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LIFE CYCLE ASSESSMENT OF SOME ALTERNATIVES FOR THE SUPPLY OF THERMAL ENERGY IN THE MUNICIPALITY OF IASI (ROMANIA)

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Abstract

At present in Romania the traditional central heating system with a combined heat and power (CHP) generation plant that supplies thermal energy in cogeneration with electrical energy is in some places replaced with decentralized systems.

The study proposes the use of Life Cycle Assessment (LCA) for the comparison of some heating systems developed in the municipality of Iasi in the North-East of Romania: a flat, a block building with gas heaters, a district heating with a thermal plant using natural gas, the traditional central heating system of the Iasi municipality with two CHP plants one supplied with natural gas and oil and the other with hard coal and oil and electric heating (seldom used for domestic heating but presented as an alternative).

The study shows that the better environmental performance of the local heating is almost totally compensated by the simultaneous production of thermal and electrical energy in CHP plants, especially in some cases in which the allocation (repartition of impacts between thermal electrical energy) emphasizes the superiority of the electrical energy. LCA study shows similar results when the method of avoiding co-product allocation is used: electrical energy is considered supplied by the general grid of the country and the impact for the production of this energy is subtracted from the combined impact (electricity + heat) of CHP plants.

The LCA study shows that the claimed environmental superiority of the local heating system is debatable in comparison with CHP plants. Where a central heating system is in place like in the municipality of Iasi, the use of heat that results anyway as co-product for electricity production can represent an alternative friendly choice for the environment, at least for a part of the city area.

Keywords: life cycle assessment, combined heat and power generation, allocation
