

PROJECTS CONCEPTS for Sustainable Buildings Partnership Pomorskie region

Debrecen, 06th July, 2017



PROJECT IDEAS for Sustainable Buildings Partnership



zarządzamy energią od 1984

Project 1 ENERGY-INDEPENDENT HOUSING (RENEWABLE ENERGY INTEGRATION IN BUILDINGS)

Project 2 MICRO CHP (10-100 kW) FOR HEAT AND ELECTRICITY SUPPLY (MULTIFAMILY AND PUBLIC)

Project 3 HEAT SUPPLY (MULTIFAMILY AND PUBLIC) BASED ON HEAT PUMPS USING (SEWAGE, GRAY WATER, EXHAUST AIR)
AND SEASONAL THERMAL ENERGY STORAGE

Project 1 - Subproject B (renovation)

The aim of the Project 1 – Subproject B....

Reduce energy consumption by increase of renewable energy use in existing buildings build from large prefabricated concrete panels

Situation description:

- *In Poland 12 mln people (30% of population) lives in large prefabricated buildings.*
- *Most of the buildings were built in the 1970s and 1980s.*
- *In many cases thermal insulation is insufficient and is unable to meet existing standards*
- *There is a need for replacement of some installations*

PROJECT DESCRIPTION

Creating a **Living Lab-based laboratory (model to be followed)**, equipped with a set of technical and technological energy saving solutions, that enable us to test, investigate and, as a result, optimize the use and interoperability of the technology **in the new multifamily buildings.**

CREATING AN ENERGY-INDEPENDENT HOUSING ESTATE



Subproject A NEW BUILDING

Living Lab-based laboratory, to test technical and technological energy saving solutions that enable test, investigate and, optimize the use and interoperability of the technology in the new multifamily and public buildings.



Subproject A1 NEW BUILDINGS in urban areas



Subproject A2 NEW BUILDINGS in rural areas



Subproject B RENOVATION

Creating a Living Lab-based laboratory, equipped with a set of technical and technological energy saving solutions that enable test, investigate and, as a result, optimize the use and interoperability of the technology in the buildings from a large prefabricated concrete panels.

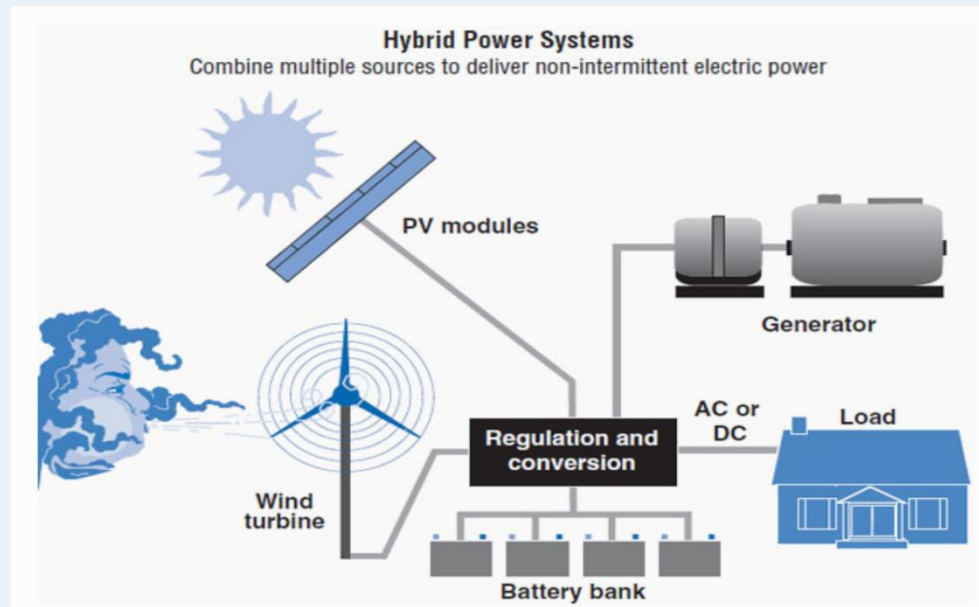
The aim of the Project 2.....

The aim is to develop small size CHP (10 – 100 kW)

- Energy utilization from organic waste (biomas, food residuals etc.)
- limitation of CH₄ emission
- conversion of waste to electricity and heat
- development of micro CHP technology, adapted to use of low energy biogas
- launch of micro-gas CHP technology in the market area where large - scale technologies do not apply

Application ideas

1. On the end of some existing district heating grids it is feasible to change a power supply for the building from the CHP. You can decrease the cost of heating that is high especially during the summertime (for hot water preparation), because of the loss in a long heating pipeline.
2. CHP as a part of hybrid renewable energy system with hybrid energy storage system.





Project 3 HEAT PUMPS SUPPLYING HEAT TO BUILDINGS (HAUSING AND PUBLIC) THAT RECOVERS WASTE HEAT DIFFERENT SOURCES LOCALLY AVAILABLE (SEWAGE SYSTEM, GRAY WATER SYSTEM, EXHAUST AIR) AND SEASONAL THERMAL ENERGY STORAGE

The aim of the Project 3.....

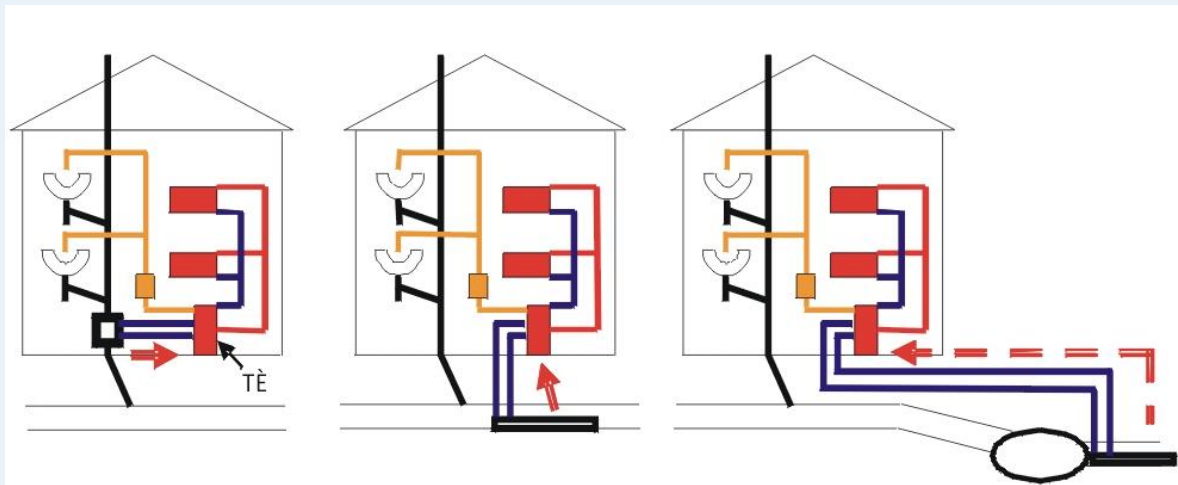
HEAT PUMPS which supplies utility heat and heat for DHW heating to the building could be charged from different waste heat sources available in the building or nearby.

The aims of the project are:

1. To test and analyze the use of recovery energy from different local available sources in order to increase COP (gray water, sewage system, exhaust air from the building).
2. To test and analyze the feasibility of using as a source of energy for heat pumps different types of Seasonal Thermal Energy Storage (**STES**) charged by heat pumps, solar energy, CHP and other locally available recovery energy sources.

Application ideas for heating pumps

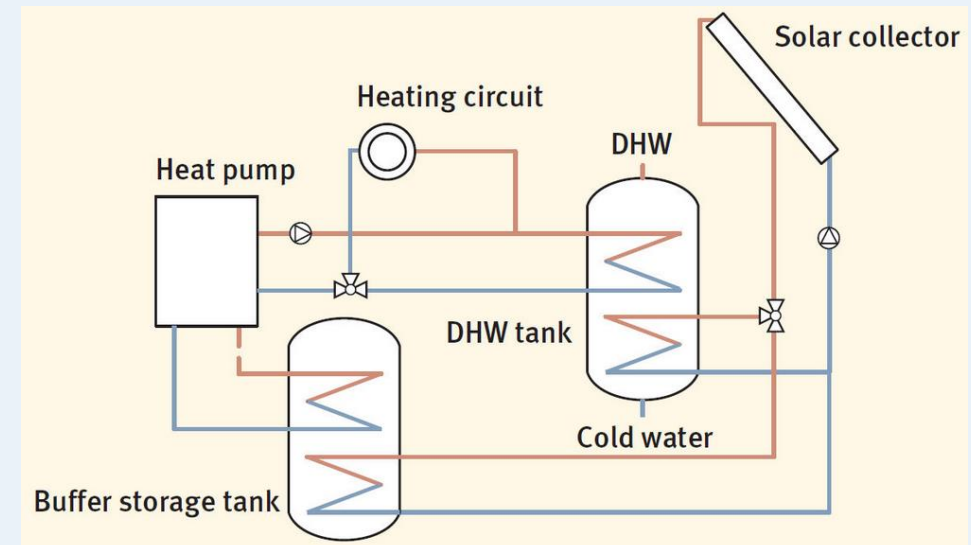
Heat extraction from different waste heat sources:



(a) Drain from the building (b) Sewer system (c) Drain from the WWTP

Fig. 1 – Points of potential heat extraction from wastewater and heat utilisation possibilities using heat pumps (heating, domestic hot-water pre-heating)

Seasonal thermal energy storage:







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