Manchester Energy: Projects

DIMMER: YOUR SMART ENERGY PROFILE FOR 2020

Models built on data from individual energy consumption and local generation reveal likely scenarios for smarter energy usage.

Whether it is conscious or not, the way you use energy is changing. There’s talk about climate change, energy prices remorselessly rise and you may have solar panels on your roof. But is there a way to monitor these changes and help consumers to develop environmentally efficient behaviours?

The ‘District Information Modelling and Management for Energy Reduction’ (DIMMER) project, a European FP7 project, is set to be one of the first to provide insights on our energy future. Using sensors to gather data on energy use in districts and cities, researchers are building sophisticated computer models, which could provide the most complete view of smarter energy use in the future.

“We are amongst the first in the world to try to capture the true diversity of energy demand in cities and project how this will change when smarter technologies will be available,” enthuses Dr Pierluigi Mancarella from the Electrical Energy and Power Systems research group.

At a local level, the group monitors energy use by individual consumers. The researchers collate the data gathered to create ‘district information models’ that represent energy use across entire areas. The models also take account of future advances in technology and possible changes in consumer behaviour.

For example, the group is developing interactive devices which tell consumers about any energy they may be wasting in their homes, helping them to take responsibility for their energy habits. “The devices will be able to interact with consumers in real time,” says Dr Mancarella. “We hope to facilitate a move towards ‘smarter cities’ where energy is used more sustainably. It may be possible to cut energy use by more than 30% simply by telling people what they are wasting and adopting more efficient technologies for local power generation.”

By monitoring how these devices affect consumption, Dr Mancarella can incorporate greater energy awareness into his models.

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“We are also looking at how other environmental initiatives may affect energy use across a district,” Dr Mancarella continues. “For example, if we replace traditional gas boilers with electrical heat pumps, gas suppliers will see a slump in demand whilst electricity supplies soar. It is these kind of dramatic changes that people want to know. Governments want to know if switching to heat pumps will reduce overall energy consumption and improve environmental efficiency, while utility companies want to know how a switch might affect demand and supply of gas and electricity.”

The accuracy of the models will be put to the test when they are trialled in Manchester and Turin (Italy).

So far the researchers of the DIMMER project have developed relevant monitoring and communication devices. They have shown that it is possible to visualise different types of energy consumption — such as lighting, heating and air conditioning — in order to identify how to target a reduction in energy use.

Soon, more sensors and interactive devices will be installed. These will further validate the models and evidence how smart control can improve the environmental performance of entire districts.

**PARTNERS**

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**LEADERSHIP**

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