

Telecom infrastructure as Virtual Power Plant

*A case study about investments and operational learnings
from Elisa's Distributed Energy Storage (DES)*

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Elisa in brief

Our mission:

”

**A SUSTAINABLE
FUTURE THROUGH
DIGITALISATION**

2.8^M
customers

&

€2.2^{BN}
revenue 2023



5,700 Elisians in 20 countries

Market position:

#1

in Finland

#2

in Estonia

With 140 years of experience

For core markets

- Telecom
- Entertainment
- IT services

For international markets

- Telecom software
- Industrial software
- Energy management

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Climate change requires our actions, fast. What is the environment we leave for generations to come

How our industry can be part of the solution?

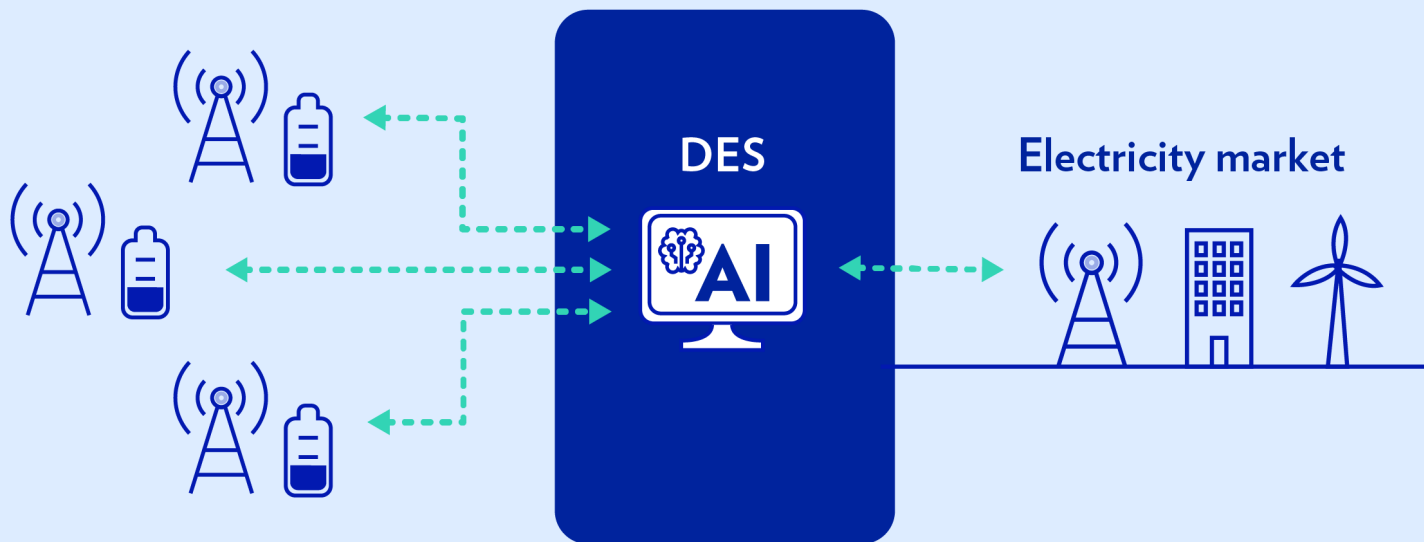


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Renewable energy needs help with flexibility – Distributed Energy Storage is a solution

DES solution reduces electricity costs and earns profit from electricity markets by intelligently managing distributed battery systems in a telco network



Case Elisa Finland

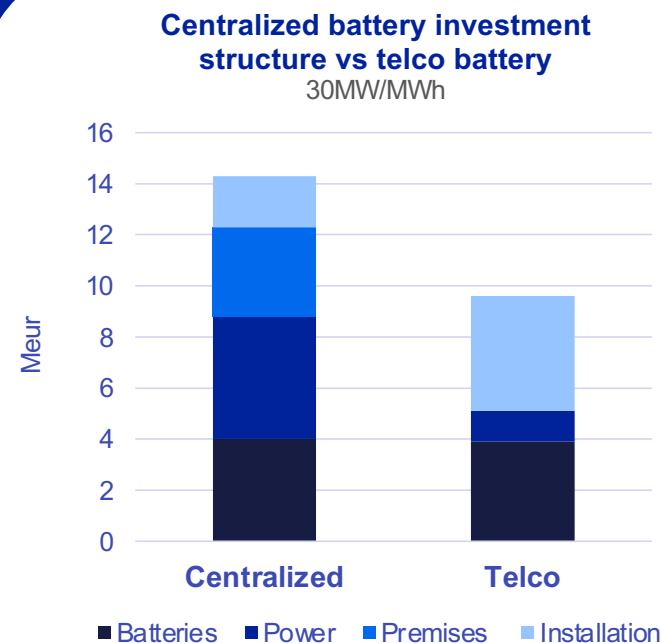
- Investment for **150 MWh distributed energy storage** at Elisa Finland network, **2000+ mobile base station sites**
- Additional battery capacity utilized for energy market (2-3x capacity to original, also improving network resiliency)
- Participation to grid balancing market & energy procurement optimization = **new revenue + cost savings**
- Up to **21,900t CO2** marginal emission reduction annually
- **Continuous operations since 2022**

Our software and services are available for other MNOs/Towercos



Billions of investments are going to grid-scale batteries

- Centralized battery investments are booming to 250 billion euros annually by 2025
- Telco infra provides decentralized alternative
- From lead acid to lithium batteries
 - Twice the lifetime (10+ years)
 - Cycles 3000 – 10 000
 - Superlight installation



Value elements of DES VPP

Balancing services

aFRR up
aFRR down
FCR-N
FCR-D
mFRR
FFR
Capacity markets



Imbalance fees

Imbalance fee mitigation
by day-ahead and intraday



Resiliency

Increased resiliency
Regulatory obligations
Dynamic high-risk
situation preparation



DES VPP



Energy procurement

Day-ahead load-shifting
PPA type optimization
Intraday trading
Hedging optimization



Grid tariffs

Day/night tariffs
Peak-load tariffs



Environment

From yearly emission certificates to
“24/7 Clean PPA” / EnergyTag
(time-of-use / marginal system level
emission reduction)



Summary - DES benefits

Financial



The extra revenue and cost savings from DES can add up to more than 50% of an operator's electricity costs

Network reliability



The increased backup battery capacity enables operators to provide better customer experience

Sustainability

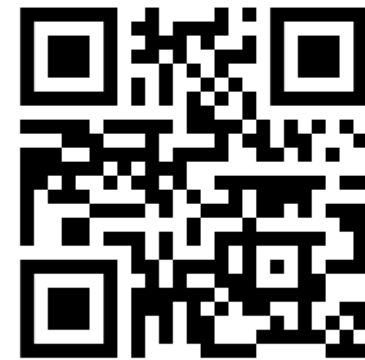


The DES solution enables renewable energy production by providing flexibility to the grid

Happy to help make DES happen also in other telco infrastructure!

Thank you!

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