

Remining Lowex – Information, Communication, Education and Participation Plan (ICEP)

General Summarized Info Guide

With Mine Water against Climate Change

Introduction

There is an undisputable need for a more efficient energy use and reduction in CO₂ emissions. Therefore in the future a huge effort must be made to conserve high quality or primary energy resources. The Remining Lowex approach gives an important contribution to these objectives. This will be achieved by the exploitation of geothermal energy from water in mines and by making use of these large water volumes for the heating and cooling of buildings.

Four ambitious local communities - Heerlen (The Netherlands), Zagorje (Slovenia), Czeladz (Poland) and Bourgas (Bulgaria) - will demonstrate the use of locally available low valued renewable energy sources, specifically from water in abandoned mines for the heating and cooling of buildings. The project approach is based on low exergy principles, facilitated by an integrated design of buildings and energy concepts. The project will realize sustainable mining communities with 50 to 100% CO₂ reduction and 60% RES compared with standard national practices. The demonstration sites contain new houses, non residential new buildings and residential existing buildings to connect with the mine water grid.

Remining Lowex will have a substantial impact on the necessary transition from fossil fuel to sustainable clean and non exhaustive energy. In addition and by means of innovative working-methods, related communities also benefit socio-economically from the project. Some old wounds, caused by the closing of mines, can therefore be healed. Thus, old mines can bring new energy in a lot of different ways when energy transition is not only a physical and technical programme but moreover a social and psychological one.

As the success of the pilots is very much depending on the motivation, collaboration and commitment of the occupants in every community, a tailored information, communication, education and participation plan (ICEP) will be prepared for Heerlen and Zargoje. The knowledge concerning the end product and options is no longer just the privilege of the professional. All parties, including the end-users, are able to participate in the process. The information and education actions will be condensed in Occupants Info Guides, in native language and customized to the locations. The customized info guides are summarized here in a general info guide.

1. Participating in Remining Lowex - General Communication and Participation Concept

It is important to raise awareness, create interest and get an optimal involvement of occupants on the demonstration site. Besides information on the project, technical aspects or planned activities in the respective communities, occupants receive guidance on energy delivery contracts with Energy Exploitation Companies on the pilot locations as well as (legal) support for energy contracting. Another objective is to “bring the EU closer to the citizens”.

Information and education will be given, on a low and very understandable level, on issues like EU climate policies, the EU constitution, etc.. It is crucial for the implementation and success of the EU energy and GHG reduction policies that the end-user is fully committed and motivated (“think globally, act locally”). The preparation and implementation of the information, communication, education and participation plan (ICEP) provides the basis for the motivation, collaboration and commitment of occupants in every community – a strong foundation for the success of the pilots.

In order to establish participation in the pilot communities, it is advisable to install a so called Forum. A Forum is a municipal driven participative process which engages local stakeholders and citizens. They shall work together in order to prepare and implement common actions for their territory that can be formalised into an action plan. The objective of the Remining Lowex Forum is to conceive and communicate initiatives and projects aimed at significantly developing sustainable energy at local level, ultimately allowing the municipality to prepare its energy future.

The goal of the Remining Forum is to involve as many local stakeholders and citizens as possible in municipal energy policy-making and to share a common vision. It is certainly more difficult to implement, but its main advantage lies in the fact that it yields better results, actions are developed and implemented in a concerted and co-ordinated way, usually by means of an action plan that is shared with a number of stakeholders. This approach also promotes a better political decision-making process, encourages energy citizenship and stimulates the market for sustainable energy. A Forum is, therefore, an excellent way of introducing changes at local level, promoting the concept of Sustainable Energy Communities and achieving the EU objectives.

According to Climate Alliance’s experience the following steps are expedient:

1. Invitation

- 1st meeting with contact person
- Clarification of needs, interests, expectations
- Identification of relevant departments and contacts in the administration
- Presentation of Remining Lowex to the city / municipality council
- Resolution of the city / municipality council

2. Inventory

- Identification of characteristics and priorities
- Existing participatory processes (Agenda 21, Energy Forum, etc.)
- Analysis of local and regional framework conditions
- Compilation of relevant activities
- Check of data availability
- On-site inspection of buildings

- Identification of relevant decisions to be taken in the next months / years
- Formulation of starting point

3. Institutionalisation

- Checking of potential organisational models
- Decision on structures
- Appointment of people responsible
- Agreements on regular communication
- Constitution of a working group
- Involvement of local citizens groups or initiatives and joint development of the participation process, based on already existing communication structures among occupants and / or by setting up new working or focal groups

4. Formulation of an Action Plan

- Definition of a long-term vision
- Agreement on priority measures
- Identification and formulation of basic resolutions
- Agreement on next steps / focal activity areas
- Agreement on the strategic development of a comprehensive approach

5. Monitoring

- Development of indicators
- Preparatory work for future reporting
- Eventually revision of the action programme
- Preparations for data collection for monitoring of individual measures and of CO₂

2. Information, Communication, Education and Participation Plans (ICEPs) in Heerlen and Zargoje

It is important to raise awareness, create interest and get an optimal involvement of occupants on the demonstration site. In order to tailor the ICEP to the pilot locations in Heerlen and Zagorje, data needs to be collected in the course of the project, including income, family size / number of children, share of single households, share of owners / tenants, education etc..

Based on this data, and taking into account existing stakeholders including community organisations and business, ICEP plans will be prepared for each location. The tailored plans will then include:

- in-depth information for all stakeholders and citizens about the project including its European dimension and its contribution to EU policies on energy and climate change as well as the planned activities in the respective community;
- additional specified information with implications and opportunities for individual groups (landlords, tenants, local businesses), in particular on the plans regarding energetic upgrading of buildings / demand side measures;
- involvement of local citizens' groups or initiatives and joint development of the participation process, based on already existing communication structures among the occupants and / or by setting up new working or focal groups, offering specific participation opportunities for urban development.

The preparation of the plans will be followed by the realization of the participation process, providing stakeholders and citizens with the opportunity to comment on the planned activities and to develop own initiatives on top, the aim being not only to consider specific needs of individual groups, but also to create a new identity among the occupants.

3. Target Groups

The communication target groups of the Remining Lowex project can be defined as:

- Local, regional and national authorities
- Existing and new investors in buildings and residences
- Organized interest groups (environmental groups, science groups, etc.)
- Tenants and users of residences and buildings that are warmed and / or cooled by the mine water
- Local community and the general public
- Other local stakeholders

3.1 Gender

Relating to the different roles men and women fulfil in society, there seem to be significant differences that also concern the work area of the Remining Lowex project.

One difference refers to the use of energy. Existing data and gender roles suggest that men produce more emissions, and more “selfish” ones – that is, related to maintaining and exercising their social status, whereas women produce emissions when caring and catering for other people (for children, the elderly, sick people). Proper participation of women and men in decision-making in all phases and aspects of funding is therefore essential: when designing, implementing, evaluating proposals, and reporting on programmes. Nevertheless, meeting of quantitative targets is but one aspect. Even more important are the efficiency and effectiveness of women’s participation.

Another difference refers to the role women and men play in the mitigation of climate change. In general, the Climate Change policy process tends to be driven by a masculine view of the problem and its solutions. And although the technological changes and instruments that are being proposed are implicitly presented as gender-neutral, they are thus in fact quite gender biased and may negatively affect women or bypass them.

On the personal level, when it comes to quality of life, thermal comfort and indoor air quality and exposure related to indoor and outdoor pollutants, existing findings suggest that there are also significant gender issues involved. This fact is due to different needs and expectations, different length of exposure, time spent indoors, and different vulnerability. In reference to energy, there are indications that men tend to prefer scientific and technical solutions, whereas women are more willing to change their own behaviour and lifestyle.

In the light of these facts, in the Remining Lowex project the objective is to ensure balanced participation of women and men in trainings and working groups, both on the side of the trainers / facilitators and the participants. To this end, targeted communication is used to motivate women to participate in the process, for direct contact and publications. Trainers and facilitators will receive a “Train the trainer“ seminar on gender issues.

At the same time, looking at energy consumption and mitigation of climate change through a “gender lens”, the following questions need to be considered:

- How can the project inform women and men best about the connections between their behaviour, energy consumption and climate change?
- How can the project help women and men to change their behaviour and cause fewer emissions?
- What impacts do energy and mitigation policies have on women and men in their work and daily lives?
- Will rising energy prices affect women and men differently?

4. Communication Contents and Messages

4.1 Technical Communication Basis: The Implementation of New Technologies

In the Remining Lowex project the heat from water in abandoned mine shafts is used for the heating of houses and others buildings. Water in the shafts located closer to the surface is used for the cooling of buildings in summer. A number of new innovative technologies will be demonstrated. In Remining Lowex they are not treated as “single components” but as a rational and crucial part in a total integrated energy concept – in a chain from source to distribution to building to end-user. The total integrated Remining Lowex approach is innovative and never has been done on this scale: using locally available low valued renewable and sustainable energy sources on community scale by building and retrofitting the built environment to be suitable for the use of low valued energy.

The philosophy and strategy in Remining is to use the low exergy approach as well as an integrated building design and energy concept to balance supply and demand side. All proposed energy concepts take into account the quality of the energy carrier: On the supply side there is the availability of low valued energy sources, i.e. mine water volumes with different temperature levels (15°C to approx. 35°C). On the demand side there are buildings which in principle can use low valued energy. In terms of efficiency this means if an average room temperature between 20 and 22°C shall be achieved, it is more efficient to use low valued energy sources than high quality energy sources.

The demand side can be linked to the supply side if a number of boundary conditions are fulfilled:

- a limitation of transmission and ventilation losses and peaks
- a limitation of internal and external heat gains
- the use of low temperature heating and high temperature cooling systems which can deal with supply temperatures of 30 - 350°C for heating and temperatures of 16 – 180°C for cooling. This can only be realized by an integrated approach taking into account the building properties in relation to the quality of the energy carriers.

4.2 Benefits and Messages for the Users of Buildings

Remining Lowex’s innovative technologies must be usable for end-users. This means that they should be easy to use as well as economically feasible, not leading to higher costs for the

end-users in comparison to traditional systems. For communication purposes and for the success of the project it is important to work out the benefits and to tune the messages to the (potential) end-users of the buildings. The following messages are important:

- **Energy saving:** The total energy use in buildings accounts for more than one third of the world's primary energy demand. There is, however, a substantial saving potential in the building stock. The Remining Lowex concept supports the development and selection of new forms of technologies including the potential for lowering exergy consumption in built environments. The according potential will be quantified.
- **Adaptation to climate change:** A major anticipated impact of climate change on the built environment in Europe is an increase in the occurrence of overheating in buildings. Combining heating and cooling in one emission system in combination with the heat pump concept can be profitable in comparison to a traditional approach.
- **Contribution to climate change mitigation:** The exergy concept allows the total CO₂ emissions of the building stock to be substantially reduced due to more efficient energy conversion processes. A contribution to CO₂ reduction can in addition be reached by the end-user.
- **Lower costs for energy consumption for end-users:** Despite a rather high level of investments for energy installations and buildings measures, the Remining Lowex concept is economically feasible through private energy exploitation, where the main investors will also effectuate the energy exploitation. Possibilities for an economically sound energy exploitation result from lower internal interest rates (6 to 8% instead of the common 15% of utilities and district heating companies), profits from selling energy not as core business, connection fees for heating and cooling and avoiding a gas infrastructure on building/dwelling level, and especially avoiding extra cooling installations. Economical benefits also occur due to the integrated design and especially by combining heating and cooling in the same emission system, e.g. floor heating and cooling, thermally activated building components etc..
- **Supply security and thermal comfort:** The strategies developed for a better and exergy optimized building design will help pinpoint specific actions to provide clean, clever and competitive energy use. Benefits for the residential habitat and accommodation are gained through the low temperature heating system which is safe, economical, healthy, comfortable, hygienic and aesthetic. This approach leads to a set of well defined performance criteria concerning energy performance, sustainability, indoor air quality, thermal comfort (365 days/year, winter and summer conditions) and health.

4.3 Messages Regarding EU Policies

By following the steps of the "Trias Energetica", the Remining Lowex project not only sets an example for Europe of how to apply an integrated design approach strategy, but thereby also contributes to EU policies. The steps of the "Trias Energetica" are:

Step 1: Limitation of energy demand (i.e. "What you don't need you don't use")

Step 2: Maximizing share of renewables (i.e. "What is left to use, do it with renewables")

Step 3: Maximizing efficiency of using fossil fuels for remaining energy demand (i.e. "What you can't cover with renewables, do it with fossil fuels in the most efficient way").

By following these steps, Remining Lowex accords and contributes to EU policies on energy and climate change:

- **Energy efficiency:** The Commission presented its Communication "Action Plan for Energy Efficiency: Realising the Potential" on 20 October 2006. Europe has embarked on an ambitious plan to cut its energy consumption by 20% by 2020 in a bid to reduce its dependency on imported oil and gas and slash its energy bill by an estimated 100 billion Euro every year. If it delivers, the plan would also prevent 780 million tons of CO₂ from being emitted in the atmosphere, or twice the amount the EU agreed to under the Kyoto Protocol.
- **Renewable energy:** On 23 January 2008, the Commission put forward a proposal for a new directive on renewable energies to replace the existing measures adopted in 2001. According to the proposal, each member state should increase its share of renewable energies in an effort to boost the EU's share from 8.5% today to 20% by 2020. While the focus of the directive is on the promotion of large scale renewable energy installations, member states are nevertheless requested to use "minimum levels of energy from renewable sources in all new or refurbished buildings". The text also makes provisions for the mutual recognition of certifications for technicians who install renewable technologies in buildings. Architects and planners are to benefit from member state 'guidance' as well when planning new constructions, while local and regional administrative bodies should be required "to consider the installation of equipment and systems for the use of heating, cooling and electricity from renewable sources and for district heating and cooling when planning, designing, building and refurbishing industrial or residential areas". The text seeks to address the problem of grid access by requesting member states to ensure that the transmission and distribution system operators provide "priority access to the grid system of electricity produced from renewable energy sources."
- **Reduction of greenhouse gas emissions:** The Remining Lowex project contributes to the "Climate Action and Renewable Energy Package" of the European Commission's legislative proposal to achieve agreed EU objectives in the fight against climate change. On 23 January 2008 the European Commission put forward a far-reaching package of proposals that will deliver on the European Union's ambitious commitments to fight climate change and promote renewable energy up to 2020 and beyond. The EU is committed to reduce its overall emissions to at least 20% below 1990 levels by 2020, and is ready to scale up this reduction to as much as 30% under a new global climate change agreement when other developed countries make comparable efforts. It has also set the target of increasing the share of renewables in energy use to 20% by 2020.

At the same time, the Remining Lowex project is a unique and explicit example of a co-operation between old and new members of the European Union. The interconnection of mining areas due to their mining history in a very natural way led to the cooperation between the main project partners.

4.4 Contribution to Climate Change Mitigation

Climate change is happening and represents one of the greatest environmental, social and economic threats in Europe. A consensus is now clear regarding the urgency to take action to tackle climate change. Energy consumption, and in particular the burning of fossil fuels, is the main source of human-induced greenhouse gas emissions.

Buildings represent about 35 - 40% of all energy used in EU countries. Thus in Europe, optimisation of the energy consumption of buildings offers the largest potential for long term CO₂-reduction strategies. It is expected that the innovative use of locally available low valued energy sources could improve the total energy efficiency by using low valued energy sources for low valued applications such as the heating and cooling of buildings. The Remining Lowex approach makes an important contribution to these objectives.

This will be achieved through the exploitation of geothermal energy from water in mines and by making use of these large water volumes for heat and cold storage, in combination with a sustainable back-up installation including polygeneration (heat pumps, biomass CHP and gas fired condensing boilers). In the demonstration projects in the Remining-Lowex communities following results are aimed at:

The CO₂ reduction amounts to at least 50% in comparison to current standards and will be increased to 100% by 2020 by replacing existing conventional fossil fuel powered back-up with biomass. The share of renewables (RES) in the total energy balance for heating, cooling, DHW and auxiliary energy is 60% (50% mine water 10% biomass back up) and will be extended to 100% by 2020 by replacing existing conventional fossil fuel powered back-up with biomass. Remining Lowex is a model project for the rest of Europe: Its high share of renewables is a result of the use of locally available low valued energy resources (geothermal, heat cold storage, local biomass), in combination with a carefully designed built environment that is suitable to use low valued energy.

4.5 Contribution to Adaptation to Climate Change

For more than 15 years municipalities across Europe have engaged in climate protection activities at local level, committing themselves to voluntary greenhouse gas emission targets and setting up action programmes to combat climate change. However, due to the fact that the world's climate system shows long response times, experts now agree that climate change can no longer be halted completely. Hence adverse experiences of weather extremes – floods, storms, extreme heat and drought – are clear signs of the severe impacts of climate change. Even if all green house gas emissions were stopped today, the impacts of climate change would still be felt for decades to come. At the same time, if an increase in the amount of carbon dioxide in the atmosphere is not stopped, risk arises of changing the climate in unforeseen ways which people might not be able to adapt to.

Global warming is a fact. Climate change is happening and it is even accelerating. What can be observed today are only early signs of climate change and the result of past greenhouse gas emissions. On 29 June 2007, the European Commission has therefore adopted its first policy document on adapting to the impacts of climate change.

One important area for adaptation measures against climate extremes such as floods, storms and overheating in summer is the built environment. A major anticipated impact of climate change on buildings in Europe is an increase in the occurrence of indoor overheating, due to reduced efficacy of the traditional and still widely used method of cooling buildings – comfort ventilation with outside air. Combining heating and cooling in one emission system in combination with the heat pump concept, as displayed in Remining Lowex, can be profitable in comparison to a traditional approach. The avoided costs for extra cooling make a sustainable heat pump concept feasible. At the same time, risk prevention for buildings and

cooling comfort during heatwaves are two areas in which synergy effects between climate change adaptation and mitigation can be achieved.

5. Means of Communication

According to the experience and the planned activities of the Remining Lowex project the following means of communication will be used:

- Occupants Info Guides
- Information on websites
- Mobile presentation system
- Free publicity
- Gadgets
- Logo, etc.
- Personal information and counselling / advice to (potential) tenants and users
- Instruction brochure
- Guided tour of power station
- Meetings etc.

In order to support the key actors on their way to an energy transition an advanced training course will be organised in Remining communities. Target groups are decision makers in municipalities as well as local industries that are involved in the building process (contractors, real estate developers, installers, supplying industries). It is planned to conduct two days of training in each community, with general items on the first day and the application of Remining Lowex ideas and the LowEx concept to the specified community on the second day. Visits on site will be part of the training. Altogether, there will be four trainings, one in each community. The documented training modules will be made available for download on the project homepage.

General goals for “community key actors” include:

- Energy supply and demand issues in local policy
- Awareness of RES potentials in local community
- Support realization of RUE measures in buildings
- Overview of possible concepts
- Launching the project
- Convincing authorities to finance a demo project
- Knowledge transfer of technical issues – demonstration of the concept’s simplicity
- Demonstration that installations can be financed from EU funding

Proposed contents are:

- Mine water use for heating and cooling – new options for mining areas?
 - a. The Remining Lowex project Heerlen – a general overview
 - b. Local situation – potentials, concept
- Balancing demand and supply side – Lowex approach
 - a. Preconditions for buildings and grid
 - b. Mine water use, drilling, distribution
- Legal and economic aspects.

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