ITS - Verkostopäivä

Tietoevry Energy & Utilities

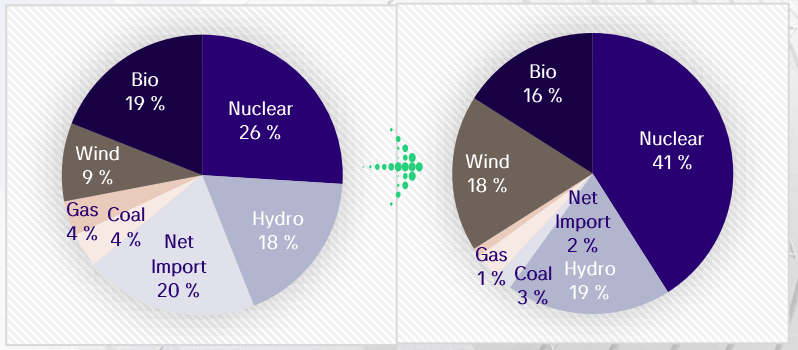
Fredrik Jansson

tietoevry

Market drivers in Finland

Macro divers

- EU regulations for green transition and cross-border interoperability
- Russian electricity and gas import replacement
- Ongoing subsidies and shift to renewables



Zero-carbon energy system achieved

Zero-carbon

Strengthen cross-border transmission capacity

Speed-up of reserves acquisition

New base generation, like nuclear to respond to increased industrial needs

Work-arounds to replace Russian import

DSOs local flex enablement

Datahub established

TODAY

Establishing new market roles like BSP,

From 60min to **15min** imbalance settlement

- Full penetration of **smart metering** infra **(2012)**
- **Nordic imbalance settlement (2015)**

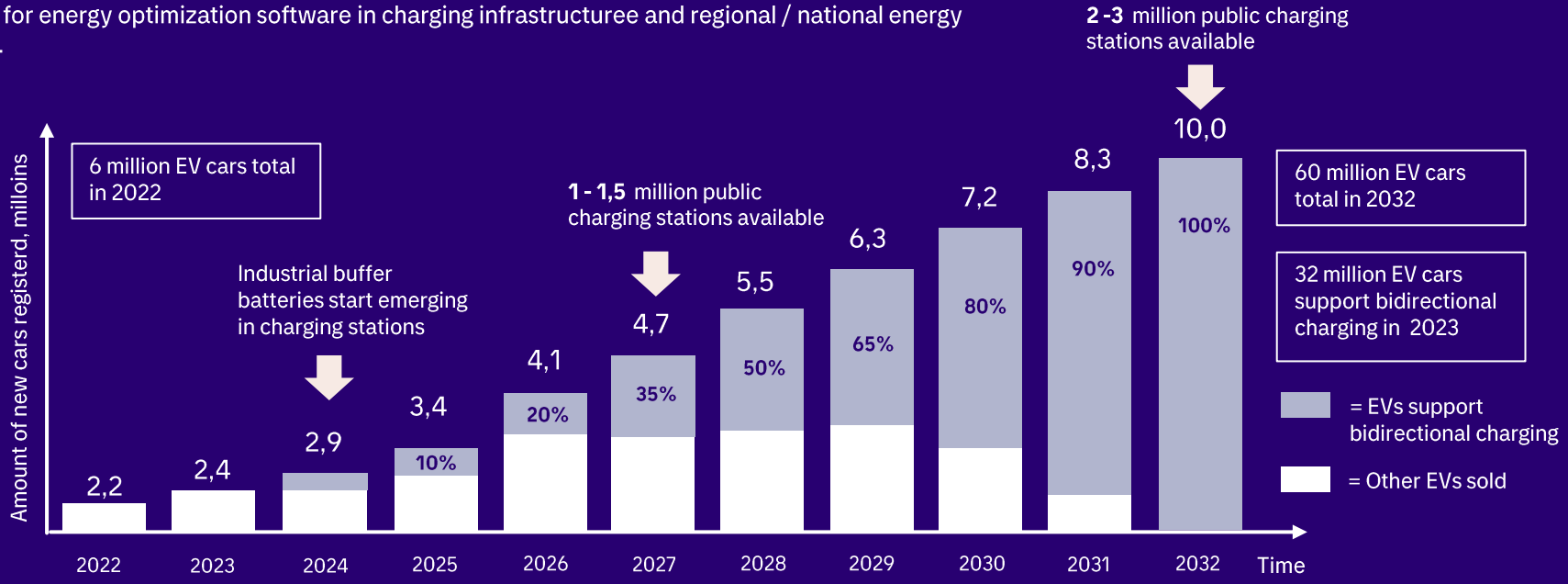
Energy production profile change from 15% import to full self-sustaining**

Increasing demand for electricity consumption (7% / 2020-2030)*

*Electricity demand estimate 2020-2030, Fingrid **Production of electricity and heat, Statistics Finland

Market landscape for EV charging in Europe

Annual volume of new Electric Vehicle (EV) registrations with grow gradually until 2032 which create significant need to develop charging infrastucture in Europe. EV volume increase create market demand for energy optimization software in charging infrastructuree and regional / national energy systems.



Source: 1) New registrations of electric vehicles in Europe, European Enviroment Agency, 10/2022,; 2) Recharge EU, European Federation for Transport and Environment 01/2020 3) Electric Vehicles – Europe, Statista, 11/2022; 4) Europe's EV opportunity—and the charging infrastructure needed to meet it, McKinsey, 11/2022

Energy management for DSO Flexibility

DSO Challenges that could be mitigated with available flexibility capacity

Network Congestion

- Transformer capacity **issue**
- Electric line capacity **issue**

Power Quality

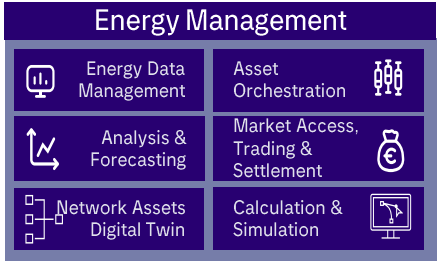
- Electric line voltage drop **issue**
- Voltage **issue** on customers
  - Low voltage
  - Overvoltage

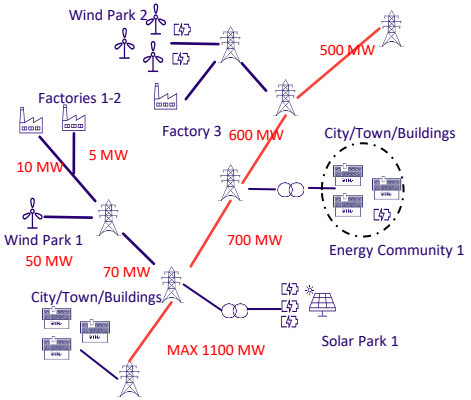
Own Assets

Service provider assets

Flexibility Markets

- Direct control or VPP of assets
- Procurement of flexibility





Issue prediction and identification

- Forecasting network consumption and production (AMR+CIS)
- Calculation of network loads with forecasts
- Identification of nodes and lines where issues might arise

Issue resolution

- Evaluate the cost of different capacity option
- Creation of control plan for own or bilaterally agreed assets
- Bid for local capacity from possible local flexibility markets

Settlement

- Calculation and reporting of utilized flexibility and its costs

On-going R&D projects

Microgrids | *Energy Reserves* | *Energy efficiency* | *EV charigng infrastucture* | *Regional transformation* | *Flexibility* | *Energy communities*

TIETOEVRY OWN R&D PROJECT PART OF THE CONSORTIUM → **TIETOEVRY SUPPORTING ECOSYSTEM**

Energy ECS

Project purpose
Energy ECS (Electronics, Components, Systems) is consortium project on smart and secure energy solution to develop a set of technologies to improve the digitalization of e-mobility systems and related energy solutions.

Tietoevry role
Turnkey software capabilities for microgrid infrastructure owners to manage number of microgrids in commercial use

Timeline
06/2021-11/2024

Key Partners
MERUS POWER, KSS ENERGIA, AURORA POWERTRAINS, LAPIN AMK, UNIKIE, strætó.is, SVARMI

GenerIOT

Project purpose
Generating and Deploying Lightweight, Secure and Zero-overhead Software for Multipurpose IoT Devices

Tietoevry role
Software capabilities build Ice halls as virtual powerplant and connect to energy reserve markets

Timeline
01/2023-12/2025

Key Partners
Tekojää, Granlund, LOOPSHORE, Nobody, Tampere University, UNIKIE

NSDC

Project purpose
The Nordic Superblocks as Decarbonization Catalysts accelerate the transition towards zero-emission buildings and carbon-neutral living. NSDC supports sustainable urban planning and development as well as building life-cycle management

Tietoevry role
Tietoevry provides a platform for collaboration and integration for Superblock stakeholders to manage their energy assets.

Timeline
10/2023-12/2025

Key Partners
SKANSKA, VARMA, Granlund, Integrio, Colliers, Tampere University, synocus, JIS

SECHA

Project purpose
Scaling EV charging solutions for new values and services in collaboration

Tietoevry role
Steering group member to identify opportunities and steer program

Timeline
11/2024-11/2026

Key Partners
Tampere University, LUT University, VTT, KEMPOWER, electrix, IGL, SAVON VOIMA, CACTOS, RAMBOLL, Kymenlaakson Sähkö

BET

Project purpose
Boosting Energy Transformation (BET) is a research initiative integrating resilience, low- carbon solutions, and electrification to accelerate multinational, cross-sectoral, and multi-level decarbonization international collaboration as a target to create new technologies, solutions and markets.

Tietoevry role
Steering group member to identify opportunities and steer program

Timeline
06/2023-12/2025

Key Partners
Vaasan yliopisto, VAASAN SÄHKÖ, Danfoss, Nobody, Wapice, JAKOBSTAD PIETARSAARI, VAASA

V4F

Project purpose
Project research and develop cost efficient and sustainable solutions for energy system flexibility.

Tietoevry role
Steering group member to identify opportunities and steer program

Timeline
10/2024 -10/2026

Key Partners
ALVA, LUT University, Tampere University, ELENIA, CALEFA, HITACHI, fortum, FINGRID, HELEN, PKS, st1, Vatajankoski

ECADEC

Project purpose
The reduction of fossil carbon emissions in the cities requires large-scale electrification of energy system, utilization of flexibility and energy saving in the energy system, buildings, and transportation

Tietoevry role
Steering group member to identify opportunities and steer program

Timeline
11/2023-10/2026

Key Partners
Tampere University, VTT, ELENIA, PORI ENERGIA, Trimble, CGI, SIEMENS, kapacity.io, ABB, TAMPEREEN ENERGIA

Strategic horizons for energy optimization in EV Charging infrastucture development

Charging optimization in heavy duty terminals

Horizon 1

Optimize heavy duty termnial energy system including additional components like miroproduction and buffer batteries

Heavy duty vehicles

Charging optimization on the road

Horizon 2

Optimize heavy duty charging station energy usage for ad-hoc charging

Heavy duty vehicles

Bilateral charging and energy optimization

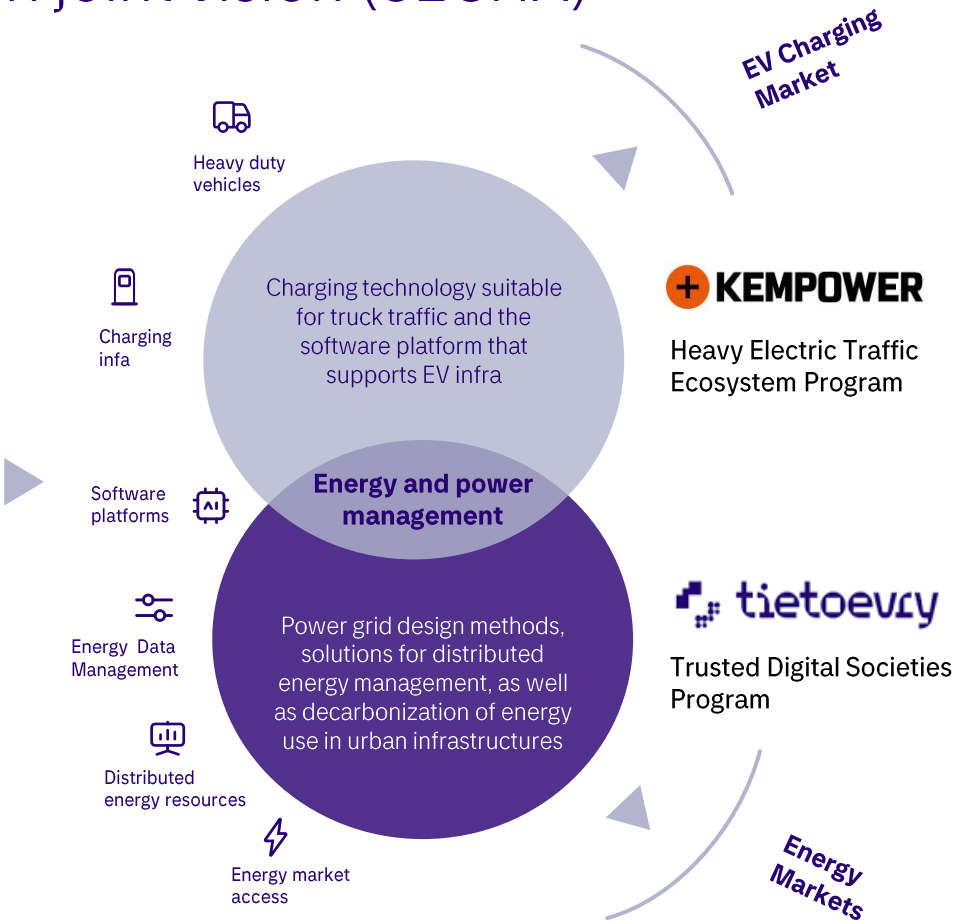
Horizon 3

Car batteries participating to demand response

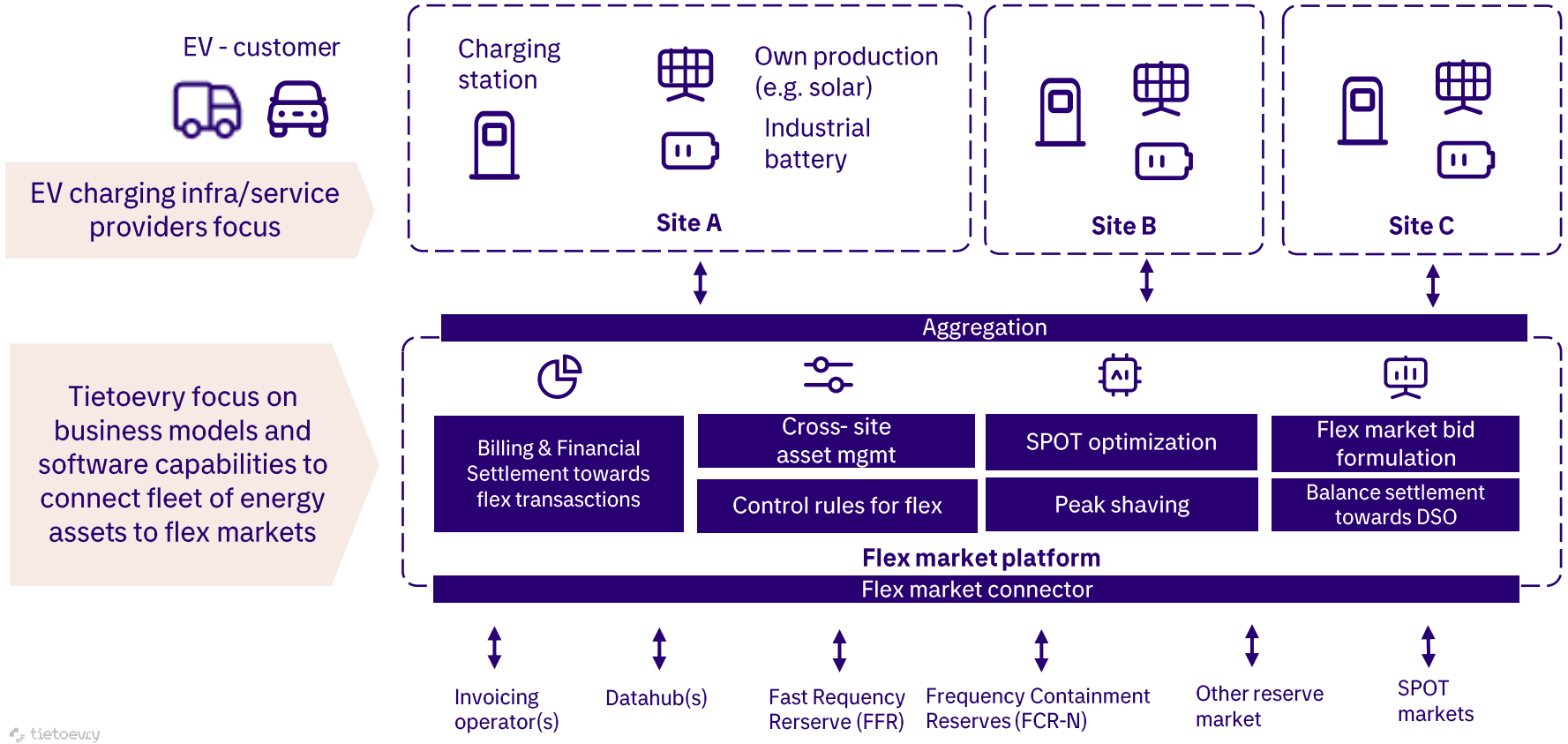
New vehicles supporting bidirectional charging

Kempower and Tietoevry Veturi joint vision (SECHA)

- Kempower's Heavy Electric Traffic Ecosystem program aims to develop charging technology suitable for heavy-duty vehicles, especially long-haul trucks, along with supporting **software platforms** and **charging infrastructure** testing platforms.
- Tietoevry Trusted Digital Societies Program develop affordable, accessible, and trusted digital services. Veturi ecosystem help **Finnish IT companies** to build globally scalable business value from responsible **data-enabled platforms.**
- Kempower and Tietoevry Veturi programs driving together **energy and power management in EV charging ecosystem based on data** which support **EV users** and **EV charging service providers** get **electricity and flexibility market access** and be more **cost efficient**. Kempower and its ecosystem bring deep knowledge about **EV charging technologies** and Tietoevry and its ecosystems build foundation for managing energy data in context of **regional energy systems like facility complex or urban areas**.
- Commercialization vision: providing **globally available turnkey offering for EV charging infra owners provided by Finnish consortium**
- Joint ecosystem of two Veturi **enhancing future exporting possibilities** and **investment in Finnish R&D**
- SECHA project build foundation **for market understanding, co-operation model, practical demostrators and new knowledge to build export business** in energy management for EV charging markets.

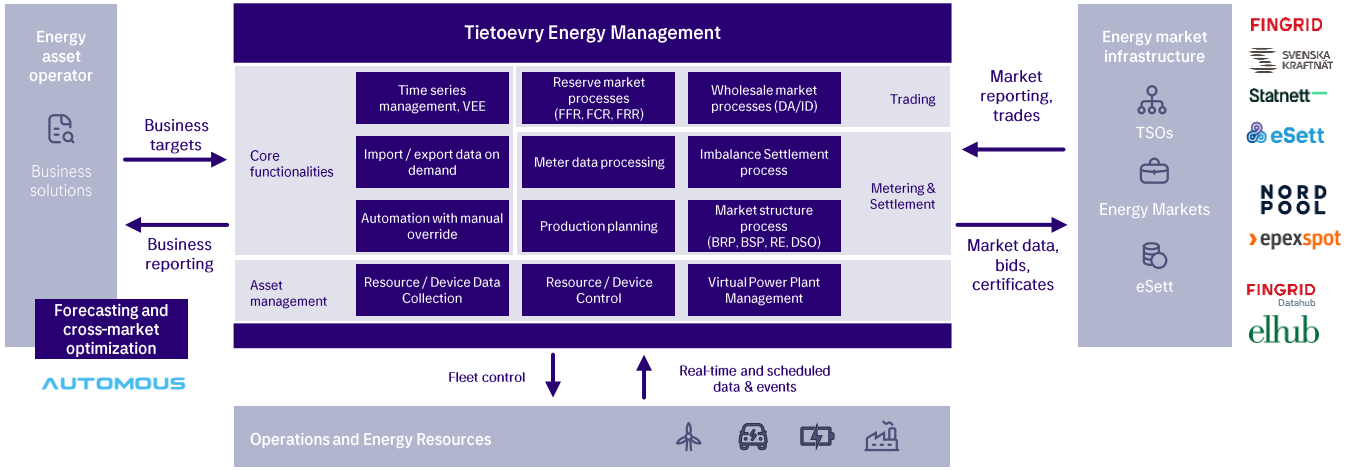


Flex market platform for EV charging infrastructure



Energy Management (EM)

We help companies to access and operate in electricity markets with data-informed decisions, minimized risk, and cost savings.



Agnostic solution

No hardware vendor lock-ins

No need to use the same software vendor for all energy related activities and workflows

Modular and scalable

Only pay for what you use

Select features that enable your business

Industry expertise

Expert support and advice on-demand

Benefits

- **Consolidate market data** and messaging management for all market flows and all markets
- **Orchestration and management** for grid connected own- or third-party assets for optimised utilisation, market bidding or optimising of internal power portfolio
- **Market integrations** for data flows out of the box including; market role specific data flows and market bidding (e.g. reserve markets, Day-Ahead markets etc.)
- **Optimized trading results** with advances forecasting and optimization

Thank you

Fredrik Jansson
fredrik.jansson@tietoevry.com

tietoevry