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## D0.1h cRRescendo P2 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 P2: 2006-2007

### 1.1. VISION AND GLOBAL OBJECTIVE OF CRRESCENDO

By the end of 2009, over 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 historic capital of the isle of Corsica. cRRescendo aims to integrate a major share of sustainability into more than 6,000 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 taking off in its first year with the realisation of the project organisation, planning of work and intensive re-planning actions in the four cities, CRRescendo is in its second year still working hard on this to realize as much of the original ambitions as possible and even trying to incorporate as much opportunities to go beyond that. One of the reasons is still that because of a delay in the start of the project, the community plans had to be revised. Besides that, especially the demonstrations of ecobuildings are strongly affected by external factors like local and national changes in policies and economic developments like the crisis in the American mortgage market, causing project developers to be cautious. That first realizations nevertheless have started is promising. Therefore, it is the conviction of the people involved, that the targets of cRRescendo can still be within reach.

### 1.2. DEMONSTRATION ACTIONS

<b>Almere (NL)</b>	reduction in conventional energy consumption: 48%
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Almere, a fast growing new town with 180,000 inhabitants east of Amsterdam, is since long committed to sustainable development. The two major new communities in cRRescendo 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 of solar collectors, biomass plant and 99 kW PV systems;
- Energy efficiency in buildings in the form of 1,100 certified 'Solar Houses', 900 other eco-houses and increasing energy awareness of occupants;
- Poly-generation by connecting all buildings to district heating fed by an existing CHP, a new biomass CHP and the Solar Island.

*Integration of RES and RUE* is realised by combining the reduction of heat-demand and sustainable supply and measures on buildings and infrastructure were integrated from the first city planners' sketches as part of the total development.

#### *Objectives second year, work performed and results achieved*

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. The inclusion of sustainability demands however has remained a priority.

Working with the new target group can also be seen as an opportunity. The cRRescendo project might become a real flagship project that inspires millions of homeowners all over the Netherlands. It has yet to be determined however how the new target group is to be integrated into the project.

The construction of the Solar Island is in its phase of preparation. Necessary permits have been granted. The realization is still expected in 2008.

In Columbuskwartier, the objective was to plan the Solar Homes, and as all is going according to plan, the construction can start soon. The first Solar Home designs in Columbuskwartier were ready to be presented for the first test (September 2007). In

addition, a few Passive Houses might be built and the option is currently being investigated. This would be an addition to the Concerto demands.

<b>Milton Keynes (UK)</b>	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 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. For Britain this is a very ambitious project. The measures to be implemented are:

- *Renewable energy supply* through a biofuel CHP plant (75 kWe/150 kWth), PV systems on 20% of the roof space (375 kW) and ground source heat pumps;
- *Energy efficiency in buildings*: 1790 apartments plus tertiary buildings with improved insulation, air-tightness and ventilation with heat recovery, water-conserving fittings, thermal system heat recovery system from cooling of ground floor commercial spaces to provide pre-heat for space heating or hot water and ground source heat pumps for inter-seasonal storage;
- *Poly-generation* through a biomass boiler (1080 kW) and small scale gas-fired CHP (1413kWe/1505kWth) with Intelligent Energy Management System.

*Integration of RES and RUE* is achieved by the design and construction of environmentally responsive buildings with integrated RES and RUE measures.

#### *Objectives second year, work performed and results achieved*

The objectives for the second year were to implement and commission the first phase of the site wide energy network, agree to high performance building designs, and commence intelligence exchange and training.

During the period, the ESCo, Thameswey Central Milton Keynes Limited (Thameswey), completed and commissioned the first phase of the CHP infrastructure, including a gas engine and private wire network, and the service to the first residents has begun. Future phases of Concerto development will connect to the network when in phase with demand and preparations for this have been undertaken: a brief for CHP Phase 2, including biomass, was issued; Thameswey recently submitted their viability study; and a site has been identified for feasibility work.

A developer, Places for People (PfP) has been selected to undertake the first high performance ecobuildings in the Concerto area incorporating building integrated RES and using specifications in excess of European Passiv Haus standards. The development will comprise 650 dwellings, plus ground floor retail/commerce, rising to thirteen storeys. Design development and training activities have been continuing since the appointment of PfP and its specialist team. With the completion of the land acquisition, a planning application will follow soon after the second period.

Design development for the first school has also progressed well; Planning Permission is expected immediately after the second period. Here also the ecobuild standards are high and with the provision of extensive PV, for which negotiations are well advanced, it is possible that this will be the first zero carbon primary school in the UK.

Away from the demonstration project, initial questionnaires and a strategy is in place to enable non-technical research to begin on the first development which has recently been completed in the Concerto area, using it as a base case for comparison with the later high performance buildings. An extensive range of smart meters for technical research has been specified in the PfP development, connected to the CHP installation.

Finally, a successful series of exchanges for training and dissemination has taken place during the period with other cRRescendo communities and with the Sesac consortium, resulting in valuable feedback and experience.

<b>Ajaccio (FR)</b>	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 urban developments dating from the 1960's as well as renovating historic

buildings in the centre. In cRRescendo, 250 apartments will be refurbished in an energy-conscious way, of which 50 are part of the protected historic centre; moreover 565 apartments will be the subject of energy efficiency and renewable energy. 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)* through solar water heating in all apartments and 70 Solar ventilation systems (the locally developed CASA system);
- *Energy efficiency in buildings (RUE)* by construction of two new High Environmental Quality (HQE certification) buildings, implementation of double-glazing with thermo-coating in all 250 apartments and improvement of the insulation of walls, roofs and ground floors;
- *Poly-generation* through a heat pump for heating and cooling (75 kWth).

*Integration of RES and RUE* will be established by research into innovative methods to integrate solar water systems in the buildings of the historic centre.

#### *Objectives second year, work performed and results achieved*

The second period was built on, to develop the national urban renewal programme for Ajaccio's new neighbourhoods. This national programme comprises 2 of the 4 cRRescendo action points.

- The construction of a public service office building in HQE (High Environmental Quality) following researches to reach zero energy, which means, the building produces the energy it needs for its own consumption. A new element has come up which has slowed down the start of the feasibility studies. In fact, a flood risk assessment has been communicated to Ajaccio.
- This assessment has meant that a large part of the land is now unsuitable for building and in particular, the area where the public building would be built. Talks with the state services have led to a positive solution, mainly a building on stilts and a slightly different implantation.
- A strengthened predefined area of twenty odd buildings to be renovated with an infrastructure of more important funding to help co-owners. These buildings are part of the first diagnosis conducted to implant solar equipment.

Two other buildings belonging to social lease holder will equally benefit from these additional funds so as to equip them with double glazing and solar panels. The number of apartments concerned is 143. Feasibility technical studies have started.

At the same time, we are also working on an additional project with regards to renewable energy production. The object of it being to bring a revenue stream to some co-owned buildings, by renting out the roofs of said buildings to install photovoltaic equipment and sell the produced energy to the National Electrical Board

This National programme has been evaluated at 119 million euros and should be definitely approved in January 2008. Its signature will allow us to begin operations financially.

One of the two action points is underway in the town centre: the construction of a social apartment building. An administrative problem had to be solved; part of the land upon which the building is proposed to be constructed is a protected sector where building is forbidden. A classification process is underway. Building permit was applied for in December 2006 and granted in October 2007. Initially, an operation of master engineering assistance was considered to define the HQE strategy and a call for a tender made with financial participation from ADEME. This was aborted as the agreement between ADEME and the Corsican region had yet to be signed. It had been replaced by a task group made of the local cRRescendo team of Ajaccio (the architect and other partners) which defined the strategy.

The construction will be undertaken using an efficient material used for the first time in Corsica on a three storeys building. The Chamber of Trades was associated with this task group, to put into place a building - site school, teaching how to process material building

waste as well as training companies on implementation of material used in the building industry.

Finally the fourth action (10 buildings in the old centre) was put on hold, due to the (at the time) missing signature between ADEME and the Corsican region. The later, signed last November, made it possible for us, from now on; to offer the flats owners of the concerned buildings a precise and global financial help.

<b>Viladecans (ES)</b>	reduction in conventional energy consumption: 56%
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Viladecans with 61,000 inhabitants is part of the complex regional web that is the metropolitan area of Barcelona. The cRRescendo project targets to develop a new eco-district "Llevant" with 2100 apartments (210.000 m<sup>2</sup>, 100 m<sup>2</sup> per apartment) in 50 buildings and 7 non-residential public buildings (33.000 m<sup>2</sup>) in a sustainable way, affecting about 6400 inhabitants. The following measures will be implemented to save 56% on conventional energy consumption:

- Renewable energy supply through solar water heaters for each new residential dwelling and 7 non-residential public buildings, in total 4500 m<sup>2</sup>, PV-system on each building (342 kW) and passive solar design;
- Energy efficiency in buildings by extra insulation and better air tightness, passive cooling and high efficiency air-conditioners with energy savings of 20%;
- Poly-generation by CHP (1500 kWe + 1875 kWth) for 2100 dwellings. The plant will combine a 1 MWth natural gas cogeneration installation with a 6 MWth boiler with a combination of traditional fuel and biofuel.

Integration of RES and RUE is implemented through design and construction of buildings with integrated RES and RUE measures in new development area Llevant with extensive public dissemination.

*Objectives second year, work performed and results achieved*

Main objectives were to adapt the legal framework, to design the power supply and to start dissemination activities. The urban development plan for the Llevant area has been drafted including all relevant measures from the cRRescendo project and is now approved by the Viladecans Council. On 19<sup>th</sup> July 2007 the Partial Plan was definitively approved by the Territorial Planning Department of the Regional Government of Catalonia. For three public buildings the technical specification documents are drafted and are now in the process of approval. On the basis of the urban development plan a feasibility study was commissioned for the energy concept of Llevant, final results were in January 2007.

Viladecans is designing a dissemination campaign that is expected to be planned by the second term of 2008.

A specific Ponent Office (existing district) is under creation for executing, managing, assessing and also disseminating the Ponent refurbishment. The Definitive approval of the Office creation as a legal body is expected by the first term of 2008.

### **1.3. RESEARCH ACTIONS**

Standardized methods are being developed by Ecofys (coordinating technical research) and the University of Oxford (coordinating non-technical research) 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 to be investigated concern the efficient collection and monitoring of the main energy flows in the buildings and the electricity supply from each renewable energy system.

The non-technical research activities aim 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 influences on occupant behaviour, local policy, local economy, marketability and cost reduction.

*Objectives second period, work performed and results achieved*

The technical monitoring guidelines were finalised in September 2006. Based on these guidelines, each of the cities has formulated its draft monitoring plan by the end of 2006. Once uncertainties in the building plans and process in all of the cities have been removed these drafts will be finalised, but that has not happened in this reporting period. Based on the monitoring guidelines and the community monitoring plans, a start with the methodology development has been made of how to obtain the EU technical indicators from the monitoring data that is expected to be obtained. Furthermore, existing web-based software to collect and process energy usage information of utility buildings (the Enerlyser) is being adapted for cRRescendo purposes.

**1.4. DISSEMINATION ACTIONS**

Both internal and external (to associate communities and broad European level) dissemination will be organised. The four cities will work together with suitable umbrella organisations to ensure broad dissemination to peer cities and other stakeholders. The main external activities include a website, biannual newsletters, visits of peer community representatives, an expert seminar, a final conference and dissemination to citizens.

*Objectives second year, work performed and results achieved*

The internal dissemination and to peer cities is on track with workshops, internal website, site visits and peer reviews. The external dissemination on EU level is under construction to be streamlined with Concerto+ activities. Objectives and means have been revised and will be in production now soon. 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 will take place at two levels:

- *The EU level:* to associated and peer communities, to actors in the building planning process and to installers and constructors.
- *The community level:* within the four demonstration sites, various types of activities are aiming at training of *parties involved in the implementation* of the demonstration work to master quality aspects and special technological aspects.

*Objectives second year, work performed and results achieved*

The active associated communities have been contracted and they have started their work. Peer review workshops and site visits have been organized. Also a climate menu training was organized to support the active associate communities in making their own action plans.

**1.6. PROJECT COORDINATOR**

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