



Miguel Á. GARCÍA-FUENTES  
CARTIF Technology Centre

# **SMART CITY PROJECTS AND THEIR EVOLUTION FROM NZEB TO PED**

INDUSTRY  
CULTURAL HERITAGE  
INFRASTRUCTURES  
WELLBEING AND HEALTH

ENERGY POLICY  
ENERGY EFFICIENCY  
RENEWABLE ENERGY  
SMART CITIES  
SMART GRIDS

AGROFOOD  
BIOTECHNOLOGY  
NATURAL RESOURCES  
CIRCULAR ECONOMY

Sustainable and Resilient Cities

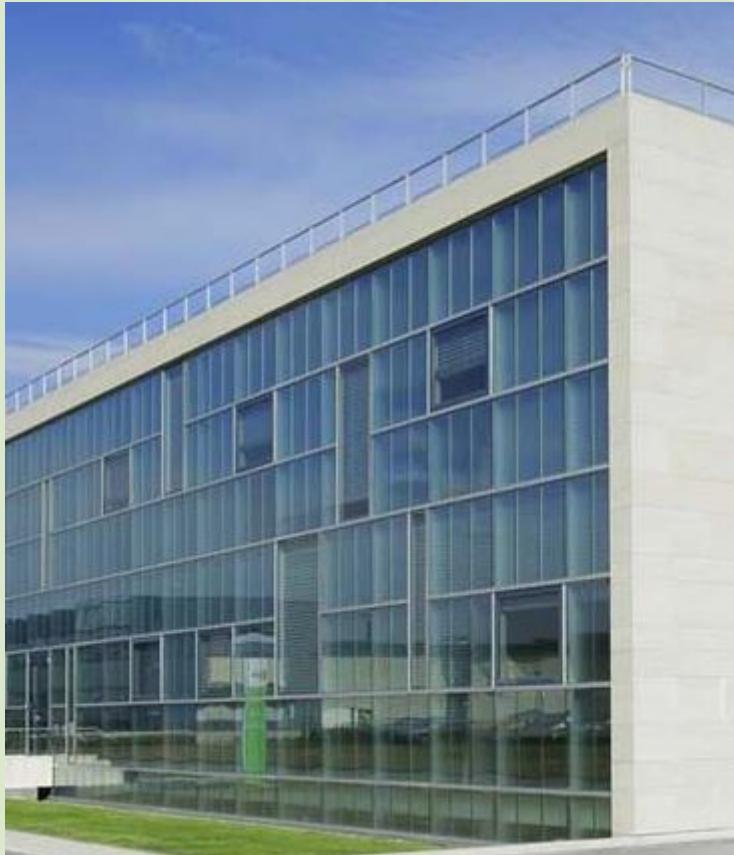


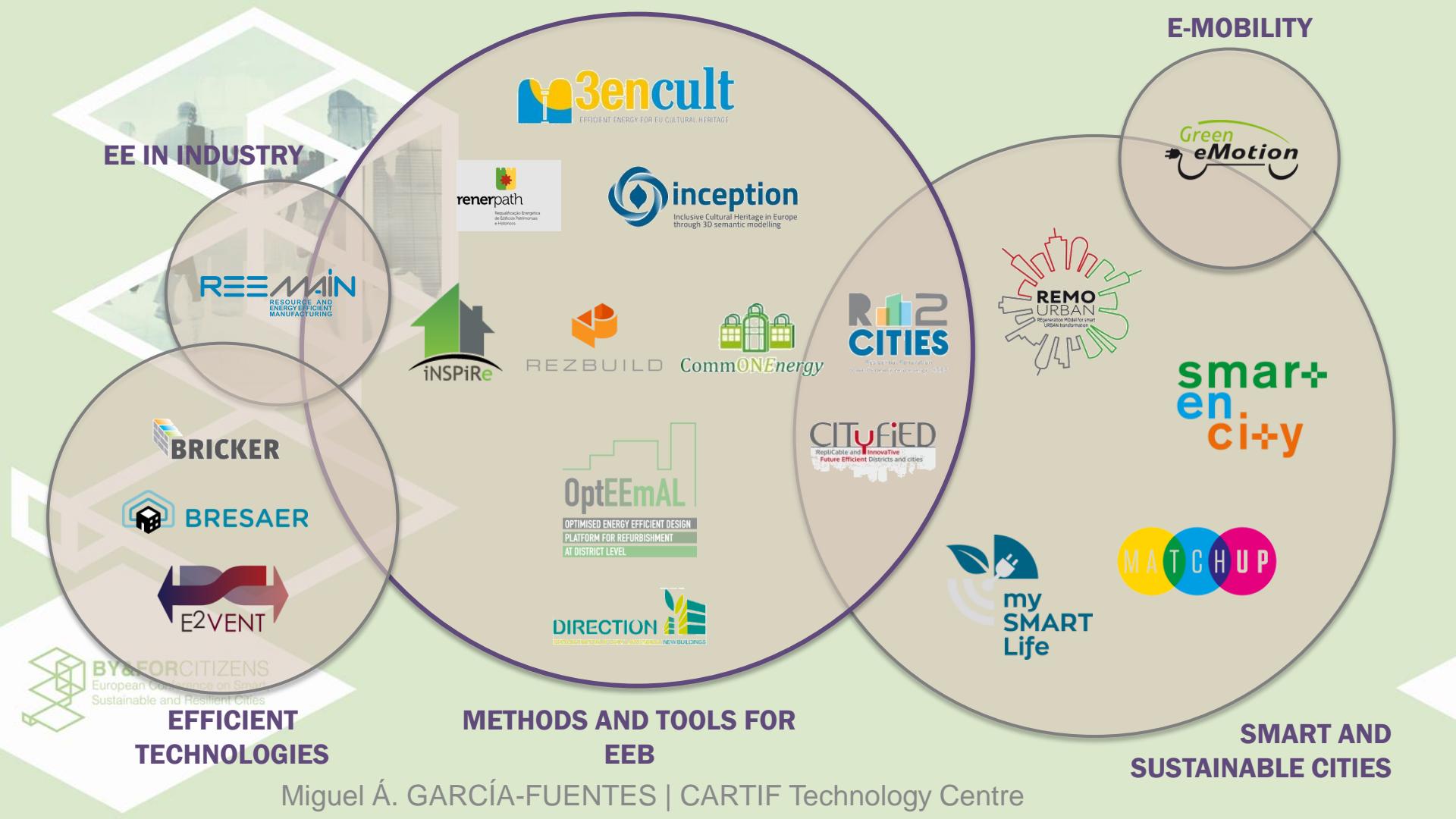
## DIGITAL SYSTEMS AND INDUSTRY

## ENERGY



## AGROFOOD AND NATURAL PROCESSES







## Energy Saving Measures

**Glass Wall + Isolation + Louvers**

**Geothermal Heat Pump**

**High Efficient Lighting**

**Free-Cooling**

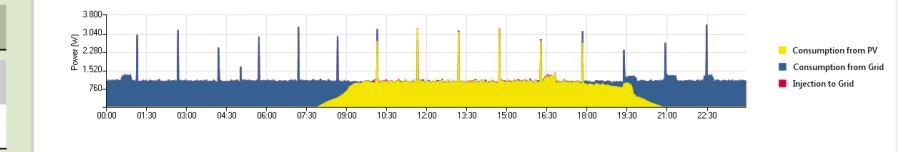
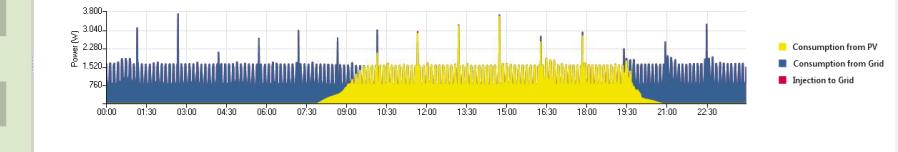
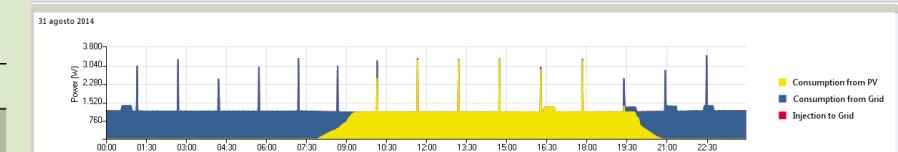
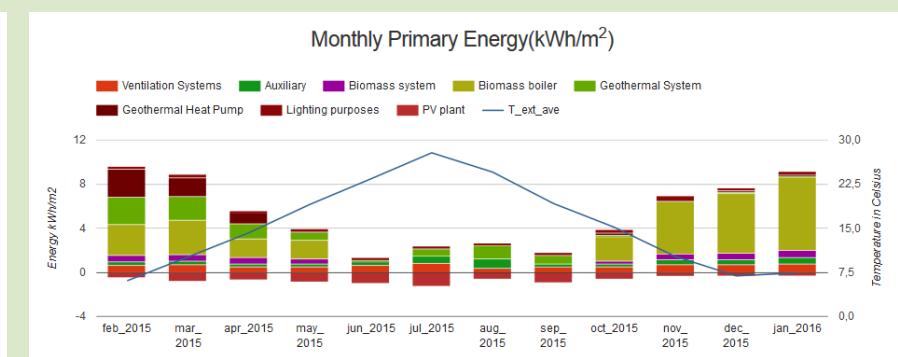
**HVAC Management (BEMS)**

**Variable flow ventilation (BEMS)**

**Lighting management (BEMS)**

**RES poligeneration Biomass + Geothermal**

**PV plant 45 kWhp (15 kWh/m<sup>2</sup>/yr)**



- Façade insulation
- PV façade (BIPV)
- Biomass based DH (1000 kW)
- Variable flow pumps
- Distribution network renovation
- Replacement of substations
- Thermal storage
- DHW centralisation
- Installation of heat allocators and thermostatic valves



Political support

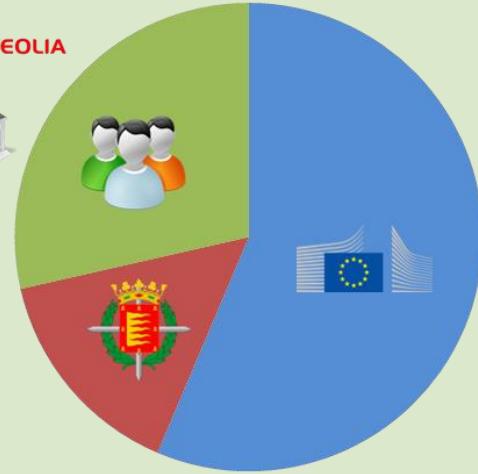
D&C activities

Technical support

Financial support



VEOLIA





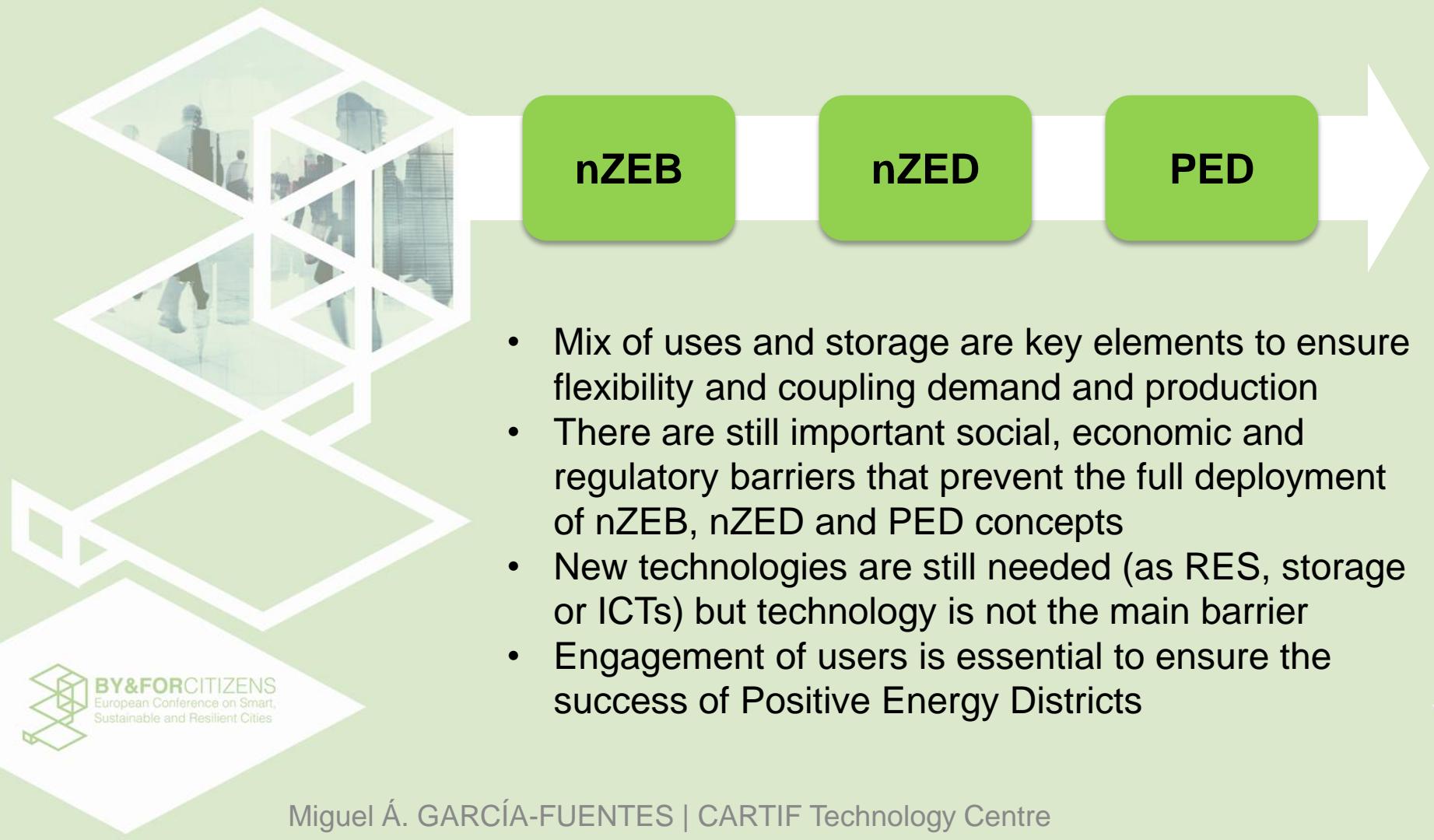
**A PED is seen as a district with annual net zero energy import, and net zero CO2 emission working towards an annual local surplus production of renewable energy.**

Energy efficiency in buildings

Towards Positive Energy Districts for sustainable urbanisation

Flexibility for energy consumption within districts

Regional/local supply of renewable energy (energy system)





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**THANK YOU FOR YOUR ATTENTION!**