

A hand holding a small white wind turbine model. In the background, a blurred face of a man is visible. Overlaid on the image are white line drawings of wind turbines and a wavy line representing a landscape or power curve.

# CPPAs in the Nordics

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# Agenda

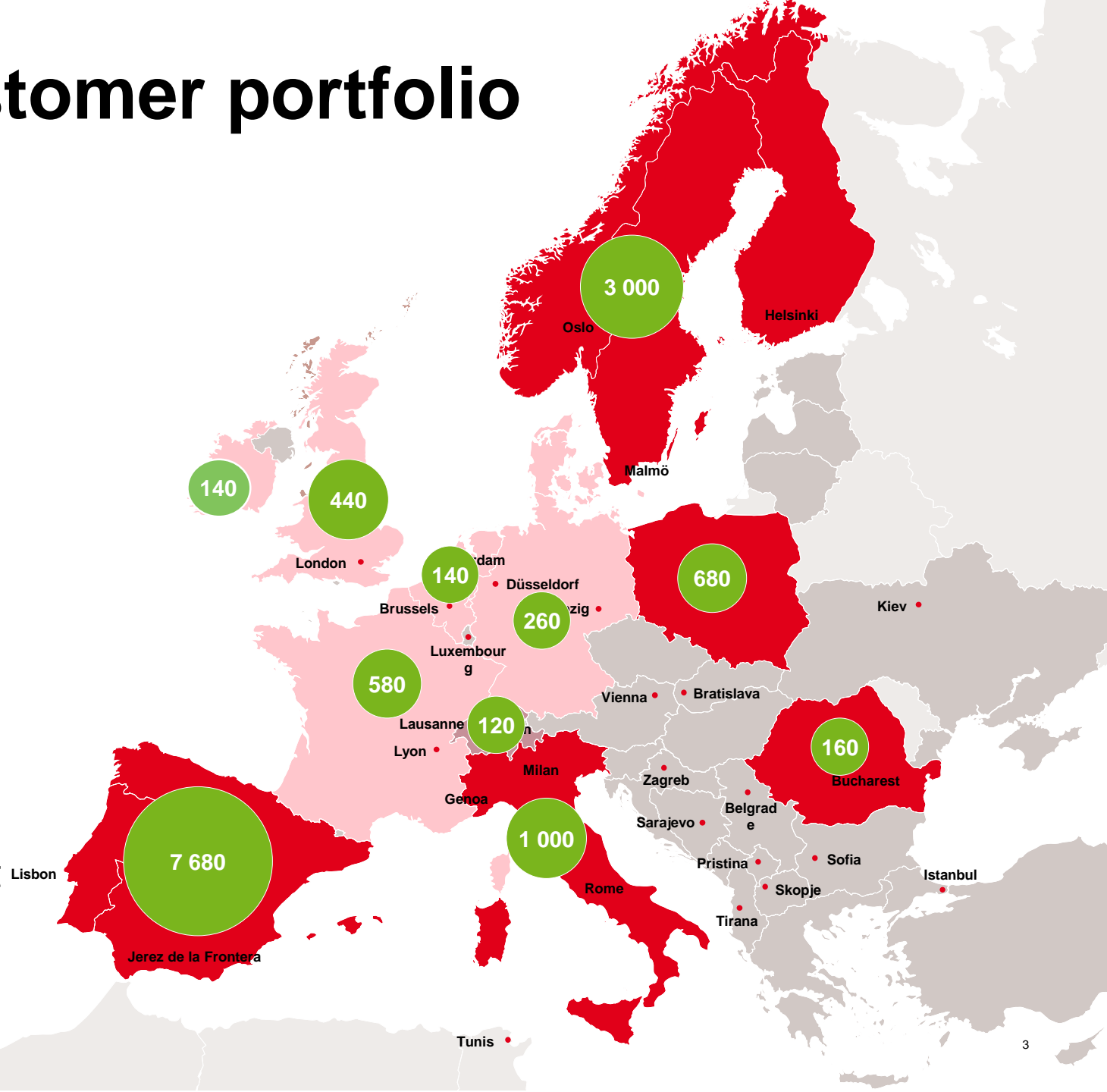
- 1. About Axpo**
- 2. The Nordic power market**
- 3. PPAs in the Nordics**
- 4. Why corporate PPAs?**

# Axpo Renewable Customer portfolio



- Axpo manages 14 000 MW
- ~20% is long term PPAs
- Risks vary from country to country
- Development from subsidy to merchant

- LT price risk, liquidity, balancing, cannibalisation
- Balancing, cannibalisation







# The Nordic power market

# The Nordic power market

## Day-ahead market:

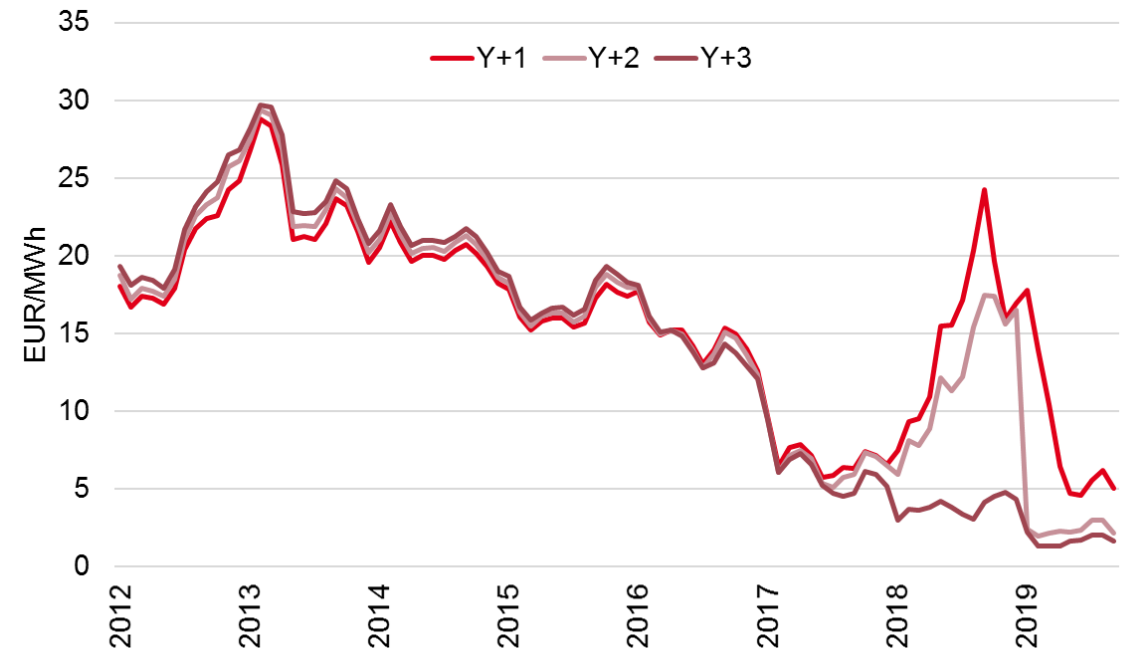
- Nord Pool Spot: physical day ahead-market
- Intraday and regulating market
- Single theoretical/reference spot price (the System price) for the whole Nord Pool area –not taking into account grid constraints
- Spot price for all price areas (5 in NO, 4 in SE, 1 in FI and 2 in DK) taking into account grid restrictions

## Financial Market:

- Future contracts for
  - System and area prices (EPADs)
  - Months
  - Quarters
  - Years (10 years ahead)
- Liquidity is very poor for contracts 3 years +

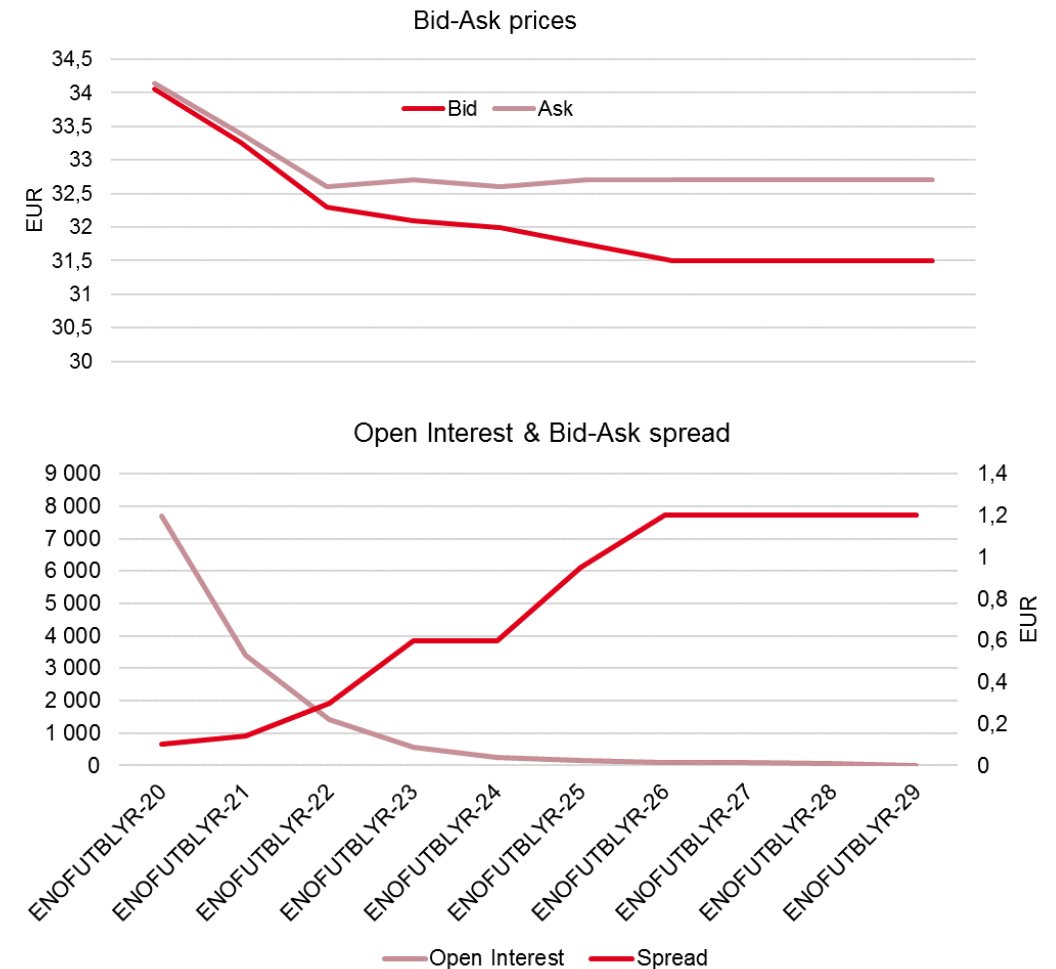
# Swedish-Norwegian Subsidy Scheme: Elcertificates

- Market based subsidy scheme
- Joint scheme in Norway and Sweden since 2012
- Targets 28,4 TWh of new renewables by 2020
  - Target reached
- Sweden have an additional target of +18TWh by 2030
- The average price for year ahead in 2013 was 20 EUR/MWh
- The year ahead price is now around 5 EUR/MWh



# Trends in the financial market

- Decreasing liquidity
- Less volumes traded meaning larger price spreads
- Price area divergence –grid and congestion
- LT: large spreads and low liquidity
- Shape –reflect LT sellers and few LT buyers
- Increased transaction cost for hedging long-term transactions





A photograph of several wind turbines on a grassy hill during sunset. The sun is low on the horizon, creating a warm, golden glow. The sky is filled with soft, wispy clouds. The turbines are silhouetted against the bright sky. The foreground shows the texture of the grass and some rocks.

# PPAs in the Nordics

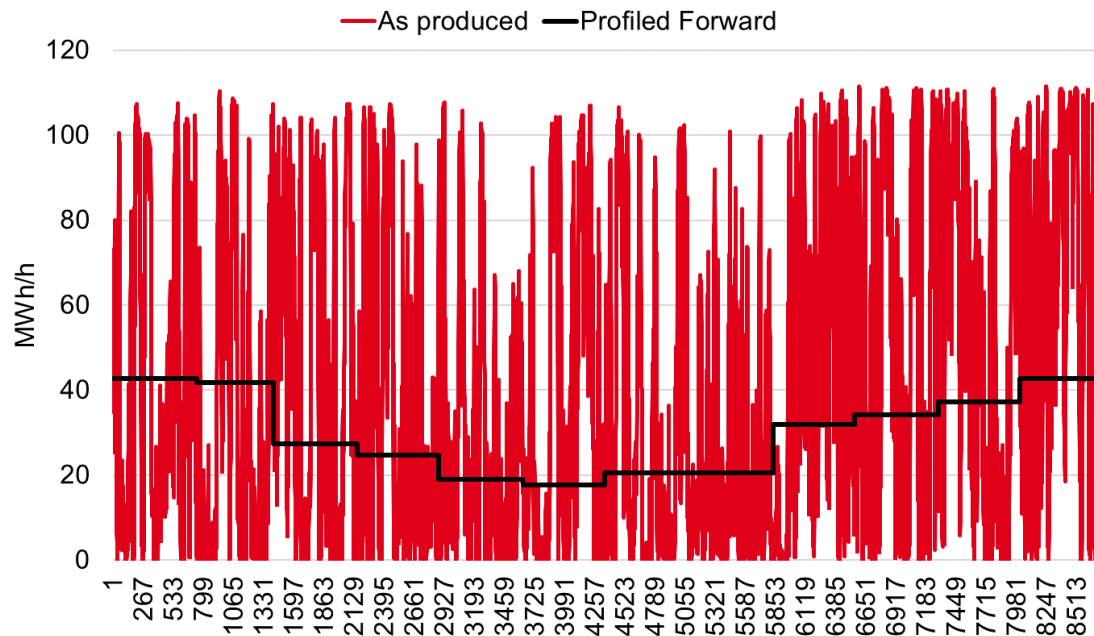


# The Nordic PPA market

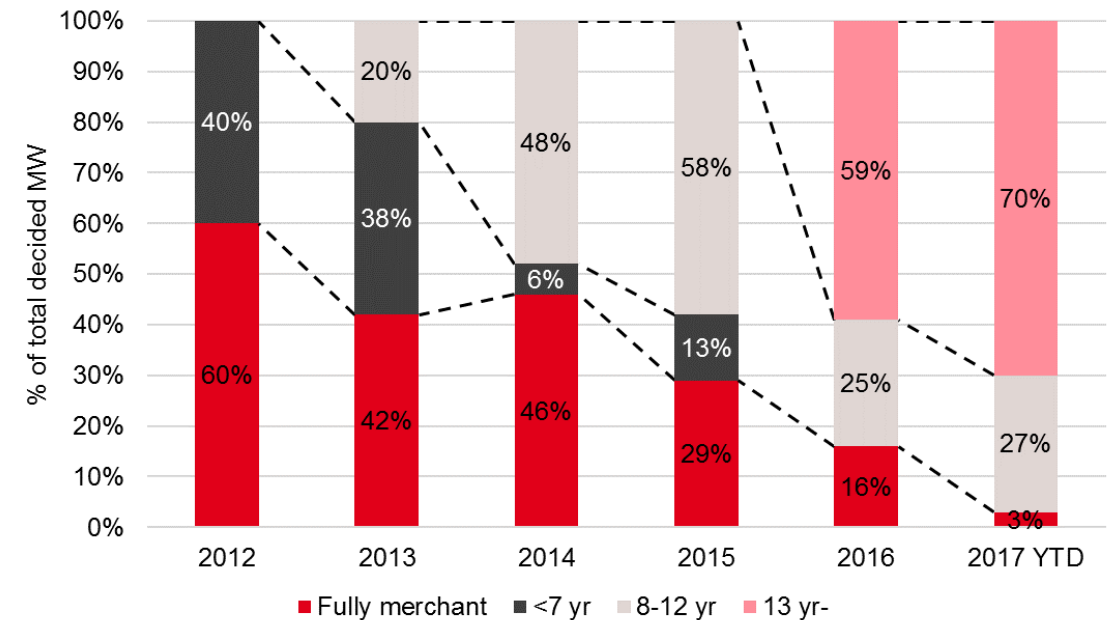
- A PPA in the Nordic context is a fixed price (EUR/MWh) agreement for a fixed or variable amount of power (~70% of P50)
  - Direct agreement with SPV and offtaker
  - Can be physical or financial
  - Tenors of typically 5-15 years (can be even longer)
  - Elcertificates and GoOs are included, but usually as a route to market
- PPAs are essential to wind developers with project financing
  - The SPV is exposed to merchant risk and the subsidy scheme is market based
  - It is usually a requirement for the bank and it can improve financing solutions for the SPV

# PPA share and structures

## PPA structures



## Inv. decisions with PPAs (Nor. and Swe.)

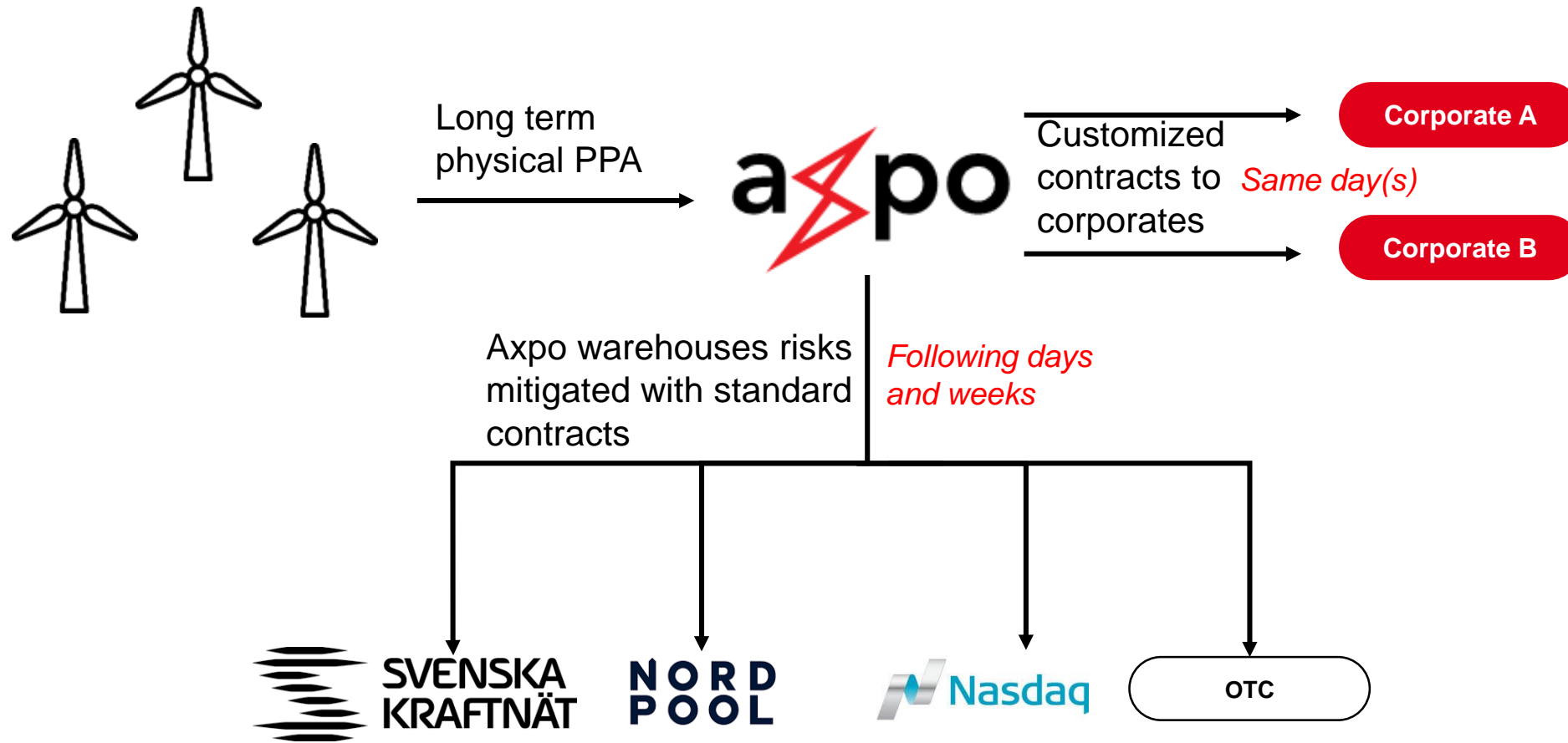


Source: Eurelectric, 2019

# PPA risks

	Short term PPAs (direct marketing)				Long term PPAs	
	Construction phase	Balancing market (d+1)	Intraday market (d)	Day ahead market (d-1)	Short term	Long term Liquid      Illiquid
Risks	1. Risk of non construction	2. Balancing market risk (forecast error, delta balancing – spot prices)	3. Market price risk			
			4. Volume risk (full load hours, availability, weather, forecast etc. )			
			5. Cannibalization risk (value of profile below base price)			
6. Liquidity risk (bid-ask spread)						
7. Model risk						
8. Credit risk (counterparty, collaterals, etc.)						

# Managing a PPA



A photograph of three business professionals in a meeting. A woman with long blonde hair, wearing a dark blue shirt, is seated at a table and looking down at a document. A man with grey hair, wearing a light blue shirt, is seated next to her, also looking at the document. A man with dark hair and a beard, wearing a grey suit, is standing behind them, leaning over the table and pointing at the document with a pen. The background is a large window with a view of a city.

# Why have CPPAs been successful?



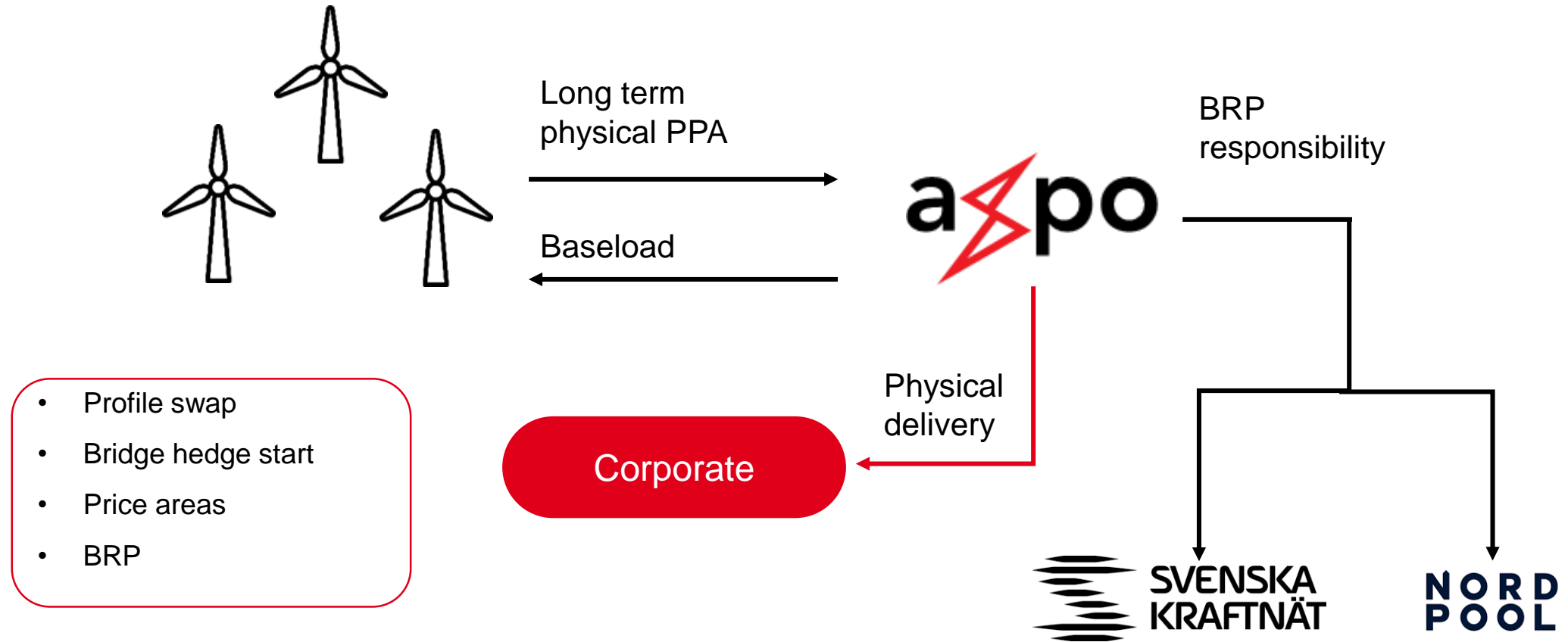
# Increasing share of CPPAs –why?

- **Timing** → expiration of existing hedges and new industries
- **Green values** → additionality and direct agreements/sourcing between SPV and the Corporate
- **Competitiveness** → wind LCOE at ~30 EUR/MWh
- **PPA experience** → many stakeholders have PPA know-how (utilities, investors, banks, lawyers etc.)
- **PPA shaping** → Utilities help shape and structure the CPPA

# Key criterias for successful CPPAs

- Increased PPA knowledge among investors and banks
- LCOE of wind power
- Solid counterparties and guarantees
- Knowledge and pricing of risks on both sides
- Additionality and green values
- Contractual framework

# Axpo's role



# Will the CPPA trend continue?

## Challenges for the CPPA market

- Additionality and green values have been an important driver for CPPAs so far
  - In a power market dominated by hydro (particularly Norway) –the green value is less attractive
  - Some industrial corporates don't buy the GoOs when sourcing from wind power
- Traditionally corporates prefer to hedge for shorter tenors –can be difficult to place a 10 year PPA
- Many corporates are reluctant to offer buyer guarantees
  - e.g. for Alcoa's CPPAs, the Norwegian Export Credit Guarantee Agency (GIEK) guaranteed Alcoa's payment obligations

# Will the CPPA trend continue?

## Opportunities for the CPPA market

- Many corporates have been targeted by SPVs and some have started to review their hedging policies
- Industry hedging needs post-2020 and new demand
- With an LCOE of around 30-35 EUR/MWh (and dropping?) wind is highly competitive –a CPPA removes the liquidity risk premium for a long term hedge for both parties
- PPA volume can be split between traditional off-takers and corporates to match hedging/vol. needs for smaller corporates




# Thank You

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