

Smart Grids Australia – A Research and Development Roadmap

Background

The Australian Government is currently investing about \$100 million in a smart grid demonstration project under the Smart Grid, Smart City (SGSC) program. The objective is to use this project to demonstrate the business case for smart grids so Australia can move towards a national rollout of smart grids across Australia's energy networks.

The Australian Government included the requirement that the successful provider of SGSC would include research and development (R&D) of smart grid technologies.

Smart Grid Australia welcomes the Australian Government on taking this leadership role in smart grids, broadly, and on R&D, more specifically.

Recognising the importance of R&D to the integration of this new technology into energy networks, SGA has been working with our members, research institutions and global organisations to better understand the R&D landscape for this new technology.

SGA firmly believes that Australia's approach to smart grid development creates an opportunity for Australia to be positioned as a global leader in upgrading energy networks and maximising the benefits of smart grids. Australia is in a good position to maximise the benefits of the technology for the Australian economy as well as working with our trading partners through global collaborations, including, for example, the International Smart Grid Action Network which includes smart grid organisations in Australia, Belgium, Canada, China, the European Commission, France, India, Italy, Japan, Korea, Mexico, Norway, Russia, Sweden, the United Kingdom, and the United States.

With this overall picture in mind, Smart Grid Australia has recently developed and released its R&D roadmap which summarises the work done by the Research and Development Working Group of SGA to encourage discussion and further development of an Australia R&D Roadmap that supports the rollout of Smart Grid technology across Australia.

This roadmap has been developed with input from universities, CSIRO and industry experts. It has been informed by a literature review and by current developments nationally and in other parts of the world where Smart Grid concepts are being deployed in local environments. By understanding smart grid research and development activities taking place around the world and identifying what is appropriate for Australia, the gaps that need local solutions have been identified.

The development of the roadmap involved two workshops with researchers and industry in Sydney and Perth, in which we sought input from experts about what research and development in smart grids, would best benefit Australia and its priorities.

For the purpose of the R&D road mapping exercise, the following vision statement has been developed. Smart Grids will deliver electricity in Australia that:

- is more environmentally-friendly – reducing Greenhouse Gas emissions & promoting resource-use efficiency across the supply chain;
- enhances social capital – empowering and benefiting consumers & establishing a knowledge-based, highly-skilled workforce; and
- supports and facilitates a healthy economy – enhancing energy security, driving operational efficiency & facilitating innovation across the value-chain.

To achieve a common vision of successful Smart Grid implementation in Australia, the R&D roadmap identifies where the most effective research investments should be made. It supports the triple

bottom-line outcomes for stakeholders and their technology investments and was categorised in the following areas:

- Governance, policy and Industry frameworks
- Operational technologies and systems
- Informational technologies and systems
- End user technologies and issues
- Cross sectoral integration

The specific research topics that have been considered in the roadmap to be high impact are:

- Smart metering systems and consumer engagement
- Control systems for networks
- Grid security measures and systems
- Policy and regulatory settings

The SGA Research Working Group recommends that:

1. All Smart Grid demonstration projects, regardless of size, should have a strong R&D component, particularly around the above topics.
2. Further investigation of the Smart Grid needs of different Australian stakeholders to identify their most urgent and appropriate issues.
3. On the basis of the above activities we need to assess the R&D roadmap, any other detailed roadmaps (e.g. ENA National Strategy for Smart Networks etc.) and the findings of Smart Grid trials already underway on a regular basis. This is especially vital in the light of information, data, experience, and knowledge being gained in demonstration projects in Australia and elsewhere. Making regular reports and holding research oriented workshops would assist in keeping up to date and disseminating information.
4. We need a systems-based, objective way of assessing real progress in smart grids in the Australian electricity industry and market compared to that in others

By issuing this report Smart Grids Australia aims to encourage the development of a suitably matched pipeline of research linked to smart grid rollout across the country that:

1. meet the needs of the Australian electricity suppliers and consumers
2. can leverage overseas research capability
3. fills important research gaps in the research community
4. is suitably funded through appropriate incentives or, the removal of barriers by energy stakeholders, and where the research will potentially generate wider benefits for the community, Government(s) contribute directly
5. measures and monitors results so that the benefits of the research can be quantified

Based on this, we seek the Australian Government's assistance to encourage R&D investment in smart grid projects and trials. SGA would welcome working with the Australian Government to develop a suitable models and frameworks that encourage smart grid research.

For further information please contact Smart Grids Australia on their web site referencing the Research & Development Working Group: <http://www.smartgridaustralia.com.au/>