



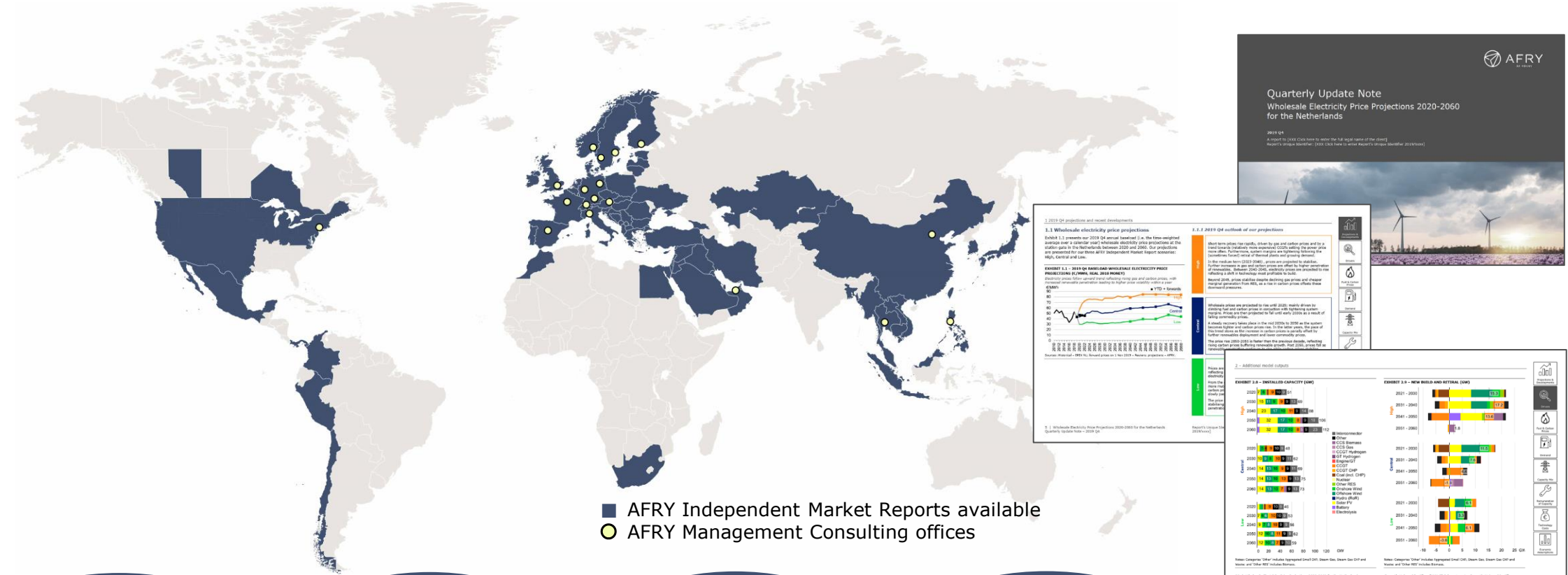
PPAs – Future Expansion?

MONTEL NORDIC ENERGY DAY – 26 AUGUST 2021

KATHRINE STENE BAKKE – AFRY MANAGEMENT CONSULTING

GLOBAL COVERAGE

AFRY Management Consulting is world's the leading energy market advisor; we currently model electricity markets in 70+ countries



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A few overarching global trends ...

1

WIDER GEOGRAPHICAL SPREAD

2

GROWING NUMBER AND TYPES OF PLAYERS

3

GREATER VARIETY OF OFFERINGS

4

INNOVATION IN ORIGINATION AND NEGOTIATIONS TECHNIQUES

The role of renewable energy (RES) PPAs

POWER PRODUCERS

POWER CONSUMERS



ROUTE TO MARKET

Producers and consumers without inhouse power trading resources need a PPA to access the market



HEDGING AGAINST PRICE VOLATILITY

PPAs may contain clauses that reduce price volatility (may be necessary e.g. to secure financing)



CORPORATE SOCIAL RESPONSIBILITY

PPAs can be a key tool for companies with ambitious decarbonisation agendas



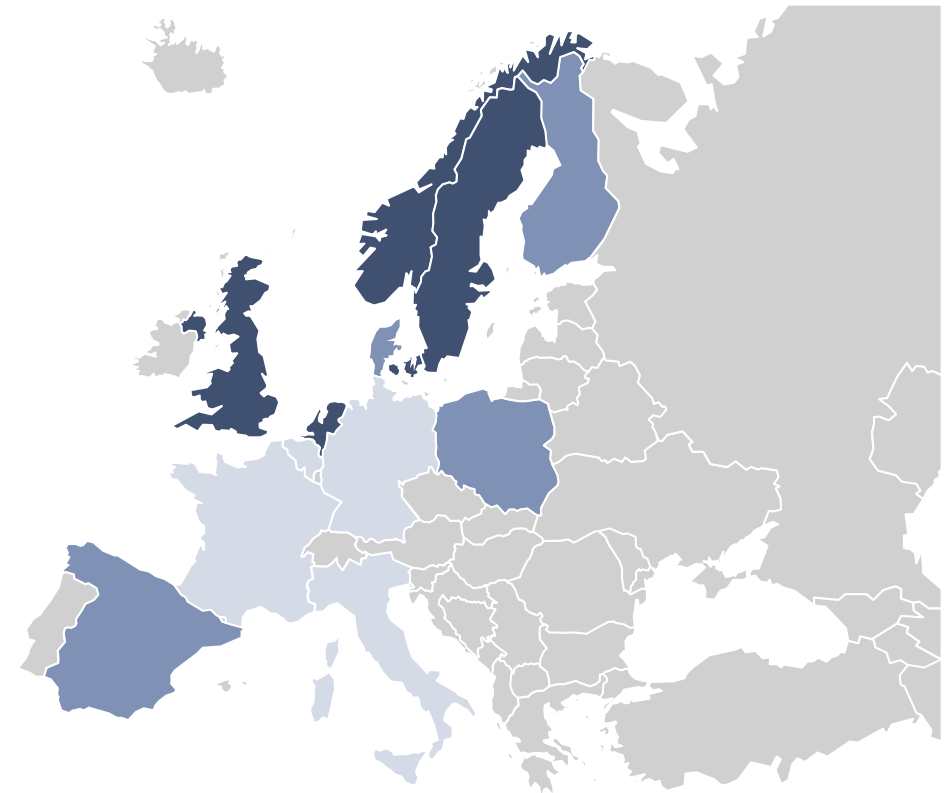
Changing incentives schemes is key to understanding the development of RES PPAs across Europe

ROLE OF RES PPAS UNDER ALTERNATIVE INCENTIVE SCHEMES

Increasing market exposure of revenues 

| Role of PPA? | Feed-in tariff | Feed-in premiums | CFD | Traded certificates | Merchant |
|-----------------|----------------|------------------|-----|---------------------|----------|
| Route to market | - | ✓ | ✓ | ✓ | ✓ |
| Hedging | - | ? | ? | ✓ | ✓ |

MATURITY OF EUROPEAN PPA MARKETS (INDICATIVE)

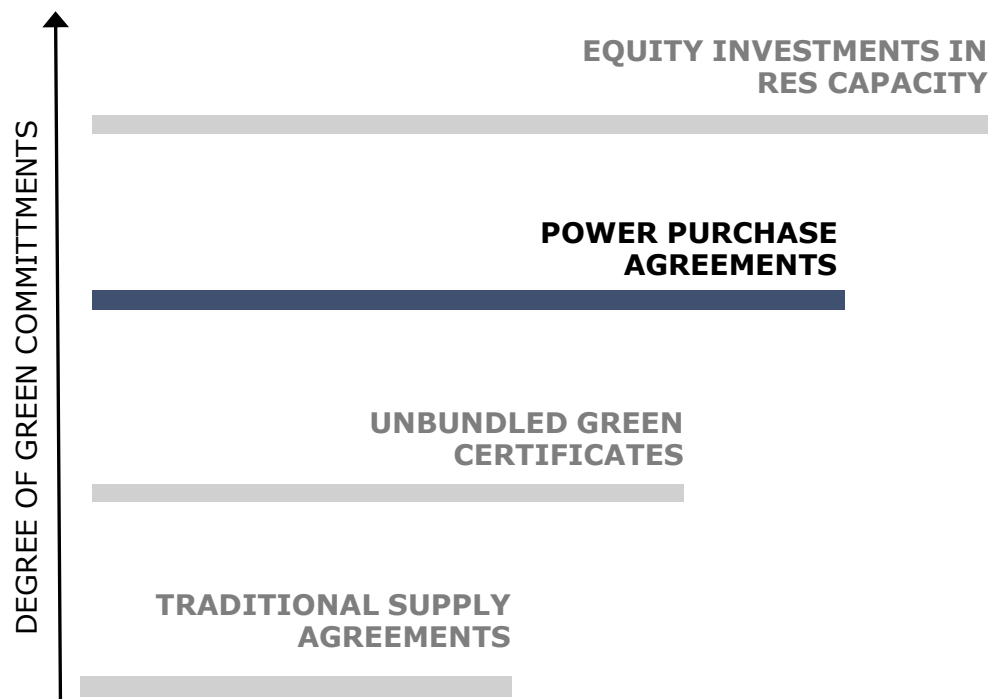


ESTABLISHED
 RECENT
 NEXT?

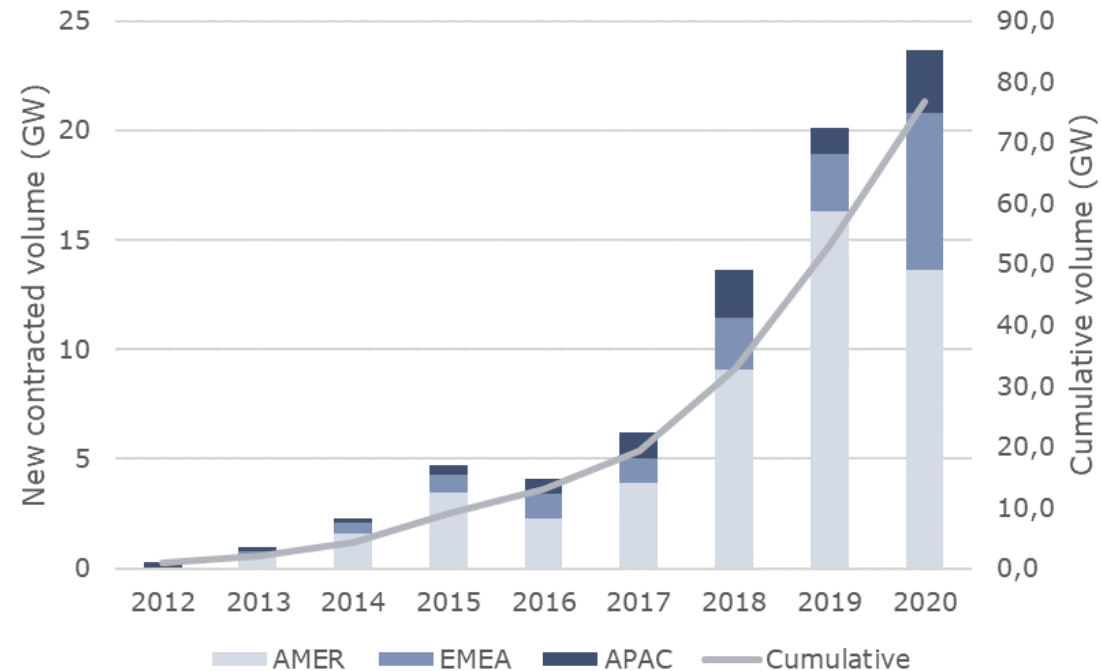
GROWING NUMBER AND TYPES OF PLAYERS

Green energy sourcing, driven by corporate climate policies, brings new players to the RES PPA market

GREEN ELECTRICITY PROCUREMENT ROUTES



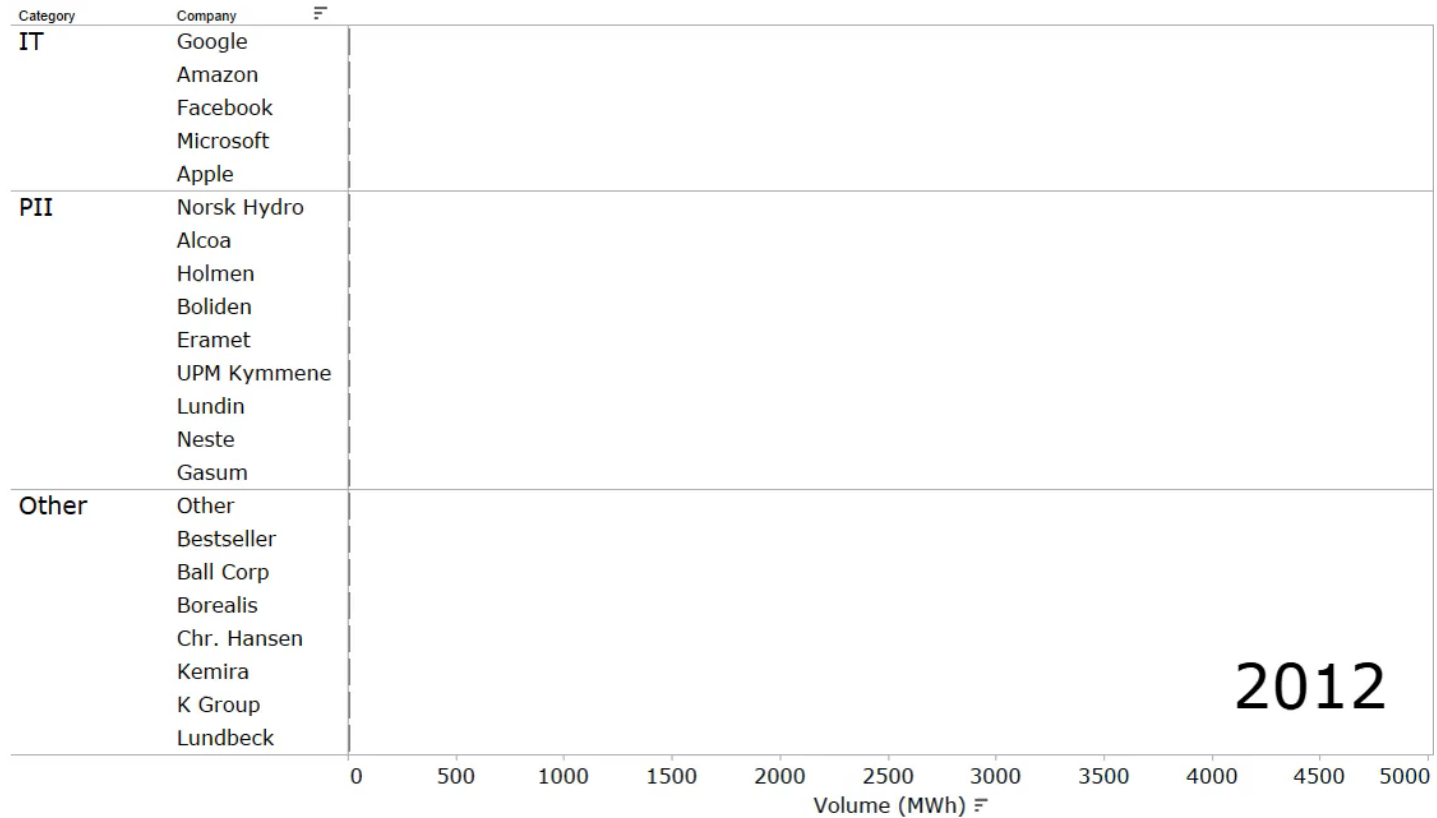
GLOBAL CORPORATE PPA VOLUMES



Source: BNEF, data are through 2020. Onsite PPAs, Australia sleeved, pre-market reform Mexico not included. APAC number is an estimate. Subject to change

Nordic CPPA market dominated by PII and IT, but new offtaker segments are emerging

CORPORATE PPAS IN THE NORDICS – DEVELOPMENT OVER TIME (MWH)

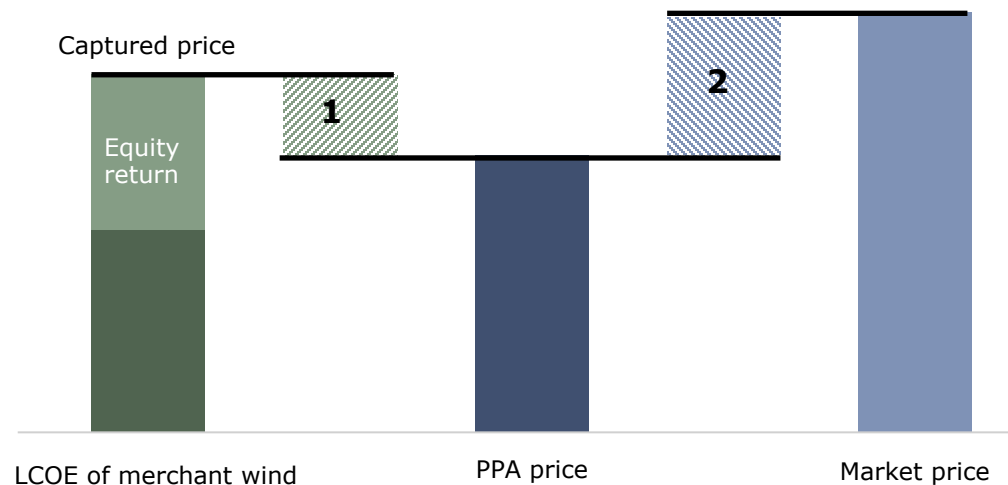


Please note:
 The figure is based on AFRY tracking of CPPs based on publicly available information and is not complete. Some volumes are estimated.

Source: AFRY Management Consulting

The Nordic PPA market is a buyers market with intense pressure on prices

DETERMINING PRICE IN A PPA



The commercial terms of a PPA is determined by bilateral negotiation and will be the result of the bargaining power of the parties and the market circumstances at the time of the deal.

- 1. How much of the equity return would the developer give up in return for higher certainty of revenues?*
- 2. Does this guarantee sufficient savings to the offtaker?*






- PPAs are generally closed at a discount to the market, in our observation this discount is increasing
- Currently see baseload PPA prices in the mid-20s (€ nominal)
- This is ~30% below the relevant forward curve and ~50% below typical consultant’s projections over the time period



For PPA prices to recover to a more 'normal' discount level, we need to increase the base of potential offtakers.

What will it take to achieve that?

Limited variety in Nordic PPA offering – innovation may be required to attract new offtakers

| | | |
|---|-------------------------|--|
|  | Type of contract | Physical PPAs dominated Nordic market in the first years, we are starting to see some financial (synthetic) PPAs |
|  | Duration | Some very long durations observed, but 10 year contracts appear to be the most common |
|  | Volume/shape | Variety in terms: as-produced, baseload, shaped baseload |
|  | Aggregation | Some aggregation of projects/offtakers observed, typically facilitated by utilities |
|  | Price | No variation – observed price clauses are fixed price for duration of contract, no indexation |

NEED FOR INNOVATION?

Potential new (non-PII) offtakers typically

- Require lower volumes
- Are uncomfortable with long durations
- Cannot handle volume risk
- Cannot meet credit rating requirements
- Do not have capacity/competence for complex negotiations on 'non-core' issues

Potential conflict with RES developers' need for PPA bankability

Aggregation – combined with streamlining of deal processes and increased transparency – can facilitate entry of new types of offtakers

When will we see new price structures (e.g. indexation with floor/collar) to allow seller to retain more of the upside?

A few overarching global trends ...

1

WIDER GEOGRAPHICAL SPREAD

'Merchant' markets and/or more market based subsidy schemes drives the development of PPAs both in the Nordics and across Europe



2

GROWING NUMBER AND TYPES OF PLAYERS

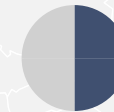
Corporates are entering a market traditionally dominated by utilities, driven by low sourcing costs and corporate climate ambitions. But IT/PIIs still dominate - there is a need to facilitate for new types of buyers, to create a more balanced market



3

GREATER VARIETY OF OFFERINGS

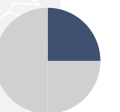
We observe some variety of offerings in products (type, volume shape, duration) but limited aggregation and no indication of more innovative pricing models

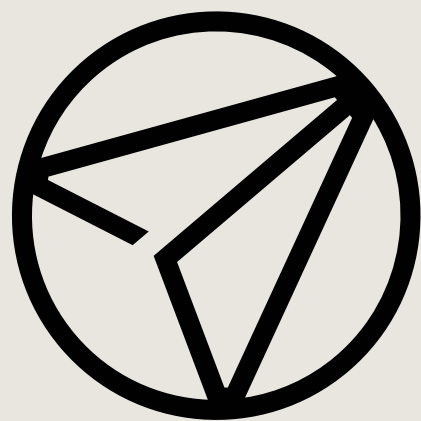


4

INNOVATION IN ORIGATION AND NEGOTIATIONS TECHNIQUES

Online platforms for price discovery and transparency are adding competitive pressure





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