

# Siemens Osakeyhtiö

#TransformTheEveryday



# Smart Energy Technologies for the sustainable energy transition

Siemens Smart Infrastructure – Sanna Häsä | Smart Infrastructure

# Technology to Transform the Everyday



Digital transformation is the key to successful and sustainable business in the fields which are the backbone of our economy:

**Industry, infrastructure, mobility,  
and healthcare.**

With our technologies, we're helping our customers accelerate their own digital transformation, to reinvent their companies and industries, and to become more sustainable.



# Growth mindset



## Facts and figures

|               | Siemens Osakeyhtiö   | Siemens AG   |
|---------------|--|--|
| Revenue       | €216M  | €72bn  |
| Employees     | 433  | 311,000  |
| Founded       | 1898   | 1847   |
| Operations in | <ul style="list-style-type: none"><li>•Finland</li><li>•Estonia</li><li>•Latvia</li><li>•Lithuania</li></ul> | <ul style="list-style-type: none"><li>•200 countries</li></ul> |

**Local businesses:**  
Digital Industries and Smart infrastructure



168 years of local history

# Siemens in Finland

**1855**

Telegraph line from St. Petersburg to Helsinki

**1898**

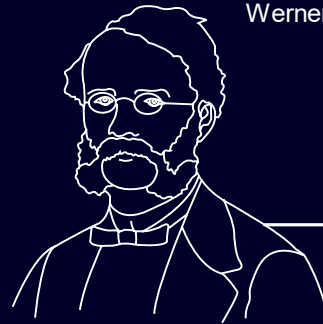
Subsidiary established in Finland

**1994–1995**

Founding of Baltic subsidiaries

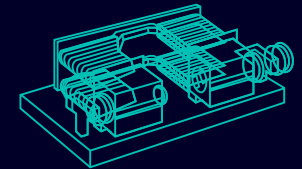
**1816–1892**

Company founder,  
visionary and inventor  
Werner von Siemens



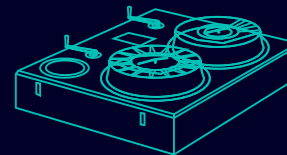
**1866**

The dynamo makes  
electricity part of  
everyday life



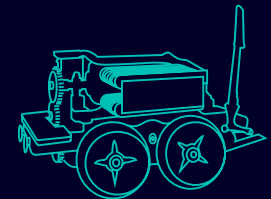
**1847**

Pointer telegraph lays the  
foundation of Siemens as a  
global company



**1879**

World's first  
electric railway



# Siemens companies in Finland

## Solutions for the greatest challenges in the society

### Global core businesses



Digital Industries



Smart Infrastructure



Mobility



Siemens Healthineers



Siemens Energy<sup>2</sup>



Siemens Financial Services

|               | Digital Industries  | Smart Infrastructure | Mobility | Siemens Healthineers | Siemens Energy <sup>2</sup> | Siemens Financial Services |
|---------------|---------------------|----------------------|----------|----------------------|-----------------------------|----------------------------|
| <b>Global</b> |                     |                      |          |                      |                             |                            |
| Revenue       | €20 bn              | €17 bn               | €10 bn   | €22 bn               | €29 bn                      | €33 bn <sup>3</sup>        |
| Employees     | 76,200 <sup>1</sup> | 72,700               | 38,200   | 69,500               | 92,000                      | 2,590                      |
| <b>Local</b>  |                     |                      |          |                      |                             |                            |
| Revenue       | €101 M              | €113 M               | €36 M    | €106 M <sup>1</sup>  | €56 M                       | €521 M <sup>3</sup>        |
| Employees     | 140                 | 255                  | 68       | 159 <sup>1</sup>     | 80                          | 64                         |

<sup>1</sup> Not including Varian Medical Finland: revenue 16 M€, employees 258 | <sup>2</sup> Siemens' share of the company is 35% | <sup>3</sup> Total assets



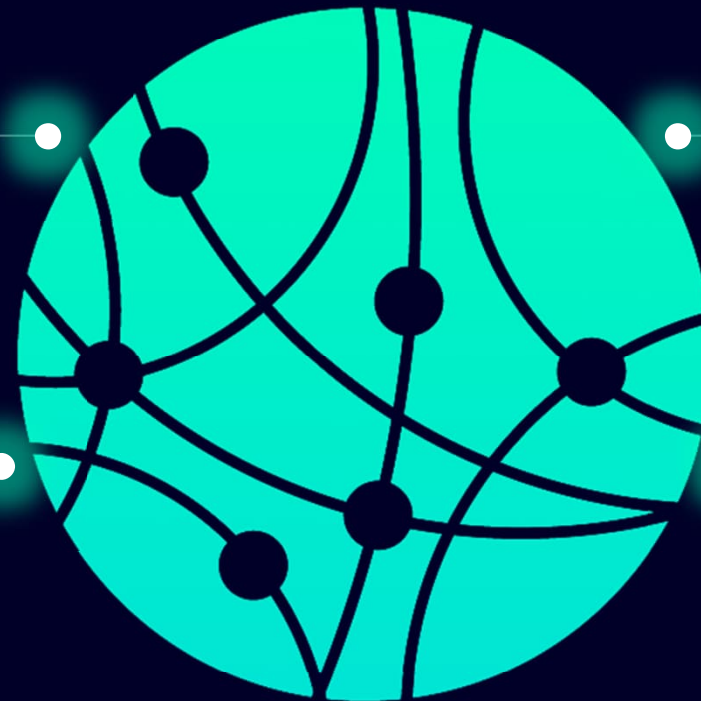
## Our four strategic priorities

### Customer impact

We anticipate what our customers need before they even know they need it.

### Technology with purpose

Innovative technology has been at the core of Siemens for more than 170 years and it will remain at the core of the future we're building.



### Empowered people

Driving progress by empowering our customers, partners and employees.

### Growth mindset

Rather than make yesterday last, we are committed to building tomorrow – by learning and being open to change.

# Siemens' commitment to sustainability

Our DEGREE framework sets clear priorities

Sustainability business

- D** Decarbonization
- E** Ethics
- G** Governance
- R** Resource efficiency
- E** Equity
- E** Employability

Sustainability in own operations



## Our value proposition for customers

Decarbonization  
and energy efficiency

Resource efficiency  
and circularity

People centricity  
and societal impact



Siemens is  
**shaping the future**

## We utilize our Company Core Technologies in all businesses



Simulation  
and Digital Twin



Sustainable Energy  
and Infrastructure



User  
Experience



Software Systems  
and Processes



Connectivity  
and Edge



Cybersecurity  
and Trust



Data Analytics  
and AI



Integrated Circuits  
and Electronics



Power Electronics



Automation



Additive Manufacturing  
and Materials

## Siemens Xcelerator – the open digital business platform



A comprehensive **portfolio** of digital and IoT-enabled offerings from Siemens and certified partners

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A continuously growing, powerful **ecosystem** of partners

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A **marketplace** to explore, educate, exchange and transact alongside a community of customers, partners and experts

# Digitalization creates value for business and a society

## Drivers for change

### Climate change

- Decarbonization
- Decentralization

### Globalization

- Competitiveness

## New business opportunities

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## Platform economy

- Outcome based business models
- Knowledge management
- Digital services
- Ecosystems
- Co-creation

## Sustainable society

### Sector coupling

### Smart society

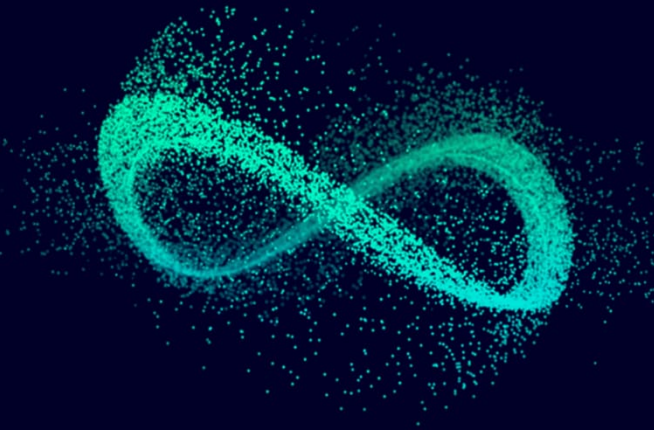


# Technology with **purpose**

# Master the digital transformation and sustainability challenges

- Automotive Manufacturing
- Airports
- Electronics Industry
- Water and wastewater Industry
- Data Centers
- Machinery and Plant Production
- Food and Beverage
- Chemical Industry
- Municipalities and DSOs
- Cranes
- Intralogsitics
- Aerospace
- Battery Manufacturing

Real world



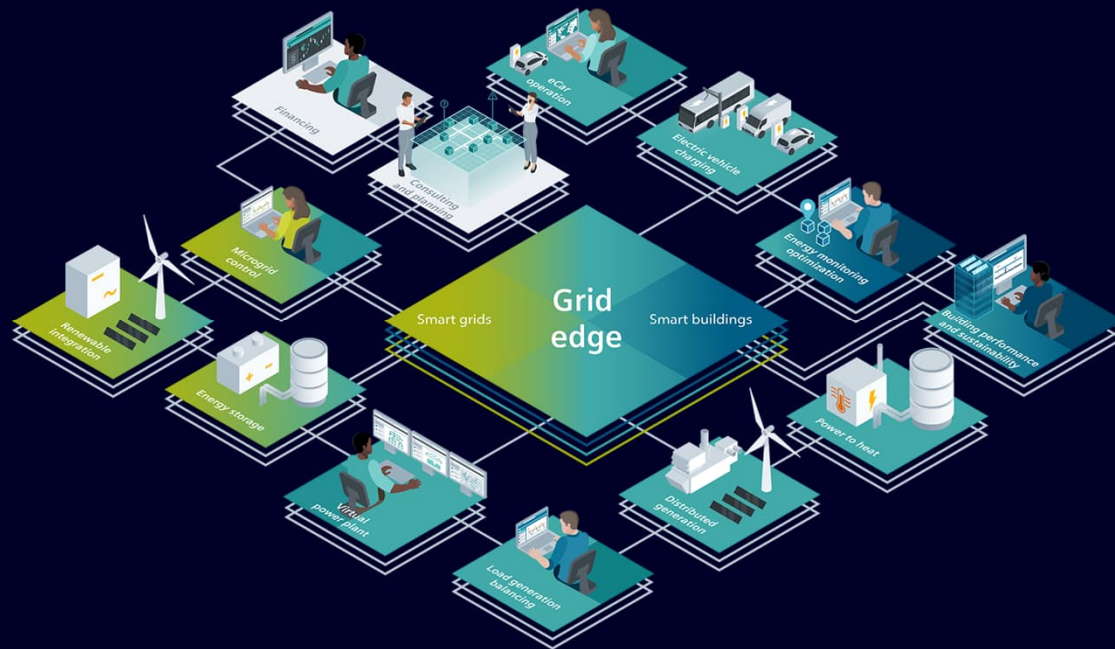
Digital world

- Glass Production
- Pharmaceutical Industry
- Campus
- Tire Industry
- Mining Industry
- Cement
- Transportation and Logistics
- Panel Building
- Wind Energy
- Pulp and Paper
- Life Science
- Healthcare
- Oil and Gas Industry



## Grid edge

### Digitalization drives energy transition



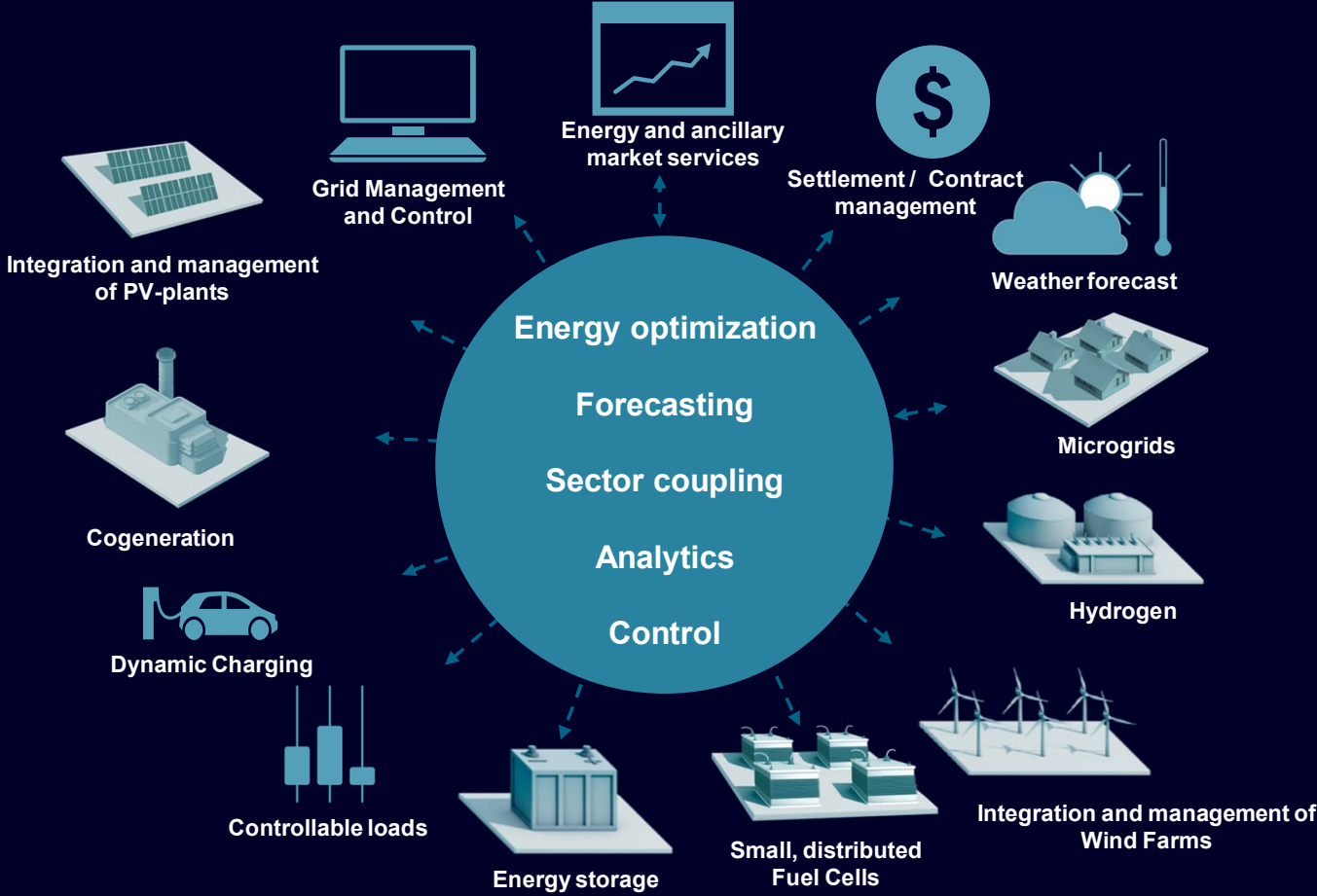
## Grid edge

The new dimension between intelligent grids, smart buildings, and prosumers is opening up space for new business opportunities and greater sustainability.

Example of solutions on the grid edge

- Virtual power plant
- Energy storage
- Solar energy system
- eCar charging

# Siemens Intelligent Energy Management System

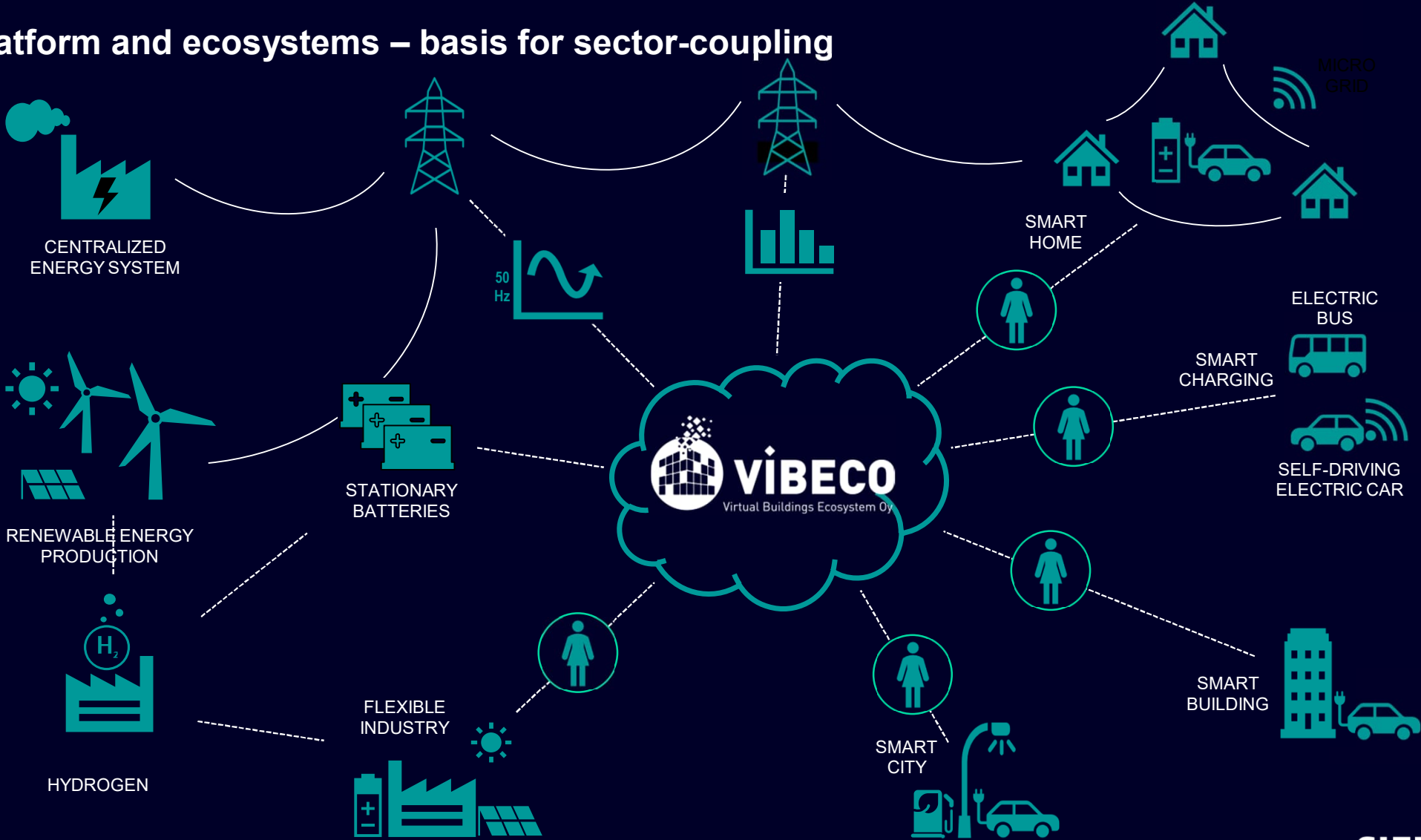




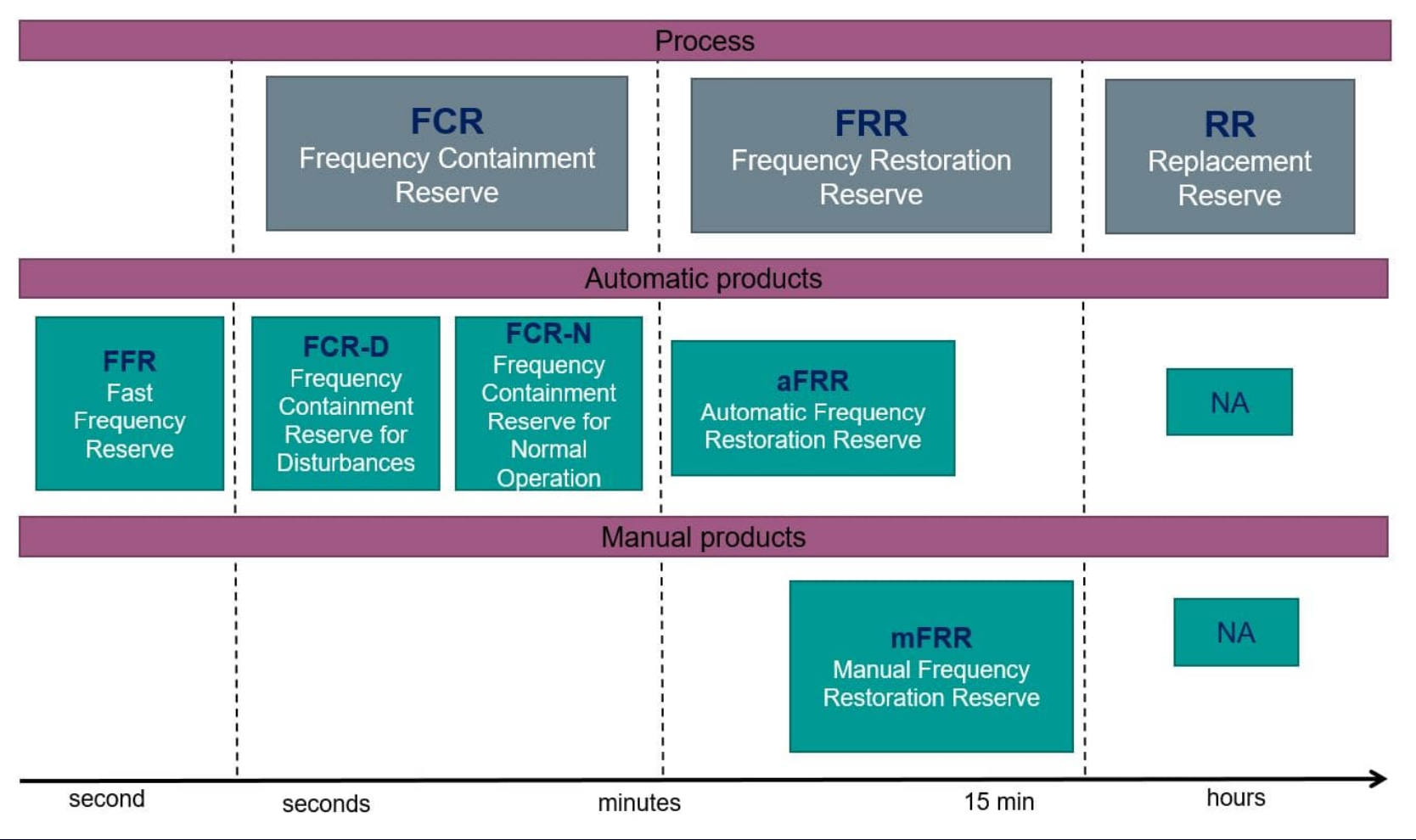
## Virtual power plant solution

- Enabler of sustainable society
- Smart energy platform connects buildings, industrial sites and other assets to the demand response market
- Assets adjust automatically their energy consumption to the energy market's requests
- Load owners can earn money by providing flexibility
- Other, new digital services

# Platform and ecosystems – basis for sector-coupling



# Fingrid Reserve Markets



Unrestricted | © Siemens Osakeyhtiö 2023 | Saana Haasa | Smart Infrastructure | 2023-11-09  
 Source: [https://www.fingrid.fi/en/electricity-market/reserves\\_and\\_balancing/#reserve-products](https://www.fingrid.fi/en/electricity-market/reserves_and_balancing/#reserve-products)

# Customer **impact**



### Smart industrial ecosystem

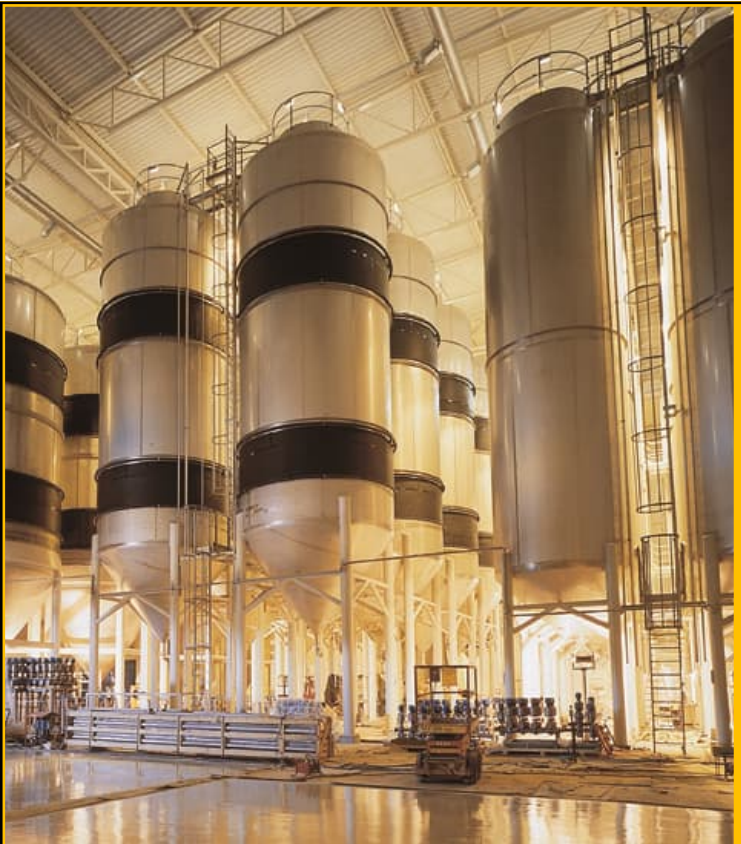
A virtual power plant, a 20 MW energy storage and the financing solutions enabling power flexibility in **Sinebrychoff brewery**.

### Smart urban district

**Sello** is the smartest and the first carbon neutral shopping center in Finland. Active contributor in optimizing district heating and energy networks.

### Smart city

Many sites connected to the same platform driving significant savings on property management costs in **Lappeenranta**.



### Sinebrychoff brewery

A virtual power plant, a 20 MW energy storage and the financing solutions for power flexibility in an industrial site.



### Aurora Pyramids, Levi

Crazy Reindeer drives sustainability by investing in a virtual power plant including building technologies and regional electrification.



### University Properties of Finland

Significant savings on property maintenance costs by analyzing and managing data efficiently.





### OYS2030

Siemens delivers a smart building and fire safety solution to Oulu university hospital as an alliance partner.

### LEMENE, Lempäälä

A self-sufficient, intelligent energy system for the Marjamäki industrial area enables the participation in the electricity market.

### Helen Electricity Network

Modernization of the Pitäjänmäki substation's protection and automation system in a challenging environment.



### Ilmatar Arena

Centralized building management system optimizes the conditions for every use purpose in the ice sports center.



### K-Lataus

Siemens has delivered more than 100 electric car high-power charging points to K-Lataus' expanding charging network.



### Greenergy

Siemens is responsible for the electricity distribution and energy management solutions of the largest data center in the Baltics.

# Sello Shopping Centre



# Sello Shopping Centre Deep-dive: Microgrid



- Battery SieStorage (2 MW, 2,1 MWh)

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  - LED lighting dali control (3000 pcs)

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  - Fans (0-848 kW scale)

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  - Ground heater electric (0-390 kW scale)

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  - Ground heater pump (0-35 kW scale)

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  - Generators (1000 kW)

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  - Solar power (0-750 kW scale)

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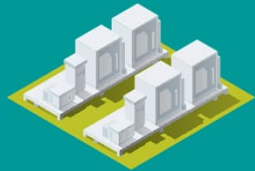
  - Cooling (0-300 kW scale)
- Next steps**

  - Additional cooling
  - Other assets

## Smart energy management and virtual power plant



## Lease-based energy storage



## Financing solutions



# Sinebrychoff

Innovative service model for Sinebrychoff contributes to Finland's ambition to become a carbon neutral country by 2035



Improved power quality in production facilities



Lower electricity costs



Reduced CO2 emissions in the national electricity network of Finland



Active participation in the energy market



Minimal expense and investment risk

Power flexibility



**~300 million liters**

... beer, cider, soft and energy drinks p.a.

SIEMENS

FLUENCE  
A Siemens and AES Company

mxw  
STORA ENSO

vibeco  
Virtual Buildings Ecosystem Oy

## LEMENE - Decentralized Energy System - Microgrid



## Microgrid System

- Solar power plants 4 MW
- Gas engines 8,1 MW
- Fuel cells 130 kW
- Electrical storages 4 MW@30 min
- Main grid connection at 20 kV
- Heat storage 30 MW

- **Microgrid controller as a Core**
- **Participation in Fingrid Reserve Markets**
- **Full Island and Black Start capabilities**
- **Forecast and optimization of CHP-production & consumption**

• <https://www.youtube.com/watch?v=7xmHg3RdM9Q&list=PL3C7A2EE19DAD4BC2&index=2>

• <https://www.lempaalanenergia.fi/lemene/>

## Case Ilmatar-Arena



## Ilmatar Arena

Centralized building management system optimizes the conditions for every use purpose in the ice sports center

### eV-charging control added

- Dynamic Load Balancing
- Participation in Fingrid Reserve Markets
- Part of the EU-funded SPARCS research project
- <https://sparcs.info/en/news/sparcs-drives-sustainable-energy-innovation-at-ilmatar-arena-in-espoo/>

We electrify **mobility** for a **better tomorrow**



## Sicharge D

- High Power DC-charging 160kW (300kW)
- Dynamic Load Balancing
- Participation in Fingrid Reserve Markets



# Thank you

Siemens Osakeyhtiö

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