

OPIS

A DOW JONES COMPANY

 | DOW JONES

Pricing Carbon & LCFS Markets with OPIS

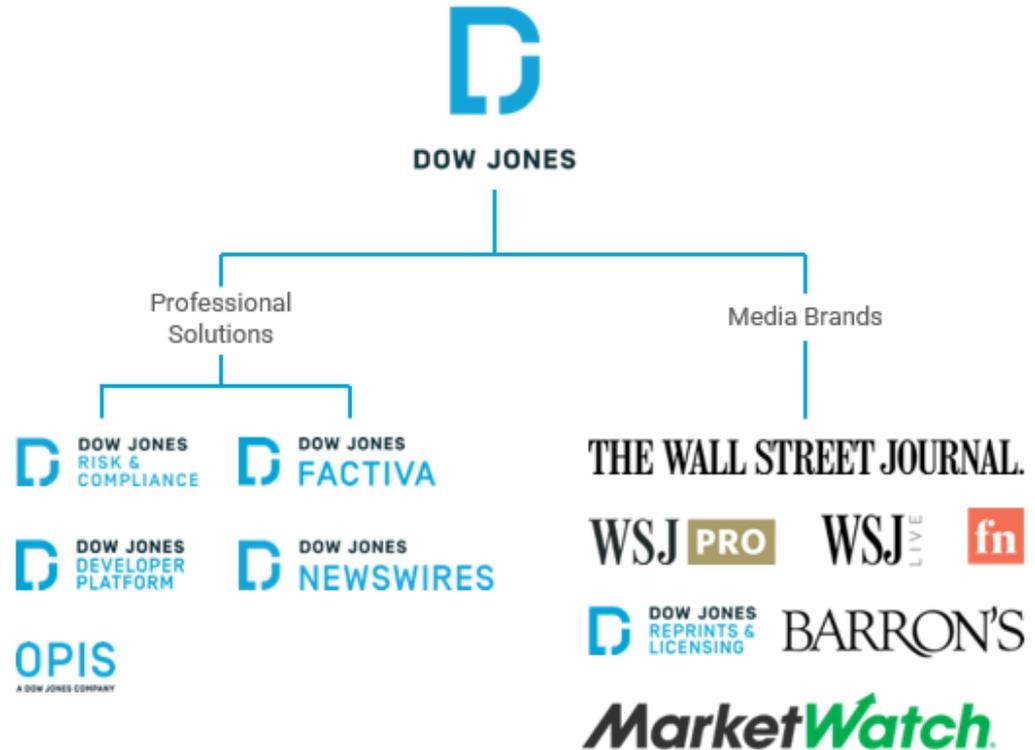
NACW 2024

Bridget Hunsucker, OPIS Global Carbon Director

Jordan Godwin, OPIS Renewables Director

Who We Are

- OPIS is a Dow Jones company. Dow Jones is a foremost provider of proprietary news, data and analysis to decision makers around the globe on multiple platforms.
- Dow Jones is a division of News Corp (Nasdaq: NWS, NWSA; ASX: NWS, NWSLV).



Celebrating 10 Years of Carbon Pricing!

OPIS delivers more than 350 daily carbon prices, news and analysis across the regulatory compliance and voluntary markets so that stakeholders can buy and sell with confidence in markets undergoing rapid transition.



The image shows a promotional graphic for OPIS carbon market reports. It features a blue header with the OPIS logo and 'A DOW JONES COMPANY' text. Below the header is a photograph of a blue bird perched on a yellow sunflower. The text 'Our carbon data creates a win-win for buyers, sellers and other species' is overlaid on the bottom right of the image. A QR code is located in the bottom right corner of the image area.

OPIS
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Our carbon data creates a win-win for buyers, sellers and other species



Pricing data, benchmarks and insights that power the global carbon market.

As the world transitions to sustainable energy, OPIS leads the way with key data on carbon price assessments, compliance costs and offset credits.

OPIS is the go-to source for trading-day carbon pricing and strategic insight supporting buyers, sellers, investors and the ultimate beneficiaries of decarbonization: our planet and all its resident life forms.



The screenshot shows a laptop displaying the 'OPIS Global Carbon Offsets Report'. The report includes a table with columns for 'Region', 'Market', 'Commodity', 'Unit', and 'Price'. The table lists various regions and markets such as 'EU ETS', 'California', and 'New Zealand', along with their respective commodity types and prices.

OPIS carbon market reports

OPIS carbon market reports provide the data and insight that market participants need to navigate volatile complexity.

Carbon Market Report
Track carbon costs and strategically manage risks with reliable and transparent trade-day data. Gain clarity in this decentralized market.

Global Carbon Offsets Report
Manage commitments to carbon neutrality. Gain visibility into voluntary carbon markets, project-specific offsets and net-zero strategies with a fair-price index.

www.opisnet.com/carbon-credit-pricing

Compliance Markets

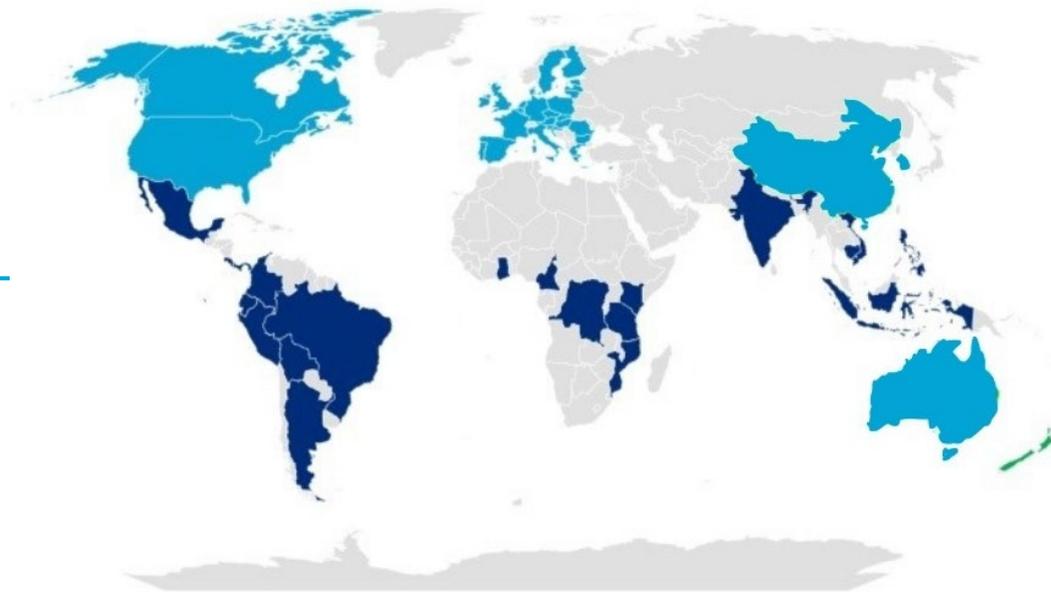
40%

of the 28 emissions trading systems currently in force

Voluntary Market

75%

of all project types represented in the market



Low Carbon Fuels & Carbon Credit Pricing

Helping manage costs and risks in a complex and rapidly evolving market

- One-stop access to more than 350 carbon and emissions market assessments
- Wholesale rack postings for 115+ ethanol and 200+ biodiesel markets
- Expert insight and weekly pricing on solar materials, including 20 polysilicon, wafer, cell and modular assessments
- News updates on environmental programs and regulatory changes

Key Products:

- Carbon Market Report
- Global Carbon Offsets Report
- APAC Carbon Market Report
- Ethanol & Biodiesel Information Service (EBIS)
- Biofuels News Alerts
- APAC Solar Weekly Report



OPIS provides solutions for all players in the carbon market, including:

- Project Developers
- Net-Zero Buyers
- Traders
- Brokers & Consultants
- Fuel Buyers & Sellers
- Researchers & Analyst
- Municipalities
- Financial Institutions

OPIS carbon market price transparency enables stakeholders to:

- Secure investment for environmental projects
- Make informed decisions on securing credits
- Mark to market asset valuation
- Help clients transact at a fair market price
- Assess the costs of achieving carbon neutrality
- Forecast voluntary carbon market prices
- Negotiate jurisdictional supply contracts
- Understand bankability of carbon projects

• OPIS Pricing Full-Day Methodology

- **Market Evaluation:** OPIS covers carbon markets the same way they trade, evaluating market data all day long.
- **Methodology Requirements:** Trade data must meet stringent methodology requirements that are published based on individual market dynamics as well as OPIS standard practices.
- **Data Verification:** OPIS editors evaluate and accept trade data from verified market stakeholders.
- **Accuracy Check:** Each piece of pricing data is scrutinized for accuracy.
- **Industry Interaction:** We talk with all types of industry players to put together the entire picture.
- **Editorial Judgement & Expertise :** Editors are experts in market trends and fundamentals and utilize editorial discretion when appropriate to make assessments decisions.

OPIS California Cap-and-Trade Assessments

- Published in the daily OPIS Carbon Market Report:
- Five vintage assessments
- Four delivery timing assessments for current year vintage
- Two delivery timing assessments for all other vintages (*prompt and forward*)
- MTD averages for all vintages/delivery timings

California Carbon Allowances (\$/mt)

Product	Vintage	Timing	Low	High	Mean	Change	Wt. Avg.	MTD
Previous Yr.	V23	Mar'24	37.72	38.27	37.995	-0.520	---	39.089
Previous Yr.	V23	Dec'24	39.47	40.02	39.745	-0.525	---	40.925
Current Yr.	V24	Mar'24	37.70	38.25	37.975	-0.520	37.895	39.069
Current Yr.	V24	Apr'24	37.92	38.47	38.195	-0.500	---	39.275
Current Yr.	V24	May'24	38.14	38.69	38.415	-0.480	---	39.480
Current Yr.	V24	Dec'24	39.45	40.00	39.725	-0.525	39.699	40.905
Next Yr.	V25	Mar'24	37.70	38.25	37.975	-0.520	---	39.069
Next Yr.	V25	Dec'24	39.45	40.00	39.725	-0.525	---	40.905
Forward Yr.	V26	Mar'24	37.70	38.25	37.975	-0.520	---	39.069
Forward Yr.	V26	Dec'24	39.45	40.00	39.725	-0.525	---	40.905
Advanced Yr.	V27	Mar'24	37.70	38.25	37.975	-0.520	---	39.069
Advanced Yr.	V27	Dec'24	39.45	40.00	39.725	-0.525	---	40.905

California Carbon Offsets (\$/mt)

Product	Timing	Low	High	Mean	Change	MTD
Golden CCO	2024	15.40	15.50	15.450	0.000	15.617
CCO(3)	2024	15.15	15.25	15.200	0.000	15.367
CCO(8)	2024	15.05	15.15	15.100	0.000	15.267
DEBS Golden CCO	2024	35.75	35.85	35.800	0.000	35.717
DEBS CCO(3)	2024	35.50	35.60	35.550	0.000	35.467
DEBS CCO(8)	2024	35.40	35.50	35.450	0.000	35.367
Zero CCO	Mar'24	15.90	16.00	15.950	0.000	16.346
Zero CCO	Dec'24	16.20	16.30	16.250	0.000	16.646
Zero CCO	Dec'25	16.95	17.05	17.000	0.000	17.396
Zero CCO	Dec'26	17.70	17.80	17.750	0.000	18.146

OPIS Cap-at-the-Rack (CAR) Prices

- Show Cap-And-Trade compliance costs on a per gallon/per liter basis
- Calculated using daily OPIS CCA assessments and fuel CO2e values for each fuel type
- Published in OPIS Carbon Market Report and Rack Reports.
-

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

Product	Price	Wk. Avg.	30-Day Avg.
CARB No. 2	38.89	38.530	41.153
B5 Biodiesel	36.94	36.605	39.097
Winter CARB RFG-R	30.54	30.256	32.315
Winter CARB RFG-M	30.54	30.256	32.315
Winter CARB RFG-P	30.57	30.290	32.352
Summer CARB RFG-R	30.60	30.324	31.564
Summer CARB RFG-M	30.54	30.256	31.494
Summer CARB RFG-P	30.50	30.222	31.459
LPG	22.10	21.899	23.390
LNG (cts/DGE)	27.80	27.543	29.418

OPIS began assessing Washington Carbon Allowance (WCA) and Washington Cap-at-the-Rack on Jan. 1, 2023.

WCA prices published daily in OPIS Carbon Market Report

Washington CAR prices published in OPIS Rack reports

Washington Carbon Allowances (\$/mt)

Product	Vintage	Timing	Low	High	Mean	Change	Wt. Avg.	MTD
WCA	V24	Mar'24	28.35	28.45	28.400	0.600	28.400	30.991
WCA	V24	Dec'24	30.05	30.15	30.100	0.600	---	32.316

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

Product	Price	Wk. Avg.	30-Day Avg.
Summer CBOB-R 10% Ethol. CAR	23.24	24.368	26.942
Summer CBOB-M 10% Ethol. CAR	23.27	24.395	26.972
Summer CBOB-P 10% Ethol. CAR	23.29	24.421	27.001
Winter CBOB-R 10% Ethol. CAR	22.71	23.805	26.320
Winter CBOB-M 10% Ethol. CAR	22.83	23.939	26.468
Winter CBOB-P 10% Ethol. CAR	22.96	24.073	26.616
Summer Conv. 87 Unl CAR	25.82	27.065	29.925
Summer Conv. 89 Mid CAR	25.84	27.095	29.958
Summer Conv. 91 Pre CAR	25.87	27.125	29.991
Winter Conv. 87 Unl CAR	25.22	26.440	29.233
Winter Conv. 89 Mid CAR	25.36	26.589	29.398
Winter Conv. 91 Pre CAR	25.50	26.738	29.563
Propane CAR	16.36	17.150	18.962
ULSD No. 2 CAR	29.08	30.490	33.711
ULSD No. 1 CAR	28.85	30.251	33.447
B5 Biodiesel CAR	27.63	28.967	32.027

OPIS California and Washington Carbon Allowance Assessments

● OPIS CCA Price ● OPIS WCA Price



Source: OPIS Carbon Market Report

March 18, 2015

OPIS Gasoline CAR: 10.13cts/gal

OPIS Diesel CAR: 12.90cts/gal

OPIS Current Year Prompt CCA: \$12.60/mt

March 18, 2024

OPIS Gasoline CAR: 30.60cts/gal

OPIS Diesel CAR: 38.89cts/gal

OPIS Current Year Prompt CCA: \$37.98/mt

CAR = OPIS current year, prompt month CCA assessment mean \$/mt x CO2e/gal of obligated fuel.

CO2e values: Gasoline: 0.00893; Ethanol: 0.00022
Diesel: 0.01024

OPIS Daily Physical Voluntary Carbon Market Assessments

- **Voluntary REDD+ Credits:** Produced by nature-based projects for Reducing Emissions from Deforestation and Forest Degradation.
- **Blue Carbon Credits:** Produced by nature-based projects that capture carbon in ocean and coastal ecosystems through the growth and conservation of habitat plants such as mangrove forests.
- **Afforestation/Reforestation Credits:** Produced by nature-based projects that plant trees or revegetate land.
- **OPIS CEO Pilot Phase (CORSIA Eligible Offsets):** Reflects credits that comply with the Carbon Offsetting and Reduction Scheme for International Aviation. (OPIS is watching Phase 1 activity closely.)
- **Core Carbon Credits (OPIS CCP):** Reflects trading for standard carbon credits, including CORSIA eligible credits, REDD+ credits and other AFOLU credits.
- **Climate, Community & Biodiversity Standards:** Reflects the co-benefits price premium for Verified Carbon Units (VCUs) that are certified by Verra's Climate, Community & Biodiversity Standards Program.
- **Carbon Neutral Fuels Index:** Provides daily assessments for the cost of offsetting combustion emissions to zero for standard liquids and gaseous fuels.

OPIS Voluntary REDD+ Credits Vintage-Specific Assessments

Volumes:

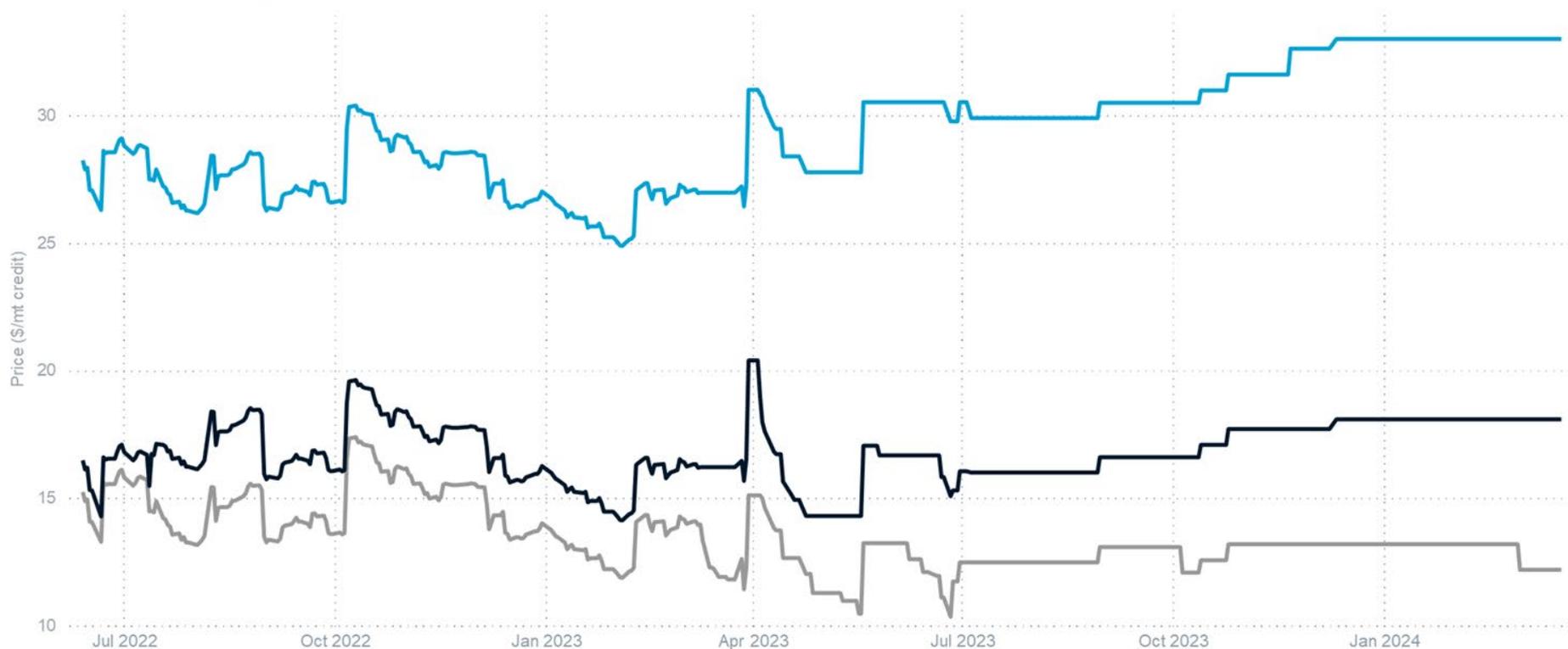
- Tier 1: 350k+
- Tier 2: 50k-349k
- Tier 3: 2k-49k

Voluntary REDD+ Credits (US\$/mt)

Product	Low	High	Mean	+/-	Wk. Avg.	MTD
Tier 1						
REDD+ Retro	0.16	2.25	1.205	0.000	1.205	1.211
REDD+ V17	0.16	3.85	2.005	0.000	2.005	2.011
REDD+ V18	0.16	8.50	4.330	0.000	4.330	4.336
REDD+ V19	3.00	9.00	6.000	0.000	6.000	6.000
REDD+ V20	4.75	10.75	7.750	0.000	7.750	7.750
REDD+ V21	5.25	11.82	8.535	0.000	8.535	8.535
REDD+ V22	6.85	13.32	10.085	0.000	10.085	10.085
REDD+ V23	7.35	13.82	10.585	0.000	10.585	10.585
REDD+ V24	7.85	14.32	11.085	0.000	11.085	11.085
REDD+ V25	8.35	14.82	11.585	0.000	11.585	11.585
REDD+ V26	8.85	15.32	12.085	0.000	12.085	12.085
REDD+ V27	9.35	16.82	13.085	0.000	13.085	13.085
Tier 2						
REDD+ Retro	0.16	4.00	2.080	0.000	2.080	2.086
REDD+ V17	0.16	5.60	2.880	0.000	2.880	2.886
REDD+ V18	0.16	10.00	5.080	0.000	5.080	5.086
REDD+ V19	3.75	10.75	7.250	0.000	7.250	7.250
REDD+ V20	5.25	12.50	8.875	0.000	8.875	8.875
REDD+ V21	6.00	13.57	9.785	0.000	9.785	9.785
REDD+ V22	7.60	15.07	11.335	0.000	11.335	11.335
REDD+ V23	8.10	15.57	11.835	0.000	11.835	11.835
REDD+ V24	8.60	16.07	12.335	0.000	12.335	12.335
REDD+ V25	9.10	16.57	12.835	0.000	12.835	12.835
REDD+ V26	9.60	17.07	13.335	0.000	13.335	13.335
REDD+ V27	10.10	17.57	13.835	0.000	13.835	13.835
Tier 3						
REDD+ Retro	0.16	5.50	2.830	0.000	2.830	2.836
REDD+ V17	0.16	7.10	3.630	0.000	3.630	3.636
REDD+ V18	0.16	11.50	5.830	0.000	5.830	5.836
REDD+ V19	4.00	12.25	8.125	0.000	8.125	8.125
REDD+ V20	5.50	14.00	9.750	0.000	9.750	9.750
REDD+ V21	6.25	15.07	10.660	0.000	10.660	10.660
REDD+ V22	7.85	16.57	12.210	0.000	12.210	12.210
REDD+ V23	8.35	17.07	12.710	0.000	12.710	12.710
REDD+ V24	8.85	17.57	13.210	0.000	13.210	13.210
REDD+ V25	9.35	18.07	13.710	0.000	13.710	13.710
REDD+ V26	9.85	18.57	14.210	0.000	14.210	14.210
REDD+ V27	10.35	19.07	14.710	0.000	14.710	14.710

OPIS NBS Voluntary Carbon Credit Assessments

● OPIS V22 REDD+ ● OPIS V22 ARR ● OPIS V22 Blue Carbon



Source: OPIS Global Carbon Offsets Report

OPIS CORSIA-eligible Credit Price Assessments (Pilot Phase)



Source: OPIS Global Carbon Offsets Report

Renewable Fuel Standard (RFS)

- Federal program established in 2005 and overseen by U.S. Environmental Protection Agency (EPA)
- Volume-based targets with individual Renewable Volume Obligation (RVO) percentages
- Biofuels generate Renewable Identification Number (RIN) credits that refiners and importers of gasoline/diesel need to purchase to be compliant
- Currently in the process of a major “set” rule
 - > Proposed targets for 2023, 2024 & 2025
 - > eRINs from EV fleet

Low Carbon Fuel Standard (LCFS)

- California program created in 2011 and overseen by California Air Resources Board (CARB)
- Assigns Carbon Intensity (CI) scores to each fuel and targets increasingly stringent greenhouse gas (GHG) target reductions in California’s transportation fuel pool
- Fuels above the target generate deficits, fuels below generate credits, and refiners need credits to be compliant
- Currently in the rulemaking process to increase the near-term stringency of the targets and establish longer-term targets out to 2040

OPIS RINs Price Assessments



Source: OPIS Biofuels Daily Report

OPIS Biofuels Deal Log Report

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Biofuels Deal Log

Deals that Define the Market

9 February, 2024

OPIS U.S. RIN VALUES (cts/RIN)

PRODUCT	TIMING	PRICE	VOLUME (K)	NOTES
Ethanol	2023	51.00	4,000	
Ethanol	2023	51.00	500	
Ethanol	2023	50.00	500	
Ethanol	2024	52.50	500	
Ethanol	2024	52.50	500	
Ethanol	2024	52.00	500	
Ethanol	2024	53.00	500	
Ethanol	2024	53.00	500	
Ethanol	2024	52.50	500	
Ethanol	2024	52.50	500	
Ethanol	2024	53.00	500	
Ethanol	2024	52.50	500	
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Ethanol	2024	52.50	500	
Ethanol	2024	52.50	500	
Ethanol	2024	53.00	500	
Ethanol	2024	53.00	500	
Ethanol	2024	53.00	500	
Ethanol	2024	53.00	1,500	
Ethanol	2024	53.00	1,000	
Ethanol	2024	53.50	500	
Ethanol	2024	53.00	1,000	
Ethanol	2024	52.50	500	
Cellulosic	2024	294.00	250	
Biodiesel	2024	53.00	500	
Biodiesel	2024	54.00	1,000	
Biodiesel	2024	54.00	500	
Biodiesel	2024	53.50	500	
Biodiesel	2024	54.00	500	
Biodiesel	2024	54.00	500	
Biodiesel	2024	53.00	500	

PRODUCT	TIMING	PRICE	VOLUME (K)
Ethanol	2023	51.00	4,000
Ethanol	2023	51.00	500
Ethanol	2023	50.00	500
Ethanol	2024	52.50	500
Ethanol	2024	53.50	500
Ethanol	2024	52.00	500
Ethanol	2024	53.00	500
Ethanol	2024	53.00	500
Ethanol	2024	52.50	500
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Ethanol	2024	53.00	500
Ethanol	2024	53.00	500
Ethanol	2024	53.50	500
Ethanol	2024	53.50	500
Ethanol	2024	52.50	500
Ethanol	2024	52.50	500



Biofuel Outright - D6 RINs (OPIS) Future

Contract Specifications

Description	A monthly cash settled future based on the OPIS daily assessment price for Physically Delivered D6 RINs for the Current Year.
Contract Symbol	RIN
Contract Size	50,000 RINs
Unit of Trading	Any multiple of 50,000 RINs
Currency	US Dollars and cents
Trading Price Quotation	One hundredth of one cent (\$0.0001) per RIN
Settlement Price Quotation	One hundredth of one cent (\$0.0001) per RIN
Minimum Price Fluctuation	One hundredth of one cent (\$0.0001) per RIN
Last Trading Day	Last business day of contract month

ICE FUTURES U.S.

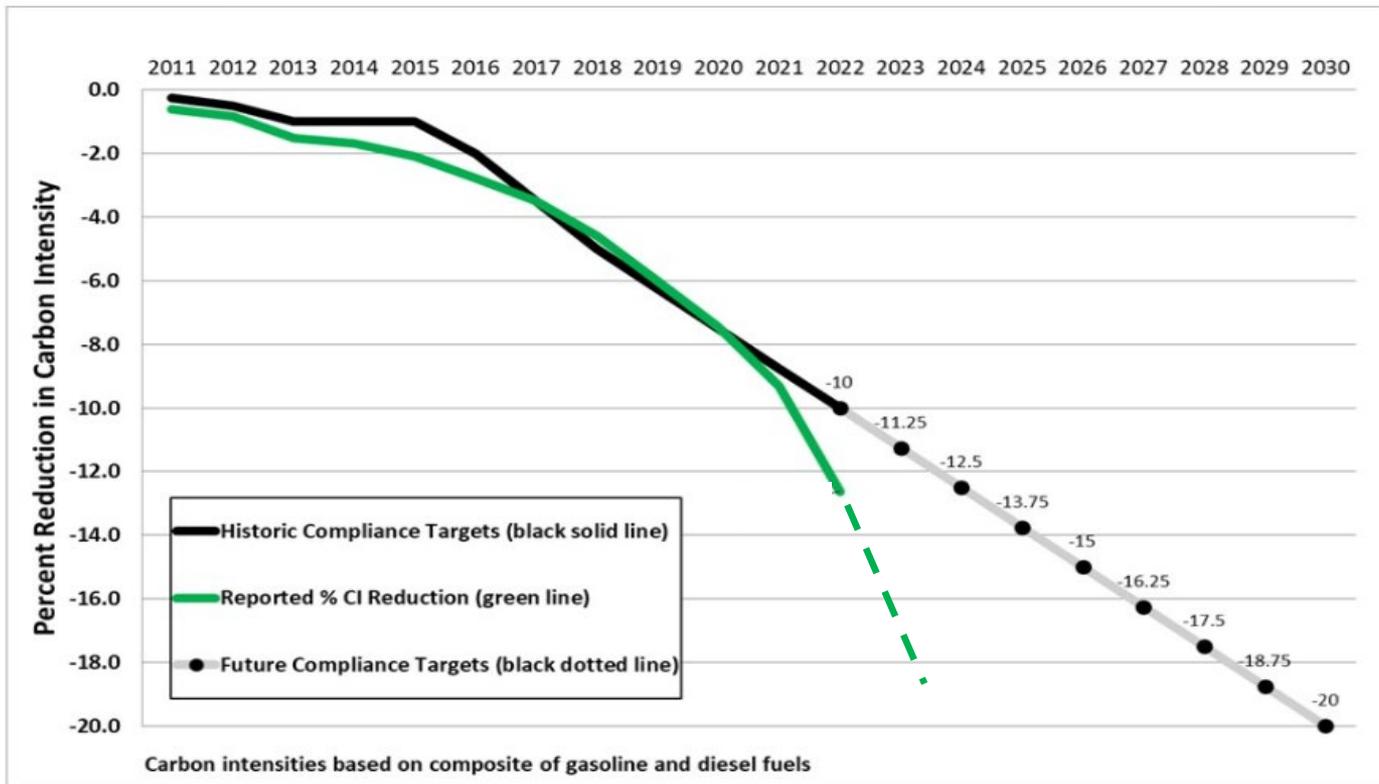
Intercontinental Exchange (ICE) futures instruments based on OPIS benchmark biofuels assessments:

- Current- and forward-year D6 ethanol RINs
- Current- and forward-year D4 biomass-based diesel RINs
- Current- and forward-year D3 cellulosic biofuel RINs
- Current- and forward-year D5 advanced biofuel RINs
- Renewable Volume Obligation (RVO)
- Low Carbon Fuel Standard (LCFS)

New ICE Renewable Diesel & SAF Futures based on OPIS assessments begin trading April 22, 2024:

- Los Angeles RD 99%
- Los Angeles RD 99% vs Heating Oil 1st Line
- Los Angeles SAF 99%
- Los Angeles SAF 99% vs Heating Oil 1st Line Future

2011-2022 Performance of the California LCFS



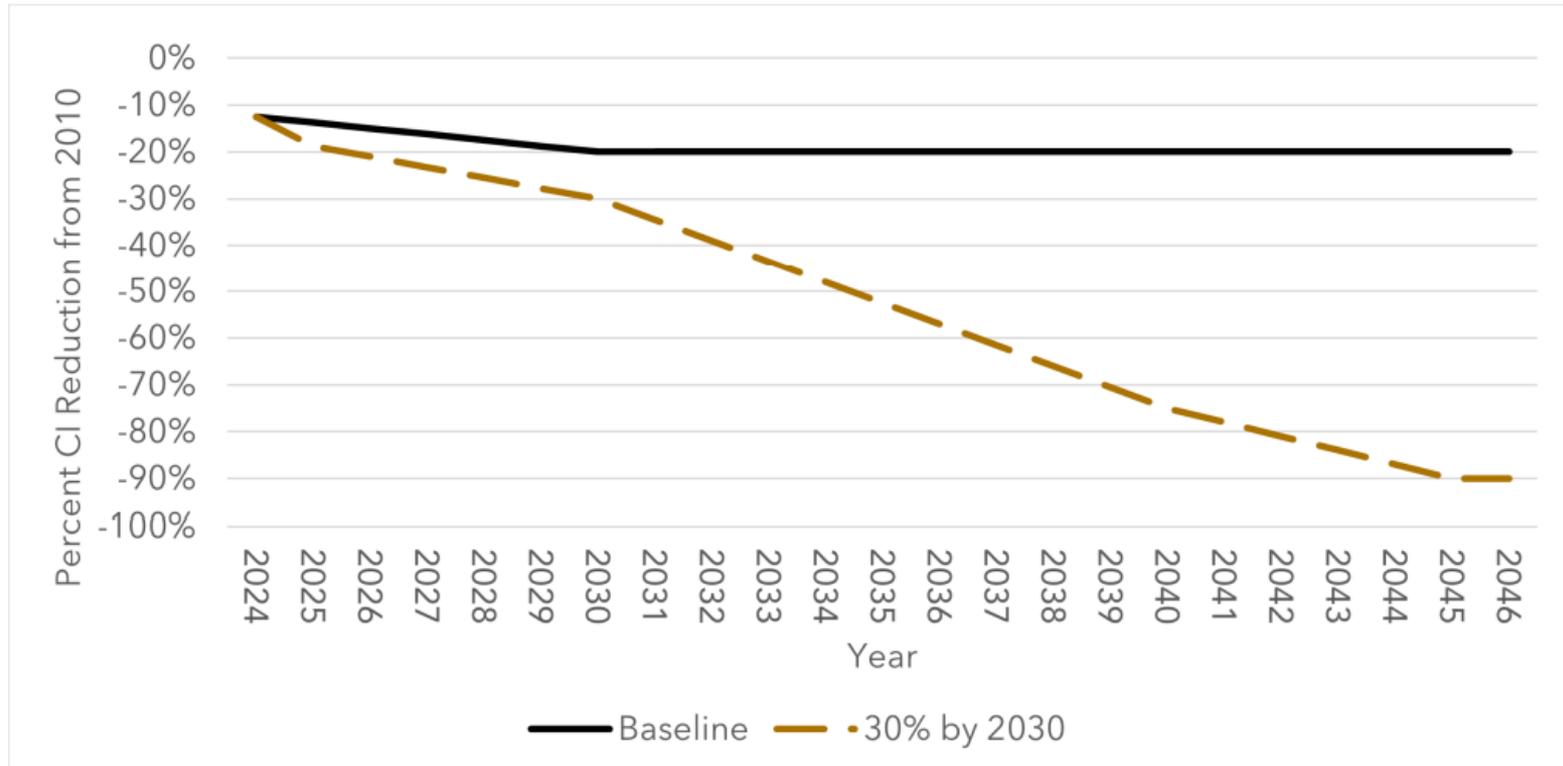
OPIS Transparency for Low Carbon Fuels Programs

● OPIS CALCFS Credit Price ● OPIS OR CFP Credit Price ● OPIS WACFS Credit Price

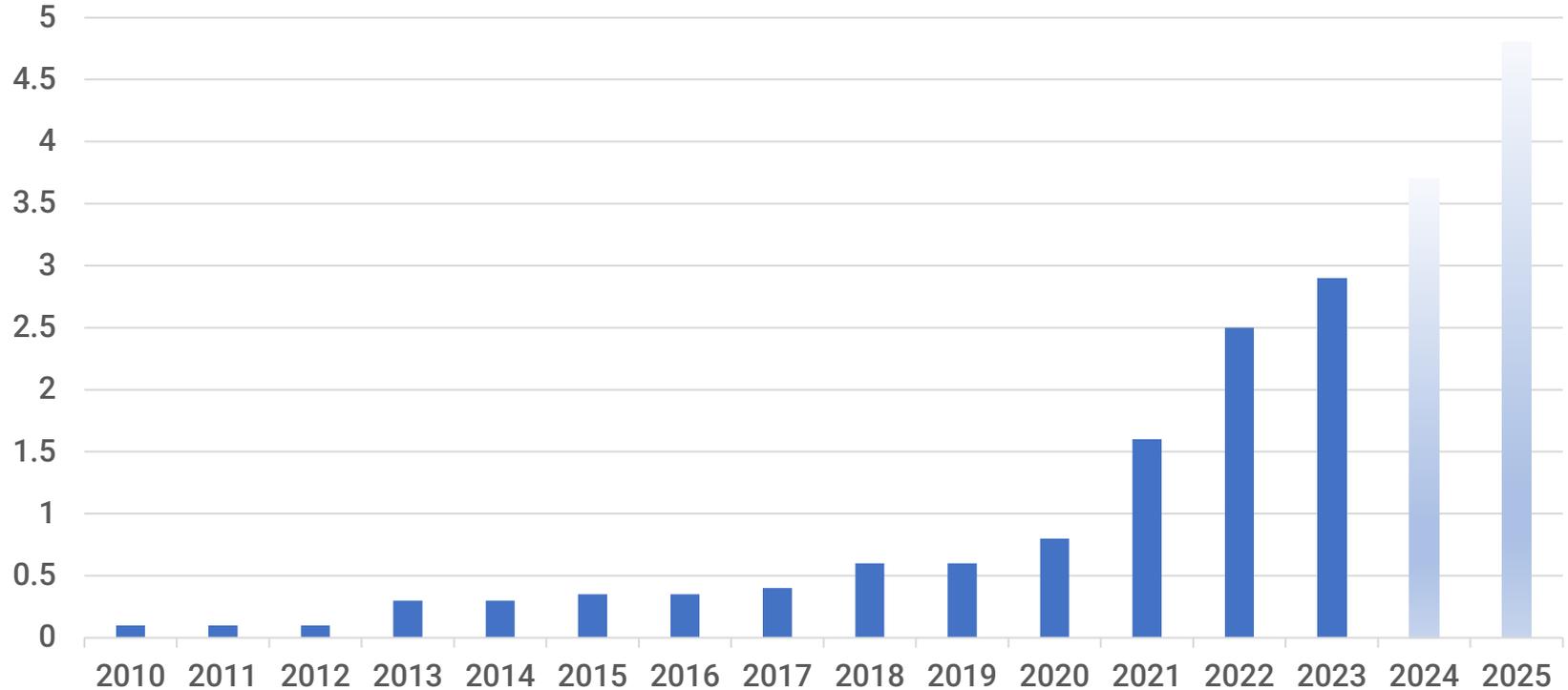


Source: OPIS Biofuels Daily Report

Current & Proposed Annual Carbon Intensity Benchmarks



U.S. Renewable Diesel Production Capacity (billion gallons/year)



OPIS Biofuels Daily Report

Export ▾

2024-02-01

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RENEWABLE DIESEL

Spot Renewable Diesel Assessment [\$/gal]

Commentary

Location	Product	Low	High	Average
Los Angeles	RD 99%	2.1879	2.2679	2.22790
San Francisco	RD 99%	2.1879	2.2679	2.22790
Los Angeles	RD 100%	4.4719	4.5891	4.53050
San Francisco	RD 100%	4.4719	4.5891	4.53050
California	RD Carbon Intensity	0.0073	0.0074	0.00736

- ASTM D975 100% renewable diesel, made from a variety of feedstocks.
- L.A. and S.F. renewable diesel price assessments have a Carbon Intensity (CI) specification of a 37.93 CI proxy.
- The L.A. and S.F. renewable diesel 100% assessments include the LCFS credit, the \$1/gal federal tax credit and 1.7 D4 biomass-based diesel RINs.

OPIS Sustainable Aviation Fuel Pricing

OPIS Biofuels Daily Report

Export

2024-02-01

SUSTAINABLE AVIATION FUEL

Spot Sustainable Aviation Fuel Assessment (\$/gal)

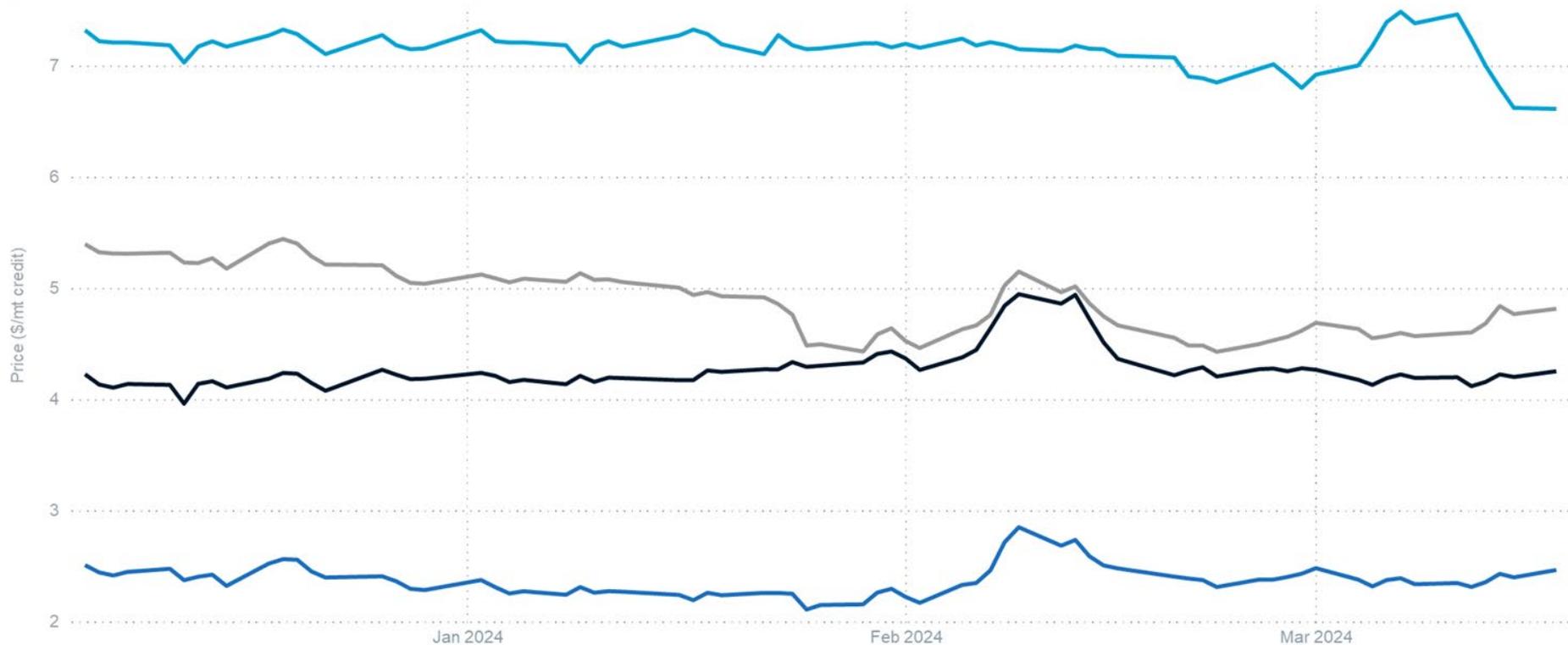
Commentary

Location	Product	Low	High	Average
Los Angeles	SAF 99%	3.7279	5.0129	4.37040
San Francisco	SAF 99%	3.7279	5.0129	4.37040
Los Angeles	SAF 100%	6.2533	7.5734	6.91335
San Francisco	SAF 100%	6.2533	7.5734	6.91335
California	SAF Carbon Intensity	0.0071	0.0072	0.00717

- ASTM D7566 100% renewable diesel, made from a variety of feedstocks.
- L.A. and S.F. SAF price assessments have a Carbon Intensity (CI) specification of a 38.68 CI proxy.
- The L.A. and S.F. SAF 100% assessments include the LCFS credit, the \$1.31/gal federal tax credit and 1.6 D4 biomass-based diesel RINs.

OPIS Sustainable Aviation and Renewable Diesel Fuel Prices

● OPIS SAF 100% Price ● OPIS SAF 99% Price ● OPIS RD 100% Price ● OPIS RD 99% Price



Source: OPIS Biofuels Daily Report

	2019	2020	2021	2022	2023
“Renewable Diesel”	202	278	392	358	403
“Sustainable Aviation Fuel”	46	88	213	288	321

Upcoming OPIS Events



16th Annual OPIS RFS, RINs & Biofuels Forum

- September 23-25, 2024
- The Radisson Blu Aqua Hotel, Chicago, IL



13th Annual OPIS LCFS & Carbon Markets Workshop

- January 14-16, 2025
- Hard Rock Hotel, San Diego, CA

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Questions?

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