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D0.1t cRRescendo P5 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

1.1. VISION AND GLOBAL OBJECTIVE OF cRRESCENDO

By the end of 2011, far over 10,000 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 over 3,150 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. The cooperation between the cities within the EU Concerto programme will not only showcase the successful integration of poly-generation and renewable energy into a large number of ecobuildings, but will also provide the tools for a successful reprise in these towns, the associate communities and

many other cities in Europe, in an ever swelling cRRescendo.

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 and Milton Keynes had started in the second project year P2.

In its third year cRRescendo developments and preparations were continued in all four cities. In Almere all major demonstration activities arrived in the realization phase, while the first 100's of Eco-houses had been delivered in NoorderPlassen-West and the building of first Solar-Houses in Columbuskwartier had started. In Milton Keynes the CHP had been realized. In Ajaccio the building of houses was delayed, but the project in P3 became ready to enter the realization phase. In Viladecans the Daycare Centre was at the last stage of realization. The building of houses was delayed, while it became clear that only a very limited part of the originally planned houses will be built.

Just in the beginning of year 4, in August 2008, the housing market crisis had a deeper impact on the demo's in UK, than thought before. Since then the housing crisis became a global financial crisis, with substantial consequences for cRRescendo. Due to the financial crisis especially the demonstrations of ecobuildings in Milton Keynes and Viladecans are strongly affected. It was promising that the development of ecohouses in Almere and renovation activities in Ajaccio nevertheless have continued more or less as planned.

During year P4 the city coordinators and project coordinator convinced the Concerto programme management with a substantial amendment that it was still possible to realize much of the original ambitions.

In principle cRRescendo spread out the activities in several work packages in year P3 to P5 over a period of four years (P3-P6), while a prolongation of the project with one year was accepted to accommodate this. Alternative demonstrations have been developed in the cities to compensate for the possible loss of ambition in the original project due to the consequences of the mortgage crisis.

In the current reporting period P5, activities were carried out basically in line with the new Annex 1 (amendment dated 26th of June 2009). The substantial change in the demo's and prolongation of the project has caused some collateral 'damage' in the other work packages (deviations are described at the work packages). In P5 and next project year P6 corrective actions taken are expected to have first effects. It is expected that another prolongation of 12 months is necessary, mainly to finish the necessary monitoring.

1.2. DEMONSTRATION ACTIONS IN cRRescendo CITIES

Almere (NL)	reduction in conventional energy consumption: 48%
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The Almere EnergyRich districts

In Almere two 'Energy Rich' districts are part of the cRRescendo project (Noorderplassen West and Columbuskwartier). About 2000 new dwellings will be built in three 'Energy Rich' classes:

- eco-houses: to be built at least 10% more energy sufficient than the building standard at the time of building;
- solar houses: solar energy plays an important role. The energy performance in these dwellings is 25% better than standard;
- passive houses: going one step further. These dwellings have an energy performance which is 50% better than standard.

Noorderplassen West: added energy-efficiency and Almere Sun Island

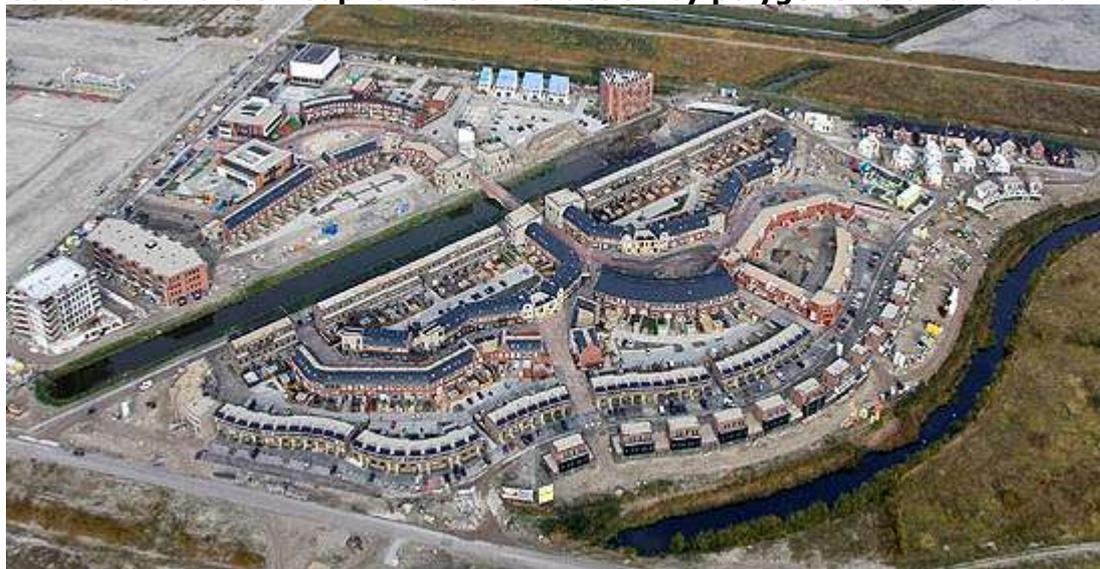
Most cRRescendo dwellings in the district Noorderplassen West are eco-houses. In this area some private dwellings have PV systems, but the major solar contribution is achieved by the Almere Sun Island.

For the first time homes in the Netherlands will be heated collectively with locally-generated solar energy. The Almere Sun Island is in keeping with the urban planning for the residential area and will become an icon in the Almere landscape. The way the island works is simple: water in the solar collectors is heated by the sun. The heated water will then be pumped directly into the district heating network that will supply heating and hot tap water to the new residential area Noorderplassen West. With a collector area of almost 7,000 m² the Almere Sun Island will be the fourth largest solar collector field in the world.

The Almere Sun Island is officially opened on Midsummer day 2010 (Monday 21 June 2010).



Columbuskwartier: supreme CO₂ reduction by polygeneration and solar energy



In the second cRRescendo district, Columbuskwartier, about 500 solar houses and passive houses are built. On these and other houses and buildings in the district a total of more than 500 kWp PV panels will be installed.

In realising its objectives, the heat for the 1,000 homes of Columbuskwartier will come from the Diemen 'Combined Heat and Power' (CHP) plant on the other side of lake IJmeer. In this respect the connection of all dwellings and buildings of the spanning district Poort to the district heating system is fed by this CHP system (a new pipeline connection from the 'Diemen' plant will be made through the IJmeer) obtaining a 93% CO2 reduction not only for Columbuskwartier but for the whole Poort district. On top of that the energy company NUON is required to deliver only green electricity in the Poort district.

Excellent example Columbuskwartier: Passive Houses BAM

Before the summer of 2010, 103 Passive Houses will be delivered in Columbuskwartier. Passive houses combine a pleasant climate in combination with very low energy consumption, which means relative low energy bills for future owners and less chances of rising energy costs. A clever design, right orientation to the sun and perfect isolation of walls and roof guarantee that little warmth escapes the building.



This means that hardly any energy is needed during the winter months. The energy is obtained by cleverly using the sun and the heat of the occupants and household appliances. The isolation not only keeps the warmth in the house during the winter months, but during the summer it regulates the intake of cold air. Because these houses have a limited demand for heat, the houses will be kept warm with a balanced ventilation system and - if needed - extra heat can be supplemented by the district city heating.

This is the first time in the Netherlands that such houses are realised in a large scale building project as social rented dwellings. The passive houses have been designed by INBO Architects from Rijswijk and are developed by BAM Vastgoed and Ballast Nedam development company under contract of the social housing corporation GoedeStede. Besides the European Commission this project is also supported by AgentschapNL with a subsidy for energy research.

Milton Keynes (UK) reduction in conventional energy consumption: 38%

Milton Keynes is centrally located in the UK, 70 miles North West of London. Elements of the programme, where a holistic approach to urban design has been adopted, include:

- Combined Heat and Power (CHP) with private wire network
- Enhanced building fabric
- Photovoltaics (PV)

Combined Heat and Power

A successful component of the Milton Keynes project has been the delivery of the CHP engine connecting via a private wire network up to many buildings in the city centre. This installation is now creating an appetite for expansion and an interesting recent development has been the proposal to build a major headquarters building at the former Hockey Stadium. As part of this Thamesway, who operate the CHP network have presented the financial case to the client.

This is currently being considered and negotiated, however it is a good indicator of the confidence now being shown in the ability of the CHP to deliver cost effective heat and power. As this site is outside the original CHP area, the client is not forced to connect to the district system, but are negotiating based on an open financial choice, competitively with other 'business as usual' energy providers.



The CHP Engine



CHP Flue

Enhanced building fabric



These elements include:

- Orientation
- U Values
- Windows
- Ventilation
- Air changes per hour

Which are all enhanced over national standards.

Solar Photovoltaics

An element of the project included delivery of a renewable energy component.

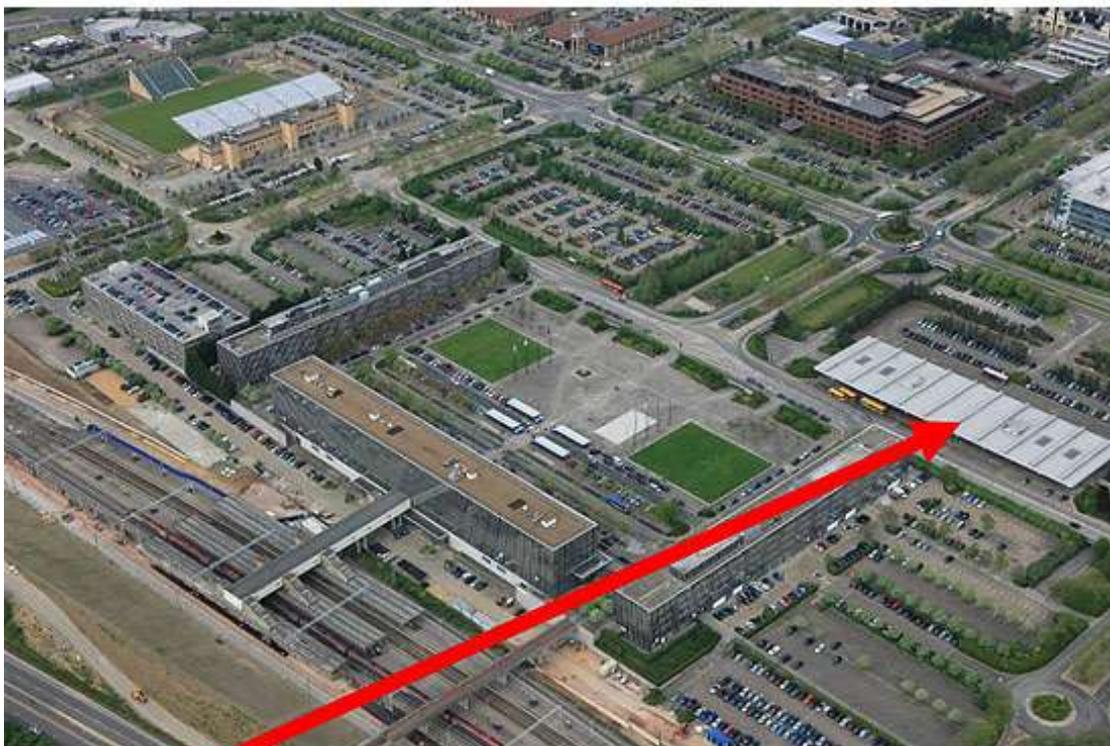
Due to the economic conditions the site intended for the installation, at B4 has not been developed for buildings.

Initially consideration was given to installing the Solar PV panels to be located at ground level on the site, this would be a facility that would be fenced off and managed for solar generation only.

The intention was that when development activity restarted, the solar installation would be temporarily removed and then integrated into the new roof design for the new development. Not surprisingly costs of fencing, lighting, CCTV and security, insurance, together with the estimated costs of removal and reinstallation, in addition to the disturbance to the yields during a potentially lengthy relocation period was seen as prohibitive as well as questionable from a sustainability point of view.

This necessitated an alternative strategy for the PV location.

A large proportion of the installation will now take place on the bus station; a Homes and Communities Agency owned building. It has a community based use in the building, and the partners have been exploring ways in which some sort of community benefit can be gained from the installation, such as free or subsidised electricity for the community use as well as being able to use some of the space in the building for dissemination and education about the project. In total the installation will provide 165kWp.



Bus station roof

Ajaccio (FR) *reduction in conventional energy consumption: 20%*

Demolition and reconstruction of a bloc of council flats made of 8 apartments:

In the new contract we have only kept one project for a complete building renovation in the old centre with solar systems (comparatively to 10 buildings in the first contract): We have already research for the feasibility of putting up solar system on 5 building roofs in the old district of town, but unfortunately, it has been proven to be impossible for 2 reasons:

- for the lack of sunshine (narrow streets, with high buildings)
- Being in a protected urban district (unsightly panels on rooftops)



Building a public office building

We have chosen a specific form of architectural "contest": 3 teams have been working with us on the programme and on finding technical solutions for a 3 months period. The office building will be built in 2011.



Winning submission:

Social Landlord: Erilia

The housing stock concerned by this action is located within the urban renovation zone, and is on track to completion. It is made up of 2 buildings (B and C). Rehabilitation work has been completed and solar panels installed on building b. Confidence tests are under way. Works are still being carried out on building C. They should be completed by spring 2011.

Although, we give special attention to the rehabilitation of the buildings themselves, the outside has not been forgotten and the outside landscaping work is almost finished.



The housing stock Saint Paul

Two buildings are undergoing rehabilitation work. Work is well under way and should be finished by the beginning of 2011. Monitoring devices have been installed. As for the above, special care has been taken for the outside landscaping work.



Roofs' improvement on watertightness before putting up solar system

Pietralba

There too it was decided after the effect to change the watertightness of the roofing before the installation of the solar systems and radiators. The accommodations are currently undergoing rehabilitation. The fill work load should be done by July 2012, but solar cells will be in place by the 1st of August 2011.



Rehabilitation work is under way although greatly delayed due to the roof surface being too weak to support solar panels. It therefore had to be reinforced and water tightness improved. There is a chance that we'll pass Crescendo's deadline for the rehabilitation work, but solar panels should be in place.

RES: Demonstration

A surface of 333 m² of solar collectors (see table below) will be installed on social housing buildings and will produce hot water for 223 apartments.

Viladecans (ES) reduction in conventional energy consumption: 56%

Viladecans is a coastal community, located 12 kilometres from Barcelona.

Specific innovation involves the balanced integration of eco-building and renewable energy supplies in new development areas with extensive public dissemination of all activities. The city has committed to reducing CO₂ emissions: On 1996 elaborated the Agenda 21 and on 1997 Viladecans had been incorporated to 'Barcelona network of towns towards sustainability'. In addition, Viladecans has signed the Declaration of Vilafranca (Towns engaged in preventing climate change) on May 2005 which is an initiative covering the whole Barcelona provincial council. Finally, Viladecans has signed its adhesion to the Covenant of Mayors on 23rd October of 2008. Promotion of future development has been integrated into the community economically and efficiently.

In the frame of cRRescendo, five public buildings will be built or largely refurbished (day care centre, youth cultural centre, historical cultural centre, sports building and municipal building) and 60 new social housing dwelling will be built with high energy efficiency requirements. In the next coming years, the municipality will also install 1 MW of photovoltaic panels in the city and will build 2.000 new dwellings in a new eco-district called Llevant. It is completed with the Solar Norm (approved on 2005 by the Plenary of City Council) that oblige to install solar thermal collectors in new buildings and large refurbished buildings to produce, at least, 60% of hot water needs.

Finally, Viladecans Council is elaborating its Action Plan for Sustainable Energy at the present that contents 143 specific actions for this purpose.



Can Xic is a refurbished ancient country house transformed in a cultural and information centre for young people. The building has an efficient envelope as well as high efficient cooling, heating and lighting. There is a photovoltaic installation of 10,3 kW.



La Pineda Day Nursery is a new building for children from 4 months to 3 years old. The

building has a efficient envelope as well as high efficient cooling, heating and lighting. The building has 12,5 m2 of solar panels and 13,9 kW of photovoltaic panels.



The Council is engaged in installing 1MW of photovoltaic panels in the municipality, up to 342 kW of them are part of cRRescendo project.



Torre Roja football field has energy efficient facilities: 164 m2 of solar panels.

1.3. RESEARCH ACTIONS

Standardised methods have been developed (and disseminated to all cRRescendo partners) 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.

Main objective fifth year, work performed and results achieved

The main objective for the fifth year was to start technical as well as socio-economic monitoring in all four cities.

During the October 2009 meeting it turned out that monitoring was not well on its way in all four cities. All cities were urged to take action, such that in April 2010 first data sets and socio-economic monitoring results could be sent to Ecofys and Oxford University. In spring 2010 it seemed that also it would be difficult to fulfil the constraints of the European Commission with the regard to monitoring 6 energy parameters for each BEST-table in the project. New corrective actions were taken.

Now (end of P5) in all cities the monitoring has started. The level and ambition of the monitoring is sufficiently in line again with the contract. During meetings with other Concerto projects it became clear, that monitoring in cRRescendo will probably perform better than average.

As an appendix A to this report a first (start-up) monitoring report will be submitted.

Whereas most research activities will end in June 2011, technical data-monitoring is expected to continue for some demonstrations.

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 are:

- 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 on 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 fifth year, work performed and results achieved

In P5 dissemination was coordinated by HCA. All four cities have executed many dissemination activities. This includes presentations on relevant events, articles in relevant magazines. Also the cities and project has been represented at all Concerto+ events.

The fifth Annual meeting in June in Ajaccio was an excellent main dissemination activity. The other main dissemination activities have been delayed (as the project was prolonged) to the sixth year. It was decided to have the final conference in Almere in 2011. The final conference is scheduled for September 2011.

1.5. TRAINING ACTIONS

Training activities within the project will take place at two levels:

The EU 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.

The community level: within the four demonstration sites, diverse 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 involved in the implementation of such projects.

Objectives fourth year, work performed and results achieved

Due to a restart with the observing communities training of the observer cities was given:

- workshop on European subsidies during 4th Annual meeting (October 2009)
- workshop on sustainable architecture during 5th Annual meeting (June 2010)

Several trainings were given in in Viladecans and Almere at community level.

1.6. PROJECT COORDINATOR

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