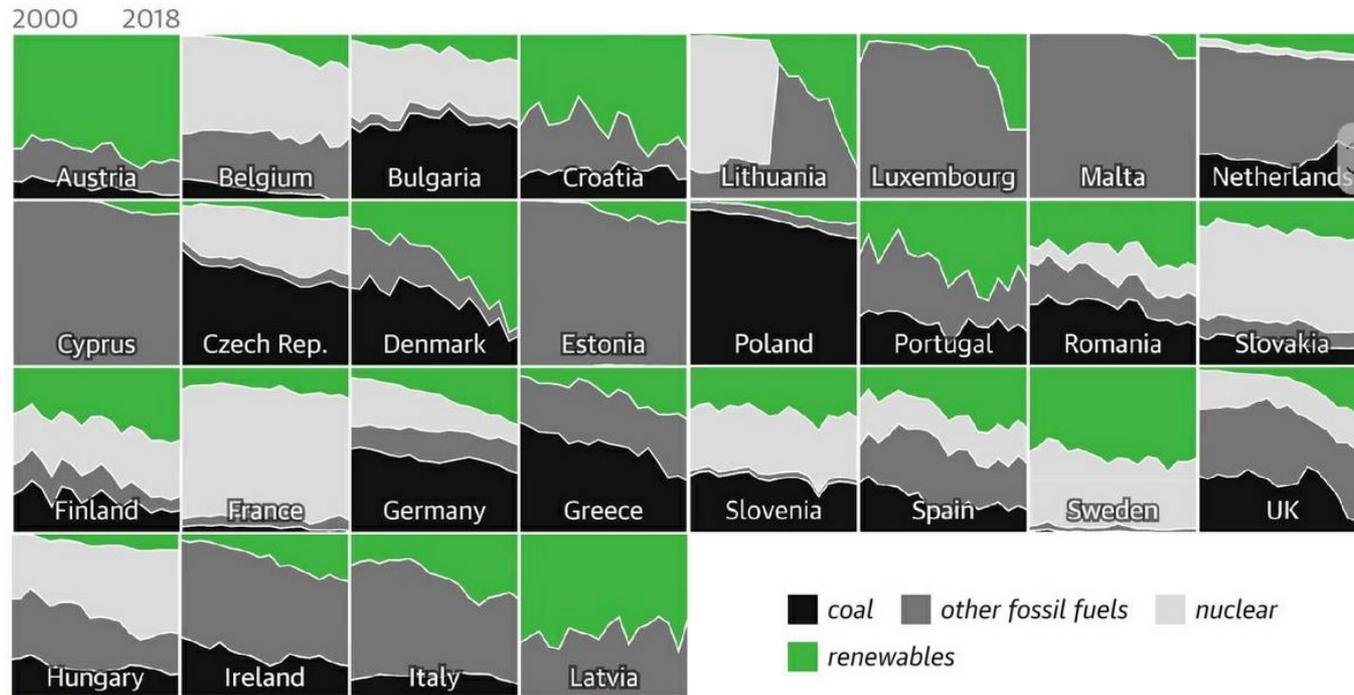


EEX Group Workshop
Biomass - Global trends and opportunities

Speaker: Robert Seehawer | EEX
27 June 2019

Power generation by source 2000 – 2018

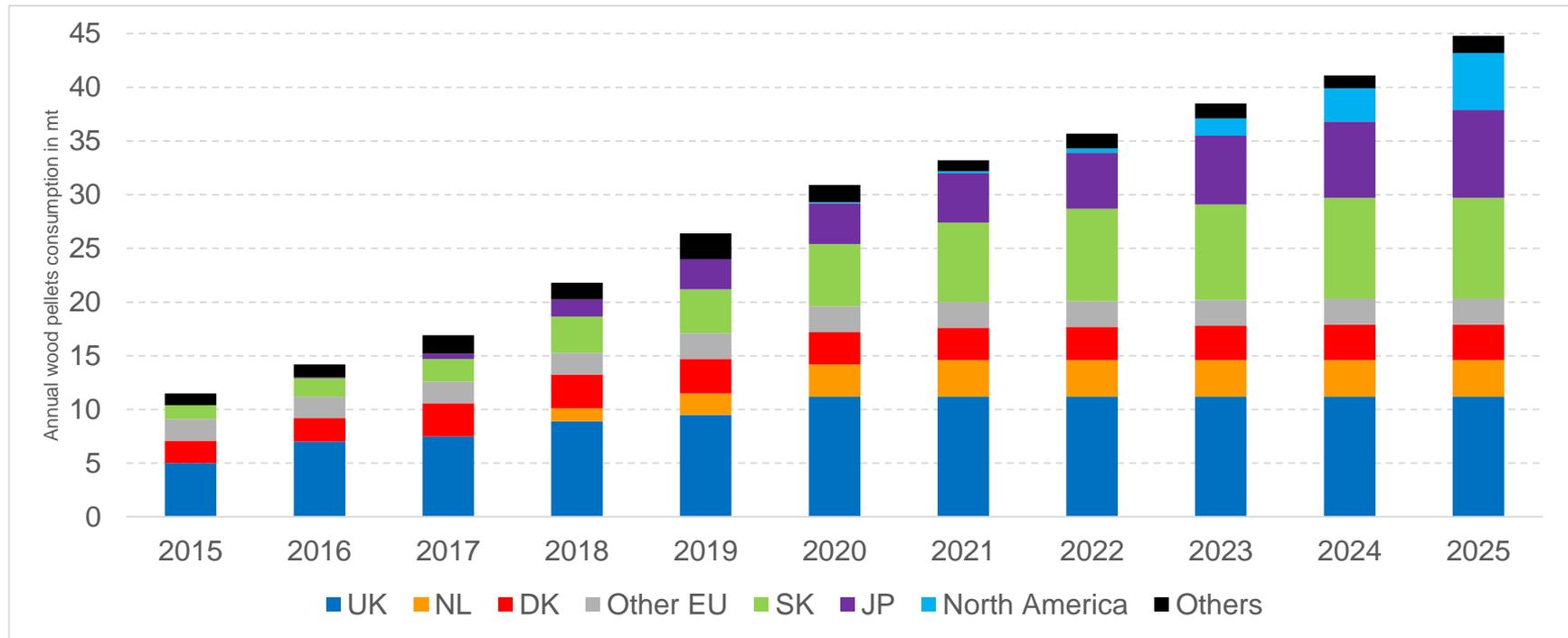


Source: Sandbag Climate Campaign

- Mix of renewable energy for power (and heat) production consist of
 - Wind, Solar, Hydro and
 - Biomass (BioGas, BioFuels, Woody Biomass, Agricultural Residuals,...)

Wood Pellets Growth forecast

- Future growth is dominated by The Netherlands, Japan and South Korea
- Wood Pellets market grew from 5mt in 2010 to ~25mt in 2019 (20% annualised)
- Market starts to trade globally and commoditised itself



Source: Argus Biomass data, European Pellets Council, HPBA US and CA stove data (2018)

Biomass to be integrated into mix of renewables – Total System Costs perspective

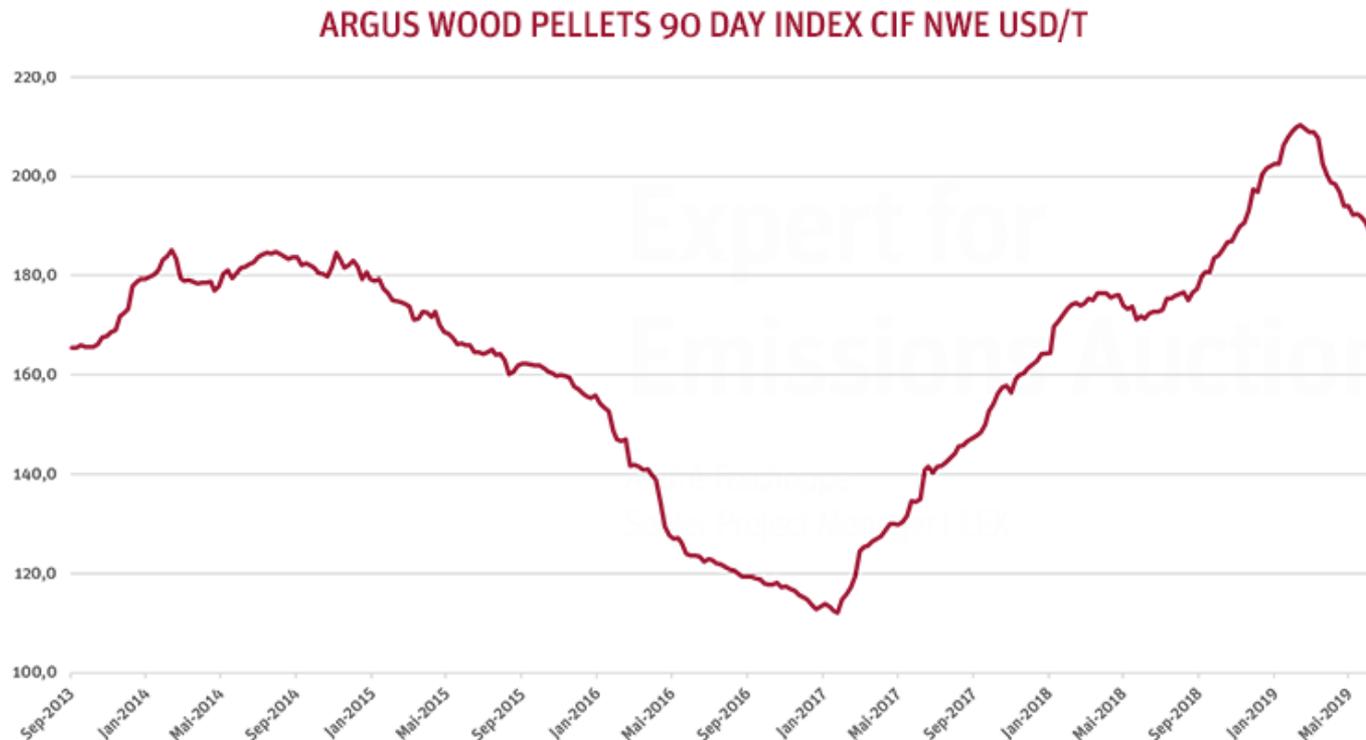
- Intermittent Renewable Energy Sources (like wind and solar) lead to “total system costs” which are usually not measured

- Total System Costs for intermittent renewables consist of
 1. **Intermittency adjustment** (not all MWh are worth equally) through supply and demand dynamics
 2. **Security of supply adjustment** (when wind does not blow and sun does not shine) through not being dispatchable – backup capacity needed
 3. **Balancing cost adjustment** through deviations from production schedules
 4. **Grid expansion cost adjustment** through requirement of transmission and distribution grids
 5. **Heat adjustment** (CHP only) through production of heat as by-product



Biomass to deliver cost-efficient contribution from total system cost perspective when used in CHP plants to decarbonise the power sector

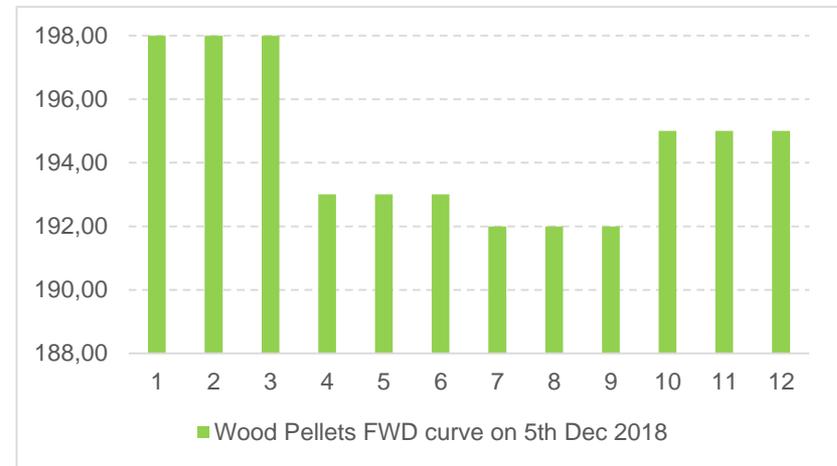
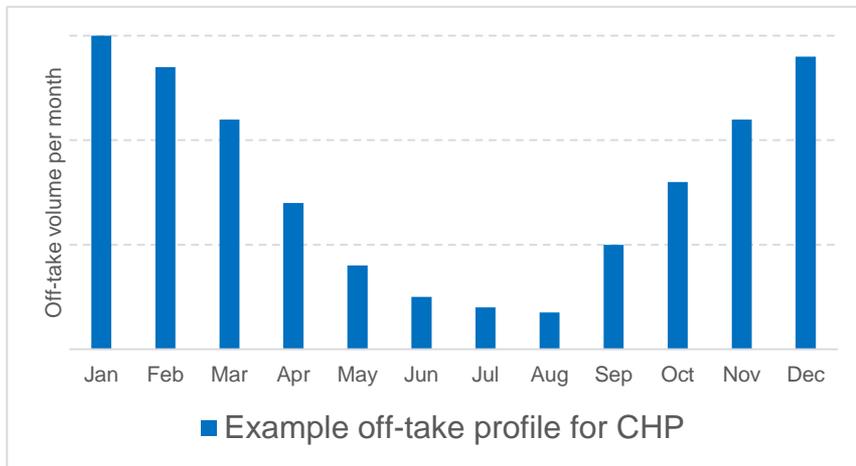
Price chart for Wood Pellets spot market



- EEX Wood Pellets futures are designed to actively manage price risks
- **Argus CIF NWE** spot index values are used for settlement of financial future

Wood Pellet FWD prices start to reflect seasonality

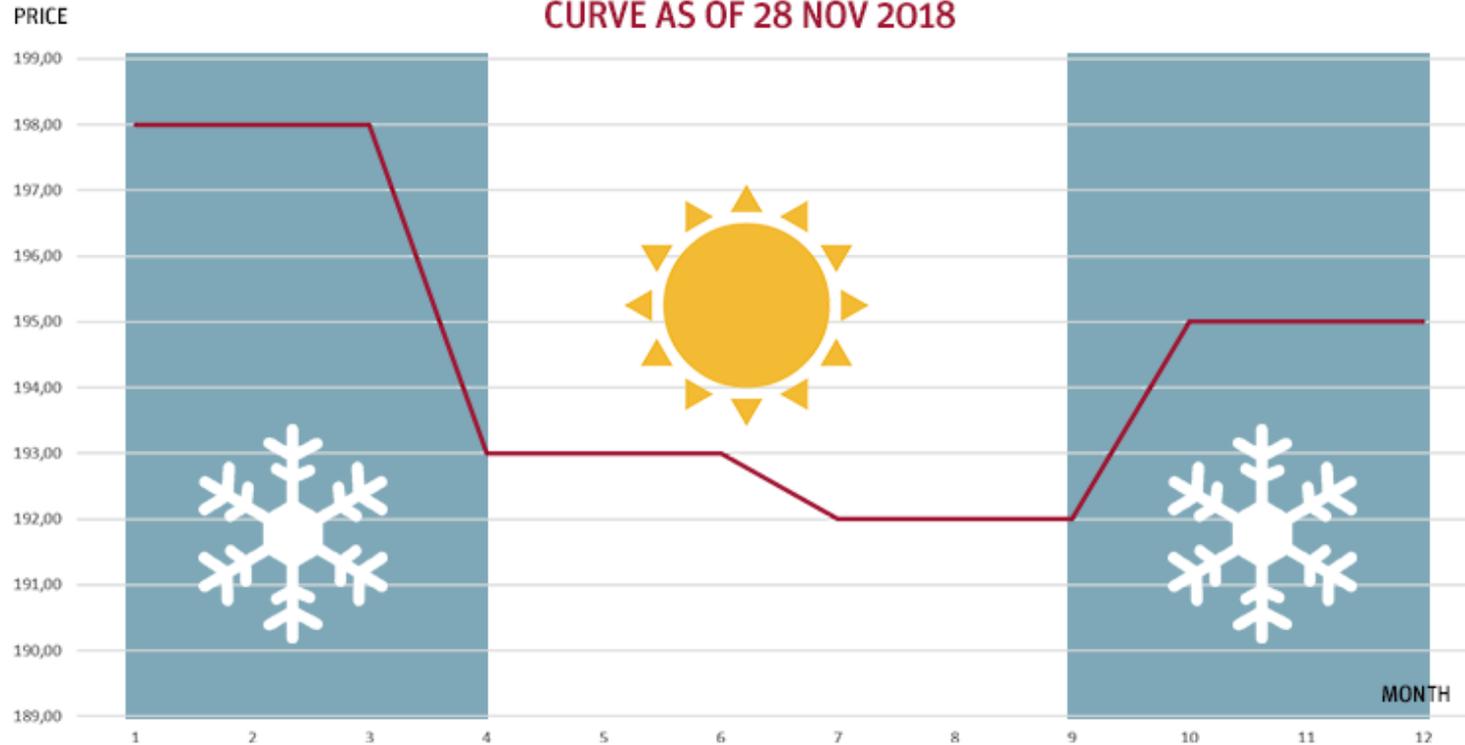
- Converting existing CHP coal plants to biomass and extending the capacity of CHP biomass plants delivers cost-effective contribution towards meeting national climate targets
- CHP off-take profile reflects seasonality which biomass market starts to adapt



- Trading in Biomass market is developing from long-term contracts (10-15 years) into short-term portfolio balancing and short-term optimisation

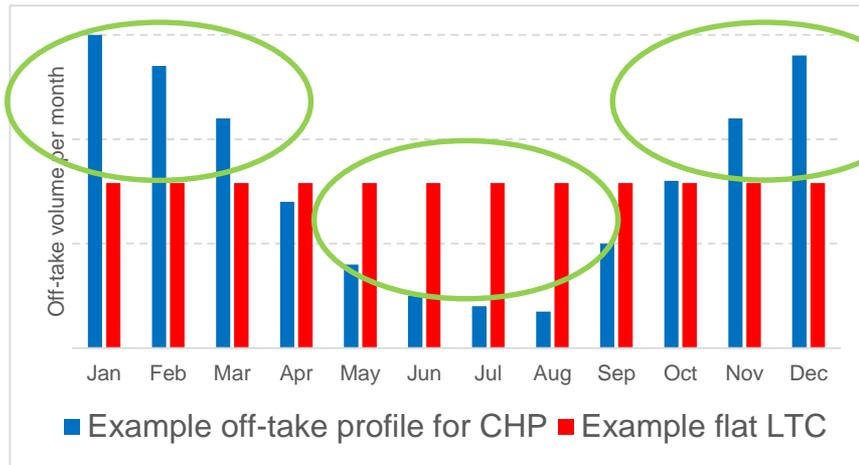
Price chart for Wood Pellets Forward market

SEASONAL PATTERN IN WOOD PELLETS FORWARD
CURVE AS OF 28 NOV 2018



Trading opportunities in short-term markets

- Current flat off-take and fixed price long-term contracts require short-term trading to integrate Biomass into mix of Renewable Energy Sources (RES)
- Flexibility and optimisation tools required to meet seasonal wood pellets demand from CHP power stations



Short-term trading opportunities for market participants



EEX Wood Pellets Futures are a short-term optimisation/ hedging tool to offer required flexibility for balancing wood pellets supply and demand

EEX Wood Pellets Futures contract specs



OTC-registered
cash-settled Futures



Based on the Argus wood pellet cif
northwest Europe (NWE) Index for
industrially used wood pellets
delivered within the next 90 days



Contract size: 100 mt
Delivery periods: next 36 months
Cross Margining with ECC products



Currency: US\$ and cents
Price Tick: US\$ 0.01 per mt



Settlement based on the Argus cif
northwest Europe (NWE) index for
wood pellets during the respective
maturity month as published by Argus
in the “Argus Biomass Markets”



Trading hours: 8:00-18:00 CET
Last Registration Day is the last
Wednesday of the respective
maturity month

Thank You For Your Attention!

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