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Finland, regulation and demand flexibility

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Fair energy

Smart metering in Finland

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- Finland was one of the first countries to adopt smart electricity metering on a large scale. The consumption and production of electrical energy in almost every electricity metering points are measured on an hourly level, and the validated metering data is available for use by the customer, balance settlement and the electricity markets.
- The legislation on this first-generation smart metering came into force in 2009, and the transition period to hourly-level metering ended on December 2013. The local distribution system operator (DSO) is responsible for electricity metering.
- The Energy Authority provided an incentive (5 euros per electricity metering point) for the operational cost of smart meters.

Current regulation methods: Innovation incentive

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- The purpose of the innovation incentive is to encourage the DSO to develop and use innovative technical and operational solutions in its network operations.
- In network operations, the key objectives of research and development activities are the development and introduction of smart grids and other new technologies and methods of operation.
- The impact of the innovation incentive is calculated so that a share corresponding to a maximum of 1% of the DSO’s total turnover from network operations in the profit accounts in the regulatory period are treated as reasonable research and development costs.

- FLEX^{e} was a consortium in Finland gathering 27 organisations covering the entire value network of energy systems.
- The aim was to create novel technological and business concepts enhancing the transition from the current energy systems towards sustainable systems.
- FLEX^{e} combined smartness, flexibility, environmental performance and economic success with customer acceptance and engagement.
- One key objective was to define the flexibility requirements for the planning and operation of integrated energy networks. This requires novel, high-quality, reliable and secured measurements, telecommunication, data processing and new technological platforms to be researched.

- Helen, Fingrid and Helen Electricity Network are engaged in a pilot project investigating the technical and commercial feasibility of a megawatt - class electricity storage system based on lithium ion batteries. The system manufactured by Toshiba was delivered by Landis + Gyr and commissioned by Helen on 1st of August 2016.
- In this pilot Helen seeks to optimize the functionality of the battery energy storage system by providing simultaneous services to multiple customers and markets:
  - Continuous adjusting power and reserve power to Fingrid (national TSO)
  - Reactive power compensation and peak shaving to Helen Electricity Network (regional DSO)
  - Energy time shifting to support renewable energy generation. The battery energy storage unit supports Helen's Suvilahti solar powerplant.

Future regulatory methods and incentives for demand flexibility

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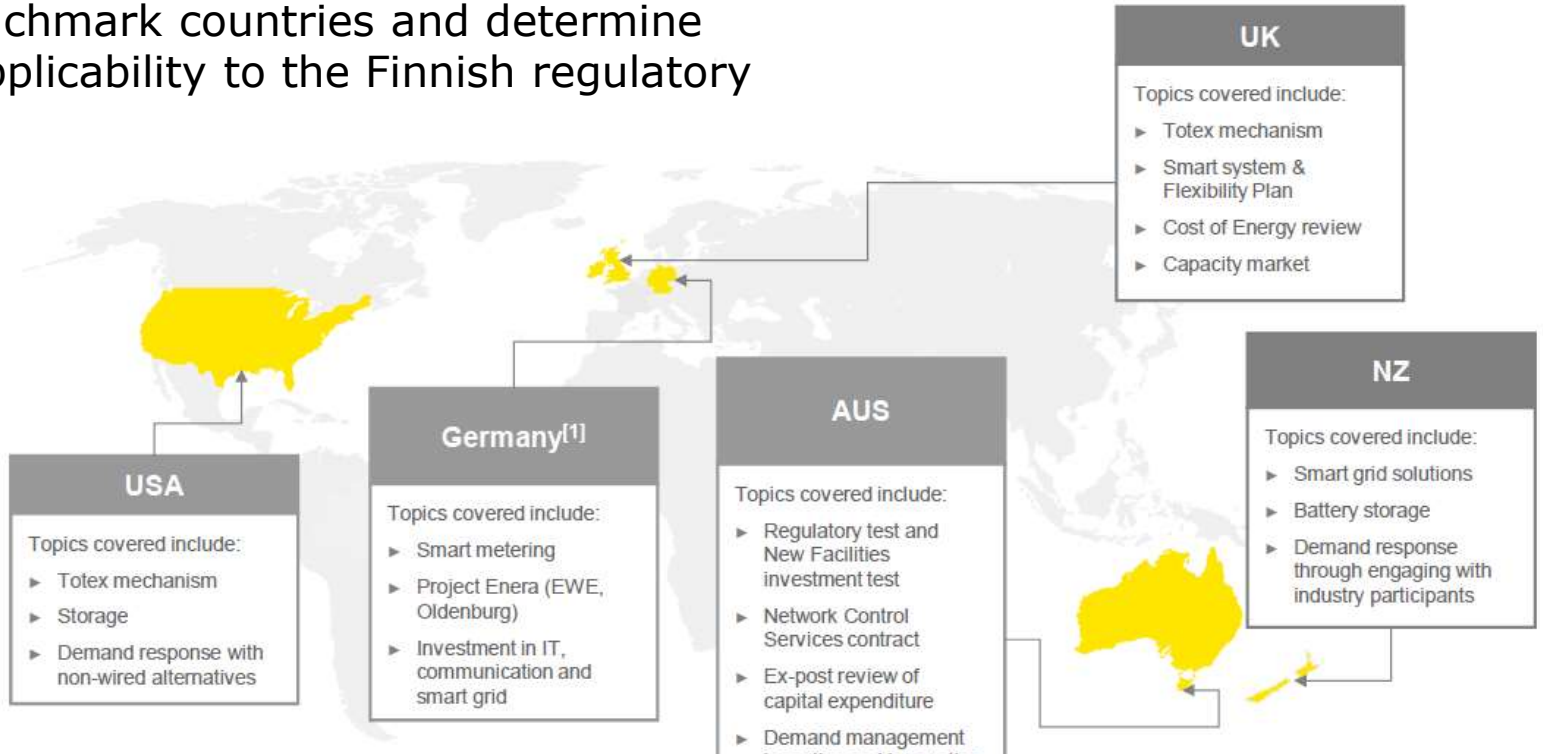
Project with EY and Energy authority to assess demand flexibility mechanisms in the benchmark countries and determine their applicability to the Finnish regulatory regime.



[1] As a result of moving to renewable generation (mainly wind), the German electricity market exhibits supply volatility and de-centralisation. This has driven DSO investment in IT, communication and smart grid and regulatory incentives to accompany this. Conversely, to other countries there are no specific demand response mechanisms in the regulation. Therefore Germany has been excluded from the analysis that follows.

Energiavirasto: Selected regulation methods supporting demand flexibility in electricity distribution network operations |

EY

Future regulatory methods and incentives for demand flexibility

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- Few mechanisms were identified as being potentially relevant to the Finnish market. In addition, a number information on the Western Power case study in Australia and numerous projects in the US and Germany were also of particular interest.
- Final report will be published in few weeks.
- As a result the regulatory investment & new facilities investment test and the demand management incentive scheme are considered the most relevant.

Mechanisms identified as being potentially relevant to the Finnish regulation

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- Australia: **Regulatory investment and new facilities investment test**
  - Tests that the regulator applies to assess the prudency and efficiency of proposed expenditure.
  - The regulatory test applies to major augmentations and requires the DSO to demonstrate that the investment "…maximises the net benefit after considering alternative options".
  - The new facilities investment test applies to all network expenditure and requires the DSO to justify investment on the basis that DSO is efficiently minimising costs and the project will generate incremental revenue to recover its costs.
  - These tests try to overcome the bias towards capex solutions caused by DSOs enjoying a rate of return for network solutions and no rate of return for nonnetwork solutions (such as demand response).

Mechanisms identified as being potentially relevant to the Finnish regulation

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- Australia: **Demand management scheme**
  - Demand management incentive scheme allows networks to increase revenue
  - Incentive payments will be up to 50% of expected costs on efficient demand management projects
  - Removes the bias towards capex solutions (which generally do not involve demand side management)

Thank you!

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