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Asta Sihvonen-Punkka

# Electricity markets promoting investments and flexibility to enable the green transition

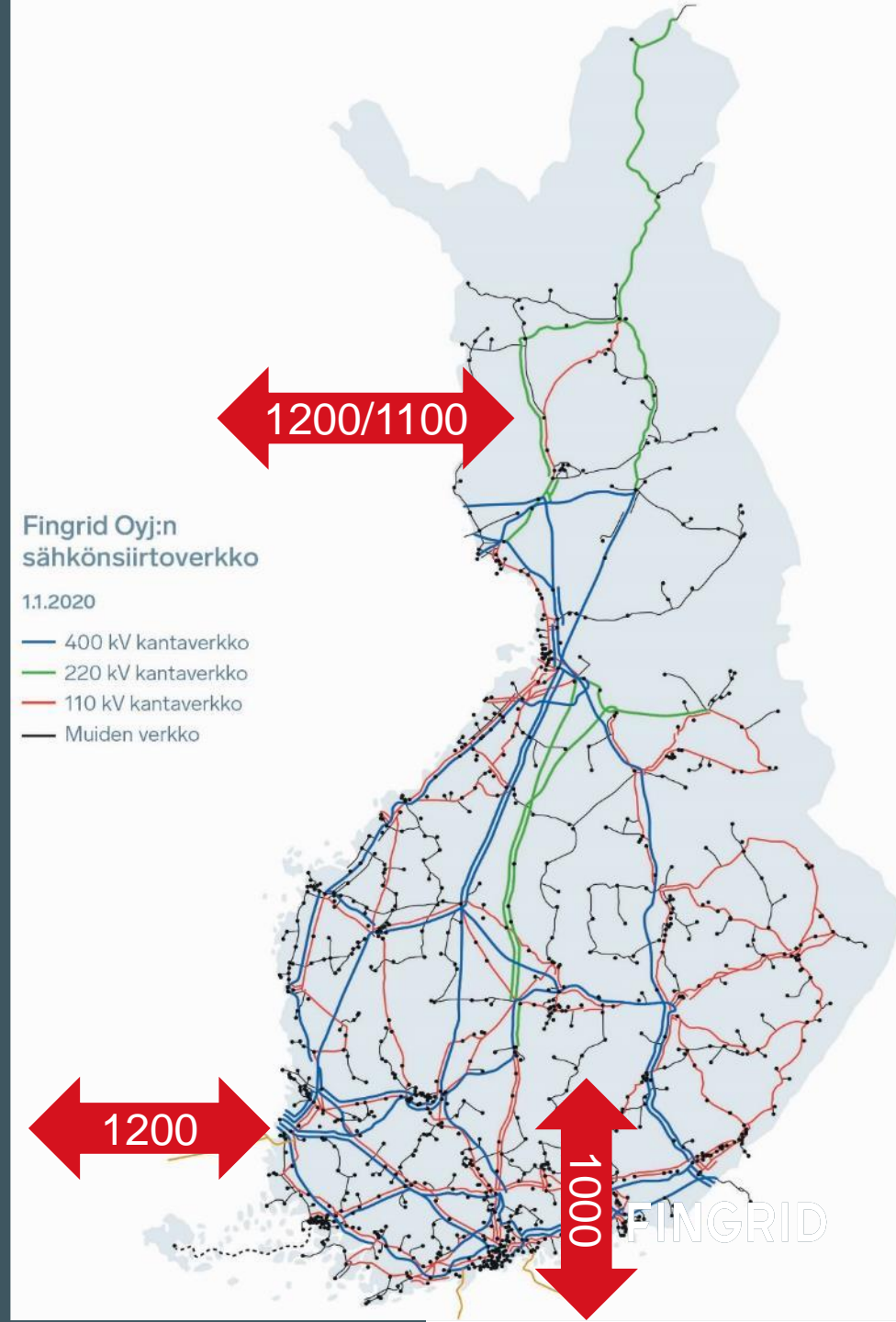
European Energy Markets -23 Conference

Lappeenranta, Finland

**FINGRID**

# Electricity Transmission System of Finland

- Consumption ca. 85 TWh
- Finland one bidding zone
- Interconnectors with Sweden, Estonia and Norway



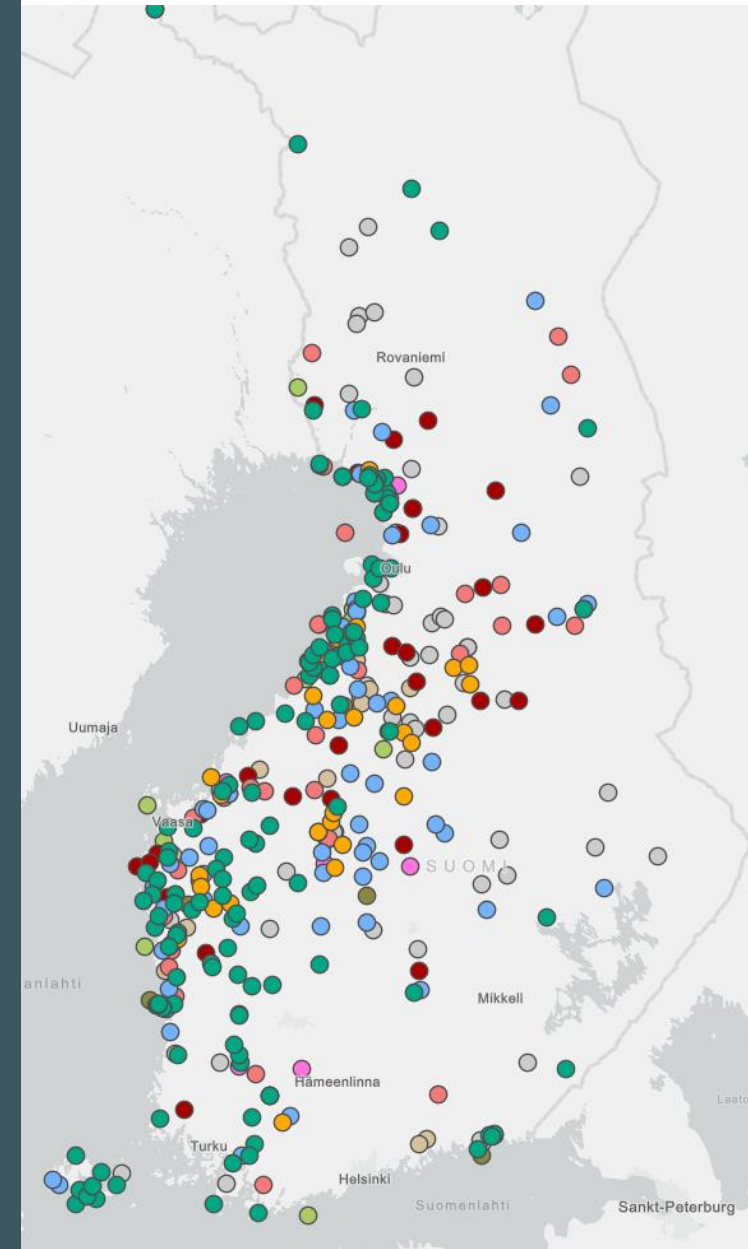
# Finland – the best place in the EU to increase production of green electricity?

- Finland:
  - Most sparsely populated EU-country
  - 5<sup>th</sup> largest EU-country by geographical size
  - Long coastline for offshore wind
  - Competitive wind conditions
- Fingrid has received 270 GW of grid connection inquiries!
  - 155 GW onshore wind, 55 GW offshore wind and 60 GW solar
  - No subsidies – market is working!

➔ At least 300 TWh of new, clean and competitive electricity

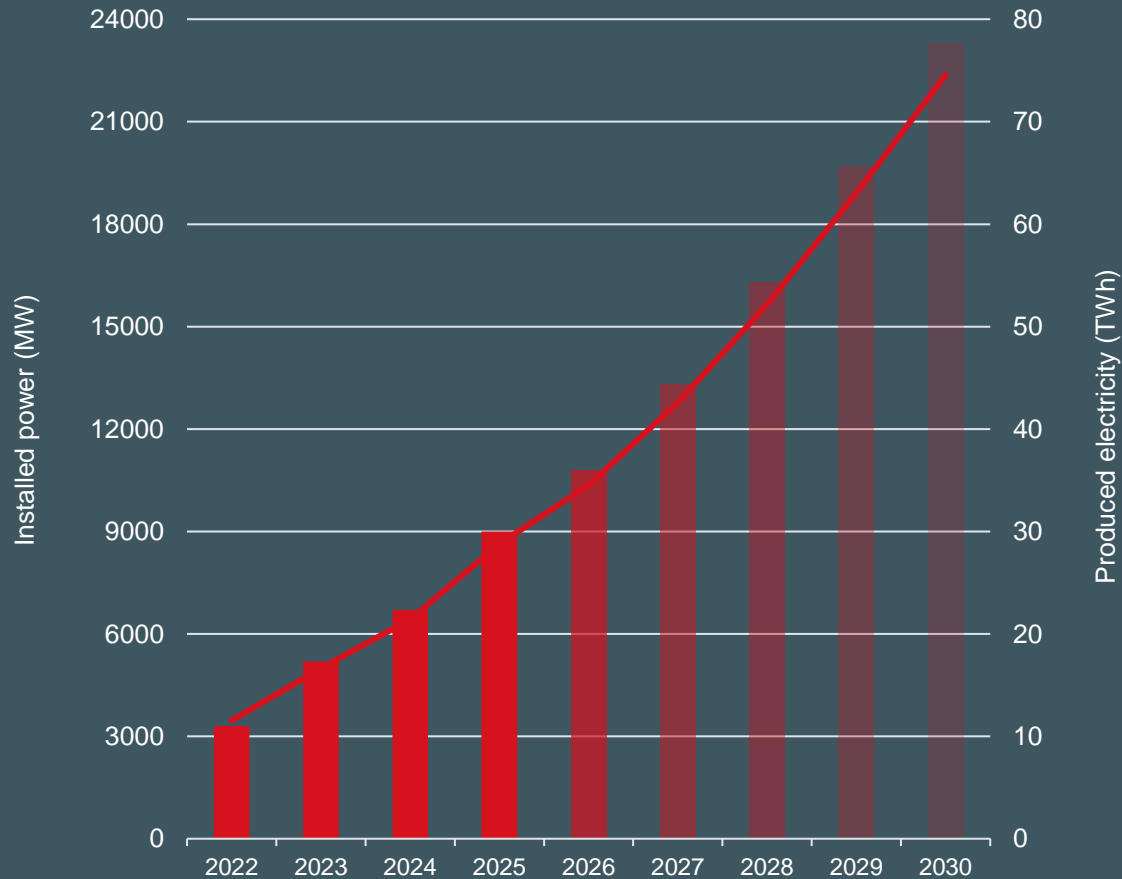
## Wind power projects

Source: Finnish Wind Power Association



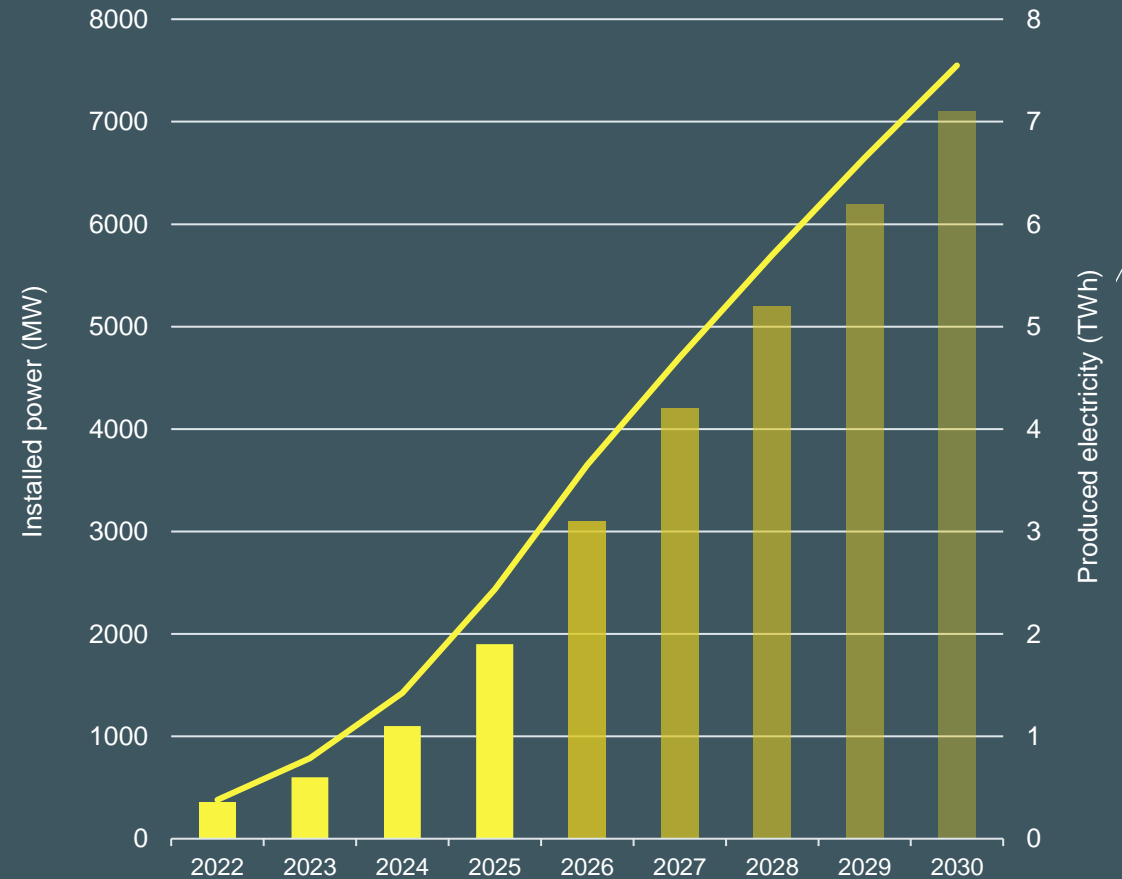
# Growth of renewable energy is accelerating

## Estimate of wind power development in Finland



Fingrid's Best Estimate

## Estimate of solar power development in Finland



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# Decarbonisation by electrification is increasing the demand for clean electricity

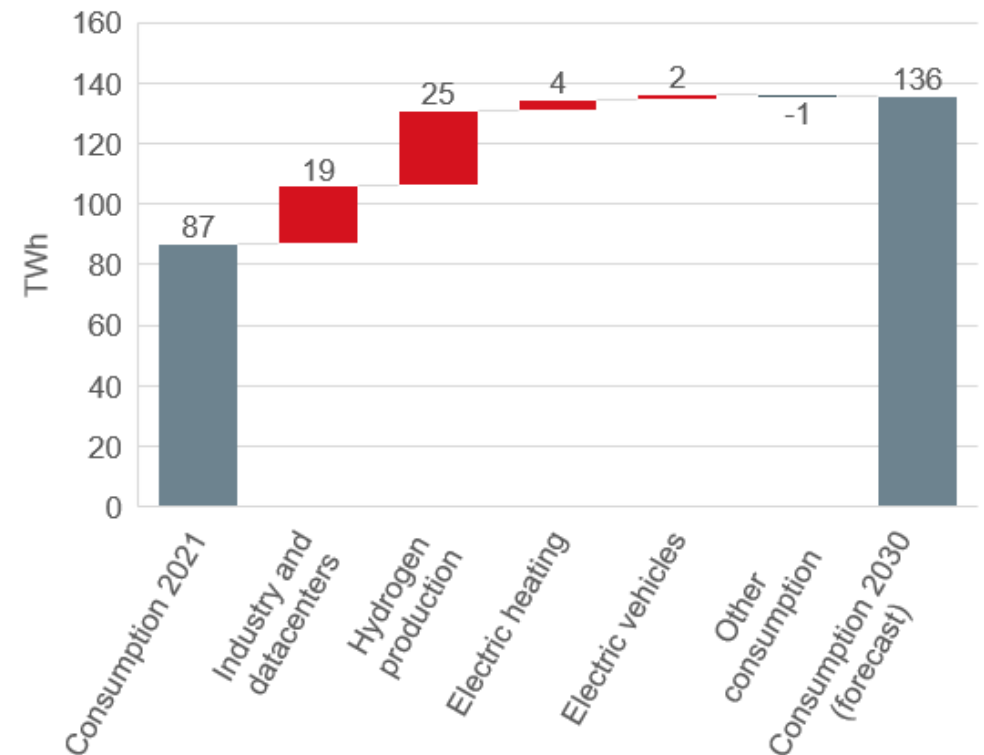
- Electrification of industry, heating & transport
  - Existing industry changing fossil fuels to electricity in heating and other processes
  - New industry based on electricity: data centers, hydrogen production (huge potential!)
  - District heating companies and households moving to electric boilers and heat pumps
  - EVs gaining foothold in Finland



Electrification is a **must** to reach the Finnish carbon neutrality target by 2035 !

Fingrid has received 12 GW / ~50 TWh of connection inquiries

## Growth components of electricity consumption



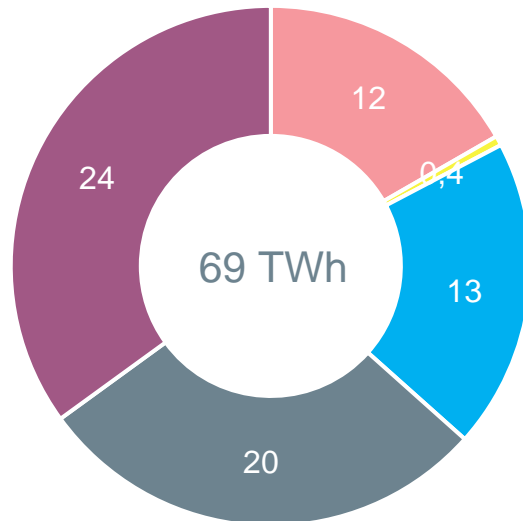
Fingrid's Best Estimate

# Electricity generation in Finland increases almost 50% by 2025

Finland becomes self sufficient on yearly level already this year or 2024 at the latest

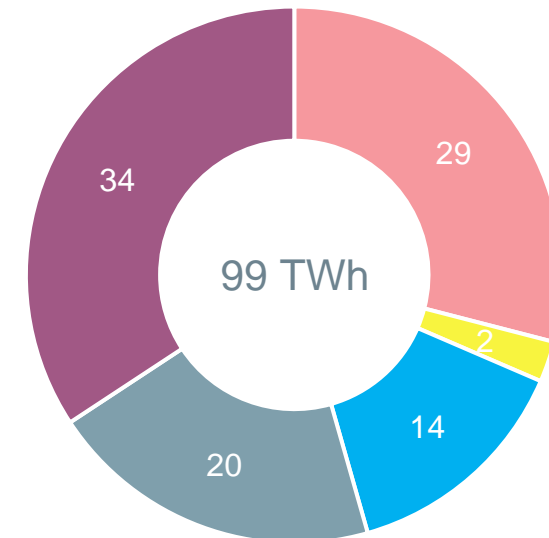
## Electricity production in 2022 (TWh)

- Wind power
- Solar power
- Hydro power
- Other thermal power
- Nuclear power



## Electricity production in 2025 (TWh)

- Wind power
- Solar power
- Hydro power
- Other thermal power
- Nuclear power

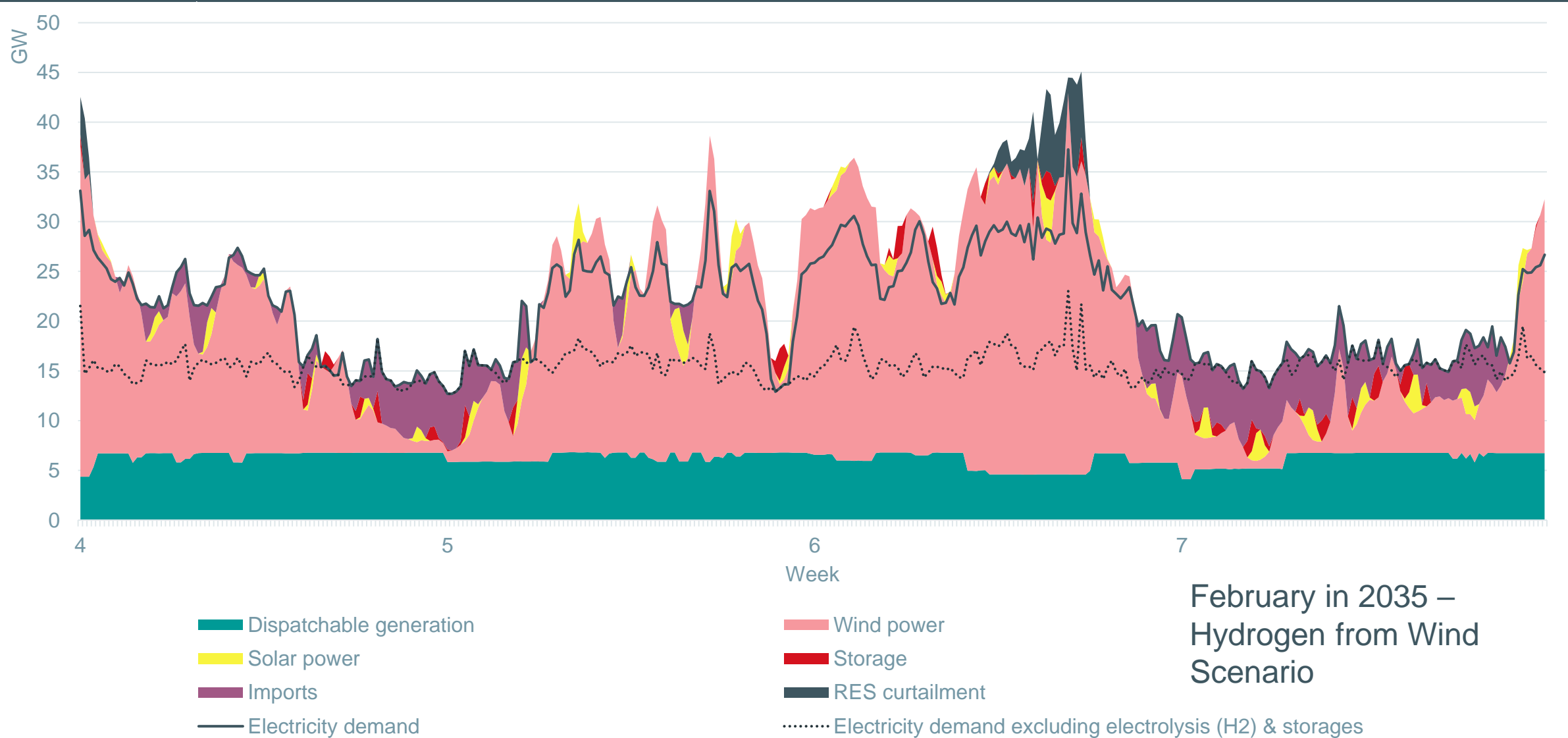


Source for 2022 data: Energiateollisuus

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# New power system is super volatile

- Increasing DSR and storages makes high share of RES feasible



# What do we need?

**Flexibility**

**Price signals**

**Investment  
signals**

**Hedging**

**Power  
adequacy**



# What is new/coming?

## Flexibility

- Finland: RES in reserve markets, Voluntary support
- EMDR: peak shaving product, flex assessment

## Price signals

- 15 min markets
- Bidding zone configurations

## Investment signals

- EMDR: PPAs and 2-way CfDs

## Hedging

- EMDR: PPAs, 2-way CfDs
- EMDR: Regional virtual hubs and LTTRs to connect bidding zones

## Power adequacy

- EMDR: flexibility measures
- Capacity mechanism solutions missing

# Conclusions

- Stable investment environment to support investments both in generation **and** consumption
- Variability in generation requires flexibility:
  - flexible consumption,
  - storage and
  - flexible generation
- Markets to follow physics: 15 min markets, transmission capacity calculation method, bidding zones, more automated reserves



# Thank you!

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