

## Insights

### Pennsylvania's Regulatory Review Commission Approves Final RGGI Rule-making

The Pennsylvania Independent Regulatory Review Commission (IRRC) on Wednesday approved (3-2) final form Regional Greenhouse Gas Initiative (RGGI) rule-making, clearing another hurdle for the state to join the multistate cap-and-trade consortium in 2022. *See page 2.*

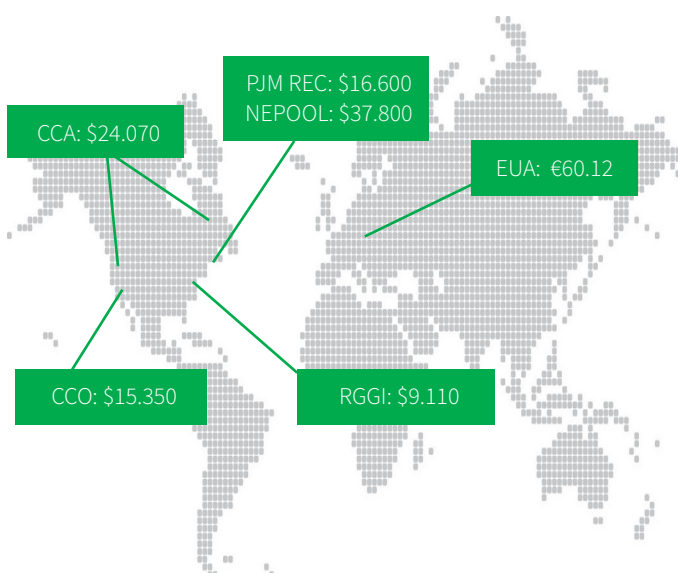
### Energy Transfer Signs 15-Year PPA With SB Energy for Texas Solar Project

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### New Zealand Sells Record Emission Allowance Volumes at Record High Prices

New Zealand sold record volumes of emissions permits at record high prices in its latest auction for these permits on Wednesday, as demand ramped up ahead of upcoming changes to the country's emissions trading scheme (ETS). *See page 2.*

## Global Compliance Carbon Markets



## Key Benchmarks

### CALIFORNIA CARBON ALLOWANCES (US\$/MT)

Product	Vintage	Timing	Price	Change
Current Yr. CCA	V21	Sep'21	24.070	-0.855
Current Yr. CCA	V21	Dec'21	24.500	-0.805

### CALIFORNIA CARBON OFFSETS (US\$/MT)

Product	Timing	Price	Change
Golden CCO	2021	15.350	0.000
DEBS Golden CCO	2021	15.400	0.000
Zero CCO	Sep'21	15.800	0.025

### CALIFORNIA LOW CARBON FUEL STANDARD (CTS/GAL)

Product	Price	Change
Carbon Credit (\$/mt)	176.5000	-1.5000
Gasoline LCFS/Crude CI Deficit 90%	19.9215	-0.1680
Diesel LCFS/Crude CI Deficit 95%	20.7415	-0.1790

### OREGON CLEAN FUELS PROGRAM (CTS/GAL)

Product	Price	Change
Carbon Credit (\$/mt)	126.0000	0.5000
Carbon CPG Gasoline 90%	7.650	0.030
Carbon CPG Diesel 95%	8.770	0.035

### REGIONAL GREENHOUSE GAS INITIATIVE ALLOWANCES (US\$/ST)

Product	Vintage	Timing	Price	Change
RGGI	V20-V21	Sep'21	9.110	0.060
RGGI	V20-V21	Dec'21	9.150	0.055

### EUROPEAN CARBON FUTURES

ICE Exchange	Timing	Settle	Change
EUA €/mt	Dec'21	60.12	-0.64
UKA £/mt	Dec'21	52.09	-0.07

### RENEWABLE ENERGY CERTIFICATES (US\$/MWH)

Product	Vintage	Price	Change
New Jersey Class I	2021	16.600	-0.250
PJM Tri-Qualified	2021	16.600	-0.250
NEPOOL Dual Qualified	2021	37.800	-0.020

## Pennsylvania's Regulatory Review Commission Approves Final RGGI Rule-making

The Pennsylvania Independent Regulatory Review Commission (IRRC) on Wednesday approved (3-2) final form Regional Greenhouse Gas Initiative (RGGI) rule-making, clearing another hurdle for the state to join the multistate cap-and-trade consortium in 2022.

The state's Environmental Quality Board (EQB) last month voted to advance the rule-making to the IRRC.

The DEP drafted the RGGI regulation on the command of a 2019 executive order signed by Governor Tom Wolf (D). Pennsylvania has a climate goal to reduce CO2 emissions by 25% by 2025 and 80% by 2050, compared to 2005 levels.

Pennsylvania's RGGI participation would reduce 188 million tons of carbon dioxide (CO2) over a decade, according to the Department of Environmental Protection.

RGGI has 11 member states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont and Virginia. Under the program, fossil-fuel power plants with more than 25 megawatts of generation capacity must offset emissions with either RGGI allowances or approved offset credits.

Before the vote Wednesday, RGGI secondary market prices strengthened 10.5cts/st for forward delivery on futures exchanges.

The Intercontinental Exchange (ICE) V21 forward December 2021 futures contract traded between \$9.10/st and \$9.20/st, up from the Tuesday OPIS assessment of \$9.095/st. Meanwhile, the contract traded on Nodal Exchange at \$9.10/st by 3:30 p.m. CT.

After the IRRC vote, the National Resources Defense Council said in a statement that the rule-making will meet additional regulatory obstacles before Pennsylvania joins RGGI.

"The Office of Attorney General has thirty days to review the legality of the IRRC's regulations and Pennsylvania's General Assembly could adopt a resolution to oppose the regulations," the group said.

--Reporting by Mayra Cruz, mcruz@opisnet.com; Editing by Bridget Hunsucker, bhunsucker@opisnet.com

## Energy Transfer Signs 15-Year PPA With SB Energy for Texas Solar Project

Energy Transfer said Wednesday it signed a 15-year power purchase agreement (PPA) with San Francisco-based SB Energy for 120 megawatts (MW) from its upcoming Eiffel Solar project in northeast Texas.

The 200-MW Eiffel project will begin construction in the first half of 2022 and deliver energy to Energy Transfer in January 2024.

"We are pleased to announce this PPA with SB Energy," said Tom Mason, head of Energy Transfer's Alternative Energy Group, in a

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news release. "It is our second significant agreement to purchase low-cost solar power to help us meet our ERCOT load requirements for our operations throughout Texas."

Energy Transfer announced the creation of the Alternative Energy Group in February to develop alternative energy projects aimed at reducing its operational environmental footprint.

Energy Transfer signed a 15-year PPA with Recurrent Energy earlier this year for 28 MW from the Maplewood 2 solar farm in West Texas.

--Reporting by Jeremy Rakes, jrakes@opisnet.com; Editing by Bridget Hunsucker, bhunsucker@opisnet.com

## New Zealand Sells Record Emission Allowance Volumes at Record High Prices

New Zealand sold record volumes of emissions permits at record high prices in its latest auction for these permits on Wednesday, as demand ramped up ahead of upcoming changes to the country's emissions trading scheme (ETS).

The Sept. 1 auction saw the sale of 11.75 million New Zealand Units (NZUs) at a unit price of NZ\$53.85 (\$37.98), handily outpacing the 4.75 million units sold during the June 23 auction at NZ\$41.70.

One NZU represents one tonne of carbon dioxide equivalent of emissions. The quarterly auction system was introduced only this year. The first-ever auction was held on March 17 with 4.75 million units sold at NZ\$36 each.

Under New Zealand ETS rules, 4.75 million NZUs are available for each auction this year but a mechanism called the Cost Containment Reserve (CCR) will release another 7 million units if the unit price rises above NZ\$50.

NZUs are also traded in the secondary markets, where prices have already exceeded NZ\$50 last month and are trading at above NZ\$59 as of Sept. 1, according to Jarden Commtrade, a carbon trading platform.

New Zealand's greenhouse gas (GHG) emissions fell by 4.5% to a seven-year low of 80,552 kt for the year ended March 2021, as COVID-19 impacted industrial, business, and social activities. But the country's ministry for the environment announced last month regulatory changes to the ETS that effectively raised the price limits for NZU auctions from 2022 onwards.

For each year from 2022 to 2025, the auction price floor will be raised in increasing magnitudes by NZ\$9.60-15.10/mt, or 47-70%, to NZ\$30/mt, NZ\$32.10/mt, NZ\$34.35/mt and NZ\$36.75/mt, respectively, the ministry said. The CCR trigger price will similarly be raised in an escalating fashion for each year from 2022 to 2025 by NZ\$19-44.22/mt, or 37-82%, to NZ\$70/mt, NZ\$78.40/mt, NZ\$87.81/mt and NZ\$98.34/mt respectively.

New Zealand's ETS covers all sectors of the country's economy although the method of participation might differ for different sectors. All sectors are currently required to buy and surrender NZUs for the emissions they produce, except for the agricultural sector, which only has reporting obligations.

--Reporting by Hanwei Wu, hanwei.wu@ihsmarkit.com; Editing by Carrie Ho, carrie.ho@ihsmarkit.com

## Renewables Key to Lowering US Green Hydrogen Costs: Hydrogen Council CEO

Meeting the US goal of producing a kilogram of hydrogen using renewable electricity for \$1 in a decade will be impossible unless the cost of generating that power decreases, the head of the Brussels-based Hydrogen Council said Tuesday.

Describing the US Department of Energy (DOE) target cost for "clean" hydrogen, which was announced in late June, as "a very ambitious target," Hydrogen Council CEO Daryl Wilson said 80% of the current cost of producing green hydrogen lies on the energy side, "so, we need to fully deploy some very low-cost renewable energy and add some innovation to make this target."

Rather, "we are projecting—on the basis of current industry efforts around the world—the price of producing green hydrogen somewhat above \$2/kg in the US by 2030," Wilson told DOE's Hydrogen Earthshot summit, which is being held Tuesday through Wednesday.

US Secretary of Energy Jennifer Granholm has described "clean hydrogen" as a "game changer" in US efforts to decarbonize the economy by mid-century.

She said the existing clean energy technologies won't get the US to its net-zero goal so "we have to innovate" and "deploy, deploy, deploy."

According to IHS Markit estimates, the cost of producing green hydrogen through splitting water molecules by electrolysis that is powered by renewable electricity is currently \$4-\$5/kg. In comparison, the cost of producing "blue" hydrogen from fossil fuels while sequestering the carbon or from renewable natural gas captured from landfills is estimated at \$1.50/kg-\$2/kg.

IHS Markit is the parent company of OPIS.

### Promise of clean hydrogen

The challenge is to make "the promise of clean hydrogen a reality" and that means investing across the entire value chain from production to transportation to end use, said West Virginia Senator Joe Manchin (D), who chairs the US Senate Energy and Natural Resources Committee and delivered the summit's keynote address.

Manchin pointed to the Senate-approved bipartisan infrastructure bill that authorizes \$9.5 billion to promote research, development, demonstration, and deployment of technologies to produce hydrogen and apply them across the value chain, including hard-to-abate sectors like long-distance trucking, shipping, steel, cement, and chemical manufacturing.

Of this amount, he said, \$1 billion is reserved to improve the efficiency, increase the durability, and reduce the cost of producing clean hydrogen using electrolyzers to less than \$2/kg by 2026.

According to DOE, there are about 170 MW of electrolyzers currently installed in the US.

### Commercialization is key

The "name of the game is commercialization," Vanessa Chan, director of the DOE Office of Technology Transition, which is charged with expanding the commercial impacts of research in technology that the agency conducts.

"Moving along that continuum is hard. It is hard because to get to that full-scale market adoption requires entire ecosystems and value chains to be convinced that investors are better off supporting your solution than what the status quo is right now," Chan said during a session on financing and deployment.

Commercialization takes a lot of time and a lot of capital, she added, pointing to the \$30 million fund that pairs national laboratories with external partners to commercialize energy technology.

However, Jigar Shah, who heads DOE's Loan Program Office (LPO), remains confident the vast majority of the green hydrogen cost reduction can be met through scaling up technology deployment that "we have helped develop at the Department of Energy and fund over 20 years."

Shah said the LPO, which provides loans and loan guarantees for large energy infrastructure projects, has received requests from \$3 billion-worth of active projects in the hydrogen industry "some of that is powered by renewable energy and green hydrogen and some of them are other colors."

--Reporting by Amena.Saiyid@ihsmarkit.com; Editing by Jeremy Rakes, jrakes@opisnet.com

## California Carbon Allowances (\$/mt)

Product	Vintage	Timing	Low	High	Mean	Change	Wt. Avg.	MTD
Previous Yr.	V20	Sep'21	23.74	24.40	24.070	-0.855	---	24.070
Previous Yr.	V20	Dec'21	24.00	25.00	24.500	-0.805	---	24.500
Current Yr.	V21	Sep'21	23.74	24.40	24.070	-0.855	23.972	24.070
Current Yr.	V21	Oct'21	23.85	24.57	24.210	-0.840	---	24.210
Current Yr.	V21	Nov'21	23.92	24.80	24.360	-0.820	---	24.360
Current Yr.	V21	Dec'21	24.00	25.00	24.500	-0.805	24.432	24.500
Next Yr.	V22	Sep'21	23.74	24.40	24.070	-0.855	---	24.070
Next Yr.	V22	Dec'21	24.00	25.00	24.500	-0.805	---	24.500
Forward Yr.	V23	Sep'21	23.74	24.40	24.070	-0.855	---	24.070
Forward Yr.	V23	Dec'21	24.00	25.00	24.500	-0.805	---	24.500
Advanced Yr.	V24	Sep'21	23.74	24.40	24.070	-0.855	---	24.070
Advanced Yr.	V24	Dec'21	24.00	25.00	24.500	-0.805	---	24.500

## California Carbon Offsets (\$/mt)

Product	Timing	Low	High	Mean	Change	MTD
Golden CCO	2021	15.30	15.40	15.350	0.000	15.350
CCO(3)	2021	14.75	14.85	14.800	0.000	14.800
CCO(8)	2021	14.65	14.75	14.700	0.000	14.700
DEBS Golden CCO	2021	15.35	15.45	15.400	0.000	15.400
DEBS CCO(3)	2021	14.80	14.90	14.850	0.000	14.850
DEBS CCO(8)	2021	14.70	14.80	14.750	0.000	14.750
Zero CCO	Sep'21	15.75	15.85	15.800	0.025	15.800
Zero CCO	Dec'21	15.95	16.05	16.000	0.000	16.000
Zero CCO	Dec'22	16.95	17.05	17.000	0.000	17.000
Zero CCO	Dec'23	17.95	18.05	18.000	0.000	18.000

## California Carbon Market Analysis

California Carbon Allowance (CCA) prices are continuing to plunge for a second straight session by \$1.185/mt for prompt delivery and \$1.305/mt for forward delivery Wednesday, a week after the results of the third quarter California Quebec joint cap-and-trade auction were released.

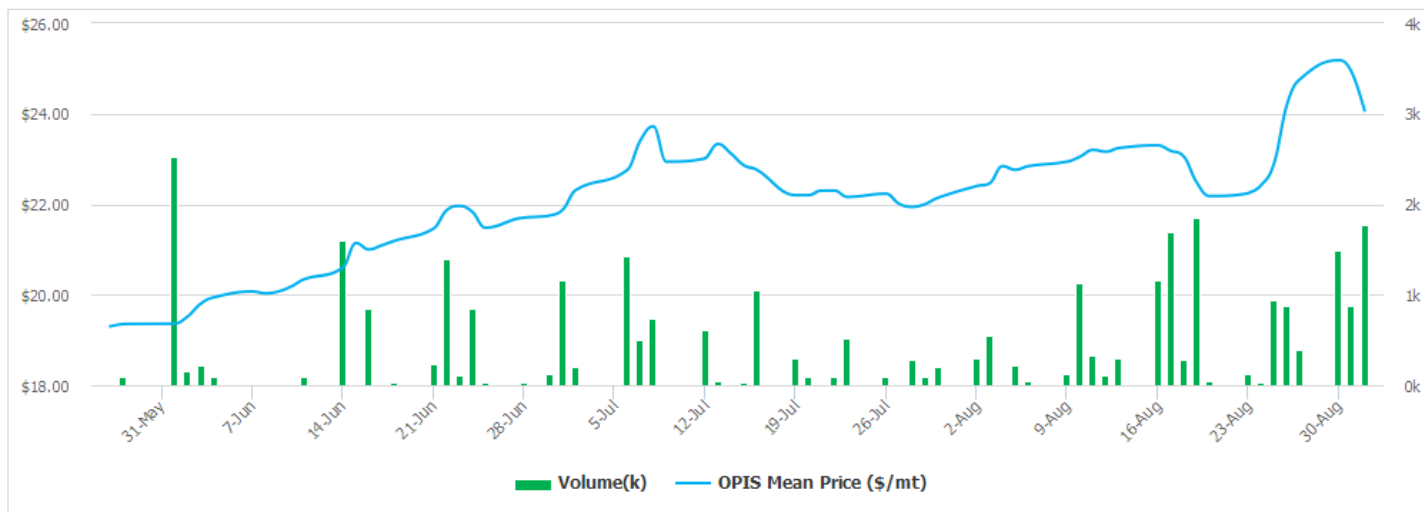
The CCA V21 September 2021 contract on the Intercontinental Exchange (ICE) traded at a high of \$24.40/mt before falling \$23.74/mt. It was assessed at \$24.07/mt, down 85.5cts/mt from Tuesday's assessment of the CCA V21 September 2021 price at \$24.925/mt.

The CCA V21 December 2021 contract traded on ICE as high as \$25/mt before tumbling to \$24/mt. It also traded on the Nodal Exchange from \$24.60/mt to \$24.10/mt. On ICE, bids were at

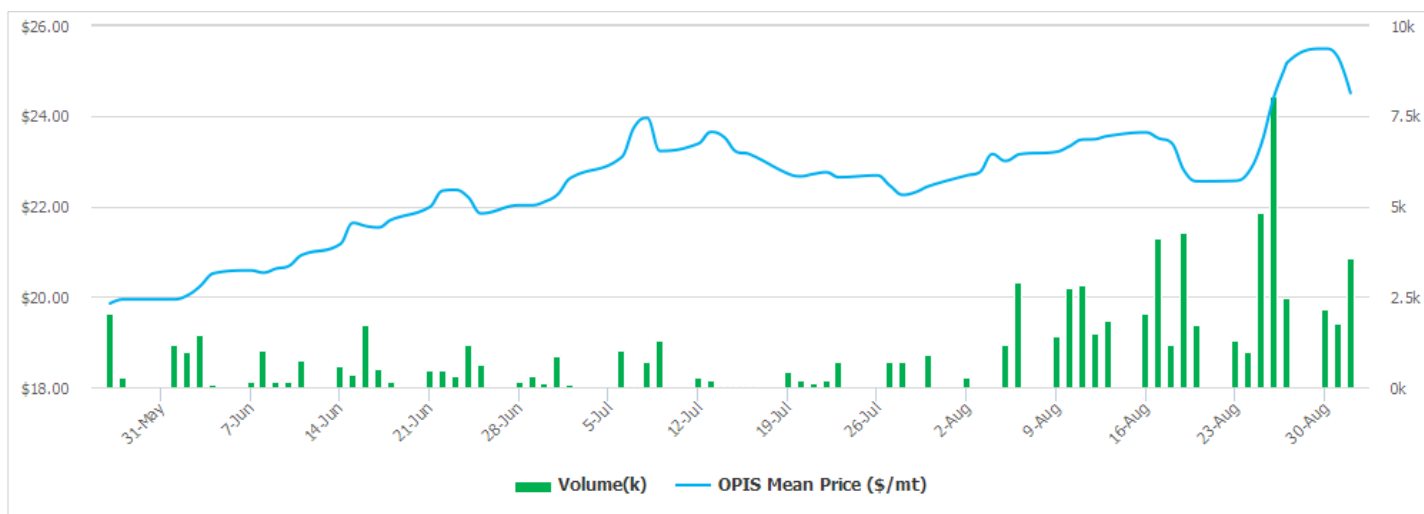
\$24.20/mt and offers at \$24.27/mt. It was assessed at \$24.50/mt, down 80.5cts/mt from the OPIS assessed CCA V21 December 2021 price at \$25.305/mt on Tuesday.

Since Monday, CCA prices have fallen by \$1.66/mt for prompt delivery and \$1.78/mt for forward delivery. The Q3 auction sold out of 79.57 million CCAs with a record high settlement price of \$23.30/mt, according to results released last week by the California Air Resources Board (CARB).

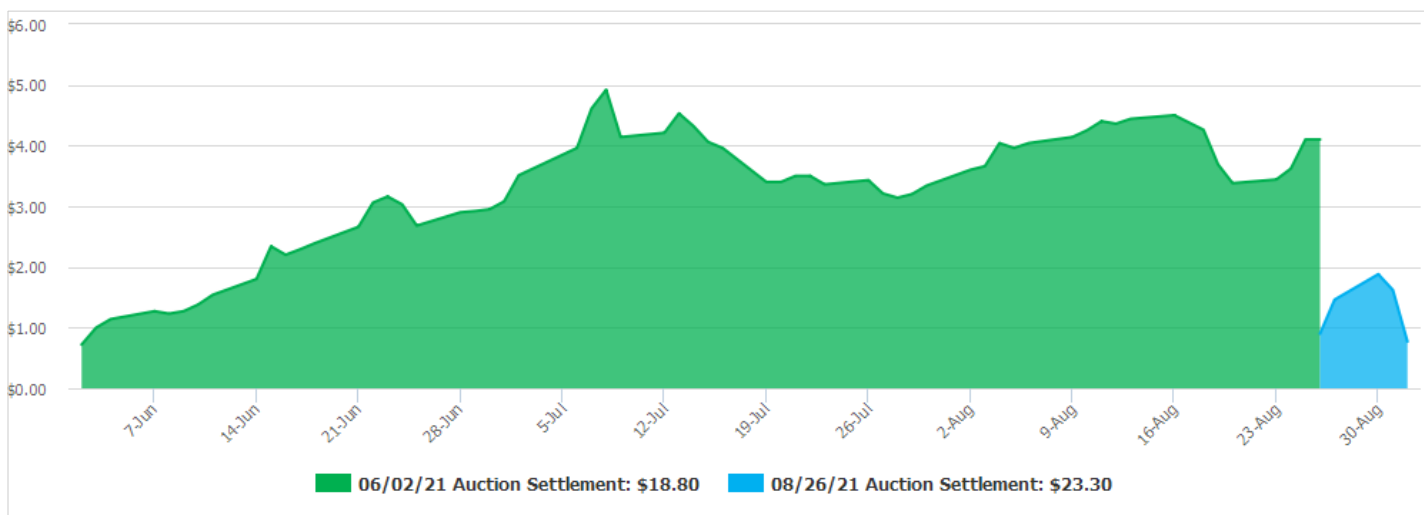
OPIS CCA CURRENT YR. PROMPT PRICES & VOLUMES



OPIS CCA CURRENT YR. FORWARD PRICES & VOLUMES



OPIS CCA CURRENT YR. PROMPT PRICE VS AUCTION SETTLEMENT SPREAD (\$/MT)



## Prompt California Static Carbon Emissions Prices (cts/gal)

Product	Price	Wk. Avg.	30-Day Avg.
Refinery	1.44	1.478	1.377

## Prompt California Cap-at-the-Rack Prices (cts/gal)

Product	Price	Wk. Avg.	30-Day Avg.
CARB No. 2	24.65	25.218	23.503
B5 Biodiesel	23.42	23.958	22.329
Summer CARB RFG-R	19.40	19.847	18.497
Summer CARB RFG-M	19.35	19.803	18.456
Summer CARB RFG-P	19.33	19.780	18.435
LPG	14.01	14.333	13.358
LNG (cts/DGE)	17.62	18.027	16.801

## Prompt Quebec Cap-at-the-Rack Prices

Product	Price (US cts/gal)	Price (CAN cts/lit)	Wk. Avg. (US cts/gal)	30-Day Avg. (US cts/gal)
Conv. 87 Unl	21.52	7.17	22.017	20.500
Conv. 89 Mid	21.52	7.17	22.017	20.500
Conv. 91 Pre	21.52	7.17	22.017	20.500
HS No. 2 Diesel	27.39	9.14	28.026	26.096
ULSD No. 2	27.39	9.14	28.026	26.096
ULSD No. 2 Winter	27.39	9.14	28.026	26.096
ULSD No. 1	27.39	9.14	28.026	26.096
Furn. Fuel Oil HS No. 2	24.91	8.32	25.489	23.734
Stove Oil LS No. 1	24.91	8.32	25.489	23.734
ULSD Furnace Oil	24.91	8.32	25.489	23.734
B5 Biodiesel	26.02	8.68	26.624	24.791
Conv. 87 Unl 10% Ethol.	19.37	6.45	19.815	18.450
Conv. 89 Mid 10% Ethol.	19.37	6.45	19.815	18.450
Conv. 91 Pre 10% Ethol.	19.37	6.45	19.815	18.450
Conv. 89 Mid 5% Ethol.	20.44	6.81	20.916	19.475

## California Low Carbon Fuel Standard

Product	Low	High	Mean	Change	Wk. Avg.	MTD
Carbon Credit (\$/mt)	175.000	178.000	176.5000	-1.5000	177.4000	176.5000
Carbon Intensity Pts Ethanol (\$/CI)	0.01426	0.01451	0.014385	-0.000125	0.014461	0.014385
Carbon Intensity Pts Biodiesel (\$/CI)	0.02207	0.02245	0.022260	-0.000195	0.022377	0.022260
Carbon CPG Diesel (cts/gal)	20.68	21.04	20.860	-0.180	20.968	20.860
Carbon CPG Diesel 95% (cts/gal)	19.65	19.99	19.820	-0.170	19.922	19.820
Carbon CPG Gasoline (cts/gal)	21.09	21.45	21.270	-0.180	21.378	21.270
Carbon CPG Gasoline 90% (cts/gal)	18.98	19.30	19.140	-0.160	19.236	19.140
Carbon CPG Gasoline Crude CI Deficit (cts/gal)	0.858	0.872	0.8650	-0.0070	0.8692	0.8650
Carbon CPG Gasoline Crude CI Deficit 90% (cts/gal)	0.772	0.785	0.7785	-0.0060	0.7822	0.7785
Carbon CPG Diesel Crude CI Deficit (cts/gal)	0.965	0.981	0.9730	-0.0085	0.9780	0.9730
Carbon CPG Diesel Crude CI Deficit 95% (cts/gal)	0.917	0.932	0.9245	-0.0080	0.9292	0.9245
Carbon CPG Gasoline Combined LCFS/Crude CI Deficit (cts/gal)	21.948	22.322	22.1350	-0.1870	22.2472	22.1350
Carbon CPG Gasoline Combined LCFS/Crude CI Deficit 90% (cts/gal)	19.753	20.090	19.9215	-0.1680	20.0224	19.9215
Carbon CPG Diesel Combined LCFS/Crude CI Deficit (cts/gal)	21.645	22.021	21.8330	-0.1885	21.9460	21.8330
Carbon CPG Diesel Combined LCFS/Crude CI Deficit 95% (cts/gal)	20.563	20.920	20.7415	-0.1790	20.8488	20.7415

## Oregon Clean Fuels Program

Product	Low	High	Mean	Change	Wk. Avg.	MTD
Carbon Credit (\$/mt)	124.000	128.000	126.0000	0.5000	125.6000	126.0000
Carbon Intensity Pts Ethanol (\$/CI)	0.01011	0.01043	0.010270	0.000040	0.010238	0.010270
Carbon Intensity Pts Biodiesel (\$/CI)	0.01564	0.01614	0.015890	0.000060	0.015842	0.015890
Carbon CPG Diesel (cts/gal)	9.09	9.38	9.235	0.035	9.207	9.235
Carbon CPG Diesel 95% (cts/gal)	8.63	8.91	8.770	0.035	8.742	8.770
Carbon CPG Gasoline (cts/gal)	8.37	8.64	8.505	0.035	8.477	8.505
Carbon CPG Gasoline 90% (cts/gal)	7.53	7.77	7.650	0.030	7.626	7.650

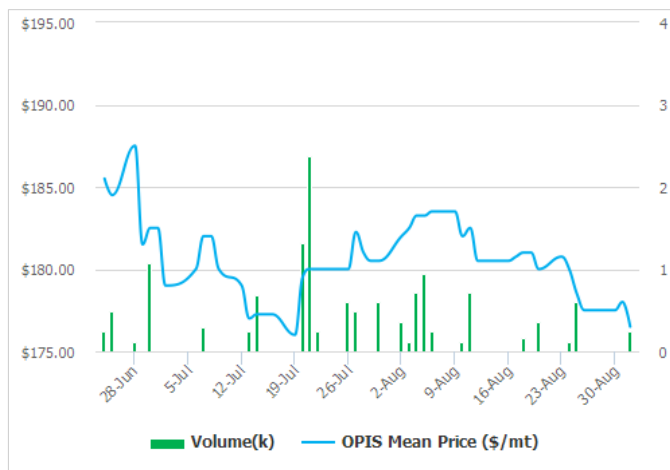
## LCFS & CFP Analysis

OPIS at midweek heard little activity in California Low Carbon Fuel Standard (LCFS) credit markets. Market sources reported credits for prompt transfer traded lightly at \$176.50/credit. The credits were assessed at that level, down \$1.50 day to day.

The LCFS assessment is down \$2 week to week. The average LCFS credit price for last week fell to its lowest level in more than two years, according to data released late Tuesday by the California Air Resources Board (CARB).

Sources reported no confirmed trading for Oregon Clean Fuels Program (CFP) credits but valued the credits at \$126/credit. OPIS assessed the credits at that level, up 50cts from Tuesday.

### OPIS LCFS CARBON CREDIT PRICES & VOLUMES



## Renewable Energy Certificates (\$/Mwh)

Product	Vintage	Low	High	Mean	Change	MTD
<b>New Jersey</b>						
Class I	2021	16.55	16.65	16.600	-0.250	16.600
Class I	2022	16.90	17.00	16.950	0.000	16.950
SREC	2021	235.00	236.00	235.500	0.000	235.500
SREC	2022	235.20	236.20	235.700	0.000	235.700
<b>Pennsylvania</b>						
SREC	2022	43.00	43.10	43.050	0.300	43.050
SREC	2023	39.40	39.50	39.450	---	39.450
Tier I	2022	16.80	16.90	16.850	-0.050	16.850
Tier I	2023	16.90	17.00	16.950	---	16.950
<b>Maryland</b>						
SREC	2021	79.40	79.50	79.450	0.000	79.450
SREC	2022	58.90	59.00	58.950	0.000	58.950
Tier I	2021	16.60	16.70	16.650	0.000	16.650
Tier I	2022	16.80	16.90	16.850	0.000	16.850
<b>PJM</b>						
Tri Qualified	2021	16.55	16.65	16.600	-0.250	16.600
Tri Qualified	2022	16.80	16.90	16.850	0.000	16.850
<b>Massachusetts</b>						
Class I	2021	36.45	36.55	36.500	0.000	36.500
Class I	2022	37.40	37.50	37.450	-0.250	37.450
SREC I	2021	321.00	322.00	321.500	1.000	321.500
SREC I	2022	327.00	328.00	327.500	0.000	327.500
SREC II	2021	286.00	287.00	286.500	0.000	286.500
SREC II	2022	275.00	276.00	275.500	0.500	275.500
<b>Connecticut</b>						
Class I	2021	37.15	37.25	37.200	-0.010	37.200
Class I	2022	36.45	36.55	36.500	0.750	36.500
<b>NEPOOL</b>						
Dual Qualified	2021	37.75	37.85	37.800	-0.020	37.800
Dual Qualified	2022	37.40	37.50	37.450	-0.500	37.450



## RECs Market Analysis

PJM and NEPOOL Renewable Energy Certificates (RECs) price movements were mixed and mild Wednesday during a thin trading session.

The Intercontinental Exchange (ICE) PJM Tri Qualified V22 futures contract did not trade but was bid and offered at \$16.80/MWh and \$17/MWh, respectively. OPIS assessed PJM Tri Qualified V22 price at \$16.85/MWh, flat to Tuesday.

Those prices declined \$1.05/MWh in the past two weeks after rallying for several weeks to \$17.90/MWh on August 18.

Elsewhere in PJM, the ICE Pennsylvania Tier I V22 contract also did not trade and was bid and offered at \$16.55/MWh and \$16.90/MWh, respectively. Pennsylvania Tier I V22 was assessed at \$16.85/MWh, down 5cts/MWh from Tuesday.

In NEPOOL, the ICE Connecticut Class I V22 futures contract traded at \$36.50/MWh. The ICE Connecticut Class I V21 futures contract was bid \$36.50/MWh and offered \$37.25/MWh.

The Massachusetts SREC II V22 contract traded on the Nodal Exchange at \$275.50/MWh. On ICE, the Massachusetts SREC II V22 futures contract was bid at \$274.50/MWh and offered at \$278/MWh.

## Regional Greenhouse Gas Initiative Allowances (\$/st)

Product	Vintage	Timing	Low	High	Mean	Change	Wt. Avg.	MTD
RGGI	V20-V21	Sep'21	9.09	9.13	9.110	0.060	9.110	9.110
RGGI	V20-V21	Dec'21	9.10	9.20	9.150	0.055	9.129	9.150

## RGGI Market Analysis

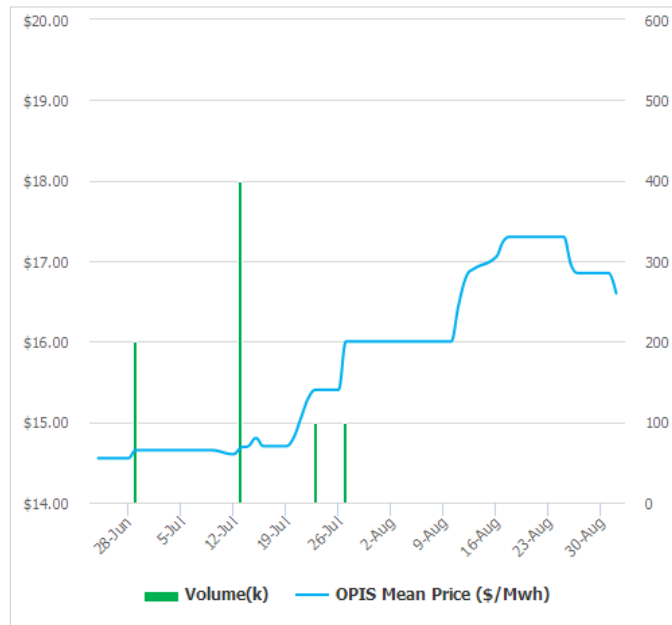
Regional Greenhouse Gas Initiative (RGGI) prices strengthened Wednesday during the Pennsylvania's Independent Regulatory Review Commission's meeting to approve final form rulemaking for the state to join RGGI by 2022.

The RGGI V21 December 2021 contract traded on ICE between \$9.10/st and \$9.19/st and had trades on Nodal at \$9.10/st by 1 p.m. CT. On ICE, bids and offers were at \$9.10/st and \$9.15/st, respectively. It was assessed at \$9.15/st, up 5.5cts/st from yesterday's assessment of the RGGI V21 December 2021 price at \$9.095/st.

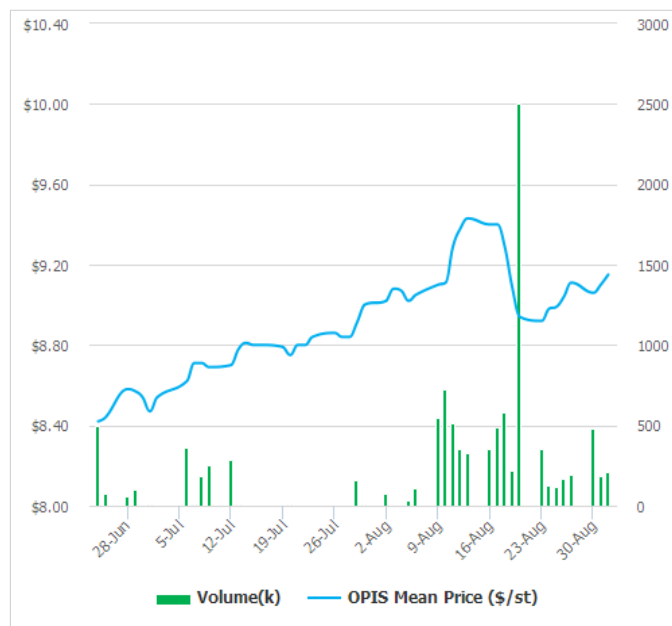
The RGGI V21 September 2021 contract did not trade, but had bids on ICE at \$9.04/st and offers at \$9.14/st. It was assessed at \$9.11/st, up 6cts/st from the Tuesday OPIS assessed the RGGI V21 September 2021 price of \$9.05/st.

Pennsylvania Governor Tom Wolf (D) signed an executive order in October 2019 ordering the state's Department of Environmental Protection (DEP) to draft regulation to join RGGI. In July, the DEP's final form rulemaking advanced following approval from Environmental Quality Board.

OPIS FRONT YEAR PJM TRI-QUALIFIED REC PRICES & VOLUMES



OPIS RGGI ALLOWANCES FORWARD PRICES & VOLUMES



## Europe Carbon Market Analysis

The benchmark ICE EU allowances (EUA) December 2021 futures contract surged higher Wednesday to yet another record intra-day high of 61.90 euros/mt, tracking a sharp morning rise for natural gas prices, but a late slide saw European carbon prices fall over the day by 0.64 euros/mt to 60.12 euros/mt.

Early gains for the benchmark EUA contract replicated new highs for the front-month continental European TTF natural gas contract, which came within a smidgen of 53 euros/MWh before crashing back to an intra-day low of 49.5 euros/MWh. The contract was trading around 12 euros/MWh a year ago.

Tightness in the global natural gas market, questions over Russian supply to Europe this winter because of wrangling related to the Nord Stream 2 pipeline and low stock levels have all conspired to push natural gas prices to record highs, making coal-fired electricity more economic. Greater coal burning this winter would in turn boost demand for EUAs.

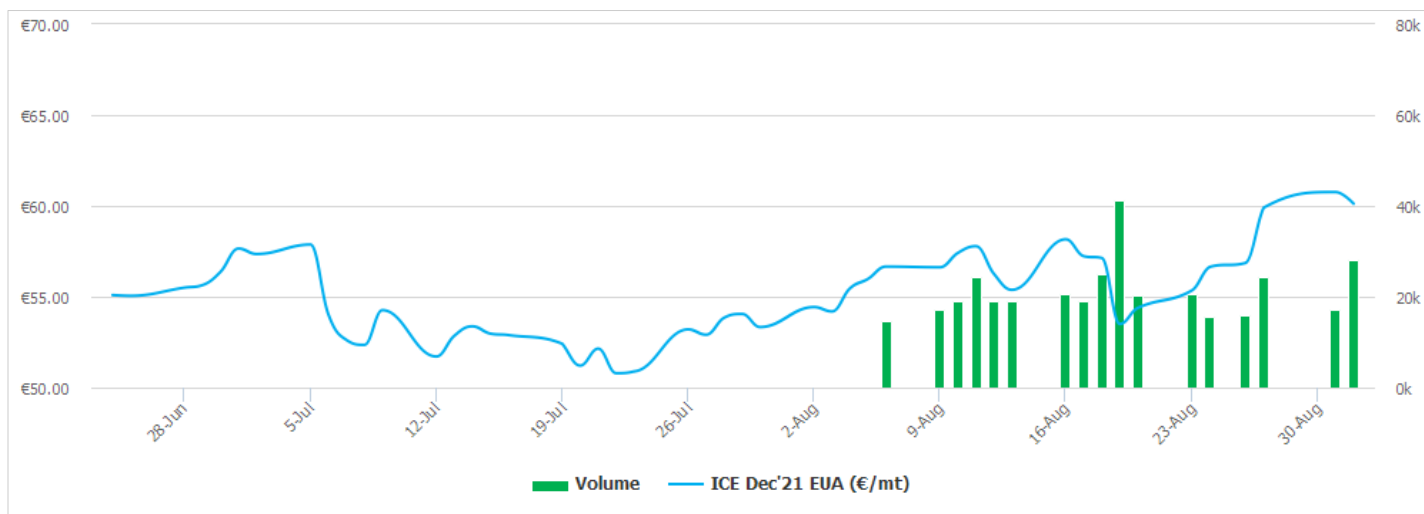
## China Carbon Market Analysis

On the Shanghai Environment and Energy Exchange, the Carbon Emission Allowance (CEA) settled Wednesday at RMB45.19/mt CO2 (\$7/mt), down 35% from the previous settlement. Trading ranged between 44.21RMB/mt and 46RMB/mt.

The total CEA listed transaction volume Wednesday was 30 tonnes. Total turnover was RMB1,355.60.

The China Shenyang carbon emissions trading market officially opened on Wednesday. The first batch of participants included more than 500 enterprises, and the total carbon allowance was around 27mt. Non-emission related companies and personal investors were able to take part in the market, as part of a trial measure to attract more players.

### ICE EUA FORWARD PRICES & VOLUMES



## European Carbon Futures

ICE Exchange	Timing	Low	High	Settle	Change
EUA €/mt	Sep'21	59.63	61.74	60.05	-0.65
EUA €/mt	Dec'21	59.60	61.90	60.12	-0.64
EUA €/mt	Dec'22	60.00	62.18	60.42	-0.65
UKA £/mt	Dec'21	51.80	53.00	52.09	-0.07

## European Carbon Auctions

Product	Exchange	Price	Change	Volume (0'000mt)
EUA €/mt	EEX	61.29	1.18	2.07
UKA £/mt	ICE	47.25	4.96	2.60

Latest auction clearing price and volume

## IHS Markit Global Carbon Index

Symbol	Total Return	Change	Wt. Avg. Carbon \$	Change
GLCARB	568.27	-0.46	39.40	-0.03

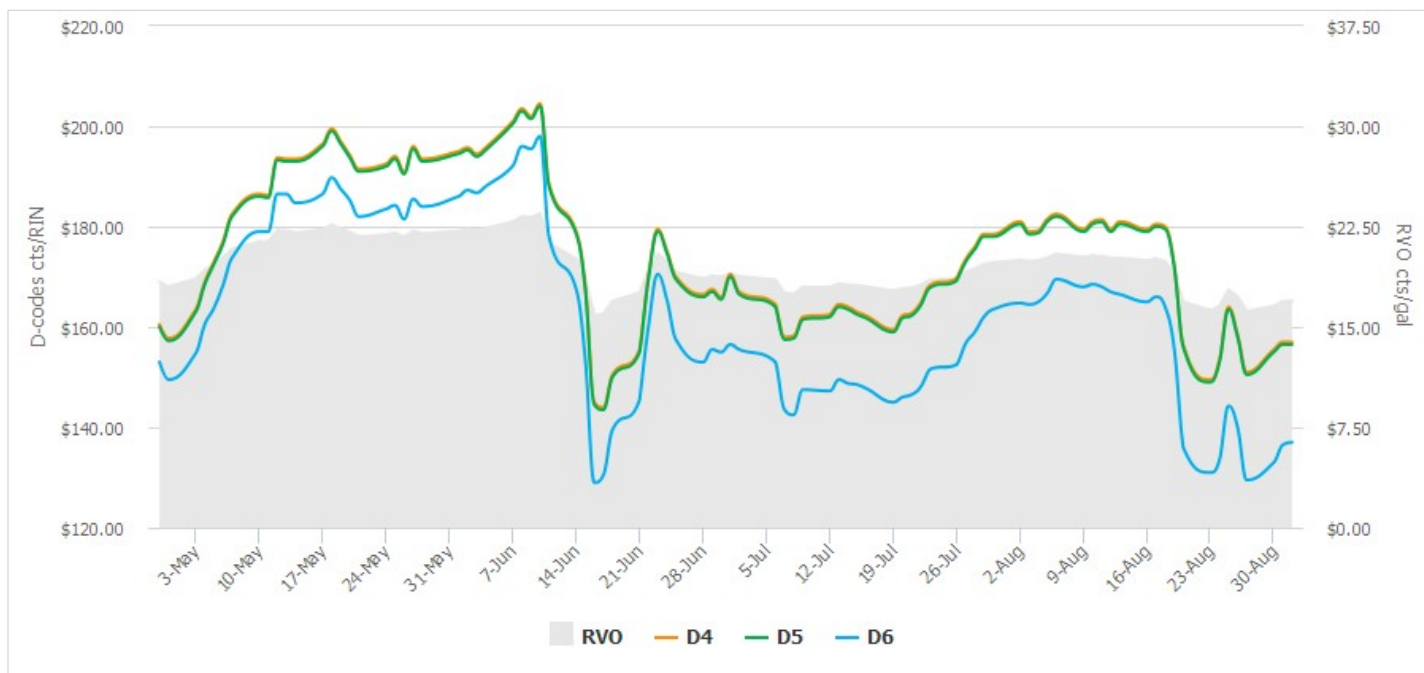
Previous business day closing price

## U.S. RINs (cts/RIN)

Product	Year	Low	High	Mean	Change	MTD
D6	2019	135.00	141.00	138.000	0.500	138.000
D6	2020	135.00	141.00	138.000	0.500	138.000
D6	2021	135.00	139.00	137.000	0.500	137.000
D6	2022	135.00	139.00	137.000	---	137.000
D3	2019	309.00	313.00	311.000	0.000	311.000
D3	2020	309.00	313.00	311.000	0.000	311.000
D3	2021	309.00	311.00	310.000	0.000	310.000
D3	2022	309.00	311.00	310.000	---	310.000
D4	2019	160.00	164.00	162.000	0.000	162.000
D4	2020	160.00	164.00	162.000	0.000	162.000
D4	2021	156.00	158.00	157.000	0.000	157.000
D4	2022	148.00	150.00	149.000	---	149.000
D5	2019	159.00	164.00	161.500	0.000	161.500
D5	2020	159.00	164.00	161.500	0.000	161.500
D5	2021	155.00	158.00	156.500	0.000	156.500
D5	2022	147.00	150.00	148.500	---	148.500
RVO (cts/gal)	2021	---	---	16.941	0.043	16.941

D6: Corn Ethanol RIN, D3: Cellulosic RIN, D4: Biodiesel RIN, D5: Advanced Biofuel RIN, RVO: Renewable Volume Obligation.

### OPIS U.S. RIN PRICES – 90 DAY TREND (CTS/RIN)



# Trade Log

## CALIFORNIA

Product	Timing	Cash Price (\$/mt)	Reference	Volume(K)	Notes
CCA Current Year	Sep'21	23.74	---	10	---
CCA Current Year	Sep'21	23.75	---	125	---
CCA Current Year	Sep'21	23.79	---	10	---
CCA Current Year	Sep'21	23.80	---	250	---
CCA Current Year	Sep'21	23.85	---	50	---
CCA Current Year	Sep'21	23.90	---	50	---
CCA Current Year	Sep'21	23.95	---	217	---
CCA Current Year	Sep'21	23.96	---	60	---
CCA Current Year	Sep'21	23.98	---	11	---
CCA Current Year	Sep'21	23.99	---	25	---
CCA Current Year	Sep'21	24.00	---	376	---
CCA Current Year	Sep'21	24.01	---	10	---
CCA Current Year	Sep'21	24.04	---	14	---
CCA Current Year	Sep'21	24.08	---	10	---
CCA Current Year	Sep'21	24.19	---	20	---
CCA Current Year	Sep'21	24.25	---	105	---
CCA Current Year	Sep'21	24.30	---	100	---
CCA Current Year	Sep'21	24.40	---	25	---
CCA Current Year	Sep'21	-0.09	Current Year CCA Prompt + 1 Oct'21	20	V21 Sep21/Oct21
CCA Current Year	Sep'21	-0.31	Current Year CCA Forward Dec'21	20	V21 Sep21/Dec21
CCA Current Year	Sep'21	-0.29	Current Year CCA Forward Dec'21	158	V21 Sep21/Dec21
CCA Current Year	Sep'21	-0.30	Current Year CCA Forward Dec'21	76	V21 Sep21/Dec21
CCA Current Year	Sep'21	-0.28	Current Year CCA Forward Dec'21	37	V21 Sep21/Dec21
CCA Current Year	Dec'21	24.00	---	10	---
CCA Current Year	Dec'21	24.05	---	10	---
CCA Current Year	Dec'21	24.10	---	69	---
CCA Current Year	Dec'21	24.12	---	100	---
CCA Current Year	Dec'21	24.15	---	100	---
CCA Current Year	Dec'21	24.20	---	10	---
CCA Current Year	Dec'21	24.23	---	62	---
CCA Current Year	Dec'21	24.24	---	20	---
CCA Current Year	Dec'21	24.25	---	50	---
CCA Current Year	Dec'21	24.26	---	60	---
CCA Current Year	Dec'21	24.27	---	56	---
CCA Current Year	Dec'21	24.28	---	50	---
CCA Current Year	Dec'21	24.30	---	890	---

CCA Current Year	Dec'21	24.31	---	25	---
CCA Current Year	Dec'21	24.32	---	55	---
CCA Current Year	Dec'21	24.33	---	176	---
CCA Current Year	Dec'21	24.35	---	55	---
CCA Current Year	Dec'21	24.36	---	10	---
CCA Current Year	Dec'21	24.37	---	45	---
CCA Current Year	Dec'21	24.39	---	10	---
CCA Current Year	Dec'21	24.40	---	56	---
CCA Current Year	Dec'21	24.48	---	70	---
CCA Current Year	Dec'21	24.50	---	295	---
CCA Current Year	Dec'21	24.55	---	393	---
CCA Current Year	Dec'21	24.59	---	10	---
CCA Current Year	Dec'21	24.60	---	298	---
CCA Current Year	Dec'21	24.63	---	130	---
CCA Current Year	Dec'21	24.75	---	400	---
CCA Current Year	Dec'21	24.84	---	10	---
CCA Current Year	Dec'21	24.90	---	20	---
CCA Current Year	Dec'21	25.00	---	20	---
CCA Current Year	Oct'21	24.05	---	20	---
CCA Previous Year	Sep'21	24.03	---	10	---
CCA Previous Year	Sep'21	24.07	---	14	---
CCA Previous Year	Sep'21	0.02	Current Year CCA Prompt Sep'21	200	V20/V21 Sep21
CCA Previous Year	Sep'21	0.03	Current Year CCA Prompt Sep'21	14	V20/V21 Sep21
CCA Previous Year	Sep'21	-0.27	Current Year CCA Forward Dec'21	10	V20/V21 Sep21/Dec21
CCA Advanced Year	Sep'21	23.80	---	100	---

### EAST COAST

Product	Timing	Cash Price (\$/st)	Reference	Volume(K)	Notes
RGGI Current Year	Dec'21	9.10	---	126	---
RGGI Current Year	Dec'21	9.11	---	5	---
RGGI Current Year	Dec'21	9.15	---	30	---
RGGI Current Year	Dec'21	9.19	---	40	---
RGGI Current Year	Dec'21	9.20	---	10	---

### RECS

Product	Vintage	Cash Price (\$/mwh)	Reference	Volume(K)	Notes
Massachusetts SREC II Vintage 2022	2022	275.50	---	1000	---
Connecticut Class I Vintage 2022	2022	36.50	---	25	---

Trade Log may contain Intercontinental Exchange data.

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