Abstract

Optimization in investment strategy is a fundamental way to achieve profitability of networks while improving reliability although the economical consequences are always dependent on the regulatory model. The changing in the operating environment is bringing new challenges and raise new questions to DNO’s. Areas such as energy efficiency, microgeneration, demand side management, energy losses, renewable energy production and smart-meters are direct responsibility of DNO’s and they all take part in the achievement of sustainable distribution networks. Regarding these matters, the study and development of tools that aid DNO’s in strategic planning for the level and type of investment that should be made is essential, in order to justify the future demands near the regulatory system.

In this project, the impact of micro generation technologies in new developments was modelled and a calculation tool was developed using MS Excel and the Visual Basic. The tool evaluates the capability of existing primary substations to cope with expected demand from new developments, where sustainable technologies and measures are expected to be adopted.

A study case was carried out to examine the impact of two new developments in distribution network. The results showed that micro generation technologies for heating purposes have a higher impact in reducing demand from the perspective of a distribution network than technologies such as Photovoltaic and Micro Wind generators which showed only to have a marginal impact in the expected demand reduction seen by primaries substations.

The risk assessment for the technical solutions, demonstrated that investment should be made in order to stimulate the uptake of micro generation in new developments. A higher uptake in micro generation would lead to maximization of existing primary substations, rather by increasing available margins or by delaying the need of reinforcement.