AIC TECHCLINIC™

Five projects highlighted during the R&D Forum and value chain mapping process were identified as topical areas for the TechClinic™.

The project proponents were **Horizon Power** (WA), **Ergon Energy** (QLD) and **Hydro Tasmani**a (TAS). All were industry-led, and involved development and piloting of remote off-grid power and storage solutions.

The TechClinic™ was attended by approximately 25 SMEs, ten utilities and system integrators, five research organisations, and ten relevant government entities. The day commenced with a description of the challenges the projects were facing on the pathway to implementation, and through a facilitated process that followed, several barriers were identified and solutions proposed.

Numerous firm-to-firm introductions resulted from the discussion on the day, including some specific solutions. For example **Cap-XX's** super-capacitor technology, previously unknown to any of the project proponents, appeared to be a perfect fit for **Horizon Power's** need for lower cost, small scale storage suitable in installations for communities of less than 150 dwellings.

Importantly, each of the project proponents identified a range of participating SMEs that they were keen to speak with after the event with the aim of assessing their capability and potentially forming collaborative relationships.

Equally important, significant actions with potential impact on the entire energy storage industry were agreed. These included:

- Agreement by **Sydney University** and **Horizon Power** to lead the formation of an Australian Energy Storage Association, which would be a collaborative industry group to address the barriers raised during the forum;
- Agreement to establish an SME sub-group to offer or develop standardised models for their energy storage devices, that were needed by the project proponents to model and understand the application of specific technology within their systems;
- Agreement by all SMEs in the room to write strong letters of support for **Hydro Tasmania's** bid to government to establish a user-led test bed for storage devices at its King Island project facility, enabling feasibility testing and in-situ trial results to be achieved; and
- Agreement by the three project proponents to work with the proposed association to develop more standardised specifications that would better communicate their technical requirements.

WHAT DID THE PARTICIPANTS SAY?

"Horizon Power was pleased to accept an invitation to participate in the Clean Energy Innovation Centre's Energy Storage R&D Forum and TechClinic™.

Through our participation we improved our collaboration with two Australian businesses that had the capability to work with us on our energy storage challenges.

The AIC's convening of these events, inviting the suggested participants, and subsequent facilitation of our project development planning assisted us in better understanding the available avenues for achieving the outcomes we need."

Thom Fox, Manager of Sustainable Energy Solutions, Horizon Power

WHO IS THE AIC?

The Australian Institute for Commercialisation (AIC) is a leading service organisation helping innovators achieve commercial success. The AIC has delivered R&D Forums across a broad range of industries, including: tourism, food technology, clean technology, ICT, nanotechnology, biotechnology and mining, working with governments, multinational firms, universities and small businesses in the process.

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AIC CASE STUDY

Australian Institute for Commercialisation

ENERGY STORAGE OPPORTUNITIES FOR REMOTE OFF-GRID SOLAR AND WIND GENERATION PROJECTS

→ AIC Industry Innovation Framework

WHAT IS THE AIC INDUSTRY INNOVATION FRAMEWORK?

The AIC Industry Innovation Framework consists of a series of structured programs designed by the AIC to help build collaborations for researchers and industry along emerging value chains in new or existing industry sectors.

The Framework's most visible components are its two workshops: the R&D Forum and TechClinics™.

AIC R&D Forums and TechClinics™ bring together researchers, technology providers, potential end-users of research and other significant stakeholders (e.g. regulators, supply chain members, government agencies) to explore opportunities whereby industry capability and R&D activities can be leveraged to meet end-users' existing or future needs.

The objective of the R&D Forum is to frame a contemporary industry challenge and reach a common understanding of the alternative solutions available, with a view to building collaboration between researchers, technology suppliers and end users.

The key objective of the TechClinic™ is to develop a list of joint actions that progress the necessary steps towards collaboration and innovative solutions.

As a whole, the AIC Industry Innovation Framework is specifically designed to identify new market opportunities for SMEs and research organisations, and to plug them into value chains with larger stakeholders to address emerging markets.

The Framework leverages SME willingness, flexibility and capability as vehicles for taking new solutions to market, and helps to align research programs to industry needs. The steps in the framework are outlined in figure 1.

CASE STUDY: DEVELOPING THE "ENERGY STORAGE VALUE CHAIN"

The AIC was contracted in 2009 by the Department of Innovation, Industry, Science and Resources, through its involvement in the Enterprise Connect Clean Energy Innovation Centre (CEIC), to run a series of R&D Forums and TechClinics™ to accelerate innovation in the development of a clean energy industry in Australia.

These events were conducted in partnership with the **Western Australian Sustainable Energy Association (WA SEA)** and **Newcastle Innovation (NI)**.

Although Australia has recently committed to increased production of clean energy from renewable sources through the Renewable Energy Target of 20% by 2020, a number of inherent problems experienced by renewable generators and grid operators (in meeting the requirements of the market) need to be overcome. One of these problems relates to the inability of a number of renewable sources to supply base load capacity, requiring some form of energy storage so supply can meet demand when it is needed.

Figure 1: AIC Industry Innovation Framework

STAGE	FORESIGHTING	R&D FORUM	VALUE CHAIN MAPPING	TECHCLINIC	COLLABORATION FACILITATION
Objective	Scan ahead to gather and interpret intelligence that will inform sector or organisational innovation strategy	Assemble broad expertise to identify the best opportunities that could be pursued based on demand and capability	For a specific opportunity, understand market characteristics, the value chain structure & participants	Assemble value chain participants, present the opportunity & facilitate collaboration discussions	Provide facilitation support to ensure potential collaborations are realised
Outcome	Intelligence to enable development of a roadmap or forward thinking innovation strategy	Identification of the most valuable and achievable market opportunities	Detailed understanding of the market, value chain structure & participants for an opportunity	Identify organisations willing to collaborate to develop a solution for the market opportunity	Transition collaboration opportunities into successful collaboration outcomes

THE R&D FORUM

The topic chosen for the first R&D Forum related to this challenge, and was **"What are the most promising energy storage technology options to meet the needs of renewable electricity generators and grid operators?"**

The R&D Forum was attended by 50 experts in their fields, including representatives from sixteen leading Australian energy storage SMEs and commenced with six brief, focused presentations from relevant experts in the energy storage field. Speakers were drawn from power generator companies **(Hydro Tasmania)**, end users **(Australian Aluminium Association)** and research organisations **(University of Sydney, University of New South Wales, Curtin University**, and **CSIRO Energy Transformed Flagship)**. Their topics included "Energy Storage and Renewables" (generator perspective), "Industry and Energy Storage", "Smart Grids and Distributed Storage", "Electrochemical Energy Storage", "Electric Vehicle Array Energy Storage and the Grid", and "Thermal Energy Storage".

After the presentations, participants were assembled into groups to workshop a series of questions posed to them by the facilitator. The collective input was collated and reduced into a series of mind maps that reflected the current innovation system in Australia.

OUTCOMES OF THE R&D FORUM

In this forum, significant new observations to emerge included:

(i) There is no existing innovation cluster for energy storage in Australia, even though there is significant industry and research capability and activity;

(ii) There are clearly differentiated economics between the energy storage needs of remote locations and the city, as current energy costs are so different. Therefore, storage solutions will be most cost effective in remote or off-grid locations (community and industrial) well before metropolitan applications;

(iii) Economics make current storage technologies already viable in some remote applications, because utility companies face high costs in remote power provision and have expressed demand for new solutions; and

(iv) Remote generation technologies exist – but the storage part of the solution is still missing.

WHAT DID THE PARTICIPANTS SAY?

"It was very beneficial... as an academic I got an insight into the challenges and problems faced by the industry".

Dr. Cagil Ozansoy, Lecturer (Power Systems), Victoria University

Several topical issues for Government bodies to consider also surfaced. These included:

- Standards and regulatory issues are hindering uptake of energy storage technologies;
- The Regulatory Framework lacks a policy on energy storage;
- Approvals for grid connection for storage require (overly) substantial compliance obligations;
- Market participation rules are restrictive and hinder uptake;
- Fast followers seem to be favoured by the regulatory structure;
- Funding support seems to have been diverted to Carbon Capture and Storage; and
- Companies and research organisations are reporting a shortage of technical skills to meet energy storage industry demand.

Most importantly however, the principal outcome from the R&D Forum was the emergence of a number of large, remote, energy utility projects in which R&D organisations and SMEs could now participate. These projects or opportunities then formed the basis for more detailed discussion at the subsequent TechClinic™.

VALUE-CHAIN MAPPING AND OPPORTUNITY ANALYSIS

A key activity following the R&D Forum was to map the value chain of the most promising opportunity identified. In this case, the value chain for renewable energy generation and storage solutions for remote off-grid applications was mapped. The activity also identified specific market opportunities where SMEs could participate, and outlined future industry needs to the research sector.

In parallel to value chain mapping, a market review was undertaken which focused on providing a better understanding of the national and global market for remote off-grid energy generation and storage solutions.

Prior to the subsequent TechClinic™ workshop, a briefing paper was also developed by the AIC and partners to share an understanding of the core problem in greater detail, and establish the best course of action for TechClinic™ delivery.