



LAND ON THE FUTURE OF SMART ENERGY

**BUSINESS
OPPORTUNITY
IN FINLAND**

Finland's Smart Grid 2.0 offers a unique R&D ecosystem that combines experienced ICT talent, a liberal energy market and a strong energy cluster

R&D PLATFORM FOR CUSTOMER AND INDUSTRIAL INNOVATION

The Finnish energy system is the most advanced in the world. The major driver for developments in Finland has been improving **service reliability** of the national electricity system. This has led to high level of energy distribution automation.

Currently, there are new opportunities related to **customer energy data**, including applications for customer level energy management and economic optimization of energy usage. Finland has been a forerunner in implementing smart meters and AMR (Automatic Meter Reading) systems. This has made possible many achievements, such as improved energy use information for customers, improved load profiling, real-time billing and remote control and monitoring, as well as improved efficiency for practical reading of the meters. Thus the Finnish ecosystem forms an ideal test bed for service providers.

Furthermore, applications for customer energy data will be needed when the amount of small-scale generation, customer-level energy storages, electric vehicles and controll-able loads

increases among customers. In the long run, **integration of electricity, heat and water metering** will create further business opportunities. As ICT plays a crucial role in the global energy industry disruption, the world-leading ICT talent Finland offers can be utilized in developing future solutions in the energy markets.

One specific opportunity is the implementation of **wide-scale demand response operator business** in Finland. A demand response operator, which practically equals to term aggregator, can act as a service provider for energy markets, balance/reserve services and for the individual customer.

SMART GRID 2.0 ALREADY IN USE

Tomorrow's energy technologies can already be developed and tested in Finland – our electricity system is called Smart Grid 2.0 for a reason. There is also a large ICT talent pool to tap into, providing a highly skilled workforce for several technology subdomains. The Finnish electricity system already uses smart grid functionalities. Finland was, for example, one of the first countries to adopt remote meters that register electricity consumption data on

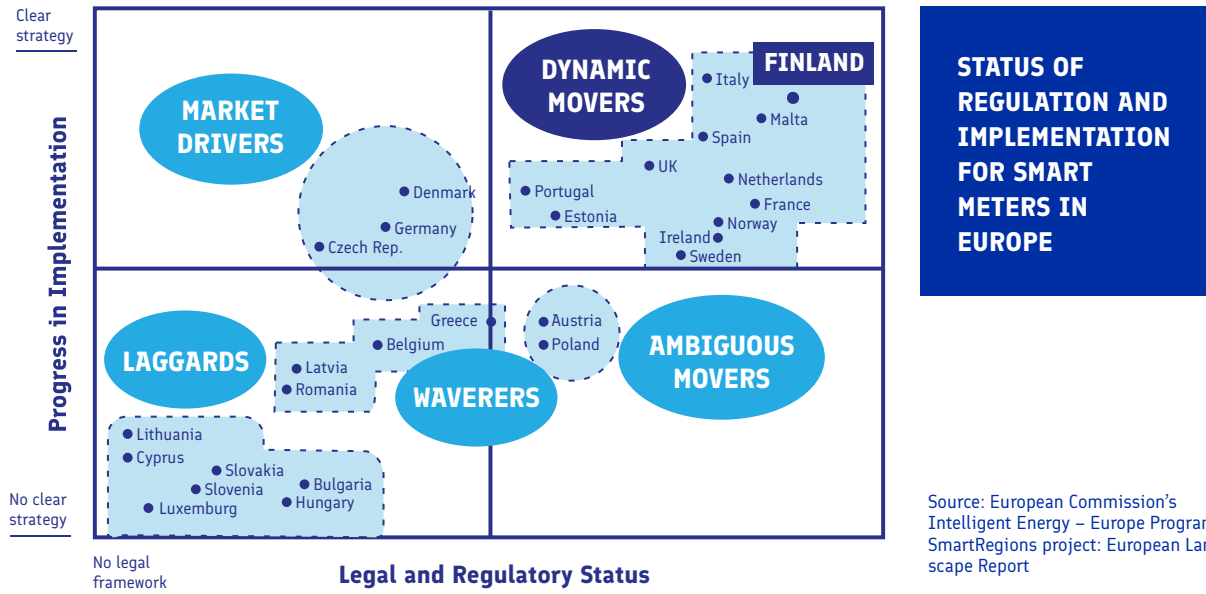
an hourly basis. Remote meters are now found in most households.

We have the largest energy cluster of the Nordics located in the city of Vaasa, with an annual turnover of 4.4 billion euros. Industry leaders like ABB, Wärtsilä and Vacon have their roots in the long tradition and competences of the Finnish energy sector. Our start-up boosted ecosystem attracts energy pioneers. Several industrial companies, such as **ABB, Alstom Grid, Landis+Gyr** and **Aidon** have significant R&D units in Finland.

Finnish electricity market has been open and interconnected with the Nordic market since the 90's. In many aspects the Finnish market is transparent and offers a flexible platform for different operators. The Finnish electricity system is well-operated, maintained and documented, forming an ideal testbed for tomorrow's smart grid solutions.

The Finnish network operators have also developed their operational processes to a great degree. Asset management in Finland is on very high level. National regulation is strongly steering the interests of operators and resulting investment plans.

FINLAND IS IN THE FOREFRONT OF SHAPING THE FUTURE ENERGY MARKETS



WHAT FINLAND OFFERS FOR ENERGY COMPANIES FACING ICT DRIVEN INDUSTRY DISRUPTION

Energy meter and device suppliers can benefit from Finnish **ICT talent** to transform into intelligent systems and networks suppliers.

- AVAILABILITY OF ICT TALENT POOLS
- NATIONAL FOCUS ON R&D
- OPPORTUNITIES WITH APPLICATIONS BASED ON AMR DATA
- STRONG ICT HERITAGE WITH WIRELESS COMMUNICATION
- START UP CULTURE
- PROVEN INNOVATION ECOSYSTEM

WHAT FINLAND OFFERS FOR ICT COMPANIES LOOKING TO EXPAND IN THE ENERGY SECTOR

Software and IoT companies can find partnering opportunities in the Finnish ecosystem to create **Smart Grid 2.0 solutions** for bigger markets.

- SMART GRID 2.0 ALREADY IN USE
- MAJOR PLAYERS LIKE ABB, ALSTOM, LANDIS+GYR
- VAASA – BIGGEST ENERGY CLUSTER IN THE NORDICS
- MOST LIBERAL ENERGY MARKET IN EUROPE
- DEPLOYMENT OF SMART METERS AND INTELLIGENT USE OF AMR DATA
- INNOVATIVE ENERGY PLAYERS, WILLING TO TAKE NEW SOLUTIONS