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D0.1y cRRescendo P6 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 P6: 2010-2011

1.1. VISION AND GLOBAL OBJECTIVE OF cRRESCENDO

By now, over 10,000 people are living 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 3,000 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. 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 cRRescend**o**.

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 six years (P3-P7), while a prolongation of the project with two years 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 P6, 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 P6 almost all demonstrations have been realised while corrective research actions have been taken to reach successfully the objectives and to disseminate results. In the final year P7 cRRescendo will finish the necessary monitoring and project evaluation. In P7 both the final international cRRescendo Conference and local seminars are scheduled.

1.2. DEMONSTRATION ACTIONS IN cRRESCENDO CITIES

Almere (NL)

reduction in conventional energy consumption: 48%

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 receives almost weekly highly interested (inter)national delegations.



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 the energy company NUON is required to deliver only green electricity in the Poort district.

Excellent example Columbuskwartier: Passive Houses BAM

At mid-autumn 2010, 103 Passive Houses have been delivered by developer BAM 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. Besides the European Commission this project is also supported by AgentschapNL with a subsidy for energy research.

Last but not least

In P6 several other buildings that make a community complete have been finalised, such as the International School Almere, the showcase Zero-Energy -House and the KlokHuis centre for education on sustainable building for children.



All three projects are iconic and paving the way for dissemination towards our



professional target groups and stakeholders but also to children and citizens.

Just like the Almere Sun Island (and often visited together) the Columbuskwartier and Poort district receives since mid-2010 almost weekly (inter)national delegations and other interested groups and individuals.

From a dissemination point of view cRRescendo is very successful.

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

P6 activities

As there was no Activity Report from Milton Keynes due to reorganisations at HCA, the following remarks are from the coordinator.

During P6 HCA has been preparing the 165 kWp PV system on the old bus station, to be installed in P7 (current and final project year).

There are no major costs items in P6, except for research.

1. Social flats

The construction of social flats was completed in July 2011 and were lived in from the date onwards.

2. Building a public office building

The building of this edifice is definitely part of the total renewal of the District and will be carried out in any event whether we do or don't get the European subsidies, but we would then, be outside our budget and find ourselves forced to cut down on equipment related to the saving of energies as originally planned.



3. 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 are installed and performing.



4. Social Landlord: Office Public Habitat de Corse du Sud (OPH2A)

The housing stock Saint Paul

The renovation of the two buildings of social flats has been completed. The monitoring devices were installed before the renovation took place. The meters of the gas heating appliances are regularly read, which enable us to compare the consumption since the instalment of the solar panels. This building was the first one to be submitted to the social monitoring campaign.



Saint-Jean 1

A thin insulation layer was supposed to be integrated to the building from the inside. Keeping in mind a high level of energetic performance, it has been decided to work



from the outside. Because of a new procurement some delays are to be noticed.

Renovation works have now been completed. The technical report is in the process of being written out.

Saint-Jean 2

The project consisted of the installation of approximately 2.961 m² of photovoltaic sensors on the roofs of social housing buildings. The objective was for the owner to carry out an investment transaction while allowing a reduction in the tenants' expenses.

The public call for tender for it was successfully carried out. The signature of public work contract was suspended as France, at the end of 2010, decided on a moratorium in order to re-examine its policy regarding subsidies for the photovoltaic equipments. After this period of reflexion, the

purchase price of kw of electricity by the national company was fixed at 0.12 cts of Euros against 0.438 cts of Euros before. As a consequence of this decision, the social owner gave definitely up the will to install such equipment because of the non profitability of the transaction. (Installing cost vs. profitability in the cost of time).

P6: Latest developments

A surface of 333 m² of solar collectors has been installed on social housing buildings and will produce hot water for 223 apartments.

The building of the public office building is further delayed, such that this delay will put the iconic project outside the official end date.

In December 2010, the French government decided to suspend the obligation to purchase photovoltaic electricity for three months. Also the purchase price of electricity produced by PV decreased of around 20 %.

Due to this the installation of 146 kWp of PV panels on the roof of housing buildings St Jean 1 was abandoned.

Viladecans (ES)

reduction in conventional energy consumption: 56%

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

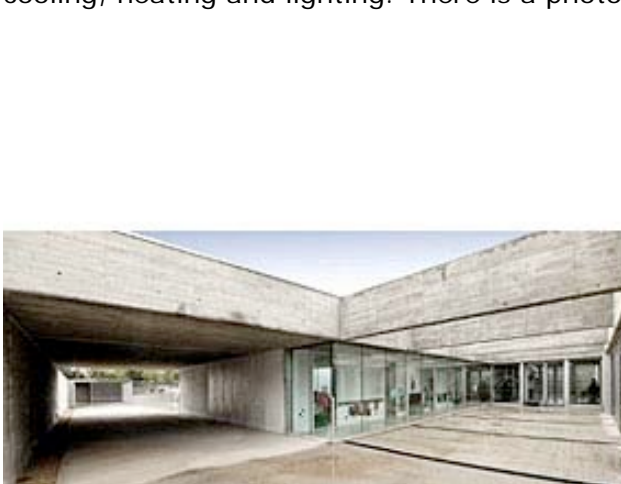
Specific innovation involves the balanced integration of eco-building and renewable energy supplies in new development areas with extensive public dissemination of all activities. The city has committed to reducing CO₂ emissions: On 1996 elaborated the Agenda 21 and on 1997 Viladecans had been incorporated 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.

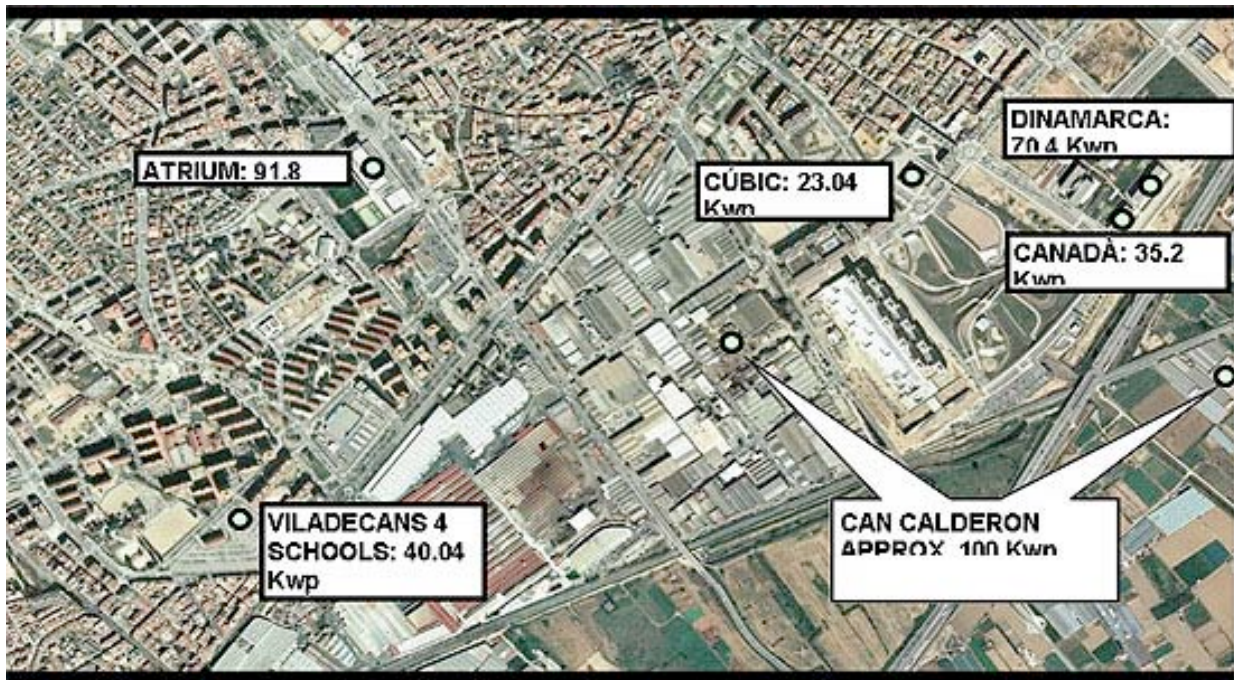


Can Xic is a refurbished ancient country house transformed in a cultural and information centre for young people. The building has an efficient envelope as well as high efficient cooling, heating and lighting. There is a photovoltaic installation of 10,3 kW.



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.

P6: Latest developments

Due to the continuing recession and the reduction of national subsidies in Spain, the building of 60 new public dwellings is cancelled, while the finalisation of 342 kWp PV will be in P7.

1.3.PROJECT COORDINATOR

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