Abstract:

Increasing shares of renewable energy resources within the electricity system, in addition to increasing numbers of domestic micro co-generation, requires different operation and management strategies for decentralised supply systems a flexible demand side management (DSM). Through the DSM, several benefits can be witnessed, it can assist in shaving the peak load, increasing the electricity autonomy, improving energy efficiency and minimizing CO2 emissions. Consumers are encouraged to shift their load based on financial incentives. Such load shifting can either be done manually by the house residents or more comfortable automatically through an Energy Management System (EMS). This EMS is usually a part of what is called a ^Smart Home". Continental, regional and local markets of electricity have been a debatable topic raised by several researchers. In this contribution, the electricity market is taken to another level. It is taken to the level of a micro market within a single home. Smart home is defined in this contribution as a home where generators and consumers communicate together through a micro market. Operational decisions are taken independently to minimize the overall energy costs. The supply side is represented by devices as photo-voltaic and micro CHP units, demand side devices are all the DSM possible devices as heat pumps, freezer or electrical boilers. Energy storage components as batteries service both, the supply and demand side and add more flexibility to the system. The main signal based on which all the devices interact is the...
internal electrical energy cost signal which is viewed by all the devices so that they can take their
decision independently. The results presented have been calculated based on experimental data using
a SimulationX, a Modelica based simulation tool. An outlook will be presented about the possible
developments that could occur to the smart home model.