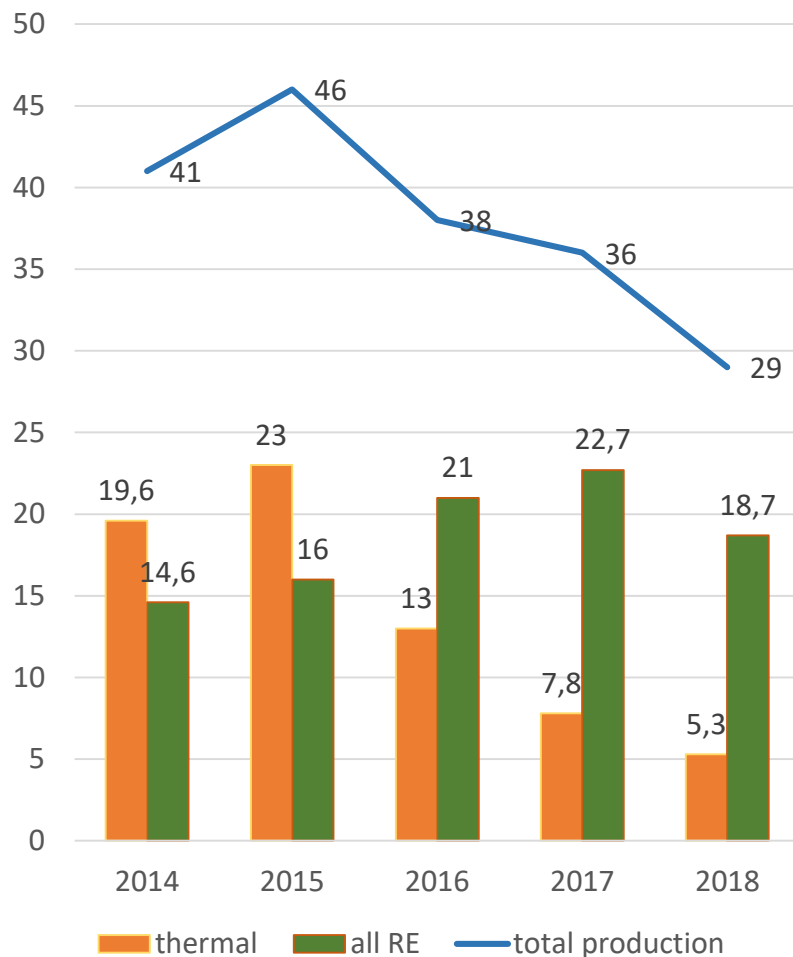


Unlocking Corporate Power Purchase Agreements (PPAs)

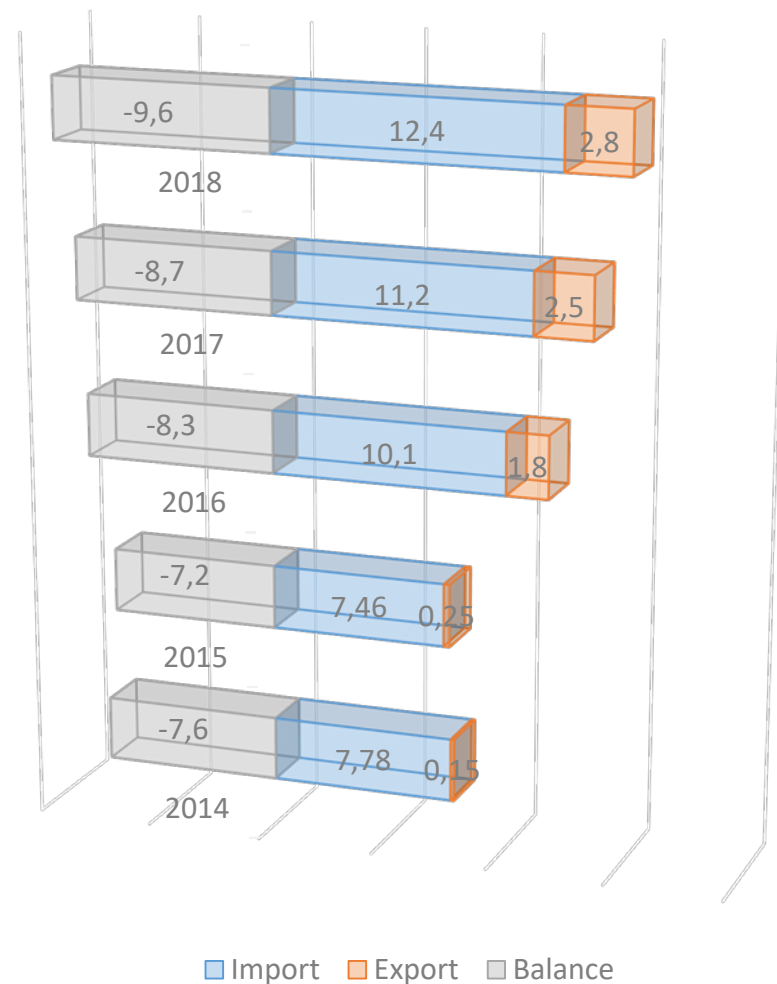
Aistis Radavičius
CEO, Chairman of the Council
Lithuanian wind power association
Vilnius 2019

Lithuanian market outlook

Electricity production (% of final consumption)



Electricity Import/Export balance (TWh)





National energy strategy: 100 % electricity and heating from RES by 2050

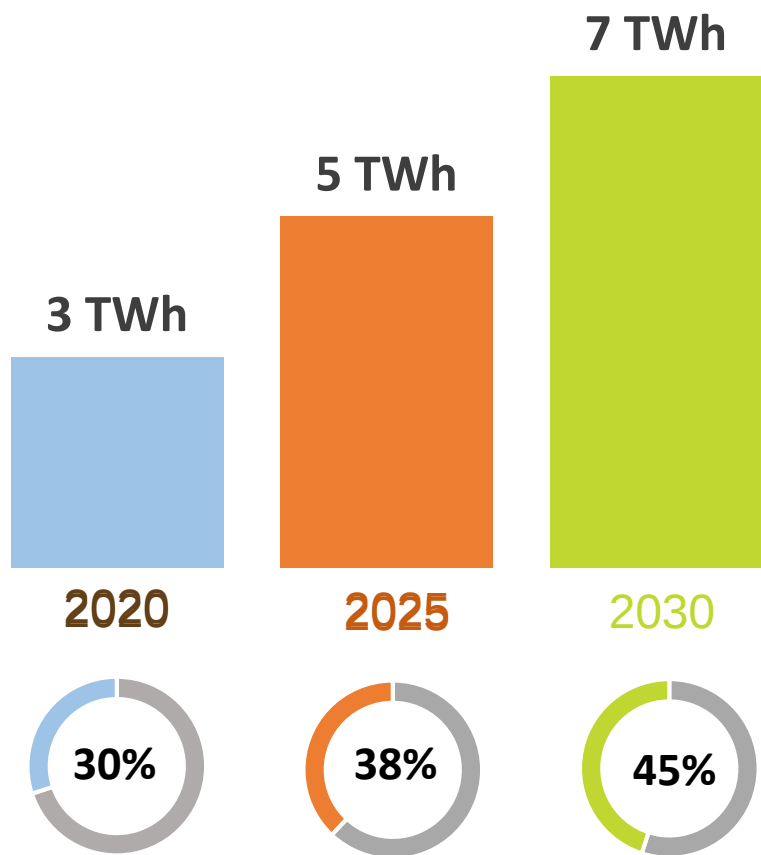
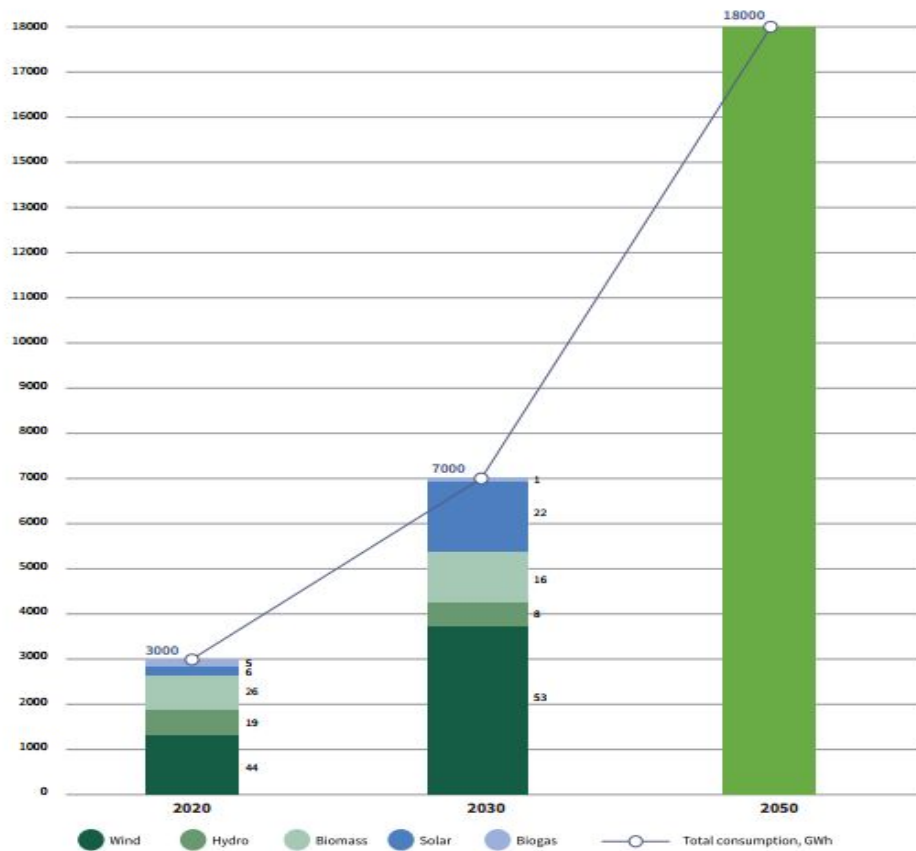
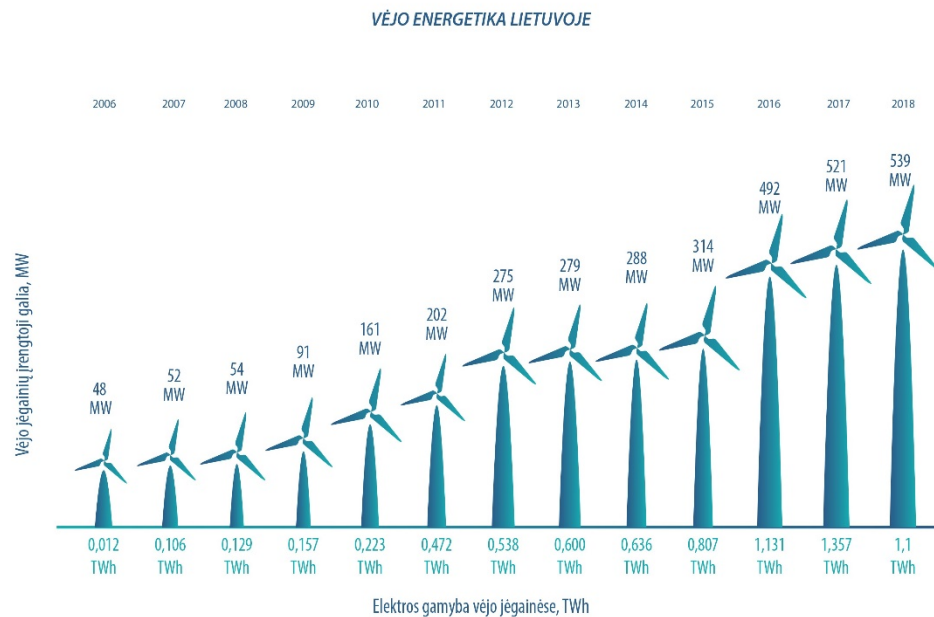


Fig. 7. Market structure by the amount of RES-generated electricity consumed, % and GWh (forecast)

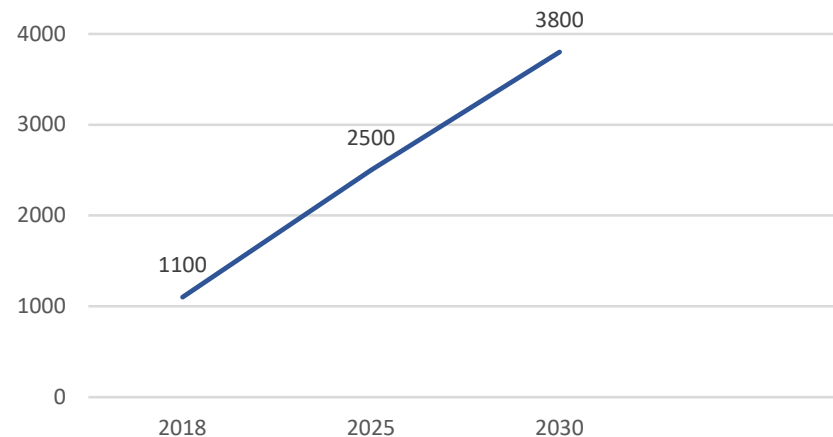


Source: Lithuanian Energy Institute, Ministry of Energy of the Republic of Lithuania.

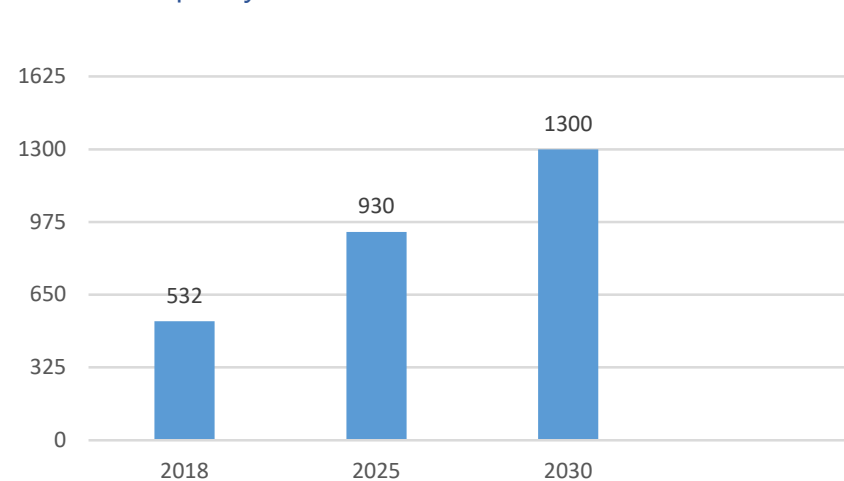
Wind energy production in Lithuania: triple increase by 2030



Annual production 2018-2030 (GWh)
(forecast)

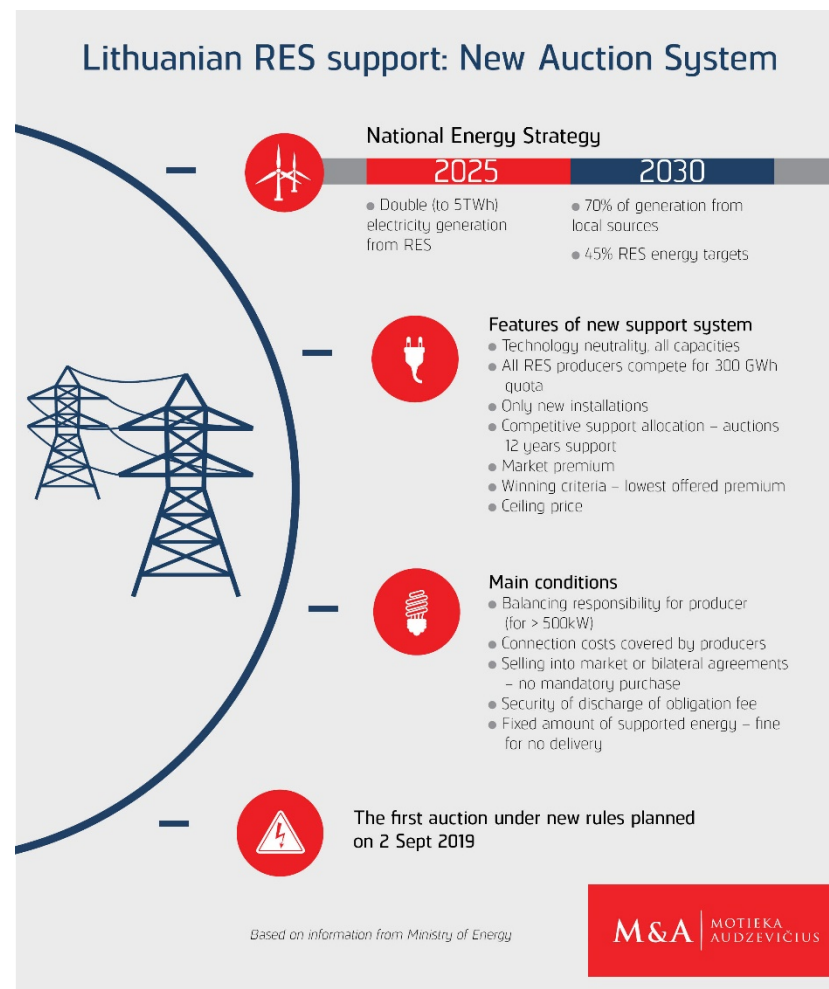


Installed capacity 2018-2030 (MW) (forecast)



Positive political developments

- ✓ National Energy Strategy adopted in 2018 (103 out of 104 MP's in favour)
- ✓ NES Implementation Plan approved
- ✓ National Energy and Climate Change Plan submitted (45 % RES in 2030)
- ✓ New support model (Market Price Premium) approved by EC
- ✓ Technology neutral tender conditions ready
- ✓ Project pipeline: auction 2019 (0,3 TWh), auction 2020 (0,7 TWh), 2021 (0,7 TWh), 2022 (0,7 TWh)





New support model: unbalanced risks

Previous situation for subsidized wind parks:

- Feed in Tariff for produced wind power
- All produced electricity is feeded into the grid
- No balancing responsibility
- No forecasting responsibility
- 40 % grid connection costs
- No power market effects
- Limited collateral or credit requirements

Current situation for new wind parks:

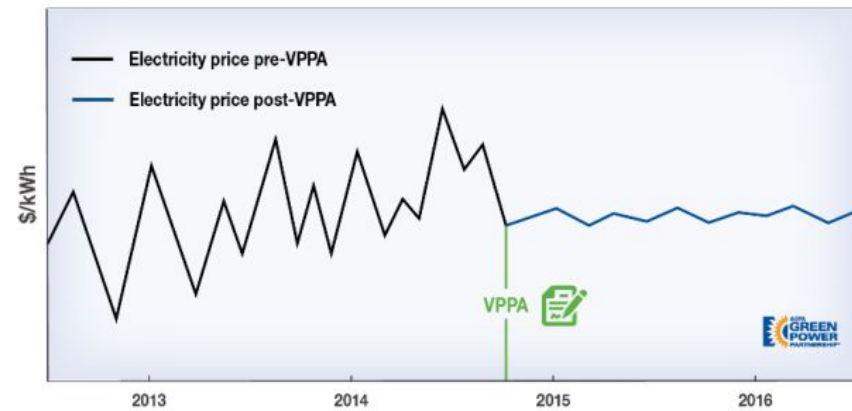
- Market based pricing
- Full balancing responsibility
- Full forecasting responsibility
- 100 % grid connection costs
- Volatility of Spot market
- Increased wind development causes cannibalization effect (increasing cost to producers)
- Auction structure does not remove price risk. It can be seen as floating addition to the realized price
- Need for fixed cash flows (i.e. PPA)

Definition: Power Purchase Agreement

Power Purchase Agreement - a type of contract that allows consumers (the offtaker), typically large commercial entities, to form an agreement with a specific energy generating unit (producer).

Typical characteristics of PPA offtakers:

- Large electricity user (factory, data center)
- Financial stability/credit-worthiness
- Focus on longer timeframes
- Willing to be "first mover"
- Looking to reduce carbon footprint
- Desire to directly create new renewable supply





Two types of PPAs

Physical PPA

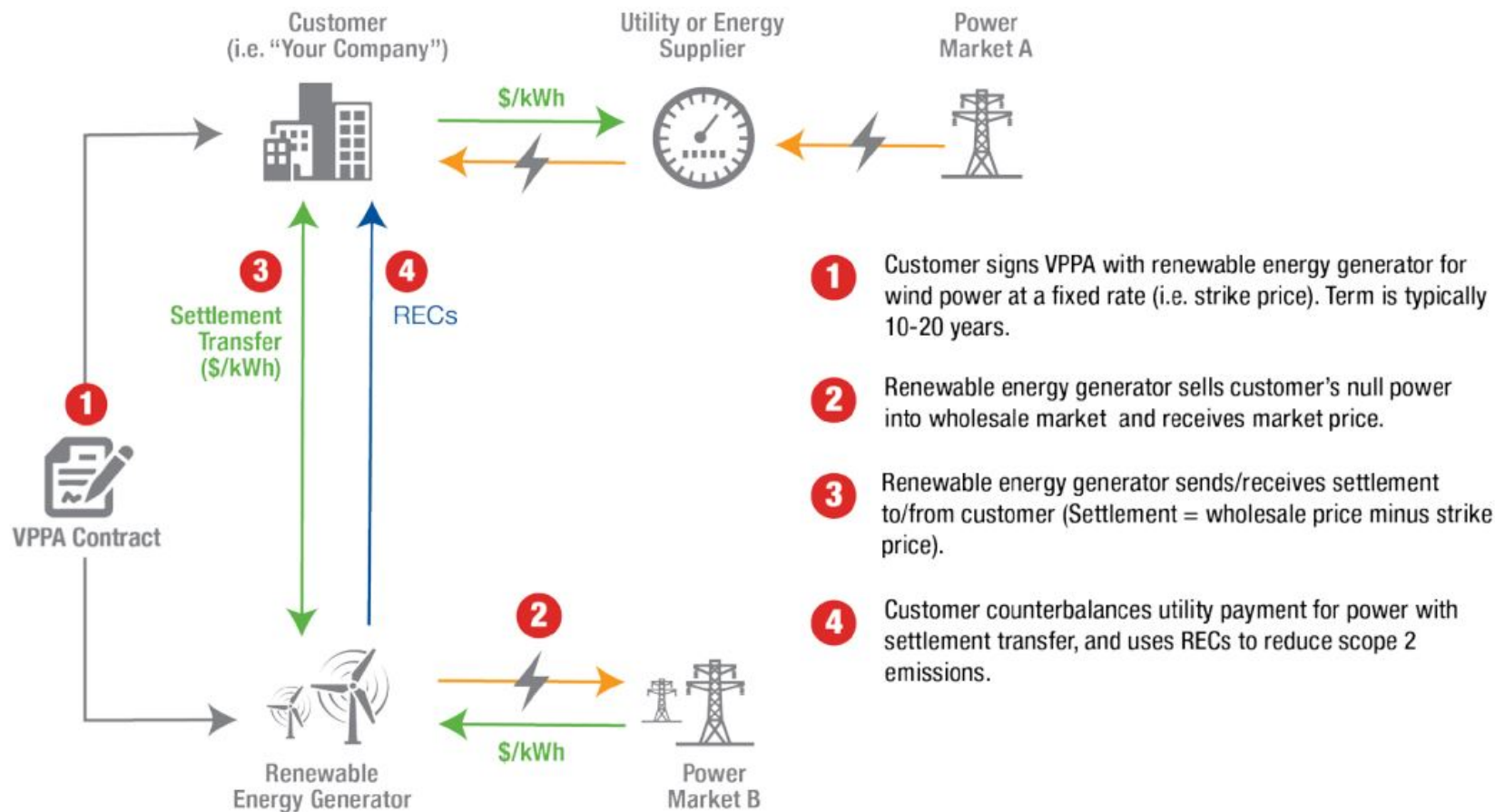
- Power is “physically” delivered to buyer
- Renewable energy project and buyer must be located in same grid region
- Limited when direct retail access is not permitted

Virtual PPA

- Financially-settled arrangement between renewable energy project and buyer
- Renewable energy project and buyer do not need to be in same grid region
- Appealing when direct retail access is not permitted
- Appealing to buyers that have multiple load centers

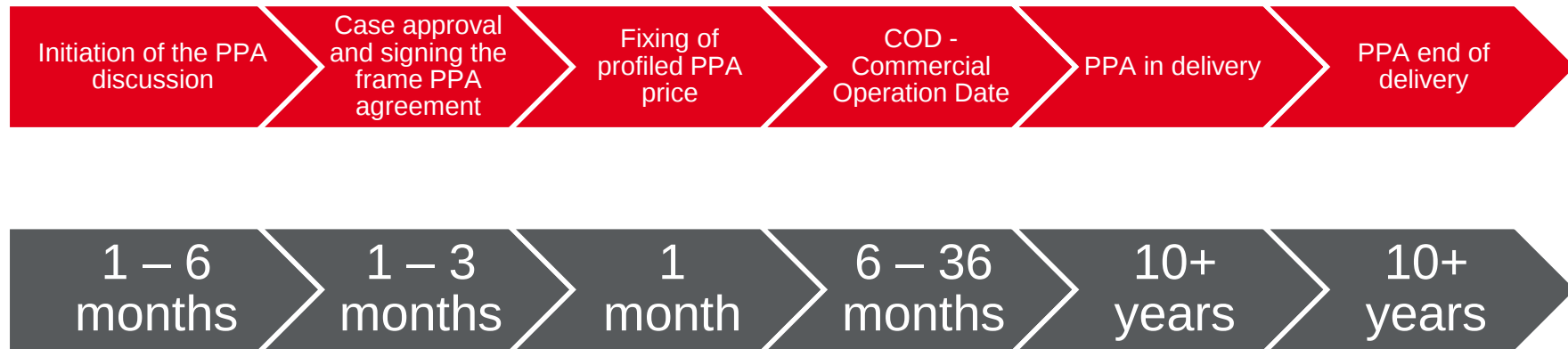


Virtual Power Purchase Agreement

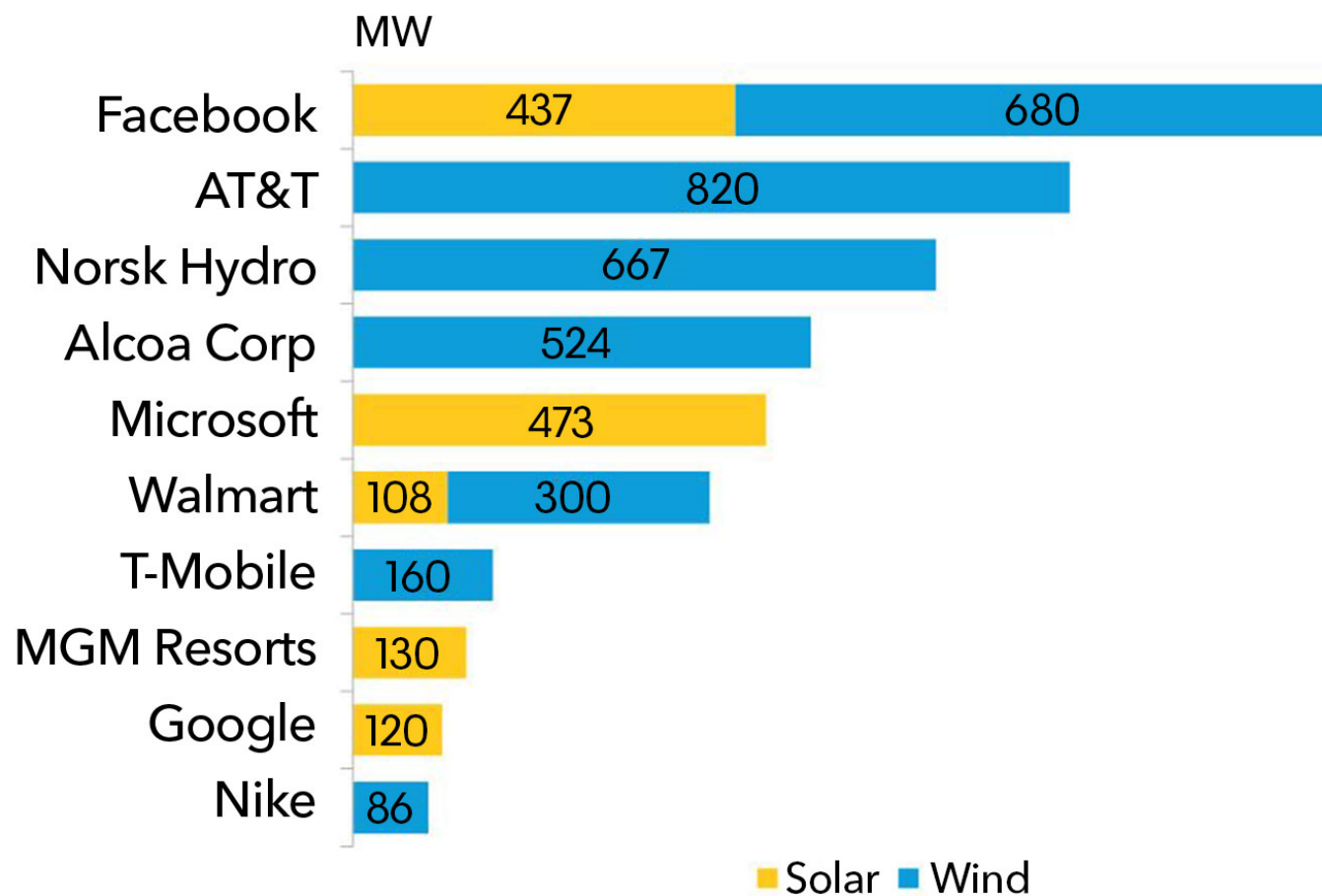




Timeline of the PPA



Top corporate offtakers, 2018



Source

Source: Bloomberg NEF. Note: Data is through July 2018. Onsite PPAs not included. These figures are subject to change and may be updated as more information is made available.



USA

- Amazon Web Services – EDP – Wind (100 MW)
- Apple – First Solar – Solar (130 MW)
- Dow Chemical – NRG – Wind (150 MW)
- Google – EDF – Wind (225 MW)
- Microsoft – EDF – Wind (225 MW)
- Walmart – Pattern Energy – Wind (116 MW)

UK

- BT, EDF, Wind, 72 MW
- BT, Pennant Walters, Wind, 23 MW
- Nationwide, BayWa, Solar, 45 MW
- McDonalds, BayWa, Solar, 15 MW
- HSBC, BSR, Solar, 61 MW

Sweden

Google, OX2, Wind, 72 MW

Netherlands

- Google, Eneco, Wind, 62 MW
- AkzoNobel, Eneco, Biomass, 50 MW

India

- HSBC, Pragathi Group, Solar, 6.5 & 2.2 MW
- Philips India, ReNEw Wind Power, Wind, 2.1 MW

Singapore

Heineken – APBS, Renewable Energy Cor., Solar, 2.2 MW

Mexico

- Coca Cola FEMSA & Heineken & OXXO – Marena Renovables (396 MW)
- GM & John Deere & Alsea – Enel Green Power (129 MW)
- Industrias Penoles – EDP – Wind (200 MW)

Chile

Guanaco Compania Minera – Enel Green Power – PV & Wind (4 MW)

Brazil

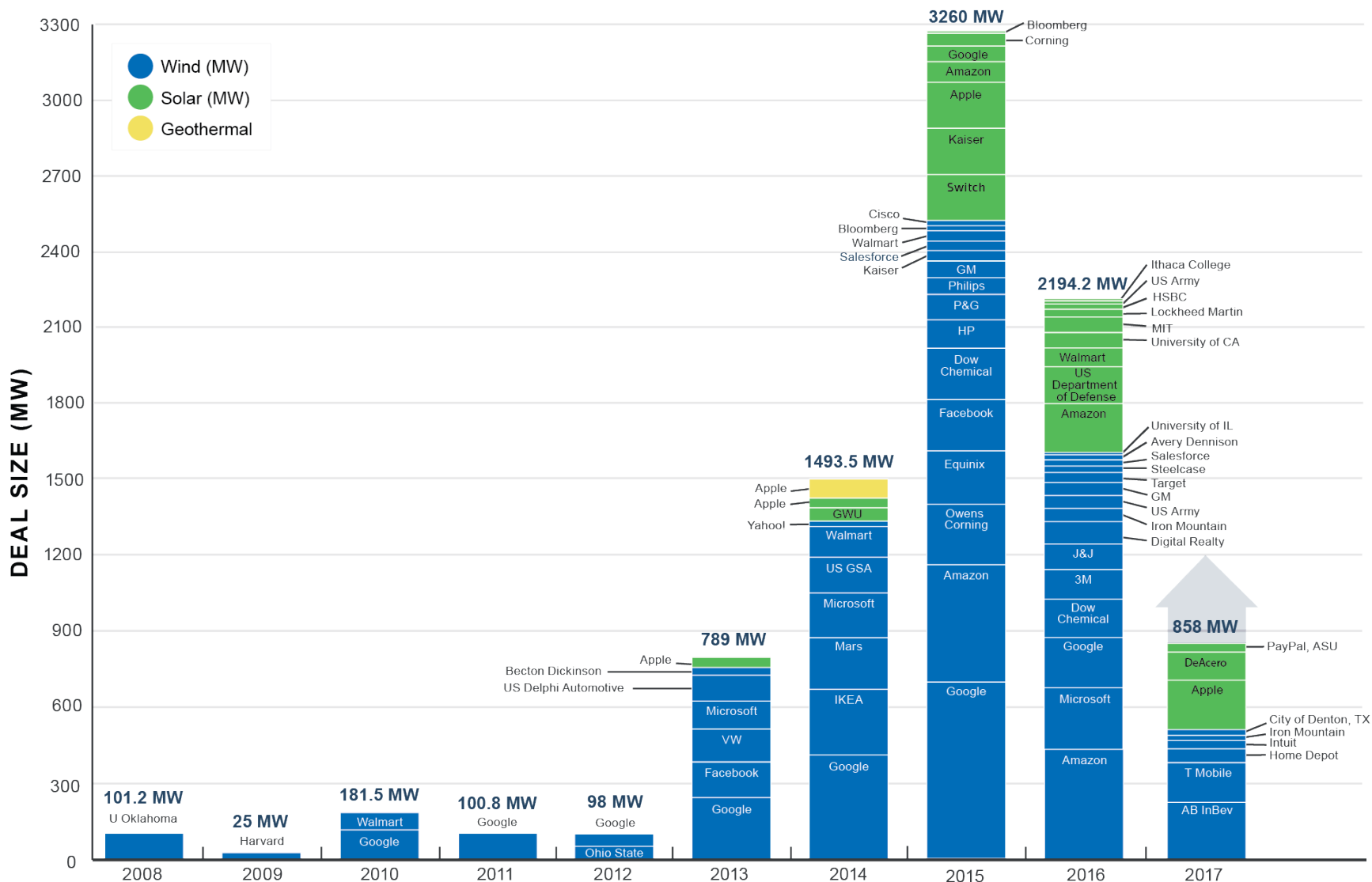
- Nestlé – Engie & EDP & NC Energia – Hydro (29 MW)
- Nestlé – Engie & EDP – Hydro & Biomass (18 MW)

Australia

Rio Tinto – First Solar – Solar (1.7 MW)



AGGREGATE OFFSITE RENEWABLE DEALS IN THE C&I SECTOR BY ENERGY TYPE*



*Based on publicly announced C&I offsite renewable energy deals (financial, virtual, green tariff, tax equity, etc.) in the U.S. and Mexico. Excludes onsite PPAs.
Last updated 04.19.17.





What we need in Lithuania for PPA`s to be signed?

New RED to come in force:

„Member States shall remove administrative barriers to corporate long-term power purchase agreements to finance renewables and facilitate their uptake.”

Changes in local legislation (Electricity Trading Rules)

Remove the requirements for the offtaker to have a licence of energy provider.

What else?

- PPAs can be signed by all producers (regardless if they participate in the new auction scheme, or not)
- All producers have to receive Guarantees of Origin (regardless if they participates in the auction, or not)
- Tax relief for the offtaker to make PPA deals attractive for them

Wind never felt better

Lietuvos vėjo elektrinių asociacija

Projektų vystytojai



UAB RENERGA



Komponentų gamintojai



ENERGETIKOS TINKLŲ INSTITUTAS



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Turbinų gamintojai



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ENERGIE FÜR DIE WELT

SIEMENS Gamesa
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Paslaugų teikėjai

