
ECTP
C2B
Energy Efficient Buildings
European Commission
SUSTAINABLE ENERGY
WEEK 24-28 JUNE 2013
EU SUSTAINABLE ENERGY WEEK
24-28 JUNE 2013
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26 June 2013
Energy

Overview Vito's interactive buildings EU projects

1. Introduction

2. EU FP7 projects

3. Conclusions

Introduction to Vito

- VITO - Flemish Institute for Technological Research - is a leading **independent** European research and consulting centre **developing sustainable technologies** in the area of **energy, environment, materials and remote sensing.**
- 700 VTE – 5 sites - total budget M€ 90-100
- Topics:
  - Industrial Innovation (new processes, materials)
  - Quality of Environment (measuring, modeling, observation)
  - Energy (transition and energy technology) => smart energy cities/smart grids

VITO sites

European Commission

Greenbridge
» FCA
» West-Flanders

Ghent
» KMO
» East-Flanders

Berchem
» MIP2
» VBBV
» VBAV

Mol
» Head office
» Sustainable chemistry, material management, health, land use
» SME's Limburg, Antwerp, Flemish-Brabant

EnergyVille
» Sustainable energy

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FP7 Interactive buildings projects

e-hub

RESILIENT

FC district — New μ-CHP technologies for energy efficient and sustainable districts

www.e-hub.org www.resilient-project.eu www.fc-district.eu

STABLE — Safety Testing Approaches for Large Lithium-Ion Battery Systems

MERITS — A RECHARGEABLE HEAT BATTERY

address® interactive energy

Step Up

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EU FP7 E-hub project

- FP7 project EeB.NMP.2010-2 NMP – 2010 - 2014
- **Energy-Hub for residential and commercial districts**
  - Cover **up to 100%** of the energy demand **on district level** with **renewable energy**
  - Match supply and demand - **conversion and storage of energy and load shifting**
  - All types of energy flow - **heating and cooling, electricity**
  - Thermal energy storage, energy management systems, business models
  - Connects **households** but also **EV, commercial buildings** or **industry**
  - **Demonstration**

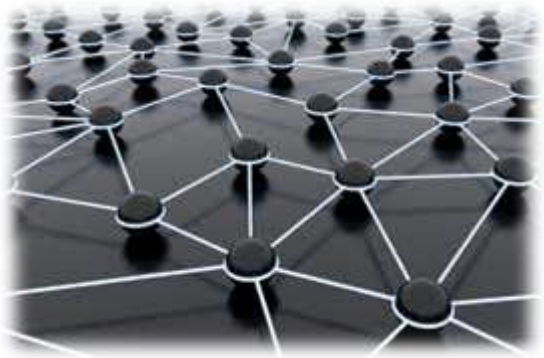
E-hub partners

- Acciona (Es)
- Solintel (Es)
- Ertzberg (Be)
- Mostostal (Po)
- D'Appolonia (It)
- HSW (Ge)
- ICAX (UK)
- Cestec (It)
- EDF (Fr)
- ISPE (Be)
- ECN (Nl)
- **TNO (Nl) - coordinator**
- VITO (Be)
- Fraunhofer (Ge)
- VTT (Fi)
- University of Genova (It)

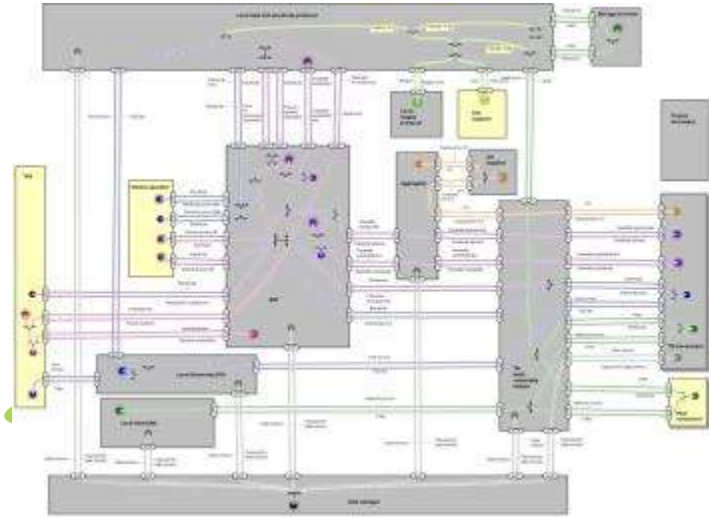
The key concepts

- Energy storage

- Energy management



- Business models



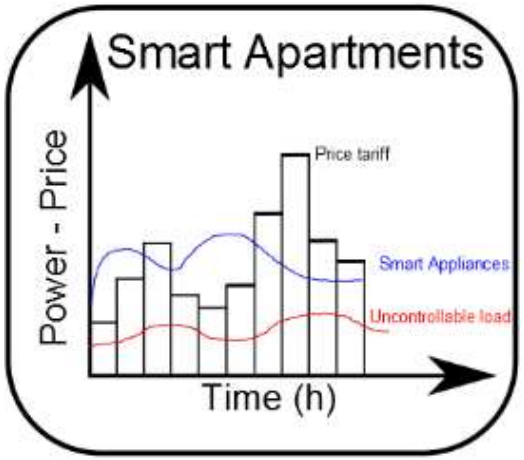
Outcomes of the project

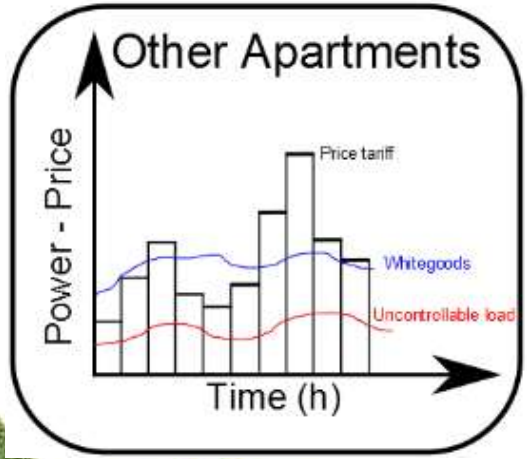
- **E-hub develops and field-tests**
  - Missing energy technologies
    - Open/closed thermochemical
    - Distributed energy storage
  - Energy management systems
  - Business models smart energy districts
- **Field-testing research solutions in the region Tweewaters, Leuven, Belgium**

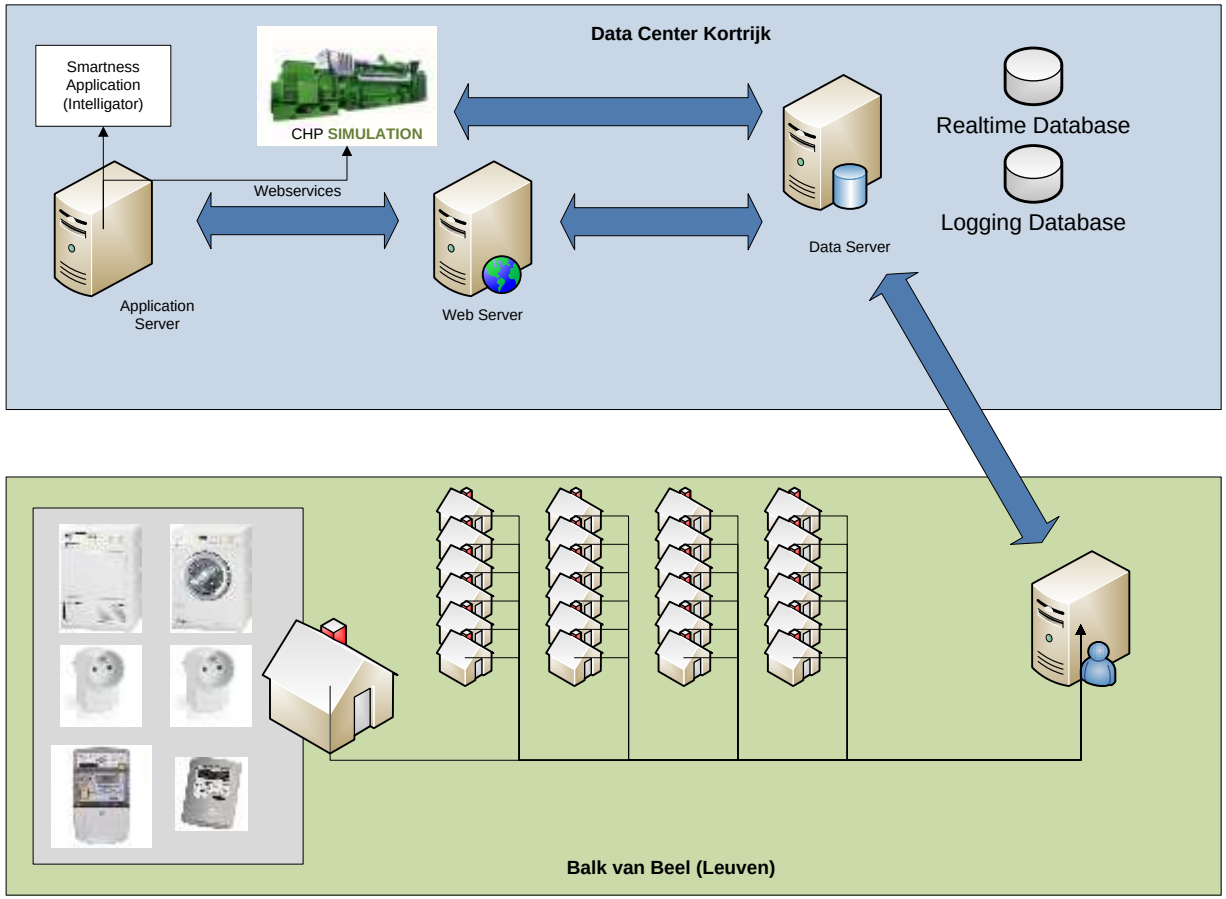
Tweewaters (Leuven, belgium)

- New/renovated district 170,000 m²
- Residential + commercial/public buildings
- Energy vision: local production + consumption of energy
- Energy concept: District heating, cogeneration, centralized and decentralized heat storage, smart control of appliances, user awareness/acceptance

Technical outlay







EU FP7 FC District

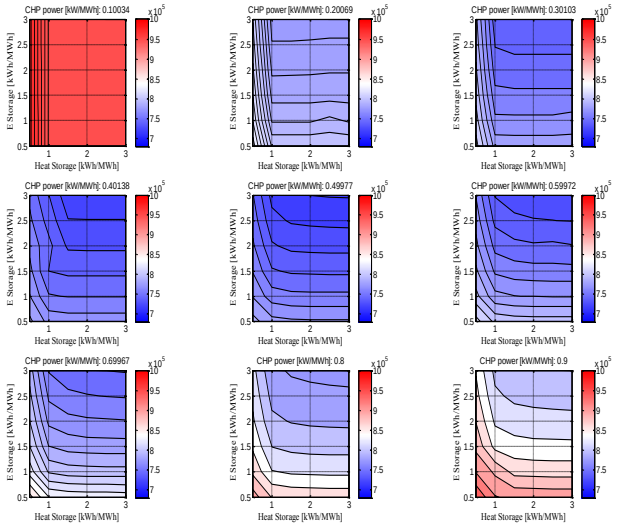
- FP7 project EeB.NMP – 2010 - 2014
- **New µCHP network technologies for energy-efficient and sustainable districts**
- Optimization and implementation of an innovative energy production and distribution concept for sustainable and energy efficient refurbished or new "energy autonomous" districts, exploiting decentralized co-generation coupled with optimized building and district heat storage and distribution network

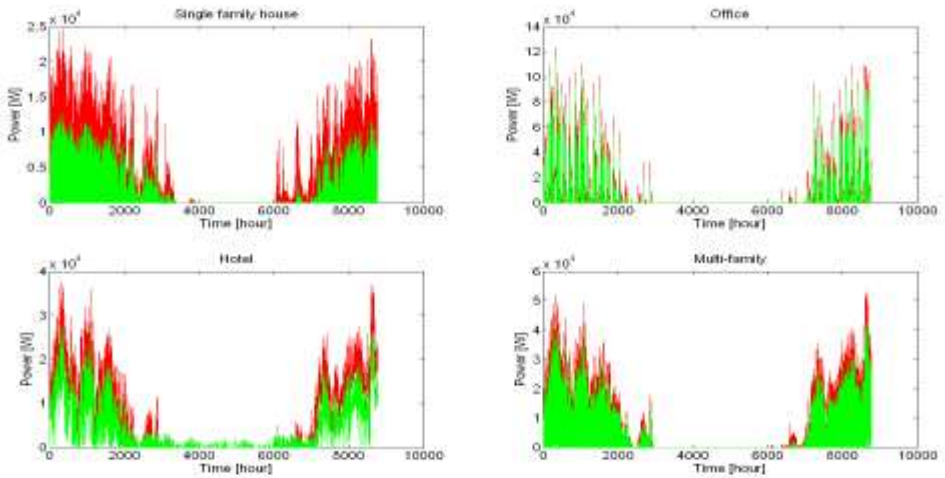
Outcomes of the project

- **FC District develops and field-tests**
  - A high temperature Solid Oxide Fuel Cell
  - Advanced, durable and cost effective insulation materials for building and district piping thermal response
  - Implement an "Intelligent Heat Network"
  - Development and demonstration of new district management business models and service models for the consumer
- **Demonstrations**

Control/optimisation of district heating networks

- Heat network vs. electricity network
- Low temperature heating networks
- Combination with thermal energy storage
- **=>Investigate the flexibility of district heating and thermal energy storage in smart grid**





EU FP7 Resilient project

- FP7 project EeB.NMP.2012-1 – 4 years - 2012 - 2016
- **Coupling Renewable, Storage and ICTs, for Low carbon Intelligent Energy maNagemenT at district level**
  - Integration and interaction between VPP, Microgrids and Energy Hubs
  - Integration of renewable energy, cogeneration, storage units embedded into an ICT framework/ICT algorithms
  - The concept is simulated, installed, monitored and evaluated in three pilot projects
  - Demonstrators in 3 countries (Italy, Belgium, UK)
  - Vito = technical coordinator (DAPP = coordinator)

European Commission

EU FP7 Resilient partners

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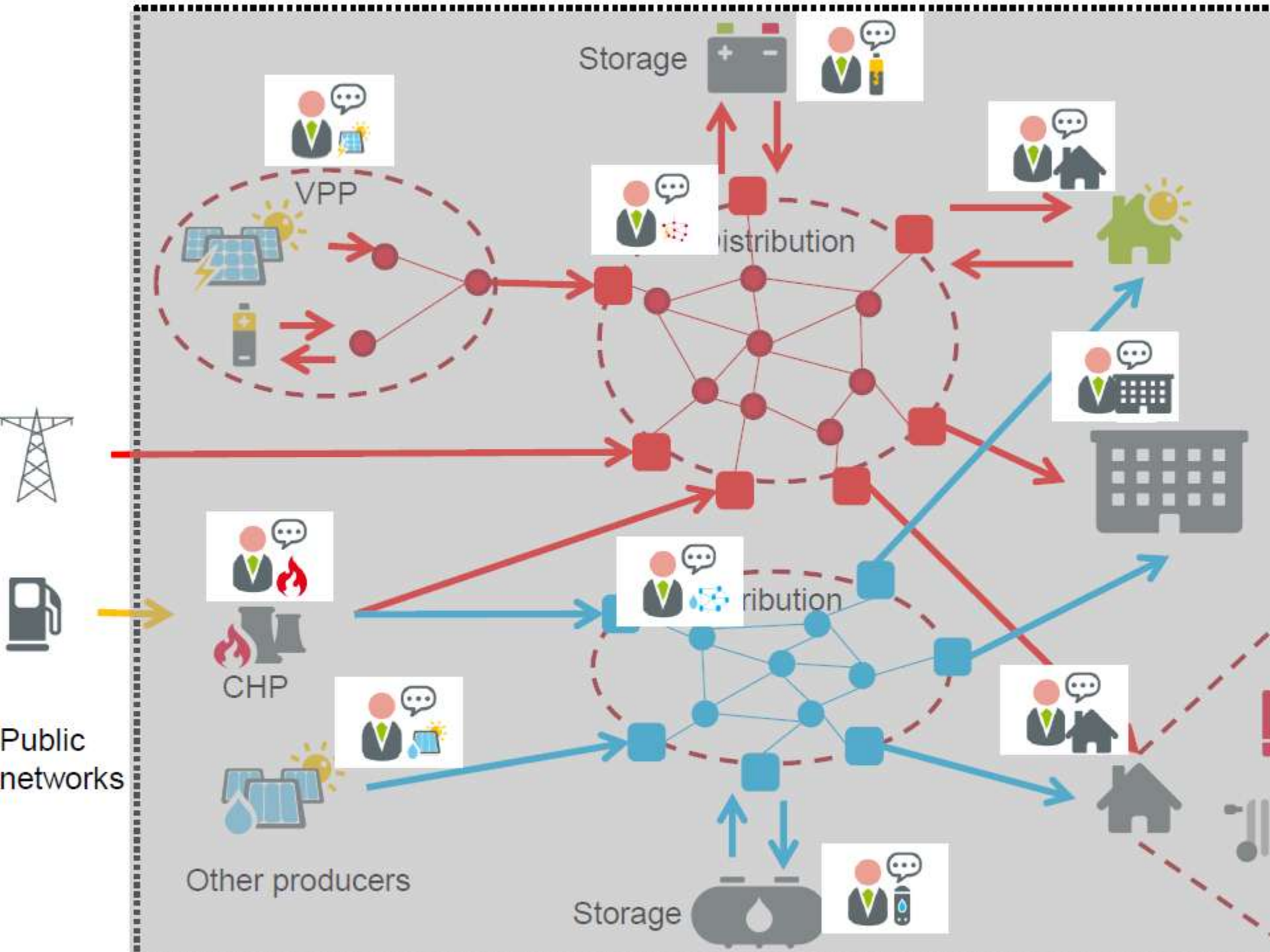
Storage
VPP
istribution
ribution
CHP
Public networks
Other producers
Storage

Conclusions

- These projects outlines the importance of combining energy systems with ICT at building and district level
  - Balancing supply/demand energy
  - Higher share of RE in buildings and districts
  - Thermal and electrical energy storage
  - Development of "missing" technologies
  - Identifying business cases for flexibility
- Concepts tested in pilot cases (building/district level)
- Don't forget the user (User behaviour)

Questions?

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  - EnergyVille – Applied research centre on smart energy districts - *co-operation between VITO, KU Leuven, IMEC*