



Batteries co-located with variable renewable energy

Kristiina Siilin, business lead in battery energy storage and flexibility

7.11.2022

Helen - an innovative Finnish energy company

1909

Established

740

Employees

1318 M€

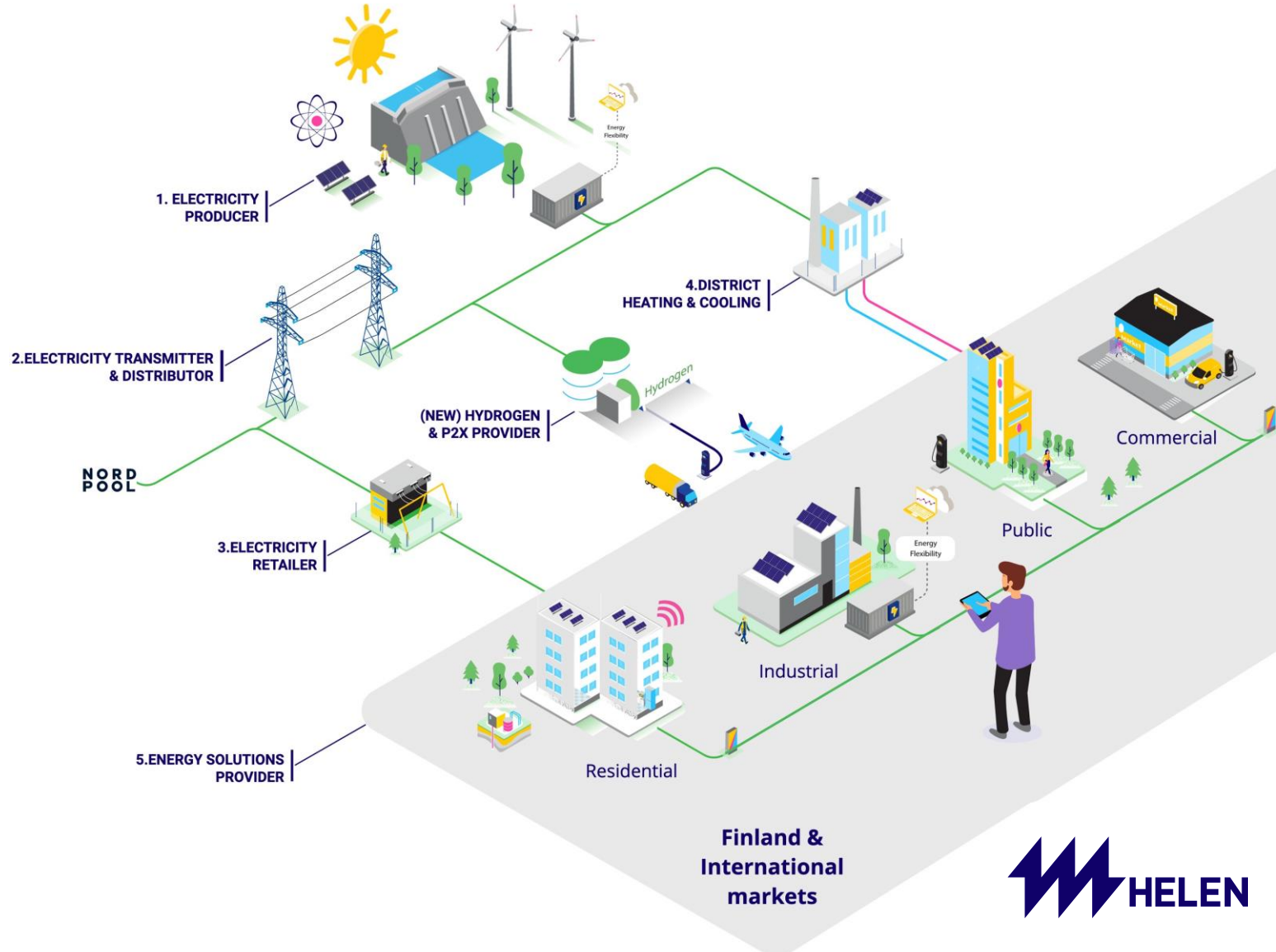
net sales in 2021

2030

Helen is carbon neutral

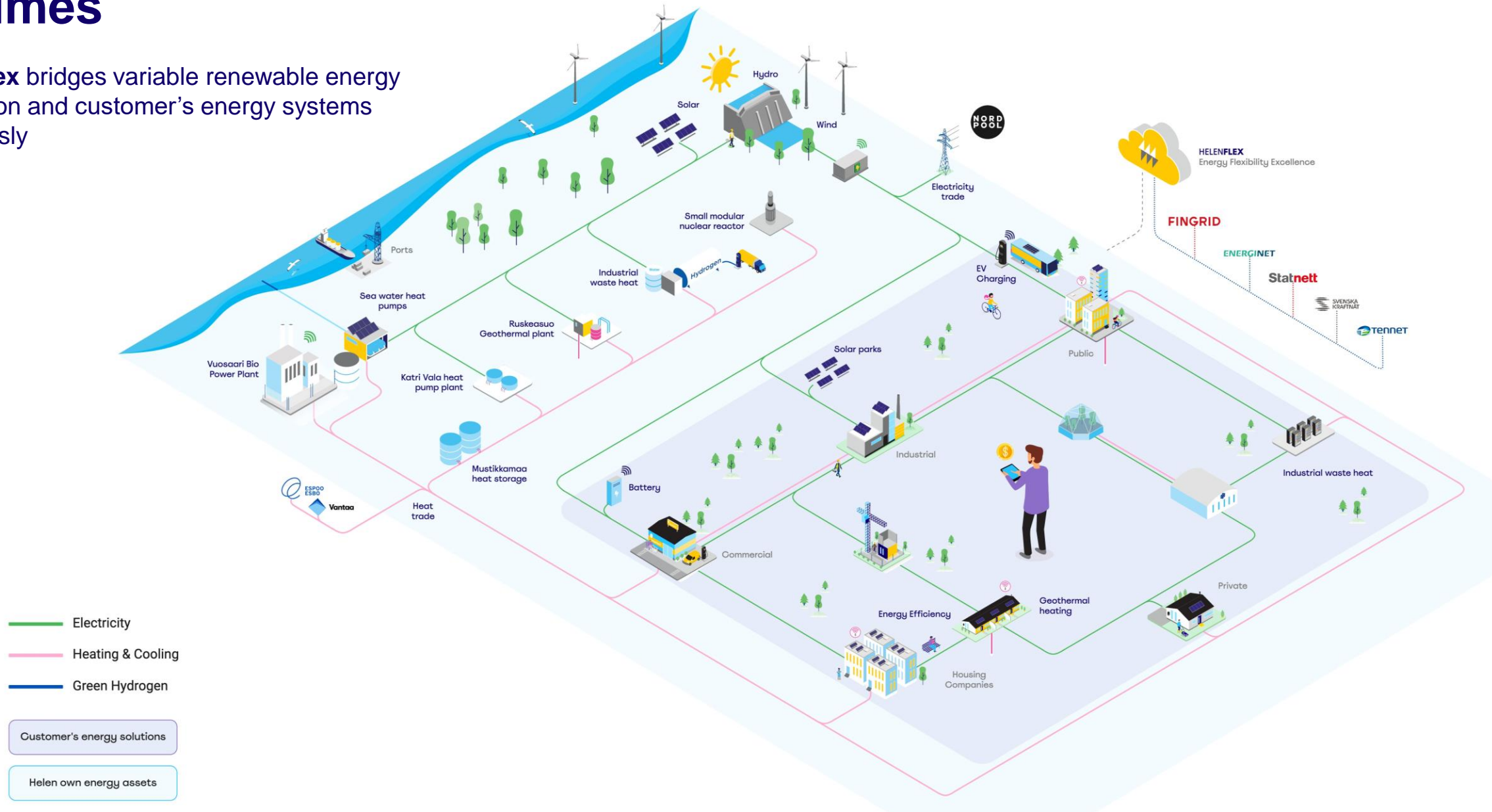
99.9%

In Helsinki, our security of electricity supply is among the best in the world



Distributed energy system needs to be in balance at all times

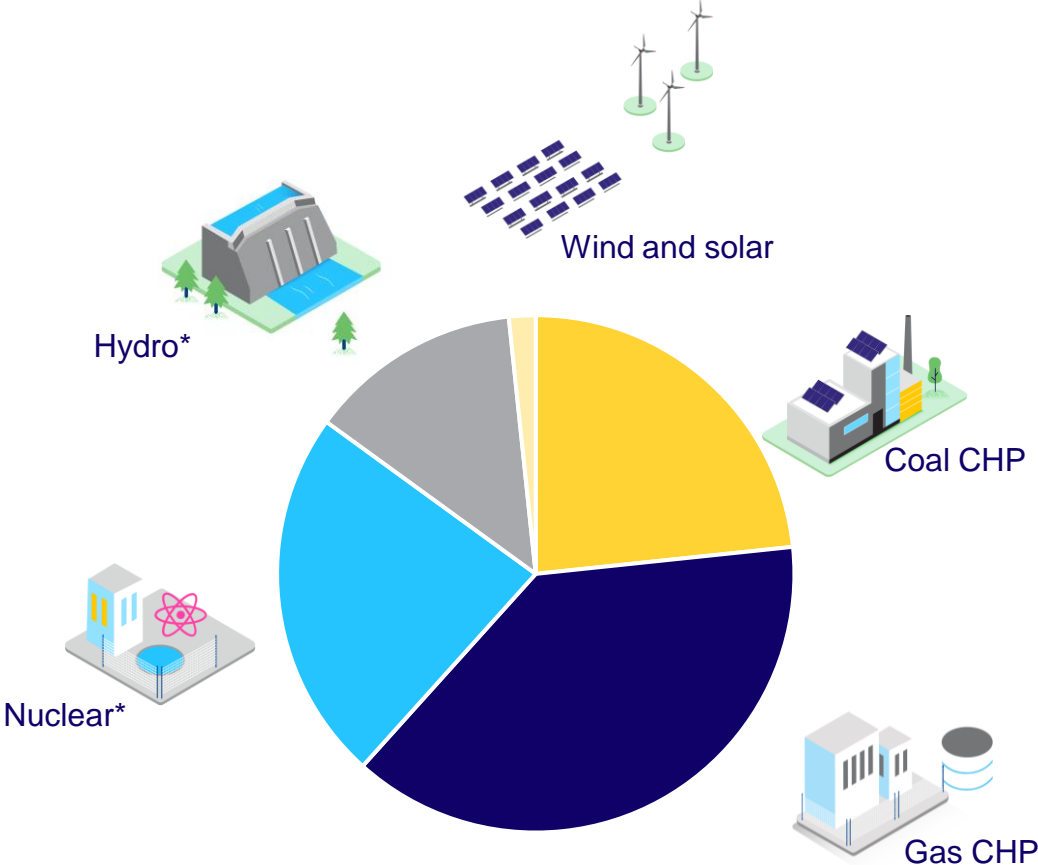
HelenFlex bridges variable renewable energy production and customer's energy systems seamlessly



To become carbon neutral by 2030 Helen's energy production portfolio is under huge transformation

Heating is being electrified

2020



*Power generation with shared holding

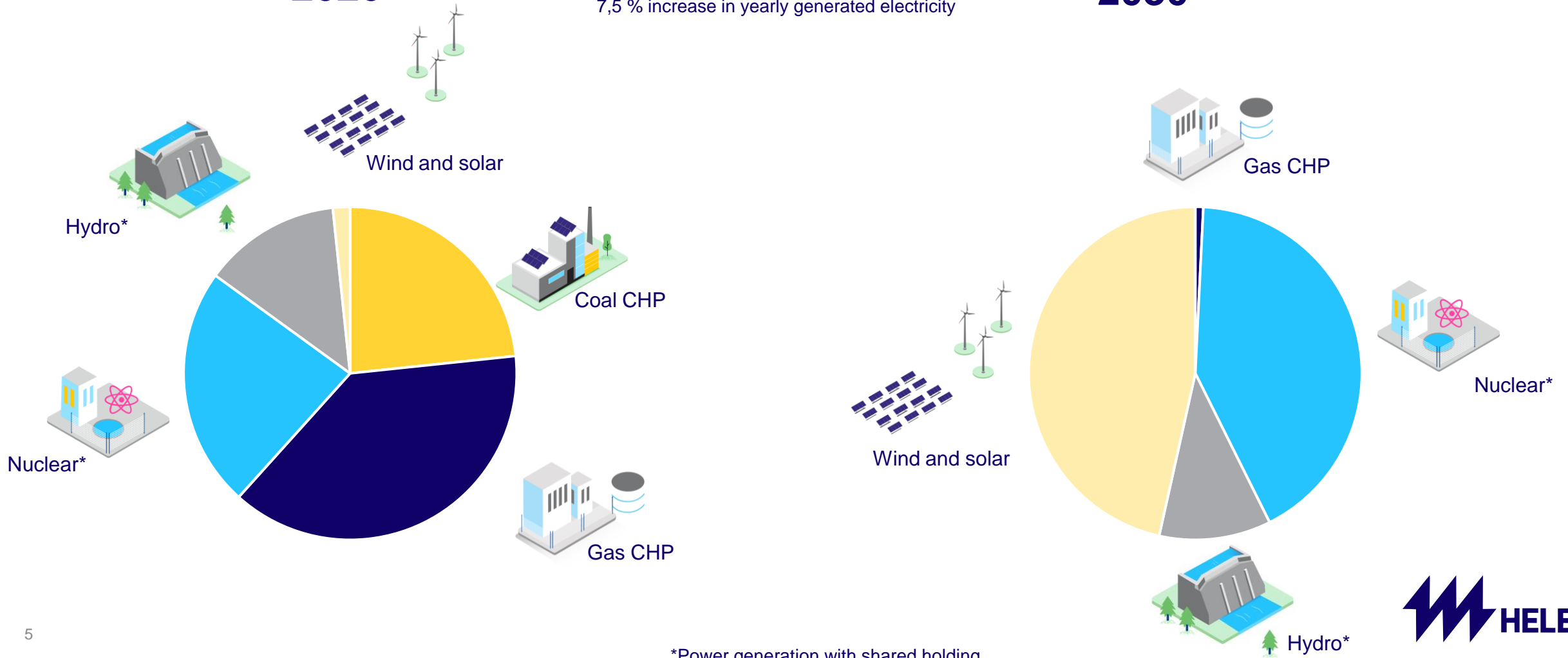
To become carbon neutral by 2030 Helen's energy production portfolio is under huge transformation

From "electricity as by-product" to "active electricity producer"

2020

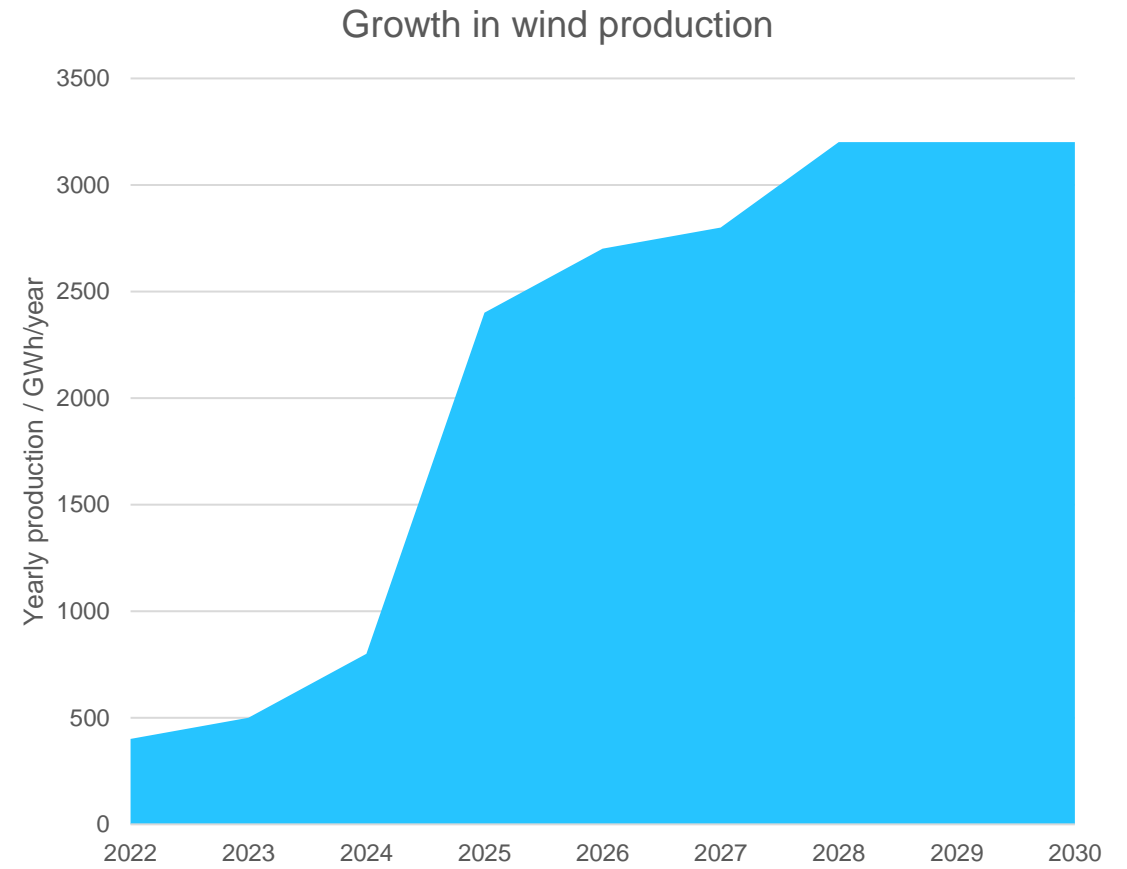
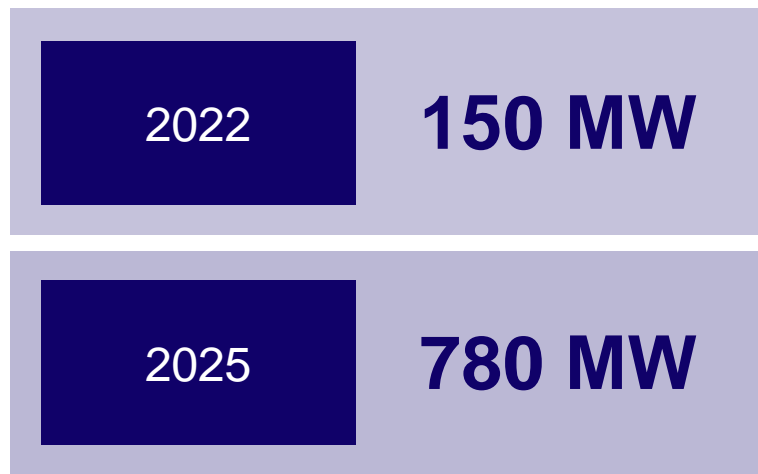
7,5 % increase in yearly generated electricity

2030



Growing share of wind power

Large share of electricity production is weather dependent



Wind production needs three-fold balancing strategy

In order for the TSO to keep the power system in balance and resilient to disturbances the grid needs support

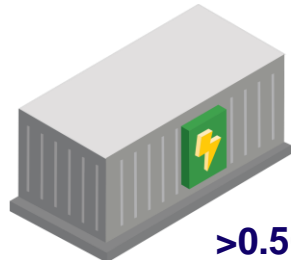
Real time



FINGRID
**MAINTAIN GRID
STABILITY AND
INERTIA**



FCR and FFR reserve products



>0.5C
Up to 30 MW

Wind production needs three-fold balancing strategy

In order for the balance responsible party to correct forecast errors and secure electricity trading the production needs support

Real time

Imbalance settlement period

Daily



Customer need

FINGRID

MAINTAIN GRID STABILITY AND INERTIA



HELEN

COMPENSATE FORECAST ERRORS



HELEN

ENERGY TIME SHIFT TO IMPROVE PROFITABILITY



Market mechanisms to secure balancing

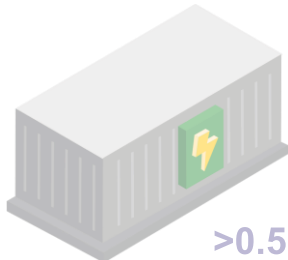
FCR and FFR reserve products

Minimize imbalance cost

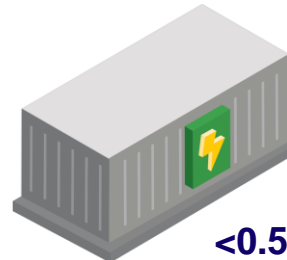
Utilize price volatility



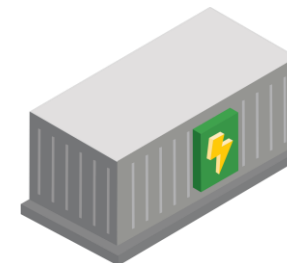
Solution



>0.5C
Up to 30 MW



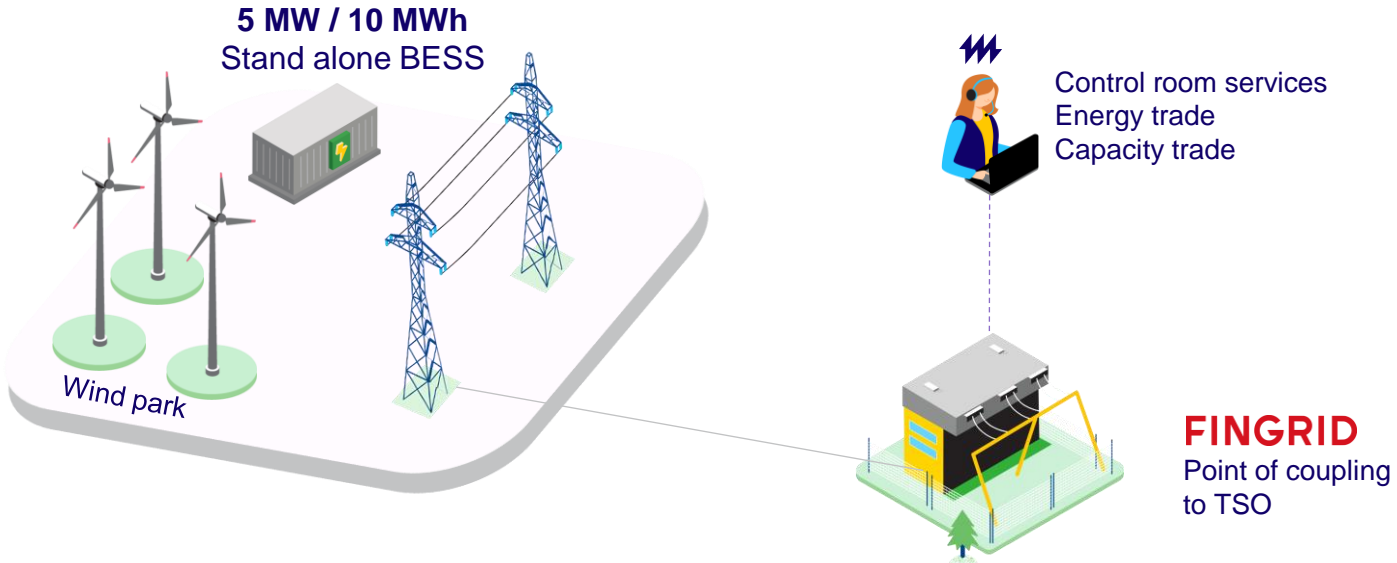
<0.5C
100+ MW



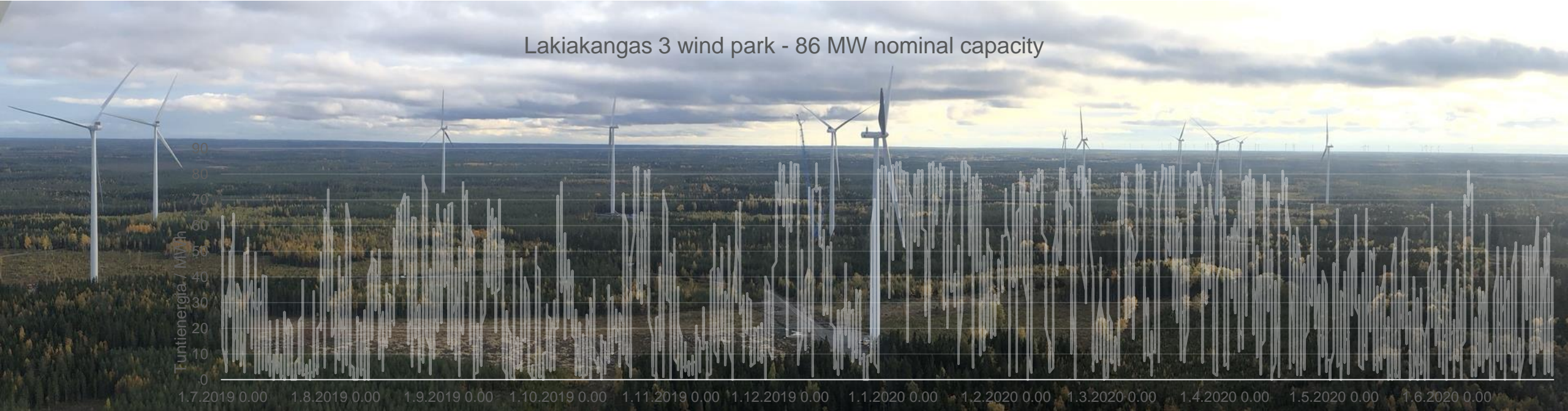
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Case study - Co located BESS with wind park



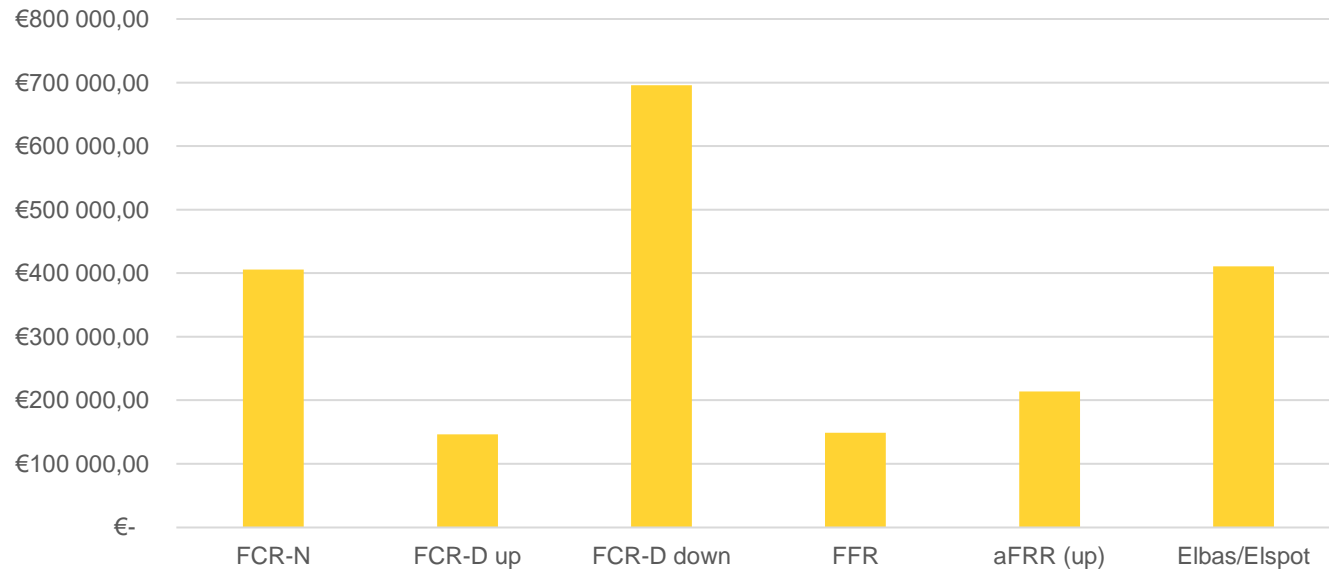
Lakiakangas 3 wind park - 86 MW nominal capacity



Increasing the flexibility of power system due to growing wind power

Use case: BESS supporting grid stability at Lakiakangas 3 wind park

Illustrative estimations of yearly revenue potential with respective markets for 5 MW / 10 MWh BESS



BESS yearly potential utilization rate at respective market

73 %

77 %

60 %

16 %

3 %

25 %



Benefits of co-location for BESS

Batteries co-located with renewable energy can be used by energy company as balance responsible party both to maximize profit and to minimize cost

MAXIMIZE PROFIT

- ✓ Optimize BESS performance and profit at reserve markets as stand alone system

MINIMIZE COST

- ✓ Use batteries as one tool to control imbalance costs and to utilize price volatility to increase overall profitability of renewable production

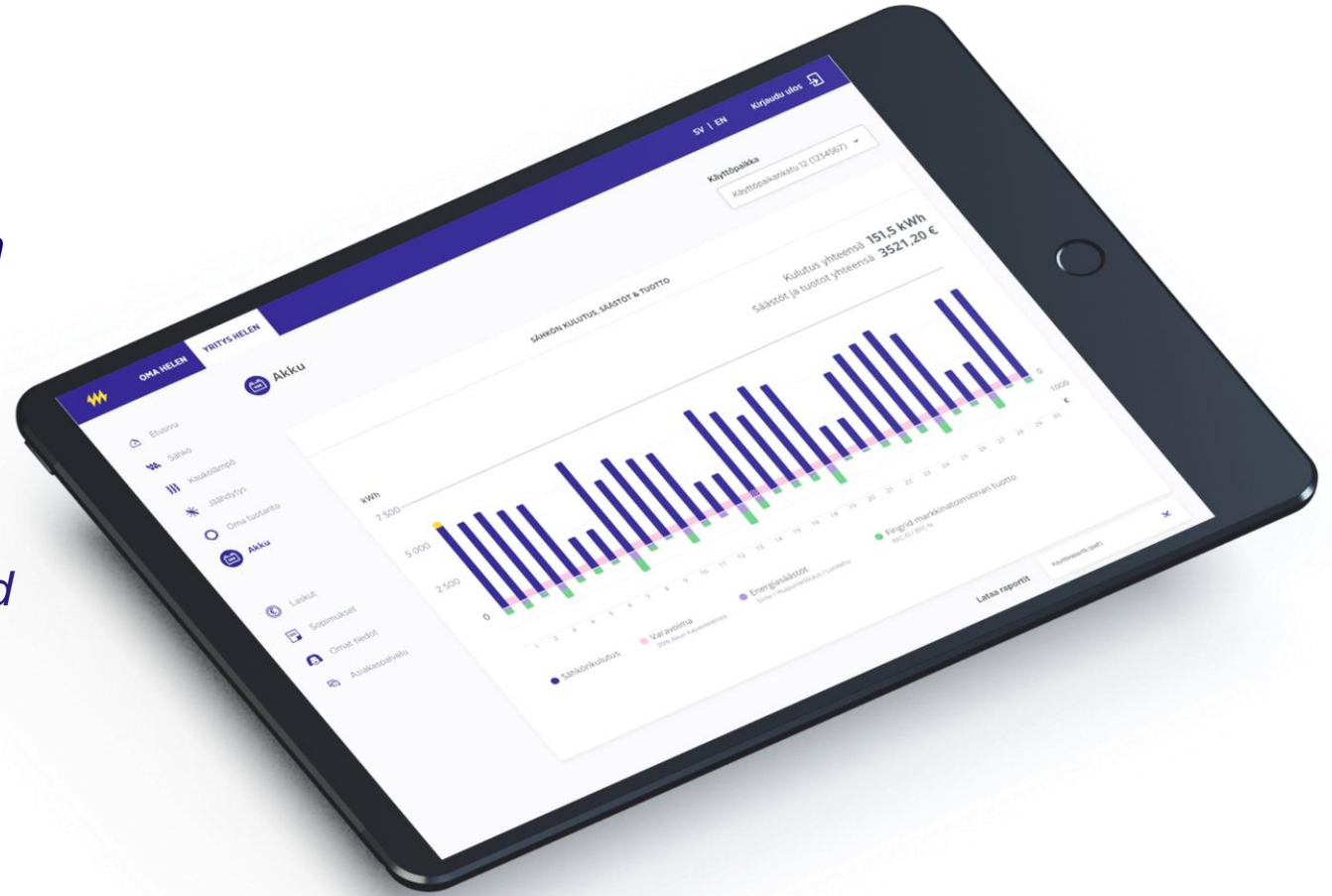
We bring the solutions of new energy era available also to our customers



Transparent reporting of revenues from electricity markets by Helen's digital service.



We maximize the revenue of customer's flexible asset with optimized market operations.



THANK YOU!



KRISTIINA
Business Lead,
Flexibility & Battery
kristiina.siilin@helen.fi
+358 40 653 1316