

## Diversity of Solutions for Different Regions of Europe

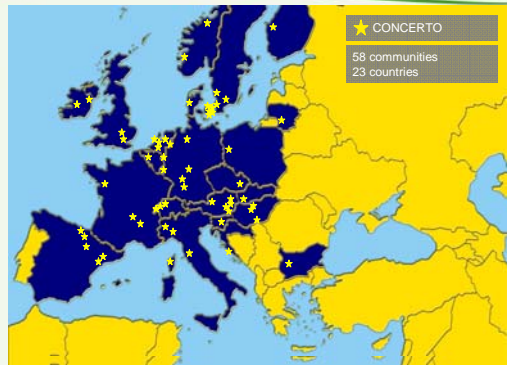
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cRRescendo confeRRence  
Almere, 13.10.2011


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## The CONCERTO Initiative



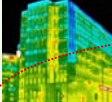
★ CONCERTO  
58 communities  
23 countries




## The CONCERTO Initiative

Integrating **multiple technologies** and a **combination of measures**:


Energy efficiency



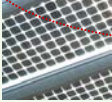
Renewable Energy




Polygeneration




INTEGRATIVE APPROACH




Research



Monitoring



Training



## The CONCERTO Initiative

**Integrating all aspects** - CONCERTO cities and communities work together to create and implement innovative solutions


They are

- bringing together **all key actors**
- **designing and retrofitting high performance buildings**
- integrated in an **intelligent energy management system**
- **monitoring and analysing energy performance and emissions' savings**
- **monitoring the social, environmental and economic benefits**




## The CONCERTO Initiative

- Assesses implementation through **technical and socio-economic monitoring** activities
- Analyses **planning and implementation** mechanisms
- Derives recommendations for **policy frameworks**



## CONCERTO Plus / CONCERTO Premium

- The evaluation of the first 9 projects has been realised by CONCERTO – Plus (Lead: Austrian Institute of Technology)
- The evaluation of the next 13 projects will be realised by CONCERTO – Premium (Lead: Steinbeis-Europa-Zentrum)



## CONCERTO in Figures



### Funding

Total eligible costs (CONCERTO 1&2):	ca. 222.000.000 EUR
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### Energy efficiency

	new	refurbishment
Residential	770.000 m <sup>2</sup> <sub>GFA</sub>	300.000 m <sup>2</sup> <sub>GFA</sub>
Non residential	109.000 m <sup>2</sup> <sub>GFA</sub>	69.000 m <sup>2</sup> <sub>GFA</sub>

### Energy generation

Installed PV capacity (large scale)	ca. 2,1 MWp
Installed PV capacity (small scale)	ca. 0,9 MWp
Installed CHP-el	ca. 18.600 MWel
Installed CHP-th	ca. 15.600 MWth

## CONCERTO Initiative – General Results



### Quantitative results:

- **530,000 tons of CO<sub>2</sub>** emissions reductions per year
- **1,830,000 m<sup>2</sup>** built to ambitious energy performance standards
- **5.2 million people** live in CONCERTO cities; **570,000 people** affected by CONCERTO activities
- **20%** reduction in electricity use; **30%** reduction of heating energy use

## CONCERTO Initiative – General Results



### Qualitative results - Citizens in CONCERTO cities

- are **positive about the effects** of the proposed developments
- foresee the **stimulation of the local economy** through new services, the possibility for new jobs, increase in the regional attractiveness, etc.

## CONCERTO communities

### Challenges and factors of success

Results from CONCERTO Plus

## How Did Communities Succeed in...



1. Planning process and implementation process
2. Overall energy performance
3. Integration of renewable energy sources and energy efficiency
4. Socio economic impact

## 1. Planning and implementation process



### a. Scoping the project – setting the objectives

#### Gaining the residents' acceptance

*CONCERTO experience:*

- strong identification of the inhabitants
- conducting initial consultations with inhabitants when planning building improvements
- information campaigns and surveys even before the demonstration activities start
- neighborhood development programmes
- define sustainability targets (eg Sustainable Energy Action Plans on a city scale )

**1. Planning and implementation process**

**a. Scoping the project – setting the objectives**  
**Gaining the residents' acceptance**

*Success factor:*

- 'one size fits all'? No!
- take into account the individual characteristics of the city
- level of centralisation or decentralisation of a country is the foremost element playing a role in the decision process

**1. Planning and implementation process**

**b. Involving the relevant actors from the start – a prerequisite for success**

*CONCERTO experience:*  
 Stakeholders involved in CONCERTO communities

Stakeholder Group	Public/public owned organisations	Private organisations
Local/regional authorities	32	0
Funding organisations and energy agencies	12	1
Energy supply companies	11	9
Research and consultancy	16	16
Building developers	17	14
End users, associations of tenants/owners	17	0

**1. Planning and implementation process**

**b. Involving the relevant actors from the start – a prerequisite for success**

*CONCERTO experience:*

- Local and regional authorities:
  - public authorities coordinate the entire planning process
- Energy agencies:
  - collaborate with or act as consultants to local authorities and other stakeholders
  - Combine technical, economic, and social and communication expertise
- Funding bodies:
  - Generally contribute a substantial portion of funds necessary to support energy-efficient building initiatives

**1. Planning and implementation process**

**b. Involving the relevant actors from the start – a prerequisite for success**

*CONCERTO experience:*

- Energy suppliers:
  - energy supply companies and municipal utility providers are almost evenly divided between the private and the public sector
  - working in conjunction with municipal utility companies and private energy supply companies to produce consensus findings strongly advised before starting activities
  - avoid and minimise any future barriers
- Developers and building owners:
  - responsible for the designing and constructing the buildings and facilities
  - housing associations play an important role in promoting energy efficiency and the use of renewable energy sources in their buildings as they typically build, own and operate buildings

**1. Planning and implementation process**

**b. Involving the relevant actors from the start – a prerequisite for success**

*CONCERTO experience:*

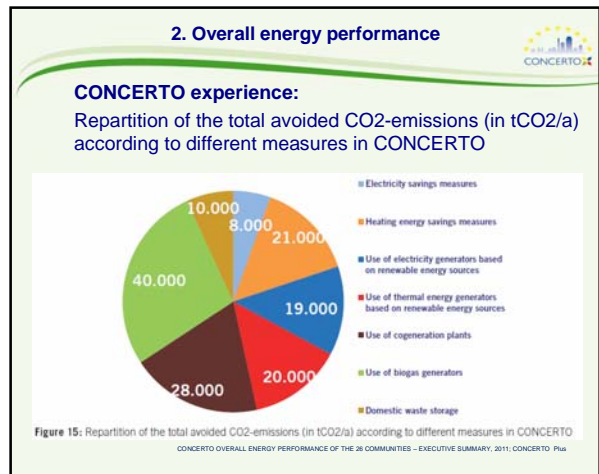
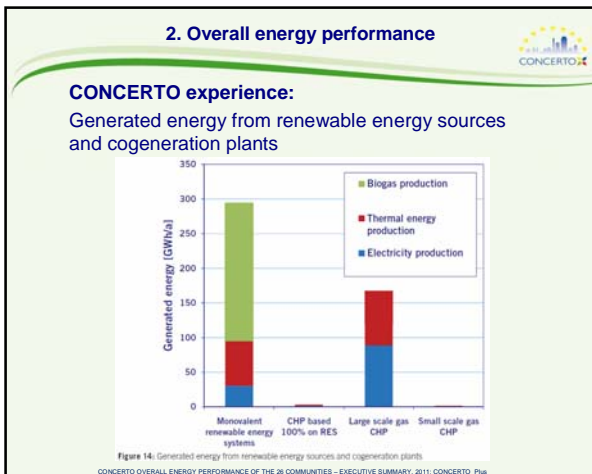
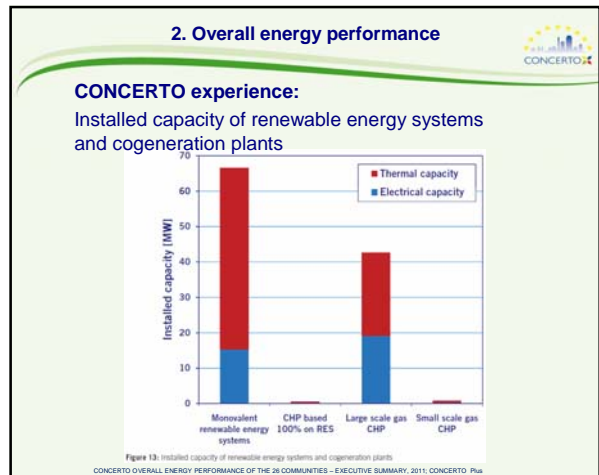
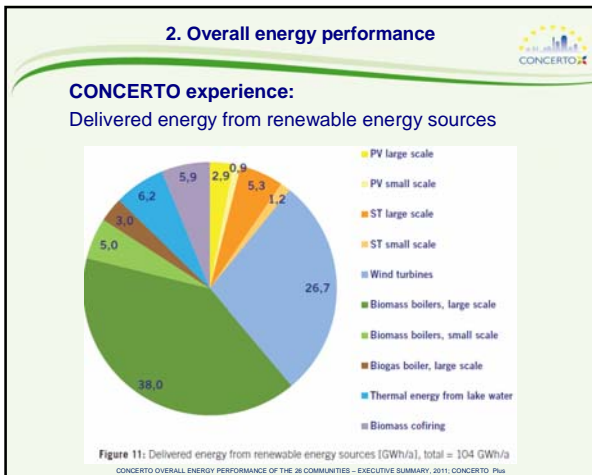
- End users (residents' associations and facility managers)
- Public-private partnerships (PPP):
  - can be very beneficial, through combining and sharing public and private sector budgets, skills, knowledge and expertise
  - PPP's achieve innovation and diversity in the provision of public services

**2. Overall energy performance**


**CONCERTO experience:**  
 Installed capacity of renewable energy technologies (MW)

Technology	Capacity (MW)
Thermal energy from lake water	16.2
Biomass boilers, large scale	18.8
Biomass boilers, small scale	3.5
Wind turbines	11.5
ST large scale	9.3
ST small scale	2.5
PV large scale	2.9
PV small scale	0.9
Biogas boiler, large scale	1.0

Figure 10: Installed capacity of renewable energy technologies (MW), total = 67 MW



## 2. Overall energy performance



**CONCERTO experience:**  
**Cities and communities should follow a triple approach:**


**1) The city approach**  
large scale biogas generation plants, wind turbines, gas cogeneration plants and waste incinerators → highest amount of avoided CO<sub>2</sub>-emissions

- take into account existing energy infrastructure characteristics
- Combining these supply-side measures with a target-group centered approach

→ very effective way to implement measures covering entire municipal areas

BUT: not sufficient enough to guarantee a sustainable urban energy system development

## 2. Overall energy performance



**CONCERTO experience:**  
**Cities and communities to follow a triple approach:**

**2) The new-neighbourhood approach**

- neighbourhood planning should always be done in a way to minimize energy use
- combination new neighbourhood approach with the city approach is crucial

**3) The existing neighbourhood approach**

- highest savings in CONCERTO:
- thermal renovation measures **combined** with
- supply-side measures eg connection to district heating infrastructure, construction of a heat distribution network in the neighbourhood to distribute heat from small-scale CHP or biomass boilers


### 3. Integration of renewable energy sources and energy efficiency

**CONCERTO experience:**  
**a. Combination of RES measures implemented in new neighbourhood development projects and neighbourhood renovation projects**

- Photovoltaic
- Large scale solar thermal connected to district heating
- Solar thermal
- Wind power plant
- CHP
- Polygeneration power plant
- Ground coupled heat pump
- Absorption chiller
- Co-firing of biomass in existing CHPPellet boilers
- Storage of domestic waste
- Biomass boilers connected to district heating
- Biogas CHP plant connected to district heating


### 3. Integration of renewable energy sources and energy efficiency

**Integration of solar thermal collector:**



Solar Island Almere

**Roof integration:**



Stadium in Grenoble  
 Amorbach neighbourhood in Neckarsulm

### 3. Integration of renewable energy sources and energy efficiency

**Façade integration:**



KECO-building in Neckarsulm  
 Soair air collectors in Falkenberg (Vaxthuset neighbourhood)

**Shading or projecting roof:**



Park house in Nantes  
 Columbuskartier in Almere)

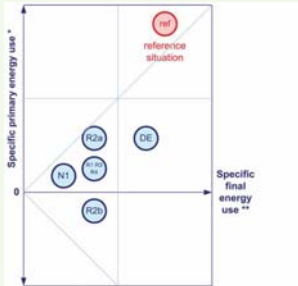
### 3. Integration of renewable energy sources and energy efficiency

**CONCERTO experience:**  
**b. Demand-side EE renovation measures implemented:**

- Thermal insulation of outside walls
- Thermal insulation of roof or upper slab
- Replacement of windows
- Improvement of air tightness
- Replacement and adaptation of heating/cooling systems in building

### 3. Integration of renewable energy sources and energy efficiency

**CONCERTO experience:**  
**Performance improvements by applying different scenarios**



**R1 Building renovation +** district heating + photovoltaic  
**R2a Building renovation +** natural gas + photovoltaic solar thermal  
**R2b Building renovation +** onsite CHP + photovoltaic  
**R3 Building renovation +** biomass decentral + photovoltaic  
**R4 Individual housing renovation +** individual heating + photovoltaic / heat thermal  
**N1 New neighbourhood +** individual heating from RES district heating + photovoltaic  
**DE New or extended distri** energy systems + selecting buildings for better connectivity

\* non-renewable part of primary energy  
 \*\* addition of electricity and heating energy use

### 3. Integration of renewable energy sources and energy efficiency

**CONCERTO experience/added value:**  
 –No “one size fits all”  
 –a CONCERT of combinations

#### 4. Socio economic impact



##### CONCERTO experience:

###### 1. Designing socio-economic activities and measuring success

- From the beginning, concepts have been clearly defined, comprehensive and tailored to the specific characteristics of the project
- Implementation of measures affecting residents have been communicated
- residents have been informed and involved in the activities from the outset and throughout all phases of the project,
- Information campaigns and surveys were started even before the demonstration activities began (especially for renovation projects)

#### 4. Socio economic impact



##### CONCERTO experience:

###### 2. Refurbishment in low-income areas

- Participation as a key method
- Residents identifying with the refurbishment activities
- A balance between correct management of public real estates and sustainability of the costs for low-income households.

#### 4. Socio economic impact



##### CONCERTO experience:

###### 3. Triggering householders' energy behaviour

- identify with their district (CONCERTO area) and are proud to live or work there
- appreciate the changes brought about by the CONCERTO initiative
- are satisfied with the better image of the district / block of flat
- welcome the higher comfort levels
- are positive about the perceived effects and planned measures because of expected overall economic benefits
- value the CONCERTO measures because they enable improvements in the image of the district and help enhance the sense of place and quality of life

#### 4. Socio economic impact



##### CONCERTO experience:

###### 4. Coping with the environmental and economic dimensions;

###### stakeholders

- appreciate improvements in the quality of life and the reduction in their environmental footprints through CONCERTO measures
- perceive a certain stimulation of the local economy through new services, the possibility for new jobs, increased skills through local training measures, increase in the local control of energy
- appreciate CONCERTO measures as means to improve or enhance the image and standing of the district and hence increase the property value and local appeal. These factors may help attracting new investment

#### Main conclusions:



- there is no „one size“ fits all
- a „CONCERT“ of combinations

#### Thank you for your attention

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