Intelligent energy regulation

Mirjana Tasevska
Morten Heebøll
Christian Salmony Olsen

Almost everyone has experienced a power blackout, which occurs when the power grid is overloaded. The overall power usage is forecasted a day ahead. When the forecast does not meet the actually energy consumption the power grid is overloaded, which will cause a frequency drop from the normal 50Hz in Europe. In this case the energy companies need to buy energy from a backup network, but if the extra power isn't enough it can result in a blackout. Also the backup energy is much more expensive than the normal day price, therefore it is preferable for the consumer to avoid any peek situation at any time of the day.

At this moment no solution to avoid this problem has been implemented, but it has become a great focus area to develop and implement a solution. We wish to propose a solution for this problem that is as efficient, inexpensive for the consumer and easy to rollout.

We have created a unit to be implemented in homes, which monitors the frequency on the power grid. When peak situations occur it will turn off certain utilities (e.g. tumble driers, refrigerators, Laptops) for an appropriate amount of time or as long as possible for the power grid to retain a normal level. Thereafter it will turn the utility back on again.
The idea is to let the consumer choose which utilities that are to be connected to our unit in the rollout phase. Later it should be integrated into all electrical utilities used in the home. Thereby the consumer will become aware of the current fluctuation electricity prices and give them an opportunity to avoid using unnecessary power when the price is high.

In the long run this should make space for more wind, wave and sun energy (which are inherently unstable energy sources) and ultimately lower CO2 emissions. At the same time the consumer can save money on their electrical bill.