



Autonomous Management System Developed for Building and District Level Applications of Control Strategies and Energy Flexibility Systems : Ambassador Project

*Auditorium Leopoldo Guimarães, FCT-UNL, Campus de Caparica
29th September, 2015
Carlos Duarte – Schneider Electric Portugal*

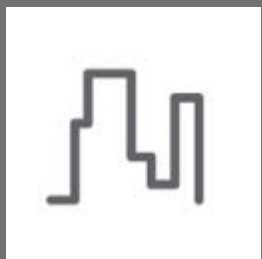




Role of urban energy management in empowering a wiser city



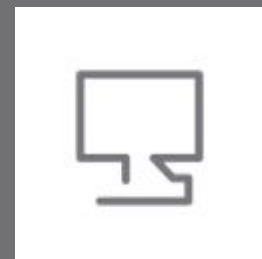
Global energy consumption will double in the next 40 years and electricity consumption will double in the next 20 globally, but in only 10 years in new economies, driven by...



Urbanisation



**Race for Energy Revolution
is led by cities**



Digitisation



Today: One way Power System



Emerging: The Energy Cloud



Source: Navigant Consulting

The Emergence of Energy Ecosystem – Reshaping the Urban Energy landscape
But the main question is: WHERE TO START ?

Step 1: Flexible Buildings

- Energy consumption prediction and flexibilities identification
- Reaction to external incentives (tariff, CO2...)
- Implementation of load curtailments, demand response
- Execution of load shedding

Confidential Property of Schneider Electric



Kergrid (France) – Smart Grid Ready Building

Impact:

- Disappear from the grid during 2 hours for the whole building
- Huge impact if all commercial buildings has this capability

<http://bit.ly/10EBZU0>

Step 2: Introducing Coordination

- Capture the holistic view of the district
- Coordination layer among multiple buildings
- Significantly increase efficiency when addressing peak shaving or demand response scenarios



Boston (USA) – Resource Advisor & Energy Operation

Impact:

- Provide city wide visibility to energy consumption
- Enhance city's ability to plan future energy efficiency projects
- Optimize \$55 million per year in spend

Step 3: Moving towards energy positive district

- Rebalance the energy mix of the district



BedZed (Sutton, UK) – Eco District

Impact:

- Optimize net cost of energy
- Minimize CO2 footprint
- Mitigate energy outages impact

Step 4: Increasing Resilience

- Storage capacity will directly impact district resiliency
- Easier to mitigate the impact of feared events



EUREF Campus (Berlin) - Micro Smart Grid

Impact:

- Optimizes energy self consumption, cost & reliability
- Participate in Demand response programs
- Ride through blackouts

From Step 1 to Step 4: District Energy Management

- District more attractive to landlord
- Less risk of power outage
- Local authorities offers new services

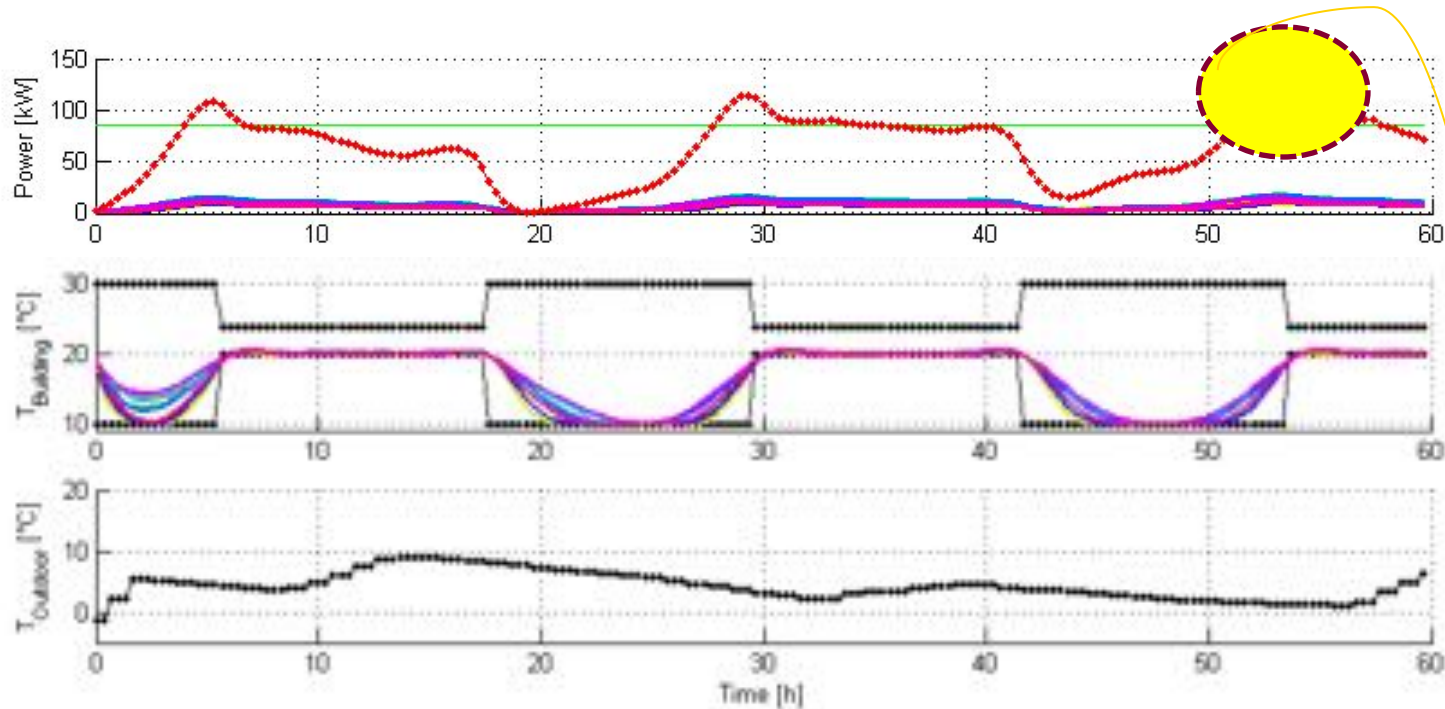


“Ambassador” project: District Energy Optimization R&D
Implemented in France, UK, Greece

Aim:

- Predict
- Optimize
- Buy and Sell

10 buildings, no coordination



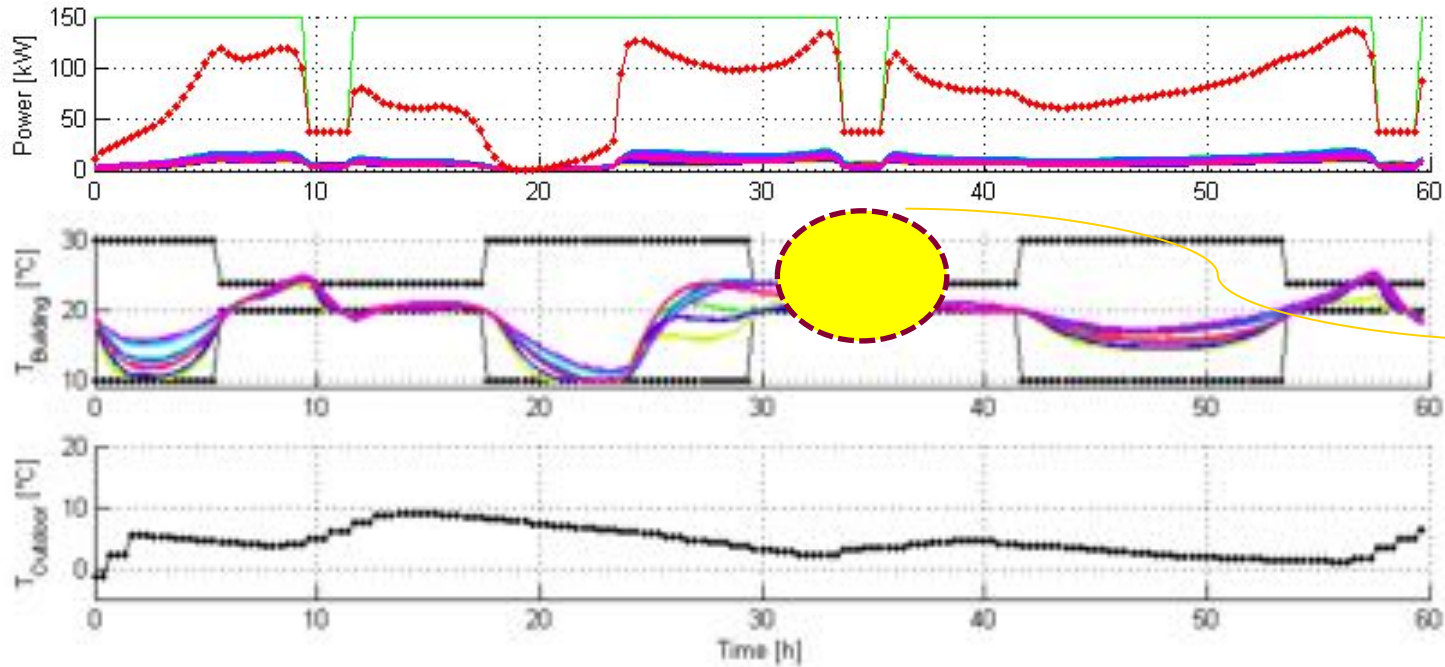
◀ Power profiles

◀ Temperature profiles

◀ Outside temperature

➤ *Power limite is not respected !*

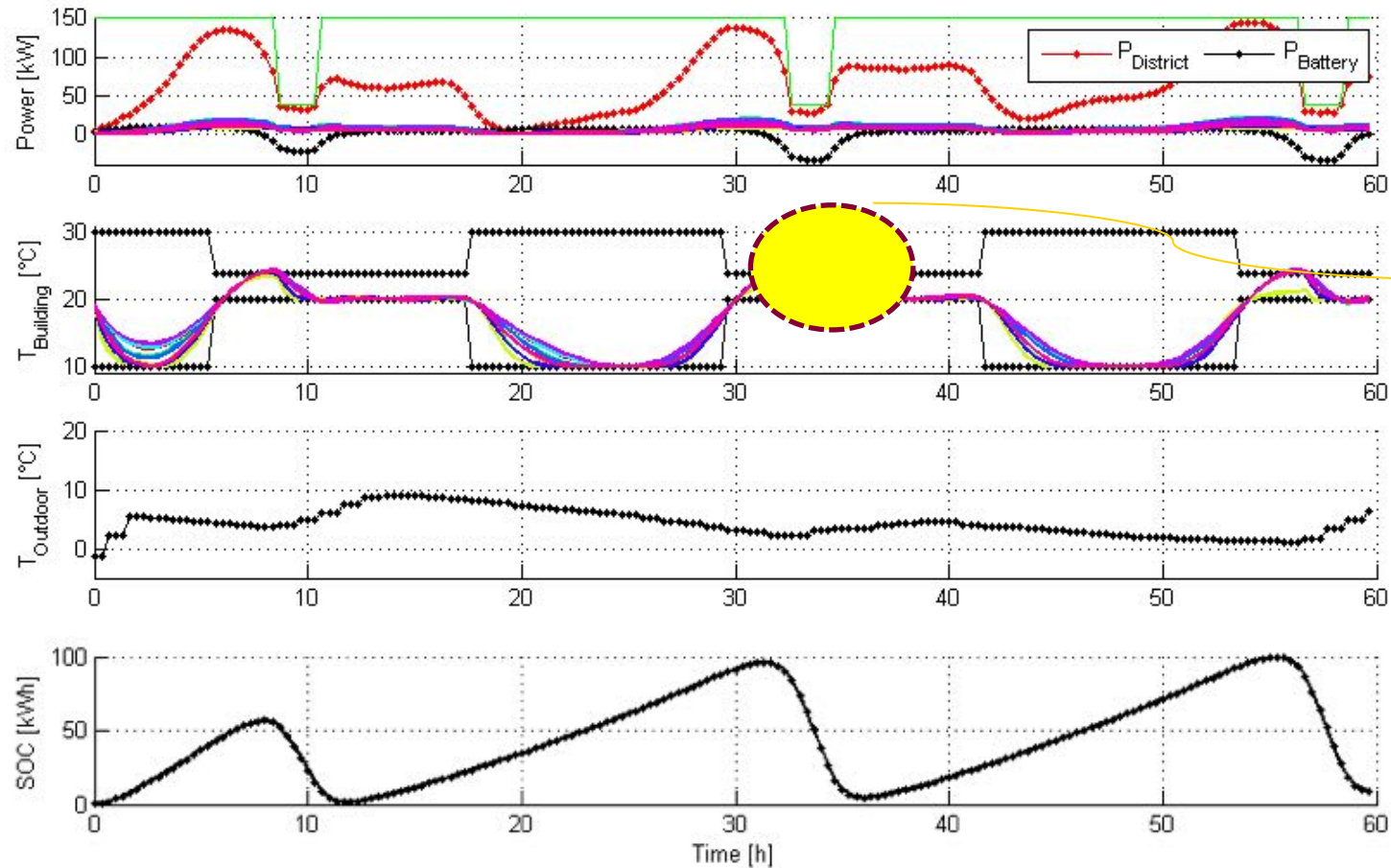
Introduction of Coordination



◀ implementation of D/R

➤ Comfort impacted...

Introduction of Coordination and storage

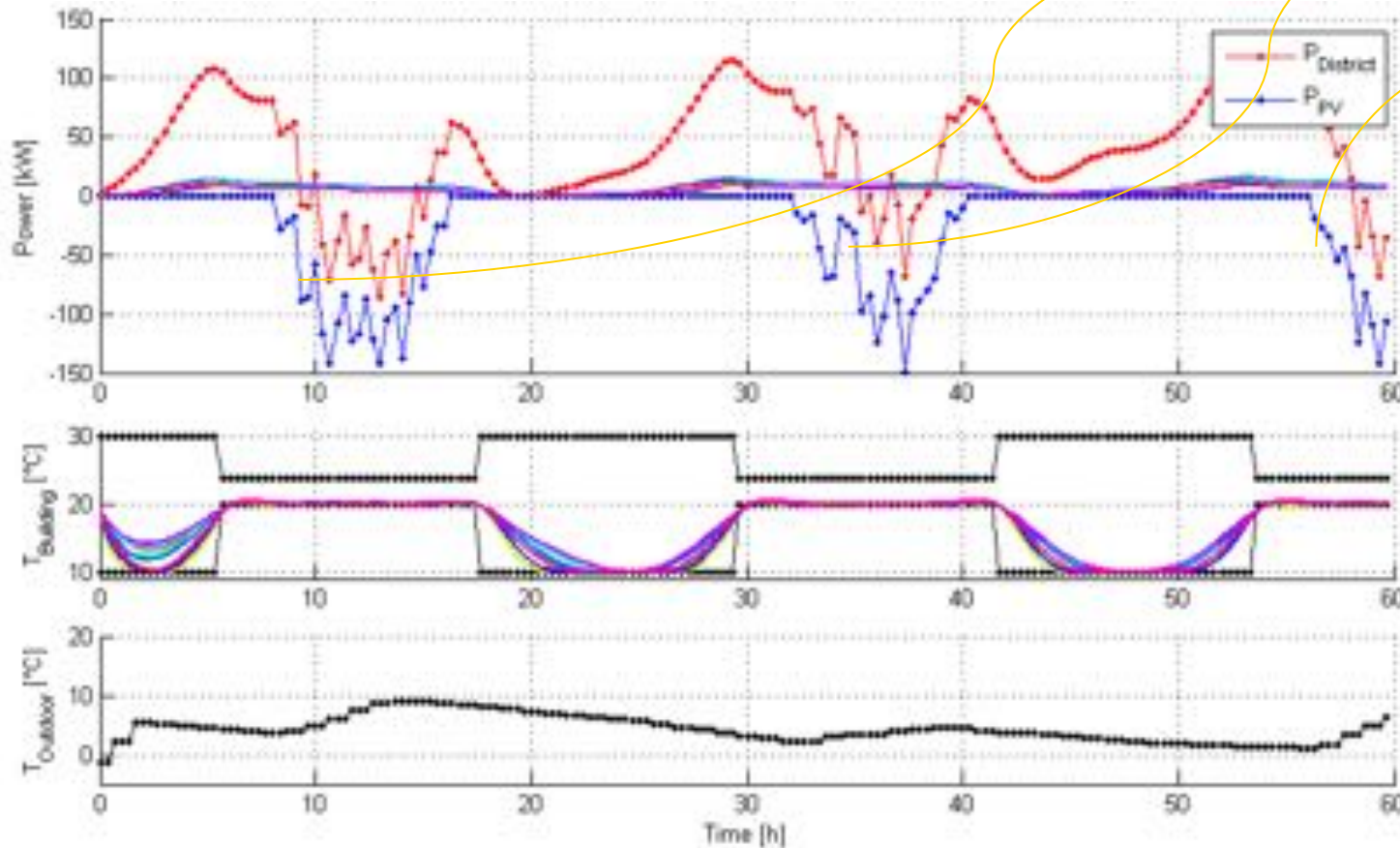


➤ Comfort respected

➤ Storage brings flexibility

PV without coordination

Energy to grid: 366 kWh



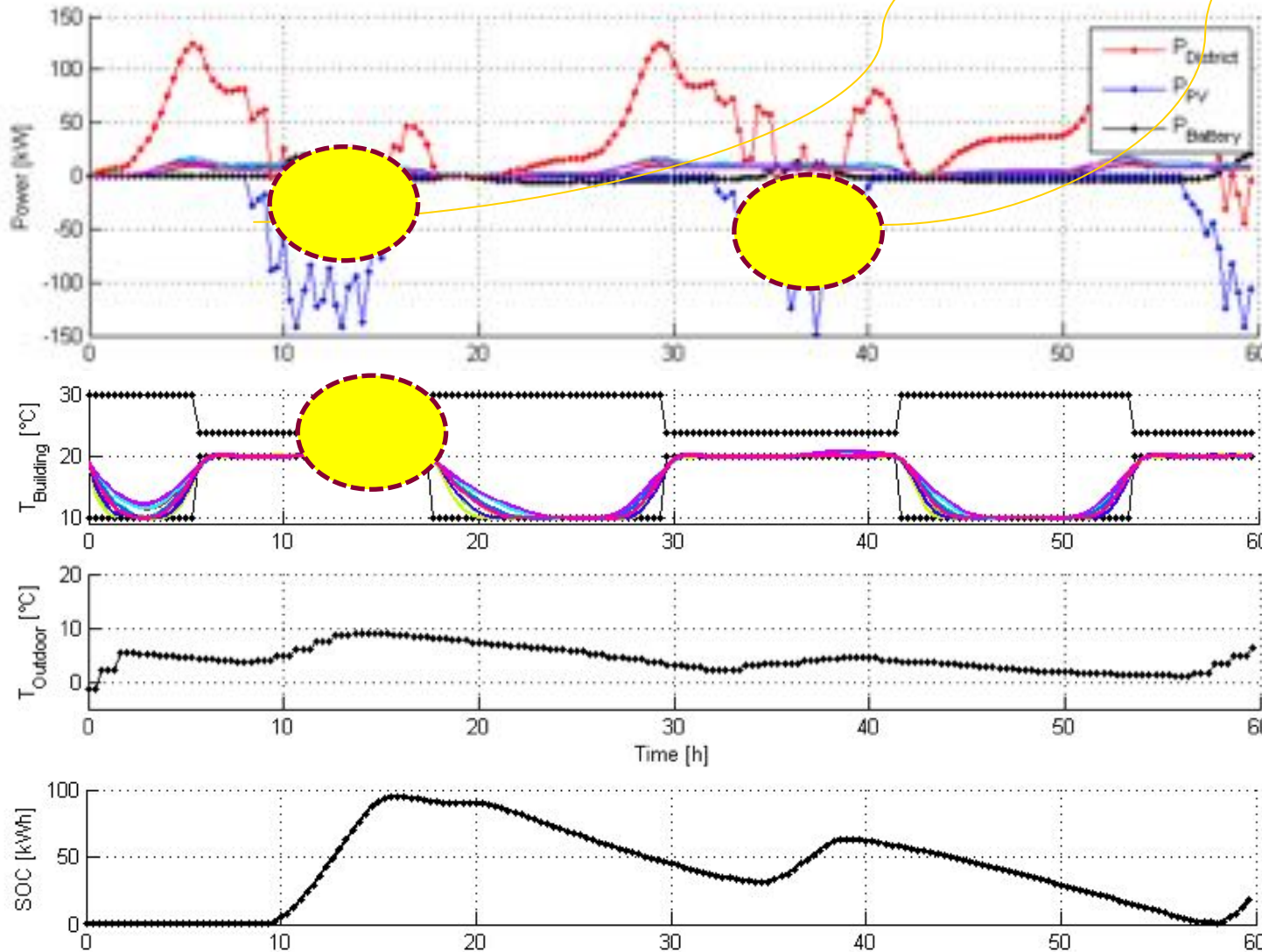
Power profiles

Temperature profiles

Outside temperature

PV with coordination and storage

Energy to grid: 155 kWh



More renewable energy consumed locally

Storage fills the gap between production and demand

Technology is important,
but...



...people are vital
to the success of a
city.

A young girl with a joyful expression looks up at a bright, green solar lamp hanging from the ceiling. The lamp is a spherical design with a green handle and a glowing white light. The background is dark, showing the wooden structure of the ceiling. The text "Make the most of your energy™" is overlaid on the left side of the image.

Make the most of your energy™