

How to boost renewables to meet the EU climate target?



Housekeeping rules



Make sure that you are muted when you are not speaking

- We are using slido for a poll and Q&A: <https://app.sli.do/event/6kacqfoc>
- The Q&A session will be after all the presentations
- Feel free to submit questions on slido during the presentations
- The questions in the slido Q&A will be read out by the moderators
- Please mention in your question if you would like to address a specific speaker with your question
- If you have any housekeeping questions, please post them into slido and we will answer them there directly
- At the end of the session we are going to collect a word cloud. Please share your main insights throughout the sessions using Menti: <https://www.menti.com/4j6vuz23k7>

Agenda

- 1 **Sjoerd Ammerlaan**, Release of the WEC Issue Monitor 2021
- 2 **Lucia Fuselli**, Overview of Market Designs Across Europe
- 3 **Annkathrin Rabe**, Renewables in Germany
- 4 **Cristian Montoya**, Renewables in France
- 5 **Andreas Formosa**, Renewables in UK
- 6 **Silvia Escudero**, Renewables in Spain and Portugal
- 7 **Christian Schnell**, Renewables in Poland
- 8 **Q&A**



Sjoerd Ammerlaan
Regional Manager Europe, World Energy Council



2021

WORLD ENERGY ISSUES MONITOR

HUMANISING ENERGY



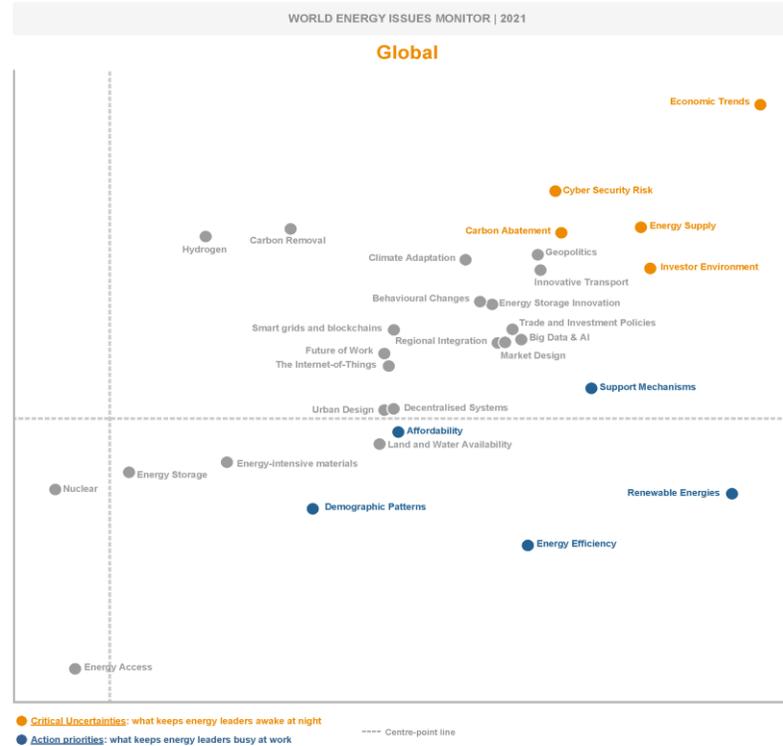
World Energy Issues Monitor 2021



First time maps for Australia and Hong Kong



Welcoming back Dominican Republic, Kazakhstan and Saudi Arabia



78%
of **TOTAL GLOBAL ENERGY CONSUMPTION**
represented in the 2021 Country Maps

GROWING REPRESENTATIVENESS



>2 500 responses from 108 countries



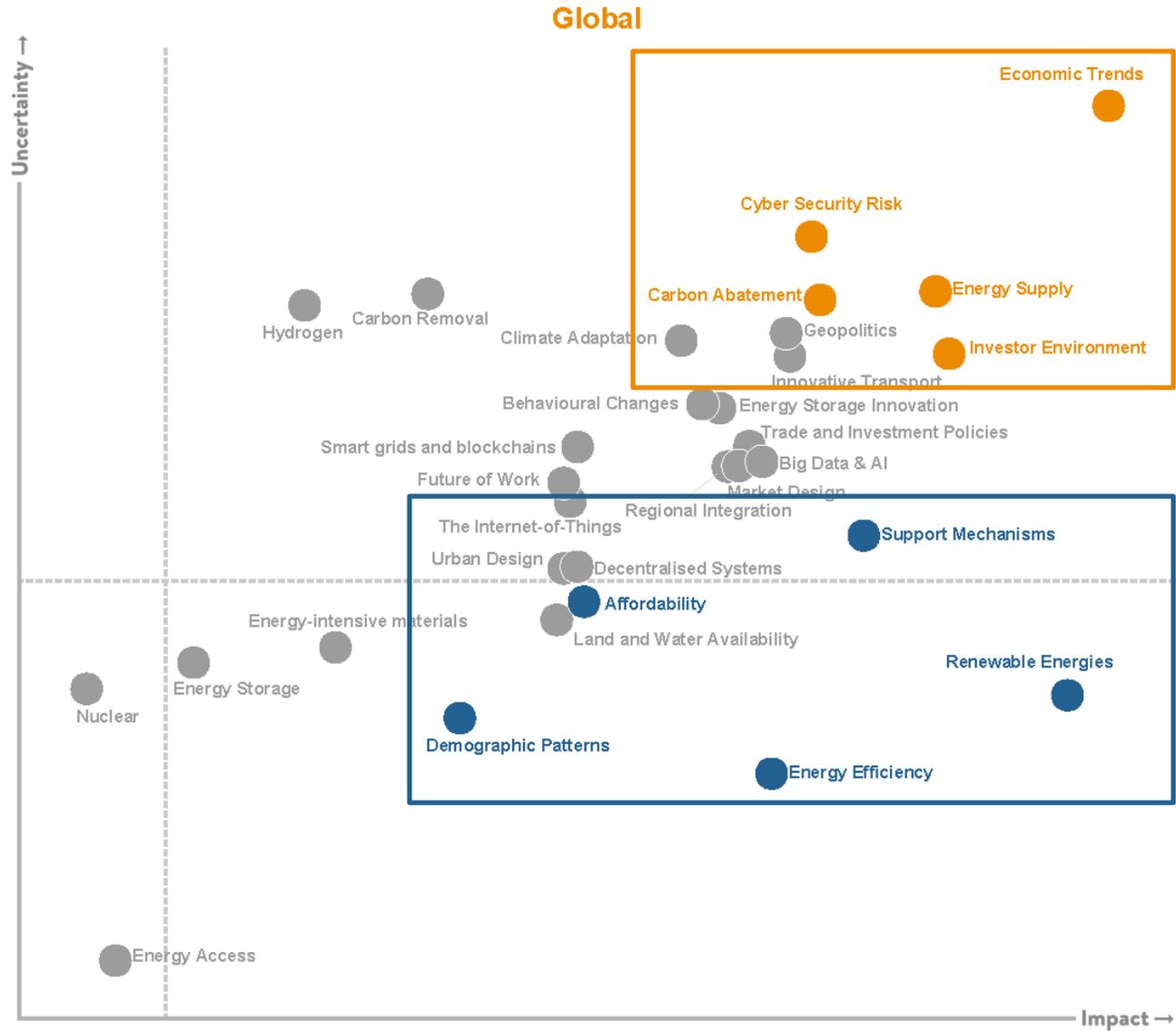
>1 000 Senior Management or higher, including C-Suite and Board



60 Country Maps (new record)



GLOBAL PERSPECTIVES



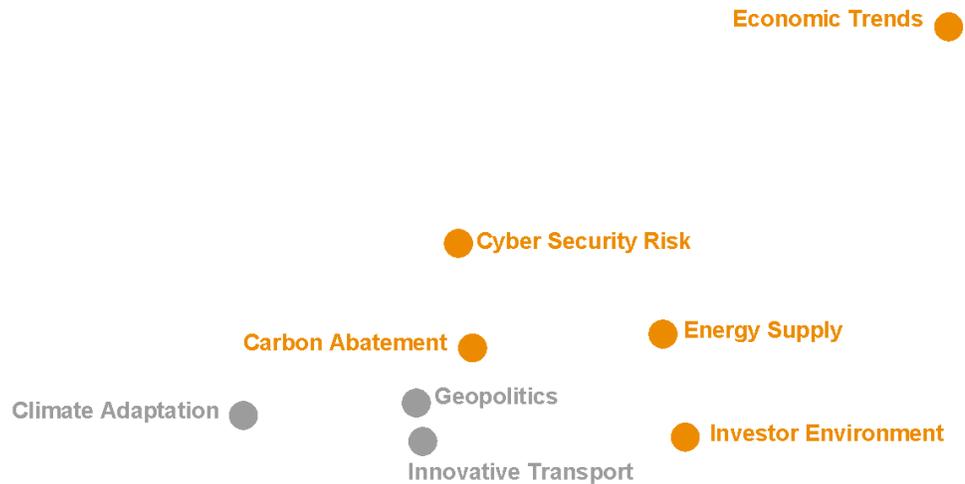
● Critical Uncertainties: what keeps energy leaders awake at night

● Action priorities: what keeps energy leaders busy at work

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Issues Monitor 2021 Global Map

Critical Uncertainties - What is keeping energy leaders awake at night?



- **Economic Trends** – clear certainty of economic uncertainties against COVID-19 with short-term economic challenges and uncertainty about longer-term economic recovery with implications for energy transition
- **Investor environment** – closely linked to economic situation with greater uncertainty on investments, availability of funds, on what / where to invest, and if there will be any support
- **Energy supply** – energy sector has kept the lights on but longer-term concerns about demand destruction and how demand might change
- **Cyber security risks** – digital solutions have helped mitigate economic impacts of pandemic raising awareness of cyber security with wide perception of more cyber-attacks
- **Carbon abatement** – essential to enable continued use of existing hydro-carbon assets while meeting meet lower carbon goals

Action Priorities - What is keeping energy leaders busy at work?

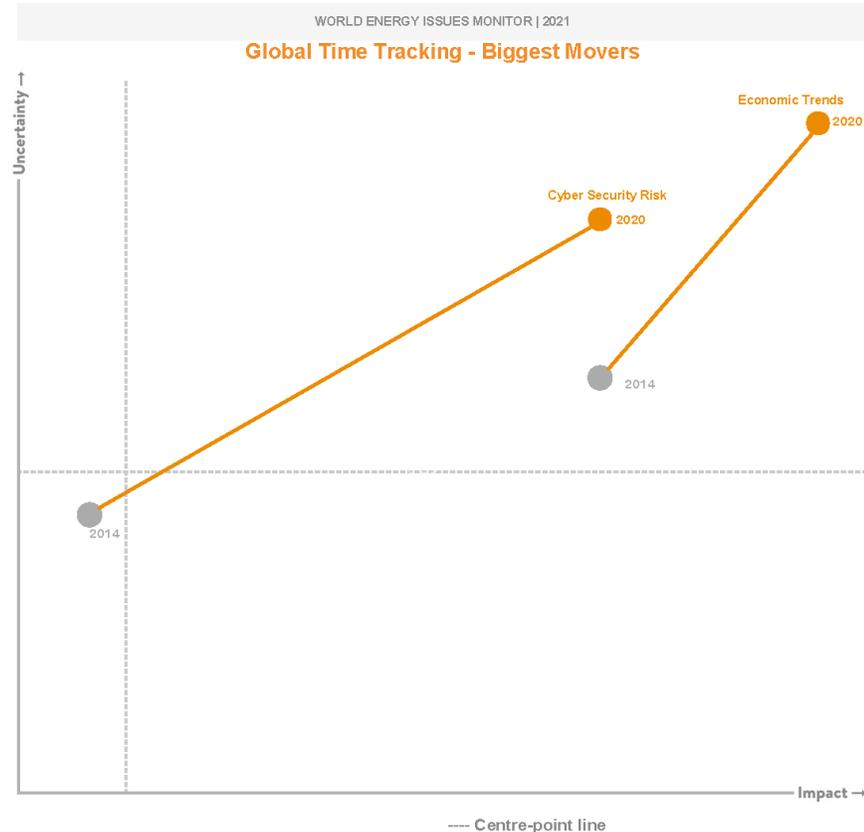


- **Renewables** – long-standing Action Priority as energy sector implements proven technologies and make them work within energy system
- **Energy efficiency** – longer-term policy aspiration with energy sector looking for continuous improvement
- **Support mechanisms** – in short-term for COVID response and long-term for feed-in tariffs or post-COVID recovery
- **Affordability** – high profile with pandemic exposing long-standing societal issues related to cost / access
- **Demographic patterns** – country specific with developing countries looking at rising urban populations increasing demand contrasting with developed countries anticipating flat or declining demand being exacerbated

How have global perceptions for energy leaders shifted with the pandemic?

GLOBAL PERSPECTIVES	2020	2021
<p>Critical Uncertainties</p>	<p>Economic Growth Commodity Prices US Policy IoT Blockchain Data AI</p>	<p>Economic Trends Investor Environment Energy Supply Cyber Security Risk Carbon Abatement</p>
<p>Action Priorities</p>	<p>Renewable Energies Energy Efficiency Capital Markets LNG Hydro</p>	<p>Renewable Energies Energy Efficiency Support Mechanisms Affordability Demographic Patterns</p>

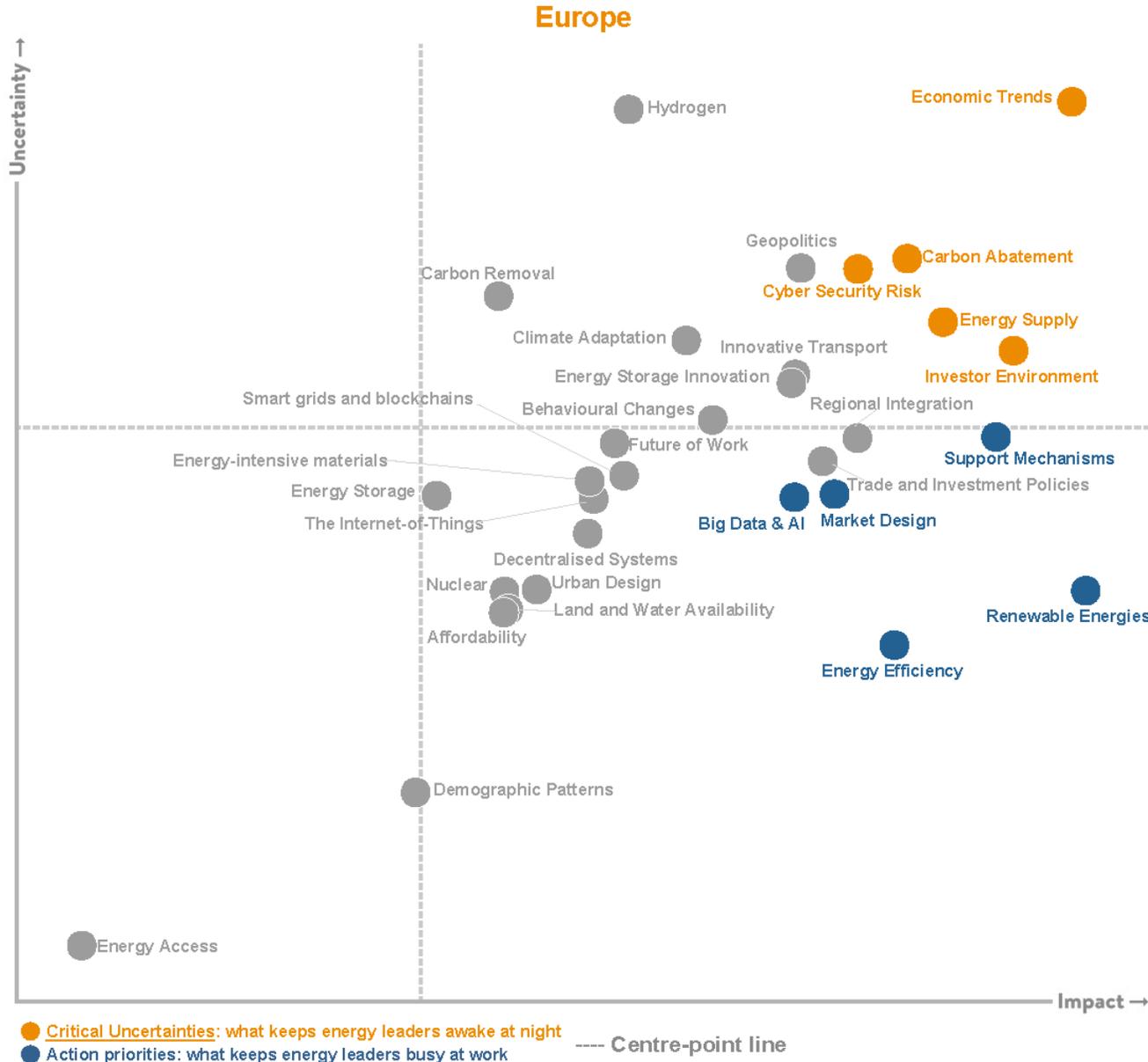
A fundamental re-set in energy leaders' thinking



- **Economic Uncertainty dominates the political and energy agenda** - A resurgence of COVID in late 2020 and reintroduction of stringent COVID mitigation measures will continue to put strain on the global economy throughout 2021
 - Potential to impact energy transition, through limited availability of capital and continued reduced investor confidence
 - Opportunity to use the post-pandemic recovery to address the societal imbalances exposed by the pandemic and enable a more inclusive clean energy transition
- **Increased digitalisation leads to increased cyber risks** – Significant reliance on digital solutions to mitigate the economic impacts of the pandemic
 - Awareness of cyber risks pushed up in the leadership agenda, driving the topic into the critical uncertainty list in this year's survey
 - Need new, agile, risk management strategies to counter its evolving risk profile and increase resilience, given its fundamental role in critical national infrastructure



FOCUS ON EUROPE REGION



Europe Energy Issues Monitor 2021

- **European climate ambitions being reinforced by post-pandemic recovery plans**
 - European Commission supporting a package of measures under the green new deal banner
 - Delayed COP26 raising ambition for UK host
 - Russia looking to nuclear for carbon neutrality
- **Greater awareness of cyber security risks and Big Data & AI**
- **Market Design and Support Mechanisms** appear as the link between Critical Uncertainties and Action Priorities:
 - Net-zero targets will require markets to be able to incorporate effectively new technologies and business models; regulatory frameworks may need to be updated;
 - Support Mechanisms: what kind of mechanisms are needed in different local contexts?

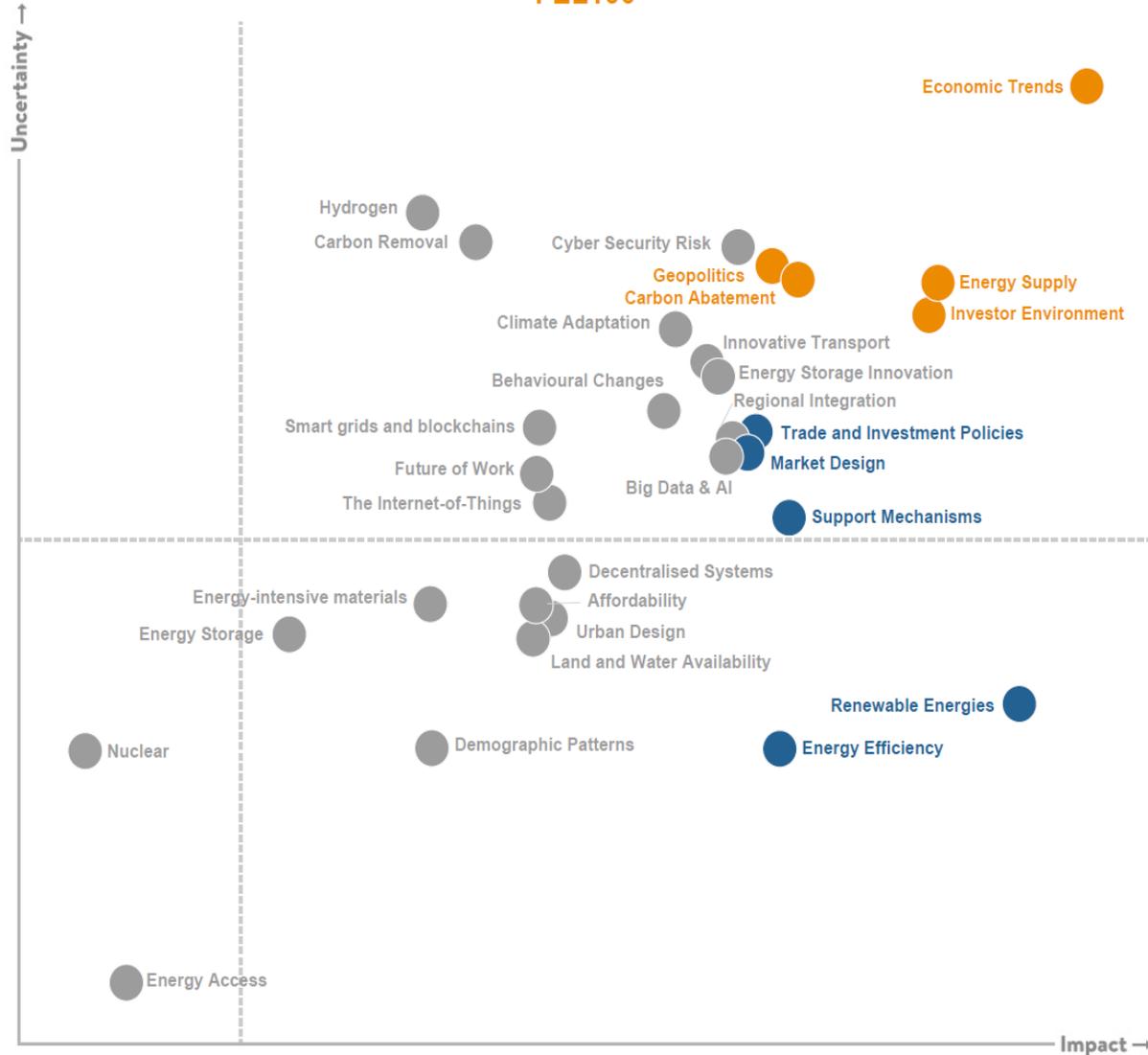
Individual country responses – ‘enablers’ for increasing RES/EE

Support mechanisms	Market design	Regional integration
Bosnia and Herzegovina	Croatia	Estonia
Estonia	Estonia	Latvia
Germany	Greece	Portugal
Ireland	Ireland	Serbia
Lithuania	Italy	Slovenia
Poland	Lithuania	
Romania	Turkey	
Russia	United Kingdom	
Turkey		

Humanising Energy

- Energy transition is not a technology or policy-driven process alone
- IM 2021: there is increased awareness that human / societal aspects need to be understood
 - Active energy citizens, empowerment of consumers
 - Consumer behaviour and public acceptance
 - Affordability / cost of energy (transition)
 - (Energy) poverty
 - Impact on industries and regions
 - ‘Inclusive’ green recovery
- In the Council’s Humanising Energy vision, such aspects are integrated in (thinking about) the energy transition

FEL100



● Critical Uncertainties: what keeps energy leaders awake at night

● Action priorities: what keeps energy leaders busy at work

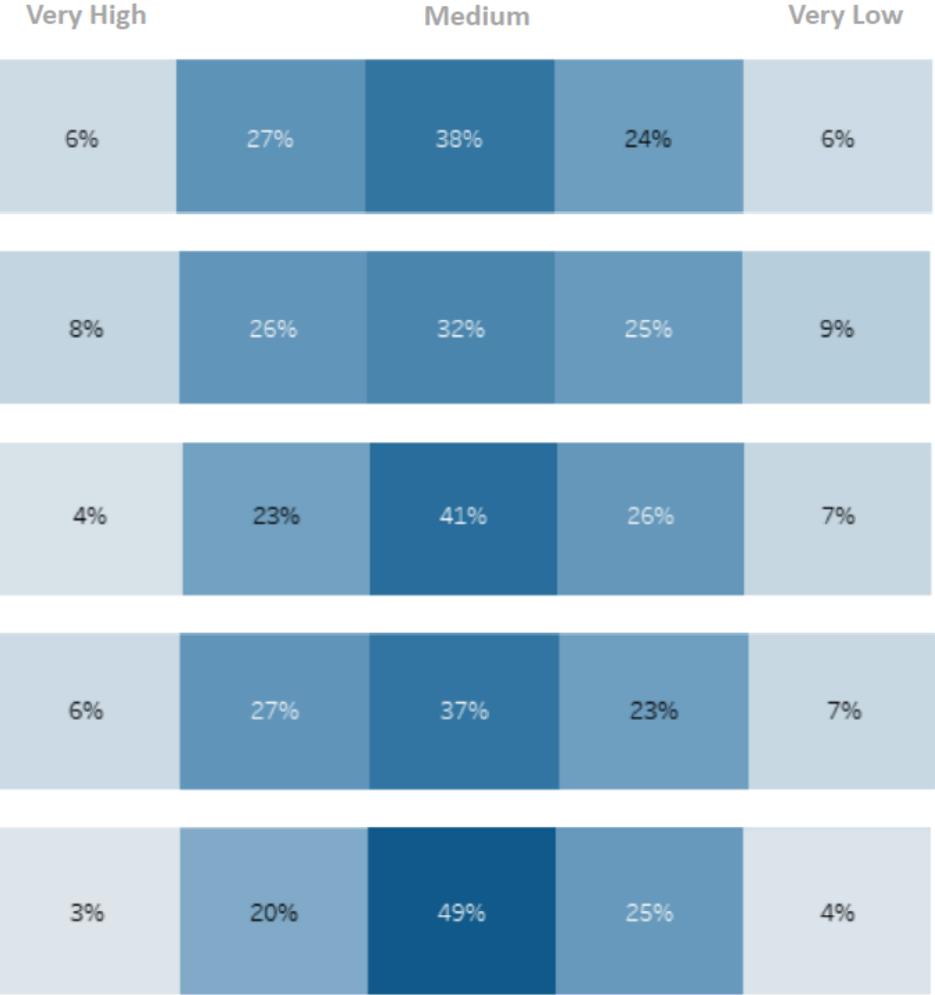
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FEL 100

- The Future Energy Leaders (FEL) community sees **economic trends** and **renewable energies** as the issues with the most significant impact in this year’s Issues Monitor, but the level of uncertainty associated with each of these issues varies significantly
- FELs see **renewable energy as the backbone of the future energy system**, with high certainty that renewable energies are a key factor in our future, and little doubt of its importance
- Other action priorities for the FEL community are **energy efficiency, support mechanisms, market design and trade and investment policies**.
- Not surprisingly, FELs have identified the **investor environment** as a critical uncertainty in addition to economic trends. Other critical uncertainties highlighted by FELs include **geopolitics, energy supply and carbon abatement**
- Around half of all FELs believe we have low or **very low preparedness for disruptions** like natural hazards, extreme weather events, pandemics, cyber-attacks or terrorism

2021	Europe	FEL100
<p>Critical Uncertainties</p>	<p>Economic Trends Energy Supply Carbon Abatement Investor Environment Cyber Security Risk</p>	<p>Economic Trends Energy Supply Carbon Abatement Investor Environment Geopolitics</p>
<p>Action Priorities</p>	<p>Renewable Energies Energy Efficiency Support Mechanisms Market Design Big Data & AI</p>	<p>Renewable Energies Energy Efficiency Support Mechanisms Market Design Trade and investment</p>

Europe – Resiliency and Preparedness



Pandemics

Natural hazards

Malicious risks

Extreme weather events

Demand-side structural changes and disruption

insights@worldenergy.org



Lucia Fuselli

Director - VVA Economics and Policy



How to boost renewables to meet the climate targets in Europe? - intro -

European renewable energy – an overview

Current targets in EU:

- 32% share of renewable energy in gross final consumption by 2030
- climate neutral by 2050

Renewables provided 38% of electricity output while fossil fuels provided 37% in 2020

International regulatory frameworks:

- Renewable Energy Directive RED I and II
- National Energy and Climate Plans
- EC Guidelines on State Aid for Environmental Protection and Energy for 2014-2020: market based mechanisms such as auctions are the main instrument of support for renewables
- Regulation on the EU renewable energy financing mechanism (EU) 2020/1294, the mechanism links countries that voluntarily pay into the mechanism (contributing countries) with countries that agree to have new projects built on their soil (hosting countries) through competitive tenders for grants

148 National regulatory frameworks still en course

European renewable energy – an overview

- **2010 – 2014** – main European countries had **Feed-in-Tariffs** for renewables
- **2014 - 2018**
 - main European countries **develop auctions** and market-based instruments and **progressively cut FiTs**
 - UK develops contracts for difference (CfDs) instrument of market stability based on supply and demand
 - subsidies for renewables in Cyprus, Austria, Lithuania, Luxembourg
 - subsidies for innovative renewables in Germany (storage) and Belgium (energy transition fund)
- **2012-2019**
 - offshore wind tender regulations in the Netherlands (2015)
 - offshore wind energy auctions in the UK and in Germany
 - PV auctions in Germany (2015)
 - capacity auctions in Spain (2016 and 2017), auctions in Italy (2012, 2016), Ukraine, Portugal (2018 – 2019)
 - FiPs awarded via auctions in Greece (three rounds from 2016 pilot)
 - FiP in Finland (technology neutral and FiP based on Nordpool market price, 2018)
 - Estonia reverse auctions (2018)

European renewable energy – auction mechanisms

- **Auction prices ranges considerably** (market, round, level of subscription of auction, link to market prices)
- **Some technologies are becoming subsidy free:** prices reached by auctions for offshore wind have been stabilizing around prices similar to current wholesale market prices, meaning Europe offshore wind could be subsidy free by as early as 2023
- **Auctions for renewables but also auction for ancillary services** (UK, Denmark)
- Some auctions (e.g. in Germany) have been undertaken specifically to encourage **community energy projects** with conditions (remuneration and permitting requirements) aimed at ensuring a leveled playing fields
- **Cross border auctions:** Germany and Denmark ran solar PV auctions (2016) open to bidders from the other country

European renewable energy – market-based countries

- FiTs remain in some countries (e.g. Poland, Cyprus) or as a support to innovative energy installations (e.g. storage...) but most renewables now utilize market-based instruments
- German cabinet approved a reform to the country's renewable law (EEG, 23/09/2020) setting out 2030 capacity expansion pathways for renewables and commits to the continuation of onshore wind subsidies (auctions on onshore/offshore wind and large scale PV) while increasingly pushing solar towards unsubsidised growth; at the same time a portion of the assets dropping out of incentives might search other forms of (private) revenue until EoL (e.g. PPAs or entering auctions)
- The UK and the Nordics now quite exclusively utilize market-based instruments (CfDs and auctions) whilst larger portion of projects being developed on a completely merchant basis under corporate PPAs (not only energy intensive industries but also tech, pharma...).

European renewable energy – PPAs

- **solar and wind PPA prices rose in 2020** (11% and 24%) despite price of technologies continuing to decline
 - demand exceeded supply, a trend that will continue in 2021
 - companies acting on sustainability commitments and offsetting climate risk
 - competition for locations, connections and permits
- **around 70 PPAs in Europe in 2020, for a total of 8.9 GW**, 54% of which with corporate offtakers (growing corporate demand +85%)

TRENDS:

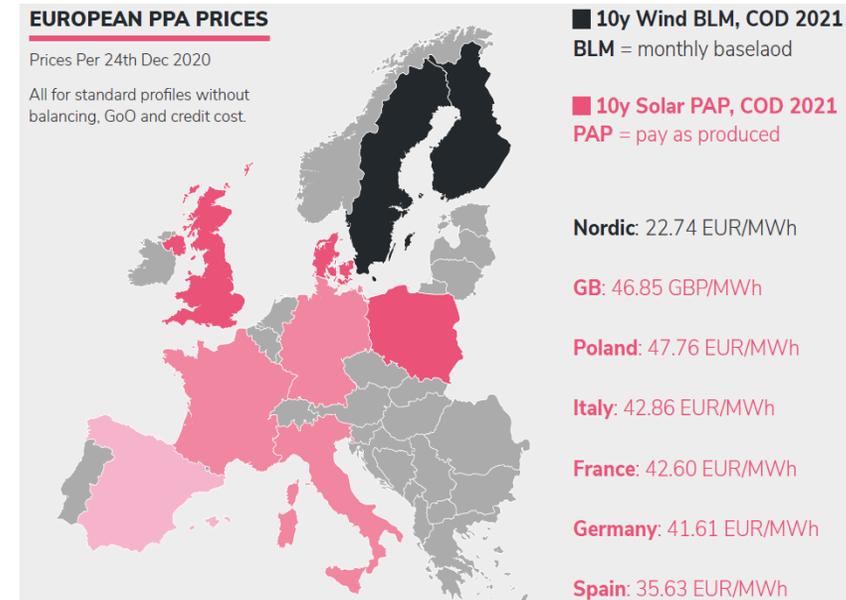
- **solar** leads the technology mix
- **Spain** as the most attractive market (low cost of tech and favourable economics in the country)
- **Nordics** PPAs (strong in 2017-2019) to a standstill due to price falls and in absence of interconnections
- **chemical companies** (e.g. Bayer) have surpassed tech acquirers
- PPA for **offshore wind**
- sellers a limited number of large sized utilities (e.g. Iberdrola, BP Lightsource...)

European renewable energy – PPAs

- **no Europe-wide single PPA market** (level of REs penetration, policies, national power prices, trading liquidity)

OUTLOOK

- Increased exposure to PPA prices, increased volatility → **investment in risk management** tools and analytics to originate, price and optimize PPA structures and for portfolio management
- Larger-sized and multi-technology PPAs → larger, geographically diversified, and vertically integrated players + **more offtakers per PPA**
- Players will seek vertical integration to be able to cover different geographies and larger, more complex deals → **increased M&A activity** (e.g. utilities/investors acquiring developers)

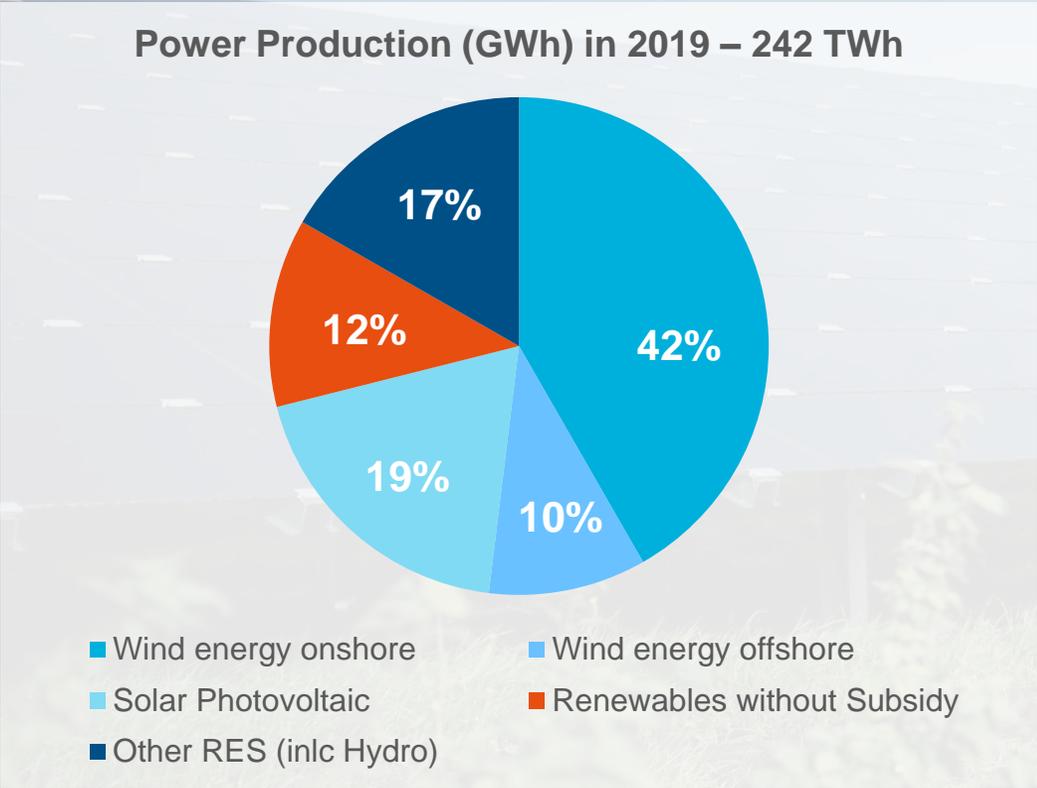




Annkathrin Rabe
Originator, Statkraft Markets GmbH

Renewable Power in Germany

Renewables under Subsidy (EEG)



Renewables under PPAs

-  Existing assets dropping out of EEG subsidy
 
-  New Assets without EEG subsidy
 
-  Existing Assets opting voluntarily out of subsidy
 
-  Existing Assets without subsidy
 


Source: BMWi https://www.erneuerbare-energien.de/EE/Navigation/DE/Service/Erneuerbare_Energien_in_Zahlen/Zeitreihen/zeitreihen.html

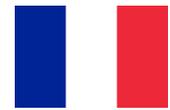


Cristian Montoya

Director Smart Grids, E-Mobility & Innovation, Alpiq

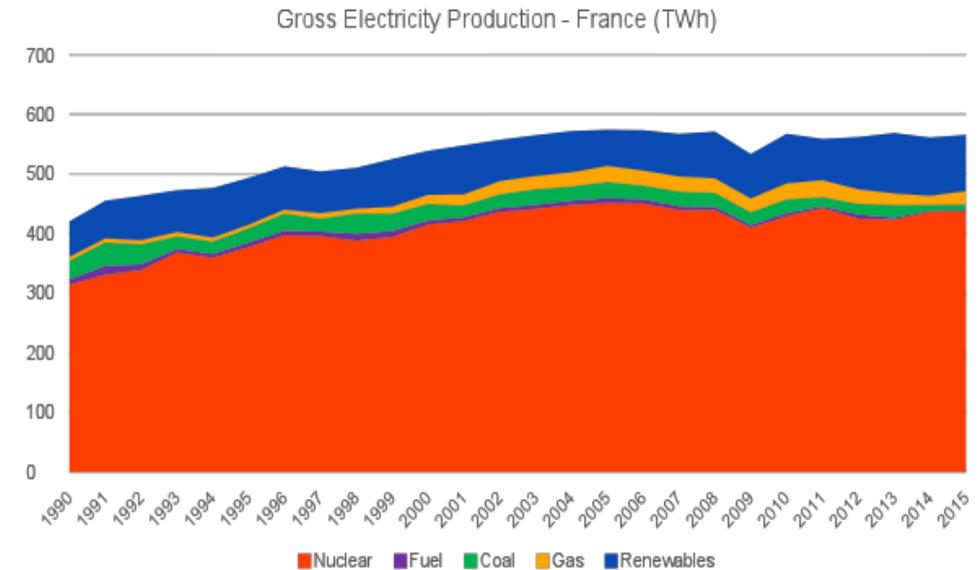
Renewables in France: Generation capacity and electricity mix evolution

France, nuclear at the heart of the electricity mix



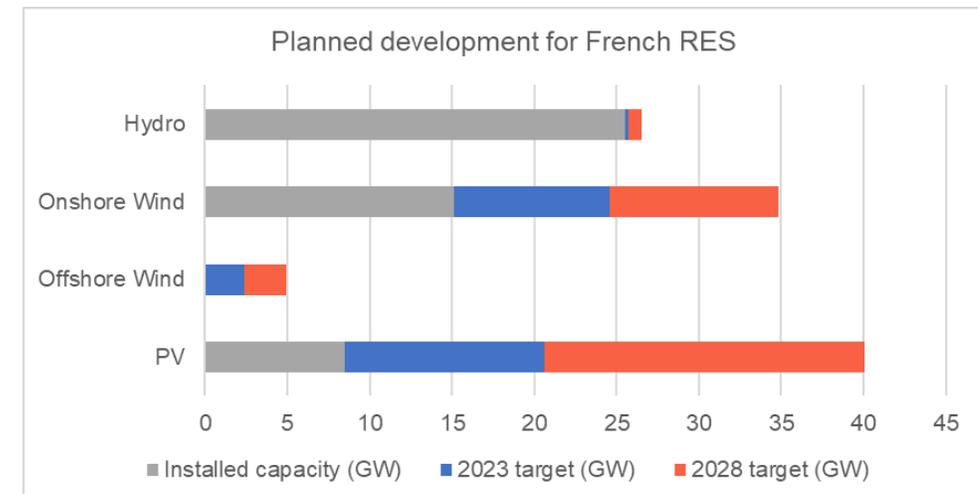
General Energy market context

- Electricity Demand: 476 TWh ;
- 102 GW peak load (thermosensitivity) vs 70 GW base load
- Electricity Generation = 567 TWh
 - > 70% nuclear generation → expected to decrease to 50% in 2035
 - +150 TWh of generation since 1990 with +17 GW of solar and wind installation (25 GW of hydro)



RES market context and perspectives

- New ambitious objectives for RES development published by the French government in January 2019.
- The French RES market remains characterized by support schemes (mainly CFD with a feed-in premium since 2017 + feed-in tariffs for small plants < 500 kW).
- Wind and PV projects are decreasing their costs, which implies lower bid prices for the CFD auctions organized by the French regulator.



What is the potential for PPA in France?

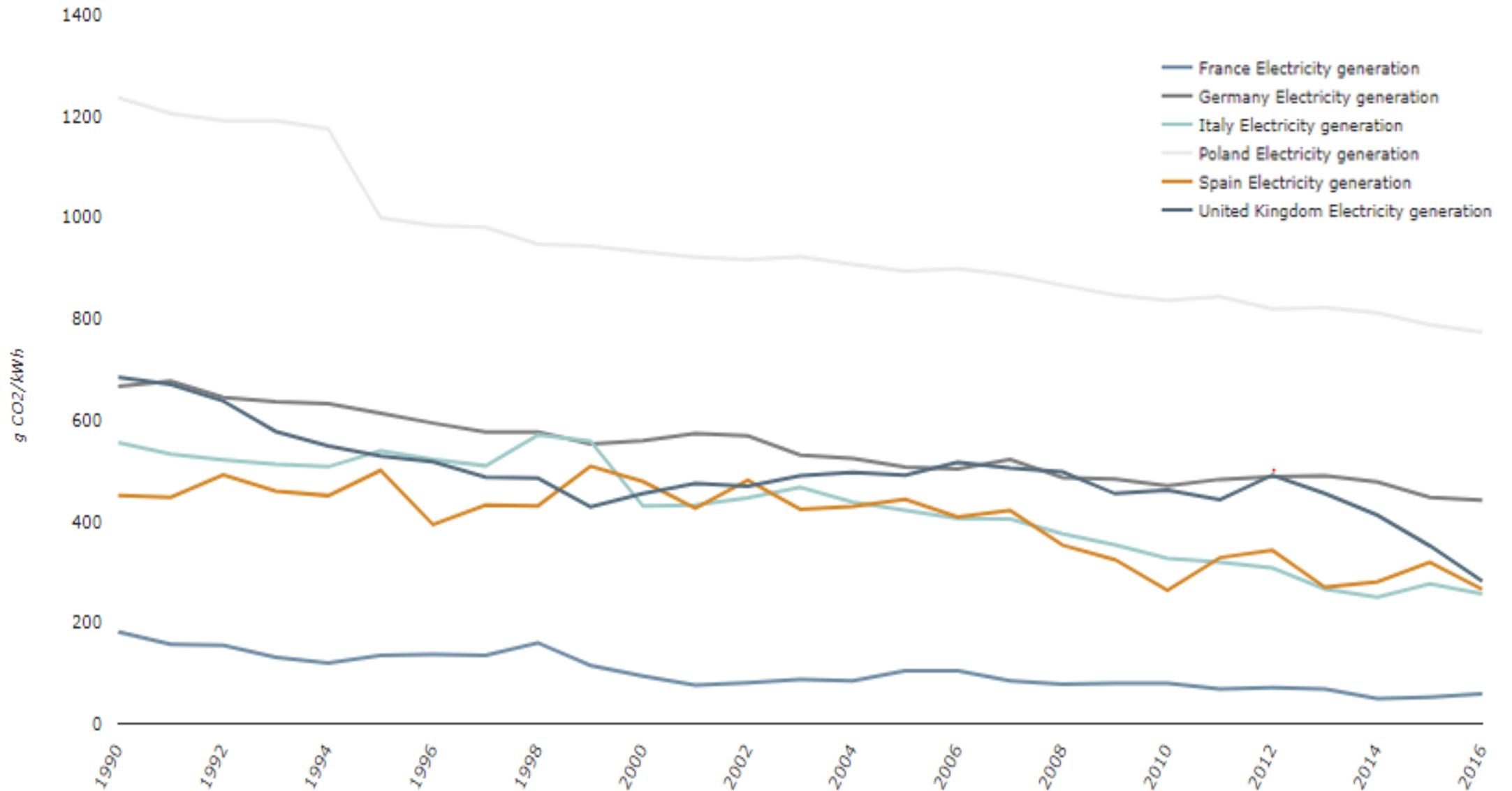
Since the beginning of 2019, there is a real trend in France towards the development of PPAs.

- **End of support schemes** for some capacities (the French regulator estimates for instance that 500 MW to 1000 MW of onshore wind won't benefit anymore from a support scheme from 2020/2021).
 - → This creates an opportunity for so-called ***brownfield Power Purchase agreements (PPAs)***.
- **Renewables are more and more competitive** (large PV is close to average Power yearly price).
- **Existing trend towards increasing CO₂ price. More that 40 €/tonCO₂**
- Companies want to develop a **greener electricity sourcing** (several French companies are part of the RE100 initiative).
 - → PPAs allow producers to sell both green electricity and green certificates to consumers that want a **full traceability for their green sourcing**.
- **Need for a greater visibility for consumers on long term purchase price of electricity** (all the more so as the ARENH sourcing will disappear in 2025 and some EXELTIUM sourcing stop during the 2020s).

Duration	Technology	Capacity	Buyer	Producer
3 years	Onshore wind	11,5 MW	METRO	EUROWATT
25 years	PV	5 MW	BOULANGER	VOLTALIA
25 years	PV	143 MW	SNCF	VOLTALIA
3 years	Onshore wind	12 MW	MAISADOUR	EDF ENR
3 years	Onshore wind	11,5 MW	SOCIETE GENERALE	EUROWATT
25 years	PV	10 MW	CREDIT MUTUEL	VOLTALIA
15 years	PV	18 MW	ENGIE SOLUTIONS	ENGIE GREEN
15-21 years	PV	47 GWh	AEROPORTS DE PARIS	URBASOLAR
15-20 years	PV	40 MW	SNCF	RES GROUP
20 years	PV	60,7 MW	AUCHAN	VOLTALIA
3 years	Onshore wind	16 MW	AUCHAN	BORALEX
3 years	Onshore wind	? MW	AUCHAN	EUROWATT
5 years	Onshore wind	39 MW	ORANGE	BORALEX
15 years	PV	51 MW	ORANGE	ENGIE GREEN

List of signed PPAs

Electricity generation – CO2 emission intensity (g CO2/kWh)





Andreas Formosa
Senior Associate, Clifford Chance

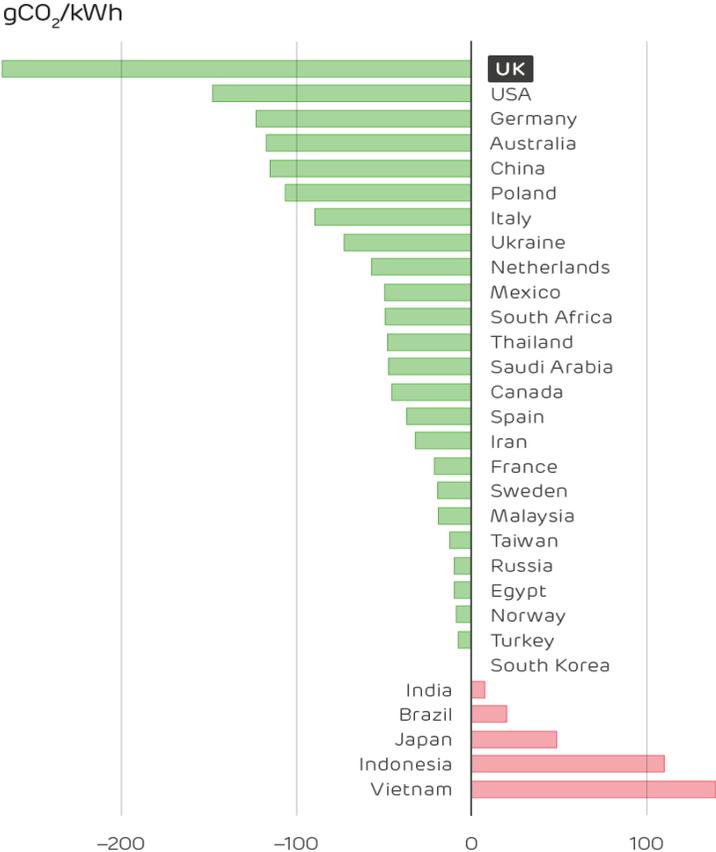
C L I F F O R D
C H A N C E

HOW TO BOOST RENEWABLES TO MEET THE EU CLIMATE TARGET
RENEWABLES IN THE UK

FEL EUROPE
26 MARCH 2021
ANDREAS FORMOSA

OVERVIEW OF UK POWER SECTOR

POWER SECTOR HAS FASTEST RATE OF DECARBONIZATION GLOBALLY BETWEEN 2010 – 2020



Source: Drax Insights

Since 2010:

- Carbon intensity reduced by 58%
- Renewable power has grown six-fold
- Coal generation fell to 2%

Looking ahead:

- Legally binding net zero target for 2050
- 5 yearly carbon budgets
- Target of 40GW of offshore wind by 2030

RES SUPPORT SCHEMES IN THE UK

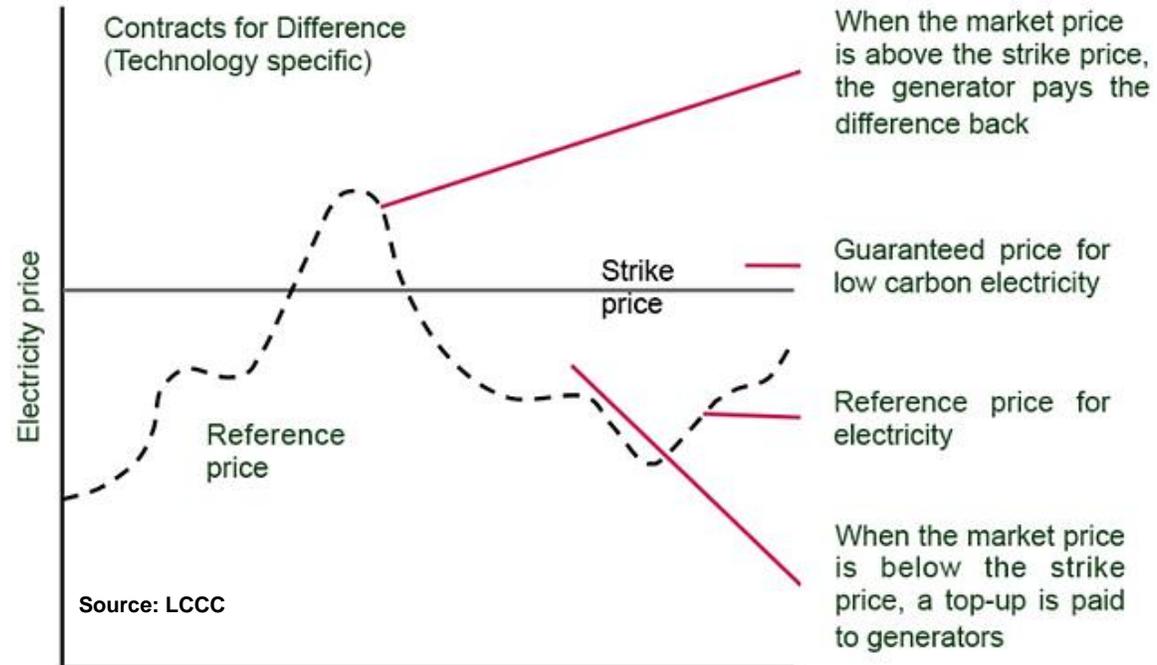
RES SUPPORT SCHEMES IN THE UK HAVE ADOPTED MARKET FRIENDLY CHARACTERISTICS

Subsidy schemes:

- **FiT** (2008)– 6.2GW
- **RO** (2002) – 32GW
- **CfD** (2015)- 15.5GW

- CfD is currently the only available subsidy scheme
- However, it is the most market based scheme

How the CfD works



UK PPA MARKET

UK HAS A LONG HISTORY OF RENEWABLE ENERGY PPAS

- Even early subsidy schemes (FiTs and RO) required RES operators to also contract with private offtakers
- CfD is only a revenue stabiliser and also requires separate route to market agreements
- Going forward we will continue to see strong demand for renewable PPAs for both generation contracted under CfD and subsidy free renewables through PPAs and corporate PPAs, due to:
 - Commitment to new CfD auctions
 - Strong corporate interest
 - Retail consumer awareness and demand

C L I F F O R D
C H A N C E

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Silvia Escudero
Originator, Statkraft Markets GmbH

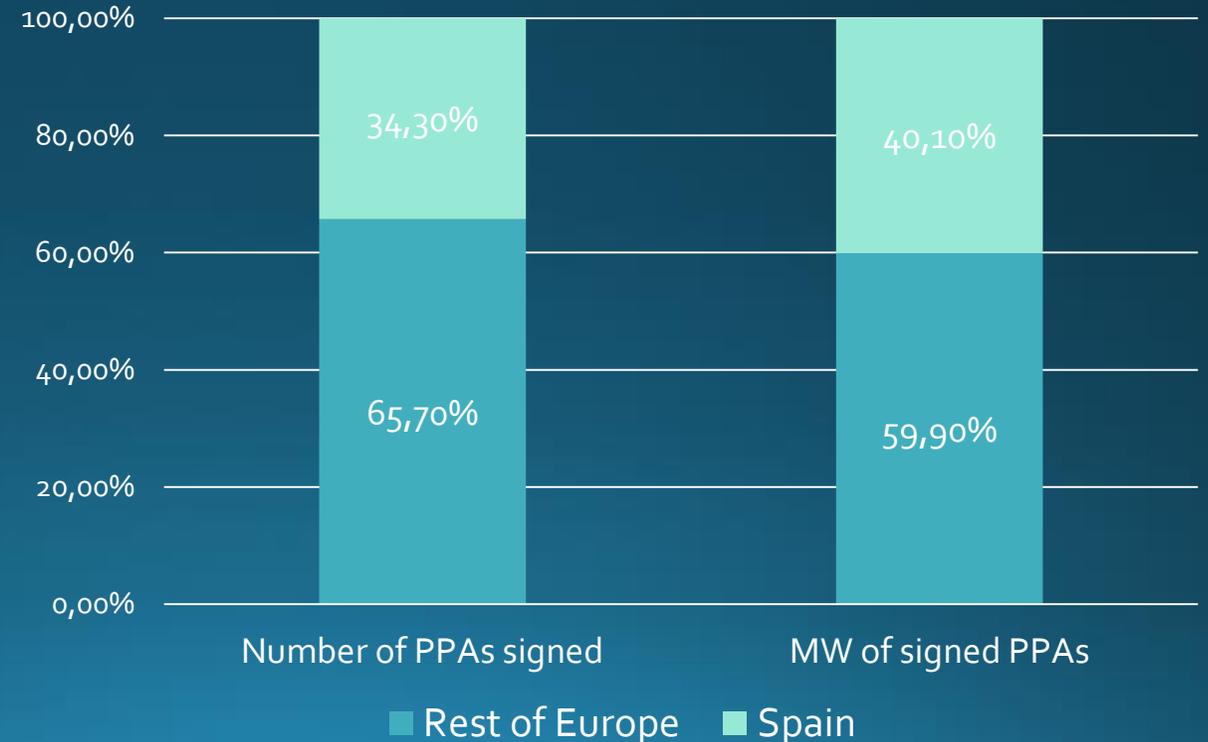
Route to Market for Renewable Energy in Iberia



Expected Quality Factor Solar Iberia



PPA signed in 2019-Q2 2020





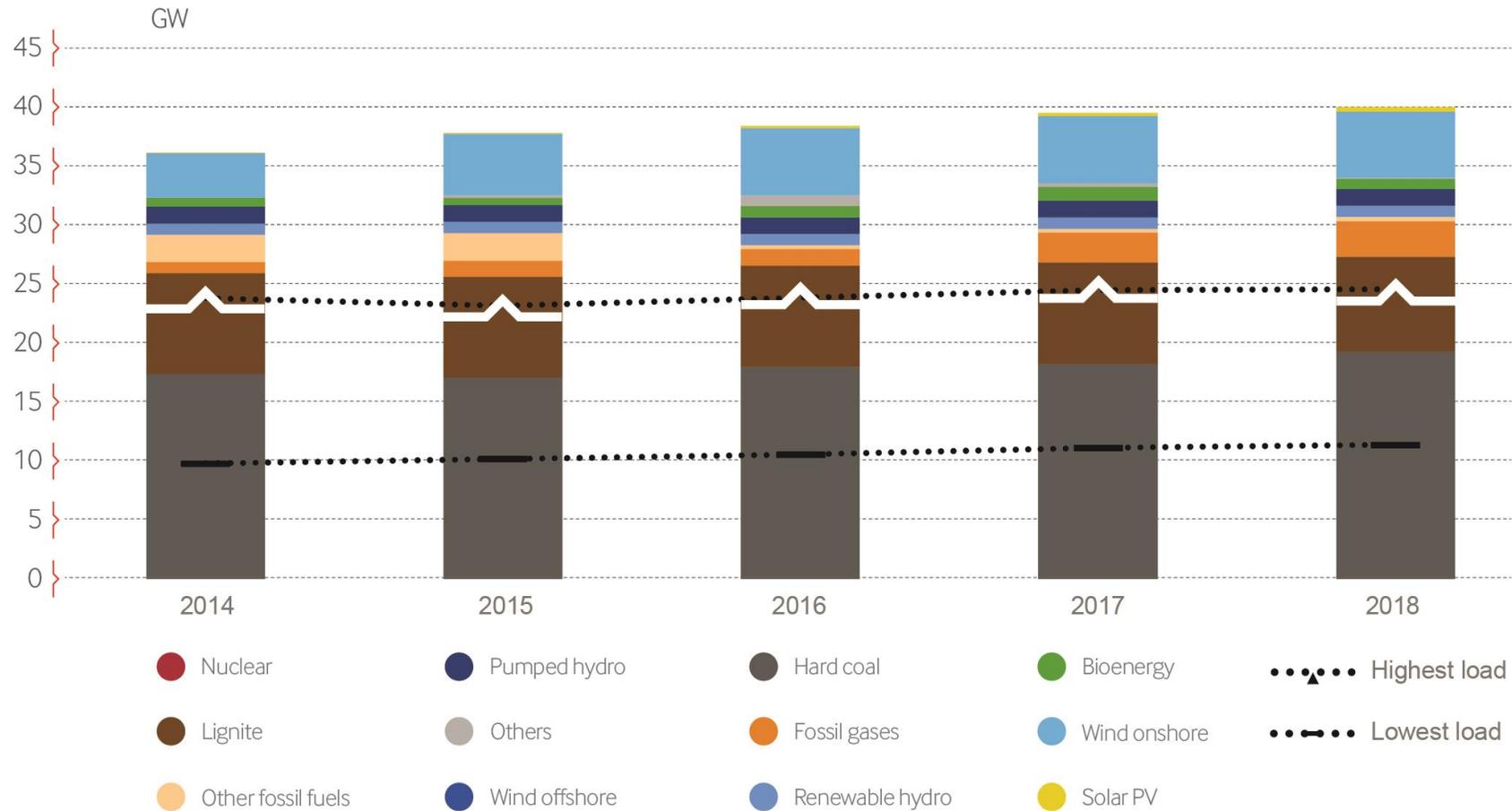
Christian Schnell
Partner, Solivan Pontes law firm



POLAND: POWER MARKET OUTLOOK

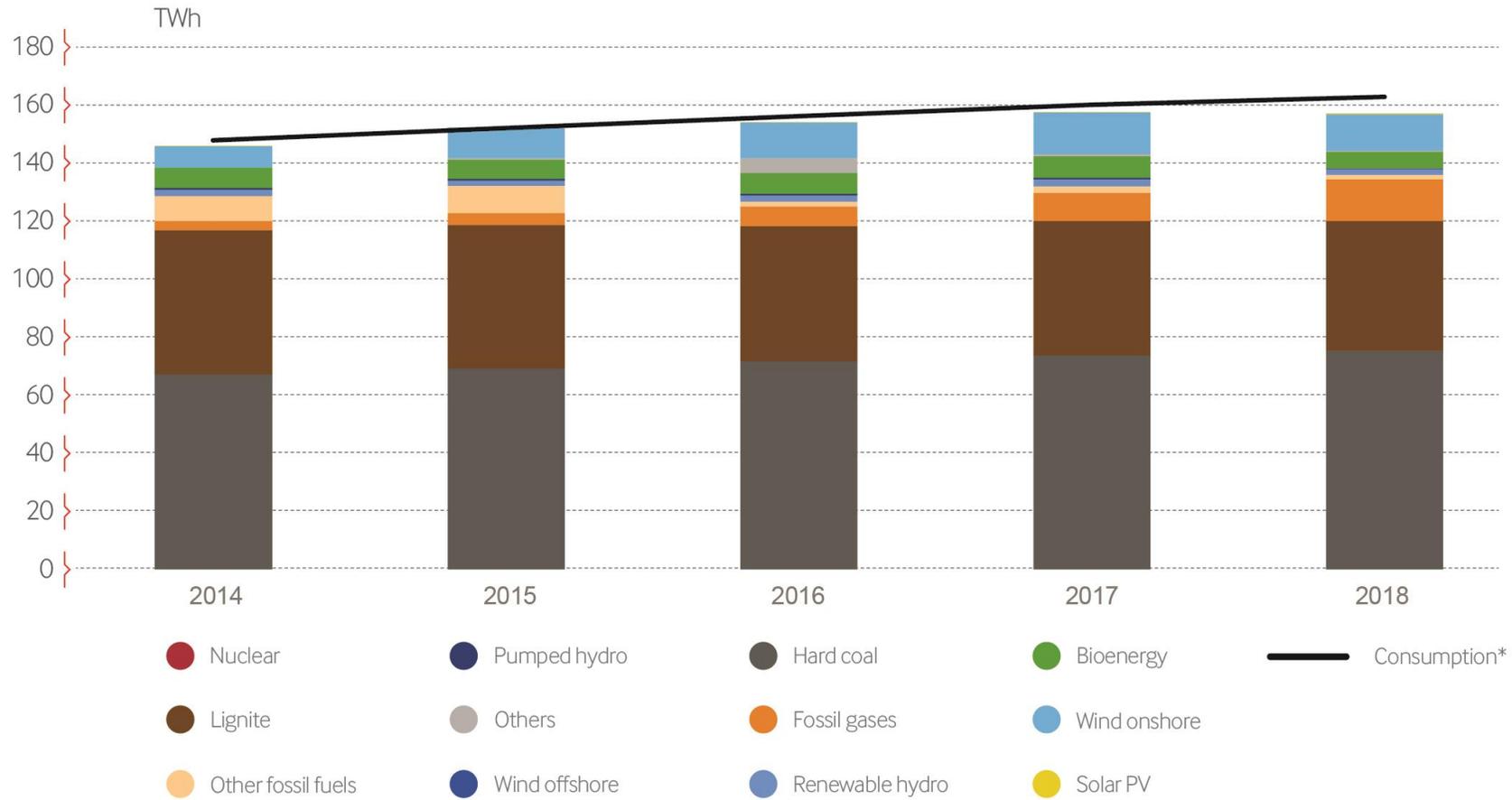
Christian Schnell, 26/03/2021

CAPACITY MIX IN POLAND



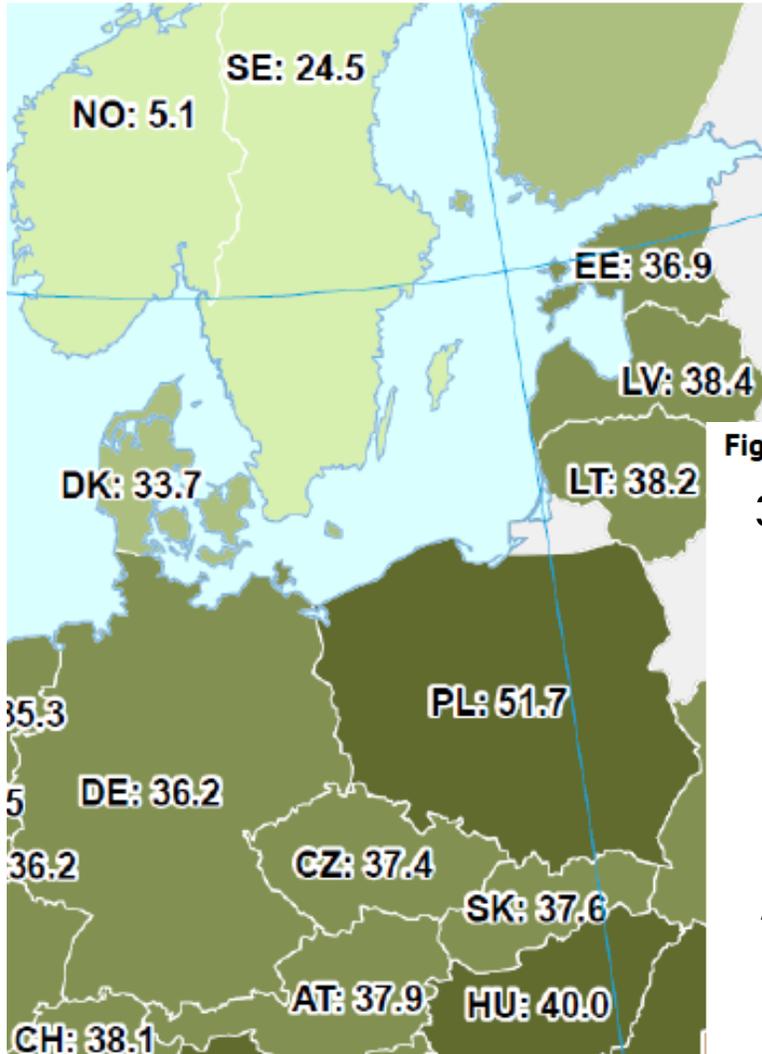
Source: eneravis based on entso-e

GENERATION MIX IN POLAND



Source: enervis based on entso-e

WHOLESALE PRICES Q3/2020

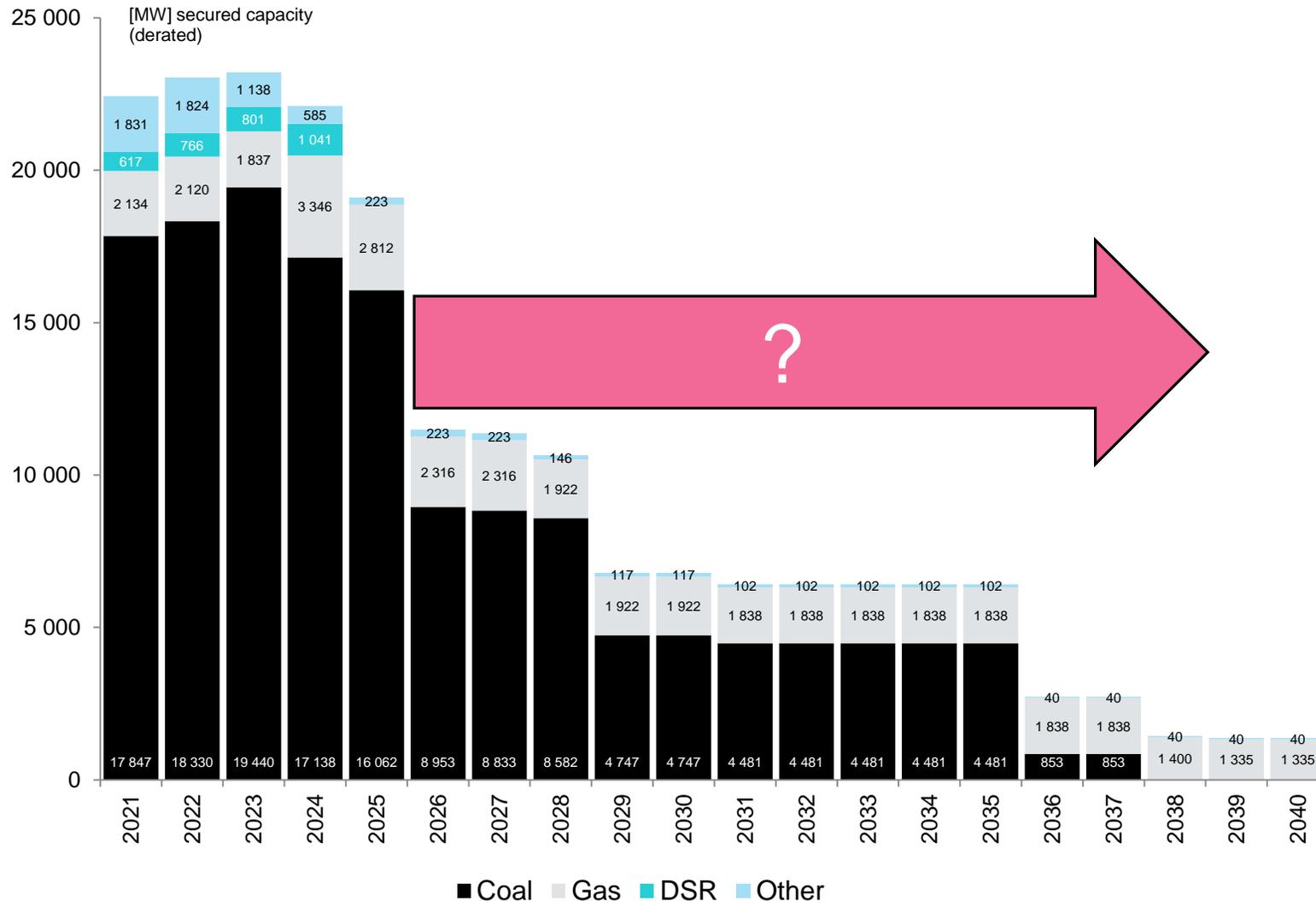


QUARTERLY REPORT ON EUROPEAN ELECTRICITY MARKETS QUARTER 3/2020

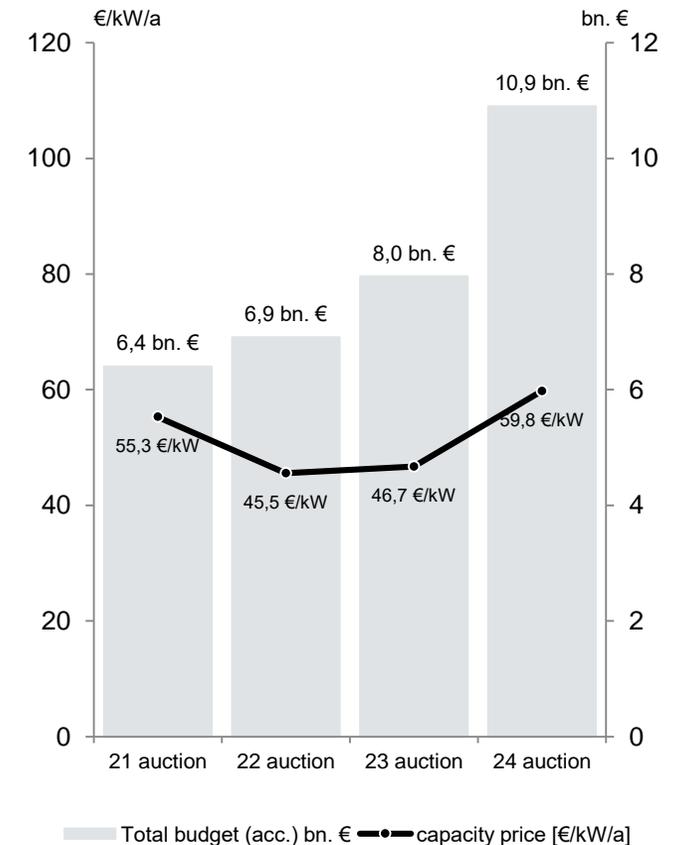
Figure 7 – Evolution of emission allowance spot prices from 2018



RESULT OF CAPACITY MARKET AUCTIONS



Total costs PLN 6 bln/year
Levy on distribution tariffs.



OPERATIVE SUPPORT FOR RENEWABLES

- **Contract for difference market premium tender system**
 - Pay-as-bid auctions organized once per year in different technology baskets, onshore wind and PV competes in the same basket and amount to 95% of the auctioned energy volume
 - Indexed strike price settled on monthly basis against the Polish PX (TGE) Base Index (for a 15-year period) and paid out in case of a negative balance (indexed strike price exceeds base index)
 - NEW: draft law requiring that every three years a positive balance (base index exceeds indexed strike price) has to be settled with the state-owned settlement agency (ZRSA) > payment for floor
- **Net-metering system for active consumers**
 - up to 50 kW installations
 - Surplus energy is ‚stored’ in the grid and redistributed with a co-efficient between 0.8 and 0.6
- **Peer-to-peer**
 - NEW: draft law allowing active consumers with up to 499 kW installations to ‚trade’ energy with neighbours in case such trade is not their main economic activity
 - Direct line is legally blocked

THANK YOU



Q&A?

WG: BLOCKER FEL EVENT: HOW TO BOOST RENEWABLES ACROSS EUROPE

Mentimeter

Regarding the event "WG: Blocker FEL Event: How to boost renewables across Europe" what are your main insights?



Closing session



Bruno Henrique Santos



Nuno Marinho

A special thanks to all the organizing team

**WORLD
ENERGY
COUNCIL**

**FUTURE
ENERGY
LEADERS**

Thank you!

