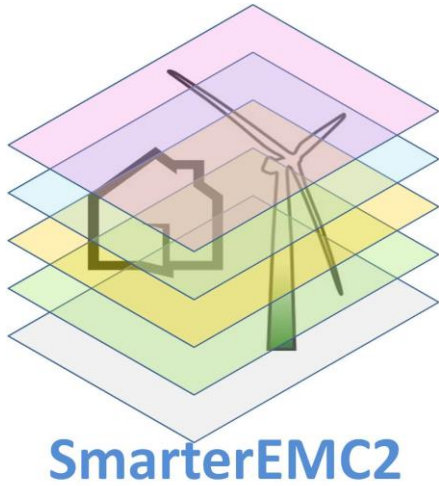


Smarter Grid: Empowering SG Market ACtors through Information & Communication Technologies



Project Overview

ETIP SNET
South Eastern Region Workshop
November 23-24
Cyprus



Ilias LAMPRINOS



SmarterEMC2

Project reference: 646470

Funded under: [H2020-EU.3. - PRIORITY 'Societal challenges](#)

[H2020-EU.3.3. - SOCIETAL CHALLENGES - Secure, clean and efficient energy](#)

[H2020-EU.3.3.4. - A single, smart European electricity grid](#)

Smarter Grid: Empowering SG Market Actors through Information and Communication Technologies

From 2015-01-01 **to** 2017-12-31, ongoing project

Project details

Total cost:

EUR 3 751 891,25

EU contribution:

EUR 3 072 655

Coordinated in:

Greece

Topic(s):

[LCE-07-2014 - Distribution grid and retail market](#)

Call for proposal:

H2020-LCE-2014-3 [See other projects for this call](#)

Funding scheme:

IA - Innovation action

Consortium



AALBORG UNIVERSITY
DENMARK

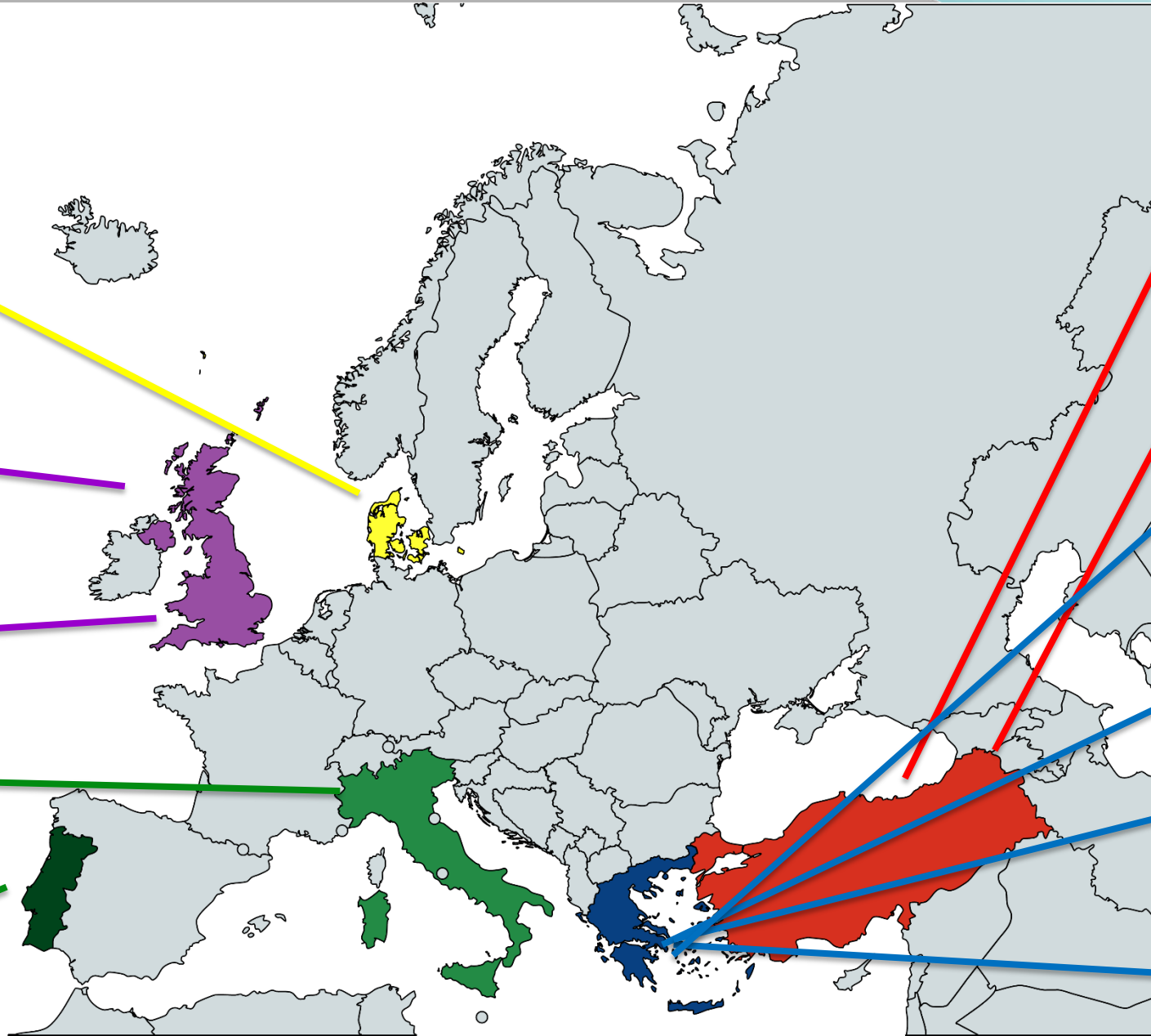


Durham
University

FUJITSU

THALES

INESCTEC



Elder

Aydem



INTRACOM
TELECOM

Objectives



Validation of ICT tools that support the integration of consumers through Demand Response services and the integration of DG/RES through Virtual Power Plants

Exploration of new ICT tools that facilitate the management and operation of the Distribution Grid

Demonstration of the innovative use of ICT tools in real life pilot sites

Evaluation of the current communication infrastructure through hardware and software simulation

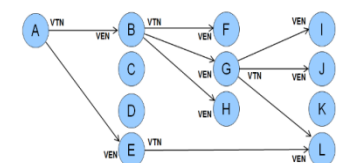
Exploration of business models that anticipate Active Customer Participation, increased RES penetration, Distribution Grid reliable operation, and open access to the Electricity Market

Assessment of the SG standardization with emphasis on market-oriented and field-level standards

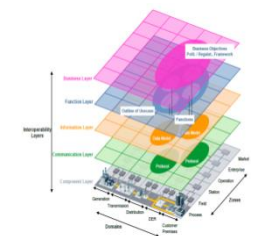
DRMS and VPPMS offered as a Software-as-a-Service



Support of multi-level hierarchically organized SG business entities



Modeling based on the Smart Grids Architecture Model (SGAM) framework



Harmonization with SG standards



Pilot II: Italy

Demonstrate the use of an **Energy Hub** for improving the performance of the grid (e.g. reduction of power outage times, power loss management, monitoring of EV charging time)



Pilot I: Greece

Demonstrate **Demand Response** for Active Customer Participation in the **Residential Sector**. Demonstrate **Virtual Power Plant** operation and management



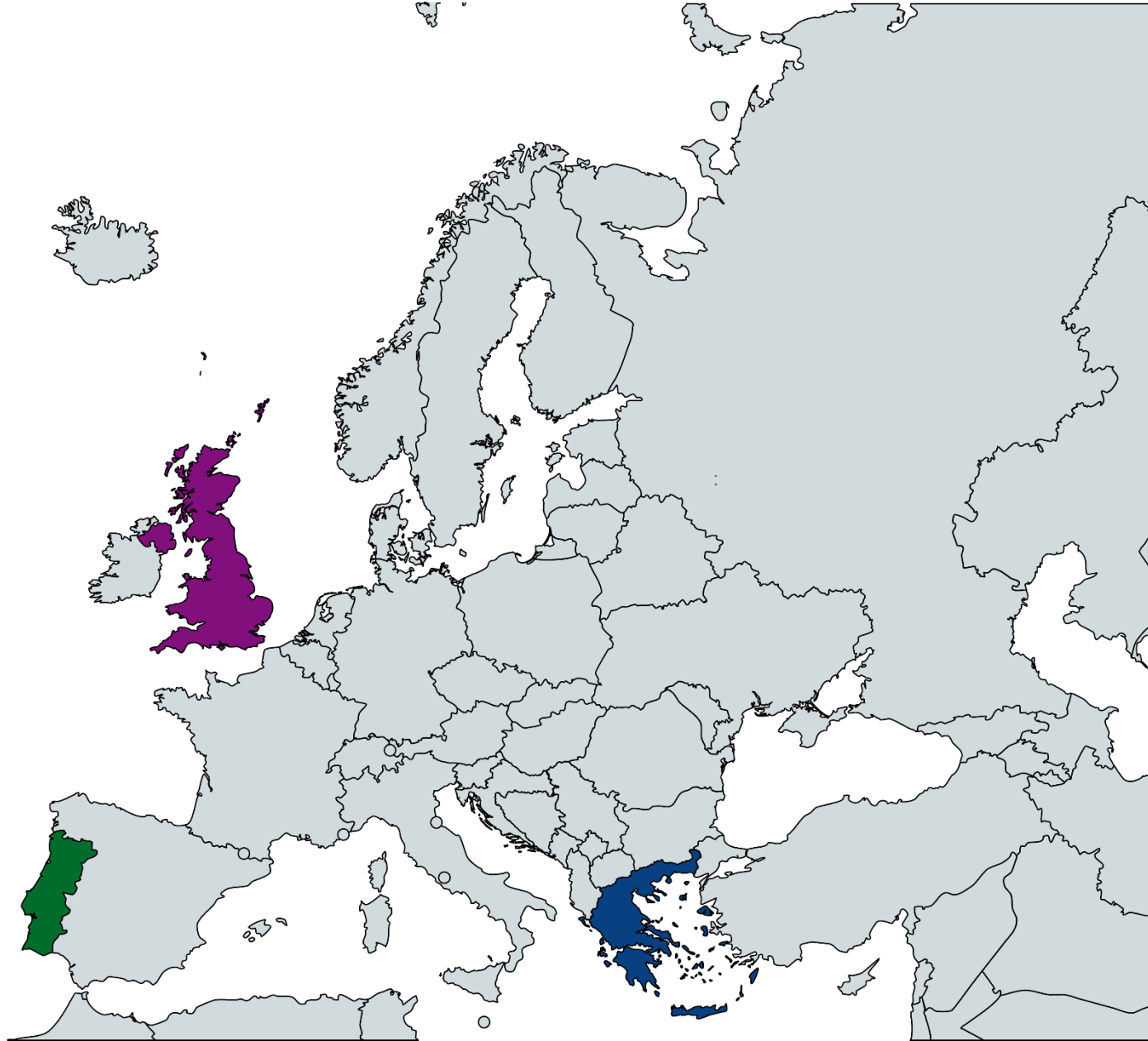
Pilot III: Turkey

Demonstrate **Demand Response** for Active Customer Participation in the **Commercial and Industrial Sector**



Lab Sim III: UK

Simulation of scalable **communication Infrastructures and schemes** supporting smart meters' data aggregation



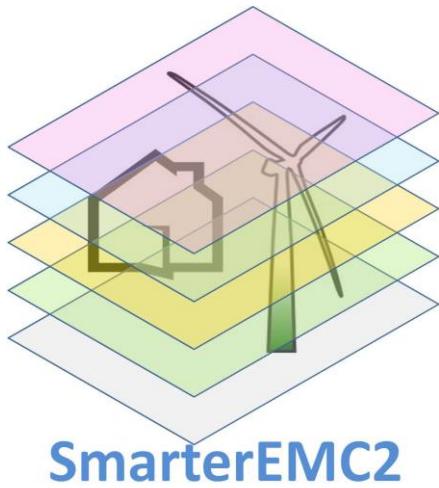
Lab Sim I: Greece

Simulation to investigate the robustness of the **communication infrastructure** to support **novel SG applications and services**

Lab Sim II: Portugal

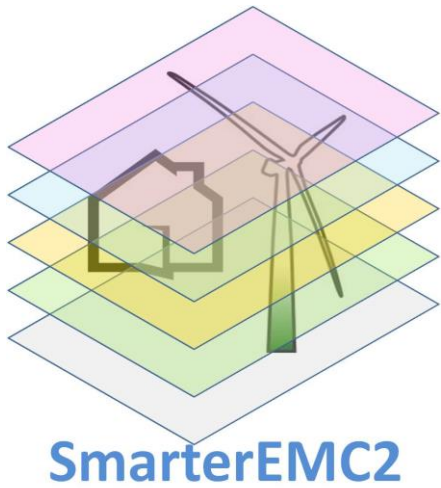
Simulation for the evaluation of the performance of algorithms related to **Local Constraints Management @ the Distribution Grid level**

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SmarterEMC2 Pilots: Residential Demand Response, Greece

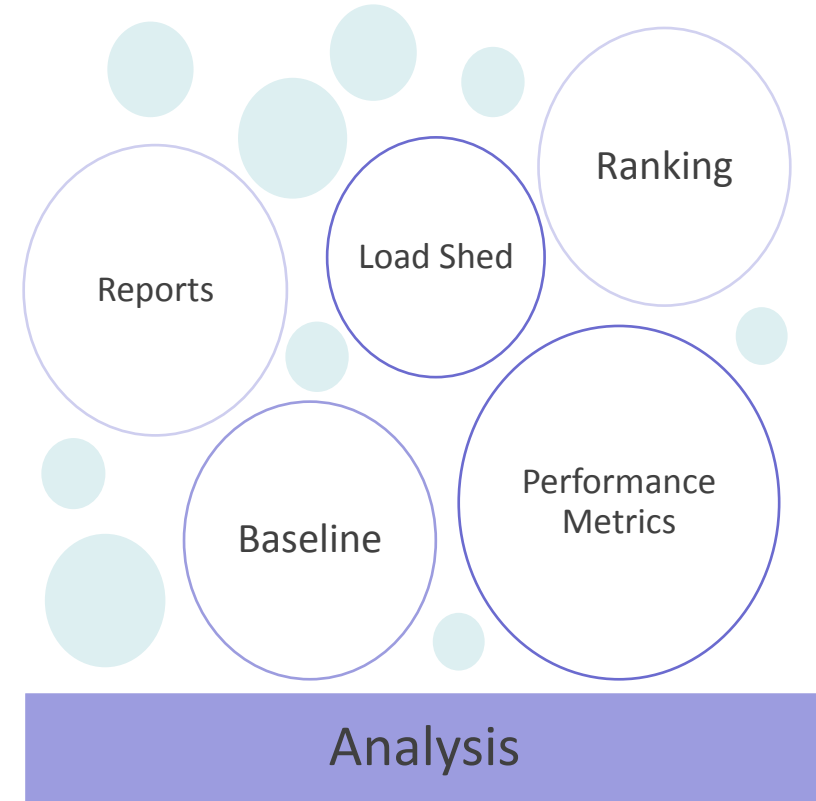
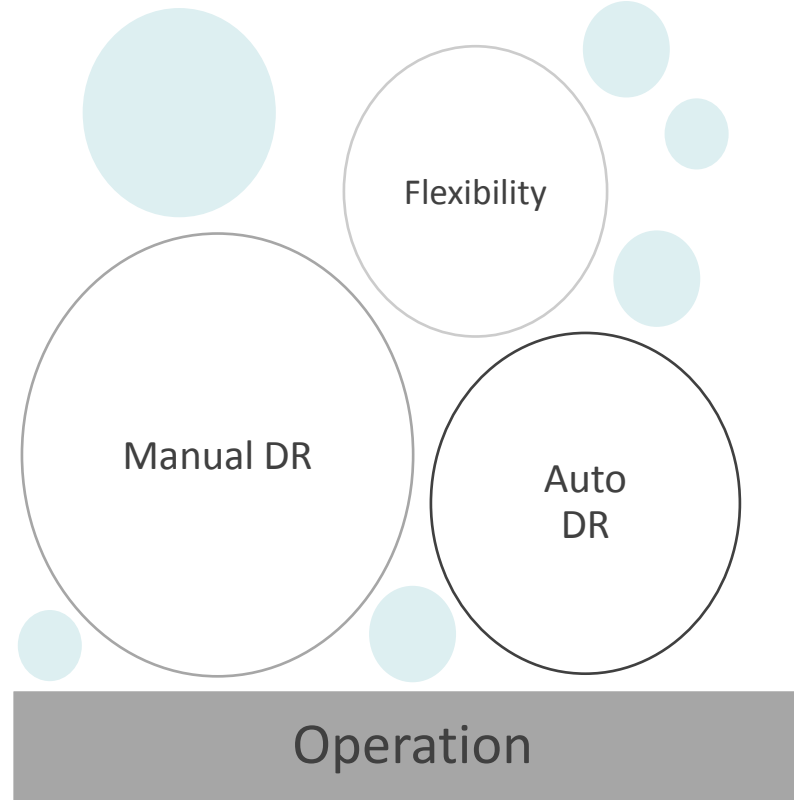
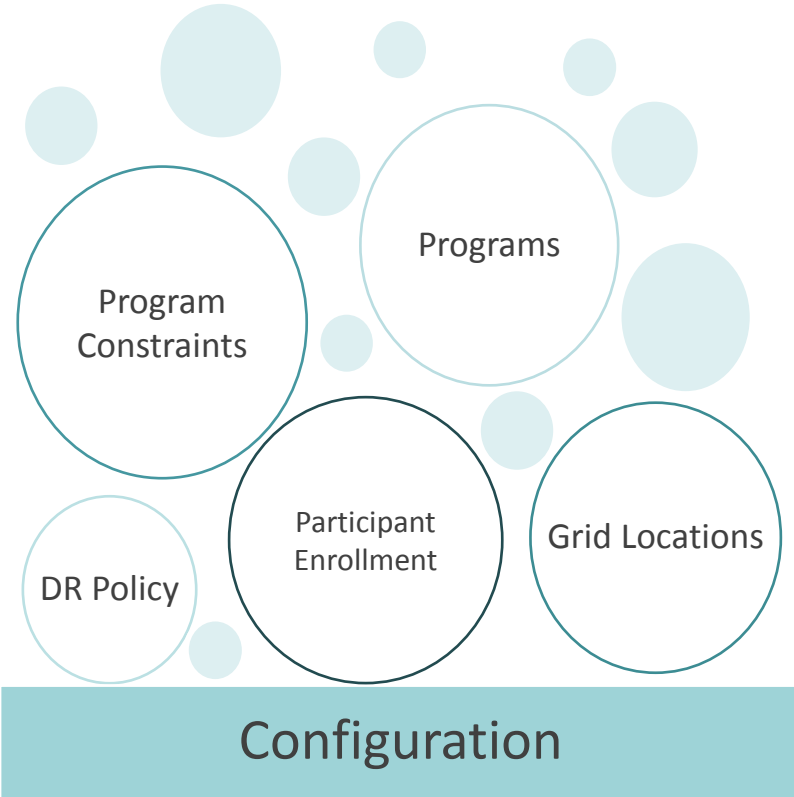
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The tools

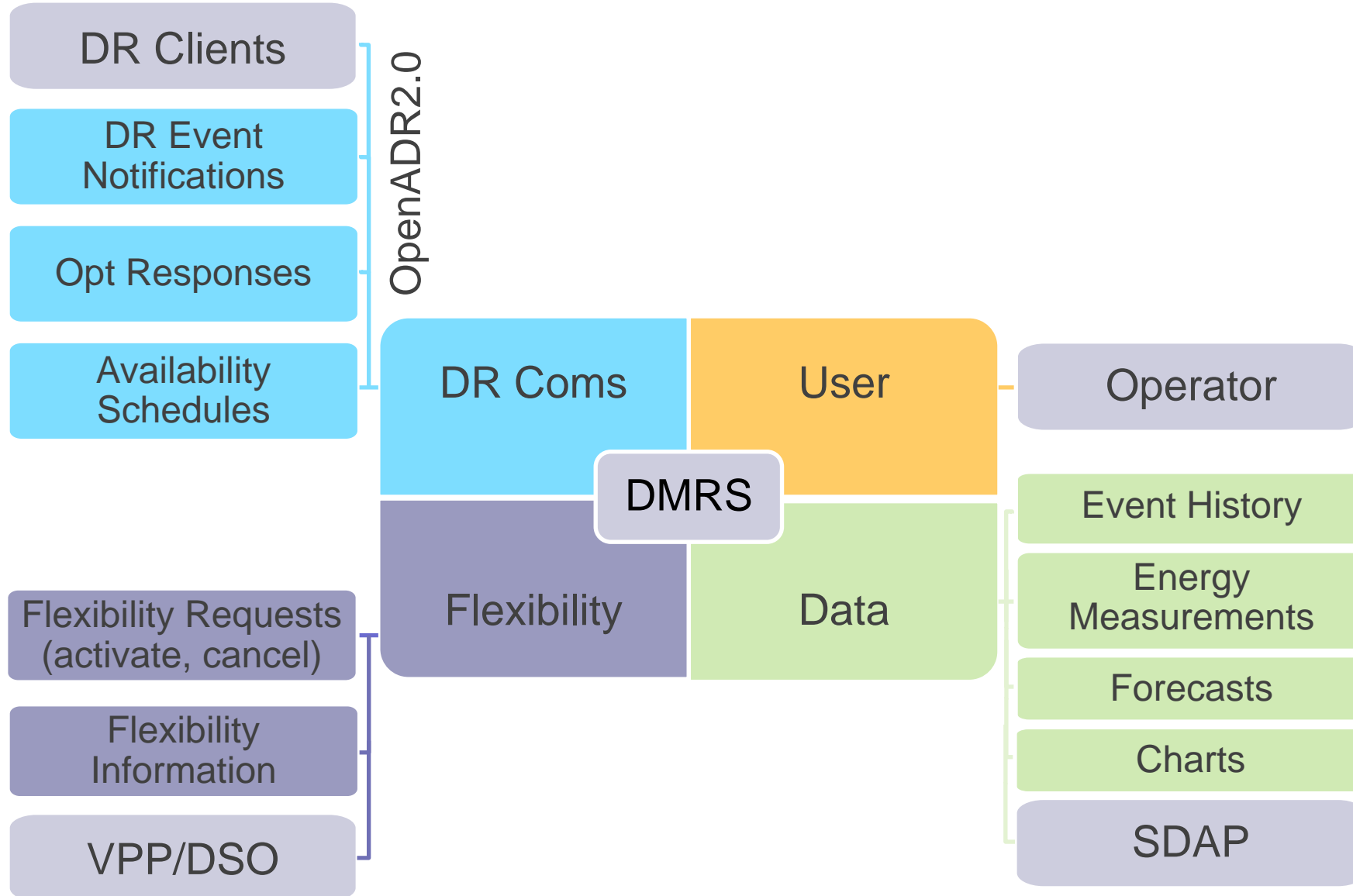


Demand Response Platform DR Management System (DRMS)

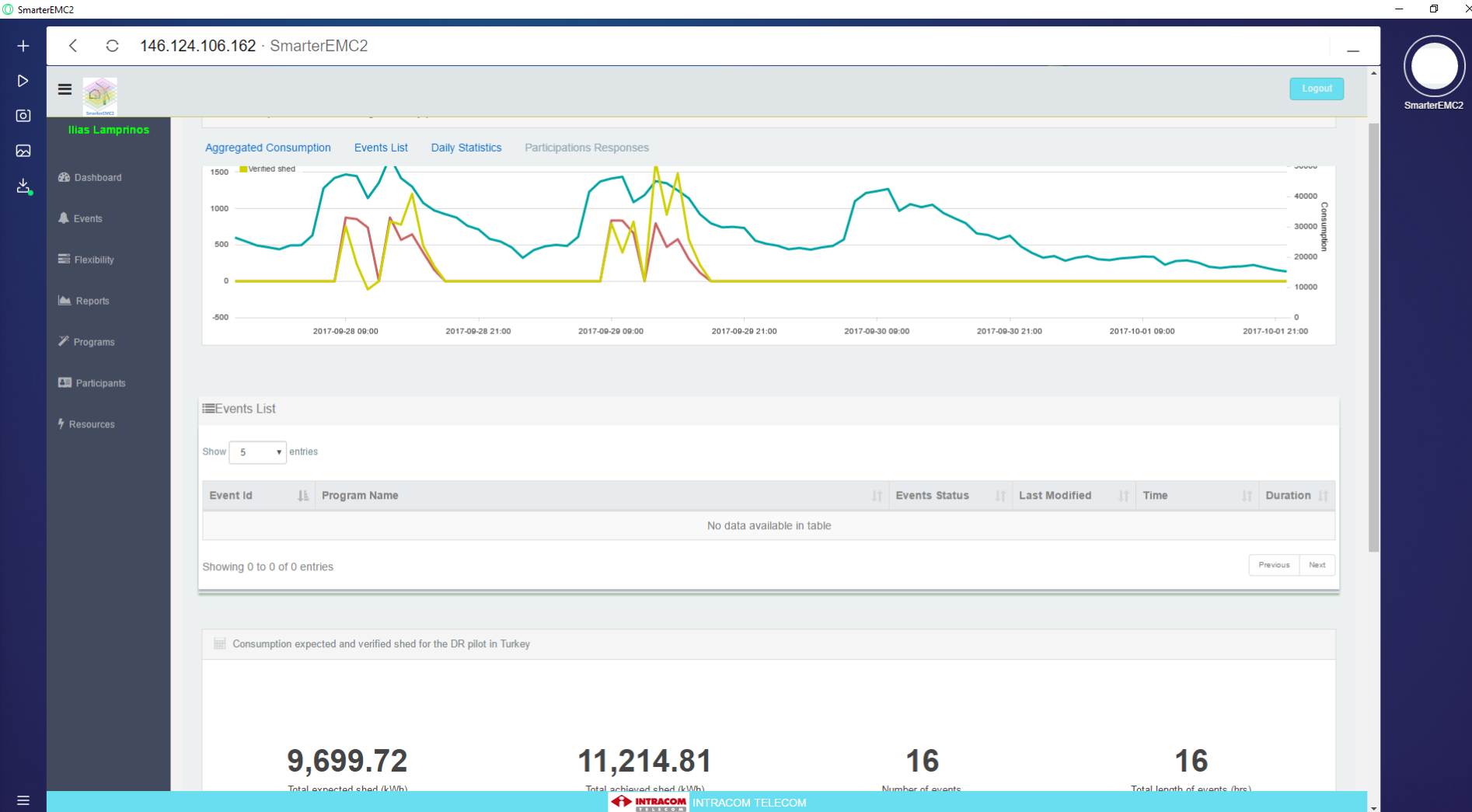


Demand Response Platform

DRMS: Software Interfaces



Demand Response Platform DRMS: User Interfaces

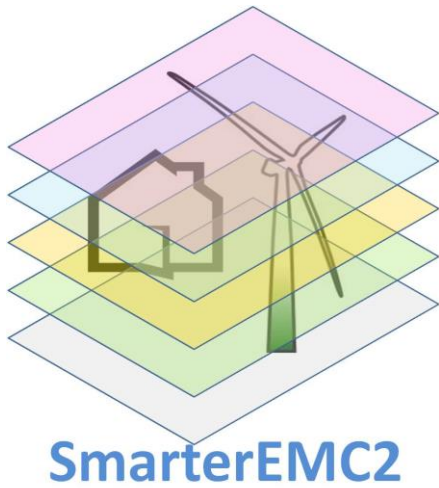


ID	Date	Start	Duration	Event status	Opt in / out
1	14-09-2017	18:00	1 hour	FAR	Opt In
2	21-09-2017				Opt In
3	28-09-2017				Opt Out
4	30-09-2017				Select

SmarterEMC2
An unexpected New Event created on 28/09/2017 18:00 with duration 1 hour



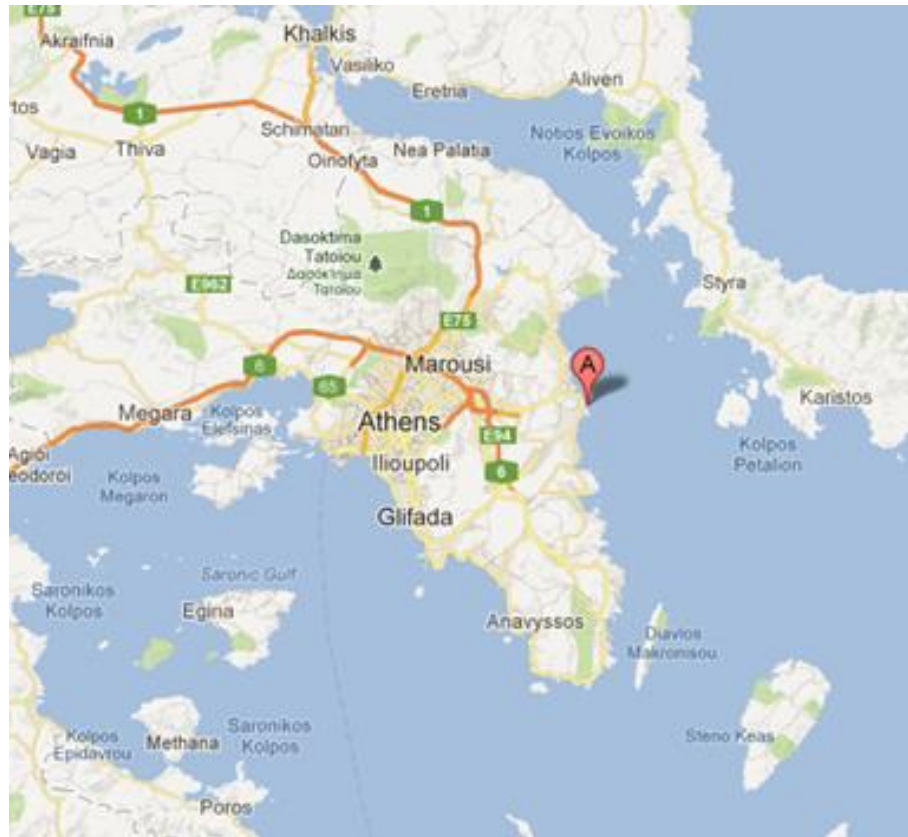
Smarter Grid: Empowering SG Market Actors through Information & Communication Technologies



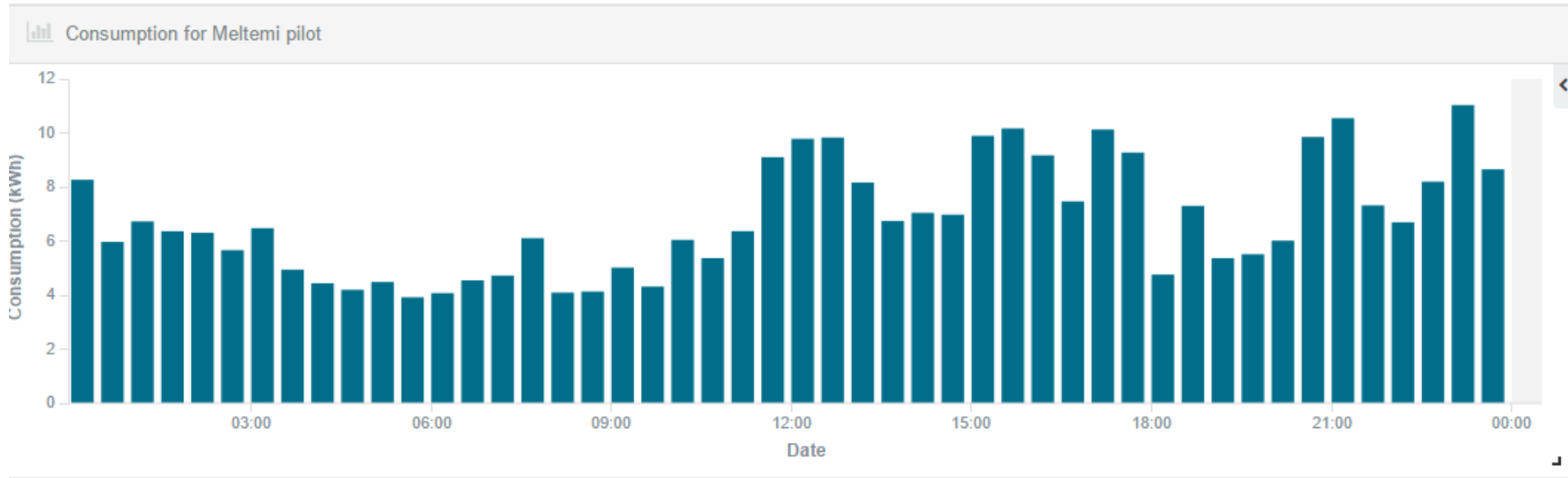
The deployment



Pilot site with residential customers



Typical profile of the consumers



- The site is mostly inhabited in the summer (for vacation).
- Loads include lighting, water heating and air-conditioning.
- A lot of the residents are elderly. Simple and efficient software/hardware tools need to be created that take this into account.



- 230 smart meters have been installed
- Measurements in 15-minute intervals
- Transmission of measurements to the HEDNO MDMS once per day
- The consumer can access the information either on the meter display or through an application.
- Increased consumption reduction potential

Physical constraints that need to be tackled: Weak telecommunications signal due to the location and physical terrain of the site.

Other constraints: Convince residents of the usefulness and safety of smart metering.

Recruiting consumers for the pilot



Eligible consumers for pilot operation included:

- Residents present at the campus in the summer period
- Residents with internet connection
- Residents with a strong signal (for the seamless operation of SMS)

Pilot info day 1-Residents were introduced to:

- Energy consumption and the environment
- Renewable energy sources
- Energy mixture of Greece-the impact of consumption on energy cost
- Energy conservation
- The concept of Demand Response
- The SmarterEMC2 project
- SmarterEMC2 application: goals and operation instruction
- Participation incentives

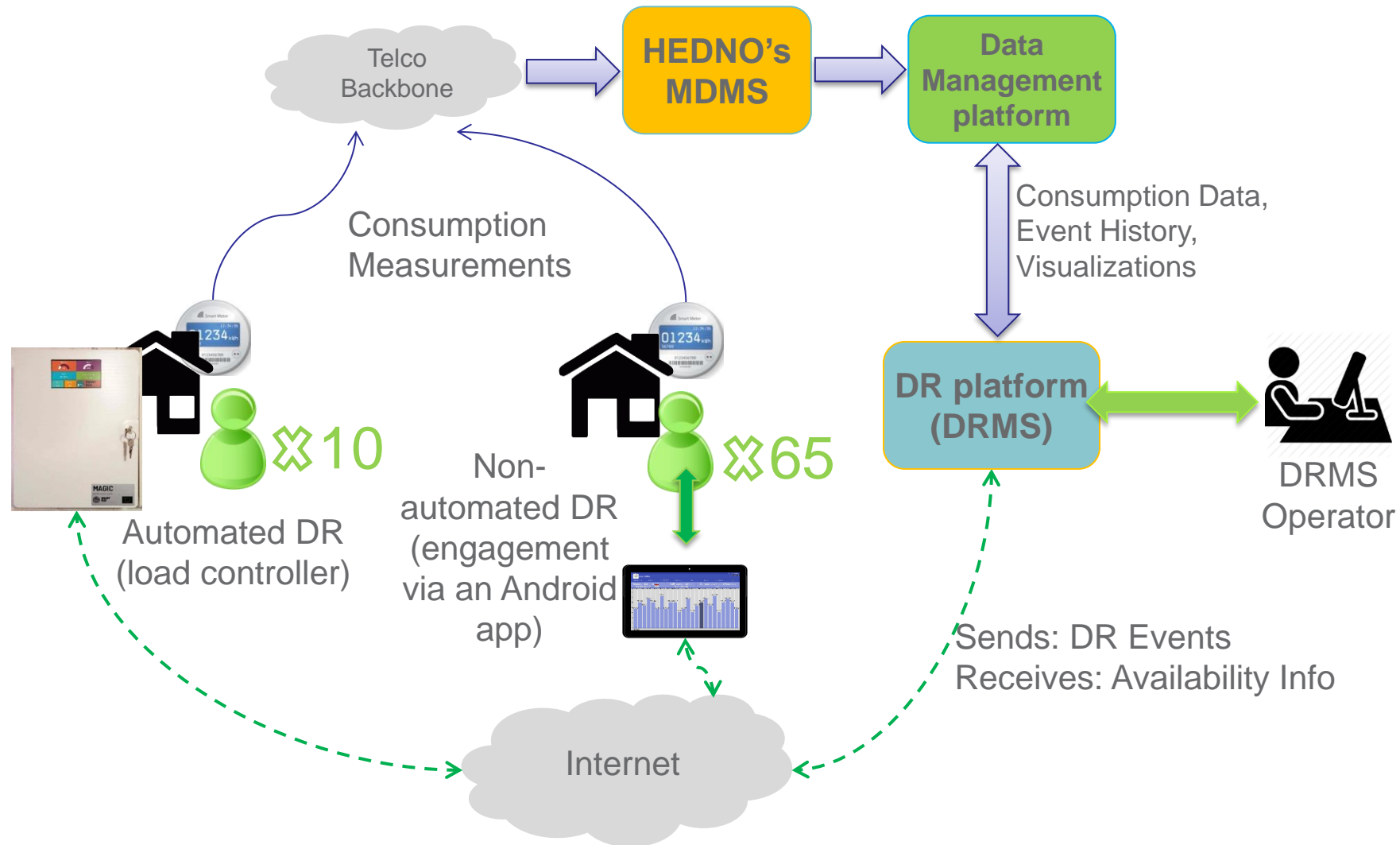
Pilot info day 2-Residents who received a tablet with the SmarterEMC2 app were introduced to:

- General use of the app
- Replying to DR Events
- Setting availability/flexibility references
- Reviewing consumption data and statistics
- Ways to reduce consumption when opting-in to a DR event

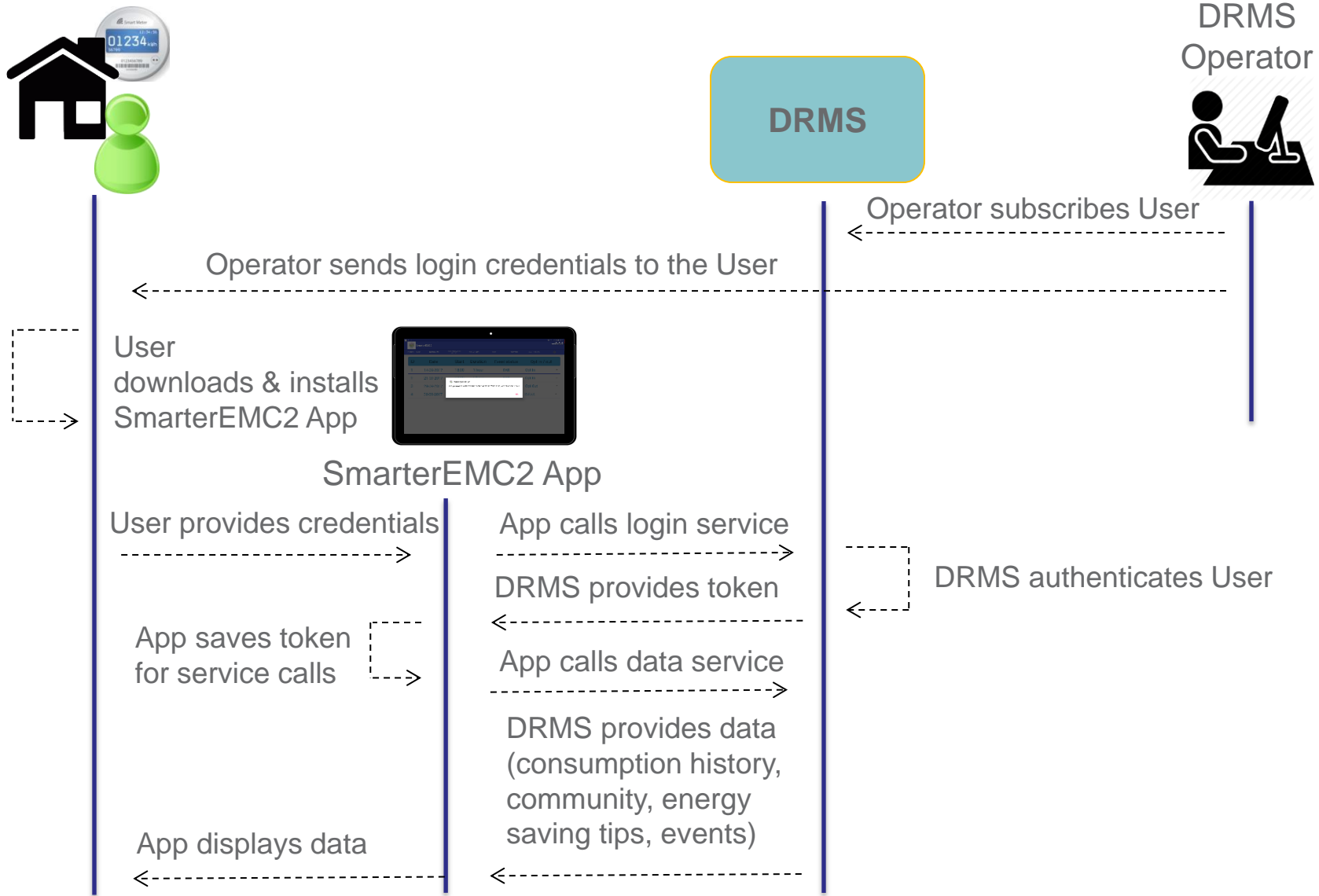
- **Informed Consent of the Participants**
- Compliance with the provisions of the **General Data Protection Regulation**
- Data collection **authorization**
- **Data handling within the DSOs infrastructure:** Standard mechanisms for handling and storing smart metering data
- **Data handling within the analytics platform:**
 - ▶ Only **anonymized** data
 - ▶ Only **authenticated** access from **certified clients**
 - ▶ **Replication of data** in the event of device or software failure

Δήλωση Συναίνεσης		
Έργο	SmarterEMC2	
Όνοματεπώνυμο Συμμετέχοντος		
<p>Σας προσκαλούμε να λάβετε μέρος στην πιλοτική φάση του έργου SmarterEMC2, η οποία θα λάβει χώρα κατά το χρονικό διάστημα από <i>ΗΜ/ΜΜ/ΕΕ</i> μέχρι <i>ΗΜ/ΜΜ/ΕΕ</i>. Η συμμετοχή σας στο έργο είναι εθελοντική.</p>		
Γενική περιγραφή του έργου		
<p>Το έργο SmarterEMC2 είναι συγχρηματοδοτούμενο από την Ευρωπαϊκή Ένωση (κωδικός έργου 646470). Πρόκειται για έργο που ανατασκοκρίνεται στην πρόκληση H2020-EU.3. - Priority: 'Societal challenges / H2020-EU.3.3. - SOCIETAL CHALLENGES - Secure, clean and efficient energy / H2020-EU.3.3.4. - A single, smart European electricity grid.</p> <p>Στα πλαίσια του έργου θα γίνει ανάπτυξη και χρήση τεχνολογικών εργαλείων υπολογιστών και επικοινωνιών (ICT), με σκοπό την παροχή υπηρεσιών Απόκρισης Ζήτησης (Demand Response). Επίσης, θα επιδειχθεί η ενσωμάτωση ανανεώσιμων πηγών ενέργειας και διεσπαρμένες παραγωγής με χρήση τεχνολογίας Εικονικών Σταθμών Παραγωγής (Virtual Power Plants).</p> <p>Μια άλλη ερευνητική διάσταση του έργου είναι η αξιολόγηση της επάρκειας των υφιστάμενων τηλεπικοινωνιακών δικτύων για τις ανάγκες της εφαρμογής σε ευρεία κλίμακα νέων υπηρεσιών Ευφώνων Δικτύων Ενέργειας (Smart Grid), όπως ενδεικτικά οι υπηρεσίες έξυπνης τηλεμέτρησης (smart metering) και Απόκρισης Ζήτησης.</p>		
Σκοπός του πιλοτικού έργου		
<p>Αξιολόγηση των τεχνολογικών εργαλείων υπολογιστών και επικοινωνιών (ICT) και των τεχνολογιών Εικονικών Σταθμών Παραγωγής στα πλαίσια υπηρεσιών Απόκρισης Ζήτησης.</p>		
Ζητούμε τη συμμετοχή σας στο πιλοτικό έργο διότι		
<p><i>Με την υπογραφή σας στο παρών έντυπο συμφωνείτε για τη συμμετοχή σας στην πιλοτική φάση του έργου SmarterEMC2 σύμφωνα με τους σκοπούς και την περιγραφή του έργου όπως αυτή έχει δοθεί στην προηγούμενη παράγραφο, καθώς και στην επώνυμη χρήση των στοιχείων κατανάλωσης εσωτερικά στο έργο και μόνο για τους σκοπούς του έργου, χωρίς καμία περαιτέρω δημοσιοποίησή τους.</i></p>		
Όνοματεπώνυμο	Υπογραφή	Ημερομηνία

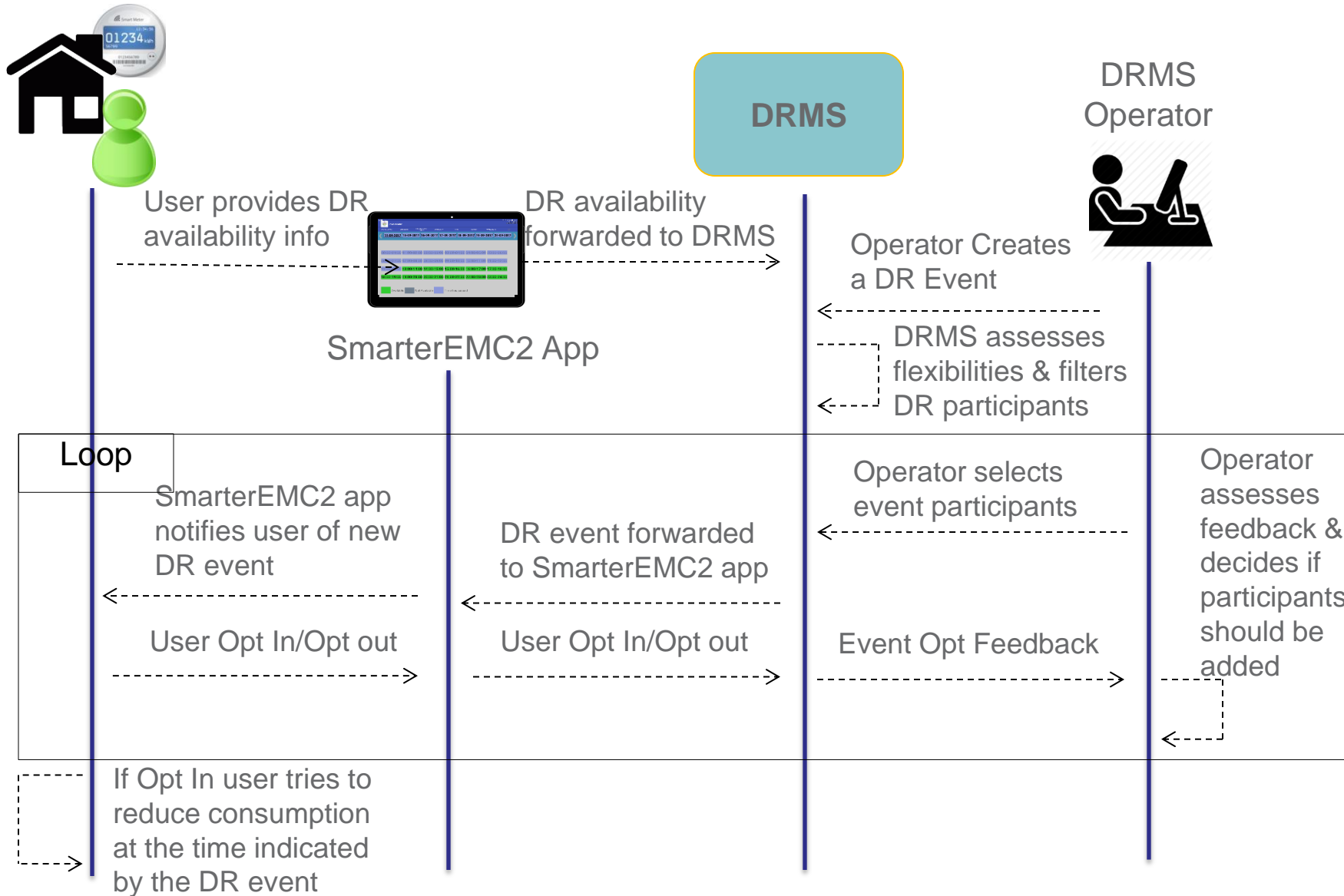
Final setup



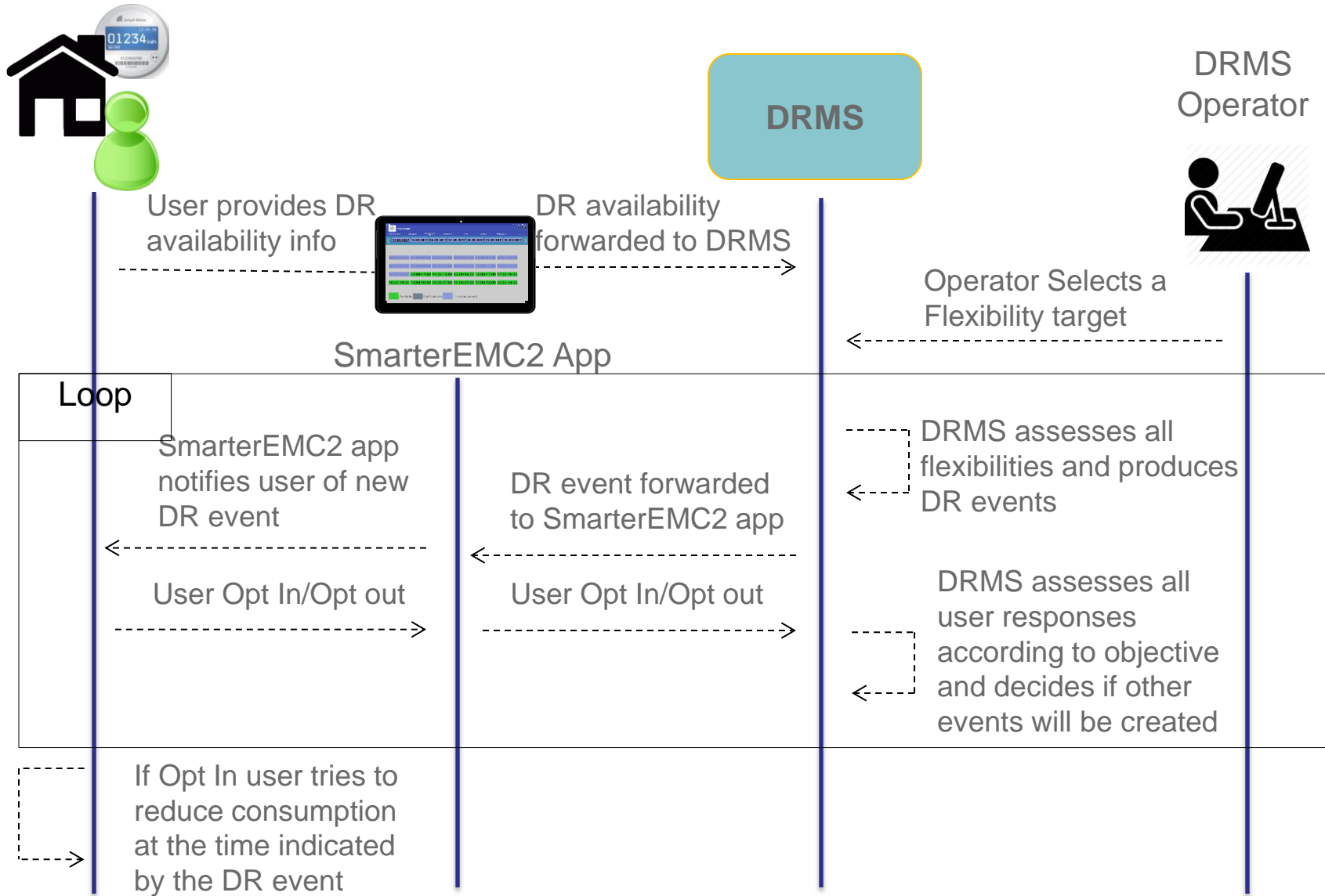
Registering for DR with SmarterEMC2 App



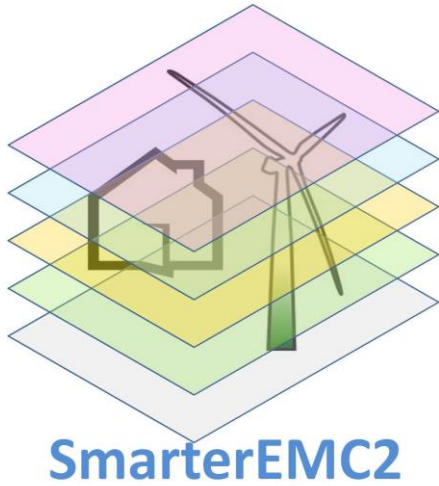
Implementing DR with SmarterEMC2 App (1/2)



Implementing DR with SmarterEMC2 App (2/2)



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...and some early findings



52
Number of events

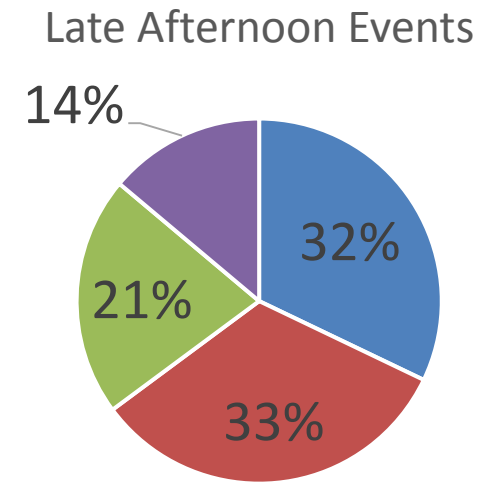
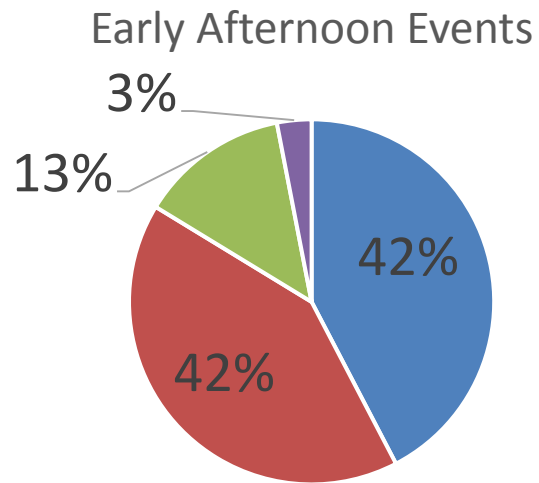
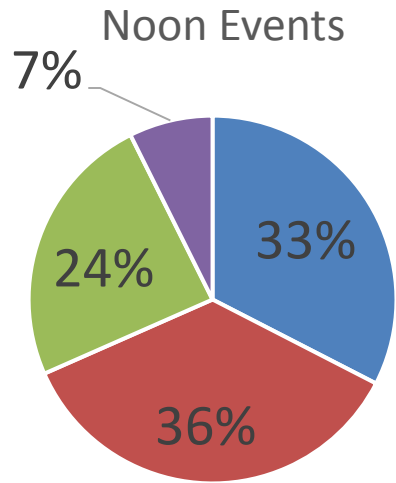
59
Total length of events(hrs)

102
Opt -Ins

75
Participants

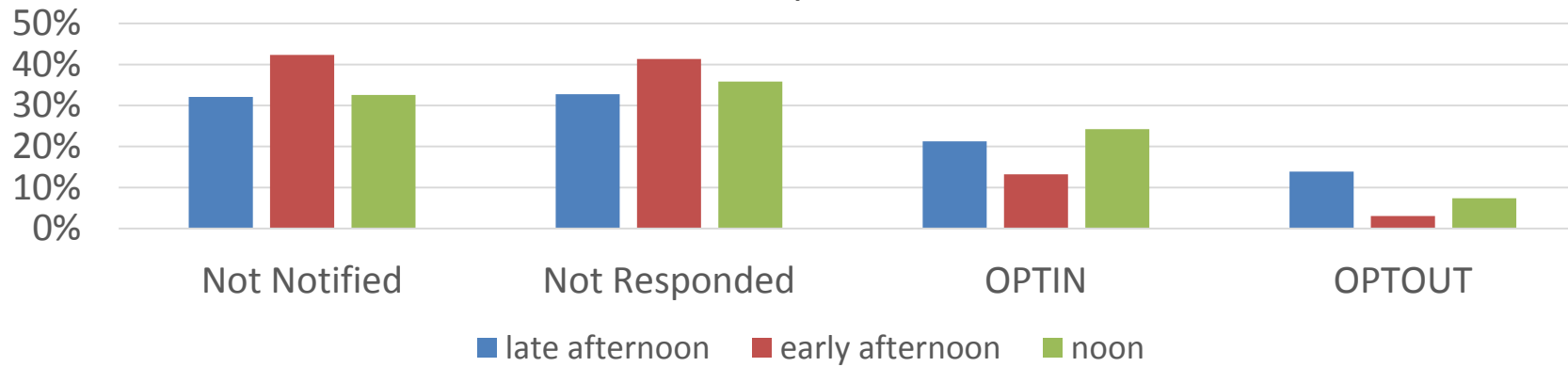
≈2
Events per week
per participant

Participants' responsiveness

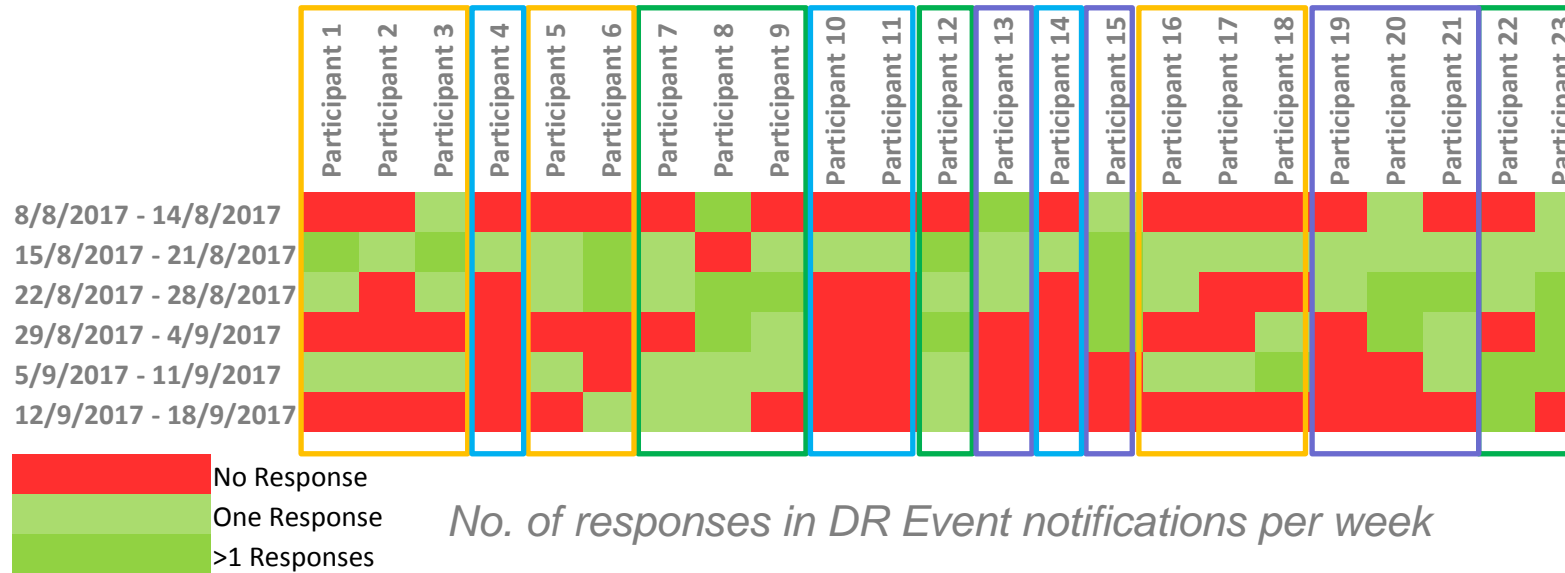


■ Not Notified ■ Not Responded ■ OPTIN ■ OPTOUT

Overall Responsiveness



Participants' segmentation (ex post)



Committed customers

Customers with occasional interest

Customers that gradually lost interest

Customers with no interest

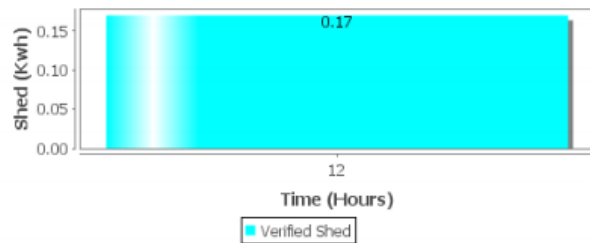
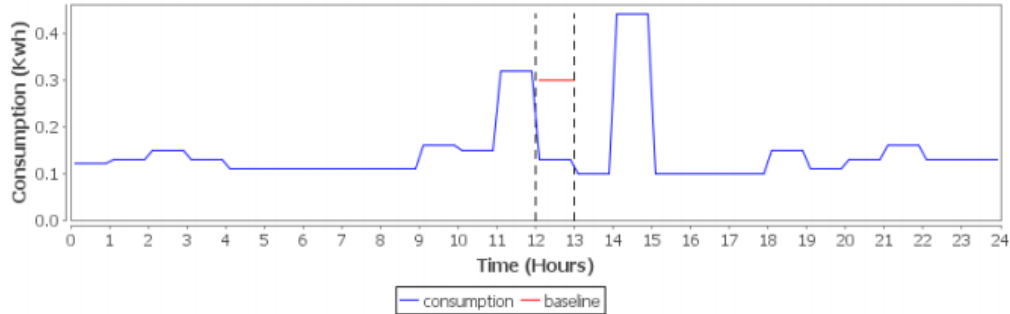
Load shifting



Event
M&V Report

Participant Name: MeltemiConsumer29
Event ID: 603
DR Program: Program_1
Status: COMPLETED

Start time: 13/09/2017 Duration: 60 min
Rumpup: 0 min



Baseline Methodology
HIGH_5_OF_10

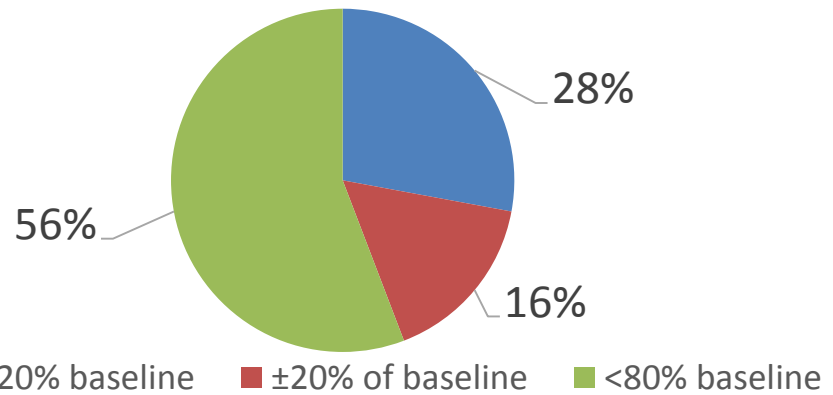
Verified Shed
0.2 kwh

Assessment of load shifting compared to the baseline

Calculating the baseline of consumers and verifying the load shedding action proved a devious task due to high variability of the residential consumption profile!

HIGH_4_OF_5 and HIGH_5_OF_10 baseline methods provided the best results.

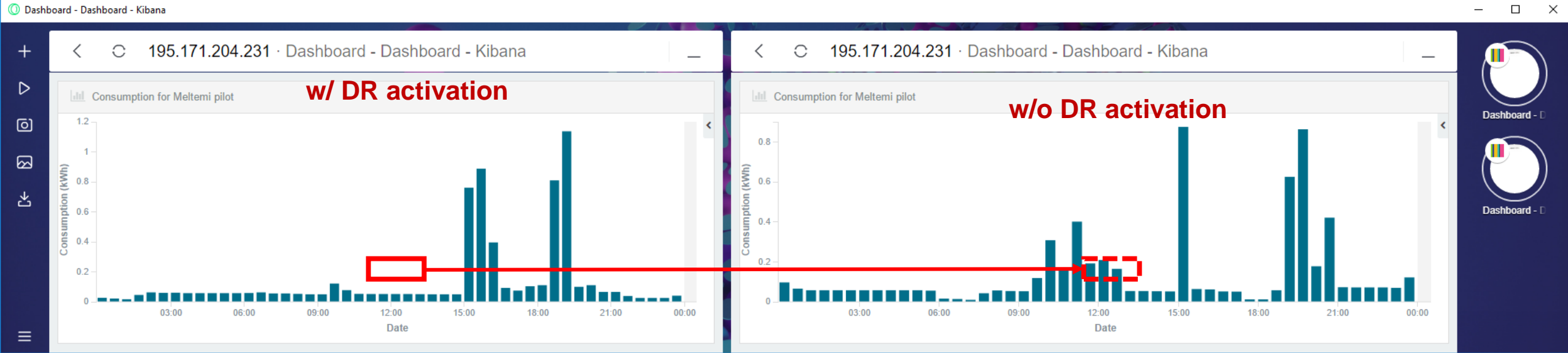
Participants' Consumption during DR Events



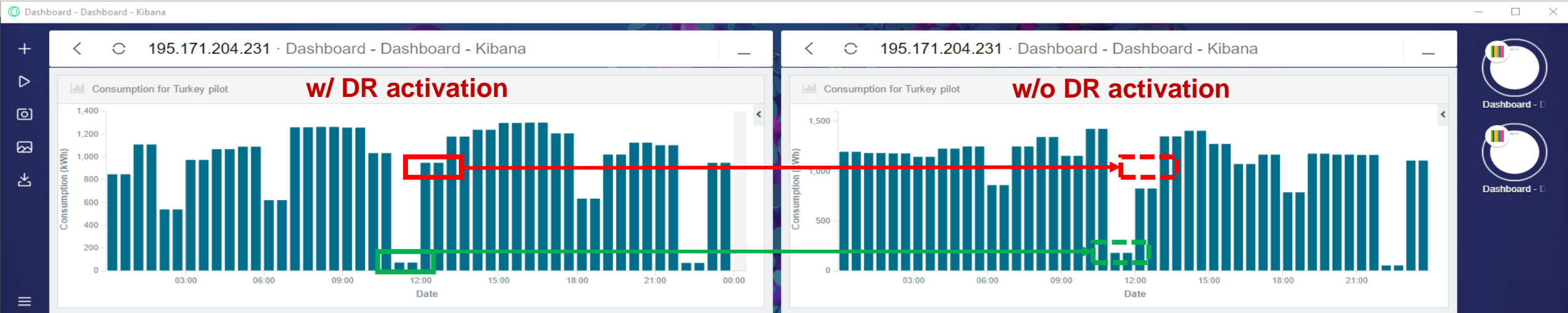
Relation of DR with EE



➤ In the R sector, DR may contribute also in EE



➤ In the C&I sector, DR contributes in altering the consumption profile, but not in significant EE



Thank you!

**Final results will become
available at
www.smarterEMC2.eu**

Contact:

labil@intracom-telecom.com