

## MARKET COMMENTARY

### Atlantic basin: European pellets compete

The spot price of industrial wood pellets for deliveries to northwest Europe (NWE) fell on the week and the continuous appreciation of the US dollar against the Euro has rendered European supplies competitive.

The 90-days industrial wood pellet price fell by \$2.06/t to \$190.01/t cif NWE on Wednesday.

Discussions focused on the spot window, with some utilities looking for opportunistic purchases that would be cost effective for power generation under state subsidies. Buying interest stood in the \$185-190/t cif NWE range in the week.

Other utilities were looking to swap or delay one to two handy-sized cargoes as they tried to optimize their portfolio provided the current spot power market conditions and respective annual maintenance schedule. At least one cargo was up for swapping between the current quarter and later in the year, and another one from April-May to later.

Volumes from European producers were on offer at prices competitive with north American supplies, after having held uncompetitive for most of 2024. This is the result of a gradual increase in cif NWE spot prices from November and as the appreciation of US dollar against the Euro since then has rendered Euro-denominated trades more appealing for end users in the EU. One US dollar was exchanging for €0.97 on 14 January, compared with €0.92 on 1 November 2024.

Utilities continued to withdraw stocks to meet strong consumption amid colder weather in late December and the first half of January, although overall inventories remain above seasonal norms for the time of the year. This is despite stronger burn for power generation in NWE during all of 2024 (see separate story), because utilities entered winter with near-capacity stocks and unusually warmer weather in October and first half of November pared consumption.

UK generation was scheduled at 2.3GW in the week to 14 January on an average hourly basis, up from 1.9GW in the previous week, grid operator data show. End of certain outages is likely to support generation in the country in the coming weeks. Drax's 645MW unit 4 will come back from maintenance on 18 January, having been offline since 2 December; and it has a planned outage scheduled for 8-9

## EUROPEAN INDUSTRIAL WOOD PELLETS

### Wood pellets - within 90 days (spot)

	Week index		Month index		
	Price	±	Dec	Nov	Oct
cif NWE \$/t	190.01	-2.06	192.70	195.46	188.70
fob Baltic €/t	169.44	-0.66	170.57	171.37	167.60
fob Portugal €/t	166.17	-1.33	165.69	166.78	165.28

### Wood pellets - within 90 days (spot)

	Price	±
cif NWE \$/MWh	40.24	-0.44
fob Baltic €/MWh	35.88	-0.14
fob Portugal €/MWh	35.19	-0.28

### Wood pellets - forward prices

	Bid	Ask	±
cif NWE \$/t			
1Q25	187.00	193.00	-2.00
2Q25	187.00	193.00	-5.25
3Q25	187.00	193.00	-5.25
4Q25	195.00	205.00	-3.50
2026	200.00	210.00	-2.50
2027	200.00	210.00	-3.00
2028	198.00	208.00	nc
fob Baltic €/t			
1Q25	167.00	173.00	nc
2Q25	167.00	173.00	-2.50
3Q25	167.00	173.00	-2.50
4Q25	175.00	185.00	nc
2026	175.00	185.00	nc
2027	175.00	185.00	-2.00
2028	172.00	182.00	nc
fob Portugal €/t			
1Q25	163.25	169.25	-1.25
2Q25	163.25	169.25	-4.00
3Q25	163.25	169.25	-4.00
4Q25	171.00	179.00	-2.00
2026	173.00	183.00	nc
2027	173.00	183.00	-2.00
2028	170.00	180.00	nc

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February. Lynemouth's 133MW unit 3, which has been offline since 6 March 2024, is expected to return online on 16 January. MGT Teeside's 285MW unit 1 went partially offline on 14-17 January, with output reduced to 150MW.

In Denmark, biomass-fired power generation averaged 694MW in the week to 14 January, above 634MW in the week prior, Entsoe data show. Orsted's 478MW Avedore unit 2 was partially offline on 12-13 January, with availability reduced to 373MW. The same unit has scheduled intermittent partial outages during 20 January-17 February.

Pellet-fired output in NWE is likely to hold strong throughout January-February in line with cold weather. In London, overnight temperatures were forecast at 1.3°C in the coming two weeks, broadly in line with seasonal norms, Speedwell data show. These were forecast at 2.1°C in the 45 days to 28 February. In Copenhagen, overnight temperatures were forecast at 1.3°C in the coming nine days, Danish Meteorological Institute data show.

Further out, prices for the summer 2025 season were expected to remain steady from the current spot market. Utilities in continental Europe typically generate less during summer in line with lower power prices. But high production costs have resulted in suppliers resisting to drop prices significantly, with not many coming forward with offers for summer or later deliveries as participants also seek more clarity over the situation of stocks by the end of the current winter.

Talks continued for deliveries in the fourth quarter of 2025 and for calendar 2026. Some buyers were monitoring offers for 2026 around \$208-211/t but firm bids were yet to surface, as participants looked to get a clearer picture around overall European post-2027 when most state subsidies for biomass-fired power generation are set to expire.

On the freight market, time-charter (TC) rates for handy-sized vessels for trips from US Gulf coast to the European continent stood just over \$11,000/d and rates for supramax-sized vessels for the same route held at \$18,800/d, from \$17,500-20,000/d a week earlier.

In the Baltics, the spot 90-days pellets price fell by €0.66/t on the week to €169.44/t fob Baltic. There was buying interest in the €165-69/t fob range for loadings throughout the balance of the first half of 2025. Some producers were unwilling to offer below the €170-180/t fob Baltic range, but other, smaller-sized firms with less capability to hold high stocks for extended periods, were expected to drop offers to match current bids. With trades expected in the coming days.

The industrial-premium spread for bulk pellets seems to have narrowed significantly for loadings out of the Baltic,

## NORTH AMERICAN INDUSTRIAL WOOD PELLETS

Wood pellets NWE to N America netbacks - spot					\$/t
Netback	Delivery period	Mid	Bid	Ask	±
NWE to southeast US	Spot	166.01	172.01	-0.06	
NWE to southwest Canada	Spot	149.51	155.51	-1.56	
NWE to northeast US	Spot	170.00		-0.05	

Wood pellets NWE to N America netbacks - spot					\$/MWh
Netback	Delivery period	Mid	Bid	Ask	±
NWE to southeast US	Spot	35.16	36.43	-0.01	
NWE to southwest Canada	Spot	31.66	32.93	-0.33	
NWE to northeast US	Spot	36.00		-0.01	

Wood pellets NWE to N America netbacks - forward					\$/t
	Mid	Bid	Ask	±	
NWE to southeast US					
1Q25	164.00	174.00	nc		
2Q25	164.00	174.00	-3.25		
3Q25	164.00	174.00	-3.25		
4Q25	174.00	184.00	-1.50		
2026	179.00	189.00	-0.50		
2027	179.00	189.00	-1.00		
2028	177.00	187.00	+2.00		
NWE to southwest Canada					
1Q25	147.50	157.50	-1.50		
2Q25	147.50	157.50	-4.75		
3Q25	147.50	157.50	-4.75		
4Q25	157.50	167.50	-3.00		
2026	162.50	172.50	-2.00		
2027	162.50	172.50	-2.50		
2028	160.50	170.50	+0.50		
NWE to northeast US					
1Q25	170.00		nc		
2Q25	170.00		-3.25		
3Q25	170.00		-3.25		
4Q25	180.00		-1.50		
2026	185.00		-0.50		
2027	185.00		-1.00		
2028	183.00		+2.00		

with buying interest for premium cargoes at €170/t fob in the week. Raw material costs were steady, allowing Baltic producers to offer competitively into NWE.

Further out, discussions for the calendar 2026 contract were delayed until summer.

Elsewhere, the fob Portugal price also dropped by €1.33/t on the week to €166.17/t fob Portugal. There were no firm offers for Portuguese pellets in the spot market, as producers focused on delivering long-term contracted supplies at higher levels than the current spot, around €180/t fob Portugal. Production costs were estimated around €140-150/t.

## European wood chips: Spot firms

The spot price of industrial wood chips for deliveries to northwest Europe (NWE) rose on the week, as strong consumption created fresh demand for restocking.

The 90-days industrial wood chip price rose by €0.10/GJ to €9.40/GJ cif NWE on Wednesday.

Strong consumption since December has been drawing on inventories, and some utilities - particularly heat generators - were looking to replenish stocks. At least some spot deals were concluded for coaster-sized cargoes, although most end-users were still receiving volumes on long-term contracts.

Further on the price upside, local demand and prices in supplying countries have also firmed in recent weeks.

In the Baltics, chip prices hovered in the €6.50-7.25/GJ ex works, and offers in the fob Baltic market around 7-7.75/GJ. Cheapest freight rates for trips out of Baltic ports to northern Europe at €2.50/GJ suggest a net-forward range of around €9.50-10.20/GJ cif NWE.

Feedstock availability has also dropped, as producers had struggled to harvest from the forest in the fourth quarter of 2024 because of wet weather conditions. This resulted in some suppliers requesting to delay cargoes. However, regional storage facilities may have sufficient feedstock supply to cover at least part of the shortfall, one participant said.

Very close or compact ice was present at the northern part of the Bothnia Bay, with 25-45cm thick fast ice at Kemi, Oulu and Tornio ports, Finnish meteorological institute data show. Open ice was present in the southern part of the bay. Ice class and tonnage restriction are in place for access to the ports.

But accumulation of ice was yet to impact supply, as

## INDUSTRIAL WOOD CHIPS

NWE wood chips - within 90 days (spot)			€/GJ		
Week index		Month index			
Price	±	Dec	Nov	Oct	
cif NWE	9.40	+0.10	9.89	9.63	9.70

Wood chips cif NWE - forward prices			€/GJ	
	Bid	Ask	±	
1Q25	8.90	9.90	+0.10	
2Q25	8.75	9.75	+0.05	
3Q25	8.75	9.75	+0.05	
4Q25	8.50	10.50	nc	
2026	8.75	9.75	nc	
2027	8.75	9.75	nc	
2028	8.50	9.50	nc	

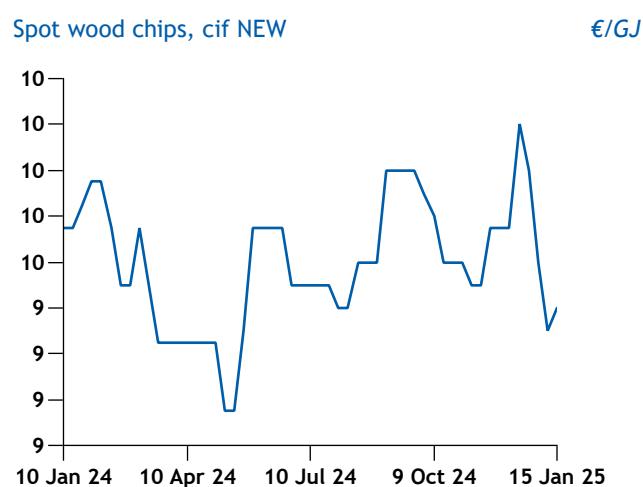
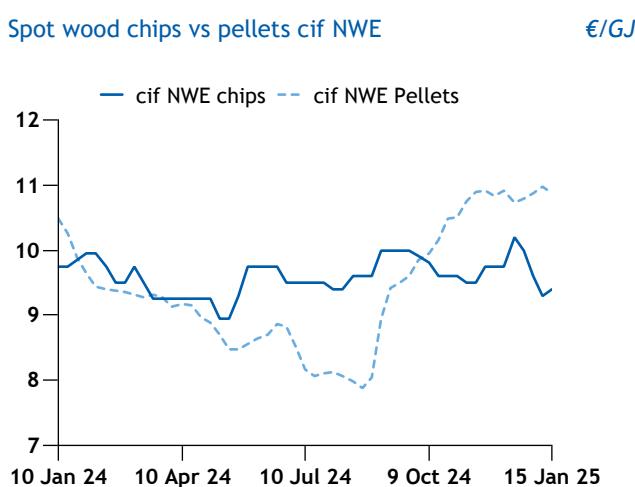
good availability of ice-class vessels prevented any delays to loading. A 5-10pc increase in overall demand could lead to two-four week delays, one participant said.

Sustained cold weather, particularly in northern Europe, may bolster consumption in the coming weeks. In Oslo, minimum temperatures were forecast at minus 1.4°C in the next two weeks and 1.4°C in the 45 days to 28 February, Speedwell data show.

Further out, overall demand for wood chips is expected to drop in the second quarter of 2025, as warmer weather and expected lower power prices will pare heating and power sector demand.

On the power sector, EPH's Provence 150MW unit 4 had an unplanned partial outage on 11-14 January and was partially offline on 15 January for planned maintenance.

Elsewhere, offers from the Iberian Peninsula stood at €7.25-7.50/GJ fob Spain. Any offers below €7/GJ fob Iberia may have certification issues, according to one participant.



## European premium: Spot up

The 45-day spot price for ENplus-certified A1-grade pellets delivered to northern Italy rose on the week, as stronger demand lent support.

The traded range for spot bulk and bagged pellets delivered to northern Italy rose by €5/t on the week on average each to €200-210/t and €210-245/t on Wednesday.

Consumption increased significantly over the past few weeks as colder weather drew on stocks. This has resulted in stronger spot demand, particularly from southern Italy – in or south of Rome – where companies have put orders for large volumes over the past week.

That said, many producers continued to deliver their contractual volumes with little supply available for the spot market.

Inventories were relatively high up until December and most companies in the wholesale segment had not anticipated a quick depletion, therefore no new orders had been placed until the past month. Any new orders for Brazilian pellets – one of the most competitive origins currently – would not be delivered to Italy earlier than March-April and could therefore not meet the current supply gap.

In Austria – another competitive origin for Italy – suppliers were attracted to firming local prices and stocks were getting depleted, leaving with little volume available to be sold in the export market. Offers for bulk pellets hovered around the €180-200/t ex works Austria range in the week. In Germany, these stood around €200-205/t ex works.

Some expected the current tightness to support spot prices for bagged pellets by around €10-15/t, noting that this would be the case only for the very short term. And that prices would drop again as the weather conditions turn.

In Milan, overnight temperatures were forecast at minus 2.3°C in the coming two weeks, and at minus 2.4°C in the 45 days to 28 February, both in line with seasonal norms, Speedwell data show.

Elsewhere, in Belgium, talks for 5,000t of bulk pellets for prompt delivery firmed above €200/t ex works. And bagged pellets in France were priced around €235-45/t delivered south and around €275-85/t delivered northern France.

Most offers for central European pellets, having risen by around €15-25/t compared with a few weeks earlier, has rendered Baltic pellets competitive for deliveries to Italy.

In the Baltics, the spread between industrial and residential-grade pellets has narrowed significantly. Buying interest for premium pellets stood at €170/t fob Baltic, while bids for industrial grade pellets were in the €165-169/t fob range in the week. Assuming freight rates from Baltic ports to Italy around €70-90/t, the net forward price would

Argus Cif NWE monthly figures		\$/t
Balance of January		190.00
February		190.00
March		190.00
April		190.00

*The figures above are an average survey result value for each month contained in the 90-day spot period. They are shown for indicative purposes, to better illustrate the composition of the market-survey component of the spot cif NWE index. The spot index value can be found on page 1 of the report.*

## EUROPEAN PREMIUM WOOD PELLETS

Wood pellets - within 45 days (spot)					€/t
Delivered northern Italy	Mid	Low	High	±	€/t
Bulk	205.00	200.00	210.00	+5.00	
Bagged	227.50	210.00	245.00	+5.00	

Premium wood pellets				€/t
Delivered northern Italy	Month index			€/t
	Dec	Nov	Oct	
Bulk	198.75	205.00	205.00	
Bagged	220.00	227.50	226.00	

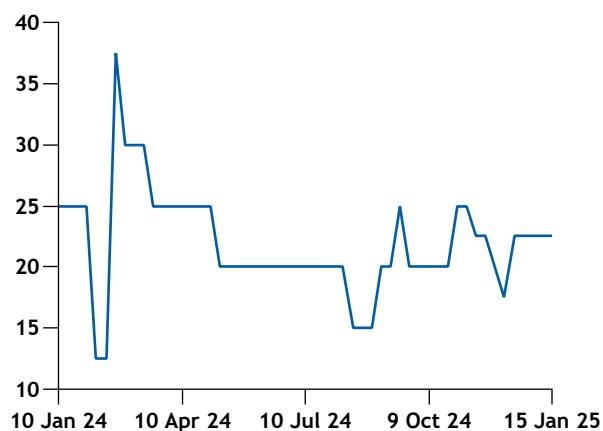
be in the €240-260/t delivered Italy range.

Some in the Baltic Sea basin received enquiries from the UK and continental Europe for small-sized cargoes out of Baltic ports in the week, although trades were yet to be confirmed.

On logistics, current bottlenecks in truck availability were preventing some players from concluding trades for additional volumes. One participant said they were bidding €4/t higher for truck transportation, in a bid to secure some new capacity to cater for new orders.

In Spain, local market prices stood around €225-235/t ex works, and even lower for large volumes to be delivered close to the manufacturer.

### Italian premium prices: bagged vs bulk



## Asian industrial: Pellet prices to S Korea rise

The 90-day spot price for Vietnamese industrial-grade wood pellets of the specification typically sold to South Korea rose slightly this week, with cfr Gwangyang prices also increasing.

Argus assessed the price of wood pellets sold to South Korea at \$130.91/t fob Vietnam, up by 69¢/t on the week, while the cfr Gwangyang price was marked at \$140.52/t, up by \$1.67/t on the week.

Wood pellet supplies from Vietnam remain under pressure because of congestion at several ports and tighter cargo availability ahead of the Tet lunar new year holiday, which runs from late January to early February.

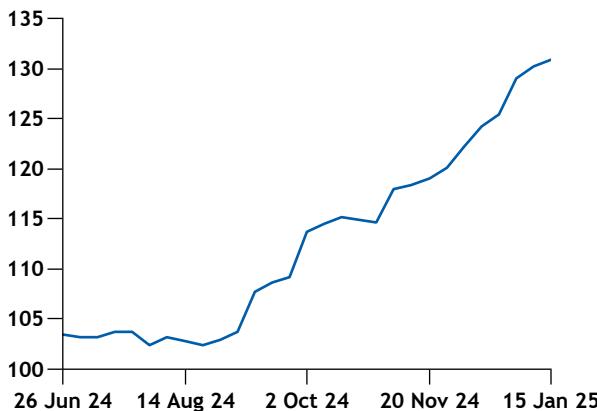
Recent heavy rain in Vietnam's central and southern regions is likely to affect wood pellet production and transportation. Early January has been very busy for Vietnamese suppliers to meet South Korean demand, according to several Vietnamese market participants.

The pre-holiday rush has supported trades in the market with a South Korean trader likely buying a February-March-loading 10,000t wood pellet cargo at around \$135/t on a fas basis. Argus only assesses the Vietnam-to-South Korea market on an fob basis and there is typically a differential of around \$5/t between the two.

State-controlled Korea South-East Power (Koen) issued a tender on 10 January for 40,000t of wood pellets to be delivered in February and March. The company will close the tender on 16 January. Koen also awarded another tender for 60,000t of imported wood pellets for delivery in March at 285,221 South Korean won/t (\$194.55/t) on a ddp basis, and 10,000t of domestically produced wood pellets at W351,000/t ddp, both excluding value-added tax.

The system marginal price (SMP) — the price at which independent power producers sell electricity to state-owned Kepco — rose for inland South Korean power, excluding Jeju

Fob Vietnam to S Korea wood pellet spot price \$/t



## ASIAN INDUSTRIAL WOOD PELLETS

Wood pellets - 90 days (spot)			\$/t			
		Week index	Month index			
		Price	±	Dec	Nov	Oct
fob Vietnam to S Korea	130.91	+0.69	125.21	118.87	114.59	
fob Vietnam to Japan FIT	139.00	-0.54	136.59	133.54	128.63	
cfr Gwangyang	140.52	+1.67	134.85	128.36	124.96	

## ASIAN PALM KERNEL SHELLS

Palm kernel shell (spot)			\$/t			
		Week index	Month index			
		Price	±	Dec	Nov	Oct
<b>Excl. to Japan FIT</b>						
fob east coast Sumatra	105.00	+3.67	96.66	93.47	86.16	
fob peninsular Malaysia	86.50	+0.40	85.67	82.38	79.04	
<b>To Japan FIT</b>						
fob east coast Sumatra	116.30	+3.21	110.11	104.82	94.30	
fob peninsular Malaysia	94.88	-0.83	93.61	90.79	86.08	

Island. The SMP was at W130.31/kWh on 14 January, up from W115.69/kWh on 7 January.

South Korea's renewable energy credit (REC) increased to W70,800/REC on 14 January, from W66,000/REC on 7 January and W68,800/REC on 9 January, the latest data show.

The Vietnamese market for pellets which meet Japan's feed-in tariff (FiT) requirements slightly declined. The fob

## Proposal to discontinue PKS fob peninsular Malaysia (excl to Japan FIT) and St Petersburg freight rates

Argus proposes to discontinue its PKS fob peninsular Malaysia (excl to Japan FIT) spot and monthly prices because of a lack of market liquidity resulting from changes to Japanese power sector sustainability regulations, which took effect from 1 April 2024.

Argus also proposes to discontinue already suspended freight rates for wood pellet shipments from St Petersburg because of a lack of activity along these routes.

Argus will accept comments on these proposed changes until 15 January. To discuss comments on this proposal, please contact Erisa Senerdem at erisa.senerdem@argusmedia.com. Formal comments should be marked as such and may be submitted by email to biomass@argusmedia.com and received by 15 January. Please note, formal comments will be published after the consultation period unless confidentiality is specifically requested.

Vietnam price for FiT-compliant pellets went down by 54¢/t on the week to \$139/t. Bulk freight rates from Vietnam to Japan were in a wide range of \$25-38/t this week.

A weaker Japanese yen could weigh on imports, although Japan's biomass demand in 2025 is likely to be stable owing to a number of new plants coming on line. This includes the 75MW Chofu and 50MW Niigata Higashikou, which started operations in December 2024. But the 85MW Suzukawa plant halted operations in December 2024 with no outlook to resume, in addition to the 20MW Tosa, which has stopped for an indefinite period since September 2024.

A Japanese trader bought a January-loading 10,000t cargo of palm kernel shells (PKS) from a supplier at \$120/t fob east coast Sumatra. The Indonesian market for PKS that meets Japan's FiT requirements was assessed at \$3.21/t higher on the week at \$116.30/t fob east coast Sumatra. The market for material that is not Japan FiT compliant was

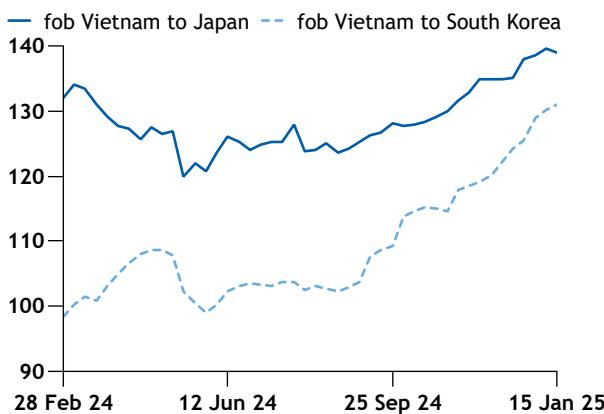
marked \$3.67/t higher on the week at \$105/t fob east coast Sumatra.

There are buyers in the market that mentioned that sellers are offering at \$110-115/t levels. But Japanese buyers are not willing to pay this price and are still bidding at around \$105/t. Deals are likely to be concluded at around \$105-110/t, market participants said.

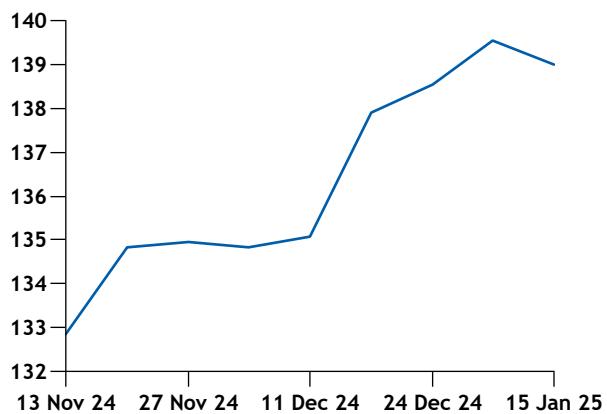
PKS supply in Malaysia could be disrupted by monsoon rain, which started again late last week, causing floods in peninsular Malaysia, with southern and eastern coastal areas particularly affected. Heavy rain could also cause issues for moisture specifications of PKS, a market participant said.

Prices for Malaysian PKS that complies with Japan's FiT requirements declined by 83¢/t on the week to \$94.88/t fob peninsular Malaysia, while prices for material not meeting Japan's FiT specifications were at \$86.50/t, up by 40¢/t on the week.

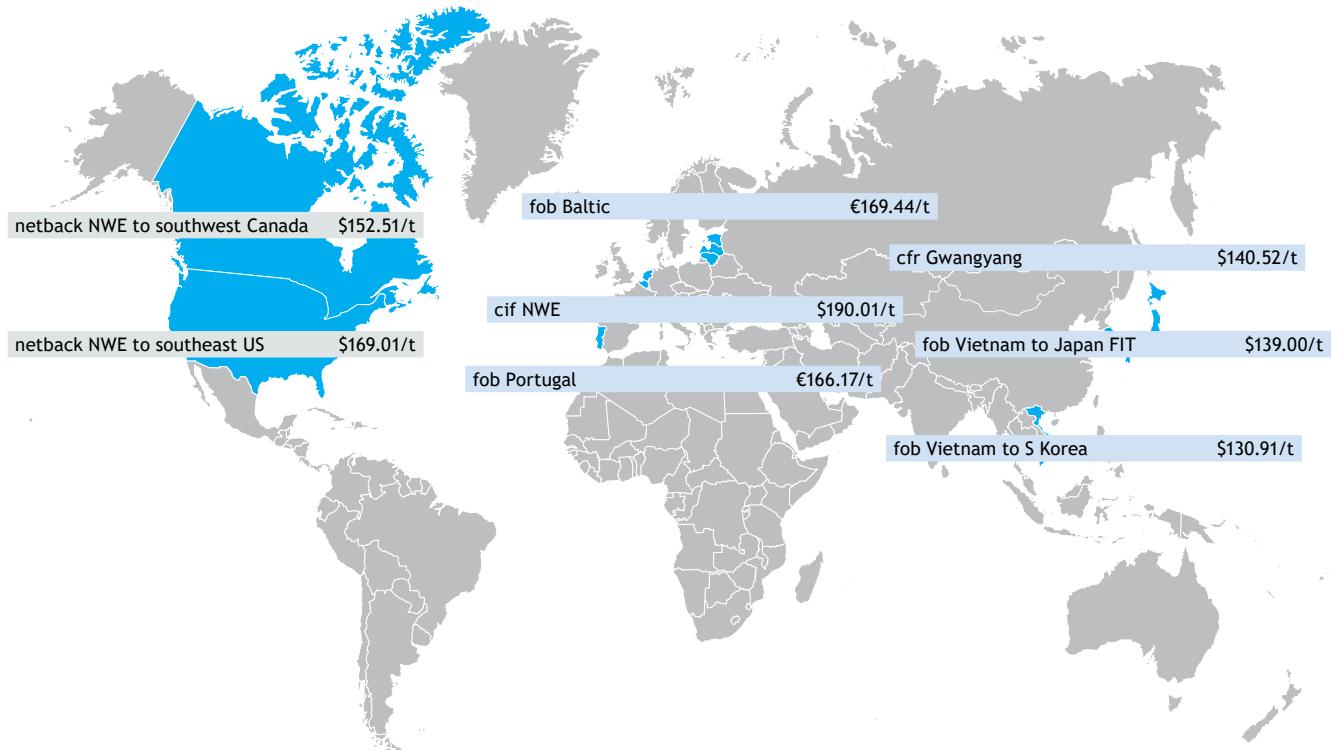
#### Fob Vietnam industrial pellet spot prices \$/t



#### Fob Vietnam to Japan FiT wood pellet spot price \$/t



## INDUSTRIAL WOOD PELLET SPOT PRICES AT A GLANCE



## COMPETING FUELS

Argus competing fuel assessments			
	Units	Delivery	Price
Europe			
Gasoil heating oil French cif NWE	\$/t	prompt	738.500
Natural gas NBP	€/MWh	Feb	48.1595
US			
Fuel oil 1% New York Harbor	\$/bl	prompt	80.685
Natural gas Nymex	\$/mnBtu	Feb	3.934
European Emissions			
CO2 EU ETS	€/t	2026	77.060

## WOOD PELLET FREIGHT RATES

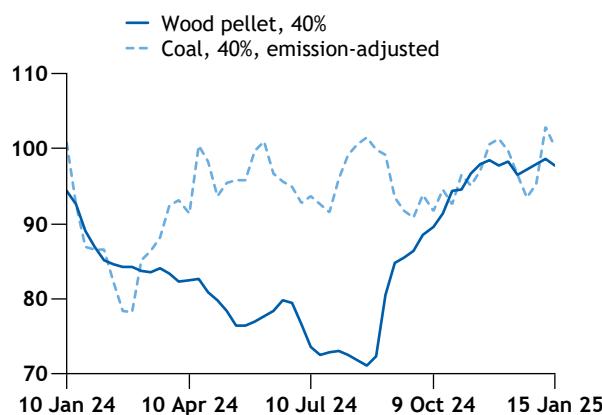
Argus wood pellet freight indications, spot cargo				
Route	Tonnage	Units	Rate	±
Aveiro-ARA	3500	€/t	21.50	+0.50
Aveiro-Copenhagen	3500	€/t	22.50	+0.50
Aveiro-Hull (UK)	3500	€/t	19.50	+0.50
Riga-ARA	5000	€/t	22.00	+0.50
Riga-Copenhagen	5000	€/t	17.00	+0.50
Riga-Stockholm	5000	€/t	17.00	+0.50
St Petersburg-ARA	3500	€/t	na	nc
St Petersburg-Copenhagen	3500	€/t	na	nc
St Petersburg-Stockholm	3500	€/t	na	nc
Mobile-ARA	25000	\$/t	24.75	-2.00
Mobile-ARA	45000	\$/t	22.00	-2.00
Savannah-ARA	25000	\$/t	21.00	-2.00
Savannah-ARA	45000	\$/t	19.00	-2.00
Vancouver-ARA	45000	\$/t	37.50	-0.50

## BREAK-EVEN GENERATION COSTS

cif NWE wood pellet break-even			cif ARA coal break-even			Natural gas TTF break even		15 Jan
Plant efficiency	Spot	2Q25	Plant efficiency	Spot	2Q25	Plant efficiency	Spot	2Q25
\$/MWh								
36%	111.78	111.77	36%	114.55	113.74	49.13%	128.68	128.92
38%	105.90	105.89	38%	108.52	107.75	55%	114.95	115.16
40%	100.60	100.60	40%	103.09	102.36	58%	109.00	109.21
41%	98.15	98.14	41%	100.58	99.87	60%	105.37	105.56
€/MWh								
36%	108.64	108.63	36%	111.33	110.54	49.13%	125.07	125.30
38%	102.92	102.92	38%	105.47	104.72	55%	111.72	111.93
40%	97.78	97.77	40%	100.19	99.49	58%	105.94	106.14
41%	95.39	95.39	41%	97.75	97.06	60%	102.41	102.60

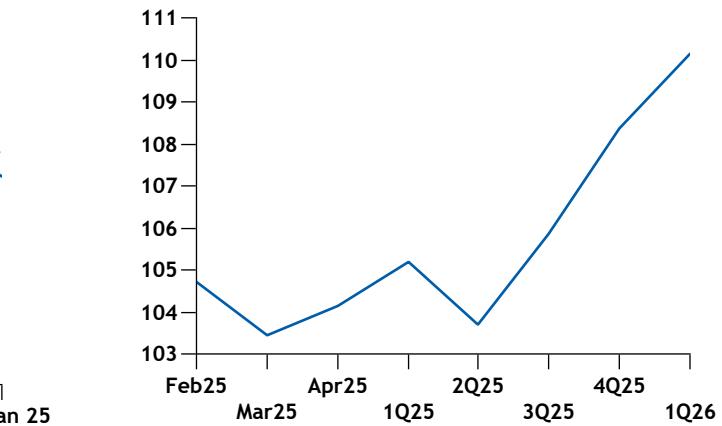
\*Break-even generation costs represent the calculated costs of generating power with wood pellets and/or coal based on Argus assessed spot prices. For a plant to break even, the combined price of power and subsidy amount (if applicable) would need to be equal to the calculated break-even generation cost.

Break-even generation cost, cif NWE spot



€/MWh

cif ARA coal swaps forward curve



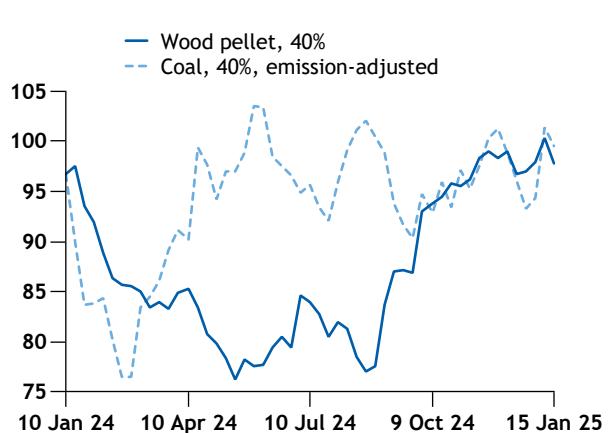
\$/t

Wood pellet, cif NWE spot premium to coal, cif ARA



\$/t

Break-even generation cost, cif NWE front quarter €/MWh



## NEWS

## NWE biomass-fired generation up in 2024

Combined biomass-fired power generation in northwest Europe (NWE) rose on the year in 2024, owing to stronger UK and Danish output, and there is scope for output to remain strong throughout 2025.

Combined biomass burn for power in the UK, Denmark, France, Belgium and the Netherlands rose to 3.5GW on an average hourly basis in 2024, from 3.2GW a year earlier, Remit and other data show (see chart).

Output in the UK rose to 2.1GW from 1.5GW a year prior, mostly owing to stronger generation at the units supported by the contracts for difference (CfD) scheme, including the newly started 285MW Teesside plant which also runs under CfDs, national grid data show. Generation at CfD units had been near zero in the 12 months to September 2023 when the scheme was economically unviable.

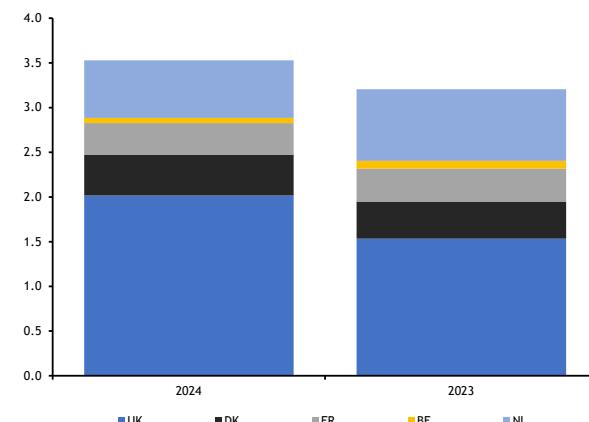
Output at MGT's Teesside plant averaged 125MW in 2024, well above 52MW during 30 September-31 December 2023, LCCC data on actual generation show. The unit started commercial operations on 30 September 2023 after multiple years of delays. It has experienced extended periods of unplanned shutdowns since it became operational because of technical issues (see chart), and has yet to achieve optimal generation.

Output at the 2.6GW Drax plant rose on the year, owing mostly to a jump in generation at the plant's CfD-supported 660MW unit 1, as well as stronger output at similarly-sized units 2 – which operates under the renewable origin (RO) scheme – and 4 – which operates partly on RO credits and partly in the balancing market.

The EP-operated 399MW Lynemouth plant also more than doubled generation on the year. This was despite near zero generation at its 133MW unit 3 compared with a year prior.

## NWE biomass-fired output up in 2024

GW



The unit has been offline for more than 10 months and is expected to return to full availability from Thursday, Remit data show.

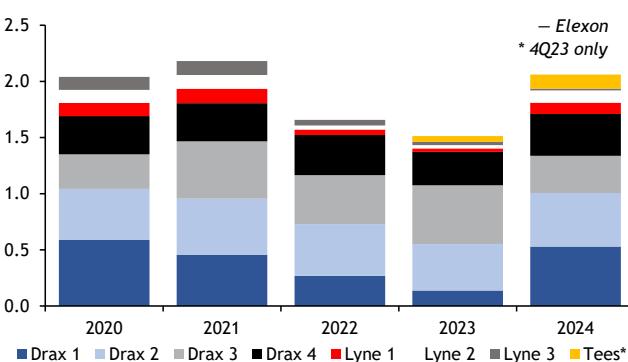
There is scope for UK output to remain strong or even higher in 2025, as positive bark spreads for CfD-operated units and forward UK power market prices suggest utilities will have an incentive to strengthen generation. Drax said in November it was “effectively fully hedged” for 2025, with 9.7TWh of net power hedged for its RO-supported hydro and gas-fired generation, and 1.7TWh hedged for its CfD-supported output. And the Lynemouth and Teesside plants, which both run under CfDs, also have an incentive to keep output strong.

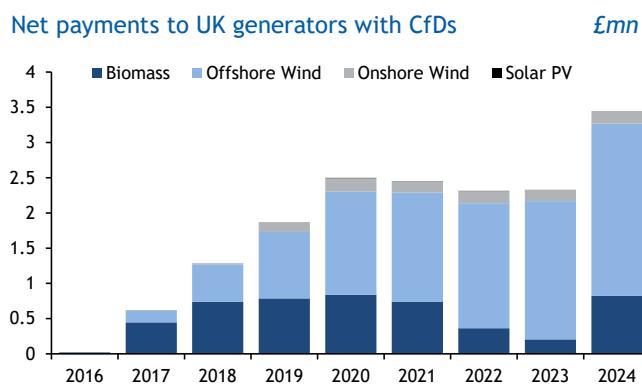
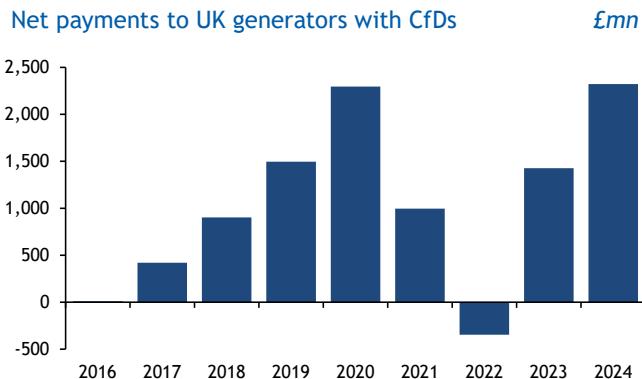
Elsewhere, Danish biomass-fired generation also saw yearly gains in 2024, Entso-E data show. Denmark's wood pellet consumption probably increased by a faster pace than generation in the first half of 2024, as the 380MW Studstrup 3 power plant had been running on coal over the same period in 2023 while the wood pellet silo was being repaired following a fire in September 2022. And in late 2024, biomass burn for power reached a three-year high in November and a two-year high in December, as unusually colder weather bolstered demand for power and heat in the country. Unplanned shutdowns at key units had also pared Danish output in late 2023.

By contrast, Dutch biomass-fired generation was set to drop on the year to about 640MW on an average hourly basis from 800MW a year prior, data from Dutch statistical office CBS and Argus estimations suggest. The downside was partly because of major shutdowns at Amer 9 and other units throughout the year. Weaknesses in Dutch power prices, particularly in January-July, also probably discouraged generation as bark spreads for SDE++ were not sufficiently

## UK pellet burn jumps in 2024

GW





attractive to bolster generation.

French biomass-fired generation, which mostly includes non-pellet types of feedstocks, fell slightly on the year in 2024. But this trend could be reversed, following an eight-year deal between utility Gazel Energie and the French government to sell power from the 150MW Provence 4 chip-fired unit, starting from 2025. The plant has been ramping up generation since 7 January, after being offline for more than a year.

Biomass-fired output in Belgium also dropped on the year, as the Engie-operated 205MW Rodenhuize plant was decommissioned in March 2023.

By Hannah Adler and Erisa Senerdem

### UK's CfD power output at record high in 2024

UK power generation supported by the state-run contracts-for-difference (CfD) scheme rose to its highest last year since records began in 2016, bolstered by improved generation economics and new capacity.

Overall output jumped to 3.5GW on an average hourly basis in 2024, up from 2.3GW a year earlier, data by LCCC, which runs the scheme, show (see graph).

Biomass-fired and offshore wind generation saw the largest gains year on year.

Biomass-fired CfD output rose to 821MW in 2024,

around 32MW above the 2019-21 average and well above just 205MW a year earlier. The UK's total biomass-fired generation, including that outside the CfD scheme, was just above 2.1GW last year, up from 1.5GW in 2023.

The rise in CfD-covered biomass-fired output came as generators were topped up by the scheme throughout the year, while industrial wood pellet prices declined significantly from record highs in 2022-23. Biomass burn under the scheme had been near zero in the 12 months to September 2023 because it was economically unviable for generators.

The start-up of UK firm MGT's 285MW Teesside dedicated biomass-fired plant, which also operates under CfDs, in late 2023 further bolstered output.

On a quarterly basis, CfD-linked biomass burn reached a yearly high of 933MW in July-September, as **biomass-fired generation margins strengthened**, with the base-load market reference price (BMRP) dropping to £80.52/MWh for summer 2024, down by almost 40pc from winter 2023-24 and by 61pc from summer 2023, and well below the strike price in biomass-fired generators' CfDs.

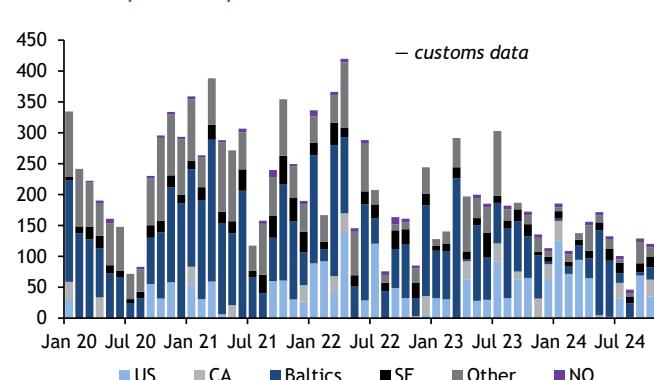
UK generator Drax's 645MW unit 1 has a strike price of £138.16/MWh (\$172.67/MWh) for its CfD unit for April 2024-March 2025, while the 405MW Lynemouth pellet-fired plant has a strike price of £145.02/MWh – meaning that they received £57.64/MWh and £64.50/MWh, respectively, from LCCC when generating last summer.

Generators have been doing more profiling, despite the overall increase in CfD-linked biomass burn, with output during weekends holding below long-term averages. Weekend output rose to 818MW in 2024 from just 178MW in 2023, but remained well below 1.5GW in 2019-21. In contrast, weekday output rose above the 2019-21 average of 792MW to 852MW.

### CfD revenues jump

Across all technology types, generators received £2.3bn

### Danish imports drop in Oct



from the scheme in 2024, up from £1.4bn in 2023 and from payments to the scheme of £346mn in 2022 (see graph). Offshore wind generators received the most net payments from their CfDs when spot prices fell in the first quarter of 2024. The intermittent market reference price – used for solar and wind power – was £64.36/MWh in the first quarter, while the weighted average capture price for CfD units was £63.20/MWh.

Offshore wind capacity covered by the scheme is due to increase from 7GW last quarter to 9.4GW by the end of this year, data from LCCC show, rising to 11.4GW by the end of 2026. Solar power capacity is due to jump sharply from 2028, with almost 2.2GW having been awarded CfDs in the latest allocation round.

By Timothy Santonastaso and Erisa Senerdem

## Nordic pellet imports fall in October

Combined wood pellet imports to Denmark, Finland, Sweden and Norway fell by 38pc on the year in October, as receipts dropped for each country, customs data show.

Overall Nordic imports totalled 146,000t in October, down from 263,000t a year earlier and half the 2020-22 October average for the region.

Danish imports, which comprise 82pc of overall Nordic imports, fell by a third on the year, probably as unusually mild weather in October and the first half of November weighed on spot demand for cargoes and encouraged consumers to delay cargoes. Unplanned outages in October-November also pared overall consumption and as a result,

import demand. Orsted's 548MW Avedore 2 and 380MW Studstrup 3 units underwent unplanned outages that lasted for most of October. The same units experienced outages in November as well.

Danish imports from the Baltics saw the largest yearly drop in volumes in October and remained significantly below the 2020-22 average for the month. Milder weather put a dent in imports from this region, which provides most of the short-term flexibility in shipments.

Baltic pellets were priced uncompetitively to northwest Europe (NWE) – including Denmark – in the first 10 months of last year, paring European demand for the origin, but they were more competitive closer to the year-end, probably to encourage some interest for the origin in NWE.

Danish imports from the US also nearly halved in October, but were offset by a jump in Canadian imports from zero in October 2023.

Overall imports in the rest of the Nordics also fell in October.

Swedish imports fell by 76pc on the year, as the country imported considerably less from Estonia, while its receipts from Denmark rose.

Finnish imports fell marginally, as higher receipts from Estonia were offset by slower imports from other countries.

Norwegian imports made up only 2pc of the Nordic mix, broadly flat on the year.

By Alejandro Moreano and Erisa Senerdem

## Baltic wood pellet exports edge up in November

Wood pellet exports from Baltic countries increased by 7pc on the year in November, supported by quicker Latvian shipments, while Estonian and Lithuanian loadings held broadly steady.

Overall Baltic exports rose to 325,000t in November, up by 22,000t on the year, supported by significantly higher shipments from Latvia to Denmark (see table).

Latvian exports to Denmark more than doubled on the year in November, supported by stronger pellet consumption in the Nordic country. Danish biomass-fired generation rose by 286MW on the year to 724MW in November, as colder weather particularly in the second half of the month bolstered burn for power and heat generation.

By contrast, Latvian exports to the UK fell by just over a fourth, which could be partly because of quicker shipments for the same route earlier in the year. But the trend is set to be reversed for December, when Latvian shipments to the UK are estimated to have risen to 152,000t, according to ship-tracking data from trade analytics firm Kpler. This would be significantly higher than 61,000t a year earlier.

Estonian exports to Denmark held broadly flat on the year, making up for the largest share in the country's overall

Baltic wood pellet exports, November					
	2023	2024	y-o-y change	2020-22 average	2024 vs 2020-22 average
Estonian wood pellet exports					
Denmark	98.3	29.3	69.0	69.2	29.1
UK	95.0	129.2	-34.2	66.6	28.4
France	4.1	11.8	-7.7	0.3	3.8
Total	201.2	178.5	22.7	188.4	12.8
Latvian wood pellet exports					
Denmark	98.3	29.3	69.0	69.2	29.1
UK	95.0	129.2	-34.2	66.6	28.4
France	4.1	11.8	-7.7	0.3	3.8
Total	201.2	178.5	22.7	188.4	12.8
Lithuanian wood pellet exports					
Denmark	12.1	5.6	6.4	1.0	11.0
Latvia	10.1	10.9	-0.8	12.4	-2.3
Italy	2.6	5.2	-2.7	18.3	-15.7
Total	33.3	33.6	-0.3	55.1	-21.8

– Customs data

exports in November, at 76pc, while exports to the UK picked up.

Elsewhere, Lithuanian exports to Denmark doubled to 12,000t.

Shipments out of Lithuania and Estonia to southern and central European destinations, particularly Italy, France and Belgium — typically consumers of residential pellets — shrunk year on year in November, as Baltic prices were deemed uncompetitive compared with central European, Balkan and Brazilian supplies. Mild weather in October and the first half of November also pared overall demand for premium pellets in these regions.

Baltic pellets were priced uncompetitively into northwest Europe (NWE) during the first 10 months of 2024, paring European demand for the origin. But the fob Baltic and cif NWE spread has widened significantly from November (see chart), which will likely encourage stronger demand in NWE for the origin. A number of spot industrial wood pellet handy-sized cargoes for Baltic pellets were concluded in December for delivery throughout the first quarter of 2025.

By Marta Imarisio and Erisa Senerdem

### EU sawn wood production to rise in 2025: EOS

European sawn softwood production is expected to grow by 2-3pc in Europe in 2025, but will stay below long-term averages, European sawmill industry organisation (EOS) economic affairs director Diego Benedetti said in the 2024 Bioenergy landscape report.

Consumption of sawn wood may increase in 2025, as interest rate cuts from the European Central Bank might stimulate construction activity. Slowdown in construction was a primary driver for the sharp drop in sawn wood consumption in 2024.

The increasing market share of wood as a building material should also support consumption in 2025.

A slower drop in building permits — which shows future construction activity trends — when compared with housing starts — which show present construction activity — also points to a market upturn. The recovery in demand could be subdued in the short term however, Benedetti said in the report.

Sawn softwood production and consumption declined in 2024, following the significant challenges facing the market from the second half of 2022.

Production at the end of 2024 was 12pc lower than in 2021 — the year that preceded the downturn since 2022 — preliminary data suggest.

Rising raw material costs — particularly in Nordic countries — and limited sawn wood sales also contributed to the downside in 2024. Raw materials prices account for 60-65pc of sawmills costs.

Going into 2025, costs for machine maintenance, labour

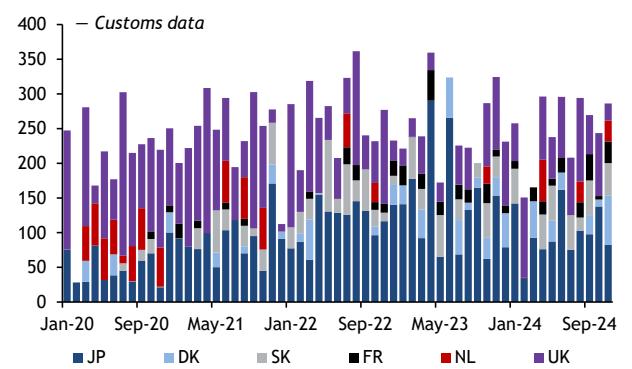
and raw material costs are set to hold high. The industry will have to focus on operational efficiency and invest in automation to manage costs, Benedetti said. EOS' raw material availability index reached its lowest level since its inception in 2013 at around 2.40. The index is a qualitative assessment of roundwood availability, 1 being the lowest level and 5 the highest.

Low raw material availability is “concerning” for the sawmill industry, he added.

Raw material availability in 2025 is projected to be “disappointing” according to EOS’ early projections and may further deteriorate once demand picks up from its current low levels. Legislation such as the EU’s [nature restoration law](#) and the land use, land-use change and forestry (LULUCF)

### Canadian exports down in Nov

‘000t



### US wood pellet exports, November

‘000t

Country	2024	2023	y-o-y change	2020-22 average	2024 vs 2020-22 average
UK	699.2	407.5	291.7	521.4	177.8
Japan	124.9	123.1	1.7	54.8	70.0
Denmark	33.5	63.3	-29.8	20.0	13.5
Netherlands	0.1	31.6	-31.5	89.9	-89.8
Total	873.8	655.6	218.2	706.3	167.5

— Customs data

### Canada wood pellet exports, November

‘000t

	2024	2023	2020-22 average
Japan	82.2	152.9	102.9
Denmark	71.0	27.0	13.9
South Korea	47.1	30.0	24.4
France	31.2	10.0	12.6
Netherlands	30.3	-	28.3
UK	24.5	104.4	98.6
Total	301.3	343.7	288.4

— Customs data

will “probably not make the availability of roundwood any better”, the sawmilling industry organisation said.

Bioenergy Europe also urged the EU in the landscape report to explicitly prioritise bioenergy in the forthcoming clean industrial deal, within EU’s clean technology framework, to secure investment and foster innovation.

The new clean industrial deal, presented by European Commission president Ursula von der Leyen in her political guidelines for the 2024–2029 mandate, will work to deliver the conditions for businesses to meet the EU’s decarbonisation goals.

By Hannah Adler

## Sweden's Sodra to sell Baltics forest land

Swedish forest industry group Sodra is planning to sell around 153,000 hectares of land and related activities in Latvia and Estonia this year.

“A process is under way to find the right buyer. But we are not in a hurry,” Sodra Skog business area president Peter Karlsson said in a statement. The company aims to finalise the divestment within 2025.

Most of the firm’s possessions in the Baltics are in Latvia, where Sodra manages 132,000 hectares of land property, of which 107,000 hectares is forest land. And of the 16,000 hectares of land Sodra owns in Estonia, 90pc is forest land.

Sodra is involved in forest management, logging, pulpwood purchasing, forest land purchasing, selling and renting of agricultural land and hunting rights rental activities in the Baltics.

Sodra lifted wood prices – for saw logs and small-diameter sawable ranges – to historical highs in October 2024, and said it was introducing a “new price calculation tool” from November, taking steps to increase financial security for forest owners and improve transparency in the wood market.

“We are operating in a market and in a global situation where everything is moving very fast, and this is creating uncertainty for forest owners,” Karlsson said in October.

The company expects 2025 to be a challenging year.

By Alejandro Moreano

## US wood pellet exports jump in Nov

US wood pellet exports jumped on the year in November, bolstered by quicker shipments to the UK, while overall Canadian exports fell.

Combined US and Canadian exports rose by 176,000t on the year to 1.2mn t in November and saw a similar increase when compared to the 2020-22 average for the month, customs data show (see tables). Stronger US exports more than offset a drop in Canadian loadings.

US exports to the UK rose by 72pc on the year to nearly 700,000t, accounting for 80pc of total US shipments in the month. This more than offset a drop in Canadian exports to the UK.

A large chunk of the November loadings out of North America were scheduled to be delivered to destination ports in December, when pellet burn for power had been expected to hold solid in the UK and continental Europe.

That said, UK pellet-fired output dropped significantly on the year in December because of unplanned outages at key units, notably Drax’s 645MW unit 4, which has been on an unscheduled outage since 2 December and is scheduled to come back on line on 14 January. MGT’s 285MW Teeside power plant was also off line on 10 December-8 January, Remit data show. Lynemouth’s 133MW unit 3, which has been on outage for over a year, remained off line throughout December, and other units at this and Drax’s York site also underwent unplanned outages for several days during the month.

The backlog from unexpectedly weaker generation in the UK in December may lead to delays of term cargoes and limited interest for spot volumes in the coming weeks. Combined loadings out of US ports bound for the UK were just under 565,000t in December, according to ship tracking data from trade and analytics firm Kpler, which would be about 100,000t below shipments a year earlier.

By contrast, US exports to Denmark and the Netherlands dropped on the year because of unplanned outages, a slow start to the heating season and changes in the term contract portfolio.

US loadings to the Netherlands dropped significantly throughout 2024, by 717,000t on the year to 1.3mn t in January-November. Most of this decline could be attributed to the termination of two term contracts between US wood pellet producer Enviva and [RWE Supply and Trading](#), which operates the 631MW pellet-fired Amer 9 plant and 790MW co-fired Eemshaven unit in the Netherlands.

US shipments to Japan stayed broadly flat on the year at 125,000t. Canadian exports to the UK fell by 80,000t to a four-year low for the month to 25,000t, although loadings were still 67pc higher on the year in January-November. Meanwhile, shipments to Denmark, France and the Netherlands rose by a combined 95,000t on the year.

Canadian exports to Japan also dropped on the year in November, which could be because of outages at certain units in the country, whereas loadings bound for South Korea increased. By Erisa Senerdem and Marta Imarisio

## South Korea's Koen issues tender to seek wood pellets

South Korean state-owned utility Korea South-East Power (Koen) issued a tender on 10 January seeking 40,000t of imported wood pellets.

The supply is for the No.1 and No.2 units at its Yeongdong biomass power plant. Delivery was requested in February

REC for independent power producers		/MW
Year	REC rate	
2025	1.50	
2026	1.49	
2027	1.49	
2028	1.48	
2029	1.47	
2030	1.46	
2031	1.45	
2032	1.44	
2033	1.43	
2034	1.41	
2035	1.40	
2036	1.37	
2037	1.35	
2038	1.32	
2039	1.29	
2040	1.24	
2041	1.18	
2042	1.10	
2043	0.99	
2044	0.81	
2045	0.50	

Source: South Korea's Ministry of Trade, Industry and Energy

REC for state-owned utilities		/MW
Year	REC rate	
2024	1.50	
2025	1.00	
2026	0.75	
2027	0.50	

Source: South Korea's Ministry of Trade, Industry and Energy

### Korea's REC changes may pare biomass imports

South Korea's renewable energy credit (REC) scheme revisions for biomass-fired power generation will boost private and state-run utilities' wood pellet imports in the short term, then curb them in the long run.

The South Korean government on 18 December announced a [gradual reduction in RECs](#) for biomass-fired generation. The new rules are set to bolster pellet imports in the short term, but the gradual reduction in RECs will result in lower overall imports and new market trends in the longer run.

The changes were designed differently for state-run producers and independent power producers (IPPs), so the impact on each group is different. RECs for state-run power generators will be reduced from 1.5 in 2025 to 0.5 for dedicated biomass utilities by 2027, and 0 for co-fired biomass generation producers. RECs for IPPs will be reduced to the same respective levels but over 20 years starting from 2026, after a one-year grace period (*see tables*).

State-run utilities will see the largest impact in the near term, given the much shorter timeline for their credit reduction, with a stronger incentive for generators to increase output when REC credits are higher. This is set to bolster imports over the next three years as utilities secure most of their pellet needs from abroad.

This is in contrast to IPPs, which will see a more gradual REC reduction in the 20 years from 2026, and their demand for imports is expected to be broadly unaffected in the near term. IPPs also have an incentive to burn more in the coming few years because of the higher REC rates compared to later.

Biomass-fired generation at some utilities may rise by 10%

Renova's Biomass-fired Electricity Sales in December 2024			
	Capacity(MW)	Electricity Sales(GWh)	Start of Operations
Akita	21	13	Jul-16
Ishinomaki Hibarino	75	52	Mar-24
Sendai Gamo	75	39	Nov-23
Tokushima Tsuda	75	22	Dec-23
Kanda	75	50	Jun-21
Total	320	177	

Source : Renova

and March 2025 on a delivered duty paid (ddp) basis. Bidders were invited to supply a minimum of 1,000 t/month for a total of 2,000t. There is no contracted unit price.

The pellets should have a net calorific value of more than 4,000 kcal/kg on an as-received basis, slightly higher than South Korea's wood pellet standard of 16.5 GJ/t or 3,943.6 kcal/kg. Sulphur, chlorine, and nitrogen content should not exceed 0.05pc, 0.05pc and 0.3pc respectively, all on an air-dried basis. Total moisture should be kept below 10pc on an as-received basis, while iron must be removed.

Koen will stop accepting bids on 16 January. They will receive price bids on 17 January from selected applications.

Koen previously issued a tender, which opened on 30 December 2024 and closed on 7 January, to seek 72,000 t for delivery in March. It asked for pellets from Vietnam, Malaysia, Indonesia, and Thailand. Russian pellets were not allowed in the tender.

Koen awarded the tender for 60,000 t of imported wood pellets for delivery in March 2025 at 285,221 South Korean won/t (\$194.55/t) on a ddp basis, and 10,000 t of domestically produced wood pellets at W351,000/t ddp, both excluding value-added tax.

By Joshua Sim

15pc on the year in 2025, according to a South Korean buyer. Higher demand for spot wood pellet cargoes has already lent support to the spot fob Vietnam price to South Korea in recent weeks.

South Korean demand for imports may decline in the longer term, if the reduced state support leads to uneconomical margins for utilities. Vietnamese suppliers have already expressed concerns about South Korean demand spiking in the near term only to decline in subsequent years.

Some utilities are set to reach the end of their economic life in the mid-2030s, including the 100pc biomass-fired Yeong-Dong units 1 and 2 which are set to shut down in 2032 and 2035 respectively. This will cut overall demand for pellets unless new power plant projects are launched.

The reduction in RECs is also set to discourage new investment. Investment firm Glenwood Private Equity, which had signed a preliminary agreement to acquire South Korean IPP SGC Green Power, cancelled the deal after the government's announcement on the reduction of RECs in December.

Utilities may also start looking for alternative, cheaper feedstocks such as wood chips going forward. Expectations of a decline in overall South Korean demand for pellets may encourage southeast Asian producers to seek to sell more to other markets such as Japan or Europe, a Vietnamese pellet producer said.

By Joshua Sim

**Renova lifts renewable power sales in December**  
Japanese renewable energy developer Renova's electricity sales in December 2024 rose from a year earlier, according to data published by the company on 14 January.

The company sold 198GWh of renewable energy in December 2024, including solar, biomass and geothermal power, which was 6pc higher than in the same month of 2023. Electricity sales generated by biomass-fired power plants in December totalled 177GWh.

The 75MW Ishinomaki Hibarino, which started commercial operations in March 2024, supplied 52GWh in December. The 75MW Sendai Gamo generated 39GWh, while the 21MW Akita provided 13GWh. The 75MW Kanda produced 50GWh of electricity.

The 75MW Tokushima Tsuda, which came on line in December 2023, and was halted from April to July 2024 for periodic inspections and from late September to 22 December 2024 for facility renovations, generated 22GWh in December 2024.

Renova sells electricity from Sendai Gamo, Kanda, and

Tokushima Tsuda under the feed-in-tariff (FiT) scheme. Electricity generated by Ishinomaki Hibarino and Akita is sold under the feed-in-premium (FiP) scheme, based on power purchase agreements with its clients.

The company is planning to begin operations at the 75MW Omaezaki and the 50MW Karatsu in March 2025, after delays in the start-up of both plants for technical reasons.

By Takeshi Maeda

### **Idemitsu trials SAF feedstock plantation in Australia**

Japanese refiner Idemitsu is set to launch a trial plantation of pongamia trees in Australia, as the company eyes the crop as a potential feedstock for sustainable aviation fuel (SAF).

Idemitsu plans to start demonstration of a pongamia — a non-edible oilseed tree — plantation in Queensland from mid-January together with US agricultural innovation firm Terviva, it announced on 9 January. Idemitsu has invested an undisclosed sum into Terviva to utilise its expertise of pongamia. Terviva has conducted over 10 years of research on the cultivation capabilities of pongamia.

Idemitsu and Terviva will carry out the trial plantation for an unspecified period on the 50-hectare (ha) land surrounding the South Walker Creek mine managed by Australian mining company Stanmore Resources. The firms are looking to verify long-term cultivation methods for pongamia and the optimisation of the entire supply chain from cultivation to oil extraction and SAF production.

The demonstration will also explore the potential creation of carbon credits from pongamia trees through afforestation and production of black pellets from pongamia shells for power generation. The companies will also study the use of pressed pongamia oilseed cake as livestock feed.

Idemitsu is planning to produce pongamia-based SAF through the hydro-processed esters and fatty acids (HEFA) method to meet expected rises in SAF demand over the energy transition period. The company aims to establish a supply chain for 500,000 kilolitre (kl)/yr of SAF by 2030.

Idemitsu aims to produce 250,000 kl/yr of SAF using HEFA technology at its Tokuyama plant in western Japan's Yamaguchi prefecture by the April 2028-March 2029 fiscal year. The company is considering procuring 270,000-280,000t/yr of feedstocks from Japan and overseas markets to produce the HEFA-based SAF, and will supply the SAF mainly to domestic users.

By Motoko Hasegawa

### **Moldova looks to Ukrainian coal to aid energy crisis**

Moldova's president Maia Sandu said today the country

is considering receiving coal from Ukraine as a way of combating its [energy crisis](#).

Speaking in public today, Sandu said discussions had been ongoing with Ukrainian president Volodymyr Zelenskyy on possible solutions to the energy crisis. "A potential solution is for Ukraine to supply coal to the power generation enterprise," Sandu said.

Zelensky said Ukraine would be ready to help Moldova with coal after a conversation with Sandu yesterday. Moldova has 1.6GW of coal-fired capacity, according to Ember data, although coal generation has been a reserve fuel in recent years, meaning any ramp-up of its reserve coal units will likely be limited in operation.

Sandu also said a solution would be to offer more autonomy to public institutions for biomass power plants, where "more generators are needed" and more wood pellets, although this would not be an immediate fix.

Moldova is currently producing 382.8MW of electricity, mostly from gas, against consumption of 725.4MW, according to state enterprise Moldelectrica. Moldova is importing 541. MW from Romania, Moldelectrica said.

*Joseph Clarke*

### DOE, EPA add advanced biofuel funding

The US Department of Energy's Bioenergy Technologies Office (BETO), in conjunction with the Environmental Protection Agency (EPA), allocated \$6mn in funding through the Inflation Reduction Act in support of three advanced biofuel development projects.

The three projects will receive roughly \$2mn each. Brooklyn, New York-based Air Company Holdings plans to scale its carbon dioxide hydrogenation reactor as an intermediate step in the production of sustainable aviation fuel (SAF). California-based Erg Bio will further its solvent pretreatment technology for use in preparing agricultural waste for use as biofuel feedstocks. New Hampshire-based Terragia Biofuels will advance its corn-stover to ethanol

technology utilizing thermophilic bacteria.

BETO supports domestic research and development of sustainable energy technologies through grants and other funding awards via the federal government.

*By Matthew Cope*

### Building materials can store significant CO2: Study

More than 16bn t/yr of CO2 could be stored by altering the composition of common building materials, according to a research paper published in the journal *Science*.

Fully replacing conventional building materials with alternatives capable of storing CO2 could store 16.6bn t CO2/yr, the study found – equivalent to around half of anthropogenic CO2 emissions in 2021.

The cumulative mass of building materials and their use over decades makes them viable for carbon storage, according to the research, which considered the potential of concrete, brick, asphalt, plastic and wood, the most commonly used materials.

The study found the most significant factor in a material's storage potential to be the scale of its use. So while bio-based plastics have the most potential per kilogram, only relatively small quantities are produced, so they have a storage potential of just 0.2bn t/yr CO2.

Conversely, concrete has one of the least impressive potentials per kilogram, but its widespread use gives it a potential of 10.5bn t/yr CO2.

"Relatively minor" adjustments to the composition of materials – such as using carbon-rich aggregates in concrete or using bricks based on biomass fibres – could allow the materials to store carbon, the study said.

Using engineered building materials to absorb CO2 could be a "logical first step", given that carbon capture and storage technologies require supplementary infrastructure development, the study added.

*By Navneet Vyas*

## WEATHER

Location	European weather - Departure from normal temperatures										°C	
	16 Jan		17 Jan		18 Jan		19 Jan		20 Jan		Precipitation (mm)	
	Avg	± normal*	Avg	± normal*	Avg	± normal*	Avg	± normal*	Avg	± normal*	5-day	15-day
UK – London Heathrow	5.2	-0.4	3.2	-2.4	2.1	-3.5	2.5	-3.0	4.1	-1.4	0.4	17.2
Norway – Bergen Florida	7.1	4.9	7.4	5.3	7.1	5.0	4.5	2.4	4.8	2.8	18.4	62.4
Norway – Oslo Blindern	5.1	7.5	4.1	6.6	3.4	5.9	0.7	3.3	0.6	3.2	0.6	19.1
France – Paris Orly	2.4	-2.2	1.1	-3.5	0.5	-4.1	0.2	-4.3	1.7	-2.8	0.1	14.8
The Netherlands – Amsterdam Schiphol	3.6	0.0	1.2	-2.4	0.8	-2.8	1.2	-2.3	1.6	-1.9	0.3	11.3
Germany – Essen	2.5	-0.2	1.9	-0.8	1.9	-0.7	2.8	0.3	1.2	-1.3	0.1	12.2
Germany – Berlin Tempelhof	2.1	1.4	1.3	0.7	1.6	1.1	3.0	2.6	1.9	1.5	0.2	6.7
Italy – Milano Malpensa	2.6	-0.9	2.2	-1.3	4.3	0.8	4.0	0.5	5.4	1.9	1.4	36.4
Italy – Rome Fiumicino	8.5	1.0	10.0	1.3	10.1	1.4	10.6	1.2	9.9	1.2	12.3	39.5
Poland – Warsaw Okocie	1.6	3.6	1.6	3.7	1.4	3.6	1.0	3.3	0.8	3.2	0.6	6.9
Czech Republic – Prague Ruzyně	0.0	1.0	-1.2	-0.1	-0.8	0.3	0.7	1.9	-0.2	1.1	0.1	6.3
Hungary – Budapest Lörinc	1.7	1.1	2.3	1.7	1.7	1.1	1.9	1.4	2.4	1.9	0.0	8.1
Serbia – Belgrade Surchin	-0.7	-2.3	-0.2	-1.7	1.4	-0.1	2.2	0.8	3.5	2.2	0.0	10.1
Romania – Bucharest Imh	0.4	1.1	1.6	2.3	1.7	2.4	2.7	3.5	2.8	3.6	0.0	8.8
Spain – Madrid Barajas	4.7	-1.0	5.7	0.0	4.0	-1.7	2.6	-3.1	3.9	-1.9	3.0	40.7

\*normal means cleaned 10-year average (2016-2025 inclusive)

– Ensemble forecasts (12:00 GMT) provided by Speedwell Weather



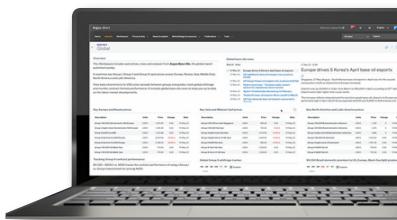
Ensemble averages and cleaned weather data all supplied by Speedwell Weather Limited (12:00 GMT). For more information visit: [www.speedwellweather.com](http://www.speedwellweather.com)

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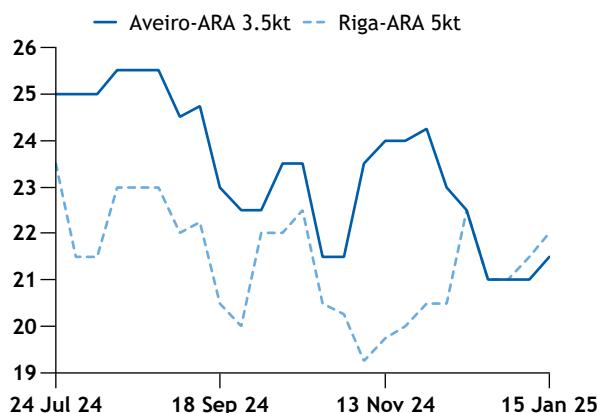
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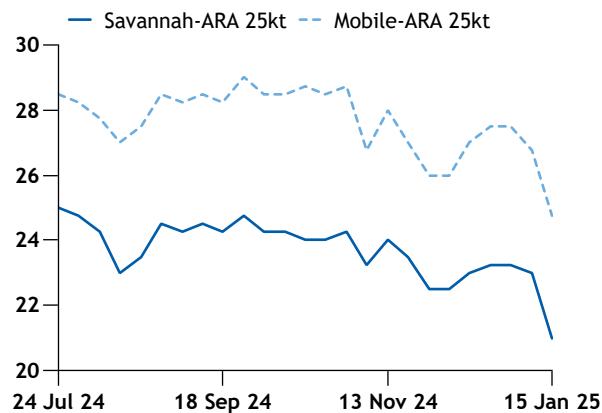
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## Wood pellet freight, coaster size



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## Trans-Atlantic wood pellet freight rates 25,000t

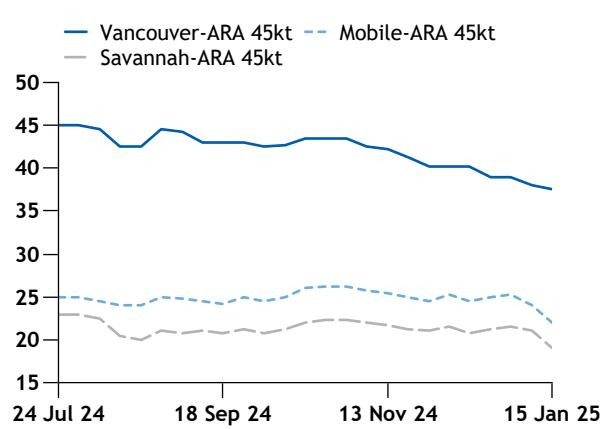


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## Trans-Atlantic wood pellet freight rates 45,000t



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