Obama Administration

Voluntary Carbon

Wide variety of players **voluntarily** setting and achieving sustainability and emission reduction goals (e.g., carbon neutral, net zero, etc.)

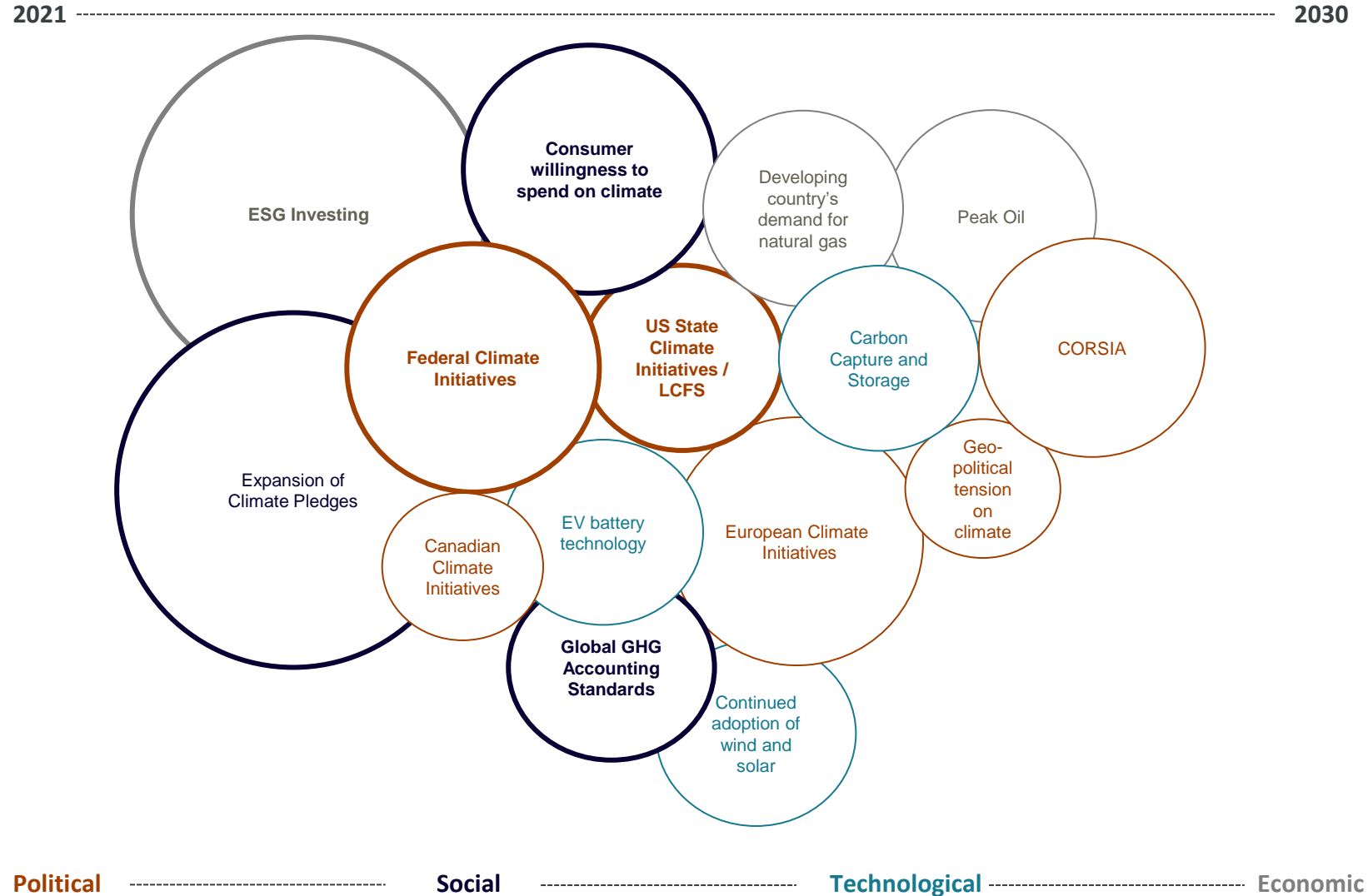
- Involves the voluntary purchase and ‘retirement’ of carbon offsets to account for emissions that cannot be otherwise reduced

ESG investing, climate pledges, consumer WTP: ESG investing, climate pledges, and consumer’s WTP premiums for green products is driving interest from voluntary buyers in RNG and Carbon markets.

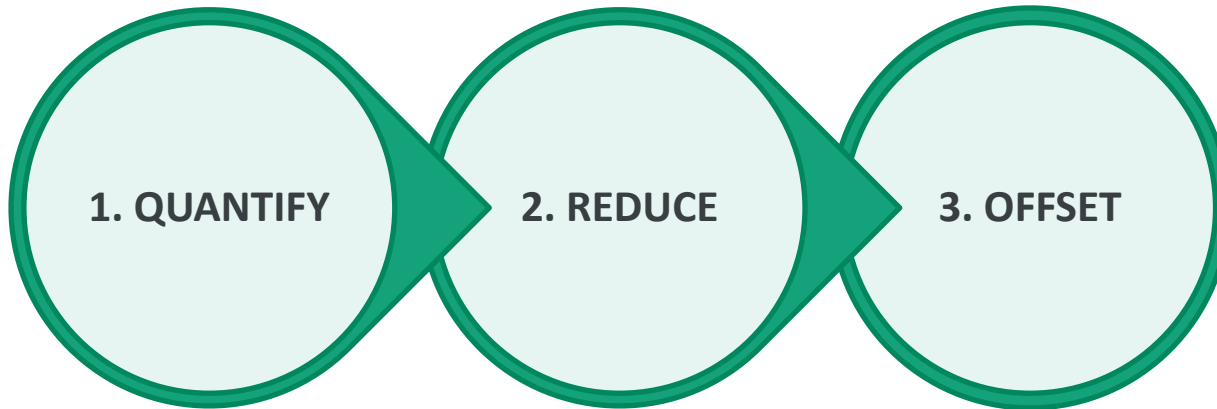
GHG accounting standards: The evolving landscape of national and international GHG accounting standards will impact which green products are adopted (e.g: Green-e for renewable fuels, CORSIA, SBTi-carbon offset guidance, WRI’s GHG accounting protocol corporate standard).

Federal and State Climate Initiatives: State and federal subsidization of clean energy infrastructure and procurement - EV, hydrogen, CC&S, RNG – will drive sustainability choices.

CORSIA: The ICAO program began in 2021 with a voluntary pilot program and will become mandatory in 2027. Incentive to offset aviation emissions and invest in Sustainable Aviation Fuels (SAF) is anticipated to climb as the program reaches its final implementation phase between 2027-2035.



GHG Emissions Framework



1. Measure emissions footprint and set reduction goal
2. Reduce footprint through facility upgrades (“low-hanging fruit”)
3. Procurement of environmental products (RNG, RECs, carbon offsets) for sustainability and ‘net zero’ initiatives and facility emissions

Sustainability goals are set and accomplished within framework of these

Scope 1: Direct emissions from owned and controlled sources



Gas boilers



Facility



Flares



Fugitive emissions

Scope 2: Indirect emissions from owned and controlled sources



Purchased electricity



Purchased heating/cooling

Scope 3: Indirect emissions from sources not owned or controlled



Business travel



Employee commute



Third party manufacturing

Scope	Example Sources	Mitigation Measures	Reporting/Registry Options
<p>1</p> <p>Direct emissions from owned & controlled sources</p>	<ul style="list-style-type: none"> Gas boilers Flares Refinery and Chemical Facility Emissions 	Carbon offsets (local/global)	<ul style="list-style-type: none"> Climate Action Reserve (CAR) American Carbon Registry (ACR) Verra Gold Standard
		Replacement of natural gas with renewable natural gas	<ul style="list-style-type: none"> Confirmed via attestation if RNG environmental attributes used
<p>2</p> <p>Indirect emissions from owned and controlled sources</p>	<ul style="list-style-type: none"> Purchased electricity Purchased heating/cooling 	Renewable Electricity Certificates (RECs) applied to electricity use or carbon offsets	<ul style="list-style-type: none"> Green-e Energy Program CAR, ACR, Verra, or Gold Standard
<p>3</p> <p>Indirect emissions from other sources</p>	<ul style="list-style-type: none"> Business travel Employee commute Third party manufacturing 	Carbon offsets (local/global)	<ul style="list-style-type: none"> CAR, ACR, Verra, or Gold Standard

1 Carbon Offset = 1 MT of CO₂e

- Carbon offsets represent 1 metric ton of carbon reduction equivalent emission reductions and can be derived from various project types (e.g., agricultural manure, forestry, landfill methane capture)



Agricultural
Projects



Industrial Projects



Landfill Gas
Capture Projects



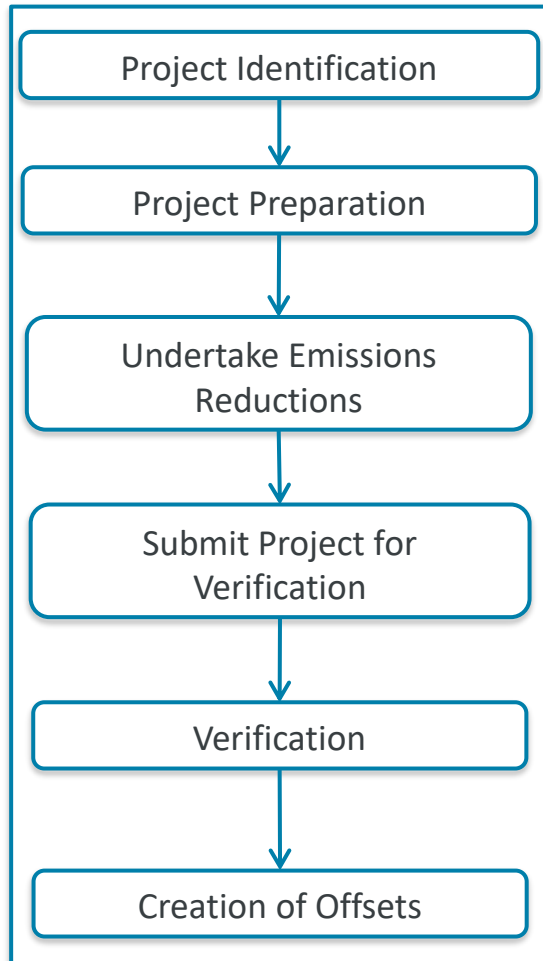
Reforestation and
Avoided
Deforestation



Renewable Energy
Projects

Carbon Offset Generation and Registry Overview

Process for Generating Offsets



The four main carbon registries are American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, and Verra (formerly VCS). These registries maintain the protocols for offset generation and govern the issuance and retirement of offsets to ensure integrity in the system.



North America

International

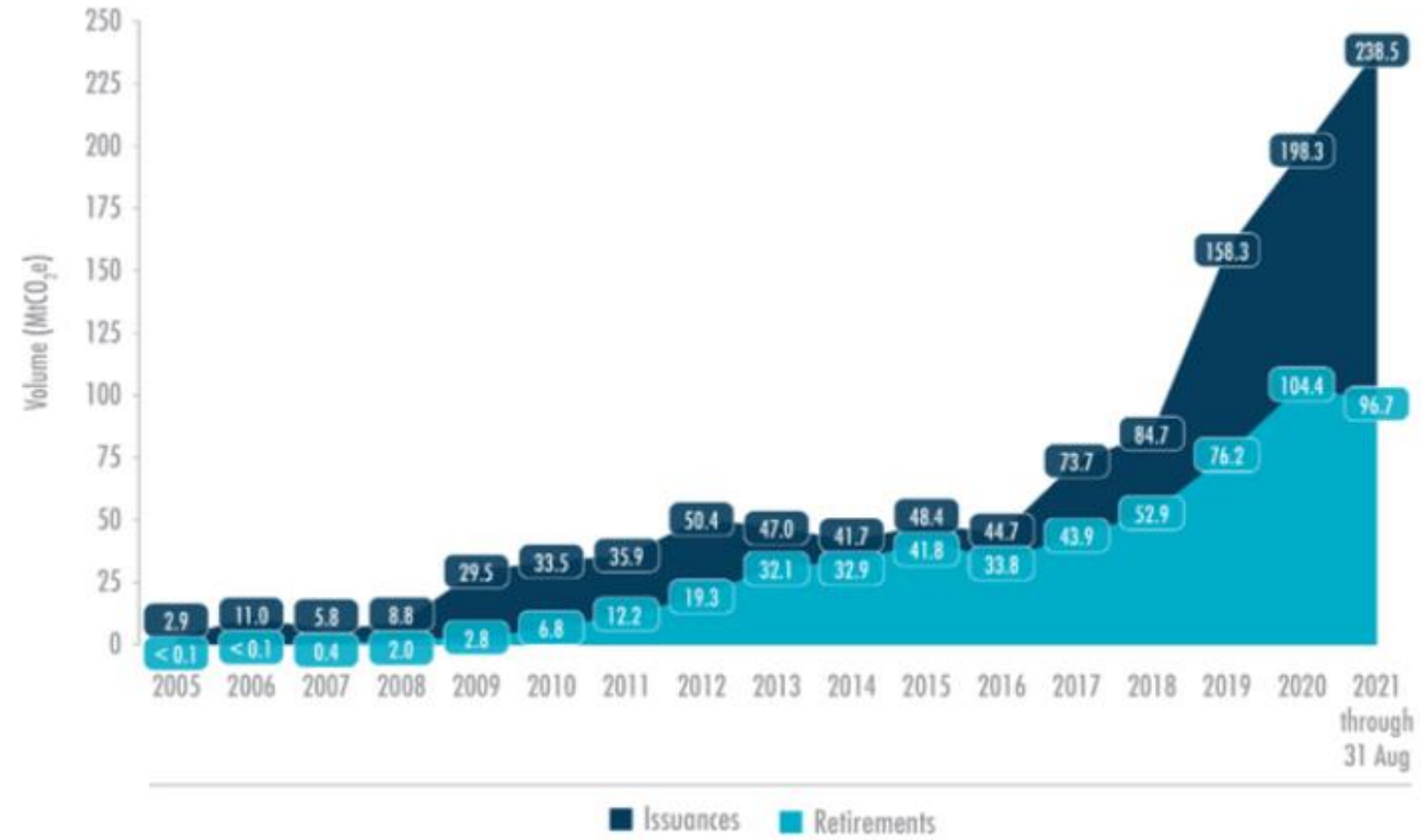
Carbon Offset Benefits and Considerations



When offsets are **used to supplement other emission reduction measures**, they are an effective tool for decarbonization

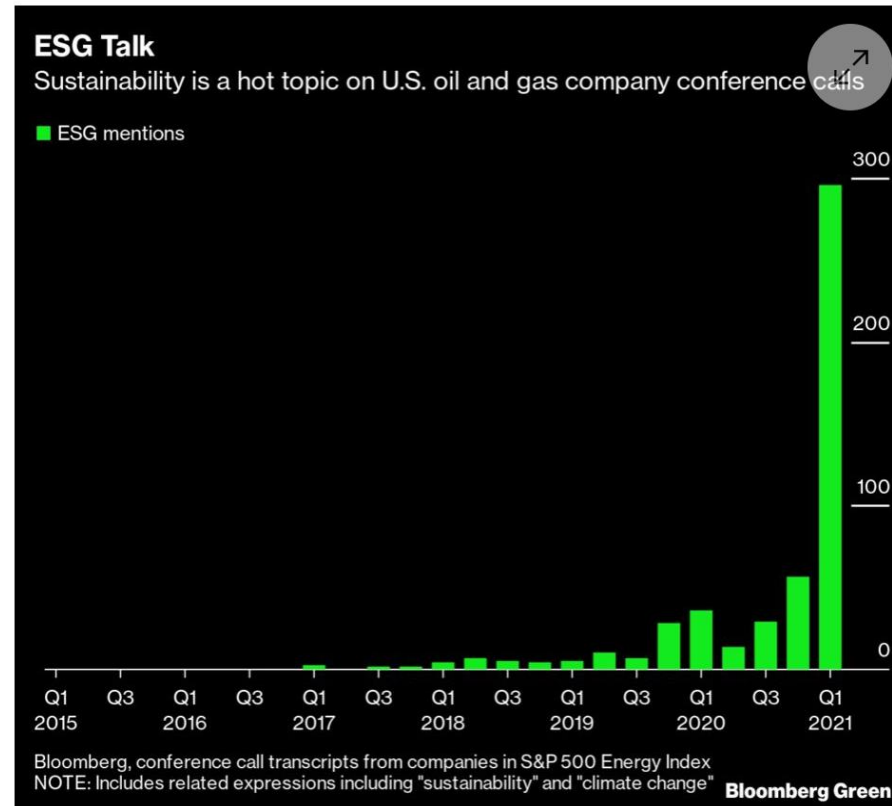
- Cost-effective option to help meet sustainability goals with a host of project types available
- Fully bankable and fungible with applications across supply chains and product categories
- Tradable and verifiable reductions that never expire until retired
- Can appreciate or depreciate like any commodity
- Variety of social, economic, and environmental co-benefits

Figure 3. Market Size by Voluntary Carbon Offset Issuances and Retirements, 2004 to 31 August 2021



Source: Ecosystem Marketplace, a Forest Trends Initiative.

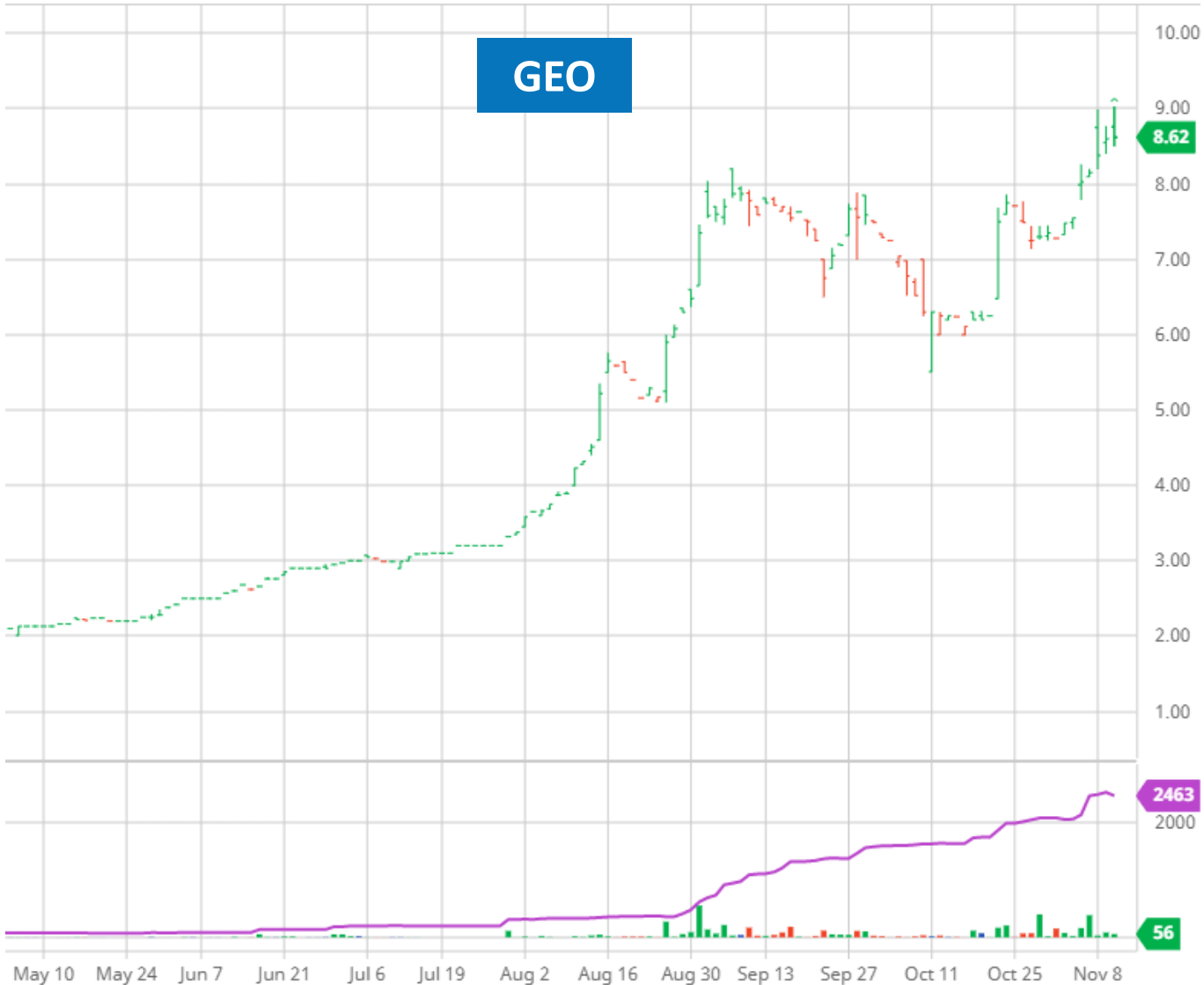
- “Insetting” vs. Offsetting
- Current Market demand drivers:
 - Increased carbon-neutral & net zero commitments and overall strengthened corporate ESG/sustainability presence
 - Universities meeting decarbonization pledges
 - Municipal Climate Action Plans
 - Paris Agreement
 - CORSIA



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11



GEO and NGENO – Dec21 Futures



Client Case Example from Upstream Oil and Gas Company:



EM directly managed the large-scale procurement of 1.8 million offsets on behalf of the Client at the end of 2020

- Completed procurement from eight different projects spanning four countries
- Blended portfolio of 80% international 20% domestic for price optimization
- Provided turnkey delivery of 1,800,000+ tonnes within one month of approval—negotiating across multiple counterparties and streamlining the contracting and delivery process for the Client
- Transparent open book process for tracking project pricing and delivery timeline

Carbon Registry	Registry Link	Project Name	Project Type	Location	Vintage Year(s)	Approx. Volume (MT)	Delivery
Gold Standard	Link	Edincik Wind Power Plant	Renewable Energy - Wind	Turkey	2014-2016	500,000	Spot
Gold Standard	Link	Landfill Gas Extraction and Electricity Generation Project Istanbul, Turkey	Landfill Gas	Turkey	2010-2014	1,500,000	Spot
Verra	Link	Kepezkaya Hydroelectric Power Plant Project	Renewable Energy - Hydro	Turkey	2012-2015	145,914	Spot
Verra	Link	Bundled Wind Power Project in Tamilnadu, India	Renewable Energy - Wind	India	2014-2018	500,000	Spot
Verra	Link	Salto Pilao Hydropower Plant Project	Renewable Energy - Hydro	Brazil	2011-2016	500,000	Spot
Verra	Link	CFL Lighting Scheme Bachat Lamp Yojana in Perumbavoor	Energy Efficiency	India	2010-2011	400,000	Q1 2021
ACR	Link	UPM Blandin Native American Hardwoods Conservation & Carbon Sequestration Project	Forestry - Improved Forest Management	U.S. - MN	2011-2014, 2018-2020	180,000	Spot and Dec. 2020
CAR	Link	Rio Grande Valley Landfill	Landfill Gas	U.S. - TX	2015-2016	17,500	Spot
CAR	Link	TRR Landfill	Landfill Gas	U.S. - MS	2019	25,000	Dec. 2020
ACR	Link	GreenTrees ACRE (Advanced Carbon Restored Ecosystem)	Forestry - Reforestation	U.S. - AR, LA, MS, TX	2019	25,000	Spot
CAR (Climate Forward Program)	Link	Dow/IOC Pointe-aux-Chenes Wildlife Management Area Phase 2	Forestry - Reforestation	U.S. - LA	2021-2030	100,000	Q3 2022
CAR	Link	Black Warrior Solid Waste Facility	Landfill Gas	U.S. - AL	2011-2013	124,727	Spot
ACR	Link	Dolton LFG to Energy	Landfill Gas	U.S. - IL	2006-2007	100,000	Spot
ACR	Link	Monjolinho Energética S/A Hydropower Plant Project (Alzir dos Santos Antunes)	Renewable Energy - Hydro	Brazil	2009-2014	200,000	Spot
Verra	Link	Recast Energy Louisville Fuel Switch From Coal to Biomass for Thermal Energy	Biomass	U.S. - KY	2020	50,000	Q3 2021
Verra	Link	Cikel Brazilian Amazon REDD APD Project Avoiding Planned Deforestation	REDD Project (NBS)	Brazil	2007-2010	500,000	Spot
CAR	Link	Maple Hill Landfill	Landfill Gas	U.S. - MO	2019	42,496	Spot
ACR	Link	Truck Stop Electrification, Texas and Oklahoma	Truck Stop Electrification	U.S. - OK, TX	2008-2010	5,399	Spot
CAR	Link	Johnston County Landfill Project	Landfill Gas	U.S. - NC	2018-2019	60,093	Spot
Verra	Link	Crow Lake Wind Emissions Reduction Project	Renewable Energy - Wind	U.S. - SD	2018	123,000	Spot
ACR	Link	The Nature Conservancy (TNC) - Working Woodlands Project	Forestry - Improved Forest Management	U.S. - KY, MI, NY, PA, TN (and more)	2018+	100,000	Q3 2021
Verra	Link	Katingan Peatland Restoration and Conservation Project	REDD Project (NBS)	Indonesia	2010-2015	300,000	Spot

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Thank you.

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Emissions House of the Year

Energy Risk Magazine,
2020, 2018, 2014, 2010

Environmental Products House of the Year

Energy Risk Magazine, 2019

Energy Risk Environmental Rankings:

- #1 U.S. Regional Greenhouse Gas Dealer
- #1 U.S. Voluntary GHG Credit Dealer
- #2 Renewable Energy Credit Dealer

Best Trading & Advisory Company in North American Renewable Identification Numbers

Environmental Finance Magazine

Hyperdrive

Tesla Emissions-Credit Revenue May Boom Again in 2021: Analyst

By [Craig Trudell](#)

January 27, 2021, 3:23 AM CST

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Tesla Inc.'s business selling regulatory credits to automakers that need help complying with emissions rules will keep on booming this year, according to Credit Suisse.

Regulatory credit revenue probably will rise to \$2 billion from about \$1.4 billion in 2020, analyst Dan Levy predicted in a note previewing Tesla's quarterly earnings Wednesday. He wrote that 2021 is higher than consensus of

Dominion Energy and Smithfield Foods Invest Half Billion Dollars to Become Largest Renewable Natural Gas Supplier in U.S.

- Companies doubling investment in Align Renewable Natural Gas(SM) (RNG) joint venture to \$500 million, extending largest RNG partnership in U.S.
- Partnership heavily investing in North Carolina, which is on track to become nation's leading producer of agricultural RNG, as well as other RNG projects nationwide
- Companies capturing methane from hog farms and converting it into clean, renewable energy in a form that can be used to heat homes, power businesses, and fuel vehicles
- Expanded partnership to produce enough RNG to power 70,000 homes and businesses, and reduce the same amount of greenhouse gas emissions as taking 500,000 cars off the road or planting 40 million new trees

GLOBAL NEWS SELECT

Carbon Offsets That Companies Are Gobbling Up Get a Futures Contract



Provided by Dow Jones
Jan 27, 2021 7:14 AM CST

By [Ryan Dezember](#)

Exchange operator CME Group Inc. plans to launch trading in voluntary carbon-offset futures, tapping into the rush by companies to make up for their emissions.

Offset credits are a climate-change currency earned through endeavors that reduce or sequester greenhouse gasses, such as paying timberland owners to leave trees standing and capturing methane fumes at hog farms.

24 March 2020

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ICAO Identifies Six Eligible Carbon-Offsetting Programmes for Aviation Industry

Awards & Recognition

EnergyRisk
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Winner

Element Markets
Emissions house
of the year

EnergyRisk
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Environmental
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20th Annual Market
Rankings 2019
Winner

Emissions House of the Year

Energy Risk Magazine,
2020, 2018, 2014, 2010

Environmental Products House of the Year

Energy Risk Magazine, 2019

Energy Risk Environmental Rankings:

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- #2 Renewable Energy Credit Dealer

Best Trading & Advisory Company in North American Renewable Identification Numbers

Environmental Finance Magazine 2019, 2020

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