



Eco-buildings in the CONCERTO initiative

Overview and first findings

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Contents of presentation

Questions

What is going on in other eco-building projects in Europe? Lessons learned?
What must be changed? What are the measured results so far?

Answers?

- Overview on the CONCERTO programme: **facts and figures**
- Challenge of **data collection** and impact assessment
- Overview on **energy performance standards and key characteristics** targeted in buildings (new buildings, renovation)
- Preliminary findings:
 - challenges for new eco-buildings
 - challenges for renovated buildings



Eco-buildings? Standards available

Aspects considered in standards

Ecological and economical aspects, social quality, technical quality, process quality, neighbourhood quality

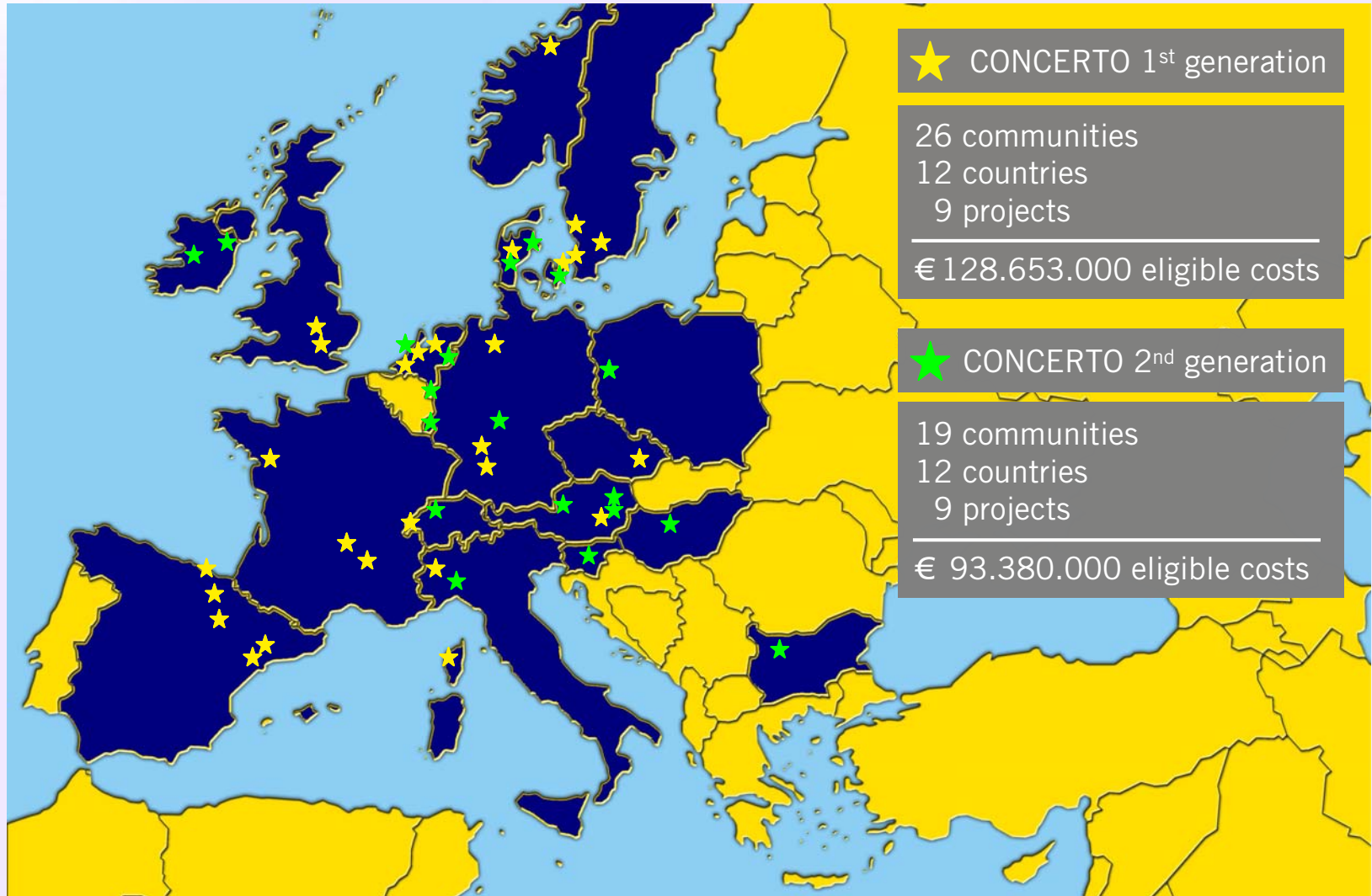
National and international standards (selection)

Country	Standard	Aspects covered
AT	Klimaaktivhaus Kriterienkatalog	Ecological aspects
DE	Passivhaus Deutsches Gütesiegel für Nachhaltiges Bauen	Energy aspects All aspects included
F	HQE	All aspects included
UK	BREEAM	All aspects included
US	LEED	All aspects included

CONCERTO

- Energy performance targets defined in relation to **national buildings codes**
- Contribution from **renewable energy sources** (RES)
- **Integration** of RES and energy efficiency measures
- International standards not requested: importance of assessment and cross comparisons

Key figures about CONCERTO



Delft, Amsterdam (NL): urban regeneration



Delft, Poptahof (Woonbron)



Amsterdam, Complex 40 (Far West)

Falkenberg (S): new housing

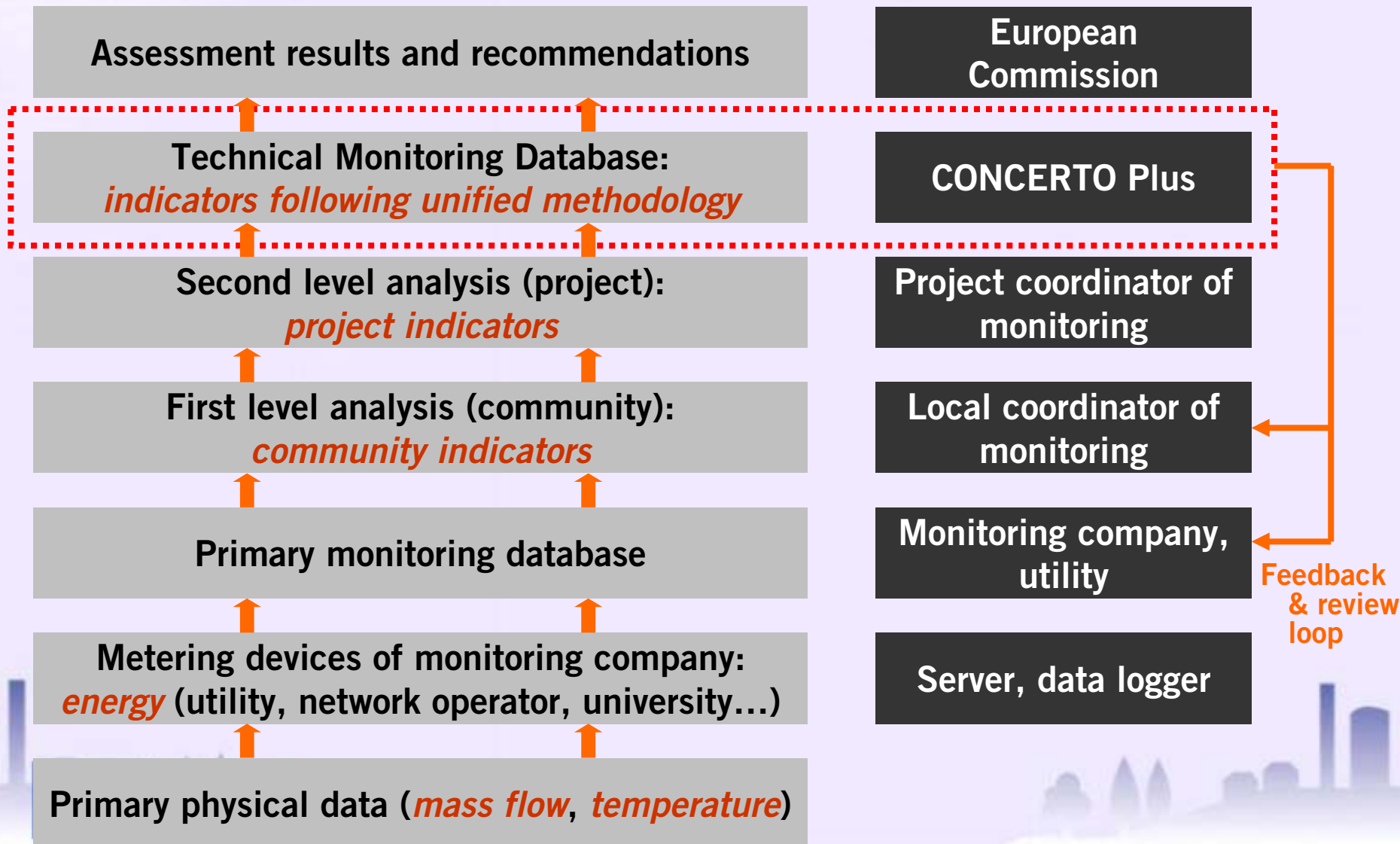


Falkenberg, Herting Gards (FABO)

Lyon (F), new urban development

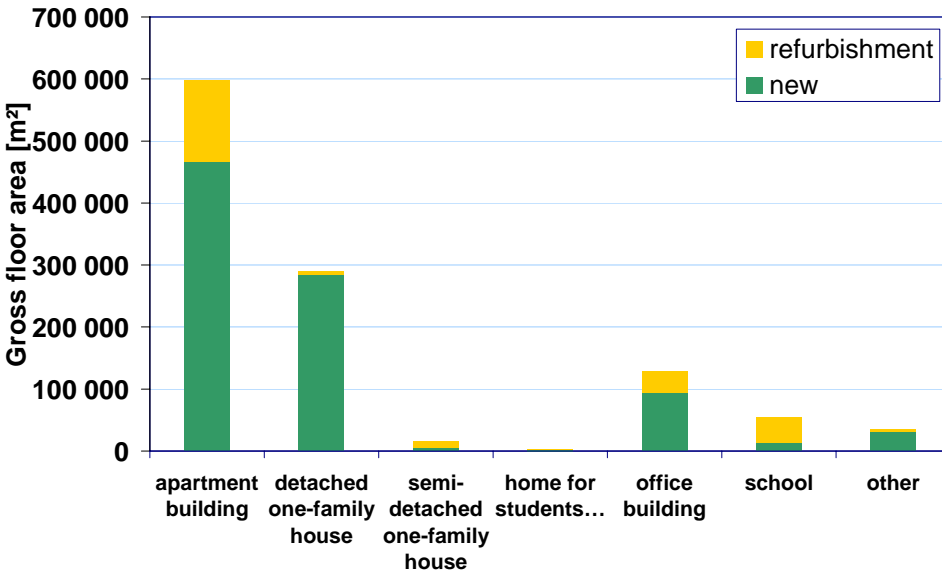


Data flow in monitoring and assessment process



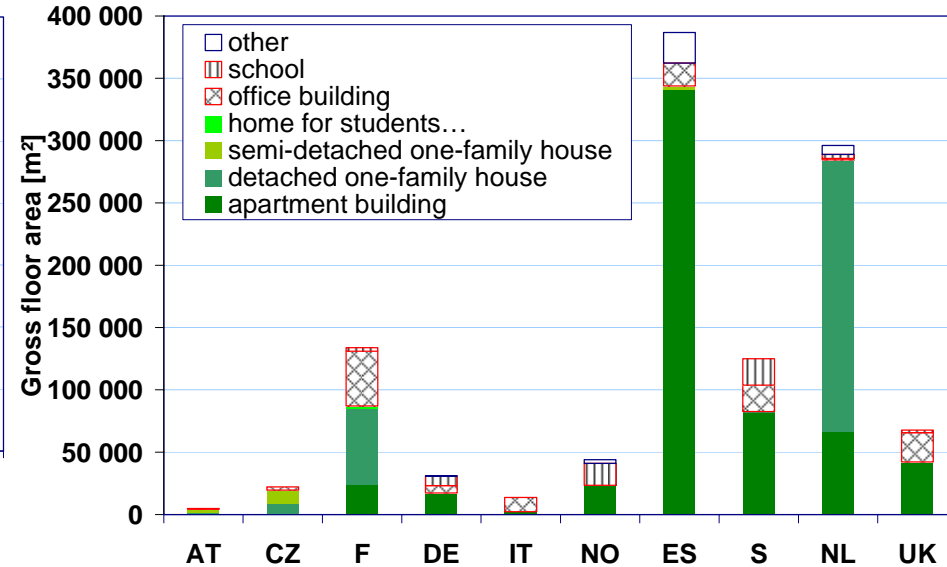
Statistics on buildings included in the initiative

Overview on the building activities **planned** in the CONCERTO (26) initiative



Building type distribution

900.000 m²_{GFA} **residential** buildings
 120.000 m²_{GFA} **office** buildings
 80% **new** buildings
 20% **existing** buildings



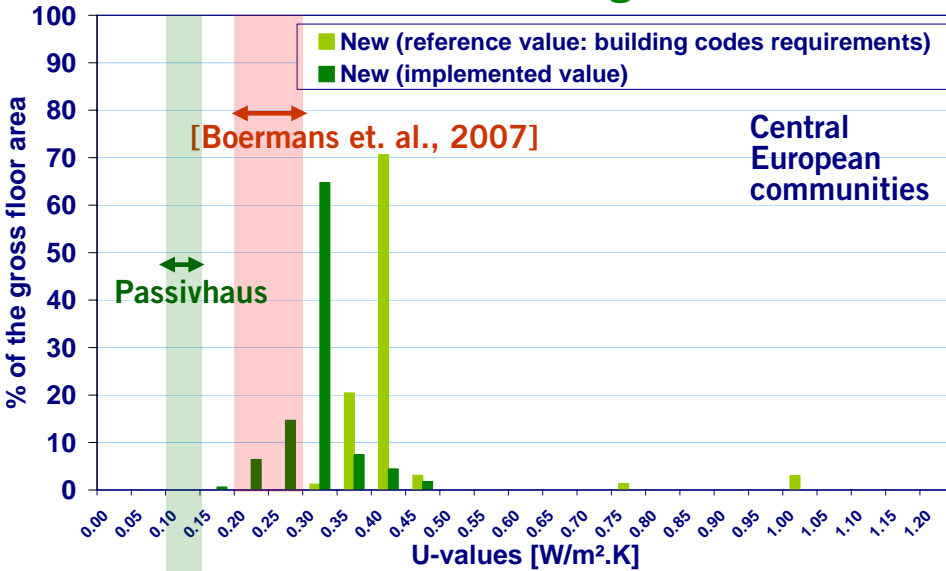
Building type distribution by countries

Current implementation status (summer 09)
 - ca. 190.000 m²_{GFA} buildings refurbished
 (ca. **50% of targeted renovations**)
 - ca. 270.000 m²_{GFA} new buildings
 (ca. **20% of targeted new constructions**)

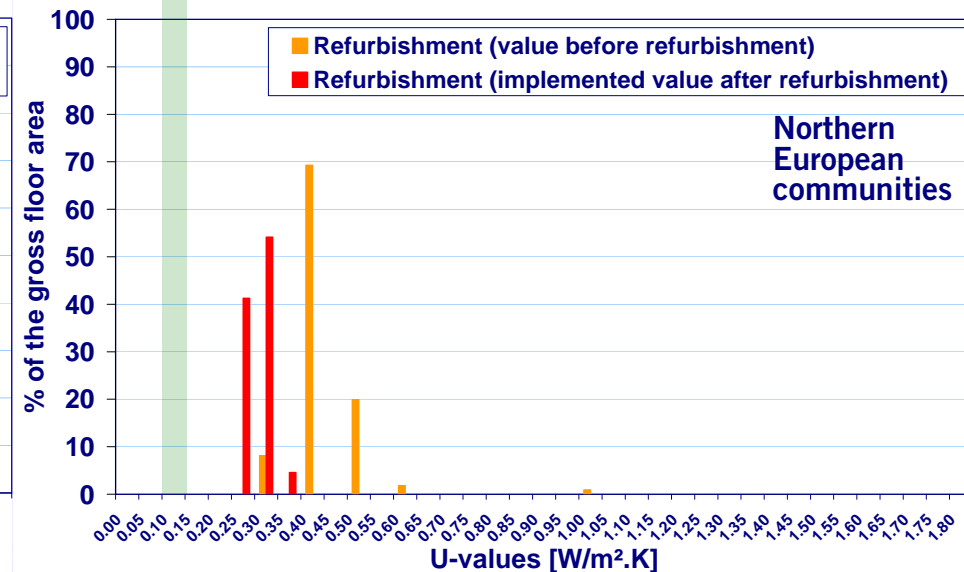
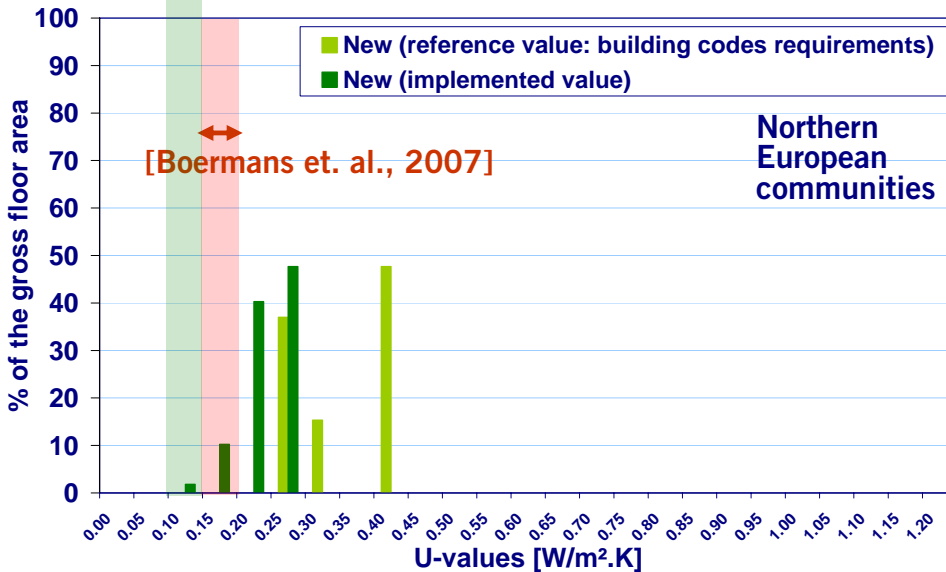
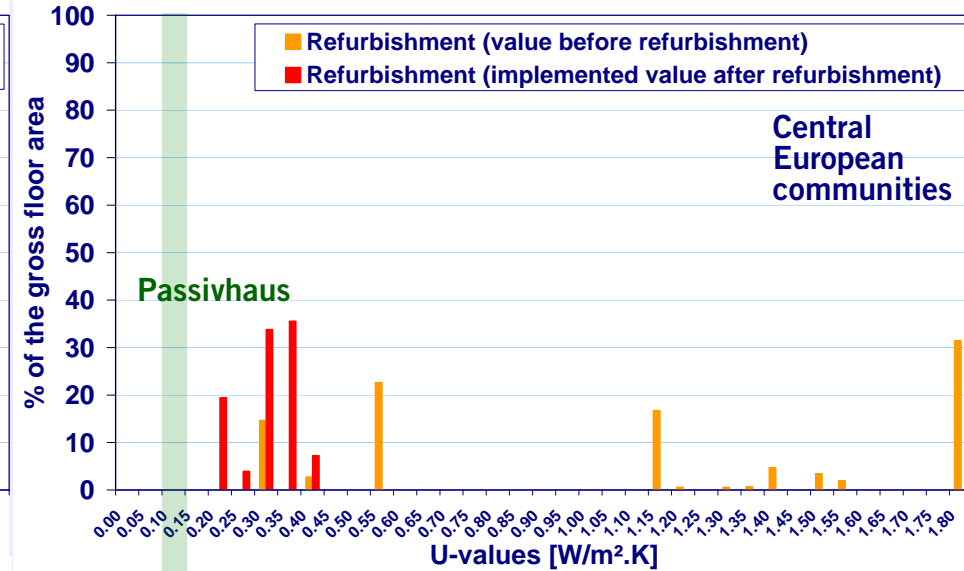
U-values of external walls

Distribution among CONCERTO communities

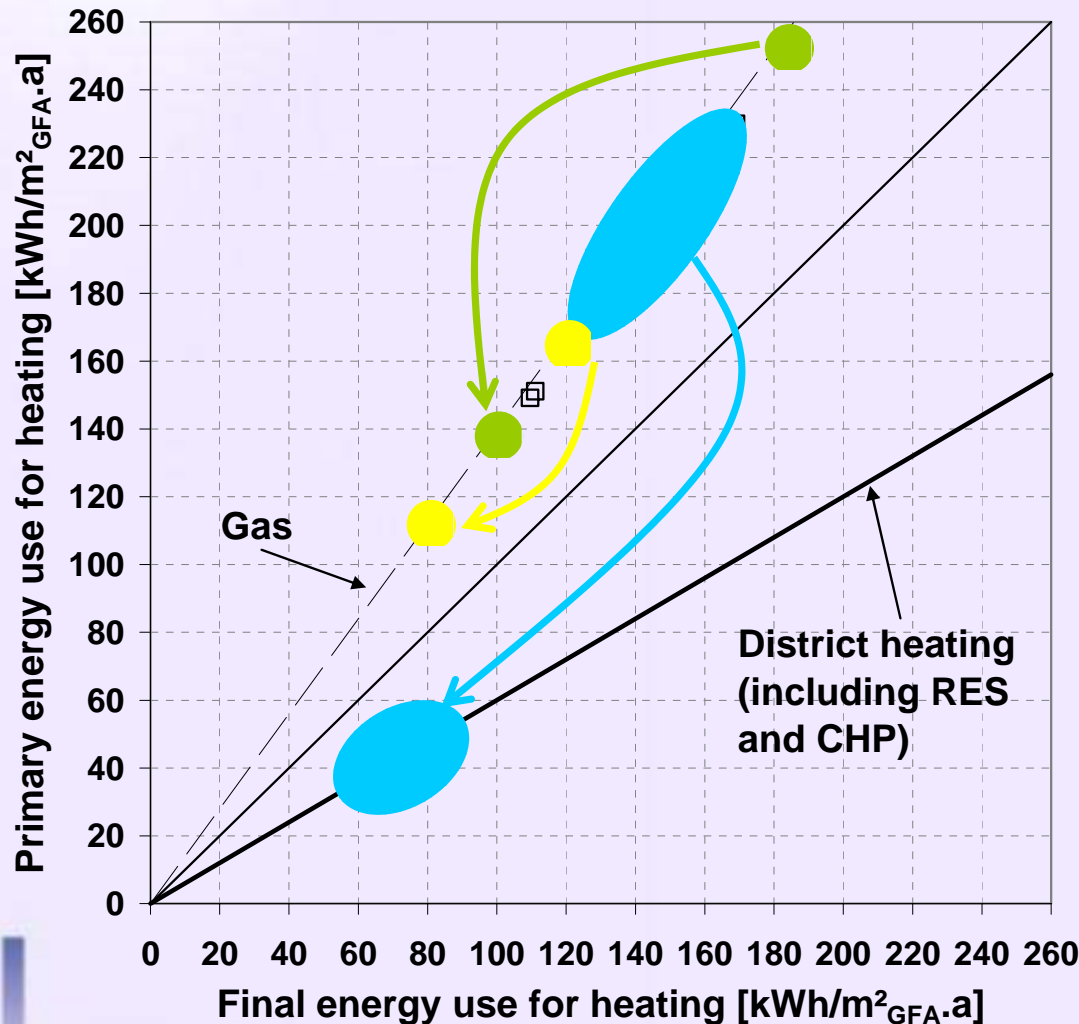
New buildings



Renovation



Use of RES in energy efficient buildings: first step towards eco-buildings



- Hanover, before renovation
- Hanover, after renovation
- Amsterdam, before renovation
- Amsterdam, after renovation
- △ Turin, before renovation
- ▲ Turin, after renovation
- Primary energy factor = 0,6 (district heating)
- Primary energy factor = 1
- Primary energy factor = 1,4 (gas)

Preliminary findings

new buildings from a technical point of view

Target values for **new buildings** (performance of **single components**) **reached** in general:

- relatively “modest” standards (better than national building codes, but few passive houses)
- **construction** process **quality: challenge** in many communities (new training programmes for site workers in France)
- RES contribution:

Application	Group of technologies used
Heating	<ul style="list-style-type: none">- District heating with a high share of RES or heat from CHP in most cases (including some Southern European communities)- Decentralised/individual solutions (solar thermal, heat pumps, individual biomass boilers) mainly in rural/low density areas- Semi-central solutions (large biomass boilers, mini CHP) in few cases
Cooling	<ul style="list-style-type: none">- Few applications of absorption cooling, one example of lake water use (Geneva)
Electricity	<ul style="list-style-type: none">- Mainly photovoltaics

- energy use monitoring: work in progress, first results are encouraging (Falkenberg...)

Preliminary findings refurbishment from a technical point of view

Only **few examples** of **comprehensive renovation** measures leading to high energy performance standards:

- “exceptional” comprehensive renovation measures implemented in unoccupied conditions (high costs, limited replicability)
- highest effort made in Central European communities: CONCERTO funding is combined with local and national funding (Hanover: 22% of the total costs are covered)
- first experience in Southern European communities: only **partial renovation measures** are implemented (low funding rate)
- gaps between measures planned and actually implemented:
 - district heating connection **not** implemented as planned in some few cases
 - **partial renovations** implemented in many cases (in particular for one-family houses)
 - ventilation systems: **no** supply and exhaust ventilation system with **heat recovery**; mostly exhaust ventilation units, sometimes in combination with exhaust air heat pumps

Planning and implementation new urban development

Challenge:

- Set ambitious energy performance requirements
- Implement optimised community energy systems (few examples: Cerdanyola)

Energy performance setting?

Role of municipality and/or urban development companies in defining requirements at different levels:

- in terms of **percentage improvements** compared to the requirements of the national building code or in terms of **concrete targets** formulated as maximal energy performance ratings in [kWh/m².yr].
- by requiring a **feasibility study** for a technical solution which is much better than the minimal energy performance requirements.
- by requiring each building developer to be **supported by energy specialists** (design consultancy).
- in few cases, by asking for **concrete technical solutions** to be used (external insulation, supply and exhaust ventilation systems).



Planning and implementation refurbishment

Challenge:

- Large scale renovation activities (high number of buildings renovated)
- High quality renovation (high energy performance level reached after comprehensive refurbishments)

Quantity?

Amsterdam example: **temporary housing renovation** (Far West) overtaking the task of renovating all buildings belonging to different housing associations in “Nieuw West” area (**neighbourhood-driven** approach).

Quality?

Delft/Poptahof example: **decisive role of developer** (Woonbron) in setting rules ensuring a high quality of construction.



New “eco-buildings”:

- Follow-up projects in Northern European communities (e. g. in Falkenberg) demonstrate that the technologies are known and are **accepted in the construction sector** (developers, construction companies...)
- In some countries (e. g. in France): technical solutions known but initial **lack of experience** in construction companies (important contribution of CONCERTO)
- **Challenge of monitoring**: actual building performance still under assessment

Building renovation:

- **Few comprehensive** renovation projects

Complexity of implementation mechanisms is a characteristic of the whole CONCERTO initiative and is a reason for the long time necessary to realise ex-post assessment.

Main challenge: access good quality data



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General information on the CONCERTO initiative

www.concertoplus.eu

