

Interoperable platforms and data exchange for energy services: practical experience from the BRIDGE projects

Dieter Hirdes| INVADE| Utility week – Vienna – 06/11/2018



MAIN GOAL

Demonstrate
how **stationary batteries**
and EV batteries can help
to integrate more
renewable electricity into
the grid





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Develop and verify
a **cloud-based flexibility
management system**
integrated with EVs and
batteries



About

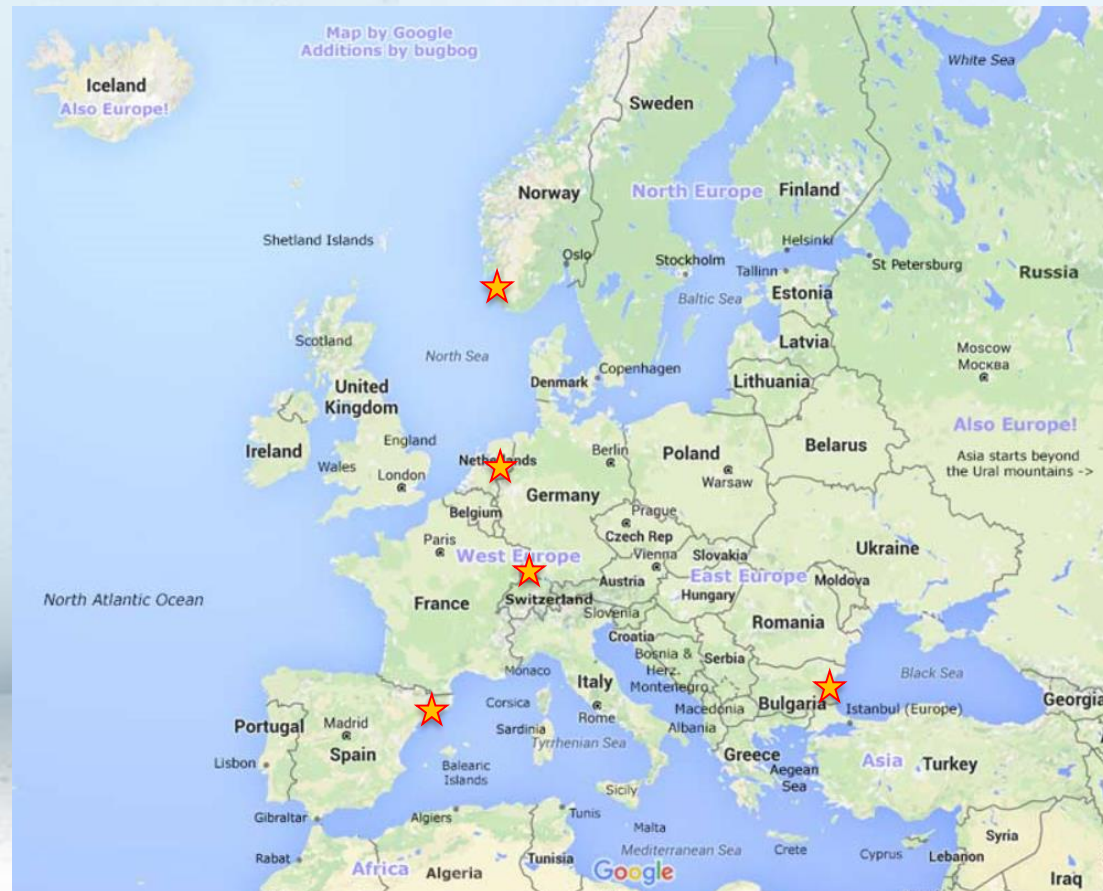


- 3 years – 2017 - 2019
- Budget: 16 M€
- EU funding: 13 M€

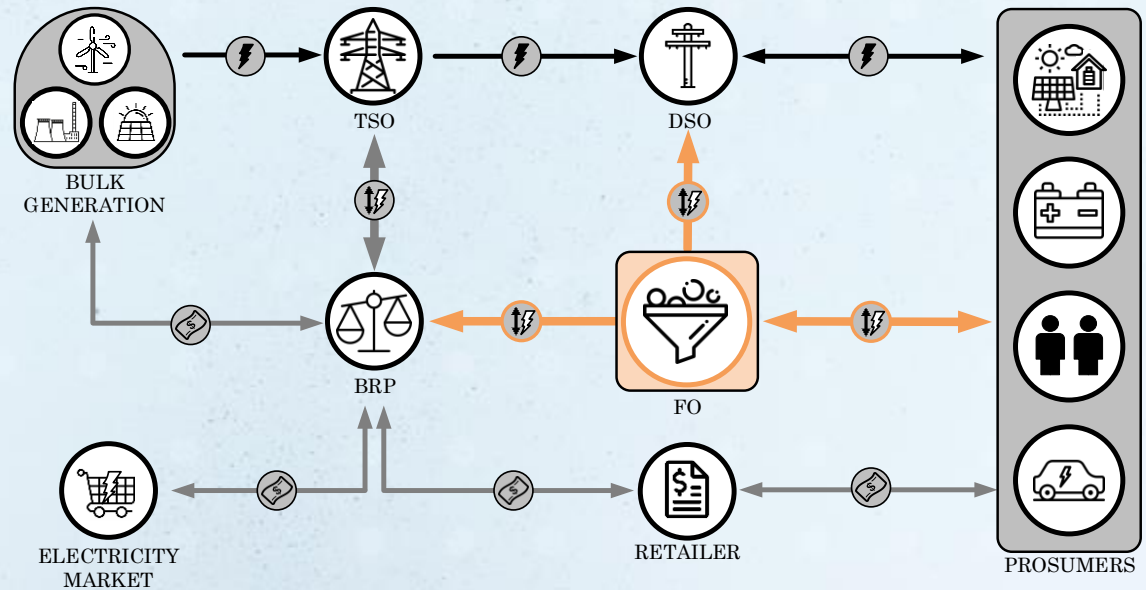
- 12 partners from 6 countries
- 5 pilot sites



Smart Innovation Norway (Coord.- NO)
 Universitat Politecnica de Catalunya (ES)
 NTNU (NO)
 VTT (FI)
 ESmart Systems (NO)
 Albenia (BG)
 Schneider Electric Norge (NO)
 Lyse (NO)
 Estabanell y Pahisa Energia (ES)
 Elaad (NL)
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Data



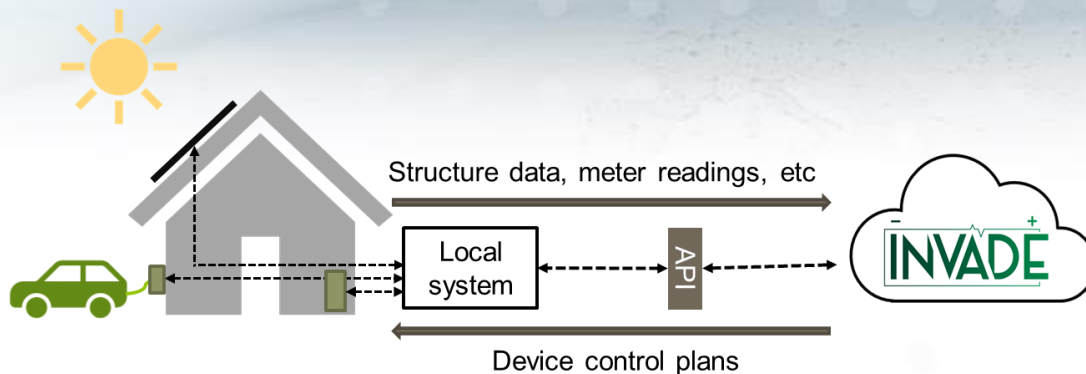
- DSOs and TSOs define their **flexibility needs** (e.g. congestion management, voltage/reactive power control)
- Send **flexibility requests** to the **flexibility operator (FO)**



Data



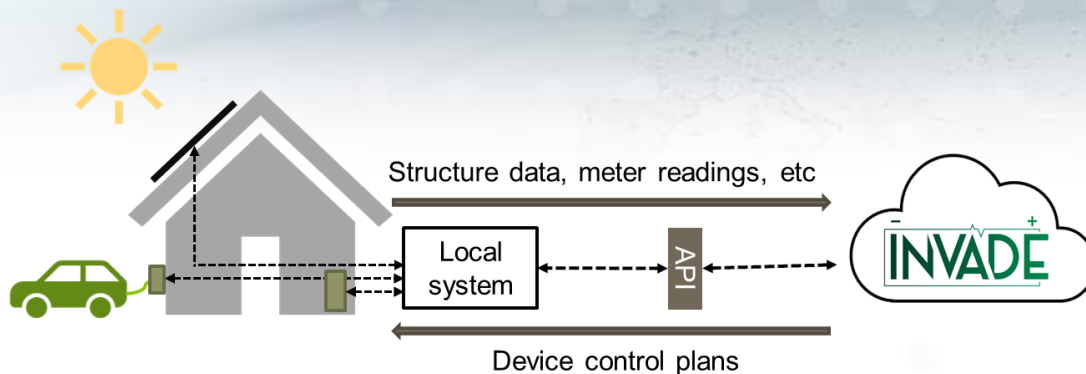
- The **flexibility operator** schedules the **flexible assets** according to different **objective functions** and **flexibility contracts**.
- The **INVADÉ platform** interacts with different **local energy management systems (LEMS)**.



Data

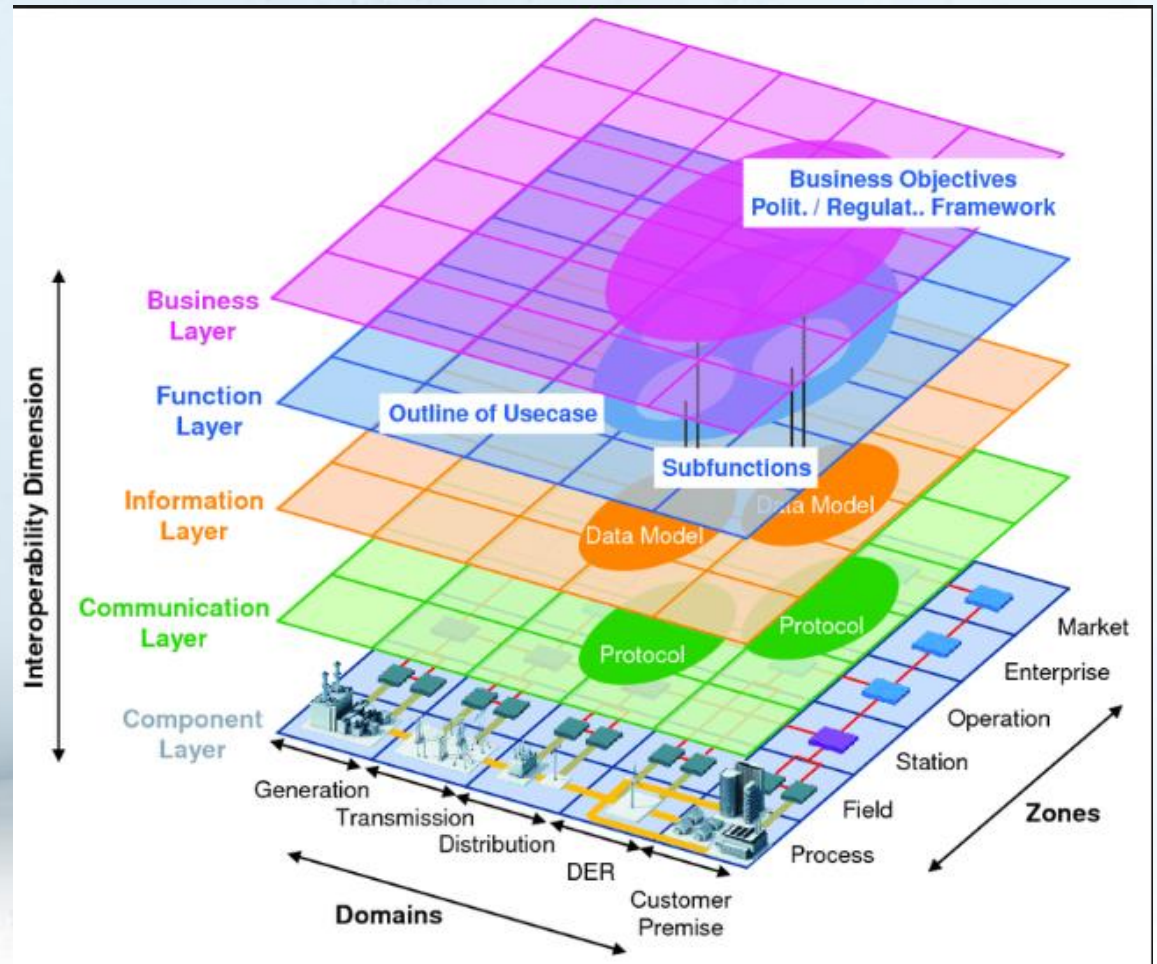


- LEMS sends **status and meter values** of flexibility sources to the FO as inputs of the **optimization algorithm**
- FO sends **control signals** to the **flexibility sources**



Architecture and platform

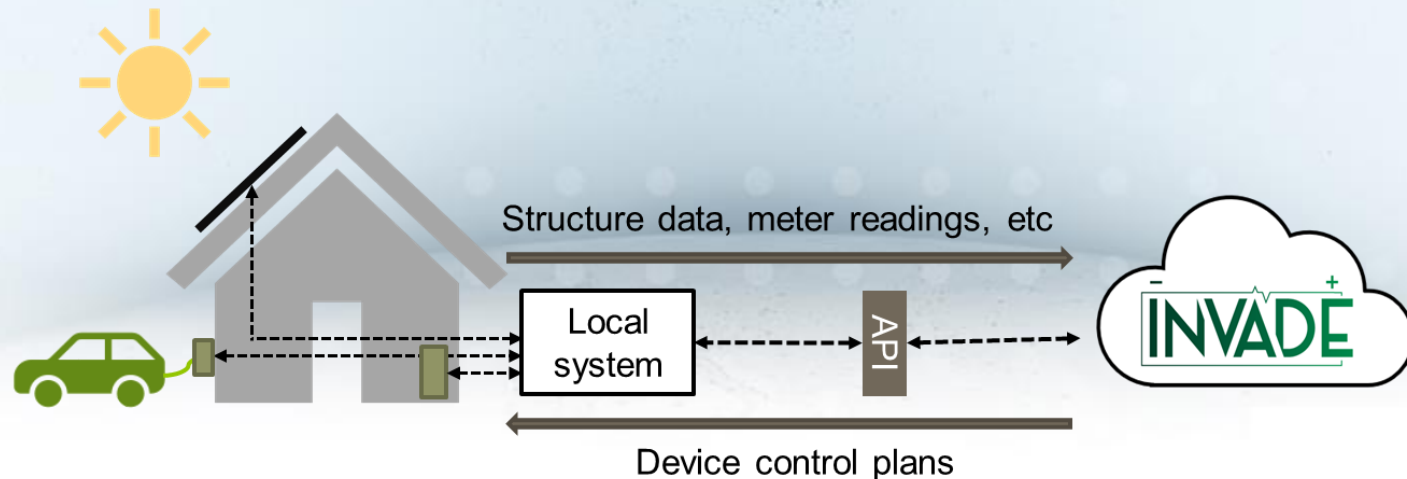
- **INVADE platform** builds on the Smart Grid Architecture Model (**SGAM**)



Architecture and platform



- Specially developed **cloud based INVADÉ platform** and algorithms, using **Artificial Intelligence** technologies
- Communication API built on SGAM



Business model

Ecosystem based business model supported by the INVADE platform:

- **Value creation** in ecosystems (open innovation)
- **Value distribution** via Internet
- **Value capture** mechanisms are new (free, freemium, no cure no pay)

Business model

- End-customers are become active
- Both energy and services are bi-directional
- Growing number of energy-IoT units at the customer premises
- Two-sided or multi-sided business model:
End-customer ← → Ecosystem

Consumer involvement and benefit

- End-customer involved in two use cases: EV charging/V2X and distributed storage
- Dedicated recruiting plan from day one with examples of benefits for participating
- Easy understandable contracts with GDPR/ data-security processes.

Consumer involvement and benefit

	Quantity	PV panels	Batteries	Heating	Boiler	EV chargers	Total users
Households	100	X	X	X	X	X	400
Housing cooperatives	5	X	X			X	500
Company premises	200+	X	X			X	2,000+
Public EC chargers	500+					X	50,000+

- **Smart EV charging** prepared for Vehicle-to-Home **reduces peaks in consumption.**
- **Distributed storage** at end-customer premises **reduces peaks in consumption and production.**
- End-users have **full control** of their participation **via the INVADE APP.**

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- **Prosumers with PV panels and batteries** can **sell stored electricity** when prices are high.
- **Consumers with batteries** can **buy electricity** when prices are low.
- Consumers and prosumers can **sell flexibility** to the future Flexibility Market.

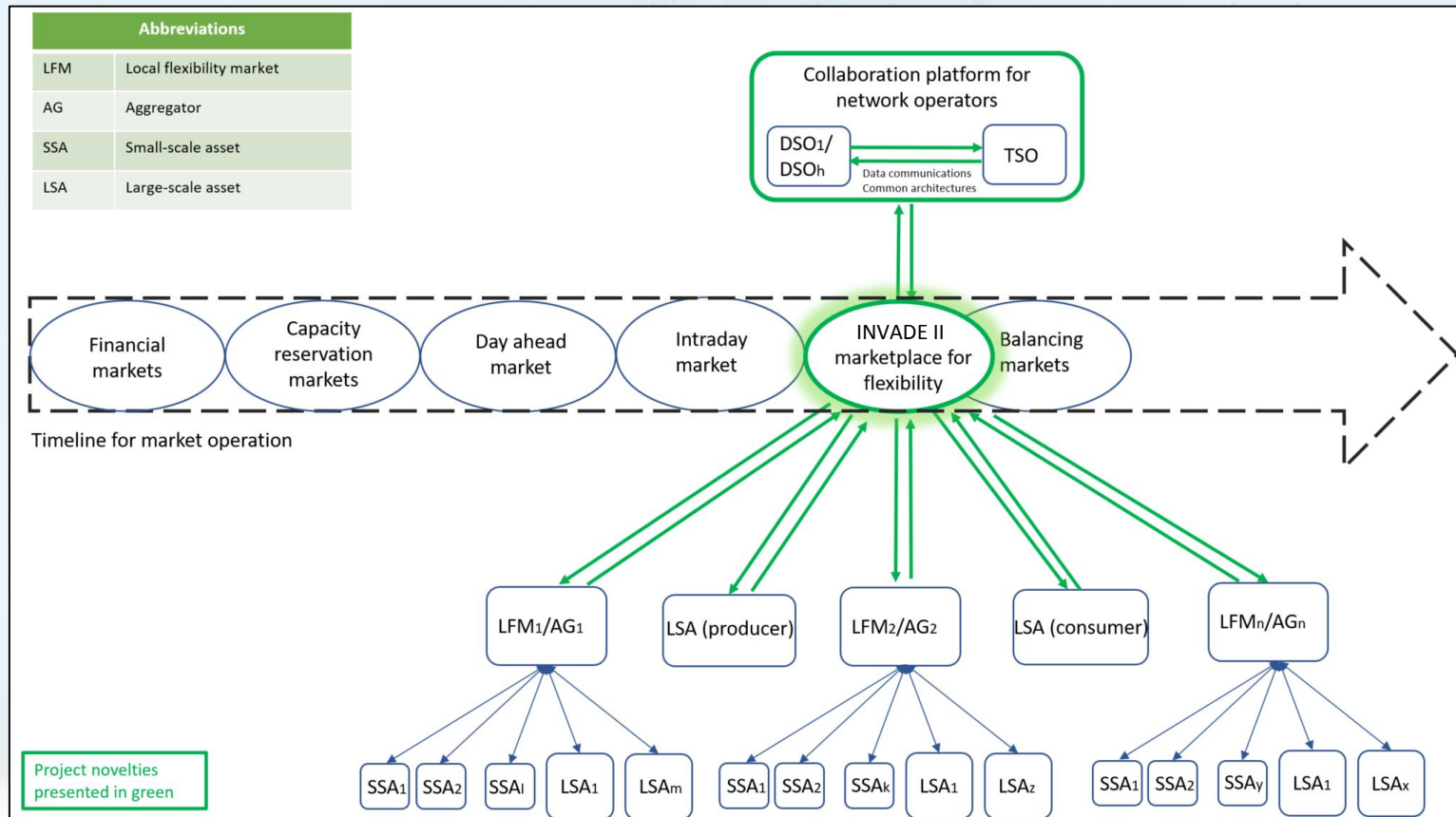
Regulation

- We need grid codes for batteries
- A battery shared by several consumers/prosumers gives more optimal load management benefits for the grid and the market than individual behind-the-meter solutions.
- Energy that charges a collective battery and returns to a unit in the collective should not be charged with a tariff twice.

Interoperability

- IO has technical, business oriented, contractual and market relevant implications.
- We apply and promote open protocols like OCPP, openADR and OCPI
- User-centric demand-response:
LEMS reroute flexibility requests to low-priority loads – not jeopardizing high priority services of health, security and convenience

Next frontier – The Flexibility Market



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