Heating and cooling with waste heat from industry

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Heating and cooling in the future will utilise energy gained from waste heat which will be distributed at low temperature using district heating and cooling networks. It will thus make use of the heat wasted by cooling systems in supermarkets and fruit storage facilities which up to now has simply been released untapped into the atmosphere. South Tyrol's EURAC Institute for Renewable Energy is exploring this new technology in the "FLEXYNETS" project which is financed to the tune of two million euros by the European research programme "Horizon 2020". Yesterday, on the 7th July, the project partners finally met at EURAC to set things in motion.

At present district heating grids run via high temperatures of around 90 °C. To heat individual buildings, the networks have to connect to sizeable thermal plants, such as block thermal plants or waste incinerating plants. The technology which will now be researched by the South Tyrol EURAC Institute for Renewable Energy on the other hand runs at temperatures between 10 and 20°C. This means that the district heating grids can be supplied with energy from sources running at much lower temperatures than previously. "We are working on developing district heating and cooling systems for tomorrow. We do not want to replace existing systems, but rather are seeking to integrate them into new concepts. Space heating, generated for example from a waste incinerating plant, is intended to be supplemented by heat generated in various everyday processes and which is currently wasted," explained Roberto Fedrizzi, scientist at the EURAC Institute for Renewable Energy and Director of the FLEXYNETS project. "By using low

temperatures when distributing heat, we reduce the present huge heat loss in the underground distribution pipelines, which will make the whole grid much more efficient in the future," said Fedrizzi. According to the experts, the energy consumption for heating and hot water could be reduced by 80%, and for cooling buildings by 40%. Across Europe, this would amount to a reduction of 5 million tonnes of CO2 emissions by 2030.

The first phase of the three-year project will concentrate on developing the technology. There will then follow a test phase which is due to begin in summer 2016. "For this first phase we will set up a laboratory in the Technology Park in Bozen-Bolzano simulating a small-scale district heating and cooling network. This will enable us to simulate and test different control strategies as well as operating scenarios," added Roberto Fedrizzi. The project's third phase is dedicated to devising incentive measures for exploiting waste heat and strategies for integrating this new technology into already existing municipal systems. For this purpose, two working groups will be set up which will include district heating experts as well as representatives of the municipalities such as energy managers.

Provided by European Academy of Bozen/Bolzano (EURAC)