



MountEE - Energy efficient and sustainable building
in European municipalities in mountain regions
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REPORT

GOOD PRACTICE SUSTAINABLE BUILDINGS, REGIONAL STRATEGIES AND FINANCING INSTRUMENTS

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Introduction

European mountains are one of the areas that will undergo significant change in the coming decades, and thus deserve special attention with regard to ecological, economic and social issues. European mountains are also an area where significant progress for reducing emissions of greenhouse gases can be made. Worldwide about half of the energy is being used for constructing, using and refurbishing houses. In Europe, the main part of energy used in this sector is spent for heating rooms, followed by providing domestic hot water. Domestic fuel and domestic gas are the most frequent energy sources. Constructing and refurbishing provides thus large potentials to reduce energy consumption.

According to the recast of the European Energy Performance of Building Directive (EPBD), by January 1st 2021, all new buildings including existing buildings undergoing major renovation will have to meet 'very high energy performance' standards. According to this new directive, public authorities have an exemplary role to play by ensuring that all new buildings they own or occupy meet the nearly zero energy standards. In a broader sense, public authorities have a strong responsibility in developing sustainable building. Here, European mountain regions can contribute to a sustainable building future.

However, for many municipalities the transition to a new sustainable and energy efficient way of building is a major challenge. Most of them lack of know-how, experience and funding. Mountain municipalities are facing additional challenges: extreme climate, low accessibility, small entities, a lack of critical mass, low population density, brain drain and lack of innovation.

The project «MountEE – Energy efficient and sustainable building in municipalities in European mountain regions » supports communities in Sweden, the Alps and the Pyrenees in order to help them achieve their objectives and transform them into front runners. In six regions MountEE will contribute to make 25 to 30 public buildings construction or renovation projects more sustainably and energy efficiently. The project involves all relevant players in the regional actions: politicians, technical and administrative staff at local and regional level, decision makers in funding institutions and key actors in the building chain. MountEE is using existing knowledge to develop regional strategies, financial tools and to support building projects.

Project partners are International Commission for the Protection of the Alps CIPRA (LI), Nenet Norrbottens Energy Agency (SE), RAEE Rhônalpénergie-Environnement (FR), Lansstyrelsen Dalarna (SE), PnR, Parc naturel régional des Pyrénées catalanes (FR), AidA Municipality network "Alliance in the Alps" (D), ARES, Agenzia Regionale per l'edilizia sostenibile (IT).

The project partners carried out a more in depth investigation of good practices in the area of sustainable buildings in their regions. NENET, Norrbotten Energy Agency, provided a template for these investigations and summarised the results from all partner regions in this short report.

Synopsis Good Practice MountEE

Partner	Successful financing instruments	Regional strategies and programmes	Model project buildings
RAEE	Social housing: Subsidies conditioned to environmental quality of buildings in Rhone-Alpes	Energy strategy in the regional natural park of the Massif des Bauges: 2008 - 2020	Town hall renovation St Verand Community
RAEE	Valorization of CEE (energy saving certificates) by the SIEL-Federation of municipalities of the Loire Department	BUILD SUSTAINABLE BUILDINGS: Local energy action program of Metropole Savoie for sustainable construction in public buildings	Town hall reconstruction and rehabilitation of Pajay
RAEE	Regional Public Third Party Financing Society for Energy Efficiency Projects in the Building Sector	The new local energy policy of the Voironnais territory 2012-2020	Town hall renovation Tournon
RAEE			Construction of a multi-pole childcare home - community of Combe de Savoie
RAEE			Construction of an early childhood center in the municipality of Saint-Pierre
ARES	Subsidies for energy efficiency measures in residential houses	Energy and environmental quality assessment of buildings: Protocol VEA	School construction Scuola di Polcenigo
ARES	Tax reduction for energy efficiency retrofitting	Regional Energy Plan Friuli Venezia Giulia	
ARES	Incentive programme for photovoltaic (feed-in tariff)		
CIPRA	"Bonus cubature" of the Autonomous Province of Bolzano (I)	Energy Vision Murau (A)	Minergie Archive Building Vaduz (FL)
CIPRA	Minergie Label (CH)	Wildpoldsried Climate Action Plan (DE)	Refurbishment School Sonthofen (D) to Passive House standard
AidA (Vorarlberg)	"Wohnbauförderung" - funding for residential buildings	Service "Sustainable Buildings for Communities"	New building Kindergarden Bizau
AidA (Vorarlberg)	Municipal Building Logbook	EBO Online Energy Report	Renovation primary school Mähdle
Nenet	Favourable terms of credit for energy efficient buildings	Network for sustainable construction and real estate management in cold climates, Umeå	Green Galären: Renovation office building Luleå
Nenet	Energy Efficiency Programme for Swedish Municipalities	Quality strategy "Residential neighborhood Sustainable Furunäset, Piteå"	Passive houses Taveliden (single-family houses)
Nenet	Funding programme Lågan: Programme buildings having very low energy use		"Bäckåsen" - a low energy apartment building in Gällivare
Dalarna	Västerås City's low-energy building concept	Close-to-zero energy strategy for Dalarna	Kungsljuset - new care dwellings in Borlänge
Dalarna	Live-cycle analysis - Egnellska huset in Falun	Energy- and Climate plan in Mora municipality	Passive houses Vitsippan, Falun
PNR	Energy saving certificates and fund for efficient energy	Sustainable construction for existing or new buildings	Catalan University

Summary good practice “Financial Instrument” per partner according to questionnaire

ARES, Italy

1) Subsidies for energy efficiency measures in residential houses

Region: Friuli Venezia Giulia, Italy
Implemented on: Regional level
Target group: Private building owners (grant recipients)

Summary:

A subsidy for extraordinary maintenance leading to increased energy efficiency in residential houses. Examples for extraordinary maintenance that can be financed are retrofit of electrical installations, installation of solar thermal systems, photovoltaic systems or geothermal plants, installation of high efficiency boilers and adaptation the heating system, insulation of the building and replacement of doors and windows.

Objectives:

- Contribute to the EU's 20-20-20 targets and objectives of the EU Directive for energy buildings near zero in 2018/2020;
- Improving in building in a safe and healthy way;
- Search and apply sustainable building technologies from environmental, economic and social criteria;

Funding/costs:

€ 9.546.287 (2011) and € 20,558,508 (2012)

Results:

4308 measures (2011 and 2012) were financed. No indicators on energy saved available yet.

Lessons learnt:

This initiative was a great success in terms giving incentives to task professional SME's with energy efficiency measures and thereby stimulating regional economy. But the programme could have been more effective in terms of reducing energy demand. There were no additional efforts - exceeding national limits in terms of energy savings or CO2 emissions reduction - required.

2) Tax reduction for energy efficiency retrofitting

Region: Friuli Venezia Giulia, Italy
Implemented on: National level
Target group: Private building owners (grant recipients)

Summary:

The Italian government allow for a tax reduction of 55% in those who carry out energy retrofit of existing buildings. The reduction is fixed according to the type of operation performed within maximum limits ranging from € 30,000 and € 100,000. In detail, this can be applied for

- upgrading the energy efficiency of the building overall:
- shadowing windows;
- installation of solar panels for hot water production;
- Replacement inefficient heating systems with systems with condensing boilers or, alternatively, heat pumps with high efficiency.

Objectives:

Contribute to the EU's 20-20-20 targets and objectives of the EU Directive for energy buildings near zero in 2018/2020.

Funding/costs:

- Costs state budget: 1,7 billion Euro; costs for the households (about 1,2 billion)
- Increased productivity: 6,4 billion Euro
- Total balance for period 2007-2010: 3,4 billion Euro

Results:

- The objectives in terms of energy savings and savings of CO2 emissions have been achieved.

Lessons learnt:

- The experience of the tax reduction of 55% is very positive. In Italy it has been extended until the end of June 2013;
- This strategy can be easily exported to other European countries.
- Requires a certain capacity for funding by the states, but a positive side-effect is the replacement of black labour.

3) Incentive programme for photovoltaic (feed-in tariff)

Region: Friuli Venezia Giulia, Italy
 Implemented on: National level
 Target group: Citizens, companies, public bodies

Summary:

The "Conto energia" is an incentive program that was created with the aim of supporting the use of photovoltaic in Italy. The program has been running since 2005. Feed-in tariffs for the first 20 years of plant life are defined. The nominal size of the PV system must be greater than 1kWp. The tariffs provided will be revised every six months from the date of entry into force of the new order, August 27, 2012, and have two types of tariff:

- all-inclusive tariff
- premium rate on the energy consumed on site.

Objectives:

- Contribute to the EU's 20-20-20 targets and objectives of the EU renewable directive.

Funding/costs:

- Financed by a levy on energy bills of all electricity operators required in support of renewable energy sources, present since 1991.
- In 2011, the total sum was 2.638.541.904 Euro.

Results:

- Italy has grown to become the second largest photovoltaic market, with an installed capacity of 15.93 GW of photovoltaics, or 448,266 plants, as of October 2012.

Lessons learnt:

- Main difficulty: numerous changes in rules and lack planning reliability for investors;
- The system favoured large plants on the costs of smaller ones;
- There is a wish and need to strengthen SME's possibilities to get into the market, as this would stimulate regional economy and there is less risk for corruption
- There is a need for simplification of procedures and for transparency in the electricity bill.

CIPRA

4) "Bonus cubature" of the Autonomous Province of Bolzano

Region: Province of Bolzano, Italy

Implemented on: Regional level

Target group: Building owner, citizens, administrators of buildings, constructors

Summary:

Building owners who decide to invest in the energy renovation of their building get the possibility to expand the volume of their building. This is an incentive as there is an increasing demand of houses in the Bolzano Province. Those, who retrofit a building on Klimahaus C standard (70 KWh/m²/year) are allowed to expand the volume of that building up to 200 m³. This must be demonstrated by a climate house calculation, which should be controlled by an authorized technician.

Objectives:

The action is part of a complex strategy to reach the "energy autarchy" in South Tyrol in 2050 and aims at obtaining a primary energy consumption of 70 Kwh/m²/year for each house and building renovated.

Funding/Costs:

- Costs for the owner: renovation, construction and costs of the calculation and certification Klimahaus. Notarial discount for the construction (25% of the fees). State subsidies or tax deduction sometimes possible (case to case).
- Costs for the province: considerably low: it is just a normal administrative task for the building authority to decide on the construction concessions

Results:

From 2nd Semester 2009 until 1st Semester of 2011, the cubature bonus was used about 1,600 times. Estimating 200 m³ per engagement, they estimate that a total of 315,400 m³ additional mass has been built (1,577 x 200). At least 12.2% of buildings in 2010 come from the cubature bonus.

Lessons learnt:

- In 2011 the program has been modified, but only for the Bolzano city area. The cubature bonus will be extended from 200 m³ to the 20 % of the total volume of the building. This extension answers the increasing demand of housing space in Bolzano and shall include in the program also the urban building typologies (condominiums).
- First considerations from the building administrators are not very positive. They think that to convince all the dwellers of a condominium to build another floor will be very difficult. Therefore the City of Bozen will take the leadership with buildings in their own.
- Critics did also come from architects, who expect a decrease in attractiveness of the building structure

5) Minergie-Label

Region: Switzerland/Liechtenstein, exported in other countries
Implemented on: (inter)national level
Target group: Building owners (public, commercial/industrial and private buildings)

Summary:

MINERGIE® is a sustainable quality label for new and refurbished buildings established by the Minergie Association. Building owners using Minergie-Label can get public subsidies or better credit conditions and can even use it as energy certificate which is obligatory for any commercial/industrial building in Switzerland. The applied standards don't exceed official instructions in many cases, but they make them obligatory. Additional investment is needed for ventilation. The label is mutually supported by the Swiss Confederation, the Principality of Liechtenstein, the Swiss Cantons along with trade and industries.

Objectives:

- Comfortable buildings which are also beneficial to health;
- High energy-efficiency and drastic reduction of the use of fossil fuels;
- Inexpensive systems providing high long-term value of buildings.

Funding/Costs:

- Costs are 3 to 10% maximum higher than normal construction. According to Minergie, returns on investments after 7 years;
- In Switzerland, financial subsidies are delivered by each canton;
- The "Building Program" can finance renovation if following Minergie but also renewable energies and is financed from the Swiss CO2 Tax (budget: 280 to 300 Million of CHF each year);
- Some banks deliver attractive credits for Minergie constructions or refurbishment.

Results:

Quantity: Today around 30.000 buildings have Minergie standard.

Quality: Certification is done on the basis of planning values and thus offers no guarantee that these values are actually met. However, research shows that refurbishment projects and single family homes are better than the standard while larger residential buildings sometimes do not meet the standards.

Lessons learnt:

- Minergie is a powerful driving force in sustainable renovation and construction promoting regional markets for sustainable buildings and creating business opportunities for innovative builders, investors, enterprises and authorities;
- Minergie is meeting the objectives mentioned above to additional costs of only 10%;
- Strengths can also be criticized: Minergie took the monopole of quality labels in Switzerland; anyhow, in other countries, it is difficult to use this label which is not always comparable to the national standards;
- Minergie takes not into account e.g. external site and mobility;
- Doubtful, whether overhead costs and return on investment really can be measured.

Dalarna region, Sweden

6) Live-cycle analysis - Egnellska house in Falun

Region: Dalarna
Implemented on: Regional level
Target group: Building owners

Summary:

Through using a LCC concept for calculating the costs of materials, installations etc., the renovation project Egnellska house could be shown to be economic even with a demanding energy target of 59 kWh added energy per square metre and year.

One of the innovative parts of the procurement process was a financial reward and penalty system for the contractor: If the contractor was doing better (in this case regarding weatherization), he would be given a reward. If the contractor did not meet targets and requirements (in this case: weatherisation and ventilation) there was a penalty to pay. In the end the ventilation operation was particularly innovative in that it uses five different systems what makes it demand-driven to a high extent.

Objectives:

- Contributing to regional, national and EU energy and climate targets;
- Testing new tools in the context of the regional collaboration forum for the construction industry;

Funding/Costs:

- By giving top priority to energy efficiency from the very start of the planning process and using LCC costing methods, it was possible to reduce the cost of certain energy-efficiency measures to the same level as in a traditional construction project.
- The public property management company is also planning for those tenants that show exceptional results in energy savings to be granted a financial reward.

Results:

The building will be monitored for at least two years before the final energy consumption can be determined. Currently, one year later, results seem to be fulfilling the targets.

Lessons learnt:

- LCC can be used as a tool to ensure the costs of different measures and actions;

- Performance-based procurement of the ventilation system proved to work extremely well, while using weatherizing levels as the basis for rewards and penalties did not work well due to insufficient measurement data.
- A solar cell facility is currently being installed, providing the building with better energy values than before.
- Monitoring of performance cannot be finalised earlier than 2 or 3 years after the end of the building work, as drying process, tuning procedures and system regulation are examples of factors affecting long-term energy consumption levels.

7) Västerås City's low-energy building concept

Region: City of Västerås, Southern Sweden
 Implemented on: Local level
 Target group: Building owners

Summary:

The City of Västerås has developed a model for the sale of municipal land in which the purchasers of the building lot sign an agreement that binds them to construct a low-energy building on the site. Within two years at the latest, the property owner must provide documented results. A comprehensive information and advice package is part of the model, incl. information e.g. via a popular TV programme. The concept includes also both a definition what is to be considered as low-energy building as well as a model for energy balance-sheet calculations, monitoring and evaluation. By that, the City of Västerås is able to control all new construction projects carried out on municipally owned land.

Objectives:

- Contributing to regional, national and EU energy and climate targets;
- Contributing to the local energy plan.

Funding/Costs:

No additional costs for the City of Västerås, as it is about making strategic use of its building land by selling lots for construction with specific energy requirements.

Results:

- Energy assessments and airtightness tests in about 30 buildings showed, that buildings were well-constructed from an energy-efficiency point of view and results exceeded expectations;
- In autumn 2012, more than 900 dwellings have been either commenced or completed in low-energy buildings.

Lessons learnt:

- The model is working in reality, and excellent relationships were established between the land purchaser and the supplier of the building;
- The model lead also to increased use of district heating, e.g. for washing machines, driers and dishwashers, and thereby reducing electricity consumption. A new type of district heating system has been developed, known as low-temperature district heating, entailing reduced system losses.

Nenet, Norrbotten and Västerbotten region, Sweden

8) Favorable terms of credit for energy efficient buildings

Region: City of Piteå
Implemented on: Local level
Target group: Building owners

Summary:

Piteå municipality is developing a specific area Furunäset/Lusthusbacken for highly energy efficient houses. In this context, Sparbanken Nord in Piteå is testing favourable terms of credit for house builders who want to invest in houses there. This has to be seen against the background, that building prices are relatively high in Sweden compared to other European countries. Property loans for private persons must not exceed 85% of the economic value of the building, while the rest of the purchase price should be covered by own funds. But in specific cases, so in this case, even an additional loan can be given.

Objectives:

- Contributing to the local energy plan and the concrete model project;
- To test specific offers with favourable terms of credits for highly efficient house projects with higher building costs but lower operating costs;
- To bundle customer's financial related operations at Sparbanken.

Funding/Costs:

Bank loan given by bank for house builder.

Results:

- An innovative offer for investors at Lusthusbacken in Piteå which is designed with a specific focus on higher building costs but lower operating costs;
- Awareness raising regarding energy and climate issues for the public;
- No final evaluation done yet.

Lessons learnt:

- It was difficult to justify favourable conditions for investors;
- A driver for this model was the bank's interest in getting a better understanding on how highly energy efficient buildings influence household's economy in the longer run, and what this means for a funding institution.
- There is a high interest in the model and its implications, both from house builders and from institutions.

9) Swedish national Energy Efficiency Support Program for municipalities

Region: Sweden
Implemented on: National level
Target group: Municipalities

Summary:

All Swedish municipalities and county councils participating in the energy efficiency programme for public buildings and transport receive annual financial support within a 5-years-period. A total of SEK 99 million (=about 11 million Euro) per year has been set aside. The

Swedish Energy Agency is administrating and implementing the funding instrument; the County Administrative Boards are working as supporting structure on regional level. Municipalities apply once for the whole period with a simple application form. The amount of funding per municipality is related to the number of inhabitants. After application, municipalities need to set up a baseline energy inventory and have to develop energy efficiency targets and an action plan. Once a year, municipalities have to report both their quantified targets and a yearly energy balance, using an online reporting tool. The Swedish Energy Agency is doing evaluation of the achieved results.

Objectives:

- Increase investments for energy efficiency measures on the regional and local scale;
- Contribute to Swedish and EU climate and sustainable energy targets;
- Support local authorities and County Councils in developing and implementing energy efficiency programs with defined quantitative targets.

Funding/Costs:

Total cost in Euros: approx. 11 mill € per year for 2010-2014

Financing: Public money

Results:

Municipalities are setting quantified targets on the local level and are obliged to measure and quantify their results. No final evaluation is done yet.

Lessons learnt:

- It was difficult to introduce a consistent reporting and evaluation system/tool, but important to link funding to reporting;
- Success factor: 5-year funding for strategically work on energy efficiency, that means: 5 years of continuous work and capacity building on local level;
- Good choice to focus on strategic work on local level, even for small municipalities otherwise lacking capacities for such type of work.
- Success factor: Support by the County Administrative Boards.

10) LÅGAN - a funding programme for building having very low energy use

Region: Sweden
Implemented on: National level
Target group: Building stakeholders

Summary:

The 5-year-programme provides financial support for demonstration projects and local/regional collaboration initiatives. It also encourages new thinking by evaluating and disseminating information from demonstration projects, and by supporting development projects. LÅGAN is a collaborative project between the Swedish Construction Federation, the Swedish Energy Agency, Region Västra Götaland, Formas and others.

Objectives:

- Implementation of 8 demonstration projects (new buildings and renovation);
- Follow up for at least 4 buildings that have been in use for at least 4 years;
- 5 regional collaboration projects with at least 8 collaboration activities;

- At least 12 projects in which new tools for implementation of highly energy efficient building projects are developed.

Funding/Costs:

- Total budget: 54 mill. SEK (about 6 million €).
- Funders: Swedish Energy Agency (40%), Region Västra Götaland, Formas Scientific Council and others.

Results:

No final evaluation is done yet, intermediate results: 3 publications on low-energy house technology; 9 demonstration projects; 6 collaboration projects; 10 new tools for implementation; Awareness raising.

Lessons learnt:

- It was difficult to encourage actors to ask for funding;
- Main strengths: Collaboration of building industry and public sector in a funding programme in a growing market;
- Success factor: Certification system Green Building and for Passive Houses.

PnR, France

11) Energy saving certificates and creation of a fund for efficient energy

Region: South France, Parc naturel régional des Pyrénées Catalanes

Implemented on: Regional level

Target group: Energy provider, municipalities

Summary:

The system of energy saving certificates is a national instrument, in which energy suppliers are obliged to prove energy savings through certificates. They can buy certificates from local authorities, social housing actors and government services of social housing (ANAH). In Pyrénées-Orientales, an organization of 222 municipalities at county level for energy management offers to gather certificates in order to sell them on a specific market in order to get a better price. Collected funds from the sale of certificates will be redistributed to municipalities in the form of grants for new renovations, which will induce new certificates of energy saving.

Objectives:

- Pushing renovation projects and energy savings;
- Improve market conditions for municipalities through gathering certificates.

Funding/Costs:

- Administration costs for gathering certificates, but better price.
- Energy supplier are obliged to prove energy savings by certificates.

Results:

Fund will start in 2013.

Lessons learnt:

- It is very difficult for small municipalities to sell their certificates by own because they can't negotiate. The fund is intended to create a positive cycle of generating certificates, selling them and funding new renovation projects by this.

RAEE, France

12) Valorization of Energy Saving Certificates

Region: Rhône-Alpes Region
Implemented on: Regional level
Target group: Energy provider, municipalities

Summary:

The system of energy saving certificates is a national instrument, in which energy suppliers are obliged to prove energy savings through certificates. They can buy certificates from local authorities, social housing actors and government services of social housing (ANAH). In Rhône-Alpes, the federation of municipalities SIEL offers to municipalities` energy management services and support. It also offers selling of energy savings certificates to finance municipal actions.

Objectives:

- Pushing energy savings projects also in small municipalities with low capacities;
- Improve market conditions for municipalities through gathering certificates.

Funding/Costs:

- Administrative assistance is included in the cost of the "Service assistance to energy management" which is charged to municipalities for about 1 € per inhabitant per year.

Results:

- Over the past 3 years, more than 100 GWhc CEE have been filed by the SIEL for an amount of 400.000 €
- SIEL now organizes for municipalities a competition on who is realizing the highest number of CEE, thereby also getting a better overview on number of projects;
- Support for some projects difficult to finance in other ways.

Lessons learnt:

- The system allows municipalities to enter into a virtuous circle of energy savings actions and is becoming stronger every year; the collective organization allowed to bypass the administrative issues and to get maximum financing. The system is duplicable.
- The main difficulty lies in the legitimacy of the holder to act on behalf of municipalities. In the case of SIEL, its status of inter-municipal structure has overcome this difficulty.

13) Subsidies to strengthen environmental quality of social housing buildings

Region: Rhône-Alpes Region
Implemented on: Regional level
Target group: Social housing companies

Summary:

Social housing buildings are often old and energy consumption is very high, leading to increasing energy poverty. Energy efficiency improvements are the best answer to reduce rental charges. Since 2007, subsidies of the regional council of Rhône-Alpes for new and retrofitted social housing are depended on to the environmental quality of projects, incl. a criteria catalogue with compulsory and soft targets to guarantee exemplary projects, training sessions for social housing staff and designers, subsidies for feasibility studies and highly efficient projects and a website and a hotline. This is a joint procedure between regional Council of Rhône-Alpes, ADEME-French Environment and Energy Management Agency and the ARRA HLM-regional association for social housing.

Objectives:

- Reduction of consumption costs for tenants;
- Reduction of fossil energy consumption and greenhouse gas emissions;
- Contribution to local employment.

Funding/Costs:

- Subsidies of about 2 000 to 4 000 € by housing
- Training and assistance for design studies are supported by regional Council and ADEME.

Results:

- Since 2007, more than 1000 new housings and more than a hundred retrofitted housing.

Lessons learnt:

- Strong involvement of social housing owners but even of regional Council and Ademe and 60% of new social housing is ahead of the regulation;
- Improved know-how of social housing staff and consultants;
- Good preparation for the changes in 2012 regarding thermal regulation;
- The assistance plan has been very efficient.

14) Regional Public Third Party Financing Society for Energy Efficiency Projects in the Building Sector

Region: Rhône-Alpes Region
Implemented on: Regional level
Target group: Municipalities

Summary:

The Local State-owned Company (SPL) responsible for energy efficiency, OSER (Regional Energy Services Operator) created on December 6, 2012, is a company dedicated to carrying out high-performing energy renovation projects. It will enable communities to conduct bold

energy renovation programmes and show exemplary dynamism. The SPL, made available to the Rhône-Alpes communities, is the first tool of this type in France.

Objectives:

- To initiate an strong thermal rehabilitation dynamism for the public heritage with a minimum BBC (low-energy building) renovation level (approximately 80kWh/m²/year).
- To provide a service offer (technical and financial) to local communities expressing a need for support for ambitious projects.
- To mutualise competences and means and capitalise on experiences.
- to complete about fifteen third-party investments per year, comprised between €0.5 Million for a work total of €15 Million

Funding/Costs:

- Capital: €5,297,000 (94.4% by the region; the remaining part by: communities on the basis of €1/inhabitant)
- Any community that wishes to become involved in an energy renovation strategy with the help of the SPL will pay an entry capital (1€/inhabitant) and a project capital (approximately 10% of the estimated cost of the work.
- The SPL intervenes as a third party to finance studies, work and the exploitation of the operation. In return, the community will pay a rental fee to the SPL during the period of exploitation of the renovated structure (between 10 and 20 years).

Results:

- None yet, as the has been created first on December 6, 2012.

Expectations:

The third-party investment proposed by the SPL makes it possible:

- to balance and secure community spending over time
- to simplify the tendering procedures
- to transfer the risks from small communities to the expert organisation SPL (deadlines, costs, management)
- to support the employment of SMEs and inject dynamism in the local economic infrastructure

AidA, Vorarlberg region

15) Municipal Building Logbook

Region: Vorarlberg
Implemented on: Regional level
Target group: Public authorities

Summary:

New public buildings get traditionally subsidies from the province of Vorarlberg. Since 2011, this funding is based on quality criteria in the fields of energy, environment and health. The quality is proven by using an Excel tool that awards points. The maximum number of points is 1,000; 900 points qualifies for the maximum funding. Below 700 points the municipality

receives a lower funding than prior to the launch. The assessment covers process and planning quality, energy and supply, health and comfort, and building materials and construction, with a total of 14 criteria.

Objectives:

- Contributing to the energy autonomy in Vorarlberg by public authorities being front-runner for the building chain and enforcing the local handicrafts and small producers;
- High quality and measureable results in the building process, incl. the use of solar energy;
- Environmental and healthy buildings for public use.

Funding/Costs:

- About 140.000 Euro were invested. The total amount of funding for public buildings in the province is expected to remain about the same, as buildings which score low receive less subsidies than before;
- About 70.000 Euro for developing instrument, criteria and evaluation;

Results:

- The first 3-4 projects have been realized, all of them scoring high.

Lessons learnt:

- The launch met fewer difficulties as expected;
- Success factor: Established and efficient networking of local politicians;
- Stimulation to build energy efficient and ecological became stronger.

16) Funding for residential buildings

Region: Vorarlberg
Implemented on: Regional level
Target group: House builders

Summary:

In Austria, funding for residential building was implemented after World War 2 to strengthen the share of private owned houses in the building stock. Nowadays, the instrument is used for guiding house builders towards healthy, energy efficient buildings. The Ecological Building Ecopass is the tool, which has to be used to get funding. It has 5 topics, 10 criteria and 50 ecological measures and you can receive max. 300 ecopoints. Funding depends on the number of ecopoints.

Objectives:

- Information and advice during the whole building process;
- Definition of modern residential building standards;
- Quality assurance by defining aims clearly in the planning phase and checking their attainment on completion incl. the Energy Performance Certificate.

Funding/Costs:

- Subsidies are paid by taxes;
- For new building you can get between €650 to €1.060 loan per m² in the highest eco level, in the lowest level you can get €350 to €730€ loan per m² including a subsidy of

22,5%. For refurbishment you get a subsidy of 40% up to €50.000 in the highest level and a subsidy of 17.5% up to €25.000 in the lowest level.

- About 10 people are working permanently for the funding of residential buildings, 5 in the administration of the province of Vorarlberg and 5 at the Energy Institute.

Results:

The analysis for the year 2011 showed, that 1.217 new apartments got funding. 28% of these new buildings were constructed in or very close to passive house and in high ecological standard. 40% were constructed as good low energy houses. In the same year 5.467 apartments got funding for refurbishment. 30% of these were renovated with passive house components, and other 35% with components close to passive house standard.

Lessons learnt:

- Costs are relatively high, but a long-term calculation incl. external costs show that the instrument is economic;
- Success factor: Strong political will and good coaching for politicians;
- Stimulation to build energy efficient and ecological became stronger.

Analysis of good practice examples “Financing Instruments” in partner regions

The collection of good practice examples in the participating regions shows, that in all partner regions some kind of successful financial instruments are available, and that there is a broad variety of various types of instruments. This is not giving a comprehensive and representative picture over all available financing instruments in the concerned regions; anyhow, an analysis of instruments is giving some interesting results (overview: see table below):

Strong position of regions

8 of 16 good examples are regional subsidies, or are linked to regional subsidies (Minergie-Label and the Swedish Lågan programme, where funding is partly coming from the regional level). This shows, that regions are both committed to climate and energy targets, and that their programmes often have a high quality level.

Energy savings vs. renewable energies

The main focus for all financing instruments presented by partners is energy efficiency, even if some instruments also include the use of renewable energy sources. Only one good practice example has been delivered which is only focused on renewable energies (Feed-in tariffs Italy). It might be worth to explore, whether this imbalance is based on a lack of specific instruments for renewable energies or whether partners do not see them as good examples.

Subsidies vs. other types of financial instruments

8 of 16 instruments are subsidies not taking into account the Italian feed-in tariff as this is neither a subsidy, nor the account Minergie-Label even if this is linked to subsidies, too. In contrary, so-called market-based instruments are in the minority: only three examples and all coming from France are about market based, two of the about white certificates and one

about Third Party Financing. And only one example comes from the banking sector. But happily, other innovative examples are part of the set: a LCC calculation tool, a contract based system for selling of municipal land and the Minergie-label.

Good spreading of target groups

The collected examples have a good spreading of beneficiaries and target groups, reaching from social housing companies to municipalities, energy providers, private and public building owners and further stakeholders.

Evaluation and controlling of results

An important factor for appraising whether the financial instruments are effective in terms of energy performance is the evaluation and controlling of results. 14 of 16 examples have at least some kind of controlling.

Costs and cost-benefit ratio

The collected examples vary a lot in terms of costs. This is also depending on the big variety of instruments. Anyhow, the partnership might consider a deeper evaluation of cost-benefit ratio for different instruments.

Table: Overview collected good practice financial instruments

Financing instrument	Partner	Type	Beneficiary/target group	Evaluation reg. energy savings	Costs
Social housing Subsidies	RAEE	Regional subsidy	Social housing companies	Yes, based on criteria catalogue	About 2000-4000 Euro per housing, reduced energy costs for deprived households.
Valorization of CEE	RAEE	White certificate fund	Municipalities, energy provider	Yes, as number of certificates linked to energy savings.	Market based instrument.
Regional Public Third Party Financing Society	RAEE	Market based	Municipalities	Yes	Basic capital: €5,297,000; For communities doing project: about 10% of total costs.
Subsidies for energy efficiency measures in residential houses	ARES	Regional subsidy	Private building owner	No, not done.	About 30 Mio Euro (2011-2012), 4308 measures, about 7000 Euro per measure.
Tax reduction for energy efficiency retrofitting	ARES	National subsidy	Private building owner	Yes.	Costs state budget: 1,7 billion Euro; costs for the households about 1,2 billion.
Incentive programme for photovoltaic (feed-in tariff)	ARES	Feed-in tariff	Citizen, companies, public bodies.	Yes, in terms of produced electricity.	2.638.541.904 Euro
"Bonus cubature"	CIPRA	Building permit	Building owner (private or social)	Yes, bonus depending on energy standard.	Costs for the province low (normal administrative task), Costs for owners: certification+renovation.
Minergie Label	CIPRA	Label combined with access to funding	Building owner	Yes, it is an energy label.	Costs max 10% higher than normal construction, but doubtful whether return on investment really can

					be measured.
Funding for residential buildings	Vorarlberg	Regional subsidy	Private house builders	Yes, linked to criteria catalogue.	Relatively high costs.
Municipal Building Logbook	Vorarlberg	Regional subsidies	Municipalities	Yes, linked to criteria catalogue.	It is expected, that costs are not increasing as it is mainly a reallocation.
Favourable terms of credit	Nenet	Reduced rate loans	House builders	Yes, but controlling difficult.	No evaluation yet, but low additional costs if any.
Energy Efficiency Programme for Swedish Municipalities	Nenet	Governmental subsidy	Municipalities	Yes, reporting each year.	Approx. 11 mill Euro per year for 2010-2014
Funding programme Lågan	Nenet	Subsidy, mainly public	Building stakeholders	Not only concrete building measures, therefore difficult.	About 6 million Euro.
Västerås City's low-energy building concept	Dalarna	Contract	House builders	Yes, defined in contract.	No additional costs for the city.
Live-cycle analysis	Dalarna	Calculation tool	Public building owner	Yes, as operating costs are part of calculation.	Low costs, giving a holistic picture of real costs for facility management.
Energy saving certificates	PNR	White certificate fund	Municipalities, energy provider	Yes, as number of certificates linked to energy savings.	Market based instrument.

Summary good practice “Regional strategies and programmes” per partner according to questionnaire

ARES, Italy

1) Energy and environmental quality assessment of buildings: Protocol VEA

Region: Friuli Venezia Giulia, Italy
Implemented on: Regional level
Target group: Municipalities, house builders

Summary:

From 31 October 2011, the region Friuli Venezia Giulia has adopted a procedure for the assessment of energy and environmental quality of buildings (Protocol VEA) to promote a better quality of living in terms of comfort and to reduce the environmental impact of buildings. The certification VEA started with a certification of the design of the new building or of the renovation is updated in case of changes in the design and is finalised at the end of construction “as built”. The certification is entered in an energy and environmental register of buildings.

Objectives:

- Contribution to the EU 20-20-20 targets and objectives of the EU Directive for energy buildings near zero in 2018/2020;
- Sustainable development of the region, preserving the historical identity of the city; and promote the maintenance of historical characters and typological buildings;
- Increasing the use certified quality and eco-friendly materials;
- Promote vocational training, participatory planning and taking informed decisions in construction.

Funding/Costs:

- Public money for developing of the strategy and for ARES staff working with the protocol.

Results:

75 buildings have been certified so far.

Lessons learnt:

- Difficulties encountered: lack of training by professionals, lack of trust in new tools and in the beginning conflicts and overlap between national energy certification VEA certification;
- The tool is innovative because it not only analyse the energy performance of the building but also the environmental loads, consumption of resources and interior comfort.

2) Regional Energy Plan Friuli Venezia Giulia

Region: Friuli Venezia Giulia, Italy

Implemented on: Regional level

Target group: Energy stakeholders

Summary:

The Regional Energy Plan is the primary planning tool to address regional energy policies. It plays a leading role in the socio-economic development of the region, and for this reason it is essential to its junction with the regional economic planning. It identifies the strengths and fixed priority actions in the field of energy that provide valuable guidance for an integrated resource planning in a vision of intersectoral action: energy is an opportunity to take advantage of the growth opportunities of the territory.

Objectives:

- Contribute to a safe, environmental energy supply, regional economic growths and energy and climate targets;
- Increase energy efficiency and reduce energy costs for consumer;
- Minimize the environmental impact of consumption of energy;
- Promote innovation and Green Technology deployment
- Promote renewable energies.

Funding/Costs:

- To achieve the desired scenario, investments of about € 856 million necessary;
- It is assumed that private investment of about 50% of this total are necessary in a first phase, and that these will be stimulated by public investment incentive of about € 128 million on renewables and energy efficiency.

Results:

An assessment of the impact of this Energy Plan has not been done yet and this is one of the weak points of the strategy.

Lessons learnt:

- The weak point of this energy plan is that its duration was fixed until 2010 and at the end no final evaluation and analysis of the achievements has been done. The region does currently not have a valid energy plan.

CIPRA

3) Energy Vision Murau

Region: Murau region, Austria

Implemented on: Regional level

Target group: Energy stakeholders

Summary:

Murau is a small region in Austria with 35 municipalities aiming to be energy self-sufficient by 2015. The strategy 'Energievision Murau' was collaboratively developed in several regional working groups managed by energy consultants of the region. Actions have been imple-

mented in the areas of private housing, public building and local economy. Starting with capacity-building and identifying important stakeholders the strategy led also to concrete investments. At all steps, the Energieagentur Obersteiermark was the main promoter of the strategy, acquiring support from particular entrepreneurs and mayors.

Objectives:

- Self-sufficient heat and electricity production from renewable energy sources within the region in 2015;
- Producing added value in the region by exporting surplus energy.

Funding/Costs:

- Management of the Energievision process and animation is supported by regional and national authorities, financing of individual projects is organised on an individual project basis, sometimes with public co-funding.
- Estimation says that around 20 Mio € will be invested in the project until 2015.

Results:

- Success in starting a process within the community with well-working theme specific working groups;
- Several successful projects: replacing oil by biomass at the region's largest energy consumer, a fossil free municipality, a new biogas plant is just built etc;
- Renewable electricity production is at 140% of the consumption already;
- All in all the region is about 80% energy-self-sufficient (according to their definition).

Lessons learnt:

- 3 main challenges: get the sceptical people on board; keep the process running over a long period of time and tenacity;
- Trust is needed. The project management team must be impartial and independent; communication must be open and honest. How the working groups are moderated is very important: actors who are normally in competition with each other, such as tradespeople in the energy sector, have to unite around a common philosophy;
- Motivated people, who take a proactive approach to implementing ideas, are active in working groups and have their own business models;
- Abstract concepts are very difficult to sell, whereas a new energy facility or a well-executed refurbishment project demonstrates both the vision and the fact that it can be translated into reality.

4) Wildpoldsried Climate Action Plan

Region: The Alps, Austria
Implemented on: Municipal level
Target group: Energy stakeholders

Summary:

Since 1999, the 2.500-inhabitant-town of Wildpoldsried has an Environmental strategy focussing on energy saving and production, sustainable building and water protection. Following its success, in 2010 the municipality adopted a climate plan. The objective is to generate 100% of the local energy demand from renewable sources by 2020.

Objectives:

- Producing more renewable energy than consuming on local level and reducing more CO₂ than generating;
- Promoting innovative, energy efficient and environmentally friendly technologies.

Funding/Costs:

Total cost of investment into energy projects (private&public) is 24 Million €, returns on investment are around 4 Million €/year in saved energy. Benefits for regional craftsmanship have not been estimated.

Results:

- In 2010, already 321% of the overall electricity requirement of the municipality was generated from renewable sources (wind, sun, water and biogas).
- 100% of the public buildings are heated by means of biomass.
- Beside a reduction of the energy consumption, the strategy of Wildpoldsried brought new activities in town. Some innovative enterprises moved to Wildpoldsried and tourism is improving. About 100 "energy-excursions" per year are organized by the town;
- Creation of about 140 new jobs.
- Some of the pilot projects of Wildpoldsried have since been copied many times by other municipalities.

Lessons learnt:

The most important and successful method in all the action is surely to win the public support for "Energy and Climate Protection" and motivate them to participate. The citizens choose rather to participate, when it is voluntarily, when connection to the energy services is not compulsory or when there are possibilities for them to invest and earn revenues from the projects, too. All individual projects have been carefully planned, calculated, and the citizens involved from the beginning.

Dalarna region

5) Close-to-zero energy strategy for Dalarna

Region: Dalarna, Sweden
Implemented on: Regional level
Target group: Energy stakeholders

Summary:

Together with other stakeholders in the construction and property management sectors in the county, the Byggdialog Dalarna network organisation has developed a strategy to promote an increase in the construction of low-energy buildings in Dalarna. The objective of the strategy is for Dalarna, being appointed by the Swedish Government to be a "Green Pilot County", to fulfil the national guidelines for energy-efficient buildings. The strategy is intended to give support and guidelines for property owners in Dalarna in planning and construction projects throughout the county. It includes an action plan for the existing building stock, and one for new construction and refurbishment. The strategy will be adapted and updated as required to keep up with national developments.

Objectives:

- Taking the lead as a county to fulfill or even go beyond governmental targets in implementation of close-to-zero energy building legislation;
- Built upon earlier experience and inspire for the future.

Funding/Costs: No information.

Results:

- Energy measures should be prioritized in the following order: Highly energy-efficient building shell - Highly energy-efficient installations - A high proportion of the energy needed should be renewable;
- Targets for new buildings [kWh/m², Atemp, year], excluding operational power are between 40 for premises with electric heating and 65 for dwellings with non-electric heating; for converted buildings between 55 for premises with electric heating and 90 for dwellings with non-electric heating.

Lessons learnt:

- Gradually raising the standard of existing buildings is essential for a transition to a sustainable energy system;
- For property already being managed, there should also be a goal of reducing energy consumption by 2020, i.e. a reduction of 20 percent calculated from the current level;
- To reduce energy consumption in existing buildings you have to work pro-actively, even with buildings that are not being rebuilt. Continuity is important and this requires established procedures and an action plan.

6) Energy and climate plan in the City of Mora

Region: Dalarna, Sweden
Implemented on: Local level
Target group: Energy stakeholders

Summary:

The plan describes how Mora municipality works with energy and climate related issues. The initial part sets out the ambitious goals for the work. The plan describes measures for different types of buildings and sets targets both for measures taken on a general level for the whole geographic area of the municipality as well as measures concerning the municipal organization alone. The targets are easy to monitor. A prioritized list of actions is presented and monitoring system is defined. Priorities and key players are identified. The plan covers all strategic and planning levels, from vision and overall goals down to concrete actions. Overall, the plan is a good example and shows a municipality with a high level of ambition in this area of energy and climate influence.

Objectives:

- Setting long-term goals to meet the national goals for the year 2050: Sweden becomes climate-neutral.
- Until 2020, energy use will be 20% more efficient than in 2008 and the average use of energy in Mora Municipality buildings will be 15% lower than in 2009.

- Specific targets for municipal buildings, e.g. Solar power will be installed on at least one public building during the period 2011 – 2014 and in renovation of municipal buildings, energy use shall be reduced by 50 percent.

Funding/Costs:

- Implementation of the plan is expected to be possible within the existing budget.
- Measures will be evaluated by profitability calculations in accordance with the LCC (LifeCycleCosts) method.

Results:

- The strategy has been evaluated after the first year, 2011. The result of this evaluation shows that work so far is in largely following the plan.

Lessons learnt:

- Building a coherent system that also works in everyday life. E.g. identifying key indicators for monitoring and indicating responsibilities;
- This strategy is a good example of how national and regional policy documents can be transformed into local targets and local actions;
- Success factors are the broad support of the program by officials and politicians who know about the strategy and use it in their everyday work.

Nenet, Norrbotten and Västerbotten region

7) Network for sustainable construction in Cold Climate

Region: Norrbotten, Sweden

Implemented on: Umeå region

Target group: Energy stakeholders

Summary:

In 2020, Umeå region aims at being world leading in sustainable building in cold climate. This vision, and later on the legal requirements of the Energy Performance of Buildings Directive were important driving factors for establishing the "Network for Sustainable Building and Administration in Cold Climate" in Umeå. It includes companies, organizations and the public sector in a joint effort for creating a market for sustainable buildings in North Sweden.

Objectives:

- In 2020, Umeå region aims at being world leading in sustainable building in cold climate;
- Create a market for sustainable buildings in Northern Sweden;
- Involve all parts of the building chain and contribute to a faster change in the building- and administration chain towards more energy efficiency.

Funding/Costs:

- Costs of about 640.000 SEK (=64.000 Euro) per year.
- Financing by membership fees and by project funding of the Swedish Energy Agency's project (programme LÅGAN for 2011-2012).

Results:

- Increased understanding of building process and an established meeting place leading to improved collaboration and interaction between all actors within the building chain;
- 50 member of the network were actively working with and improving of quality programme for the development of a big new residential area in Umeå;
- Members of the network have actively contributed to improve development schemes in Umeå region, incl. land distribution questions;
- Implementation of several concrete projects.

Lessons learnt:

- Important to keep interest up for the network and ensure an active participation of the majority of members over a longer time period;
- Important to realize concrete results that answer member's expectations.
- Success factor: members signed a Letter of Intent when they joined the network. By that, they commit themselves to both contribute to the network and to learn from the network;
- Recommendation: Start with an intensive phase of consultation and discussion with potential members of the network to be clear about expectations, and check, whether this kind of network is the most suitable instrument.

8) Quality Strategy "Residential neighborhood Sustainable Furunäset Piteå"

Region: Norrbotten, Sweden

Implemented on: Local level

Target group: Energy stakeholders, house builders

Summary:

The strategy "Sustainable Furunäset" aims at leading to a truly sustainable district where in a continuous learning process step by step new buildings with high quality are added and experience from earlier building phases are transferred to the next, By contract, house builders are obliged to follow defined quality rules incl. even sub-contractors. After buildings are finished, results have to be reported and after 2 years an evaluation has to be done. The municipality has to approve all reports. All house builders have to participate in a municipal quality consultation. In the long run, the quality strategy for sustainable buildings in a model area shall be a model for a general policy on sustainable building in Piteå.

Objectives:

- Contribution to meet targets of the energy- and climate strategy and EU directive;
- Laying the ground for an attractive residential neighborhood in which the principals of social, economic and ecological sustainable are implemented;
- In the long run, the quality strategy for sustainable buildings in a model area shall be a basis for a general policy on sustainable building in Piteå.

Funding/Costs:

Public money for developing of the strategy and for staff for quality consultation.

(Expected) Results:

- 10 single family houses and 4 apartment wood buildings, connected to district heating based on renewable energies and have an energy demand of max 58 kWh/m² (with exemption in specific cases max 75 kWh)
- Car-free district
- 30 gardens plot for inhabitants

Lessons learnt:

- High building costs are a problem, specifically a problem for apartment buildings as entrepreneurs expect the rent to be such high that they will not find tenants.
- In the first dialogue meetings, the number of participating politicians and house builders were quite low.
- A Dialogue with funding institutions/banks leading to specific offers for house builders for single family houses with better loan conditions.
- Political commitment for Piteå's energy and climate strategy is important.

PnR

9) Call for projects "Sustainable construction for buildings"

Region: South France, Parc naturel régional des Pyrénées Catalanes
Implemented on: Regional level
Target group: Municipalities

Summary:

The network of the eco construction and the eco renovation of Pyrénées-Orientales developed a call for projects, "sustainable construction for existing or new buildings". It intends to stimulate and guide municipalities and associations of local authorities in the realization of "demonstrative" projects of construction or renovation. Engineering and technical support for the design of the projects is given as well as a subsidy for expenses linked to sustainable construction as insulation and construction in Eco-materials. The beginning of the operation was in November 7th 2012, the end is February 22th 2013.

Objectives:

- Promote innovative technologies in construction, efficient energy and environmental materials and to favor good practices and exemplary projects
- Create synergies between different stakeholders of projects and to accompany the initiatives "shared", based on the multi-sectorial integration.

Funding/Costs:

- Three prize-winners will benefit for 30 000€ for each project and from 50 000 € maximum each. About 10 000€ are necessary to set aside for communication activities.
- This operation was estimate at 250 000 €. The County council will pay all those costs

(Expected) Results:

- Promoting wood as construction material (PEFC or FSC);
- Use of products with very low emissions, low heavy metal content and dangerous substances for environment and health;

- Awareness raising on environmental impact of choice of materials and promotion of local eco-materials;
- Promotion of smart sustainable systems (renewable energy, smart metering systems, rainwater use);
- Integration of transport, e.g. limited parking space, charging stations for e-cars...

Lessons learnt:

- The programme is ongoing, no evaluation yet.

RAEE

10) Energy strategy in the regional natural park of the Massif des Bauges

Region: Regional Natural Park of Massif des Bauges, Rhône-Alpes
 Implemented on: Regional level
 Target group: Stakeholders

Summary:

The Regional Natural Park of Massif des Bauges includes 65 municipalities with in total 67,000 inhabitants and an area of 90,000 hectares. Its strategy is defined in its charter renewed in 2009. It is noted in particular that "The Regional Natural Park of the Massif des Bauges must raise its level of demand, as regards consumption savings, preservation of resources, a willingness to experiment with new solutions, especially in the development of renewable energy available in the territory". The Charter proposes to implement a "sustainable" energy policy in all sectorial policies (housing, transportation, business, tourism, agriculture,...). The Park committed itself, with the structures that compose it, to control energy consumption, to promote and use renewable energy.

Objectives:

- Raise the share of renewable energies from today's 11% to at least 20% until 2020;
- Initiate and boost energy savings programs;
- Initiate and develop awareness raising campaigns;
- Giving advice in energy and climate.

Funding/Costs:

- Budget for awareness and advice activities: 40.000 Euro per year
- Budget for Call for tenders 220.000 Euro

(Expected) Results:

- Proximity is the key aspect of regional natural parks, so they have a strong asset for the success of projects on their territory.
- Increased human and material resources and establishing a "Energy, Climate Plan, mobility" Commission and to hire an engineer in energy as project manager;
- Launching a call for proposals called "Territorial Climate and Energy Plan" leading to tangible results like village initiative photovoltaic plants, exemplary construction and renovation of buildings).

Lessons learnt:

- The "Climate Plan" initiated in 2012 will evaluate the relevance of this strategy.

11) Action program Metropole Savoie: Sustainable public building construction

Region: Metropole Savoie

Implemented on: Regional level

Target group: Building players (municipalities, owner, consultants, user)

Summary:

The local energy action program "BUILD SUSTAINABLE BUILDINGS" for sustainable construction in public buildings of Metropole Savoie (representing 115 municipalities) aims at leading a network of buildings actors (authorities, social housing owners, consultants and firms) to develop the taking into account of the environmental quality in new and renovated buildings on the basis of training and assistance actions. The actions plan goes from 2009 to 2015 and it is based on 2 main actions.

- A call for tenders for the selection of about 12 projects assisted by Métropole Savoie-ASDER and financially supported for additional services (air tightness, energy performance, methodology for consumption follow up, embodied energy calculation...).
- Training sessions: awareness of elected representatives, training of action and event managers

Objectives:

- Networking and mobilization of actors;
- Increasing competence of professionals in the building sector;
- Promotion of low energy and high environmental quality building.

Funding/Costs:

- Total budget : 713 500€
- Subsidies of the Regional Council for different type of activities between 25 to 80%.

Results:

- Massive and effective mobilisation covering all trades of construction;
- Creating an appreciated forum where players of the same territory can share and learn.
- Too early to assess the practical effects of this approach even if initially BBC (low consumption building) projects move towards higher performance.

Lessons learnt:

- No final evaluation yet:
- The mixing all the players in the building creates a dynamic and technical solutions are applied by contractors.
- The need for concerted effort is taken into account by all. In addition, the program was expanded to other partners and experts to share resources and enhance every step by the experience of others.

12) Local energy policy of Voironnais territory 2012-2010

Region: Pays Voironnais, Rhône-Alpes

Implemented on: Local level

Target group: Energy stakeholders

Summary:

After an operation of thermal improvement of buildings and the adoption of the Energy Climate Plan, the Pays Voironnais (34 municipalities - 92 000 inhabitants) has defined a new local energy policy 2012-2020 based on the analysis of long term energy stakes as well as acquired experience. It proposes to work on different thematic: the energy efficiency of public buildings, the energy efficiency of housing (social owners, low-revenue household, individual owners, co-owners), the energy efficiency of renewable energies, advice and promotion of smart energy solutions.

Objectives:

- Increasing energy efficiency of public buildings, e.g. through better centralized energy monitoring, energy advice and renovation of public buildings;
- Increasing energy efficiency of housing, e.g. through subsidies and projects;
- Increasing efficient use of renewable energies, e.g. through supply with local wood, district heating networks and individual solar water heater;
- Improved advice service for various target groups.

Funding/Costs:

- About 720.000 € per year.
- For 2013, a budget of 300.000 € was allocated to energy policy of the Pays Voironnais.

Results:

No final results yet, but concrete results are expected in all thematic areas:

- involvement of all actors and especially citizens
- a real dynamic for renovation of the public and private property
- a reinforcement of requests and a more frequent use of bio based materials
- a contribution to the preservation of the air quality
- a development and a sustainability of renewable energies

Lessons learnt:

- Policy is built on the basis of successive territorial projects and is already well established and defines specific actions by target;
- Combination of advice/assistance with financial support to projects.

AidA (Vorarlberg region)

13) Sustainable Buildings for Communities

Region: Vorarlberg

Implemented on: Regional level

Target group: Local authorities, planners and craftsmen

Summary:

Since 2006, the Umweltverband Vorarlberg runs together with the partners Energy Institute Vorarlberg and Spektrum GmbH the advisory service "Nachhaltig:Bauen in der Gemeinde" (sustainable construction in municipalities). The Umweltverband Vorarlberg is a public authority held by all 96 municipalities in the Province of Vorarlberg. Contents of the advisory service: Coaching of public building owners, planners and craftsmen during the whole planning and building process of energy efficient and ecological public buildings.

Objectives:

- Reducing heat demand in new and renovated public buildings to passive house level;
- Reducing primary energy to passive house level;
- Supporting the use of renewable energy for heating and the implementation of solar plants to produce energy;
- Construct buildings with less embedded energy, avoid poisonous materials and to strengthen the use of local, renewable products.

Funding/Costs:

- The community pays about 1% of the building costs for the coaching service;
- The builder pays the worked hours of the 3 partners;
- Each public building is accompanied by an expert for public procurement, an architect or building service engineer specialized on energy efficiency and a building physicist specialized on ecological materials..

Results:

- 46 public buildings, half new constructed, half renovated in or close to passive house standard and measured air quality;

Lessons learnt:

- The service has not been not properly evaluated, so since 2011 an evaluation tool is connected with the funding;
- Pollution levels in conventional new buildings or refurbishments is up to 10 times higher than for ecological optimized buildings;
- In a new building with ecological materials the generated additional costs are only about 1-2% higher. The additional costs of increased energy efficiency pay for themselves.

14) Online EBO, Online Energy Report

Region: Vorarlberg
Implemented on: Regional level
Target group: Local authorities, facility manager

Summary:

Since 2001 the so called e5 program is running in Vorarlberg with an increasing number of participating municipals. The target of the program are municipals acting ecologically sensitive and against climate change. To raise awareness to energy demand and resource management it was necessary to measure the demand of public buildings and facilities. Starting with simple excel-sheets the requirements were constantly increasing leading to the EBO software which is able to record the most important energy demands on a yearly base.

EBO is an electronic tool to record the heat demand, electricity and water consumption (+ the costs of these consumptions) on a yearly level. The evaluation helps decision makers to recognize and optimize the energy demand of public buildings.

Objectives:

- Recording of energy demand in buildings and the evaluation of the collected data;
- Benchmarking in the whole country or province is available.

Funding/Costs:

- Free of charge for e5 members, start and yearly payment for non e5 municipals, province license 15.000 €;
- Every community is paying an activating fee depending on its size (714 to 1.529 €) and a yearly fee (357 to 510€).

Results:

- Starting with only 6 municipalities, there are meanwhile now 56 user communities and the provinces of Tyrol and Styria have bought the EBO program;
- About 1000 buildings are constantly evaluated in the EBO tool.

Lessons learnt:

- EBO is self-sustainable economically, but in some cases the costs for the EBO had to be explained to the municipalities;
- Success factors were: good user feedback, funding from the provincial government, politicians committed to EBO;
- The users themselves are putting forward proposals for improvements aimed at users – very few report programmes (only controlling and accounting);
- Main strengths: a very large number of participants, raising the benchmark quality.

Analysis of good practice examples “Regional Strategies” in partner regions

In all partner regions, good practice examples on regional strategies and programmes can be found, and all partners are experienced in strategy development and processes. Even if there are different types of strategies and programmes, do they have much in common and similarities specifically regarding processes and lessons learnt can be found across the partnership.

Set of examples: municipalities, municipal associations and regional level

Partner submitted examples for strategies of individual municipalities (4 examples), but also for municipal associations (4 examples) and for the regional level (6 examples).

Overall energy and climate strategies vs. sector-specific programmes

The set of good examples includes both comprehensive energy and climate strategies (6) but also specific strategies and programmes for the building sector (8).

Main target groups of strategies and programmes

Not unexpected are the general energy and climate strategies targeted to a broad range of stakeholders. They are aiming at paving the path for transforming the community towards sustainability and are often the result of a comprehensive stakeholder-dialogue. In the more sector-specific strategies and programmes, private and public house builders and owners are the main target group.

Interaction private and public sector

The public sector is generally seen as driver and model, but the important role of the private sector (business and household) is always taken into account. In general, the interaction between public authorities and the private building sector is often seen as decisive for long-term success.

Main lessons learnt

Lessons learnt in the various good examples have a lot in common, what is positive in terms of transferability across Europe and within MountEE partnership. As important for success the following factors were mentioned somehow in most of the questionnaires:

- Broad long-term commitment to energy and climate protection, specifically on the political level (public sector as model);
- Starting early with stakeholder dialogues and have an open and good communication;
- Building up trust between the actors and stakeholders of the process, if possible, get even sceptical people on board;
- Important to keep interest up in a process and realise concrete results;
- The more active participation the better the implementation;
- Communicate and offer benefits for stakeholders, (business opportunities, revenues, funding).

Table: Overview collected good practice regional strategies

Regional Strategy	Partner	Type	Target group	Measurable / tangible results	Budget
Energy strategy Massif des Bauges	RAEE	Overall energy strategy	Energy stakeholder	Increased human and material resources, launching a call for proposals.	Awareness and advice: 40.000 Euro per year, Call for tenders: 220.000 Euro
Energy Action Program Metropole Savoie	RAEE	Overall energy strategy	Energy stakeholder	Effective mobilization, low consumption building move towards higher performance.	713.500 Euro
Local Energy Policy Voironnais	RAEE	Overall energy strategy	Energy stakeholder	In progress, no final results.	720.000 Euro per year
Energy and Environmental Quality Assessment of Buildings	ARES	Sector specific strategy	Municipalities, house builders	75 buildings certified so far.	Staff costs for developing strategy and working with protocol.
Regional Energy Plan Friuli Venezia Giulia	ARES	Overall energy strategy	Energy stakeholder	Yes, in terms of produced electricity.	No information about budget available.

Energy Vision Mura	CIPRA	Overall energy strategy	Energy stakeholder	Yes, several successful projects, increased self-sufficiency.	Public funding for process management, projects financed on individual basis.
Wildpoldsried Climate Action Plan	CIPRA	Overall energy strategy	Energy stakeholder	Yes, 321% of total power consumption covered by renewables, 140 jobs.	Total costs of investments (privat and public) estimated to 24 Mill. Euro.
Service "Sustainable Buildings for Communities"	AidA (Vorarlberg)	Sector specific strategy	Local authorities, planners and craftsmen	Yes, linked to criteria catalogue.	Paid by users.
EBO Online Energy Report	AidA (Vorarlberg)	Sector specific strategy	Local authorities, facility manager	Yes, linked to criteria catalogue.	Payment of license fee etc. by user communities
Network Sustainable Construction Umeå	Nenet	Sector specific strategy	Building stakeholder, energy consultants, municipalities	Yes, e.g. input of network members to Umeå land use planning documents.	64.000 Euro per year.
Quality Strategy Residential Neighbourhood Piteå	Nenet	Sector specific strategy	Municipality, house builders, Financiers	Implementation work in progress, decision on quality programme.	No information on total budget available.
Energy Strategy Dalarna	Dalarna	Overall energy strategy	Energy stakeholder	Defined energy demand targets for buildings.	No information on total budget available.
Energy and Climate Plan Mora	Dalarna	Overall energy strategy	Energy stakeholder	Evaluation 2011 shows that work is following plan.	Within the regular budget.
Sustainable Construction for existing or new buildings	PNR	Sector specific strategy	Municipalities	In progress, no evaluation yet.	250.000 Euro

Summary good practice “Model buildings” per partner according to questionnaire

ARES, Italy

1) School construction Scuola di Polcenigo

Region: Friuli Venezia Giulia, Italia
Implemented on: Local level
Target group: Local authority, students, teachers, building companies

Summary:

The City of Polcenigo wanted to build a new wing of the school that fulfilled the criteria of earthquake resistance, being a near to zero energy building and including rainwater use. 12 classrooms were needed: 5 for primary school, 5 for secondary school and 1 for plural classroom activities. Importance has been attached to the use of wood-based materials, the reduction of thermal bridges and high-quality and energy efficient glazing. A 8m² solar thermal plant for the production of hot water is integrated. In terms of saving water, rainwater is used for cleaning, fire fighting water and toilets.

Objectives:

- Building an highly energy efficient and healthy school;
- Involve students and teachers in a training course on sustainable construction: Lectures and study visits will be carried out to understand the principles of sustainable building and construction in wood.

Funding/Costs:

- Total costs: € 1,070,000.00
- Financed by funds of the City and through regional and provincial government grants.

Results:

- School built in energy class A, with a reduction in fuel consumption by about 50% compared to the national legislation with a consequent reduction in CO₂ emissions;
- Energy certification for buildings;
- Awareness raising and improved knowledge on energy and sustainable buildings.

Lessons learnt:

- Time for completion were very short (integrated contract and prefabricated wooden structure), and the results are excellent;
- It would be interesting to monitor the real consumptions of the building when it comes into operation;
- Involving students and teachers in the construction of the new school were a success.

CIPRA

2) Minergie Administration Building Vaduz

Region: Vaduz, FL
Implemented on: Local level
Target group: Building stakeholders

Summary:

The archive and administration building of the Land Liechtenstein is the first public building in Liechtenstein certified "Minergie P". Despite special thermic and humidity needs for the magazines of the archive, the building has very low energy consumption. The back of the building is integrated into the slope. Thanks to its massive shape and its thick walls, the insulation is efficient in any season and no air-conditioning is required. The use of the humidity-absorbing material "Prosorb", thick concrete walls and clay-panels require only a minimal ventilation and air-conditioning. The low needs in heating and cooling are covered by a ground water heat pump. The roof is planted with grass.

Objectives:

Combining energy efficiency and environmentally friendly building materials with the needs of a public archive: long term protection from natural external climate condition.

Funding/Costs:

- Total costs 13,89 Mio €, equivalent to 4.435 €/m²;
- Financed by the government and administration of Liechtenstein.

Results:

- In comparison to the earlier archive, energy consumption has been reduced by 80 %;
- The prospect of this public building was a long-lasting, resistant construction which needs minimal input over the time;
- New materials (Prosorb) proved to be useful for regulating humidity.

Lessons learnt:

- The building shows that there is no contradiction between energy-efficient-building and special needs like constant humidity and temperature.
- Success factors were the commitment of the building owner to create a resistant, long-lasting building even at increased costs, and to have a strong promoter by the former head of the archive; long term vision.
- The building administration "Hochbauamt Liechtenstein" had the instruction to implement energy-efficiency in all public buildings
- Experiences are transferable to other locations, as archives are needed in several places and institutions;
- Collecting all data required for the Minergie-Standard was difficult and did cost much time.

3) CIPRA: Refurbishment School Sonthofen to Passive House standard

Region: City of Sonthofen
Implemented on: Local level
Target group: Building stakeholders

Summary:

The project is a total refurbishment with high energy and spatial standards of the high school in Sonthofen at running school business. Integrated planning have been taking into consideration ecological and economic criteria such as energy saving, life cycle costs and the use of regional and sustain-able construction materials. A reduction of follow-up costs and maintenance of the building value in the long term could be reached as well as a reduction of the use of fossil energies and of CO2 emissions of over 80%.

Objectives:

- Correct deficits in the construction, also in terms of safety and function at running school business integrating ecological and economic criteria;
- Reduction of follow-up costs and maintenance of the building value in the long term;
- Reduction of the use of fossil energies and of CO2 emissions of over 80%;
- Integrated planning involving the architect, all specialist planners and the school;
- Transferability of the experiences to other school buildings of the same construction type.

Funding/Costs:

- Total costs 17 Mio. Euro
- Funding from Deutsche Bundesstiftung Umwelt (DBU): 125.000,00 €, for the analysis of the building structure and planning;

Results:

- CO2 emissions of the high school are reduced by more than 80% compared to the old building (= - 440 tons per year);
- An analysis of life cycle costs allows for reducing follow-up costs for single construction parts and a longer life time for certain parts.
- Short transport distances for regional construction materials..

Lessons learnt:

- Refurbishments of existing buildings for more energy efficiency are worth the costs in the long term due to lower running costs;
- The re-use of existing construction material saved energy and costs compared to a new construction;
- The experiences can be transferred to other school buildings of the same construction type.

Dalarna region

4) Kungsljuset – new care dwellings in Borlänge

Region: City of Borlänge
Implemented on: Local level

Target group: Building stakeholders

Summary:

The Municipality of Borlänge energy and climate strategy contains requirements for energy efficiency in new constructions at a maximum of 80 kWh/m². Therefore, new dwellings for assisted living (46 apartments with capacity for 51 residents) now under construction are calculated with an added energy demand of 61 kWh/m² per year. This includes solar panels for hot water demand.

The contractors who are submitting a tender must prove how targets are to be met and has to show a quality and environmental management plan specific to each project. Materials should be proved to be environmentally friendly. Staff has been involved in the planning process and were also able to take part in the evaluation of tenders thanks to a model that has been developed to make this legally possible. The various contractors that submitted tenders each had 1.5 hours in which to present their project planning for groups of staff and for the developer. LCC is used to calculate consequences.

Objectives:

- Contributing to energy, environment and climate targets;
- Ensuring high quality building process and involvement of staff;
- Proving economic reasonability through LCC calculation.

Funding/Costs:

No information, but based on LCC calculation;

Results:

- High energy-efficient buildings for assisted living under construction;
- Involvement of staff;
- LCC was used as a tool in producing estimates;
- Proven sustainable building materials selected.

Lessons learnt:

- Building in an energy-efficient way is a complex process that rarely has one single solution. Building on previous experience is therefore both necessary and crucial;
- The builder has recently revised its business plan and now requires a maximum energy level of 70kWh/m² for new buildings;
- Staff participation in both the planning and the selection of contractors is an activity that also contributes to the next step in the development of an energy-efficient building. The sense of ownership of a project like this are also forms the basis for changing staff behaviour towards energy efficient habits.

5) Dalarna: Vitsippan – Passive house apartments

Region: City of Falun
Implemented on: Local level
Target group: Building stakeholders

Summary:

The municipal housing company in Falun is currently building 54 apartments in the Vitsippan complex, all with spacious patios or glazed balconies. The buildings being planned in this

district were chosen as pilot sites for the construction of passive houses and the actual apartments are designed with a specific energy consumption of 51 kWh/m². The requirement for airtightness is very strict and set at 0.15 l / (sm²), and the windows have a U factor of 0.8 W / (m² K). Through the project, the municipal property company, Kopparstaden, has become a leader in the field of energy efficient buildings. No one else in the county has previously built housing at such an energy-efficient level as this. In the procurement process, the company demanded strict and non-negotiable energy requirements and set at the same time set an upper limit on costs. Contractors who submitted tenders needed to show in their bids how they will fulfill energy requirements within the given cost framework.

Objectives:

- Building houses that are cheap to administer;
- Contributing to the municipality's energy and climate plan.

Funding/Costs:

It is about 5% more expensive to build a passive house and, according to estimates, the pay-off time 8 years.

Results:

- Since the buildings have recently been completed, the follow-up of energy efficiency has not yet been started.
- During the project, the contractors specially trained their construction workers;
- These passive-house projects have attracted a lot of attention in the region and several study groups have visited the buildings.

Lessons learnt:

- Building energy-efficient dwellings at a level of 75-80 kWh/m² with added heat coming from a district heating system no longer entails higher costs. However, when you choose to go down to the levels of passive-house standards, investment costs increase by about 5%, as this project shows.
- Contractors see this procurement as a challenge, but are nevertheless positive. Compared with national construction airtightness requirements at 0.8, builders now typically manage levels of 0.15. This is such rapid progress that it is worth more publicity.

Nenet, Norrbotten and Västerbotten region

6) Passive houses Taveliden

Region: City of Umeå
Implemented on: Local level
Target group: Building stakeholders

Summary:

The City of Umeå, Dragon School's building programme and consult company Sweco are partner in the "Network for Sustainable Building in Cold Climate". This was the starting point for a successful collaboration. Existing plans to let students of Dragon School's building programme to build low-energy-houses on existing grounds changed after consultations with

Sweco's passive house architect to building certified passive houses. Now, the first environmentally certified 3 single families in passive house standard in Northern Sweden are realised, and 6 more are planned in a phase 2.

Objectives:

- Implementing an adapted passive-house concept for single-family for Northern Sweden with a focus on healthy and renewable building components;
- Realize model buildings: 3 passive houses in phase 1, 6 more in phase 2;
- Teaching students on forward-looking building concepts;
- Environmental certification and passive house certification of buildings.

Funding/Costs:

- Costs: about 10-12% higher building costs than for a standard single-family house, certificate costs about 3-5% of total costs;
- Estimated selling price: about 400.000 Euro.

Results:

- 3 passive houses incl. use of renewable primary products as building components for a healthy and comfortable interior climate;
- Successful passive-house and environmental certification for buildings;
- Teaching and training for future house builder with Show-and-tell model project;
- Improved knowledge for Dragon School's project leader/teacher

Lessons learnt:

- There is still a need to increase the understanding of the principles of passive-houses concepts to make it possible to consequently adapt technical solution to Northern Sweden's climate;
- As students are building the houses, the demand for controlling and for adjustment was relatively high.
- There is a need to further develop the market for high-quality building components to reasonable prices. Otherwise, the European passive houses certification standards cannot be full-filled without high costs, which only few people can afford. This is true for some regions with really harsh climate, e.g. in the mountain regions in Northern Sweden or generally north of the Polar Circle.
- Commitment of Umeå municipality, Dragon school's building programme and Sweco were decisive for success.

7) "Bäckåsen" – a low energy building in Gällivare

Region: City of Gällivare
Implemented on: Local level
Target group: Building stakeholders

Summary:

The cold climate in the northern parts of Sweden makes great demands on the construction work to achieve high energy efficiency. The 100% governmentally owned mining company LKAB has been mining in the area of Kiruna and Gällivare/Malmberget for more than 100 years. The expansion of the iron ore fields around the mining industry result in a huge demand for new housings. Bäckåsen is the first construction of apartment buildings in Malmberget in the last 50 years. It is a low energy house built with industrial methods. Pow-

er consumption is less than 75 kWh/m² and density lower than 0.4 l/m²s. The building is environmentally classified (Silver).

Objectives:

- Contributing to sustainability targets in new residential areas as described in planning document "New Vision Gällivare";
- Creating new living space in a phase of change due to a growing mining area;
- Developing prefabricated low-energy-houses for Northern climate;
- Strengthening building industries competence to build low-energy houses for the Northern climate at reasonable costs.

Funding/Costs:

Mining company LKAB and national funding programme.

Results:

- A environmentally certified high quality building.

Lessons learnt:

- A better result could have been achieved through a better place and a more adapted shape of the house;
- Sustainability as one of the strategic priorities for New Vision Gällivare was an important driver for the project.

8) Green Galären: Renovation office building Luleå

Region: City of Luleå
Implemented on: Local level
Target group: Building stakeholders

Summary:

Galären is a group of companies in the property sector and the only property company in Norrbotten that received the European Commission's Green Building certification. Galären is also a member of the Sweden Green Building Council. In a comprehensive renovation project of an office building built 1968 the house owner Galären aims at getting certification according to EU standard Green Building and a reduction of energy demand of 30% compared to legal standard. The project also includes removal of PCB materials and replacement with environmentally friendly and healthy materials.

Objectives:

- Creating an environmentally friendly, healthy and energy efficient renovation project, certified according to EU standard Green Building;
- Reducing energy demand by at least 30%, thereby also reducing operating costs;
- Strengthening Galären's position as a leading property company in a high-quality sector of buildings;
- Increasing profitability through reduced operating costs and through offering attractive objects to possible tenants;

Funding/Costs:

No information available.

Results:

- A GreenBuilding certified high quality office building with focus on a comprehensive solution for health and environment.

Lessons learnt:

- An important driver was Galären environmental policy documents combined with the demand for high-quality office buildings and the need to reduce energy costs;
- The GreenBuilding certification system is an important incentive for house owners.

PnR:

9) PnR: Catalan University

Region: Prades, South France

Implemented on: Local level

Target group: Building stakeholders

Summary:

The cross-border cultural association "Universitat Catalana d'Estiu " decided to install infra-structures of teaching and accommodations in the Castel Vall Roc located in Prades (not in the area of the Natural regional park but close to). This little town has a mediterranean climate and many hours of sun. The maximum consumption for new extensions had to be less than 130 kWh/m²/year incl. heating, hot water, ventilation, lighting and cooling. But the architect managed to go below 50% under this level with local renewable energy and test of measure of permeability in the air. Even for renovated parts of the building, very low levels could be reached, and the building will be labelled according "BBC". The hot water is produced by solar panels on the roofs of the extensions, with supplement pellets wood and centralized storage of 3000 l.

Objectives:

- A common desire to the contracting authority and to the project manager was an eco design and environmental concerns: Global energy optimization and, use of healthy materials
- Respect of the patrimonial specificities of the castle.

Funding/Costs:

- Building extensions: 1 240 000 € (free tax). (1 900 € free tax./m²);
- Starting of the extensions: 200 000 € (free tax);
- Renovation for the castle: 1 590 000 € free tax. (1 290 € free tax./m²).

Results:

- North façade : 16 cm wool of rock behind wooden board R = 4
- West & East gables : 15 cm expanded polystyrene with coating R = 4
- Ground : 10 cm expanded polystyrene R = 3
- Roof : 35 cm straw + 10 cm fiber wood R = 7.5.

Lessons learnt:

- This project is an important good practice example in the region;

- Indoor climate and living comfort are very good, what is important for transfer of experiences;
- Measurements are under process for confirming calculated results.

Rhone Alpes region

10) Town hall renovation St Verand Community

Region: St. Verand, France
 Implemented on: Local level
 Target group: Building stakeholders

Summary:

The Town Hall of Saint-Vérand in Isère is an important heritage to preserve. Thus the choice for renovation was to maintain the appearance of the exterior and thus to insulate the building from the inside resulting among others into the removal of all existing wood floors and all interior refurbishment. Beyond, it was decided to change the building use into a town centre incl. e.g. post office and town hall. The building has been designed according to the standard BBC (Low Consumption Building): consumption of primary energy must not exceed - 40% of the conventional reference. All choices of materials, construction systems, insulation etc. were chosen according to different scenarios tested both to measure their technical impact and their economic impact to find the best possible ratio between technical and environmental gain according to costs.

Objectives:

Preserving a historic building while increasing energy and environmental performance.

Funding/Costs:

- 1 137 000 € (excluding exteriors), and 917 000 € (renovation works only);
- Subsidies : 457 350 € representing 40 % of the investment

Results:

Improving energy performance from 316,39 kWh/m² /year to 97,31 kWh/m² /year

Lessons learnt:

- This project is a pilot in the Rhône-Alpes and will serve as a reference for other similar projects.
- The qualities of insulation and careful implementation guarantee a good part of the thermal performance of the building. Further important factors are air tightness and use of waste heat;
- The proposed transformation of the Municipality is guided by a comprehensive high environmental quality environmental approach: energy conservation, maintenance, thermal comfort in winter and summer, acoustic management, management of construction waste are priorities.

11) Town hall reconstruction of Pajay

Region: Pajay, France
Implemented on: Local level
Target group: Building stakeholders

Summary:

Politicians in Pajay wanted to make the renovation and reconstruction of the city hall to an exemplary project and in collaboration with the architecture, town planning advice centre CAUE ambitious energy saving targets were defined, incl. insulation, air tightness and humidity sensitive ventilation, while keeping the historic facade. A thermal solar plant is part of the concept. The project was finalised in February 2012. Thermal calculation shows that the building performance approaches BBC standard (Low consumption building) with a consumption of primary energy of - 45% of the conventional reference.

Objectives:

Prove commitment to environmental protection.

Funding/Costs:

Investment: 893 000€ all taxes included

Results:

- Improving energy performance from 149,60 kWhep/m² /year to 81,72 kWhep/m² /year.
- The objective BBC renovation is not reached.

Lessons learnt:

- The objective BBC renovation is not reached due to the characteristics of this type of historic building;
- The thermal insulation is not sufficient for the BBC renovation performance level;
- An airtightness test has been carried out after the placing of the film and some airtightness defaults have been corrected. A second test was performed at the end of construction to ensure that the value of air permeability was consistent with the regulatory calculation.

12) Town hall renovation of Tournon

Region: Tournon, France
Implemented on: Local level
Target group: Building stakeholders

Summary:

The City of Tournon has been committed to environment protection and energy savings for a long time (e.g. energy consumption monitoring for municipal buildings since 2006, investment in a wood boiler in a school in 2005, and energy saving measures reg. public lighting). In 2007, the municipality started a project aiming at retrofitting of the town hall and the creation of rental housing for people with economic and social difficulties.

There were many problems to solve in the town hall retrofitting: from a roof in poor condition to a lack of insulation, lack of air tightness generating great discomfort and electric and thereby expensive heating. Electric heating has been replaced by connection to district heat-

ing supplied by a pellets wood boiler. A solar thermal system provides hot water, and a 9 kWp PV plant is producing electricity.

Objectives:

- Improving comfort inside the building making it airtight;
- Improving energy performance through insulation and use of renewable energies;
- Making the building accessible for disabled people and meet safety standards.

Funding/Costs:

- Total cost: 495 688.65 € exclusive of tax. Additional costs linked to additional energy efficiency were 30% due to specific building conditions (normally 8-12%)
- Subsidies: 101 257 € HT (20%)

Results:

- BBC standards (low consumption building) could be met;
- Energy demand could be reduced from 154.1 kWh/m² SHON /year to 36.8 kWh/m² SHON/year.

Lessons learnt:

- Success factors: Companies have been invited to a training, performance tests in place and a guarantee of results that has stimulated business;
- Characteristics related to BBC not sufficiently taken into account by the craftsmen who responded on the basis of a classical rehabilitation;
- There was a need for high availability of contractors and continuous monitoring by the responsible for works of the municipality.

13) Construction of a childcare home in Combe de Savoie municipalities

Region: Community of Municipalities of Combe de Savoie, France

Implemented on: Local level

Target group: Building stakeholders

Summary:

Due to the growing needs for childcare, the Community of Municipalities of Combe de Savoie (CCCS) and the Community of Municipalities Gelon Coisin (CCGC) came together for the realization of two twin nurseries. The target was to meet the objective of the BBC label (low consumption building) and integrate ambitious criteria for the environmental quality of the building specifically to reach a very good indoor air quality. Because of very motivated and informed owners, the selected contractor proposed to go beyond by offering a passive house (heating needs <15 kWh/m².year). In the end, the building has been realised with the following features: pellet boiler 15 kW, solar thermal system 6m², highly efficient ventilation with heat recovery, passive solar energy use (e.g. orientation of building), efficient lighting, and choice of environmental and healthy building materials.

Objectives:

- Providing parents with childcare;
- Realising a building with high energy performance and a healthy indoor climate.

Funding/Costs:

- Total cost: 845 557 € HT;

- Public subsidies : 80%

Results:

- Compliance with BBC label (2005);
- Compliance with requirements of passive buildings.

Lessons learnt:

- The close collaboration between owners and contractors have allowed to bring this project to high levels of environmental and energy performance.
- Additional costs related to performance have been mastered, and owners have benefited from additional financing for the ambitious requirements of the project. Surcharge of 6% to go from low consumption level to passive level;
- The owner has evaluated needs and expectations in collaboration with users. Then the program was clearly defined with specific energy and environmental goals.
- The contractor has ensured the follow up of objectives of this environmental approach.

14) Construction of an early childhood centre in Saint-Pierre d'Allevard

Region: Saint-Pierre d'Allevard, France

Implemented on: Local level

Target group: Building stakeholders

Summary:

Based on a strong commitment to environmental protection, the city of Saint-Pierre d'Allevard decided in 2010 to build an innovative early childhood centre focusing on energy and environmental performance. The site is located at an altitude of about 520 m and planning includes reinforced insulation, high air tightness, efficient lighting and highly efficient ventilation. A pellet boiler and solar thermal systems are providing heat and warm water. The project is following the principle of a high environmental quality label. The target is to go beyond the BBC level (low consumption building) by 50%.

Objectives:

- Contributing to energy and climate targets;
- Realising a building with high energy performance and a healthy indoor climate.

Funding/Costs:

- Total cost: 1 847 830 €
- Subsidies: 573 396,18 € (Loan 0% CAF (Family Allowance Fund) : 100 000 €

Results:

- BBC performance reached without asking for the label and air tightness tests carried out with great results;

Lessons learnt:

- Technically and economically the project went smoothly thanks to the motivation and involvement of the owner and secondly through effective partnership with the contractor team.

- Technically, the project went far in terms of energy performance. However the label Effinergie has not been applied for because the cost of the latter was considered too expensive.
- The end of the construction is scheduled for late 2012, as there has not yet been heating season there is no figures on consumption.

Vorarlberg region

15) New building kindergarten Bizau

Region: Bizau, Vorarlberg, Austria
 Implemented on: Local level
 Target group: Building stakeholders

Summary:

The new kindergarten building integrates naturally into the existing built environment and creates convincing outside spaces with very close ties to the surrounding village and mountains. The building itself is designed as a structural timber construction. In terms of energy engineering the new building is of passive house design. The use of ecological, sturdy building materials guarantees a long service life, contributing positively to sustainability. This was a result of a successful cooperation with the service package and a good teamwork between architect and building service engineers.

Objectives:

- Contributing to energy, climate and environmental targets;
- Realising a building with high energy performance and a healthy indoor climate;
- Taking the lead as municipality in innovative energy efficient building processes.

Funding/Costs:

- Total cost: The total building costs were 1 Mil. €, 1.967 €/m²
- Financing: local authority and the county.

Results:

- A building with an energy demand of 10 kWh/(m²a);
- The targets of the ecological program were met and the building has been awarded with two prizes.

Lessons learnt:

- A good cooperation between architect and mayor in an ambitious community was the basis for success;
- Good night cooling concept part of success;
- The building convinces architects who think high energy efficiency is not corresponding with good architecture.

16) Vorarlberg: Renovation primary school Mähdle/Wolfurt

Region: Mähdle/Wolfurt, Vorarlberg, Austria

Implemented on: Local level

Target group: Building stakeholders

Summary:

After 35 years of use the elementary school Mähdle in Wolfurt, Austria was redesigned and renovated in 2009 to meet current and future demands of everyday school life. The renovation included wide-ranged thermal energy improvements to the building envelope aimed at bringing it up to passive house standards, and an increase in the building's compactness, something normally difficult to achieve with an existing building. Adhering to passive house standards as closely as possible is a requirement for the building-related zero energy balance. The hot water and heating energy demands of the school were reduced by about one quarter thanks to a large area of solar thermal collectors, while a ground source heat pump covers the remaining energy requirements. In the annual balance, a photovoltaic array on the roof of the school building offsets the electricity consumption of the heat pumps and other technical plants and of a neighbouring fire station for the town of Wolfurt, erected at the same time as the renovation of the school. (Text. Detail, Green books "Net Zero Energy Buildings" Karsten Voss, Eike Musall)

Objectives:

- Contributing to energy, climate and environmental targets;
- Realising a building with high energy performance and a healthy indoor climate;
- Taking the lead as municipality in innovative energy efficient building processes.

Funding/Costs:

- Total cost: The total building cost were 3,8 Mil. €, 936€/m³ BRI
- Financing: local authority and the land.

Results:

- A building with an energy demand of 15 kWh/(m²a);
- The targets of the ecological program were met;
- Published in "Zero energy building" of University of Wuppertal

Lessons learnt:

- A good cooperation between architect and mayor in an ambitious community were the basis for success;
- The building is a very good example for a passive house standard in renovation combined with PV plant.

Analysis of good practice examples “Sustainable Buildings” in partner regions

Even though all partners presented good practice examples in the field of sustainable buildings, the level of experience is very different. There is also indication that the number of realised good examples with focus on sustainable energy differs a lot between regions in general: While in Vorarlberg many best practice examples already have been realised, there are only very few in other regions or the ambitious level is relatively low.

Type of buildings

Public buildings like town halls and administrative buildings accounts for 4 examples, kindergarten, schools and Universities for 7 examples and residential buildings (social and/or municipal housing association) for 3. One example is about an office building from and for the private sector. One example is a technology.

Comprehensive environmental approach

In the majority of good practice examples, not only a great energy performance was required, but a more comprehensive environmental approach was implemented. A good indoor climate and the use of healthy and environmental building materials were important, too. In most cases, the combination of these requirements was an important factor for success for convincing decision makers to invest, but also to get users and citizens on board.

Integration of renewable energies

In the majority of examples, the use of renewable energy is part of the building concept, both in new constructions and in renovation projects.

Controlling results and certification

In general, the follow-up and controlling of results is good in most of the projects. Certification seems to be a strong tool both to ensure high-quality projects and to push for more ambitious projects. It is important for building owners to be able to prove high environmental and energy performance and to use it for marketing.

Commitment, collaboration and participation

An important success factor is a close and faithful collaboration between awarding authority and contractors based on a strong commitment for ambitious and well-working sustainable buildings. An effective and clear communication structure is needed to avoid misunderstandings. Beyond, the participation of users already in an early phase of the project and in best case changing over to a day-to-day commitment to energy savings is the cherry on the top.

Table: Overview collected good practice regional strategies

Building	Partner	Type	Renovation vs. Construction	Measurable / tangible results	Budget
Town hall St Verand	RAEE	Administration building	Renovation	Improved energy performance from 315 to 97 kW/m ² and year.	Total cost: 1.137.000 Euro
Town hall Pajay	RAEE	Administration building	Renovation	Improved energy performance from 149 to 81 kW/m ² and year.	893.000 Euro
Town hall	RAEE	Administration	Renovation	Improved energy perfor-	495.688 Euro

Tournon		building		mance from 154 to 36 kWh/m2 and year.	
Childcare home Combe de Savoie	RAEE	Educational buildings	Construction	Compliance with BBC label	Total cost: 845.557 Euro
Childhood Centre Saint-Pierre d'Alleverd	RAEE	Educational buildings	Construction	Compliance with BBC label	Total cost: 1.847.830 Euro
Scuola di Polcenigo	ARES	Educational buildings	Construction	School built in energy class A, - 50% energy reduction compare to national legislation.	Total cost: 1.070.000 Euro
Minergie Archive Building Vaduz	CIPRA	Administration building	Construction	80% less energy demand compared to earlier building.	Total costs 13,89 Mio Euro, 4.435 Euro/m2
School Sonthofen	CIPRA	Educational buildings	Renovation	80% less energy demand compared to old building.	Total cost: 17 Mio Euro.
Kindergarten Bizau	AidA (Vorarlberg)	Educational buildings	Construction	10kWh/m2 and year..	Total cost 1 Million Euro.
School Mähdle	AidA (Vorarlberg)	Educational buildings	Renovation	Energy demand 15 kWh/m2 and year.	Total cost: 3,8 Million Euro
Office building Luleå	Nenet	Administration building	Renovation	30% energy demand reduction compared to standard.	No information available.
Passive houses Taveliden	Nenet	Residential houses	Construction	Calculated according to FEBY: 12 kWh/(m2a), according to PHPP: 19 kWh/m2a.	About 10-12% more expensive compared to legal standard building.
Apartment Building Gällivare	Nenet	Residential houses	Construction	Calculated energy demand: 75 kWh/m2	No information available.
Care dwellings Borlänge	Dalarna	Educational buildings	Construction	Calculated energy demand 61 kWh/m2.	No information available.
Passive houses Falun	Dalarna	Residential houses	Construction	Calculated energy demand 51 kWh/m2.	About 5% more expensive compared to legal standard building.
Catalan University	PNR	Educational buildings	Renovation	No final energy reduction data available	1.240.000 Euro (free taxes)

Conclusions comparing results from survey on barriers and survey on good practice

The project MountEE is focusing on mountain regions with their specific challenges in terms of sustainable building, as there are low accessibility and remoteness as well as harsh climate and in general a majority of small municipalities, suffering of a lack of resources. Anyhow, all partner regions could contribute with good practice example to the good practice survey. This is encouraging and a good basis for further work. Comparing the results from both surveys (on barriers and knowledge gaps and on good practice results) the following conclusions can be drawn:

Matching of barriers and know-how across the partnership

The role of Vorarlberg as one of the leading regions in Europe when it comes to sustainable and energy efficient building has been well-known from the start of the project and is planned to be used to give expert advice to the other regions. Anyhow, the survey on good practice shows that the know-how level in general is high, but also that partners can offer specific know-how to others. A concrete example: a main barrier for many partner is, that lifecycle costs / overall total costs are not taken into account if it comes to decision making on investments. On the other hand, Dalarna can provide one good practice example on using LCC analysis in cost-calculation.

Development and improvement of funding policies

All partners agree that insufficient funding schemes for sustainable building are a main barrier in their regions, and that a further development of funding policies is necessary. This is also a concrete working task for the MountEE project. Happily enough, the survey of good practices is showing a broad variety of concrete and interesting financing instruments across the partnership. Specifically interesting is on the one hand the strong position of regional funding policies in the survey, and the fact, that some innovative examples like the LCC calculation tool, a contract based system for selling of municipal land and the Minergie-label are part of the set.

Developing MountEE regional strategies and transferability

In the next phase of the MountEE project, each region works out regional strategies for ecological and energy efficient building and renovation. This should be based on WP2 work. The high know-how level of all partners regarding strategy development is a good basis for that. Anyhow, the partnership should discuss how the collective know-how can be supportive for the concrete work on regional level. This is not an easy thing to do: probably, more concrete information is needed than that already collected. What is more: when transferring experience, it is necessary to adapt good practices from specific contexts to be able to apply them in a new context. There might be specific conditions in the origin region which are not there in the applying region. Beyond, pilot or demonstration projects are often driven by a great enthusiasm and less bureaucratic resistance due to the lack of permanency in pilot programs. Anyhow, to make use of the comprehensive know-how of the partnership to improve regional strategy making within MountEE seems to be decisive for success of the project.

General conclusions

Both exercises (analysis of barriers and gaps and investigations of good practices) have been an important step in MountEE project:

- for each partner to understand the needs of its region
- for the consortium to think together how MountEE can contribute to the needs, where can they benefit from the experience from each other
- to read, describe and exchange on a basis of pool experience,
- to think, prioritize and plan in an efficient way the next steps of the project
- to think about the way to highlight the results of the project and organize efficient capacity building, training and communication activities

Partners discussed the results of this report and the barriers report during an expert meeting on 15.01.2013 in Kiruna/SW.

Annex 1: Questionnaire

Region / local area considered:	Good practice submitted by
<p>1) Short description of the action/strategy/project (200-400 characters)</p> <p>Title of the strategy/building project/instrument</p> <p>Short summary of the strategy/building project/instrument</p>	
<p>2) Background/targets (500-700 characters)</p> <p>Guiding questions:</p> <p>How did the idea for the strategy/building project/instrument come up? What challenges (problems) was aimed to tackle by implementing this? Please describe the general background.</p> <p>Does the action fit into a broader (regional/national) strategy? If yes, please describe shortly.</p>	
<p>3) Detailed project/program description (1000-1400 characters)</p> <p>Guiding questions:</p> <p>What are the main objectives and concrete targets? Mention quantified objectives if any.</p> <p>What long term and indirect benefits are expected from implementing this strategy/building project/instrument?</p> <p>Who (what structure/organization) is implementing the strategy/building project/instrument?</p> <p>What is/are the target group(s) the action/strategy/project is directed towards?</p> <p>What is currently the geographical level of implementation of the action/strategy/project?</p> <ul style="list-style-type: none"> - Local level (1-2 municipalities) - Small regional level (limited number of municipalities) - Wider regional level (province or sub-unit) - Other (specify) <p>Since when has the strategy/building project/instrument been implemented? Until when will it be running?</p> <p>How is the strategy/building project/instrument implemented? Through what steps/methods?</p>	

Does the strategy/building project/instrument offer any service packages or tools? If so, please describe.

Please describe how the strategy/building project/instrument has been organized. (e.g. who has been involved in developing the strategy/building project/instrument and in implementing the strategy/building project/instrument?)

Have you encountered difficulties in involving actors/stakeholders?

How could this strategy/building project/instrument have been improved further?

4) Funding/financing/costs (200-400 characters)

Guiding questions:

What is the total cost (in Euros, if possible)? For financial instruments: what is the total funding that is available?

How is the strategy/building project/instrument financed? Who is involved (public, private bodies, users, etc.)?

Is the strategy/building project/instrument financially self-sustainable (returns on investments, etc.)? If so, how? Calculation method?

What are the human resources dedicated to this strategy/building project/instrument?

5) Main results (800-1200 characters)

Quantified results?

Which indicators were used?

Other results?

6) Analysis – lessons learnt and success factors (600-800 characters)

Guiding questions:

Has the strategy/building project/instrument been evaluated? What are the main results (avoided cost, pollution or GHG emissions avoided, creation of jobs, etc.)?

Have the targets been met or are they in the process of being met?

What difficulties have you encountered? And how were these overcome?

What are the drivers and success factors that can facilitate the implementation of the action strategy/project/instrument?

Should another local government be interested in "importing" this initiative, what would be

your recommendations? What would be key requirements to maximize chances of success?

What makes this strategy/building project/instrument innovative? In which way(s)?

What makes this strategy/building project/instrument transferable? In which way(s)?

What is the main strength/quality of this initiative?

7) Time frame

Start date? End date? Ongoing strategy/building project/instrument

8) Contact project owner

Organisation:

Name contact person::

Address:

Phone:

Email:

Web site:

9) Add Logo and 2-3 pictures or diagrams if appropriate!

Annex 2: List of Partners

Partner name	Abbr.	Country	Profile of the organisation
International Commission for the Protection of the Alps CIPRA	CIPRA	LI	NGO, non-profit umbrella organisation with ca. 100 member organisations committed to the protection and sustainable development of the Alps. Well experienced in the management of trans-national projects
Nenet Norrbottens Energy Agency	Nenet	SE	Regional Energy Agency, non-profit company. Active in Northern Euro-pean countries and especially in Sweden.
Rhônealpiénergie-Environnement	RAEE	FR	Energy Agency, practitioner and multiplier at regional level in the French Alps
Lansstyrelsen Dalarna	Dalarna	SE	Public authority, responsible for development and communication of regional energy policies and SEAPS, coordinating regional energy and building projects.
Parc naturel régional des Pyrénées catalanes	PnR	FR	Public organization for local and regional planning. Support of municipalities in the regional parc and in the Pays Terres Romanes in order to develop innovative actions and to develop energy policies
Municipality network "Alliance in the Alps"	AidA	DE	Network of appr. 300 municipalities in the Alps (AT, CH, DE, FR, IT, SL). Focus on sustainable development, energy efficiency and climate change
Agenzia Regionale per l'edilizia sostenibile	ARES	IT	Society owned by Regione Friuli Venezia Giulia. Promotes sustainable and environmentally-friendly construction, and improvement in construction quality

Annex 3: Comparison of regions

Region	Average Temp. (C)	Price for electricity (Eurocent)	Price for oil (Eurocent)	Price for district heating (Eurocent)
Kiruna	-1	10	13	5-9
Norrbottn and Västerbotten	3			
Dalarna	4,2	10	13	7-9
Vorarlberg	8	16	10	7-9
Friuli	About 8	17-18 plus fix expenses for contract		
Rhone-Alpes	7-9	11	10	8-9
Pyrenees	7-11	11	10	6-9