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D0.11 cRRescendo P3 summary

CONCERTO INITIATIVE cRRescendo

Combined Rational and Renewable Energy Strategies in Cities, for Existing and New Dwellings and Optimal quality of life

Instrument: Integrated Project
Thematic Priority: Integrating and Strengthening the
European Research Area (2002-2006), Sustainable
Energy Systems

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1. PUBLISHABLE EXECUTIVE SUMMARY

cRRESCENDO P3: 2007-2008

1.1. VISION AND GLOBAL OBJECTIVE OF cRRESCENDO

By the end of 2010, 15,000 people will live in modern, comfortable, healthy and energy-efficient homes due to the well-orchestrated sustainable developments of the metropolitan areas of Almere, Milton Keynes, Viladecans and Ajaccio. The first three cities are new-towns close to a capital (Amsterdam, London and Barcelona respectively, while Ajaccio is the historic capital of the isle of Corsica. cRRescendo aims to integrate a major share of sustainability into 5,000 new and existing homes and their energy infrastructure in order to demonstrate the possibility, feasibility and most importantly to meet the citizens' wish to live in a comfortable energy efficient home in a healthy and clean environment.

After some delay in the start of the project, the cRRescendo project was well on its way to be on track in the second year. At the end of the second year though it became clear that the crisis in the American mortgage market, was also causing project developers to be cautious in Europe. Nevertheless first promising realizations in Almere had started in the second project year P2.

After the third project year P3 the partners in cRRescendo are convinced that the ambition of cRRescendo is still within reach.

In principle cRRescendo brought the level of activities in several work packages down during the third year and spread these activities out over two years. At the same time an amendment was proposed to have a prolongation of the project with one year to accommodate this delay. In the meantime in P3 alternative opportunities were developed in the cities to compensate for the possible loss of ambition in the original project due to the consequences of the mortgage crisis. During the third year it was clear that the mortgage crisis was becoming a housing market crisis in Europe, first in Spain but then also in the UK. It seemed that the housing market did not substantially affect the market in Almere nor Corsica (situation summer 2008).

In this third year cRRescendo developments and preparations were continued in all four cities, while in Almere all major demonstration activities arrived in the realization phase.

Ajaccio is now ready to enter the realization phase in the next project year.

Regarding the application of (large scale) renewable energy in Almere the ground work of the SolarIsland was almost ready in summer 2008 (to be ready autumn 2008). Also three phases of the district heating were ready, while the infrastructure is to be completed in the next year. Regarding the sustainable building activities: 100's of Eco-houses have been delivered in NoorderPlassen-West while the realization of Eco-houses and Solar-Houses in Columbuskwartier have started (first Solar-House was ready around summer; official opening 6th November 2008).

In Milton Keynes the CHP has been realized. The building of houses is delayed.

In Viladecans the Daycare Centre was at the last stage of realization. The building of houses is delayed.

Afterword.

Just after the third project year, in August 2008 the housing market crisis had a deeper impact on the demo's in UK, than thought before. Then since September 2008 the housing crisis became a global financial crisis, with unknown consequences for cRRescendo. Due to the financial crisis especially the demonstrations of ecobuildings are strongly affected. It seems promising that realizations of ecobuildings in Almere and preparation of renovation activities in Ajaccio nevertheless have continued as planned. During our PCC meeting (November 2008), the city coordinators and work package leaders were convinced that with intensive re-planning of actions it is still possible to

realize much of the original ambitions. It may be necessary to incorporate opportunities such as to built less houses but to raise the Concerto level (e.g. to built 'passive houses').

1.2. DEMONSTRATION ACTIONS

Almere (NL)	reduction in conventional energy consumption: 48%
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Almere, a fast growing new town with over 180,000 inhabitants east of Amsterdam, is since long committed to sustainable development. Lately this commitment is renewed in the so-called Almere Principles. The two major new cRRescendo communities in Almere's new districts NoorderPlassen-West and Columbuskwartier will comprise 2,000 Eco-homes and a number of commercial and public buildings and affect 5,000 people. The measures will save 48% on conventional energy in a well-balanced mix of:

- Renewable energy supply by means of a Solar Island of more than 1.5 hectares with 7000 m² of solar collectors and 99 kW PV systems;
- Energy efficiency in buildings in the form of 2000 Eco-houses and certified 'Solar Homes', and increasing energy awareness of occupants;
- Poly-generation by connecting all buildings in NoorderPlassen-West to district heating fed by an existing CHP and the Solar Island, feeding this district heating infrastructure;
- Poly-generation by connecting all buildings in Columbuskwartier to a new district heating infrastructure and CHP of the Diemen Centrale with 100% of the electricity used in Columbuskwartier being produced by renewable sources (green electricity).

Special attention is given to specific innovations, such as:

- Integration of RES and RUE in city planning, area-development, public tendering, architecture and building;
- Architectural integration of PV in the built environment;
- Large-scale implementation of certification scheme for Solar Homes.

Objectives third year, work performed and results achieved

The objectives for this project period are:

- the finalizing of contracts between city Almere and energy company NUON as well as between Almere and real estate developers;
- the extension of the district heating systems in the two districts
- the start of the realization of the 6.900 m² Solar Island by Nuon;
- the design and start of the realization of Eco-houses, Solar-Homes and Passive Houses by real estate developers and private house builders;
- to carry out other RE measures (such as PV solar on houses);
- to help build up two sustainable communities.

In line with these the following activities have been done and results have been reached in P3:

- the signing of all contracts between Almere and NUON and Almere and real estate developer;
- to make an agreement on a sustainable solution for the heat and electricity supply of Columbuskwartier;
- the phased delivery of the district heating system extensions;
- the design and start of the Solar Island by Gemeente Almere and NUON;
- the design and start realization of all Eco-houses and a substantial part of the Solar-Houses by real estate developers, including the first deliveries of Eco-houses;
- to work increasingly with private developers and to enhance the role of citizens in the building process and support them. A paradigm shift towards more private development is taking shape in the Netherlands. This has as a result increased the

number of challenges in the cRRescendo project. It means that a much more diverse target group has to be reached;

- to enlarge the cRRescendo area if necessary.

Milton Keynes (UK)	reduction in conventional energy consumption: 38%
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The long reputation for innovation in energy of Milton Keynes, a new town in the London area with 215,000 inhabitants, is connected to the vision to create a sustainable community with true integration of environment and socio-economic factors. In cRRescendo some 3,800 people in 1,800 homes in the new Sustainable Residential Quarter will benefit from a balanced combination of RUE and RES, saving 38% on conventional energy use. The measures implemented are:

Renewable energy supply (RES)

- Biofuel CHP plant (75 kWe/150 kWth);
- PV systems on 20% of the roof space (375 kW).

Energy efficiency in buildings (RUE)

- 1790 apartments plus 8 tertiary buildings with improved insulation, air-tightness and ventilation with heat recovery to reduce heat demand with energy savings from 34-49% above standard;
- Water-conserving fittings to reduce domestic hot water consumption;
- Thermal system (heat recovery system from cooling) to provide pre-heat for space heating in the dwellings above when cooling for base load purposes in the winter [e.g. server room or superstore cooling], or pre-heat for hot water throughout the year for use of reject heat from buildings with a cooling load;
- Ground source heat pumps expected to be 5 with combined capacity 4.7 MWth for inter-seasonal storage.

Poly-generation

- Biomass boiler (1080 kW) and small scale gas-fired CHP (1413 kWe/1505 kWth).

Integration of RES and RUE

- Integrated design and construction of environmentally responsive buildings with integrated RES and RUE measures;
- Create Ecobuildings with integrated RUE/RES saving a further 27% CO₂ per year.

Specific Innovations

- The operation of the renewable energy, Combined Heat and Power (CHP - gas-fired and biomass) and ground source heat pumps will be conducted using an Intelligent Energy Management System to optimise the energy consumption on both supply and demand sides;

Objectives third year, work performed and results achieved

The objectives for this project period are:

- Monitor activities related to original energy concept and strategy and provide management and technical support to ensure optimum delivery. Complete feasibility study for building-integrated wind generation.
- Feasibility Study and commitment for CHP Phase 1 Extension; commence detailed de-sign.

- Complete detailed design, obtain planning permission and prepare for construction for B4 Phase 1 and school developments.
- Negotiations for contracts / leases for site B4 Phase 1 between Developer - EP and Developer - ESCo. Contract negotiations for CHP Phase 1 Extension between EP - ESCo.
- Facilitate implementation of technical monitoring systems.

Work performed & results achieved

For most of Period 3 there was good progress in developing the demonstration project proposals. The developer for B4 Phase 1, Places for People (PfP), and MKC developed their detailed design proposals for the residential and school buildings and were granted Planning Permission. The CHP Phase 1 was operating consistently, and funding to extend the service was approved.

During the last few months of Period 3, negotiations have continued but progress has been slowed by external economic factors which have disrupted the UK housing market and affected the viability of the project.

The ESCo (Thameswey CMK Ltd) monitored levels of energy supply and demand patterns and used management and technical support to ensure optimum delivery.

Negotiations between EP and Thameswey CMK Ltd (the ESCo) are nearing completion to extend the CHP system/network to serve the Concerto developments and others.

Recently, since the delays to B4 Phase 1, negotiations have concentrated on provision of services to other (non-Concerto) developments.

The two design teams (PfP for the B4 Phase 1 development and MKC for the school) have continued relevant training and knowledge transfer activities to develop necessary design skills for high energy performance buildings

Ajaccio (FR)	reduction in conventional energy consumption: 20%
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Ajaccio, the ancient capital of Corsica with 56,000 inhabitants, is facing the challenges of renewing the urban developments dating from the 1960's as well as renovating buildings in the historic centre. Since 2002, a significant urban renewal program was started by the City of Ajaccio in partnership with ADEME. In cRRescendo, 2,000 people will be affected through energy-conscious refurbishment of 250 apartments of which 50 are part of the protected historic centre of this medieval town; moreover 565 apartments will be the subject of energy efficiency and energy renewable. Furthermore a new office building and a new apartment building will be erected. To save 20% on energy consumption, the following measures will be applied:

Renewable energy supply (RES)

- Solar domestic hot water in all apartments (in total 2040 m²);
- 70 Solar ventilation systems (the locally developed CASA system) in the apartment buildings with a total of 3 kW PV.

Energy efficiency in buildings (RUE)

- Construction of two High Environmental Quality (HQE) new buildings: one building with 15 apartments and one new public service office building;
- Implementation of double-glazing with thermo-coating in all 250 apartments;
- Improvement of the insulation of walls, roofs and ground floors.

Poly-generation

- Heat pump for heating and cooling (75 kWth) in the office building.

Integration of RES and RUE

- Research into innovative methods to integrate solar water systems in the buildings of the historic centre.

Specific Innovations

- Eco-renovation in the old, historic and protected city centre;
- Use of the locally patented CASA solar ventilation system;
- Use of the HQE (High Environmental Quality) scheme in Corsica.

Objectives third year, work performed and results achieved

The objectives for this project period are:

The objectives for this period were to officially complete the national programme of urban renewal which included building Les Cannes' community centre, as well as, setting up a policy dedicated to sustainable development within the framework of the Home improvement programme for the old city centre.

It was planned to start building a council bloc of flats in the old city centre.

Finally, after the signature of the convention between ADEME and the Corsican Region (this convention described the different terms of getting financial subsidies for the production of sustainable and renewable energies for individuals or social housing agencies), plans were: to start an information campaign aiming at the owners in the new district and the old city centre.

Work performed & results achieved:

- Studies with suppliers of a supplementary programme to install PV on roofs.
- Coordination of planning activities for the renovation areas.
- Amendment of the OPAH contract.
- Working out a reply against the appeal regarding the building permit for the council block of flats.
- Following up (monitoring) the instalment of the monitoring equipment for the public services building (community centre). (St Jean).
- Meeting with a local team specially put together for the building of the energy zero HQE public services building.

Viladecans (ES)	reduction in conventional energy consumption: 56%
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Viladecans with 65,500 inhabitants is part of the complex regional web that is the metropolitan area of Barcelona. Since the 1980's, a series of changes is taking place including the integration of the town centre and achieving a certain town consciousness. The cRRescendo project targets to develop 2100 apartments in 50 buildings and 7 non-residential buildings in a sustainable way, affecting about 6400 inhabitants. The following measures will be implemented to save 56% on conventional energy consumption:

Renewable energy supply (RES)

- Solar water heaters for each new dwelling and 7 non-residential buildings, in total 4500 m²;
- 6 kWp PV-system on each building (342 kW);
- Passive solar design.

Energy efficiency in buildings (RUE)

- Extra insulation (walls, roofs, floors, windows) and better air tightness, with energy savings of 50% on heating demand;
- Passive cooling and high efficiency air-conditioners with energy savings of 20%.

Poly-generation

- CHP (1500 kWe + 1875 kWth) for 3000 dwellings. A total of 25% renewable energy renewable energy (biomass and/or wind and/or solar) will be used.

Integration of RES and RUE

- Design and construction of the buildings with integrated RES and RUE measures;
- Create Eco-buildings with integrated RUE / RES saving 4000 tonnes CO₂ per year.

Specific Innovations

- Balanced integration of Eco-building and RES in new development area with extensive public dissemination.

1.3. RESEARCH ACTIONS

Standardised methods will be developed by Ecofys and the University of Oxford to monitor the technical and non-technical issues of the project, in order to be able to improve future replications of the cRRescendo concept.

Technical parameters that will be investigated concern the efficient collection and monitoring of the main energy flows in the projects, such as the electricity, cooling and heating demands in the buildings, but also the electricity supply from each renewable electricity generator and renewable heating system.

The non-technical research activities have the objective to obtain a clear understanding of the socio-economic aspects connected to the sustainability measures in the cRRescendo communities and to deliver basic input for the transition to a sustainable future. Research items will include:

- Influence on occupant behaviour (to what extend does the project have effect on the energy consumption etc), attitude towards RUE en RES and perception of quality of life;
- Influence on local policy (to what extend has the target setting changed);
- Influence on local economy (how can the benefits be measured);
- Processes in decision making (what are the key arguments, actors);
- Marketability (sales time, buyers' interest, space rented) of ecobuildings;
- Cost reduction and added value of energy services.

Objectives third year, work performed and results achieved

Based on the monitoring guidelines, each of the cities has formulated its draft monitoring plan. Once uncertainties in the building plans and process in all of the cities have been removed these drafts will be finalised. This has not happened in this reporting period due to the financial crisis.

Web-based software to collect and process energy usage information of utility buildings (the Enerlyser) has being adapted for cRRescendo purposes (please refer to the Activity

and Management report for further details). Testing with residents of the software has not taken place in this reporting period due to the financial crisis.

1.4. DISSEMINATION ACTIONS

Both internal (between the four partner communities) and external (to associate communities and broad European level) dissemination will be organised. The four cities will work together with suitable umbrella organisations, including the European New Towns Platform, to ensure broad dissemination to peer cities and other stakeholders. The main external activities will be:

- Project website, publicly accessible;
- Newsletter (2 per year);
- Visits of peer community representatives to all four project sites;
- Contributions to events and media focused on the target groups;
- Organisation of an expert seminar in Brussels (by subcontractor: New Towns Platform);
- Final conference for the target groups (authorities, researchers, builders, project developers, architects, etc.);
- Dissemination to citizens / inhabitants on energy conscious behaviour.

Specific attention will be given to the participation of members of female interest groups and the involvement of SME's.

Objectives third year, work performed and results achieved

Internal dissemination and dissemination to peer cities is ongoing, taking shape in workshops, the newly-released internal website (www.crrescendo.net), site visits and peer reviews (the most recent one in Milton Keynes in May 2008).

External dissemination on EU level is being streamlined with Concerto+ activities. Crrescendo has been presented at the Concerto+ visit to Almere. The external dissemination to the citizens of the demonstration cities is on track within the demonstrations.

Several presentations at external events were given and input was given to the Concerto+ actions.

1.5. TRAINING ACTIONS

Training activities within the project take place at two levels.

The EU or national level:

- Associate and peer communities: Two training sessions will be included that will instruct workers in associate and peer communities how to establish sustainable communities in the Concerto spirit (both in a technical and in a political / process sense);
- Actors in the building projects planning process, such as authorities, project developers, housing corporations and architects will be trained to apply sustainable measures and benefit from the lessons learned in organisation, policy and technology aspects;
- Installers and constructors: on technology aspects.

At the community level, within the four demonstration sites, diverse types of activities are carried out, aiming at training of parties involved in the implementation of the demonstration activities to master quality aspects and special technological aspects involved in the implementation of such projects.

Objectives third year, work performed and results achieved

The active associated communities are making their own action plans based on a climate menu training done in P2. Peer review workshops and site visits have been organized.

1.6. PROJECT COORDINATOR

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