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# Argus European Emissions Markets

Daily European greenhouse gas markets, news and analysis

Issue 23-38 | Thursday 23 February 2023

## MARKET COMMENTARY

### Allowances edge higher

EU emissions trading systems (ETS) allowances stabilised to record their smallest day-on-day move in over a week on Thursday, after having posted their largest in almost a month in the previous session.

The EU ETS December 2023 contract closed at €96.90/t of CO<sub>2</sub> equivalent (CO<sub>2</sub>e), which was up by €0.50/t CO<sub>2</sub>e from Wednesday to recover a portion of the previous session's losses. The product remains on track to record a second consecutive week-on-week gain, standing €0.82/t CO<sub>2</sub>e above where it closed last week.

The front year dipped to €95.91/t CO<sub>2</sub>e in the opening hour of Thursday's session. But it once again found technical support here – its intraday low on Wednesday was €95.95/t CO<sub>2</sub>e – and it tested this level on several occasions without breaking below it. This provided the product with upside, and it rallied to €97.85/t CO<sub>2</sub>e over the following hour.

But the front year appeared to run into resistance here around its five-day moving average, and it reversed direction to stand back down at €97/t CO<sub>2</sub>e by the time of the day's primary market auction of allowances at 10:00 GMT.

The EU-wide sale for some 2.41mn permits drew bids for 5.12mn allowances, producing a bid-to-cover ratio of 2.12. This was up from 2.04 in the previous such auction and the highest for any EU-wide sale in two weeks.

Some 24 bidders took part in the auction, up from 20 in the previous auction and the highest participation rate in a month. The sale cleared at €93.26/t CO<sub>2</sub>e, below trades of €93.91/t CO<sub>2</sub>e seen on the spot product in the secondary market 15 minutes before the auction's close.

The sale's weak price settlement initially weighed on the front year, which dropped to €96.19/t CO<sub>2</sub>e over the following 10 minutes. But the product found belated support from here from the auction's firm demand and bids as high as €105/t CO<sub>2</sub>e submitted to the sale, climbing throughout early-afternoon trading to peak at €98.17/t CO<sub>2</sub>e shortly before 14:30 GMT. This marked the front year's lowest intraday high since 15 February.

The product came under renewed downward pressure from here, possibly taking downside from weaker moves in wider equities markets on the opening of US trading. It declined gradually over the remainder of the session to stand

## PRICES

EU allowances				€/t CO <sub>2</sub> e
Scheme	Period	Bid	Offer	+/-
EU ETS	Spot	93.62	93.64	+0.46
EU ETS	Mar 2023	93.84	93.86	+0.45
EU ETS	Dec 2023	96.89	96.91	+0.50
EU ETS	Dec 2024	101.53	101.63	+0.54
EU ETS	Dec 2025	105.91	106.41	+0.56
EU ETS	Dec 2026	109.96	110.96	+0.81

UK allowances				£/t CO <sub>2</sub> e
Scheme	Period	Bid	Offer	+/-
UK ETS	Spot	78.80	78.90	+0.25
UK ETS	Mar 2023	78.75	79.75	+0.25
UK ETS	Dec 2023	82.74	82.76	+0.30
UK ETS	Dec 2024	87.50	88.50	+0.25
UK ETS	Dec 2025	94.49	95.49	+0.25
UK ETS	Dec 2026	96.87	98.87	+0.25

slightly below the midpoint of its intraday trading range at market close.

The UK ETS December 2023 contract closed at £82.75/t CO<sub>2</sub>e (€93.91/t CO<sub>2</sub>e), having risen by £0.30/t CO<sub>2</sub>e from Wednesday to mark its smallest day-on-day change in two weeks. The product is on track to record a second consecutive week-on-week loss, standing £0.35/t CO<sub>2</sub>e below where it closed last week.

The rise in UK carbon prices slightly lagged that of the EU ETS on Thursday, widening the contract's discount to the EU to around €2.99/t CO<sub>2</sub>e from €2.80/t CO<sub>2</sub>e in the previous session.

Carbon market liquidity at the exchanges declined on Thursday. Some 15.3mn EU ETS December 2023 allowances changed hands at the Intercontinental Exchange (Ice), down from 18.7mn in the previous session and the lowest traded volume for the delivery on the platform since 13 February.

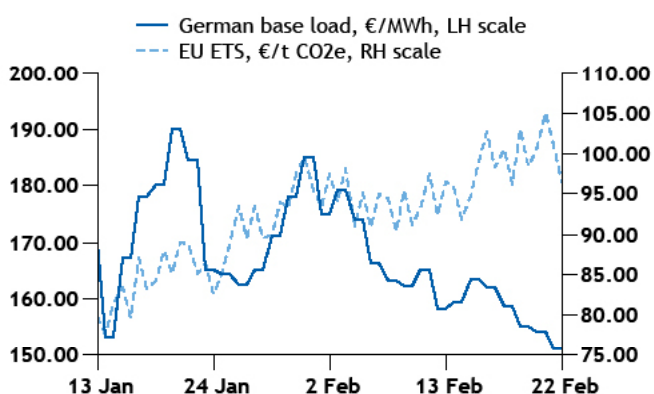
And 702,000 UK ETS December 2023 permits were seen to trade at the Ice over the course of the day, compared with 2.39mn on Wednesday, when the fortnightly primary market auction of allowances had boosted trading activity.

## AUCTION AND EXCHANGE SETTLEMENTS

EU ETS primary market auction results							
Latest auction date	Auction type	Host platform	Auctions remaining (2023)	Auction Volume (mn) remaining (2023)	Index type	Latest values	Change
Thu, 23-Feb-2023	Spot Market - EU Primary Auction CAP3 - EUA	EEX	122 left out of 143	352.5685 left out of 403.1575	Price (€/t CO2e)	93.26	-2.09
					Bids (mn)	5.1160	+0.1905
					Volume (mn)	2.4090	+0.0000
					Cover ratio	2.12	+0.08
					Participants	24	+4
Tue, 21-Feb-2023	Spot Market - EU Primary Auction CAP3 - EUA	EEX	123 left out of 143	354.9775 left out of 403.1575	Price (€/t CO2e)	95.35	+1.62
					Bids (mn)	4.9255	-0.1410
					Volume (mn)	2.4090	+0.0000
					Cover ratio	2.04	-0.06
					Participants	20	+0
Mon, 20-Feb-2023	Spot Market - EU Primary Auction CAP3 - EUA	EEX	124 left out of 143	357.3865 left out of 403.1575	Price (€/t CO2e)	93.73	+0.88
					Bids (mn)	5.0665	+1.0195
					Volume (mn)	2.4090	+0.0000
					Cover ratio	2.10	+0.42
					Participants	20	-1

Ice, 17:00 London Time, 23 February 2023							
Month	Open	High	Low	Settle	Open Interest	Cumulative Vol	Weighted Avg
EU							€/t CO2e
EUA Dec 23	96.07	98.17	95.91	97.58	293873.00	15334.00	97.08
EUA Dec 24	101.65	102.83	100.83	102.26	91178.00	1257.00	101.98
EUA Dec 25	106.95	107.11	106.07	106.84	20142.00	181.00	106.76
EUA Dec 26	111.00	111.20	110.45	111.14	1756.00	85.00	110.96
Total						16857	
UK							£/t CO2e
UKA Dec 23	82.90	82.90	82.15	82.76	23285.00	702.00	82.61
UKA Dec 24	na	na	na	88.01	621.00	0.00	na
UKA Dec 25	na	na	na	95.00	na	0.00	na
Total						702	

### German year-ahead power vs Dec 2023 EU ETS



Emissions-adjusted bunker fuel		\$/t
EU CO2 weekly snapshot, 16 Feb		101.452
Rotterdam/Antwerp 0.5%S fuel oil weekly avg., week ending 16 Feb		583.350
Rotterdam/Antwerp 0.5%S fuel oil including CO2 cost*		903.175
Rotterdam/Antwerp 0.5%S fuel oil including CO2 price increase		54.83%
*1t of VLSFO emits 3.151t of CO2, according to IMO's 2014 guidelines. Theoretical costs considering the proposed inclusion of shipping in the EU ETS		
Global emissions pricing, 22 Feb		
	Price	±
Global compliance carbon index \$/t	80.08	-3.37
Global green power index \$/MWh	6.75	+0.08

## Record transition spend still 'not enough'

Global investment in energy transition technologies hit a record high last year at \$1.3 trillion – but this is still not enough to meet a 1.5°C global warming scenario, renewable energy agency Irena and non-profit the Climate Policy Initiative (CPI) found in their latest report.

Spending on renewable energy, energy efficiency, electrification of transport and heat, energy storage, hydrogen and carbon capture and storage (CCS) hit an all-time high, “despite the prevailing macroeconomic, geopolitical and supply chain challenges”, the report found. Globally, investment in transition technologies rose by 19pc on the year and by 50pc from 2019, before the Covid-19 pandemic. Renewable energy and electrified transport saw the highest spending.

But annual investment must “at least quadruple” to keep the world on track to limit global warming to 1.5°C, in line with the Paris climate agreement, Irena and the CPI said. Investment in the transition needs to reach on average \$5.7 trillion/yr during 2021-30 and \$3.7 trillion/yr in 2031-50 to align with Irena’s 1.5°C scenario.

But even as spending on renewables increases, fossil fuel investment and subsidies are also rising, the report noted. Fossil fuel investments for 2022 stood at \$953bn, preliminary data show – just shy of the \$1 trillion invested in the sector pre-pandemic in 2019, the report found. Separately, the sector worldwide received \$2.9 trillion in subsidies during 2013-20, it said. Preliminary data from energy watchdog the IEA last week projected [record high fossil fuel subsidies](#) of \$1.097 trillion in 2022.

Investment is too focussed on specific technologies, Irena and the CPI said. More financing must be directed towards less mature technology and to sectors outside power generation, it added. Spending is also too concentrated in certain regions, Irena found. “The disparity in renewable energy financing received by developed versus developing countries has increased significantly over the past six years”, Irena director general Francesco La Camera said. “Countries defined as ‘least developed’ by the Intergovernmental Panel on Climate Change attracted only 0.84pc of renewable energy investments on average between 2013 and 2020”, the report found.

Climate finance was a key topic at the UN Cop 27 climate summit last year, and will continue to dominate discussions at Cop 28 in December, as parties take further steps towards setting up the [loss and damage fund agreed](#) at Cop 27.

“Today’s environment calls for a fundamental shift in how lending is made to developing nations... and particularly how countries in the global north support countries in the global south to cope with and adapt to crises related

to climate change, the cost of living and debt”, the report found. Failure to address this would slow the transition to decarbonisation, it said.

The report recommends that policymakers make best use possible of public funds, including through collaboration with multilateral development banks and development finance institutions. “Public finance should continue to be used strategically to crowd in additional private capital”, it added.

*By Georgia Gratton*

## Poland passes wind farm location law change

The Polish Senate has unanimously approved an amendment in the country’s onshore wind act which eases restrictions on where new wind farms can be installed.

The Senate decided that the minimum distance between onshore wind farms and residential areas is regulated at 500m, amending the [so-called 10H rule](#) which stipulates that wind sites must be built within a distance from the surrounding area of no less than 10 times the height of the turbines.

The Senate’s decision was not in line with the parliamentary energy committee’s proposal, which suggested that new wind farms would need to be located at least 700m away from residential zones.

The decision clarifies that developers can build new wind farms at a distance of less than 500m after consultations with residents and local communities. In these cases the investors will have to pay additional distribution and production fees.

The 10H rule is maintained in case of new wind farms being built close to national parks and natural reserves, according to the Senate’s decision. Onshore wind turbines can regularly be 150m or taller, which excluded them from being 1.5km from settlements.

The amendment can allow [up to 22GW of new capacity to be installed](#), according to Polish wind energy association PSEW’s estimations. This is sharply above the 7GW of onshore wind potential envisaged if the 700m minimum has been adopted.

*By Apostolos Tsarikas*

## Eni power sales fall in 2022

Italian Eni’s retail and renewables arm Plenitude made a smaller profit last year compared with 2021 owing to lower retail power sales, while output from renewable sources increased because of increased wind and solar capacity.

Plenitude made an adjusted profit of €78mn in the fourth quarter of 2022 compared with €86mn in the last quarter of 2021. In 2022, the company reported an adjusted profit of €345mn, down by 5pc from €363mn in 2021 owing to “market trends”, the company said.

Retail and business power sales to end consumers were 4.43TWh in the past three months of 2022, down from 4.72TWh in the previous year. And retail sales stood at 18.77TWh across 2022, up from 16.49TWh in 2021 owing to the “growth of activities” in Italy and sales from the [recently-acquired Spanish energy retailer Aldro Energia](#).

Electricity production from renewable sources stood at 652GWh in the fourth quarter of last year, increasing from 470GWh in the final quarter of 2021 owing to the “operation of acquired assets”, Eni said. Output from renewables was 2.6TWh across 2022, rising from 986GWh a year earlier.

Plenitude’s installed capacity from renewables stood at 2.2GW at the end of last year, doubling from 1.1GW in 2021. Plenitude boosted its renewables portfolio last year by acquiring 110MW of onshore wind farms from Italian wind power developer Fortore Energia. And the company increased its pipeline of wind and solar assets by a further 1.6GW through [the acquisition of local integrated utility PLT Energia](#).

The power generation business from gas-fired units made an adjusted profit of €40mn in the last quarter of 2022, up from €16mn in the fourth quarter of 2021 owing largely to a “favourable price scenario”, Eni said. Gas-fired generation

brought in a profit of €270mn in 2022, up from €113mn over the previous year.

Power sales in the open market totalled 5.07TWh in the fourth quarter of 2022, down from 7.74TWh in the final quarter of 2021 mainly owing to lower volumes marketed to power exchanges, Eni said. Wholesale power sales across 2022 were 22.37TWh against 28.54TWh a year earlier.

Thermal generation in the last three months of 2022 stood at 4.95TWh, falling from 6.36TWh in the fourth quarter of 2021. Output from gas-fired units totalled 22.37TWh across 2022 compared with 28.54TWh the previous year.

Eni expects Plenitude to grow its renewable generating capacity to more than 7GW by 2026 and at least 15GW by 2030. In January, [Plenitude formed a joint venture with Irish floating wind developer Simply Blue](#) to develop a pipeline of floating offshore wind projects in southern Italy.

Earlier on Thursday, Eni [reported](#) a profit of €13.81bn for 2022, more than double the €5.82bn it made in 2021, with cash flow from operations coming in at €17.46bn against €12.86bn the previous year.

By *Timothy Santonastaso*

## UK to do more to tackle industrial power costs

The UK’s newly merged Department for Business and Trade has announced a package of measures to bring down energy costs for key industries so they are in line with international competitors.

The ‘British Industry Supercharger’, to be consulted on in spring, will exempt about 300 energy-intensive industries – mostly in the steel, metals, chemicals and paper sectors – from certain costs arising from renewable energy obligations, such as feed-in tariffs, contracts for difference and renewable obligation certificate schemes. Reduced network charges for industrial consumption might be also considered.

The measures aim to enhance the international competitiveness of such sectors, which made up 28pc of UK exports in 2019. They also seek to make the UK more attractive for international investment and boost development of growing industries, such as electric vehicle and battery manufacturing. UK battery production plans were dealt a blow earlier this year when start-up Britishvolt, which had planned to build the country’s first gigafactory, went into administration – with Australian firm Recharge Industries, a subsidiary of Scale Facilitation Partners, poised to acquire it.

“UK industrial electricity prices have been uncompetitive for many years,” UK Steel’s director-general, Gareth Stace, has said. “The government took a great step towards leveling the playing field for the steel industry.”

This initiative is part of an energy security strategy



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launched in August, that sought to fully exempt energy-intensive industries from [specific levies](#). The government also extended electricity bill discounts for businesses until [31 March 2024](#).

British Industry Supercharger measures are expected to be rolled out from spring 2024, depending on the consultation's outcome.

By Gabriel Lorca Aicardi

### Swiss winter power reserve hits 336MW

The Swiss federal council has signed a third winter power reserve agreement, lifting available capacity to 336MW.

The contract was agreed for Compagnie Industrielle de Monthey's 40MW Thermatel combined-cycle gas turbine plant, whose capacity will increase to 50MW after a steam turbine overhaul in September.

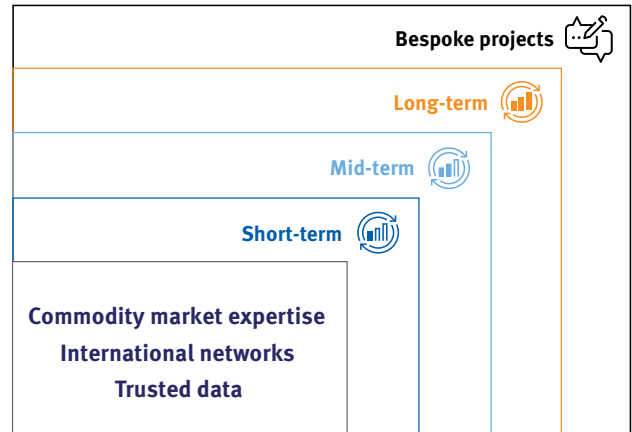
The contract stipulates a total fixed cost of SFr21.5mn (\$23mn), covering the period from 15 February 2023 to 30 April 2026. Variable costs – including procurement, transport, storage and CO2 allowances – will depend on utilisation of the plant, which will operate only in emergencies.

This is the third winter power reserve agreement signed by the Swiss government. The first was with US producer GE Gas Power [in September](#), and the second was with Swiss firm Groupe E [in December](#).

The winter power reserve initiative was launched in August to ensure there is enough flexible capacity to avoid energy shortages. It supplements [a plan to build a hydro-power reserve](#).

By Gabriel Lorca Aicardi

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European weather - Departure from normal temperatures												°C
Location	24 Feb		25 Feb		26 Feb		27 Feb		28 Feb		Precipitation (mm)	
	Avg	± normal*	Avg	± normal*	Avg	± normal*	Avg	± normal*	Avg	± normal*	5-day	15-day
UK – London Heathrow	5.3	-0.5	5.2	-0.6	4.9	-0.9	4.8	-1.1	4.2	-1.7	1.2	10.4
Norway – Bergen Florida	3.1	0.7	0.5	-2.0	0.4	-2.1	3.4	0.8	3.5	0.8	0.6	39.4
Norway – Oslo Blindern	1.2	3.0	0.3	2.0	0.4	1.9	1.2	2.6	1.8	3.1	1.8	9.3
France – Paris Orly	7.6	2.5	4.8	-0.4	3.0	-2.3	1.6	-3.8	1.2	-4.2	0.6	9.5
The Netherlands – Amsterdam Schiphol	4.9	1.1	4.2	0.4	3.5	-0.4	2.8	-1.2	1.3	-2.7	3.6	15.9
Germany – Essen	3.4	0.3	2.6	-0.6	0.9	-2.4	0.1	-3.3	0.7	-2.8	4.4	18.6
Germany – Berlin Tempelhof	4.1	2.3	-0.2	-2.2	-1.9	-4.0	-1.1	-3.3	-0.1	-2.4	6.3	18.0
Italy – Milano Malpensa	10.0	3.9	11.0	4.8	4.3	-2.1	2.6	-4.0	3.0	-3.7	19.3	32.7
Italy – Rome Fiumicino	9.2	0.4	11.2	2.1	8.7	-0.6	7.8	-0.7	8.9	-0.2	31.5	55.5
Poland – Warsaw Okecie	5.9	6.9	2.8	3.6	0.7	1.4	-0.4	0.2	1.0	1.4	8.6	18.4
Czech Republic – Prague Ruzyně	5.7	5.3	-0.9	-1.4	-3.7	-4.4	-4.3	-5.1	-2.7	-3.6	5.6	13.4
Hungary – Budapest Lorinc	10.2	7.6	5.7	3.0	1.4	-1.5	1.9	-1.1	2.5	-0.7	12.2	19.3
Serbia – Belgrade Surcin	11.4	8.1	9.1	5.7	3.5	-0.1	3.0	-0.8	3.8	-0.1	25.2	39.6
Romania – Bucharest Imh	5.9	4.1	8.6	6.7	11.7	9.6	10.7	8.4	6.5	4.0	9.0	20.5
Spain – Madrid Barajas	3.3	-4.0	3.4	-4.0	4.4	-3.1	2.4	-5.1	1.8	-5.8	1.8	25.5

\*normal means cleaned 10-year average (2004-2013 inclusive)

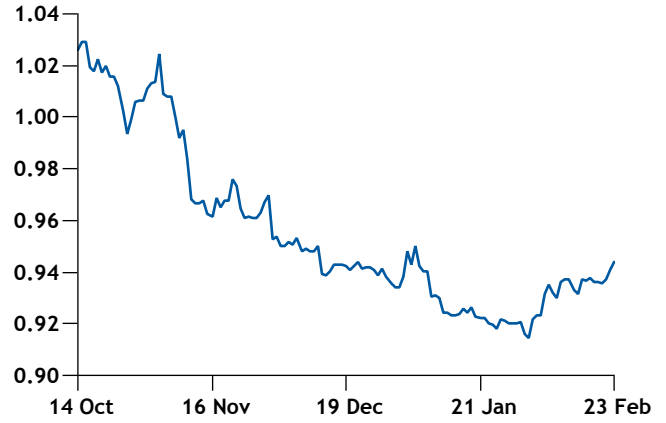
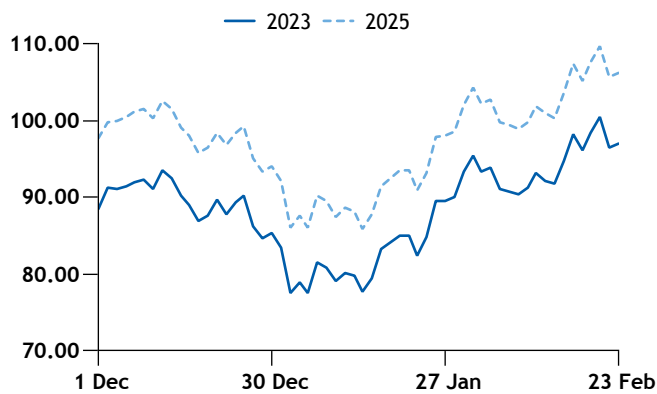


Ensemble averages and cleaned weather data all supplied by Speedwell Weather Limited (12:00 GMT). For more information visit: [www.speedwellweather.com](http://www.speedwellweather.com)

EU ETS Dec 2023 and 2025 allowances

€/t CO<sub>2</sub>e

Exchange rate: \$ to €



Argus successfully completes annual losco assurance review

Argus has completed the 11th external assurance review of its price benchmarks covering crude oil, oil products, LPG, chemicals, thermal and coking coal, natural gas, biofuels, biomass, metals, fertilizers and agricultural markets. The review was carried out by professional services firm PwC. Annual independent, external reviews of oil benchmarks are required by international regulatory group losco’s Principles for Oil Price Reporting Agencies, and losco encourages extension of the reviews to non-oil benchmarks. For more information and to download the review visit our website <https://www.argusmedia.com/en/about-us/governance-compliance>

Verified emissions from stationary installations during phase three of EU ETS								<i>mn t CO<sub>2e</sub></i>
Country	2020	2019	2018	2017	2016	2015	2014	2013
Austria	27.03	29.56	28.40	30.56	28.99	29.49	28.05	29.80
Belgium	41.76	44.84	44.18	43.77	43.66	44.71	43.85	45.23
Bulgaria	25.58	32.14	31.03	34.91	33.41	36.26	34.31	32.70
Croatia	7.32	7.53	7.44	8.37	8.27	8.39	8.39	8.79
Cyprus	4.29	4.46	4.59	4.67	4.65	4.37	4.47	4.02
Czech Republic	54.77	62.59	66.91	66.98	67.53	66.65	66.70	67.71
Denmark	10.84	12.07	14.95	15.06	17.22	15.80	18.39	21.60
Estonia	5.62	8.49	13.85	14.67	13.45	11.89	14.97	15.92
Finland	19.58	23.25	26.26	25.14	27.23	25.47	28.76	31.49
France	84.12	94.59	97.48	106.84	101.71	99.69	100.27	114.59
Germany	320.94	363.16	422.26	437.64	452.85	455.65	461.29	481.09
Greece	31.77	40.48	47.11	49.57	46.30	49.88	55.37	58.63
Hungary	18.95	19.53	20.05	20.64	19.40	19.65	18.82	19.13
Iceland	1.78	1.81	1.85	1.83	1.78	1.81	1.75	1.78
Ireland	13.31	14.19	15.52	16.90	17.74	16.84	15.96	15.69
Italy	126.38	141.19	146.48	155.33	154.98	156.21	152.58	164.50
Latvia	2.04	2.52	2.61	2.05	2.20	2.31	2.35	2.65
Liechtenstein	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lithuania	6.14	5.86	5.95	6.28	6.16	6.84	6.86	7.46
Luxembourg	1.38	1.50	1.47	1.49	1.50	1.66	1.93	1.85
Malta	0.81	0.74	0.70	0.72	0.58	0.89	1.66	1.70
Netherlands	74.21	83.82	87.41	91.42	93.87	94.12	89.07	86.95
Norway	23.74	24.60	25.18	25.39	25.17	25.68	24.96	24.68
Poland	174.67	184.46	199.97	202.17	198.05	198.70	197.13	205.74
Portugal	18.77	21.64	26.29	30.08	25.76	27.96	24.20	24.66
Romania	32.98	36.56	39.62	40.62	39.78	42.40	42.58	42.41
Slovakia	18.19	19.90	22.19	22.06	21.26	21.18	20.92	21.83
Slovenia	6.10	6.25	6.49	6.57	6.48	6.11	6.12	7.39
Spain	89.06	109.83	127.37	136.32	123.56	137.27	124.85	122.81
Sweden	18.03	18.78	19.86	19.65	19.74	19.24	19.33	20.14
UK	106.90	119.64	128.86	136.88	147.16	175.86	197.98	225.24

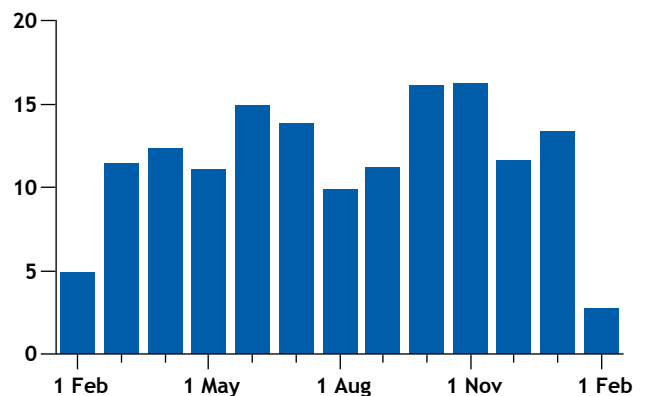
EU ETS Dec 2024 allowances

€/t CO<sub>2e</sub>



CER issuance levels

mn t CO<sub>2e</sub>



## SPARK SPREADS

### Spark spread calculations

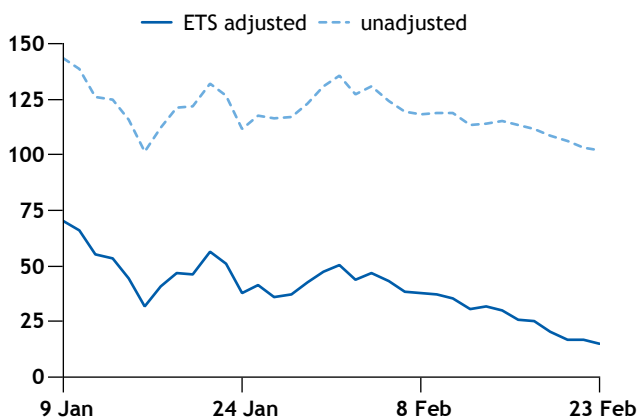
Spark spreads for various thermal efficiencies are calculated from Argus outright fuel, CO<sub>2</sub> emissions and electricity prices, and are not assessments based on actual spark-spread trades. Fuel, emissions and electricity prices are taken from the Argus European Electricity, Argus European Natural Gas, Argus Coal Daily International, Argus European Products and Argus European Emissions Markets daily reports.

A selection of spark and dark spreads are published in the print report. A full range of spark and dark spreads can be accessed through Argus Direct. Please contact [sales@argusmedia.com](mailto:sales@argusmedia.com) to arrange access.

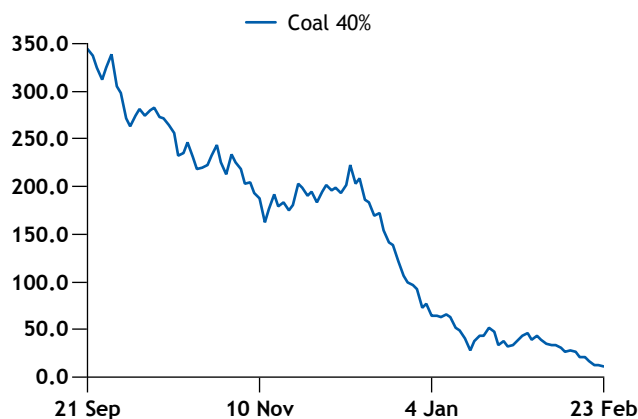
UK ETS and CSP adjusted spark and dark spreads					€/MWh
Contract	NBP 55%		ARA Coal 40%		
	base load	peak load	base load	peak load	
Working day ahead	18.563	24.663	5.624	11.724	
March	25.016	38.016	9.505	22.505	
April	22.459	36.009	5.975	19.525	
May	20.448	35.798	3.711	19.061	
June	20.497	34.897	-	-	
July	23.124	35.674	-	-	
August	21.840	35.040	-	-	
2Q23	21.118	35.568	4.511	18.961	
3Q23	25.579	39.129	10.015	23.565	
4Q23	32.552	65.802	25.845	59.095	
1Q24	27.432	56.282	25.354	54.204	
Summer 2023	23.349	37.349	7.262	21.262	
Winter 2023	29.992	61.042	-	-	
Summer 2024	10.146	28.996	-	-	
Winter 2024	23.678	63.478	-	-	
2024	18.093	44.678	9.647	36.232	

UK unadjusted spark spreads				€/MWh
Contract	NBP 49.13%			
	base load	peak load		
Working day ahead	41.558	47.658		
March	49.394	62.394		
April	46.955	60.505		
May	44.908	60.258		
June	44.873	59.273		
July	47.575	60.125		
August	46.132	59.332		
2Q23	45.562	60.012		
3Q23	49.851	63.401		
4Q23	56.162	89.412		
1Q24	51.384	80.234		
Summer 2023	47.707	61.707		
Winter 2023	53.773	84.823		
Summer 2024	35.491	54.341		
Winter 2024	49.816	89.616		
2024	43.099	69.684		

German calendar-year base-load dark €/MWh



German year-ahead adjusted dark spread €/MWh



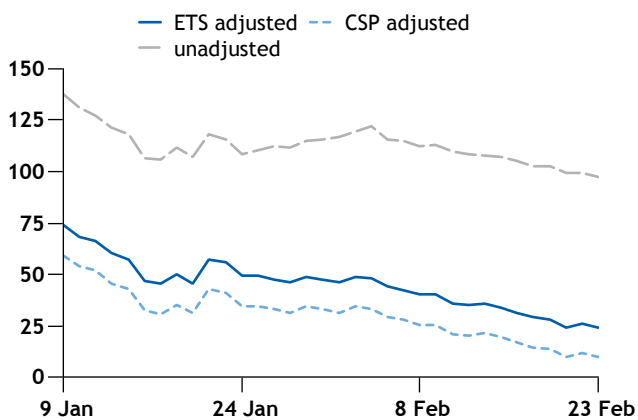


SPARK SPREADS

German ETS adjusted spark and dark spreads €/MWh					German unadjusted dark spreads €/MWh		
Contract	Germany VTP 55%		ARA Coal 40%		Contract	ARA Coal 40%	
	base load	peak load	base load	peak load		base load	peak load
Working day ahead	-9.956	-6.606	-13.963	-10.613	Working day ahead	65.857	69.207
March	1.940	15.190	-1.361	11.889	March	78.646	91.896
April	-5.260	4.940	-8.292	1.908	April	71.715	81.915
May	1.886	9.386	-1.373	6.127	May	78.634	86.134
June	8.349	19.749	-	-	2Q23	78.432	88.182
July	18.913	34.513	-	-	3Q23	95.331	117.081
August	13.190	25.990	-	-	4Q23	116.655	157.655
2Q23	1.658	11.408	-1.575	8.175	1Q24	120.126	159.126
3Q23	17.222	38.972	15.324	37.074	2Q24	82.335	98.635
4Q23	27.330	68.330	34.451	75.451	2024	101.981	137.481
1Q24	25.983	64.983	33.529	72.529	2025	80.290	107.540
2Q24	-6.181	10.119	-4.262	12.038	2026	74.025	102.825
3Q24	-0.308	17.092	-	-			
2024	10.252	45.752	15.058	50.558			
2025	-0.776	26.474	-10.517	16.733			
2026	12.067	40.867	-20.142	8.658			

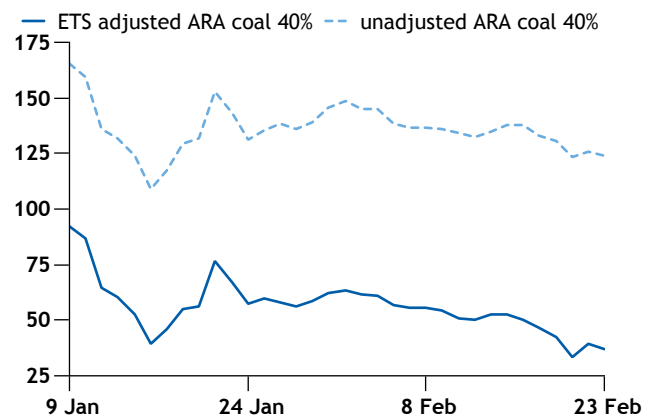
UK calendar-year base-load dark

€/MWh



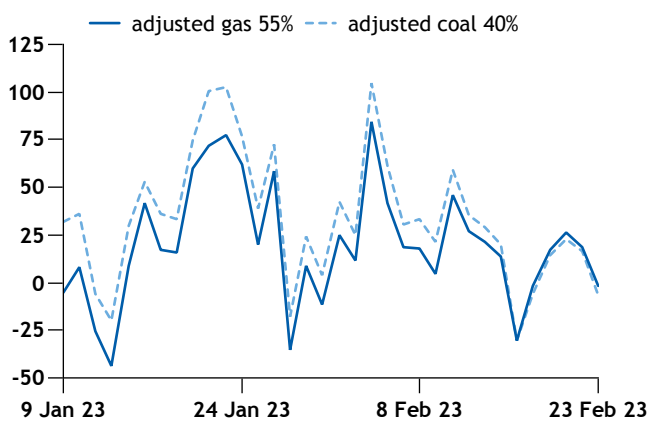
French calendar-year base-load dark

€/MWh



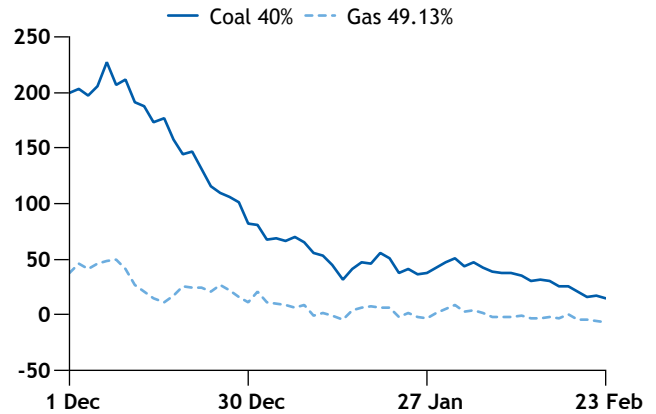
Dutch day-ahead peak-load spark vs dark

€/MWh



German year-ahead adjusted spark and dark

€/MWh

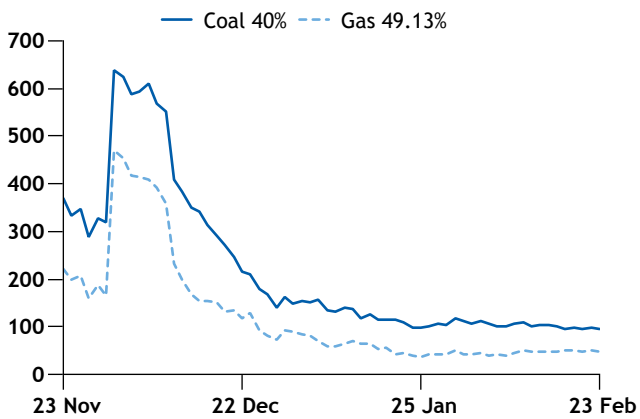


SPARK SPREADS

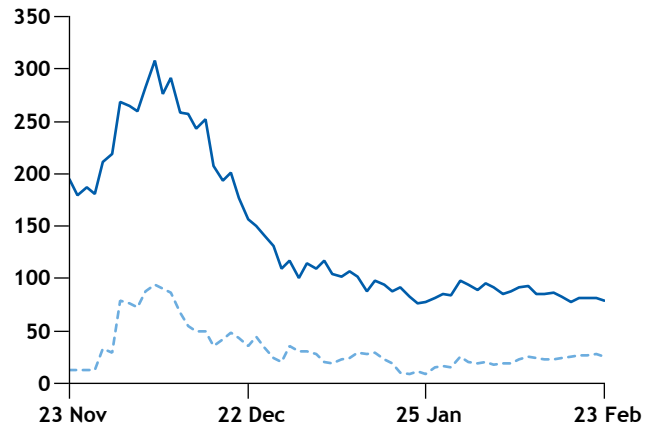
Dutch ETS adjusted spark and dark spreads					€/MWh
Contract	TTF 55%		ARA Coal 40%		
	base load	peak load	base load	peak load	
Working day ahead	-7.570	-2.020	-12.213	-6.663	
March	2.863	8.963	-1.211	4.889	
April	-4.533	1.017	-8.792	-3.242	
May	2.272	5.272	-2.423	0.577	
2Q23	0.831	6.231	-3.675	1.725	
3Q23	11.226	15.126	7.874	11.774	
4Q23	17.330	46.680	22.451	51.801	
1Q24	14.437	77.087	20.529	83.179	
2024	2.688	21.438	4.558	23.308	
2025	-0.939	22.311	-13.517	9.733	
2026	12.999	14.349	-22.392	-21.042	

Italian ETS adjusted spark and dark spreads							€/MWh
Contract	PSV 55%		ARA Coal 40%		ARA Coal 40% (incl. fuel tax)		
	base load	peak load	base load	peak load	base load	peak load	
Day ahead	30.680	38.130	27.037	34.487	22.810	30.260	
March	27.008	43.558	24.289	40.839	20.062	36.612	
April	15.340	28.440	13.808	26.908	9.581	22.681	
May	19.531	33.531	16.927	30.927	12.700	26.700	
2Q23	19.858	34.008	17.625	31.775	13.398	27.548	
3Q23	34.449	49.699	32.824	48.074	28.597	43.847	
4Q23	38.017	66.967	43.501	72.451	39.274	68.224	
1Q24	34.060	54.710	37.879	58.529	33.651	54.301	
2024	21.188	43.188	23.058	45.058	18.830	40.830	
2025	4.334	22.234	-7.517	10.383	-11.745	6.155	

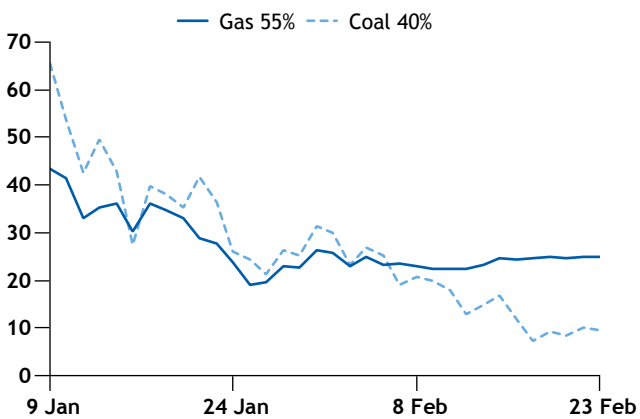
French front-month base-load spreads €/MWh



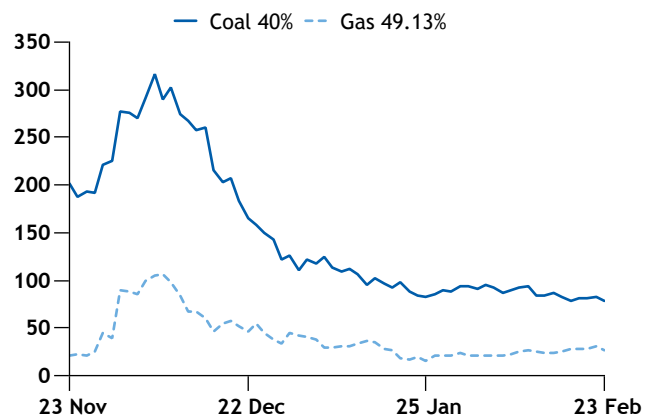
German month-ahead base-load sparks €/MWh



UK front-month base-load spark vs dark £/MWh



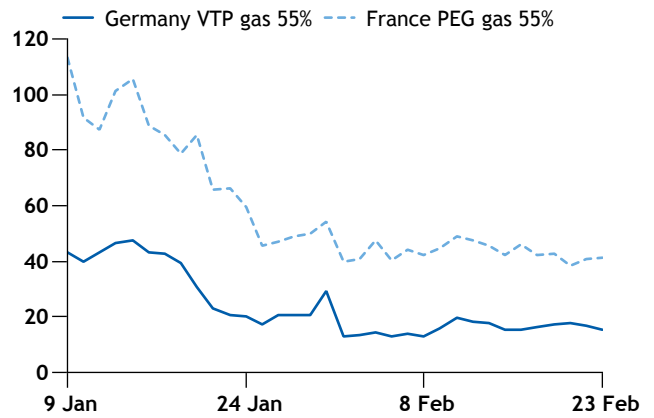
Dutch front-month base-load spreads €/MWh



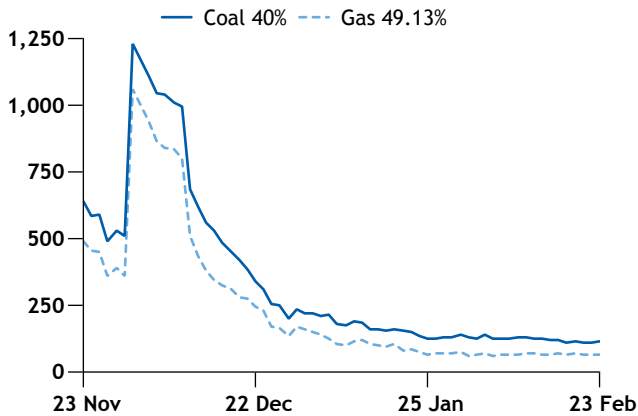
**SPARK SPREADS**

French ETS adjusted spark and dark spreads					€/MWh
Contract	ARA Coal 40%		Peg 55%		
	base load	peak load	base load	peak load	
Working day ahead	14.287	17.437	21.293	24.443	
March	16.289	32.939	24.454	41.104	
April	3.958	17.408	11.854	25.304	
May	1.127	13.677	9.958	22.508	
2Q23	4.375	18.375	12.245	26.245	
3Q23	20.074	48.574	26.608	55.108	
4Q23	85.951	212.451	87.194	213.694	
1Q24	118.279	276.029	-	-	
2024	37.058	136.058	38.552	137.552	
2025	-7.817	86.483	-	-	
2026	-19.592	63.608	-	-	

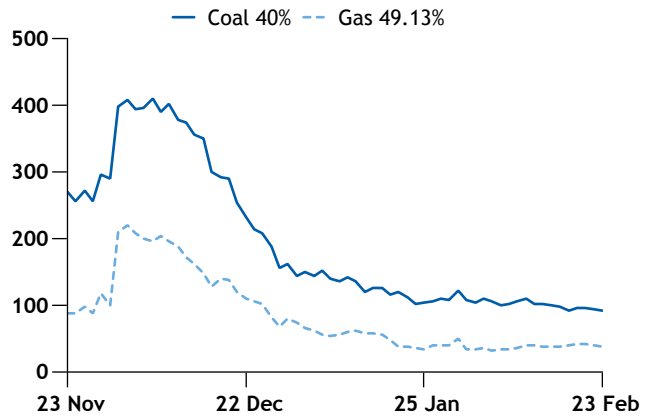
German vs French front-month peak-load spark €/MWh



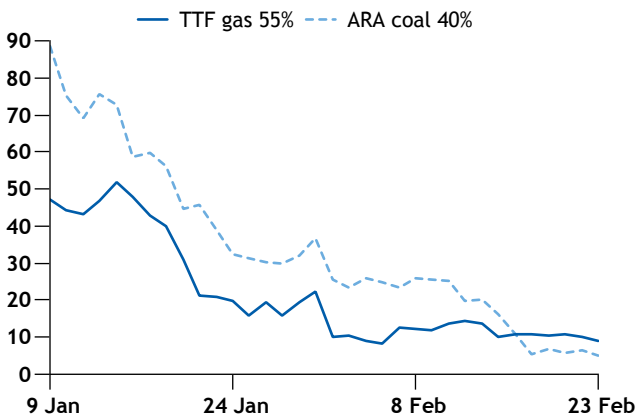
French front-month peak-load spreads €/MWh



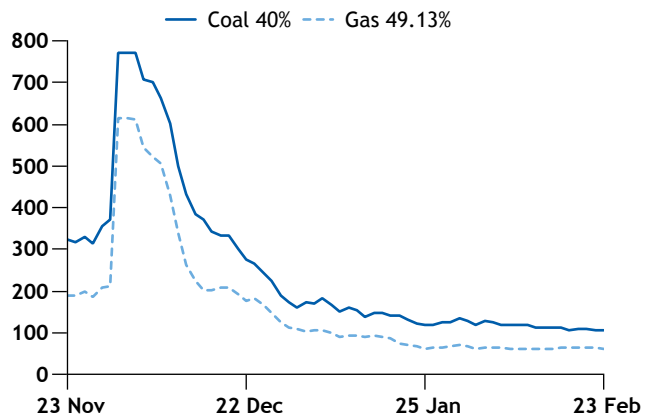
German month-ahead peak-load sparks €/MWh



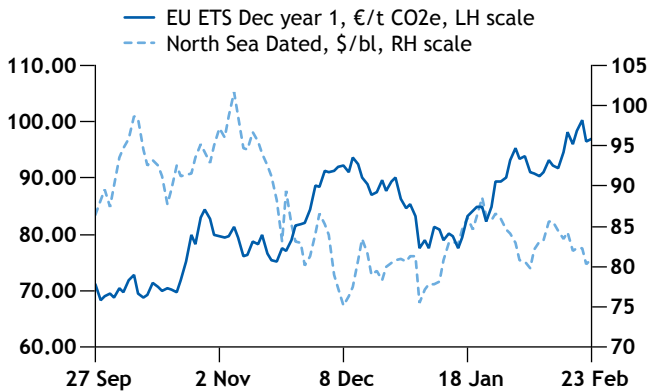
Dutch front-month peak-load spreads €/MWh



UK front-month peak-load spark £/MWh



EU ETS Dec 2023 vs North Sea Dated crude



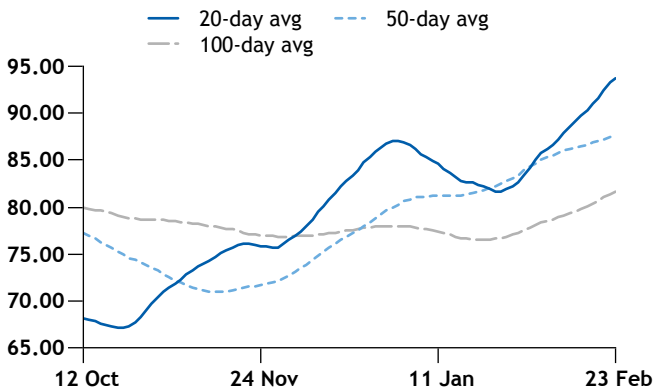
EU ETS Dec 2023 allowances

€/t CO<sub>2</sub>e



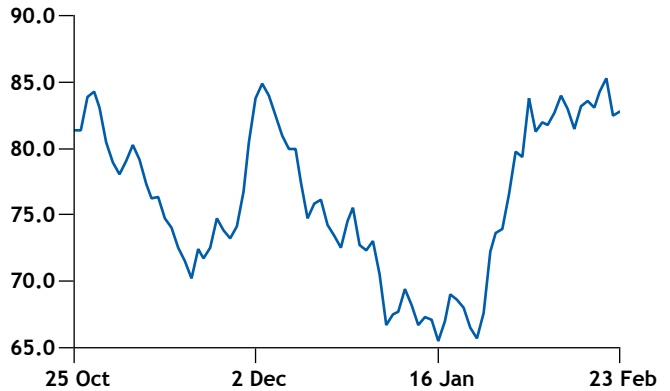
EU ETS front-year allowance moving average

€/t CO<sub>2</sub>e



UK ETS Dec 2023 allowances

€/t CO<sub>2</sub>e



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**Registered office**  
 Lacon House, 84 Theobald's Road,  
 London, WC1X 8NL  
 Tel: +44 20 7780 4200

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**Editor**  
 Justin Colley  
 Tel: +44 20 7780 4274  
[emissions@argusmedia.com](mailto:emissions@argusmedia.com)

**Customer support and sales:**

[support@argusmedia.com](mailto:support@argusmedia.com)  
[sales@argusmedia.com](mailto:sales@argusmedia.com)

London, Tel: +44 20 7780 4200

Houston, Tel: +1 713 968 0000

Singapore, Tel: +65 6496 9966



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