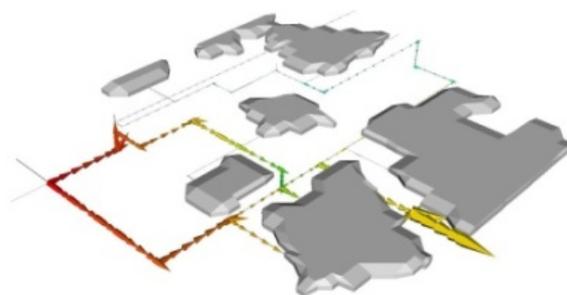


Research

Remining-Lowex (EU, Concerto-Plus project)

Remining-Lowex is an FP6 Concerto-II project that envisages to help old European mine regions to evolve into sustainable communities through the efficient integration of heat demand and production according to Lowex principles.

Four ambitious local communities (Heerlen NL, Zagorje SLO, Czeladz PL and Bourgas (Cherno More) BG) will demonstrate the use of local available low valued renewable energy sources, specifically from water in abandoned mines for heating and cooling of buildings, based on low exergy principles, facilitated by an integrated design of buildings and energy concepts. They will realize 2 sustainable mining communities



(Heerlen and Zagorje) with 50 to 100% CO₂ reduction and 60% RES compared with standard national practices. The two demonstration sites contain 440 new houses, 57000 m² non residential new buildings, 84500 m² non residential existing buildings, and 3 existing prepared buildings to connect with the mine water grid in Heerlen and 6000 m² new and 2000 m² existing buildings connected to mine water and 1154 existing houses connected to biomass in Zagorje. Feasibility studies leading to concrete local sustainable energy plans and implementation will be demonstrated in Czeladz, Bourgas (Cherno More), Zagorje and the nearby former mining communities in Heerlen. Dissemination takes place in different levels: direct transfer of knowledge to the REMINING communities, use of geothermal energy and heat/cold storage in mines to mining areas in Europe, Russia and Ukraine by involving EURACOM, and the use of local available low valued renewable energy sources in combination with an integrated energy design of buildings for the development of sustainable communities in general, by involving the European Climate Alliance and the LowEx network. REMINING has special emphasis of the social aspects in (former) mining communities like unemployment, fuel poverty, poor health conditions resulting in poor quality of life, environmental problems. An integrated sustainable redevelopment will contribute to a high extent in the rehabilitation of this areas and integrating RES from local available sources in combination with RUE in new and existing buildings.

VITO will share its experience in the development of mine water systems and conduct research with respect to the improvement of modeling tools for flow and temperature behavior.

Interesting links:

- <http://www.remining-lowex.org/>
- http://www.imwa.info/docs/imwa_2011/IMWA2011_Ferket_287.pdf

Optimization of the energy conversion of low-temperature geothermal heat

Geothermal heat in Flanders is available at relative low temperatures (100-150°C), so that the energy conversion of heat to electricity is low. The goal of this PhD is to optimize the conversion of this geothermal heat to a useful energy form. This can be electricity, but also heating and/or cooling of buildings.

Thermodynamical cycles for low temperature heat applications, like the Organic Rankine Cycle (ORC) and Kalina cycle, are optimized to achieve the most economical utilization of the geothermal heat. The optimum plant will probably be a cogeneration or even trigeneration plant.