Wind energy potential in Lithuania: opportunities and challenges

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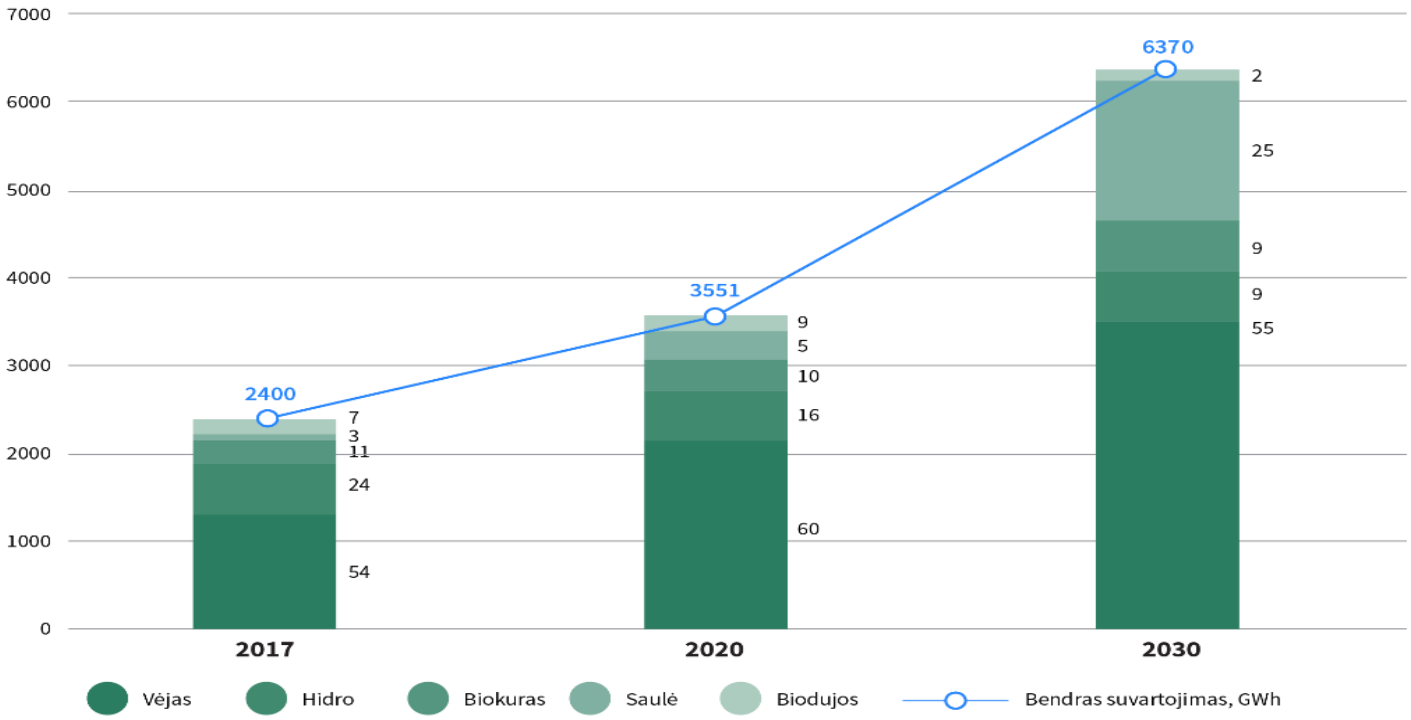
National Energy strategy – 50 % renewable electricity by 2030

Market structure based on the amount of electricity consumed from RES,% and GWh (forecast)



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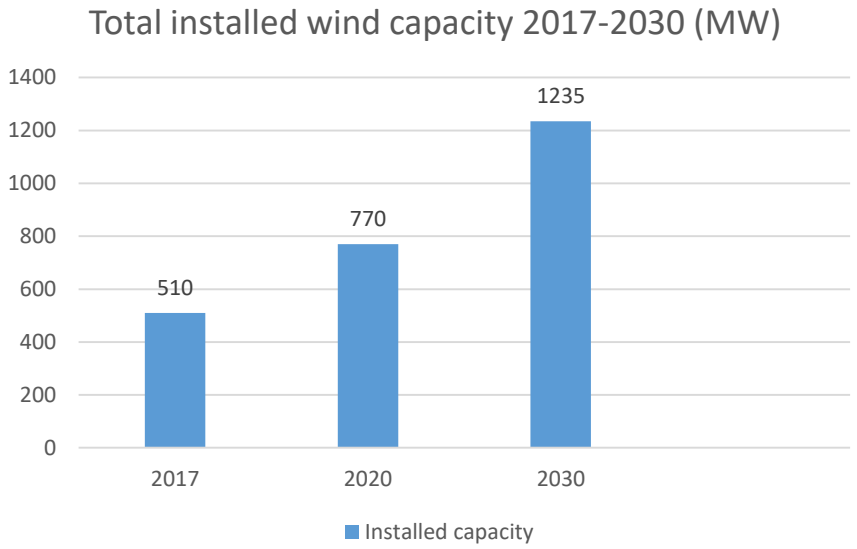
Wind development proposals in National Energy Strategy until 2030



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Wind Europe estimation of Lithuanian potential onshore: 1500 MW could be installed by 2030

Onshore wind power cumulative capacity to 2030

	LOW	CENTRAL	HIGH
Germany	60,000	70,000	71,000
France	31,320	36,360	41,400
Spain	30,000	35,000	40,000
United Kingdom	13,000	15,000	20,000
Italy	10,700	13,600	16,700
Sweden	9,000	12,000	13,000
Poland	7,000	10,500	12,000
Netherlands	8,000	8,000	15,000
Portugal	6,750	7,000	7,250
Austria	5,000	6,700	8,000
Greece	3,400	6,200	7,000
Ireland	5,000	5,600	6,700
Denmark	3,650	5,000	6,500
Finland	3,000	5,000	10,000
Romania	3,025	4,500	6,000
Belgium	3,400	4,400	4,400
Bulgaria	691	1,200	3,000
Lithuania	750	1,100	1,500
Czech Republic	1,450	1,900	2,450
Estonia	600	744	1,000
Cyprus	158	483	600
Hungary	300	300	1,500
Luxembourg	100	100	200
Malta	50	50	100
Slovenia	3	50	100
Slovakia	3	300	500
Croatia	500	1,500	2,000
Latvia	63	500	648
TOTAL EU-28	206,913	253,087	298,548

Proposed in NES: ~ 1235 MW

Proposal is adequate, if we talk about onshore

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No offshore wind in National Energy Strategy?

- Changes done to Reneable Energy Law **in 2017**
- **Seabed** research**, cost&benefit evaluations, grid connection cost** and other nece**ssary evaluations**
- **R**esearch r**esults by 2021-2022**
- **Offshore parks in EEZ not earlier than 2025-2026**

Result: no clear vision on offshore =
no clear division between onshore and offshore wind

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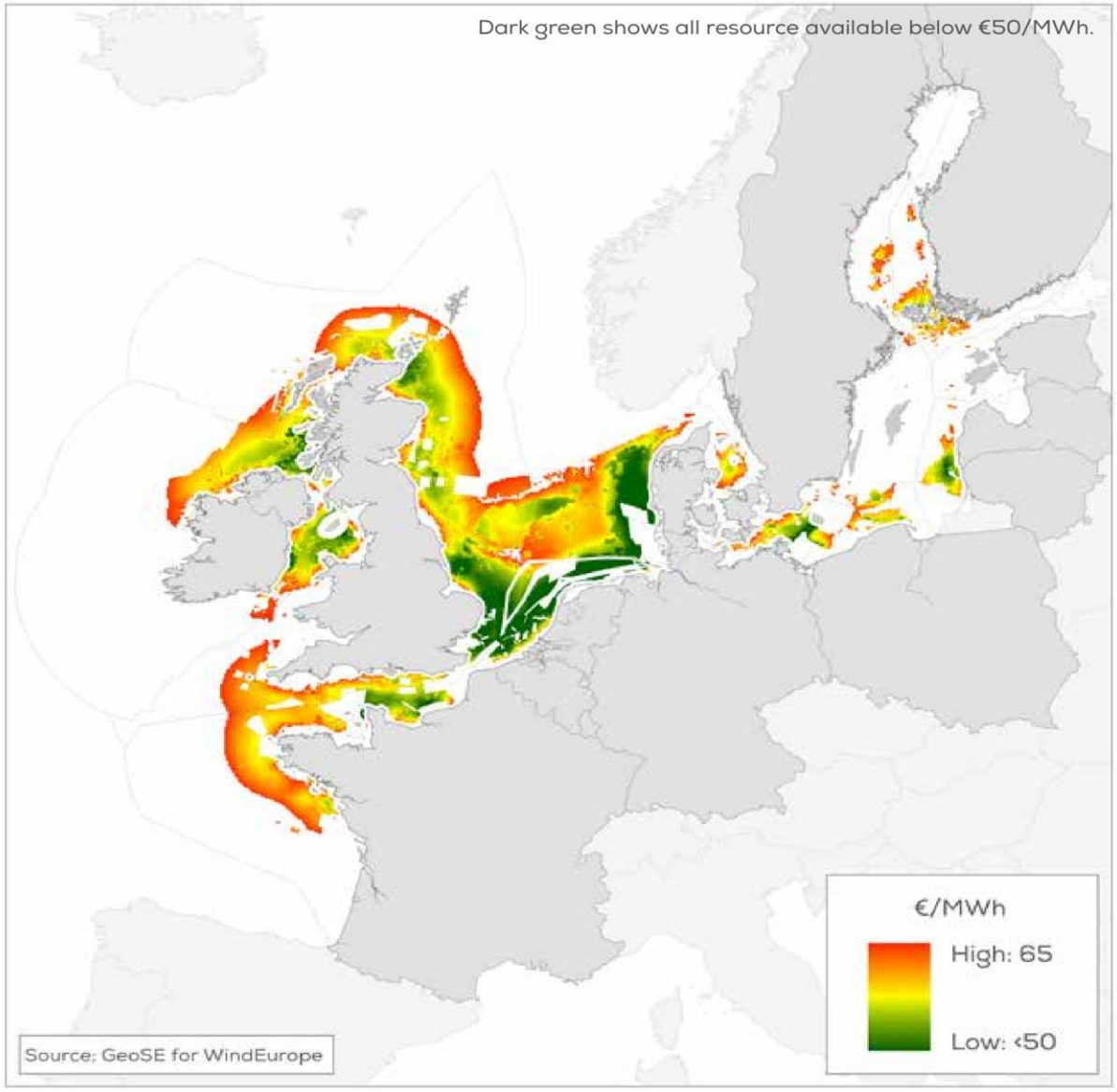
Map of economically attractive resource potential at end of 2030 (upside scenario)



Germany, Latvia and Lithuania have the most economically attractive offshore potential in the Baltic sea region

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What are the main constrains/worries/challenges?

From Goverment side:

- **Grid stability**
- **Grid availability**
- **Cost for grid**
- **Cost for consumers**

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What are the main constrains/worries/challenges?

From Investor side:

Increasing complexity of development process:

- **Radars**
- **Spatial planning/sanitary zones**
- **Growing noise requirements**
- **Increasing enviromental requirements for birds and bats**
- **Increasing price pressure from landowners**
- **Increasing taxation from municipalities**

Political uncertainty

Low market prices

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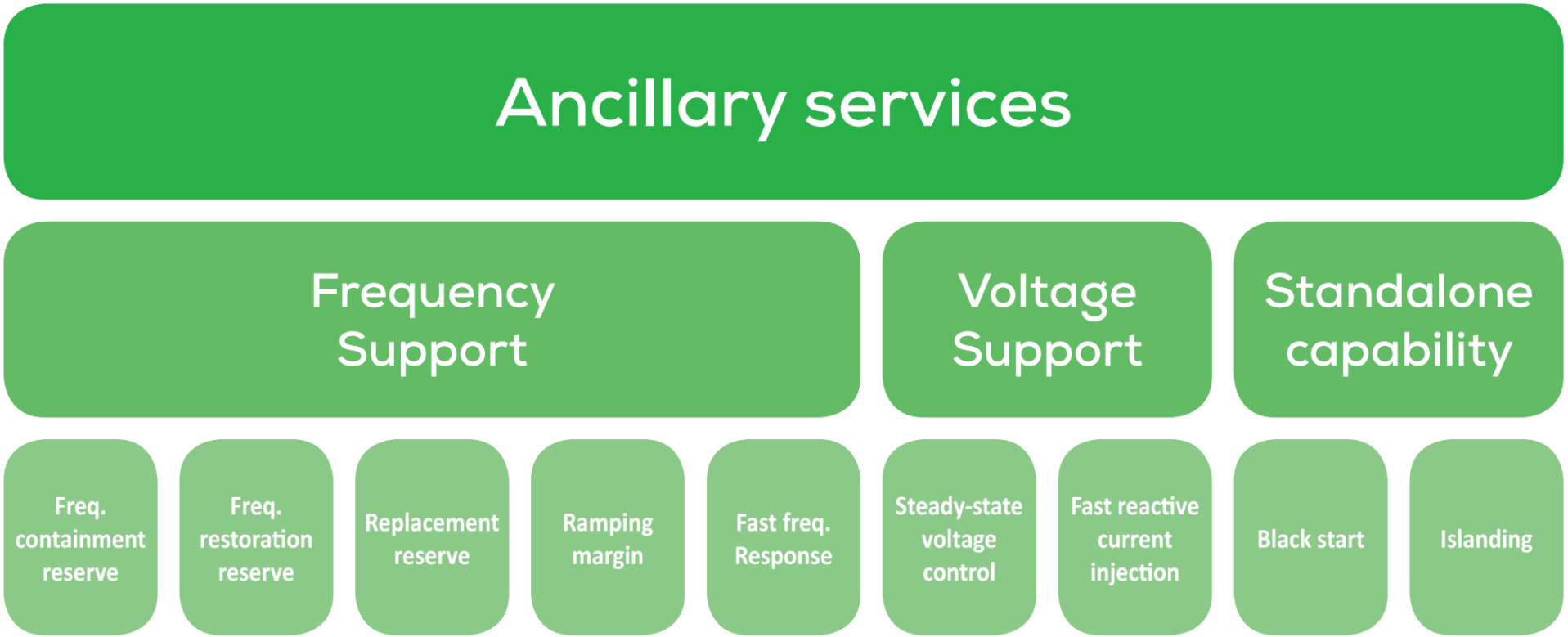
Grid stability: Wind turbines can provide grid stability services



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Grid availability and cost for grid: Up to 500 MW of wind can be integrated without significant cost

According to Lithuanian TSO „LITGRID“:

- **Up to 500 MW of additional wind (above the current 510 MW)** can be integrated **without reconstructing the grid (minor costs up to 4,8 MEUR for substations)**
- **Integration of higher volumes requires investment upgrading the grid: additional 1000 MW (above the current 510 MW) – 90 MEUR**
- **For debate: does integrating 1000 MW really requires building 400 MW of new reserve capacity??**
- **Common Baltic balancing market starting in 2018**

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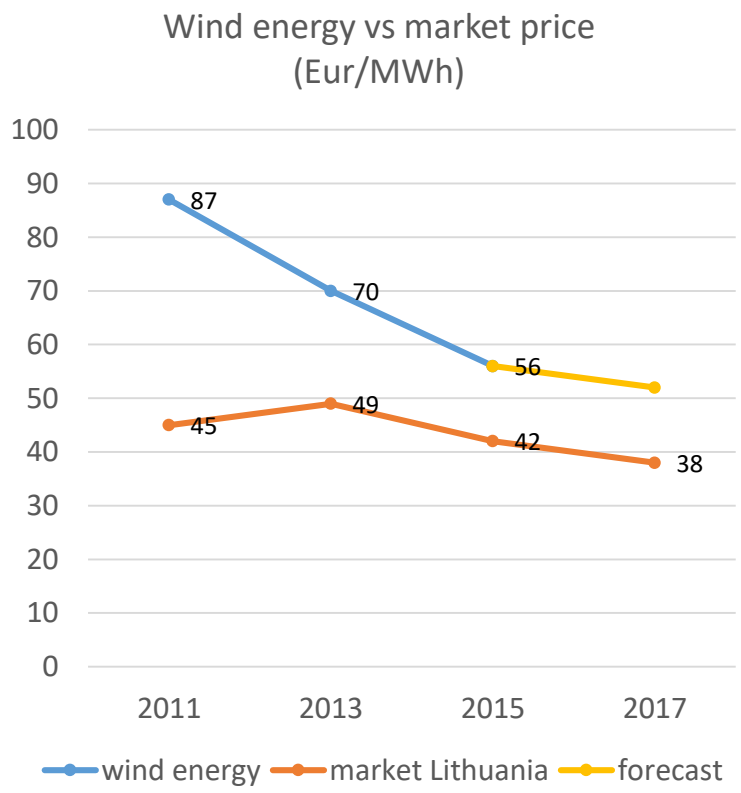
Cost for consumers: further onshore development possible without additional burden to consumers

Further development possible without additional burden to consumers

- **Wind is already the cheapest option for new installations**
- **New 350 MW onshore – 11 MEUR/y**
- **2019 - 2023, 8 wind parks (139 MW) out of subsidy (18 MEUR/y)**



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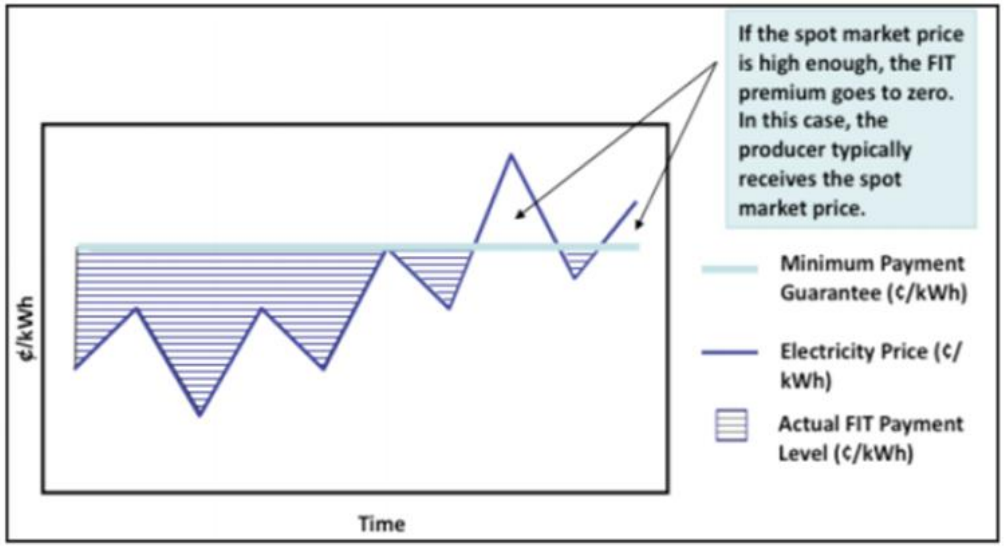
Choosing the most suitable support scheme

Sliding feed-in premium (sFIP) support scheme

- Producer trades electricity in the market
- Producer is responsible for balacing
- A sliding premium above the market price is paid to the producer
- Optimized financial burden for consumers; revenue stability for producers provided



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To sum up:

- The proposed development of wind in National Energy Strategy is adequate if to be allocated only to onshore
- Offshore development is postponed for almost a decade, so the main focus should be on onshore
- Wind can contribute to lower prices in the market and grid stability
- Wind is the cheapest form of electricity generation and up to 500 MW additional onshore does not cost to connect

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Proposals:

- Make a clear distinction between onshore and offshore development
- Set a clear five year framework for additional 350 MW onshore
- Conduct a study on grid availability after 2022
- Increase RES targets, if offshore is included

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Thank you!

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