

# NVE workshop: Flexibility from ESWH

*May 4<sup>th</sup>, 2021*



# THE EUROPEAN LEADER OF WIDESPREAD DEMAND RESPONSE

**VOLTALIS operates 1 million appliances to participate in electricity markets**

Voltalis has already equipped over  
**100,000 homes and 3,000 commercial buildings** **free of charge**  
and has been operating daily on the **electricity markets** for over 12 years.

The *European Investment Bank* is backing Voltalis to install **150,000 more sites**



Yesterday: fuel produced power



Tomorrow: intermittent renewable and flexible consumption

# THE TECHNOLOGY TO OPERATE ESWH AT SCALE

# A FIELD-TESTED TECHNOLOGY FOR ESWH



## *Remote communication*

A small computer **connected remotely** to Voltalis' Control Room.  
Send detailed consumption data and receive control orders.



## *Control and metering*

Connected to the appliances to **execute the control orders**.  
**Meter** the consumption of the appliances and the building.

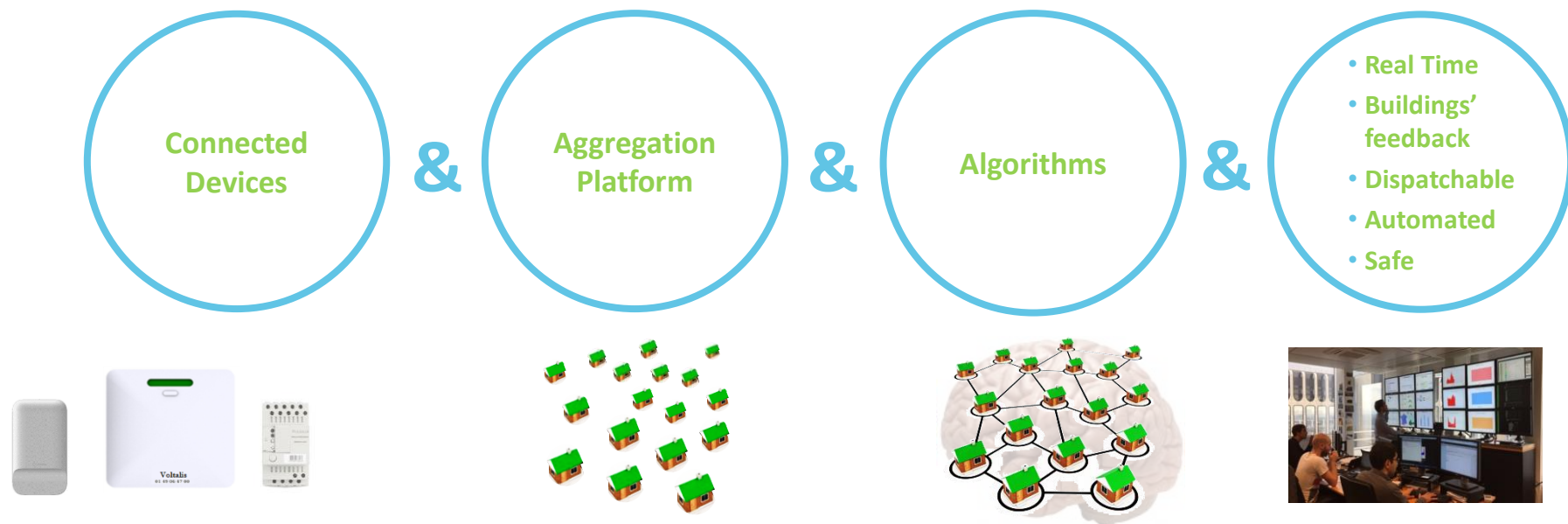


## *Voltalis Control Room*

**Operates in real time** the optimisation of flexible appliances.  
Sells the flexibility to the power markets.

**Actual setup and choice of devices depend on the building and its appliances**  
**ESWH are easy to connect:** the control device can be directly connected to the appliance

# A PLATFORM WITH THE HIGHEST STANDARDS



## REAL TIME

- ✓ Time response < 1sec
- ✓ Parallel computing
- ✓ Algorithms can be **hosted on the Bluepod** for a **better resilience**
- ✓ **Continuous processing** (e.g. for frequency regulation)

## SCALABLE

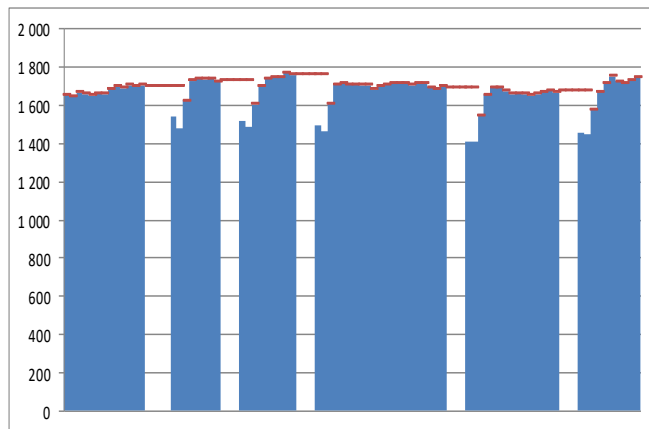
- ✓ Edge computing
- ✓ Linear scale-up of IT infrastructure
- ✓ **Dynamic load balancing**
- ✓ **Field proven**: over 200bn entries in the database, and up to 100m data collected daily

## SECURED

- ✓ **Critical servers separated**
- ✓ **Encryption**
  - Unique ID/key per device
  - Secured communication (from SSH)
  - Asymmetrical authentication (RSA)
  - Symmetrically encrypted communication
- ✓ **Private key in vault chip**
- ✓ **M2M tunnel through dedicated VPN**

## « PRIVACY » READY

- ✓ **Private cloud, local hosting**
- ✓ **Anonymized data**
- ✓ **Opt-in** (volunteers)
- ✓ **On-premises algorithms**
- ✓ No access to past data of home for new tenant



## Effortless consumption reduction of space heating

**short and targeted interruptions** save energy without any loss of comfort and without any effort.

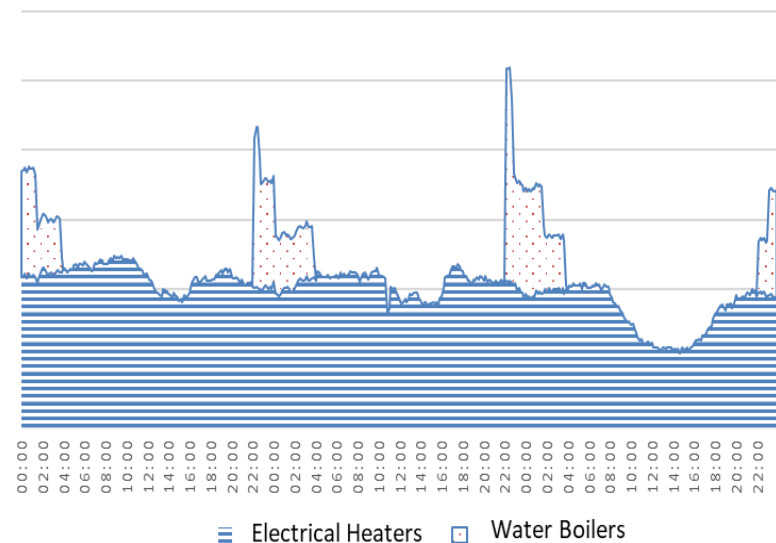


## Energy Management System

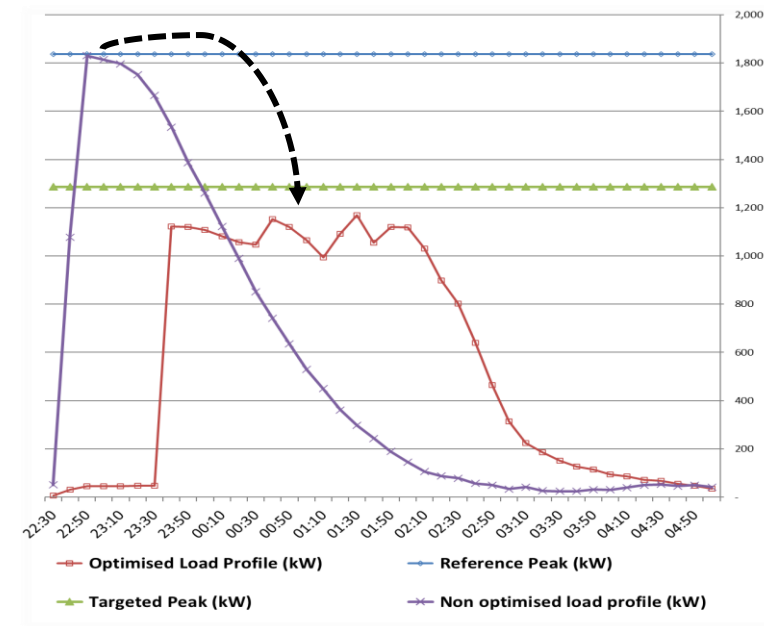
advanced functionalities allow the participants to further optimise their consumption.

# **ESWH OPERATED IN THE POWER SYSTEM**

# ESWH DEMAND CAN BE CONTROLLED BASED ON THE POWER SYSTEM NEEDS



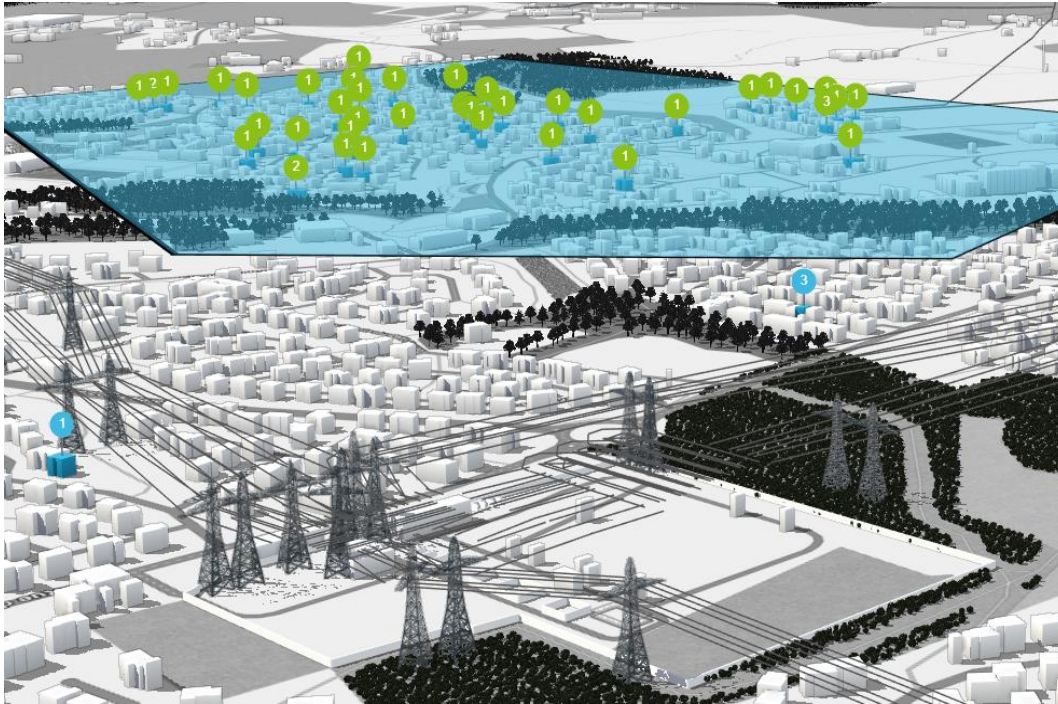
Consumption of electrical heaters and water boilers in one ski resort:  
an **artificial peak is created by ESWH**  
because triggered by retail off-peak price



Reduction of peak demand for 2,000 ESWH:  
**reduced grid investments**



# FLEXIBILITY CAN BE MANAGED LOCALLY



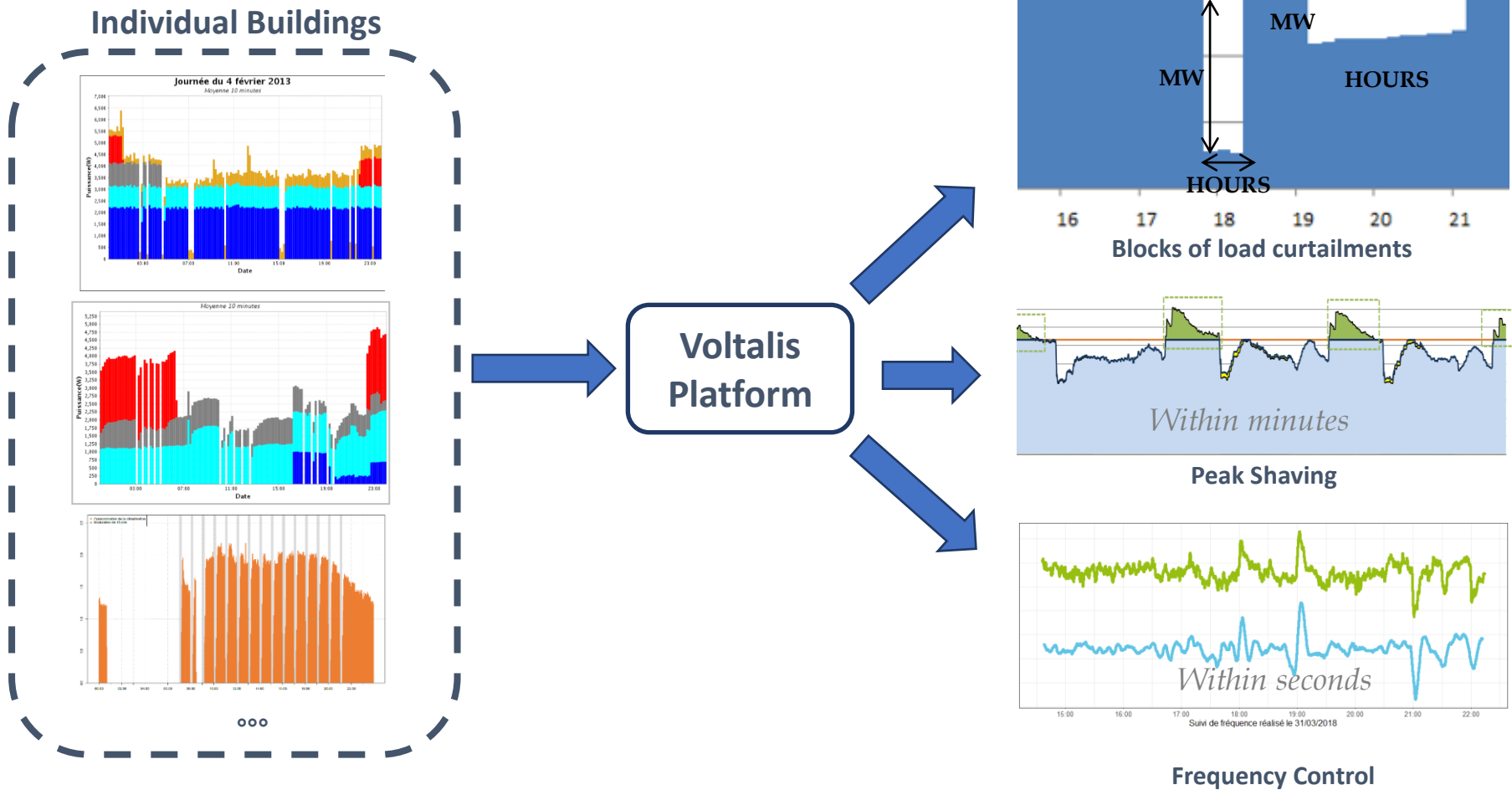
- ❖ Sites can be managed locally through a dedicated interface: any area can be selected



- ❖ This can be used to avoid grids reinforcements that are only needed for a couple of hours or days each year

# ESWH CAN PARTICIPATE IN MANY OTHER MARKETS

Below are actual examples of services provided to the power system:



**Voltalis offers its flexibility on the day-ahead spot market, as any power plant.**

## THE CLEAN ENERGY PACKAGE IS PAVING THE WAY FOR DEMAND RESPONSE PARTICIPATION IN ALL MARKETS

### Article 17 of the Electricity Directive (2019/944)

*“Member States shall allow final customers, including those offering **demand response through aggregation**, to participate alongside producers in a non-discriminatory manner **in all electricity markets**.”*

- ❖ Potential of 160 GW for DR in Europe<sup>1</sup>, mostly within buildings and homes
- ❖ DR is needed for the transition and reduces the cost of power for everyone
- ❖ DR can participate in all markets, as an alternative to generation, without discrimination

1. Clean energy package, Evaluation report, Annex 7

[https://ec.europa.eu/energy/sites/ener/files/documents/2\\_en\\_autre\\_document\\_travail\\_service\\_part2\\_v2\\_412.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2_en_autre_document_travail_service_part2_v2_412.pdf)

# An opportunity to find out more!



**DR4EU - EER Joint Event on 6<sup>th</sup> May 2021 (15.30-17.30 CET)**

**The benefits of Demand Response for Electricity Retailers and Consumers**

**Register by email to: [info@dr4eu.org](mailto:info@dr4eu.org)**

***Thank you!***

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