



Unified demand response interoperability framework enabling
market participation of active energy consumers

Sustainable urban regeneration model development, demonstration of Smart City technologies in energy, transport and ICT

Sustainable Places 2020

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DRIMPAC project aims to enable the participation of small prosumers (building level) in implicit and explicit Demand Response programs within a future electricity market environment. It will address the interoperability gaps along the DSO-prosumer path by developing an end-to-end solution connecting the major standards (OpenADR, OneM2M, IEC 61850...), while striking the right balance between comfort preservation and energy conservation in home dwellings via environment and preferences monitoring and intelligent algorithms.



OUR CHALLENGE



CREATE GRID-TO-MARKET
COMMUNICATION SYSTEMS



DEVELOP **INTEROPERABLE SMART
Building EMS**



INCREASE THE OVERALL **ENERGY
DEMAND FLEXIBILITY** OF BUILDINGS



OBJECTIVES

- Develop and deliver the DRIMPAC solution as an **interoperability TECHNOLOGICAL ENABLER** for small prosumer Demand Response
- Define innovative service offerings and **BUSINESS MODELS** for energy retailers
- **DEMONSTRATE AND VALIDATE** via piloting and market testing on real users

HIGH-LEVEL USE CASES

DRIMPAC will develop the ICT infrastructure to enable services and devices interoperability among energy market stakeholders and small to medium size prosumers for:

- **Implicit Demand Response** services based on day-ahead dynamic tariffs (load shifting)
- **Explicit Demand Response** services (load shedding or generation curtailment)



FLEXIBILITY RESOURCES



RESIDENTIAL BUILDINGS - introducing demand response functionality to the “smart-home” environment.



TERTIARY BUILDINGS - achieving interoperability with all main building control & automation standards & protocols in the domain.



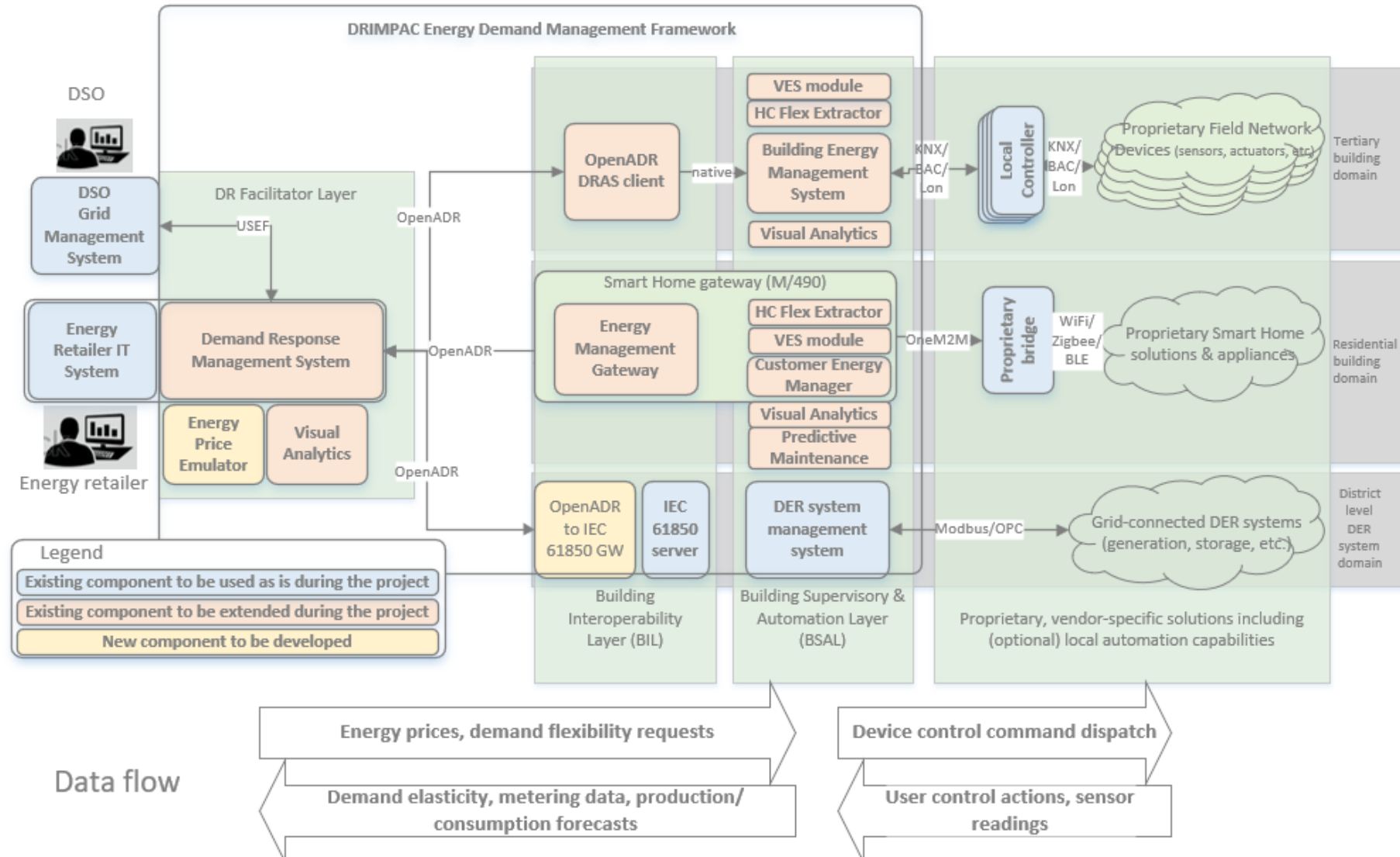
DISTRICT LEVEL ENERGY RESOURCES - facilitating proper and standards-compliant DER integration for district-level DR services.

DRIMPAC scope is to provide the open, standards-based technological framework that enhances building management intelligence for enabling end-to-end communication between the building and the DSO via aggregators in order to publish building-demand flexibility information for implicit and explicit DR operations, while preserving comfortable and healthy living conditions.

Concerning the ICT framework, it comprises two main service layers: the **INTEROPERABILITY LAYER** and the **AUTOMATION LAYER**.

Demand response programs require **SMART ENERGY METERING** and control of the building assets along with the automated communication between energy market actors and buildings.

DRIMPAC Management framework

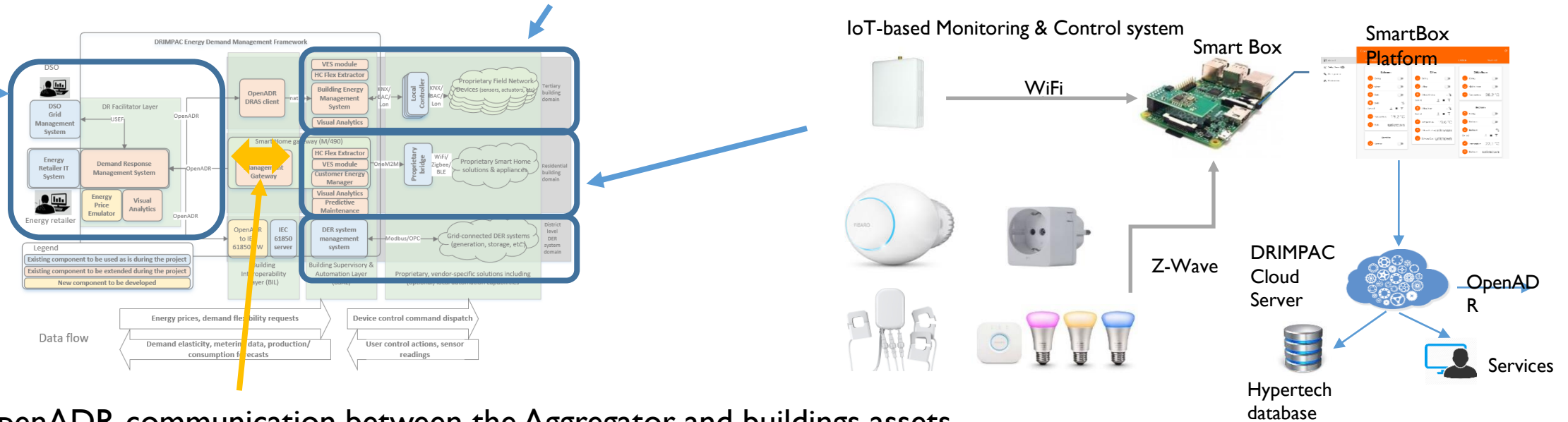


Where are we now:

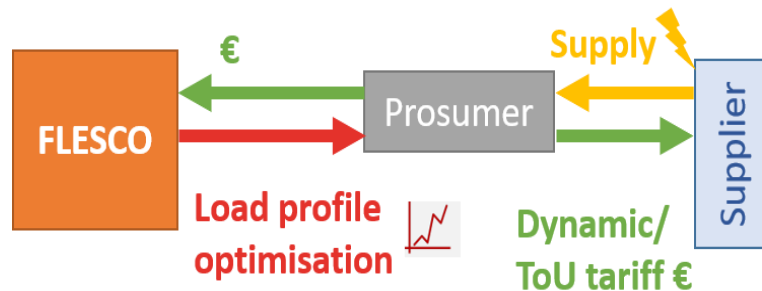
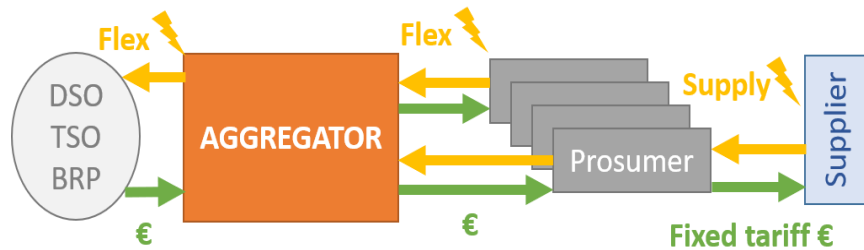
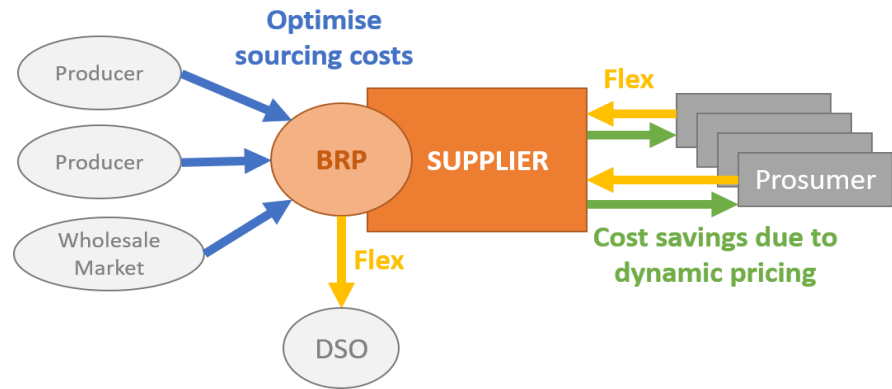


Develop and deliver the DRIMPAC solution as an interoperability TECHNOLOGICAL ENABLER for small prosumers' Demand Response

- The ICT backbone for the connectivity of DSO/AGR/platform/asset (DL-DER) is complete.
- Hypertech's energy management system, Smart boxes and local IoT monitoring/control system are completed.
- UCY's InEIS platform that will be used as an interface with commercial BEMS is complete



- OpenADR communication between the Aggregator and buildings assets
- Extension of the current VTN/VEN regarding EiReport
- Development of several data-driven value-added software components (Flexibility forecasting, Predictive maintenance, VES) and UIs for DRIMPAC stakeholders



DRIMPAC is developing and testing different innovative DR business models at four pilot sites:

- **Integrated Supplier and Aggregator**
 - For suppliers to optimise the balance position of their portfolio by applying dynamic pricing schemes
 - Additionally provide flexibility for the DSO
- **Independent Aggregator**
 - Dissociating energy supply and flexibility services
 - Provide flexibility for the DSO
- **Flexibility Service Company (FLESCO)**
 - Service provider for load shifting behind the meter
 - Maximise prosumers' benefit from dynamic/time-of-use pricing schemes



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Thank you

Q&A

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