



Resilient

Integrating renewable DHC in practice

Peter Verboven

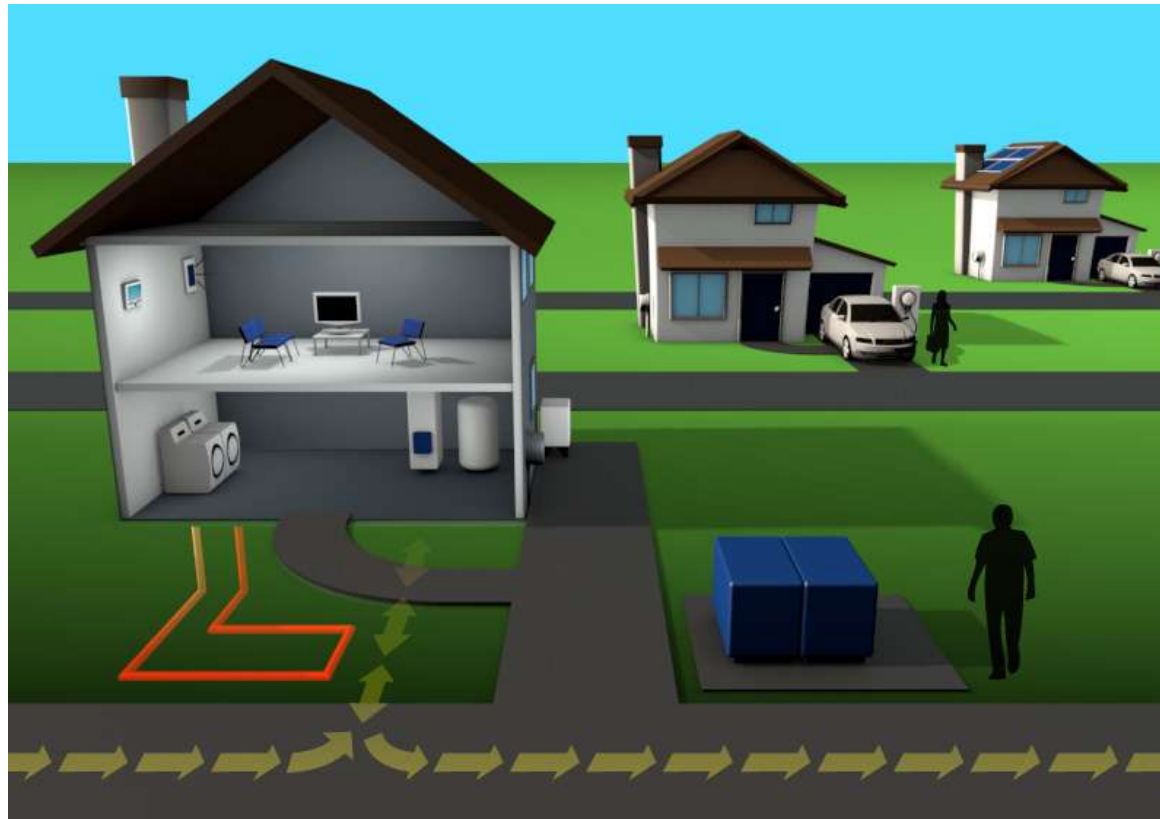




Agenda

1. Integrated energy districts
2. The Resilient project
3. Lessons learned
4. Challenges ahead

Integrated energy districts



The district of the future

Smart buildings
◆
Sustainable production
◆
Active demand



Integrated energy districts

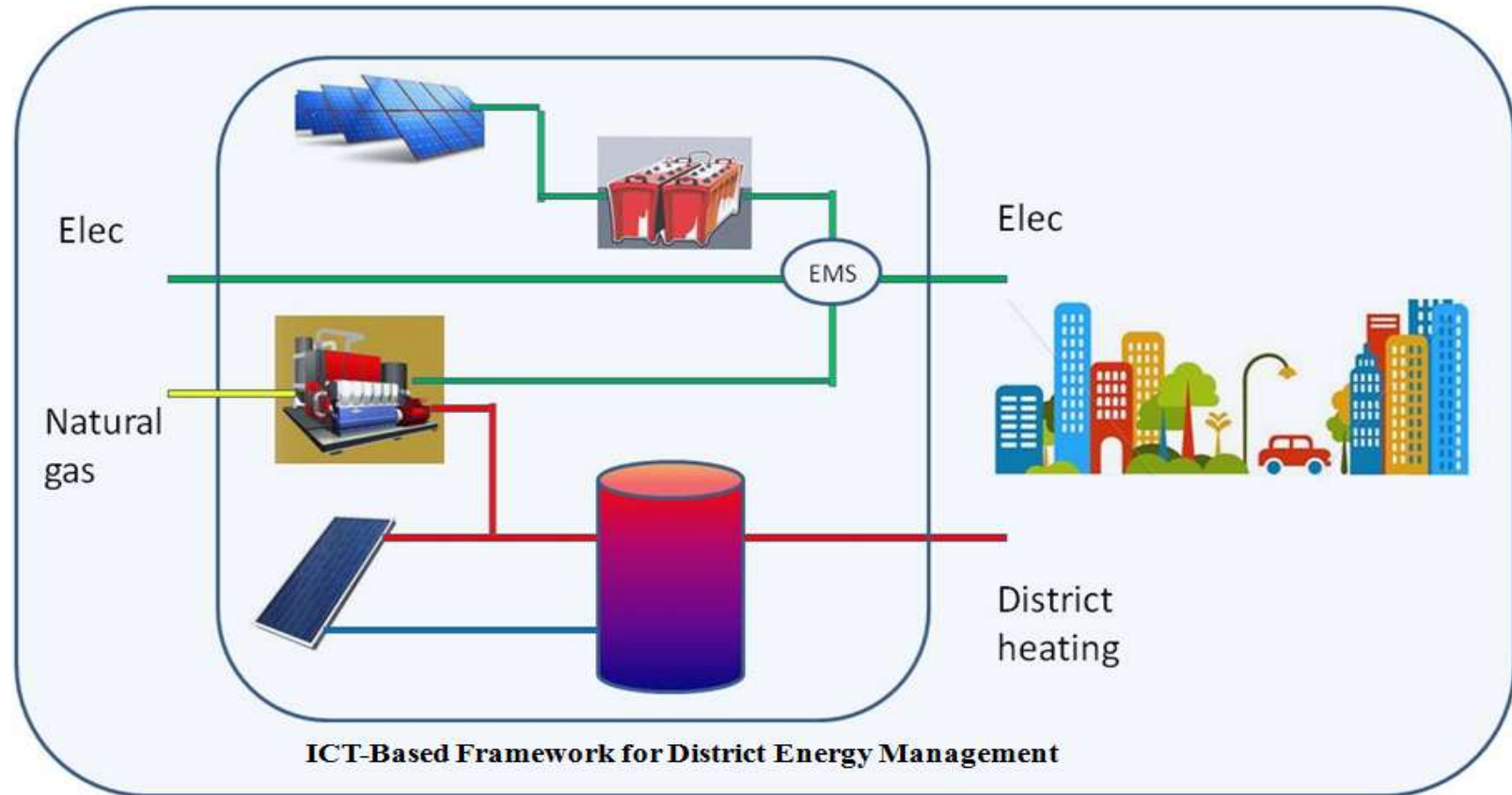
- Multiple energy carriers
- Multiple sources
- ... and people



Agenda

1. Integrated energy districts
2. The Resilient project
3. Lessons learned
4. Challenges ahead

The Resilient project



3 demosites in Europe: Hasselt, Cardiff, Savona
8 million budget; 5,5 million financing
4 years; 520 person-months

The Resilient project



D'Appolonia
Vipiemme
Univ. Genoa



Cardiff University
BRE
Blaenau Gwent County



Cordium
Infrax
TerraEnergy
Vito
26/04/2012



Acciona



CSTB
CEA
Sigma Orionis



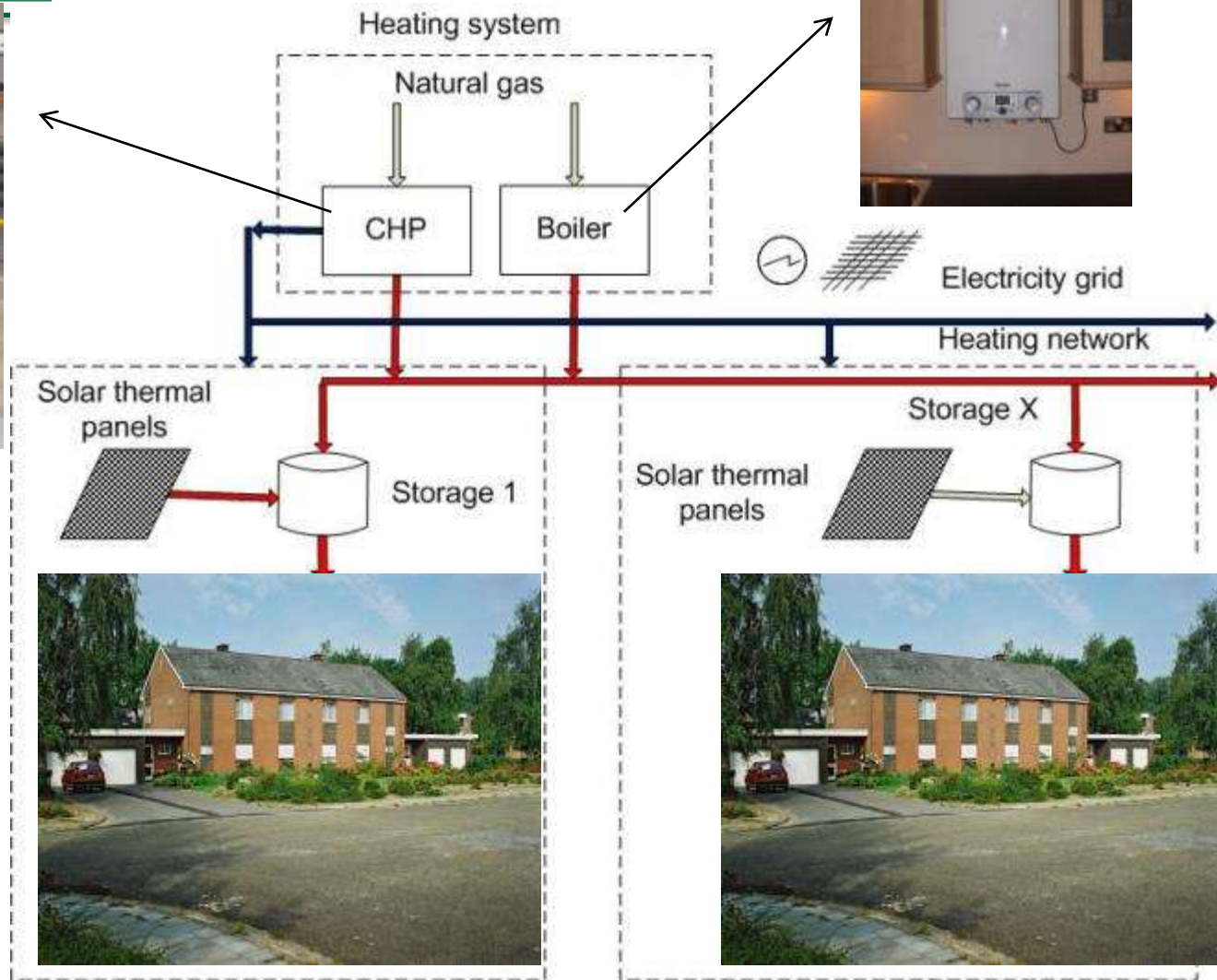
The Resilient project – case Hasselt

- Demosite = Social housing compound

Refurbishing of buildings
+
innovative energy system

- Refurbishing: not the scope of this project
- Energy system:
 - CHP
 - Solar thermal
 - Local buffering in boilers
 - Smart meters
 - ICT to tie it together

Case Hasselt



Building 1

Building X



The Resilient project – case Cardiff

- Demosite = Brownfield development

Rebuilding of houses and shops
+
innovative energy system

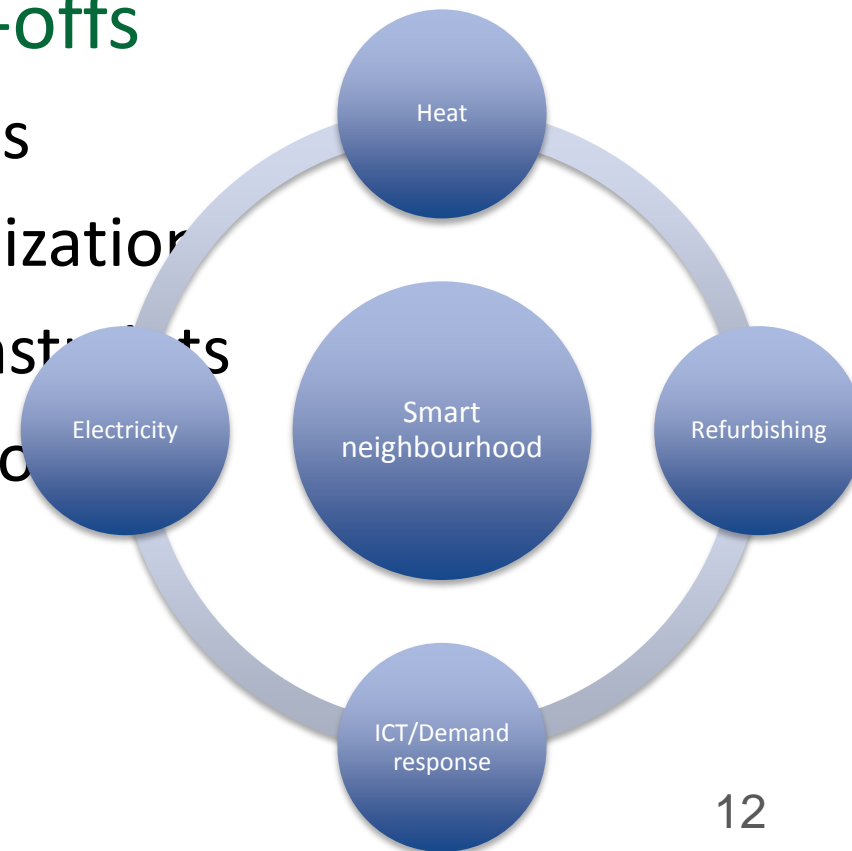
- Energy system:
 - CHP
 - *Central* underground buffering
 - *PV*
 - Smart meters
 - ICT to tie it together



Agenda

1. Integrated energy districts
2. The Resilient project
3. Lessons learned
4. Challenges ahead

- The case for DHC alone is very hard
- Integration means trade-offs
 - Marginal cost of measures
 - Thermal or electric optimization
 - Huge socio-economic constraints
 - Second best partial solutions



- Coordination vehicle is needed
 - Cooperation, ESCO,...
 - Cost allocation, profit sharing
 - Legal/regulatory hurdles
- Support schemes necessary during introduction



Lessons learned

- The end user may not like 'smart'
 - Transparency
 - Simplicity
 - Robustness



Agenda

1. Integrated energy districts
2. The Resilient project
3. Lessons learned
4. Challenges ahead

- User involvement
 - Social housing
- Economic constraints and technological possibilities
 - Fixed budgets
 - Limited individual spending power

- Grasping the broader context
 - Energy poverty
 - Other uses of the technology
 - Transferability
- Making it sustainable
 - Permanent legal framework
 - Validate positive business case



Annex



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 7.10.2009
COM(2009) 519 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Investing in the Development of Low Carbon Technologies (SET-Plan)

(SEC(2009) 1285)
(SEC(2009) 1296)
(SEC(2009) 1297)
(SEC(2009) 1298)

DEDICATED TO MAKING A DIFFERENCE



EUROPEAN COMMISSION

Brussels, XXXX
COM(2011) 885/2

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Energy Roadmap 2050

(SEC(2011) 1565)
(SEC(2011) 1566)
(SEC(2011) 1569)



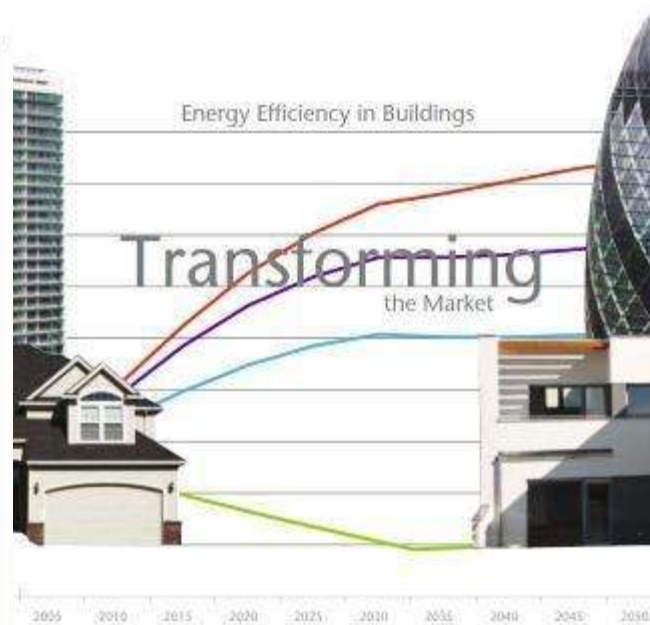
**ENERGY-EFFICIENT BUILDINGS PPP
MULTI-ANNUAL ROADMAP
AND LONGER TERM STRATEGY**
Prepared by the Ad-hoc Industrial Advisory Group

Risø Energy Report 10



Energy for smart cities in an urbanised world

Risø-R-17 (ISSN) November 2011
Edited by Niels Larsen and Lene Sønderborg Pedersen



Risø DTU
National Laboratory for Sustainable Energy



The European Electricity Grid Initiative (EEGI)

Roadmap 2010-18
and
Detailed Implementation Plan 2010-12



May 25th 2010



European Electricity Grid Initiative Roadmap and Implementation Plan
May 25th 2010
Version V1