



4RinEU

Reliable models for deep renovation

Sustainable Places 2019
Cagliari, 6 June 2019

Data Handling in 4RinEU



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723829



4RinEU OBJECTIVE

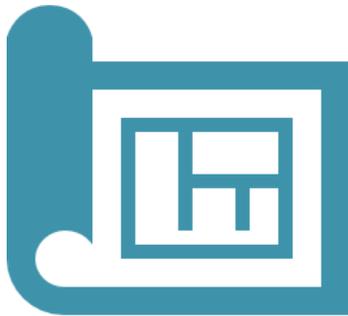
Improve information flows and knowledge share among stakeholders

- Several methods and tools in the project to deliver this
- Main principles:
 - Cover the whole life cycle
 - Address performance and function
 - Collect quantitative and qualitative data
 - Transform data into information and knowledge

INFORMATION FLOW

Tools and approaches for:

Design
process



Business
modelling



Data collection
and processing



DATA FOR RENOVATION

Before renovation:

- What is the status of the building?
- What are the main needs?
- What is the overall performance?
- What are critical areas?
- What are common user complaints?

After renovation:

- How is the building performing now?
- How are new technologies working?
- Is the building performing as designed?
- Is something not working as expected?



DATA ALLOWS TO...

- Verify performance targets
- Confirm effectiveness of design
- Correctly operate and maintain a building

No understanding without data

DATA USES IN 4RinEU

project objectives

Energy saving at least of 60% in comparison to pre-renovation levels

Improvement of Indoor Environmental Condition and Air Quality

Increase of Renewable Energy Generation and self-consumption of the renovated building

Did we do this? Check through data

DATA USES IN 4RinEU

- Collect data to guide renovations
 - *What is the pilot building's performance and characteristics, before even starting the design?*
- Monitor renovations
 - *How are prototype technologies actually performing in real buildings?*
- Monitor KPI
 - *Did the post-intervention performance improve as expected?*
- Feed back on renovation outcomes to users
 - *What data do owners, occupants, facility managers need to access to better engage with the renovated building?*



4RinEU PROCESS

- Gather requirements from pilots
- Pre-installation monitoring
- Ad hoc campaigns (e.g. IAQ)
- *Installation of technologies*
- Post-installation monitoring
- Ad hoc campaigns (e.g. IAQ)
- KPI tracking & evaluation
- Information feedback (bespoke dashboards)

RECOMMENDED DATA SET

- Weather
 - Temperature
 - Humidity
 - Solar radiation*
 - Wind speed, direction*
 - Rain*
 - CO2
- Indoor environment
 - Temperature
 - Humidity
 - CO2
 - Luminosity
- Occupancy
 - Presence
 - Windows opening
- Consumption
 - Thermal metering
 - Water flow rate, temperature
 - Electricity metering
 - Separate lights and appliances
- Equipment setpoints
- Resolution: **5 minutes**

**third party data*

AD-HOC ANALYSES

Eq-ox (EURAC prototype)

Multiple parameters

IAQ

Thermal comfort

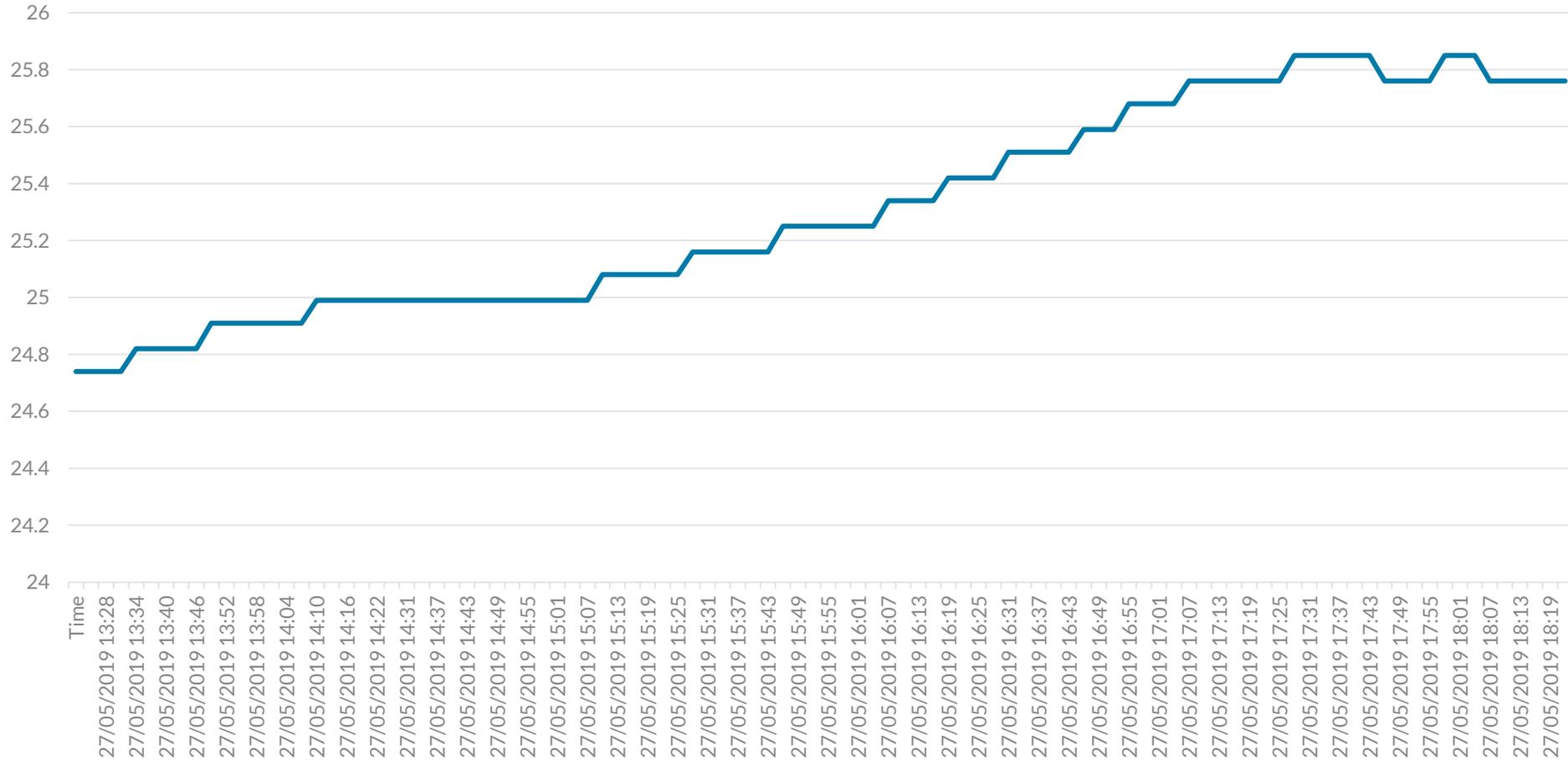
High detail monitoring

Bellpuig pilot, 3 apts, 7-9 plug loads

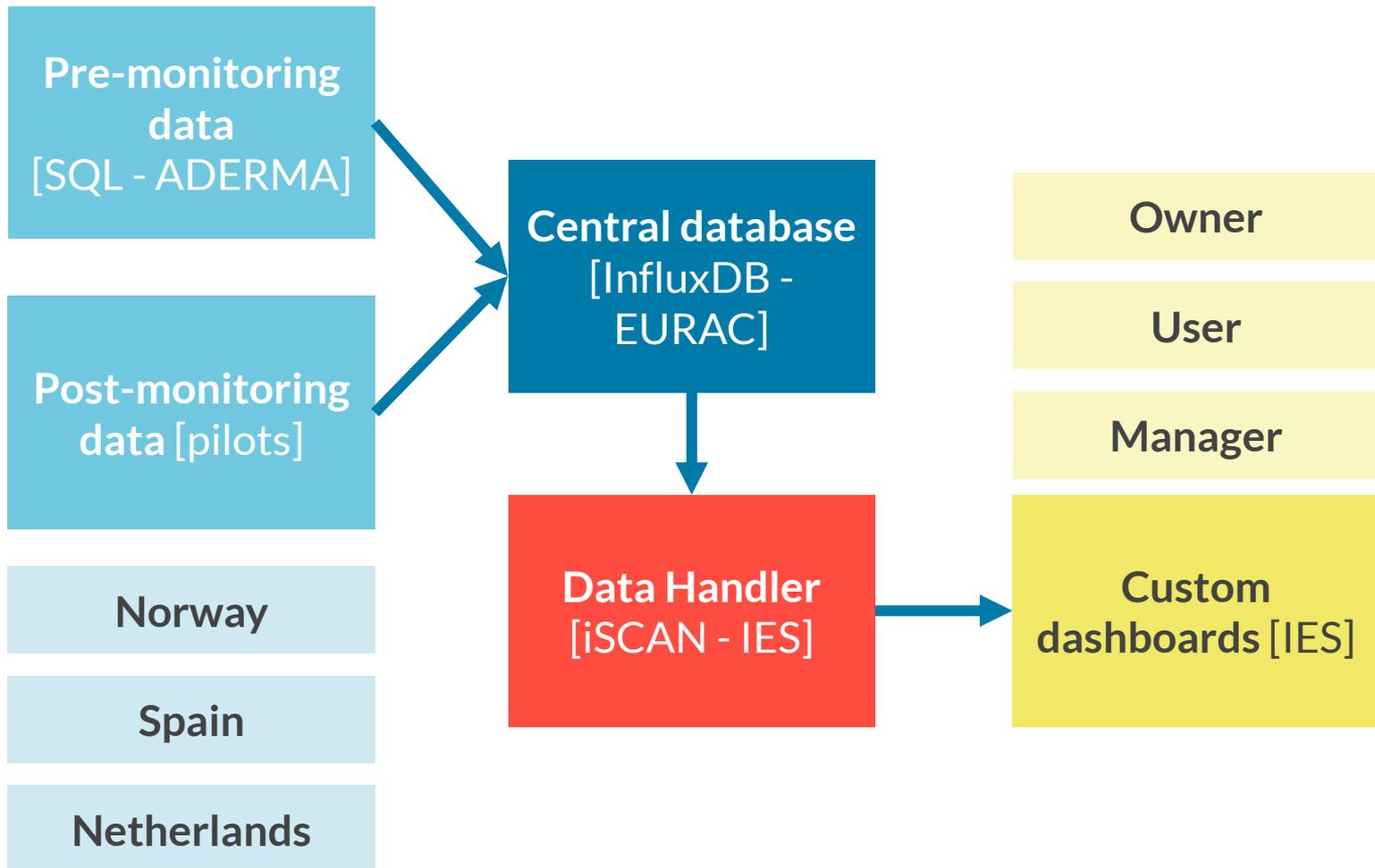
Track specific appliances (fridge, tv, oven...)

Thermal loads (electric heater, water heater...)

DATA SAMPLE



4RinEU ARCHITECTURE





4RinEU

THANK YOU!

Any questions?

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