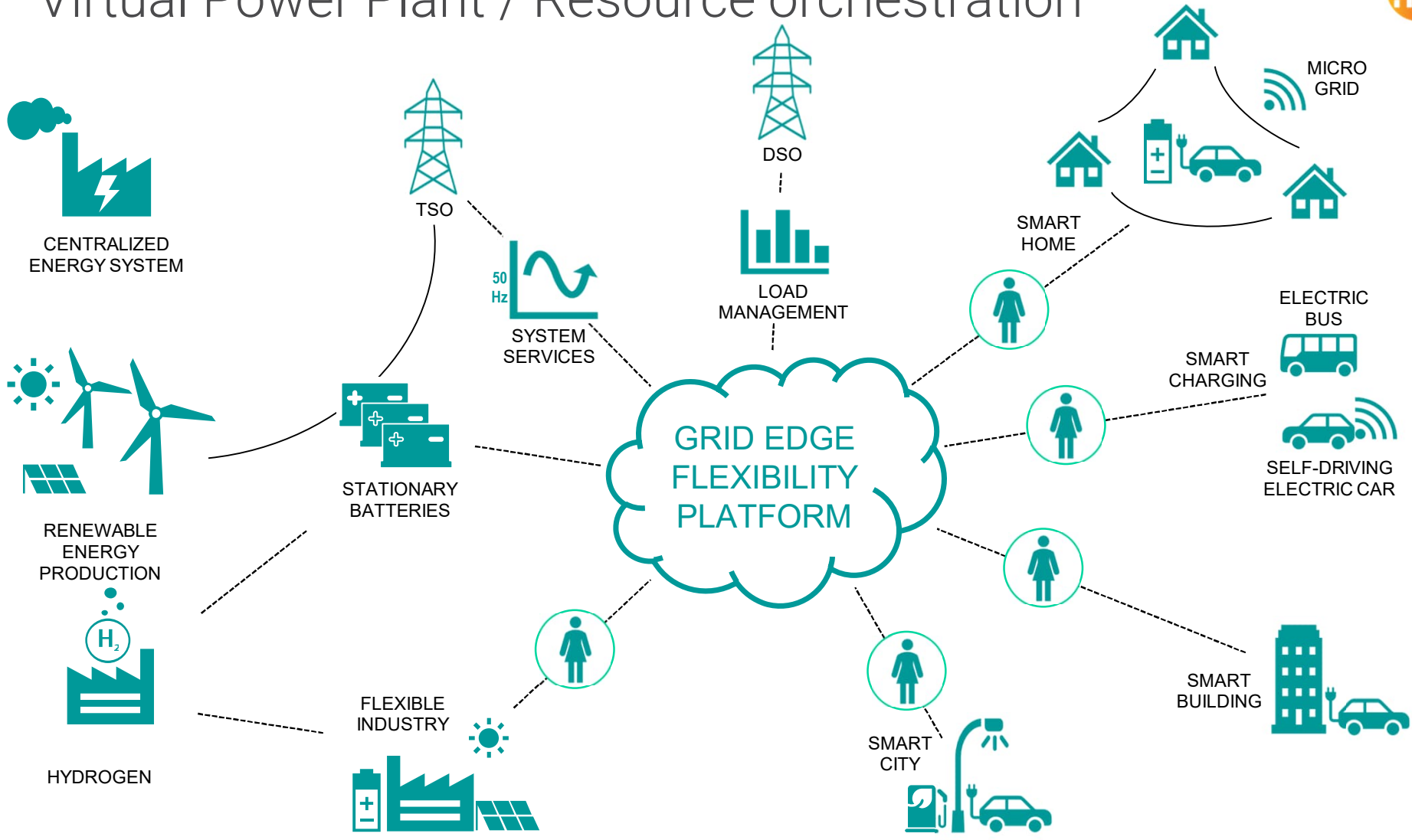


Sustainable future needs a new approach

Veikka Pirhonen | CEO, VIBECO Oy
10.5.2022

Virtual Power Plant / Resource orchestration



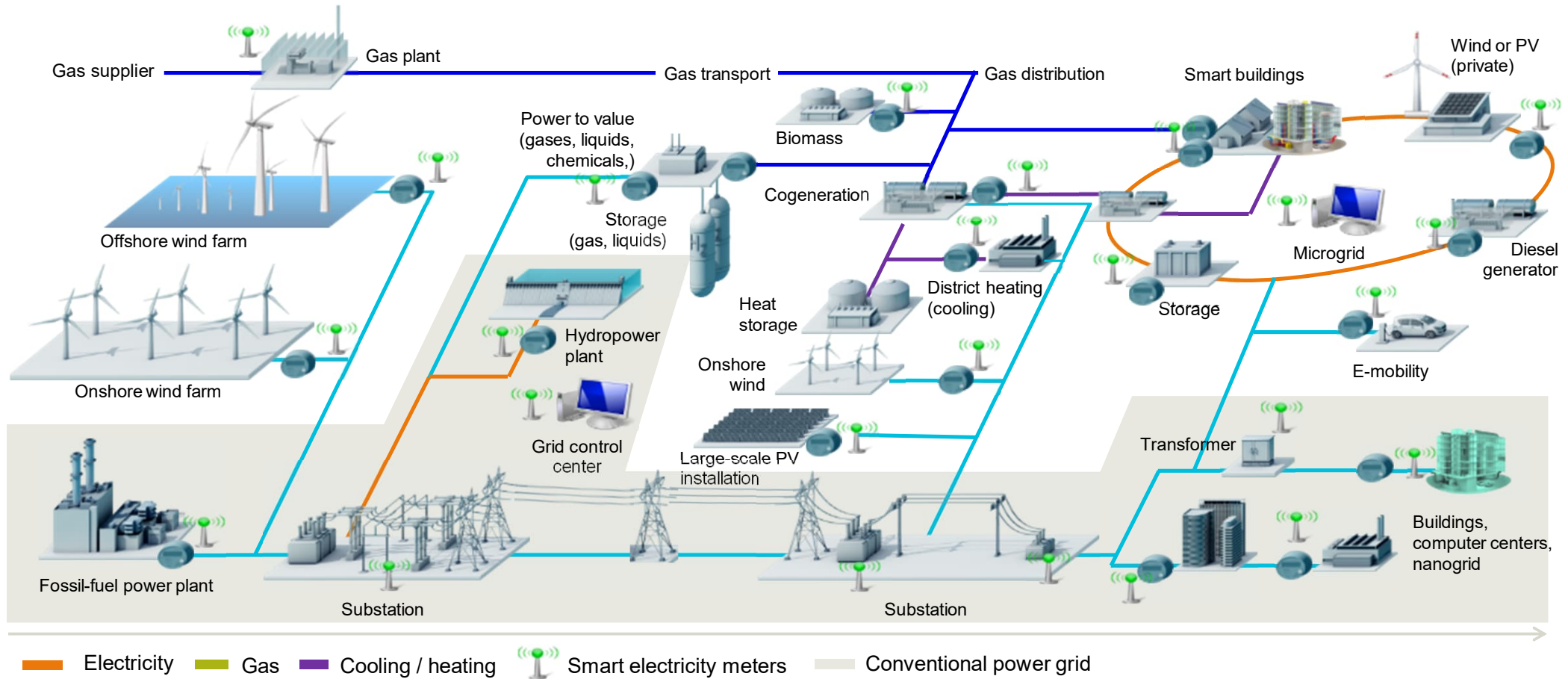
The national goal:
carbon neutral Finland in:

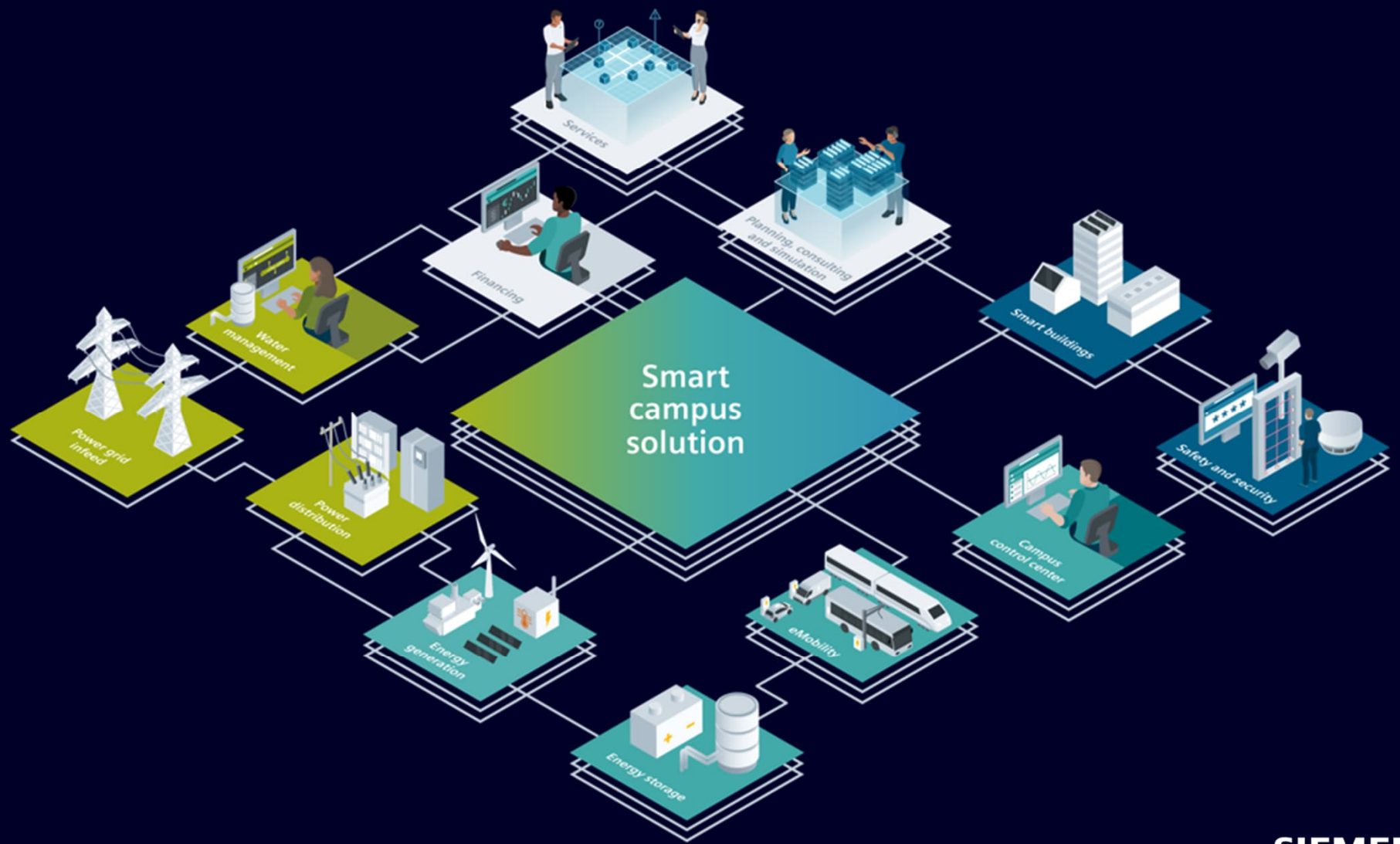
2035



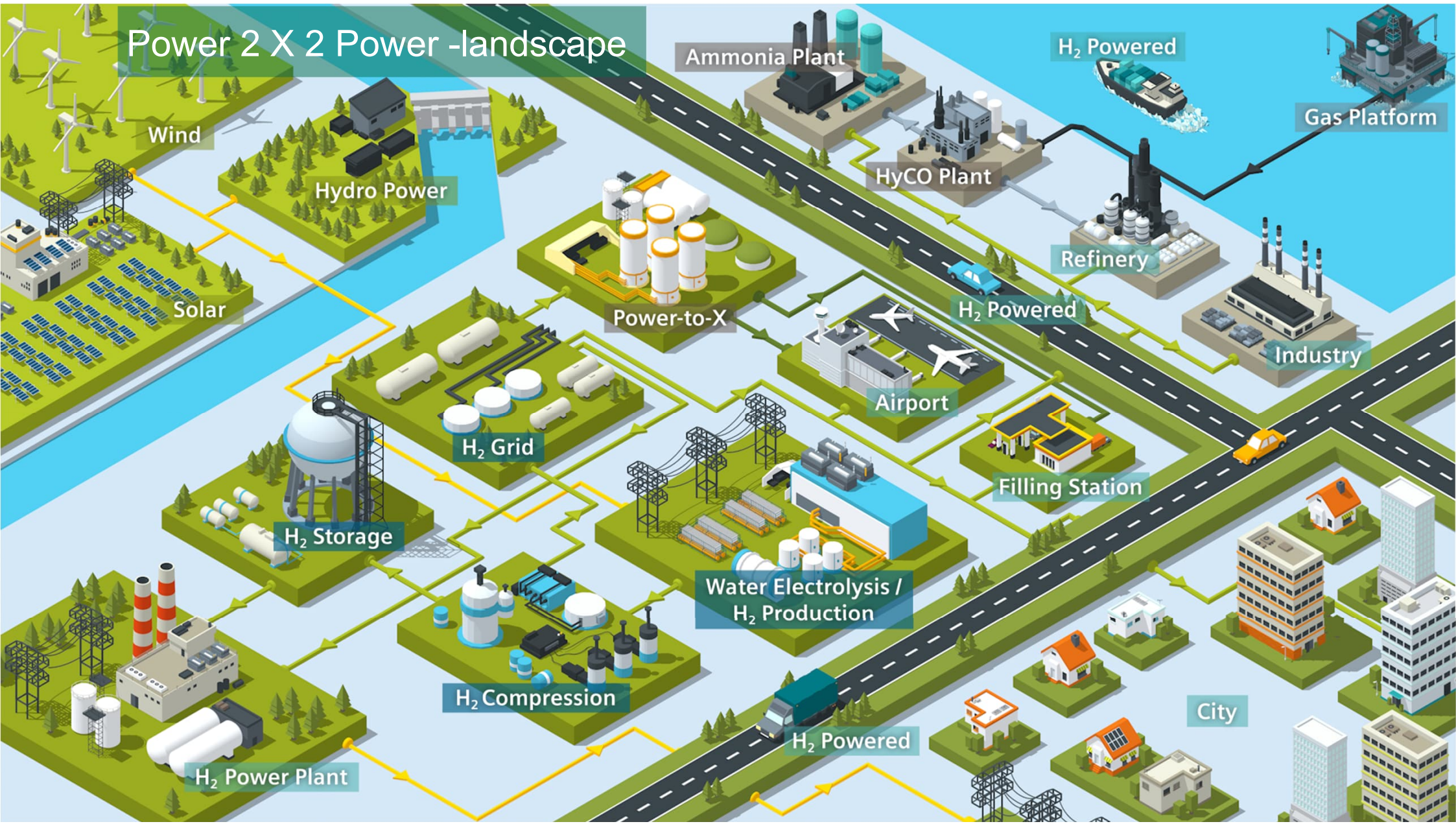
The energy system has changed fundamentally

From centralized grid to distributed energy and energy balancing



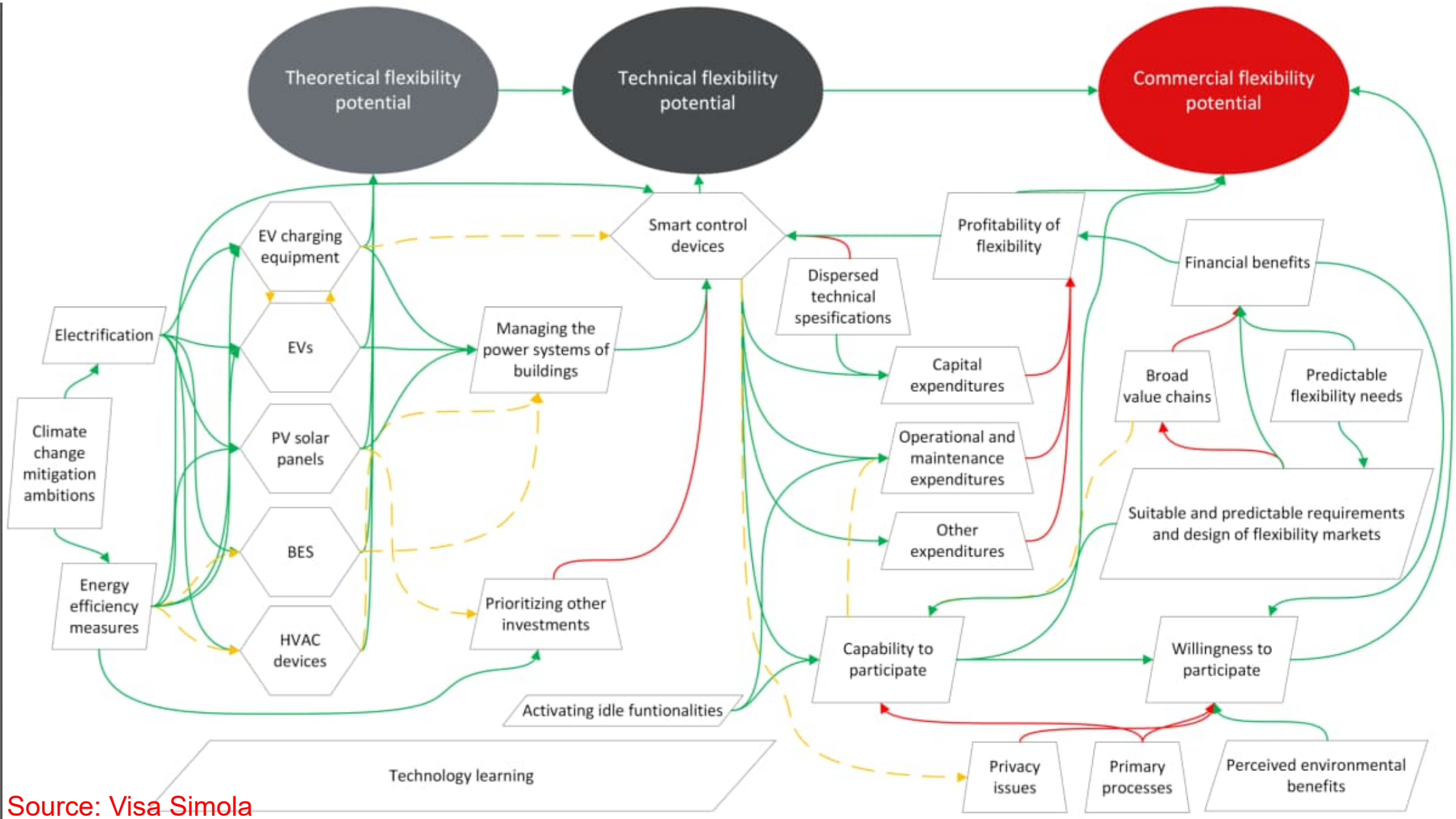


Power 2 X 2 Power -landscape



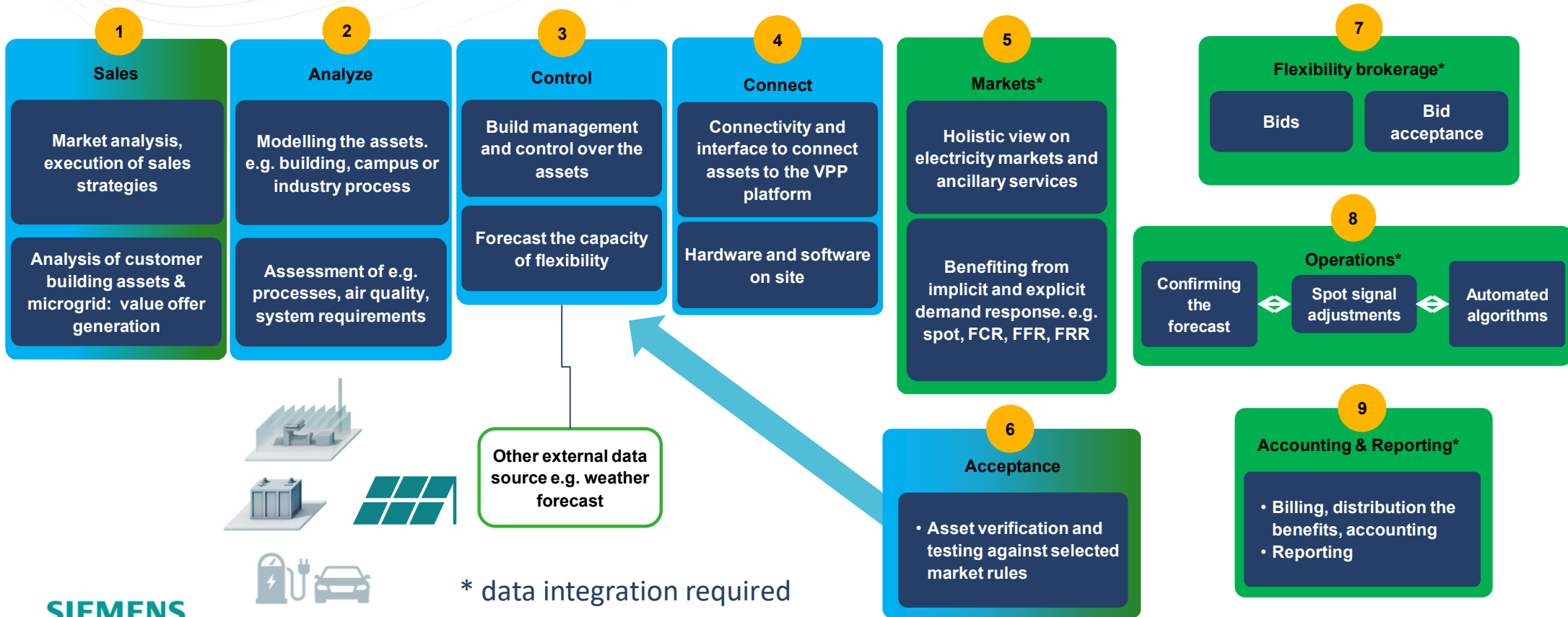
The background of the slide is a dark blue gradient with numerous 3D-rendered molecular models. These models consist of spheres of varying sizes connected by thin rods, representing chemical structures. The spheres have a glossy, reflective surface. A semi-transparent white rectangular box is centered on the slide, containing the main text.

H₂ economy requires intelligent multiside orchestration platform



Source: Visa Simola

Operation chain to benefit from flexibility

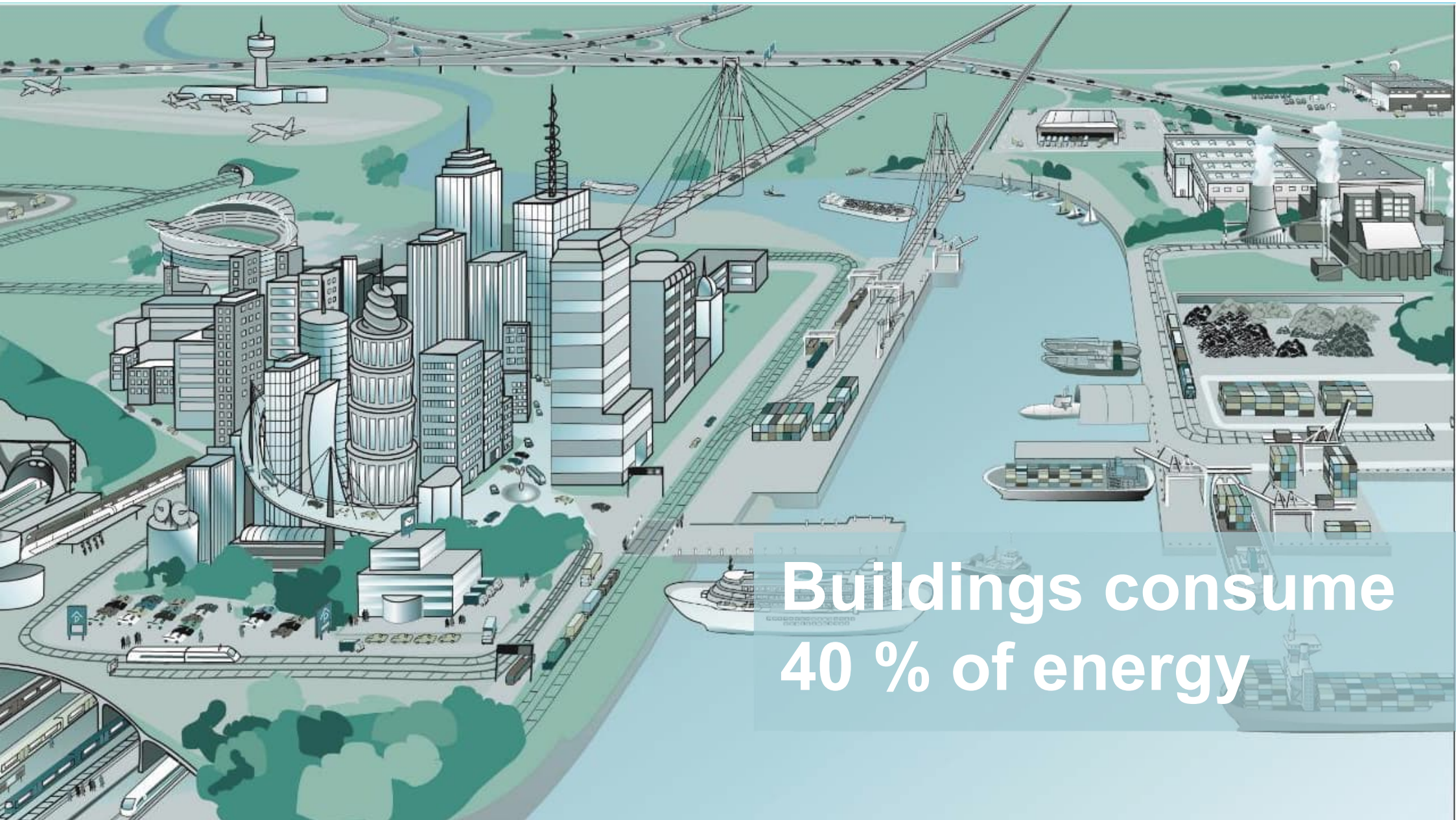


New business models and logics drive new ecosystems Siemens technology as an enabler

SIEMENS
Ingenuity for life



Several approaches



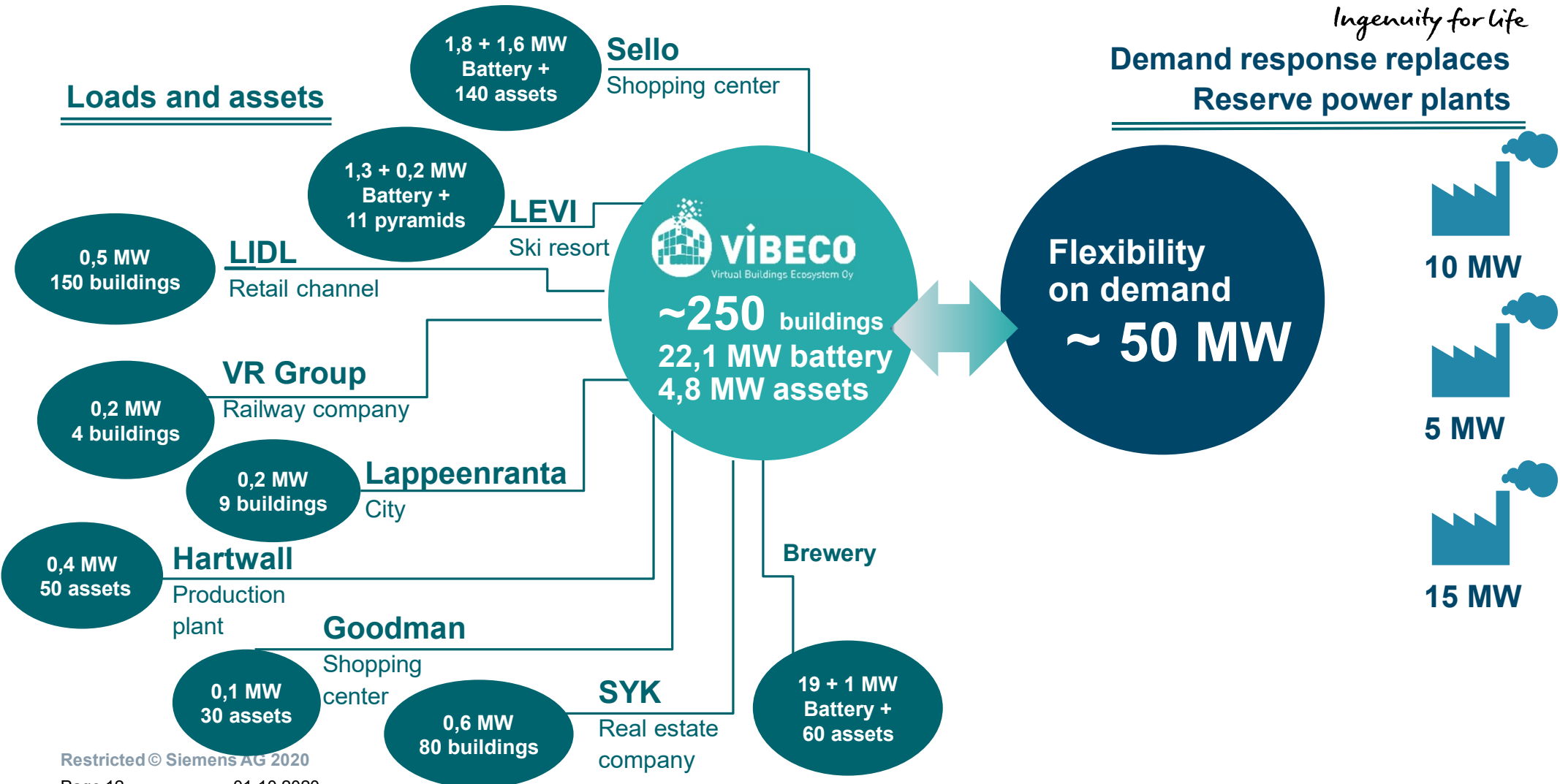
**Buildings consume
40 % of energy**

VIBECO – We make real what matters

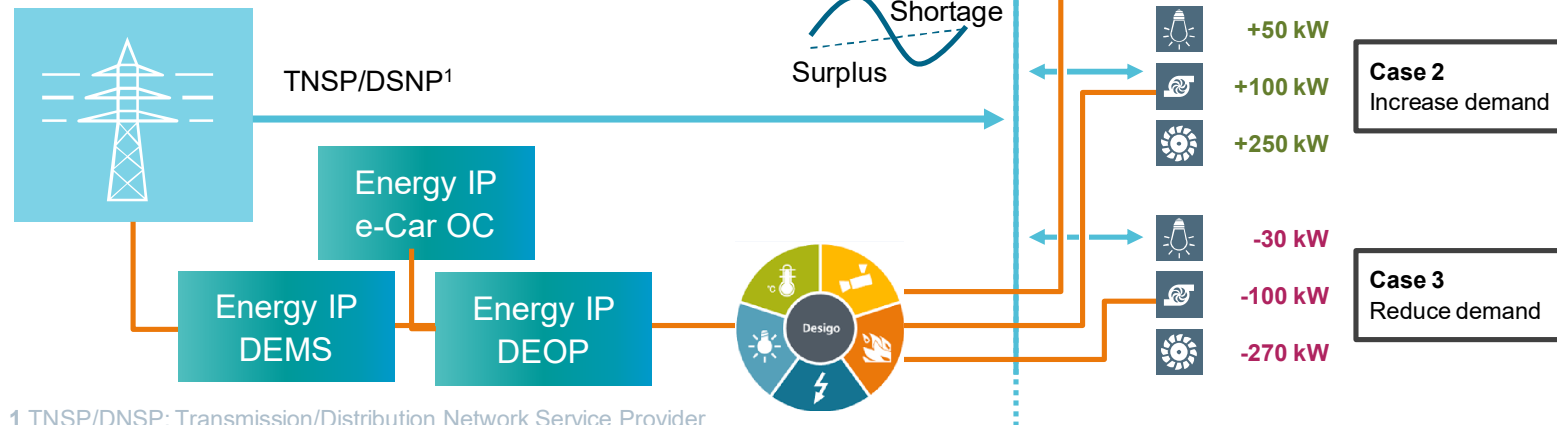
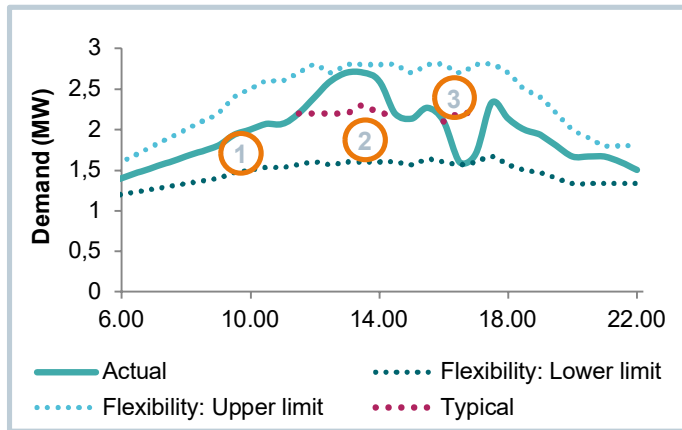
SIEMENS

Ingenuity for life

Demand response replaces Reserve power plants



Virtual power plant service - Management of building loads



EnergyIP DEOP calculates flexibility curves for each hour

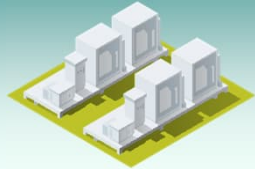
	Lights	30 kW
	Parking heating	200 kW
	Ventilation	200 kW

¹ TNSP/DNSP: Transmission/Distribution Network Service Provider

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
STORAGE

vibeco
Virtual Buildings Ecosystem Oy





Sinebrychoff, Carlsberg Group

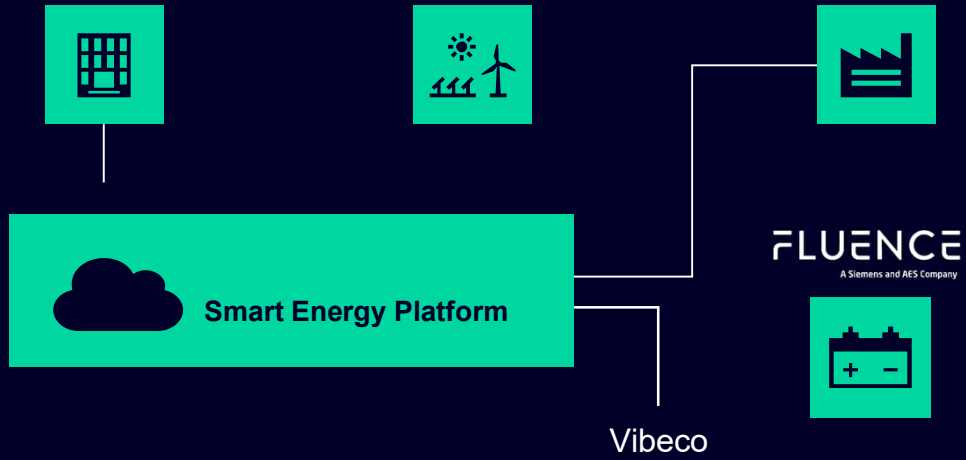
“This innovative model developed by Siemens and its partners is an ideal all-in-one solution.”

Pasi Lehtinen, VP Supply Chain at Sinebrychoff

Reduced CO₂
In the national electricity network of Finland

Monetarization
In the energy market

20 MW
Battery storage electricity costs



A Virtual Power Plant Solution for Aggregating Photovoltaic Systems and Other Distributed Energy Resources for Northern European Primary Frequency Reserves

by Rakshith Subramanya ^{1,*} Matti Yli-Ojanperä ¹ Seppo Sierla ¹ Taneli Höiltä ¹ Jori Valtakari ² and Valeriy Vyatkin ^{1,3,4}

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³ SRT, Luleå University of Technology, 97187 Luleå, Sweden

⁴ International Research Laboratory of Computer Technologies, ITMO University, 197101 St. Petersburg, Russia

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Academic Editor: Seppo Valkealahti

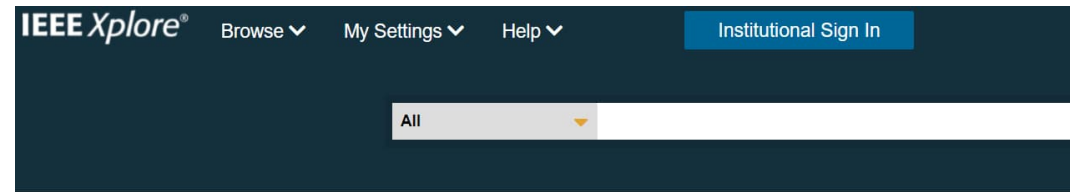
Energies **2021**, *14*(5), 1242; <https://doi.org/10.3390/en14051242>

Received: 3 February 2021 / Revised: 12 February 2021 / Accepted: 18 February 2021 / Published: 24 February 2021

(This article belongs to the Special Issue Emerging Photovoltaic Technology in Northern Europe)



Figure 21: Example view of online energy prediction model for Sello in Action E6-1. This is a short term view (2 days prediction for electricity demand for 1 electricity metering point. Source: VTT



Conferences > 2021 IEEE PES Innovative Smar...

Interfacing Third Party Cloud Services to a Virtual Power Plant

Publisher: IEEE

Cite This

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Rakshith Subramanya ; Seppo Sierla ; Matti Yli-Ojanperä ; Henri Makkonen ; Mahdi Pourakbari-Kasmaei ; Valeriy Vyatkin

43

Full

Text Views

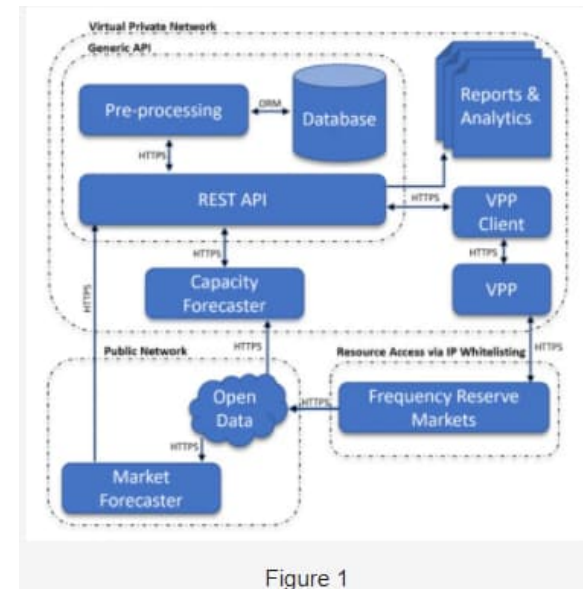


Figure 1

Smart society

Smart platform connects buildings, energy systems and industries to boost efficiency and sustainability in a society.



Thank you.



Smart Readiness Indicator – Sello as a case example



↑ 90 % of domains above medium level, 40 % of domains 100 %, high SRI scores for all impact categories, SRI A level

↓ Dynamic building envelope not applied

?! Part of the smart energy system, microgrid functionality. High SRI score is achievable with district heating

Sello

Project Data

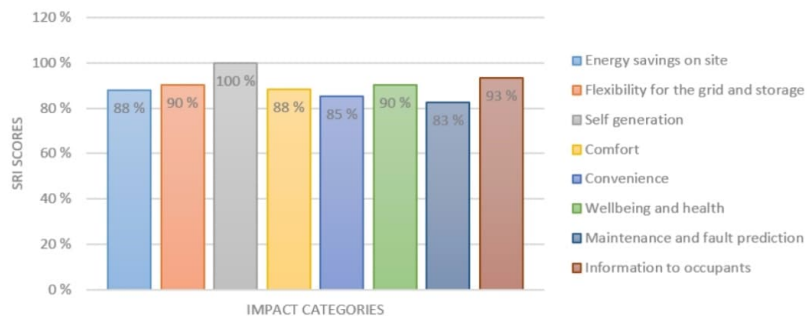
Location	Espoo, Finland
Year of Construction	2003
Type of Building	Shopping Centre
Floor Area	100 000 m ²
Number of Floors	N/A
Environmental Certificate	LEED Platinum
Indoor Climate Class	S2

Basic Design Features

- District Heating
- Air Heating
- Mechanical Balanced Ventilation with Heat Recovery
- Solar PV Utilization
- Advanced Demand Management
- Electricity Storage

Smart Readiness Indicator (SRI)

SRI SCORES BY IMPACT CATEGORIES



SRI SCORES BY DOMAINS



N/A - Category/domain is not assessed, because of irrelevance

Sello

SRI score

92%



Design by Laura Remes

Top score for Sello

SIEMENS
Ingenuity for life

Sello

SRI score

92%

Building Type	Year of Construction	Assessed Services	Absolute SRI Score	Relative SRI Score
Shopping Centre	2003	41/52	73 %	92 %
Office	1990	36/52	43 %	60 %
Office	2014	44/52	48 %	55 %
Educational	2018	45/52	47 %	52 %
Office	2013	44/52	42 %	50 %
Educational	2015	33/52	35 %	46 %
Office	2004	36/52	35 %	46 %
Residential	2018	28/52	28 %	46 %
Hotel	(2020)	39/52	33 %	41 %
Residential	1967	20/52	11 %	40 %



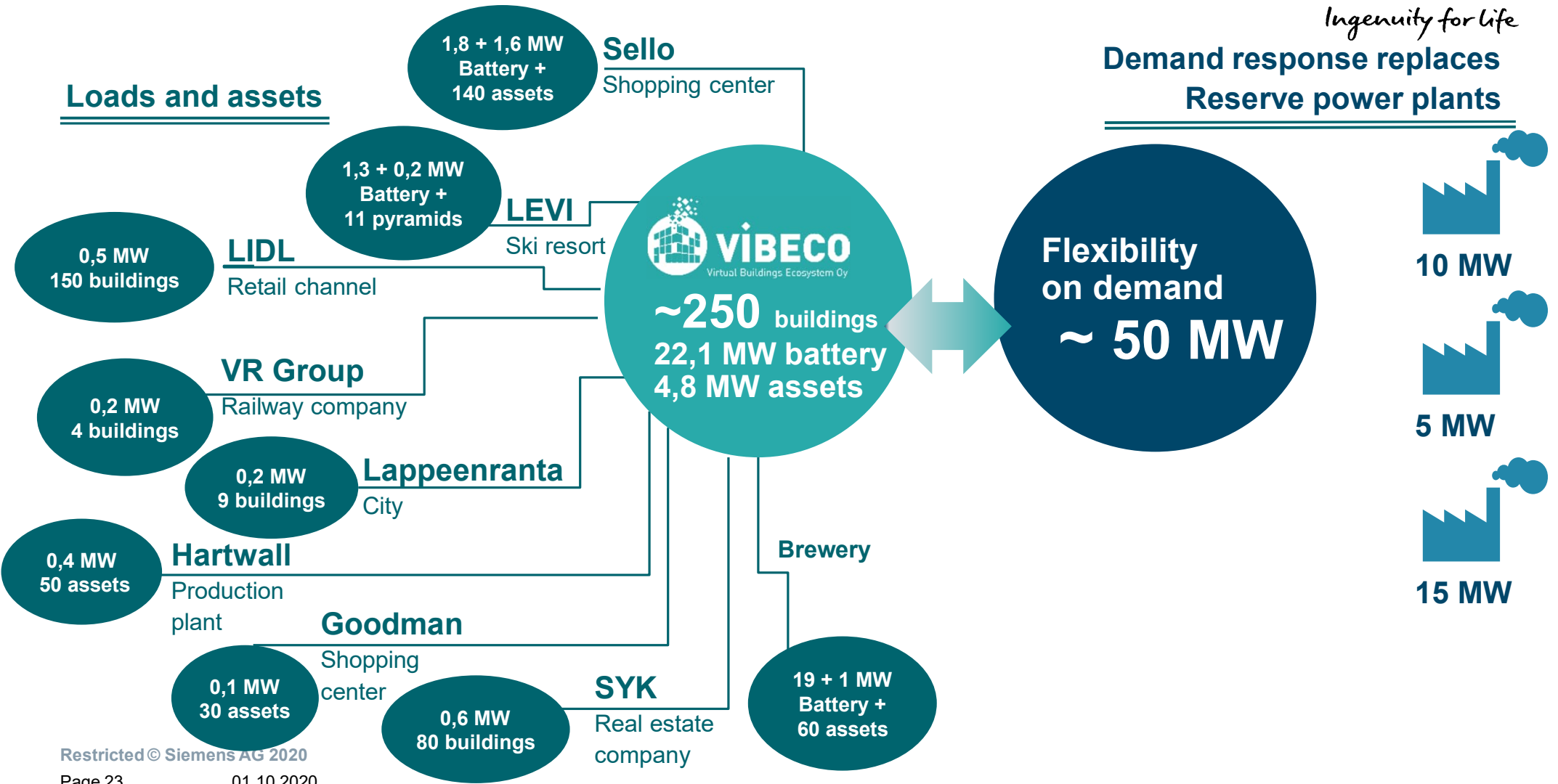
Design by Laura Remes

VIBECO – We make real what matters

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Ingenuity for life

Demand response replaces Reserve power plants



Smart society

Smart platform connects buildings, energy systems and industries to boost efficiency and sustainability in a society.

