FUTURE PROOFING IN AUSTRALIA'S ELECTRICITY DISTRIBUTION INDUSTRY

CLEAN ENERGY COUNCIL

A collaborative project to enhance the flexibility and resilience of Australia's electricity distribution systems and the installations that connect to them as the industry transforms to a renewable energy future

Project Summary

24 September 2015

OVERVIEW

The continued integration of renewable energy into Australian distribution networks represents one of the largest economic, regulatory and technical challenges that the industry has faced to date. The extent of this reform brings with it risks and opportunities.

The Clean Energy Council (CEC), in conjunction with its members and other key stakeholders, has scoped a comprehensive program of work that will begin to address some of these challenges.

With the objective of enhancing the flexibility and resilience of Australia's electricity distribution systems, the CEC-led *Future Proofing in Australia's Distribution Industry* (FPDI) project will analyse existing and emerging issues while identifying potential future roadblocks to the continued deployment of renewable energy.

Ultimately the project seeks to build the foundations to facilitate the effective and efficient integration of renewable energy systems for Australia's electricity distribution industry. Its goal is to maximise the benefits of the transformation of this key industry toward a renewable energy future.

The project consists of a suite of coordinated packages of knowledge and information sharing activities, and industry capability building that captures necessary detail while facilitating industry engagement.

Objectives

Fundamentally, the project's core objectives define a framework for the detailed scope to be developed and executed. The CEC will work closely with its members, key stakeholders, the Australian Renewable Energy Agency (ARENA) and the Department of Industry to deliver the project's objectives, which include:

- To systematically identify key barriers that currently challenge the sustainable integration of renewable energy and demand management and what is needed for efficient resolutions both in the near and long term.
- To establish, coordinate and maintain relationships and transparent dialogue between key stakeholders.
- To ensure a holistic approach to the distribution industry.
- To provide a set of recommendations and advocacy platforms to inform policy and

regulation reform aimed at alleviating barriers to the integration of renewable energy and demand management.

- To demonstrate the technical performance of existing and emerging renewable energy and demand management technologies and explore their value to the distribution network.

The detailed scope of work includes technical, economic and regulatory analysis, forums, knowledge gathering and dissemination of the project outcomes. This approach is intended to create the environment for well-rounded stakeholder engagement throughout the project that will reinforce project *outputs* and target specific beneficial *outcomes* from each aspect of the project.

In doing so the work aims to enhance the flexibility and resilience of Australia's electricity distribution systems and the installations connected to them as they transform to a renewable energy future.

Background

A paradigm shift is occurring where consumers who were once complacent are now armed with significant choices about their energy consumption and supply

The Australian electricity distribution industry is currently facing a multitude of complex and interrelated issues surrounding the integration of renewable energy and demand management technologies into distribution networks.

Consumers now have choices. Choices which, while being of low impact individually, will collectively drive significant change. In conjunction the long-lived assets and risk averse nature of distribution businesses creates an inertia which slows the response to change.

During 2013 the CEC held a series of workshops across Australia with the objective of bringing together electricity industry stakeholders to discuss and understand the challenges faced by the ongoing expansion of commercial-scale inverter energy systems (IES). These events evolved into a forum for discussion on a range of complex and interrelated issues surrounding the integration of renewable energy, storage and demand management into Australia's distribution networks. The views of more than 100 industry experts were collected, which provided the CEC with a unique understanding of the issues currently faced by Australia's electricity distribution industry[1].

The workshops identified that the challenges are multi-faceted, and no one entity has an

[1] See CEC website for the full summary: http://www.cleanenergycouncil.org.au/policy-advocacy/arena/FPDI-project.html

appropriate business objective to address them holistically. Unless a coordinated approach to addressing these issues is implemented, there is a risk that inefficiencies will arise from issues being addressed in a piecemeal and reactive fashion. The FPDI project was created in an attempt to overcome this risk and is specifically designed to enhance transparency to avoid this outcome.

THE PROJECT

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This project aims to facilitate a coordinated approach that explores technical, knowledge, regulatory and economic challenges while seeking out workable and agreed solutions to carry forward.

Within the project's objectives the project's scope of work seeks to maximise benefits for a broad cross-section of stakeholders with national representation. There are four core work streams:

- Storage and demand side management (DSM)
- Regulatory and economic frameworks
- Technical challenges and 'best practice'
- Information sharing

Implemented over two to three years, each work stream will comprise of a suite of packages. Each will begin to address some of the existing barriers and lay the foundations towards the efficient integration of renewable energy systems, storage and demand management into the Australian distribution industry.

Project benefits

The FPDI project aims to secure Australia's energy sources for future generations through maximising the ongoing flexibility and resilience of the electricity supply industry to the challenges ahead

Consumers are now driving the industry towards the need to facilitate the transformation of Australia's electricity systems to work seamlessly with the integration of renewables. This project provides the first steps necessary to achieve this outcome, and will have significant impacts and long-term benefits to a broad stakeholder base.

The project brings together key stakeholders across the entire spectrum, from technology developers, market operators, distributors, government and regulators. This coordinated approach seeks to identify and address the challenges to, and opportunities from, grid integration, which will have economy-wide impacts.

The core goal of the FPDI project is to maximise the efficiency of investments in distributed renewable energy as we transition to a cleaner energy future, by providing integrated policy and/or technical solutions to key challenges faced by the industry.

These benefits will be realised through:

- Increased engagement and participation of key stakeholder groups;
- Increased coordination and collaboration between government, industry and research communities;
- The application of innovative thinking to business models;
- The application of new technologies to overcome challenges;
- The identification and removal of potential roadblocks to increased renewable energy penetration;
- The demonstration and publication of the value of embedded generation, storage and demand side management technologies;
- The development of technical best practice guidelines;
- A range of knowledge sharing activities focused on performance data, industry integrity, and policy/regulatory frameworks;
- Increasing knowledge and information about the industry and a range of technologies associated with renewable energy and enabling technologies; and
- Ongoing industry development.

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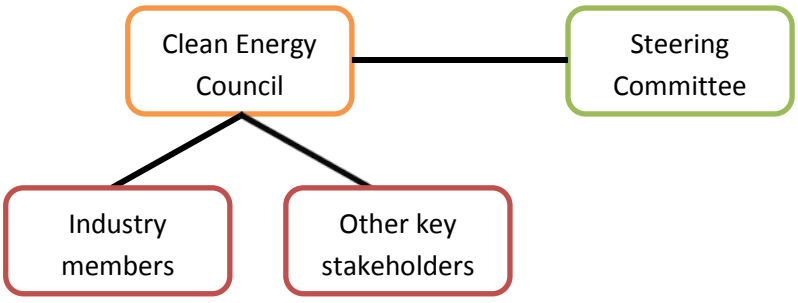
Project governance

Fundamentally, the FPDI project seeks to bring together key stakeholders to derive mutually beneficial outcomes. The CEC will support the project by providing oversight, project management and communications and media services



The value in this project is not the individual studies or activities but the coordination, network development, relationship management and information flow. The CEC will use

its industry-facing position and credibility to bring together the key stakeholders to deliver these outcomes.

In order to ensure perspectives are well-rounded, the project's Steering Committee includes a broad cross-section of industry views that will add significant value to the project outputs.

While the CEC will chair the committee, its role and that of members is defined within a formal framework which provides for consideration and agreement on aspects of the project scope and deliverables through this consultative forum. The additional role of the Steering Committee is to capture other related works in order to avoid duplication and identify knowledge gaps in the industry.

The following organisations are formally participating on the project Steering Committee.

ARENA (Observer)
AGL
Alternative Technology Association (ATA)
Australian Energy Regulator (AER)
AusNet Services
CSIRO
Department of Industry (Observer)
Energex
Energy Networks Association (ENA)
Energy Retailers Association of Australia (ERAA)
Marchment Hill Consulting
Pacific Hydro Pty Ltd
University of Technology Sydney

Other key stakeholders such as the Australian Energy Market Commission, Australian Energy Market Operator and Standards Australia have also expressed a willingness to contribute where relevant.

It is anticipated that Working Groups will be established for various programme activities on an as-needs basis. The CEC has received informal commitments from parties wishing to contribute their expertise as the work progresses.

The CEC will utilise its in-house capability to deliver the communications and events needed to execute the project's objectives. This will include publication of materials, forums, media outreach and online communications via the CEC's websites and other online channels as needed.

Funding

Impartial funding is critical to the success of this project. The CEC has successfully

negotiated funding agreements with ARENA to cover the analytical components of the project's initial two stages. This funding was received from ARENA through the Emerging Renewables Program.

Further funding will be sought as the project progresses beyond the initial stages.

Key industry stakeholders will also be contributing significant in-kind resources to contribute to the value of each aspect of the work. As the scope is also designed to maximise capacity building across the industry the extent of engagement adds priceless value.

Scope of work

In order to capture the need for outputs to feed into future work activities a staged programme of work has been designed. This strategy aims to ensure that the flexibility of the project's scope is maximised in delivering the project's objectives.

The project's scope has already delivered the Priority 1 tasks, and is currently reviewing the next and future strategic priorities.

Priority 1 actions (year 1)
Analysis of opportunities for demand side management activities in commercial premises
Review of regulatory and policy work undertaken to date
Review and critical evaluation of policies and incentives locally and review of international settings
Valuation methodology for small scale embedded generation and storage contribution to networks
Assessment of industry requirements for a commercial scale inverter performance study
Grid connection experience survey of generators #1
Priority 2 actions (years 1-2)
Storage safety performance study
Value of large scale embedded generation and storage contribution to networks
Best practice guidelines for the connection of embedded generation (Part 1)
Priority 3 actions (years 1-2)
Storage technical performance study
Energy storage and demand side management workshops

Innovative network augmentation funding model investigation
Best practice guidelines for the connection of embedded generation (Part 2)
Grid connection experience survey of generators #2
Priority 4 actions (years 2-3)
Inverter performance study
Best practice guidelines for the connection of embedded generation (Part 3)
Inverter Energy Systems Workshops in capital cities
Evaluation of the reliability contribution of renewable energy technologies at the fringe of grid
Grid connection experience survey of generators #3
Distributor workshops to outline connection processes and requirements to potential connecting parties
Industry workshops to enable ongoing knowledge sharing
Standard development and advocacy

Communications

The CEC will utilise its in-house communications team's capability to deliver on the communications and events requirements to execute the project's requirements. This will include publication of materials, forums, media outreach and online communications via the CEC's websites and other online channels.