Nominee: The EU Horizon 2020 EURECA Project

Nomination title: The EURECA Project: Driving energy efficiency in European data centres through innovation

Project Summary

Perhaps many of the European citizens are unaware how much our everyday economic and social wellbeing depends on reliable, secure and efficient data centres and the services they provide. Data centres are facilities that provide the connectivity hubs, power distribution, operational environment and physical security for some of the critical equipment needed to support our digital age.

EURECA was funded under the European Horizon 2020 research and innovation framework to help address the data centre energy efficiency challenge.

Through a number of innovative engagement approaches, supported by state of the art models and tools developed specifically by the EURECA team, the project managed to support innovative consolidation, new build and retrofit data centre projects in member states, leading to savings of over 131 GWh/year of primary energy from pilots in Ireland, Netherlands and United Kingdom.

Additionally, EURECA supported the development of European standards, best practices and policies related to energy efficiency in data centres and green public procurement by providing the scientific evidence, data and technical guidance. In terms of policy, EURECA influenced various initiatives such as the EU Green Public Procurement Criteria for Data Centres; Ecodesign legislation for servers and data storage products (GROW Lot 9); Environmental Management Audit Scheme - Best Environmental Management Practice on Telecommunications & ICT Services Sectors (EMAS); and Art 6, Energy Efficiency Directive. For standardisation, EURECA contributed to a number of standards, including the EN50600 series on data centres, such as EN50600-99-1 and EN50600-99-2. EURECA team members also play an active role in developing the EU Code of Conduct for data centre energy efficiency.

Finally, EURECA trained over 815 stakeholders through 10 face-to-face training events held across Europe. Many more stakeholders were trained via an online platform. This is in addition to over 14

knowledge sharing events in 10 European countries. EURECA legacy will be sustained and the benefits replicated through the online support platform created by the project, which includes tools, training material, case studies, and a dedicated marketplace which already lists over 200 data centre energy efficiency related products and services.

Innovation and challenges addressed

The EURECA project set initially to support public sector data centres in reducing their energy consumption through innovation procurement. To do so, the EUREC A project had to identify the major areas for innovation in public sector data centres; develop a framework to support such efficiency innovation in a measurable and scalable way (replicable beyond the supported pilots); reach out to potential public sector entities who are likely to be interested in procurement (e.g. due to end of life, restructuring, end of contracts, etc.) within EURECA's timeline; engage with them to raise awareness of the importance of embedding energy efficiency criteria, as well as innovation, in their procurement processes; and last but not least, support them throughout their procurement journey.

In terms of areas for innovation, for the first time, EURECA managed to identify where the real opportunity lies in EU public sector data centres, based on a substantial dataset collected from the various pilots. A number of areas were identified at Strategic, ICT, and infrastructure level (see D5.2 attached, section 4, for more details) which is helping drive various policies.

To address these innovation areas, novel frameworks and tools were designed. EURECA managed to model for the first time the relationship between technical aspects such as server utilisation and facility efficiency; optimising hardware refresh rates; and business case development. This was published in high standing scientific outlets (http://ieeexplore.ieee.org/document/8263130/) and was used to build online tools which helped guide the various pilots (see D5.2, section 5).

Another innovation developed under the EURECA project is the engagement approach, which built upon experience gained from the early pilots. This helped identify barriers to adoption of energy efficiency and innovation procurement in public sector (see D5.2, section 8), that EURECA addressed in its approach.

EURECA managed to shed for the first time the light on the size of the opportunity in EU public sector data centres, helping create the needed business cases to trigger the energy efficiency projects. As an example, EURECA managed to provide reliable estimates for the running cost of hosting a server in public sector, found to be €14K. EURECA also managed to find a correlation between the number of public sector employees, and servers hosted (20 to 1). These figures

provided unprecedented insights into public sector data centres. For example, if we take the UK with 5.492 million public sector employees (ONS, Sept 2017), EURECA models can help approximate the running cost of UK public sector data centres, found to be £3.4B! Such figures are helping mobilise political interest to address energy efficiency in such server rooms, particularly through consolidation. For example, EURECA has been cited in a recent UK parliamentary report calling for action on ICT energy consumption, which was followed by wide media attention (see D5.3 for references).

Finally, and based on the lessons learned and an ongoing review and refinement process, the bespoke training programme designed under EURECA is considered world first targeting innovation procurement in public sector as a mechanism to drive data centre energy efficiency.

Impact and tangible benefits

EURECA was funded to support the European Union's 2020 and 2030 sustainable energy objectives. Namely, by helping reduce the energy consumption and greenhouse gas emissions of public sector data centres.

To this end, EURECA supported consolidation, new build and retrofit data centre projects in member states, leading to savings of over 131 GWh/year of primary energy from immediate pilots supported within the project lifetime in Ireland, Netherlands and United Kingdom (plus various ongoing ones in other member states). This equated to more than 27.83 tCO2/year savings, with annual electricity bill savings of €7.159M.

A detailed breakdown of the different figures, calculation methods, and models is provided in the attached project deliverable D5.2.

These are the immediate savings identified during the project lifetime and do not account for impact generated through policy influence as well as training and education activities.

Why nominee should win

EURECA made major contributions to increasing energy efficiency in data centres.

On Energy Savings

- EURECA empowered the EU public sector to identify 131 GWh/year of primary energy savings through innovation

- The EURECA team analysed over 337 data centres in Ireland, Netherlands and the UK helping them identify the major energy saving opportunities

On Policy

- More than 10 EU policies, legislations & standards were informed by EURECA

On Building Capacities

- 815 stakeholders trained through events held across the EU, not counting online training

- 14 knowledge sharing events attracting 955 attendees were organised in 10 European countries