

Track 2 - The smart energy system transition in cities and regions

**Title of the proposed paper**

Optimal control of a group of heat pumps to reach power balance within a smart grid controlled district

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**3 keywords**

smart grid, power balancing, heat pump

**Text abstract (max. 300 words)**

For the new Meppel district Nieuwveense landen a hybrid energy concept is developed based on biogas cogeneration. The generated electricity is used to power domestic heat pumps which supply thermal energy for domestic hot water and space heating demand of households. In the paper we investigate scheduling of a group of heat pumps in order to minimize the maximum peak of total electricity consumption. Results of different control methods are presented indicating the possibility to balance electric power demand for the group of heat pumps. The control methods used are reference control, ILP control and time scale control. The paper addresses specific issues like computational hardness, difficulty of prediction of energy demand and maintaining privacy throughout the communication network. We also present ideas which may solve these issues.