

Australia-Indonesia Centre **ENERGY** Megatrends

Australia and Indonesia

In spite of their close proximity and the sharing of an international maritime border, Indonesia and Australia are very different nations. Geographically, politically, culturally and economically they bear some similarities, but also some stark differences. Nonetheless, both nations are located in the Asian economic region which is transforming rapidly, presenting opportunities and necessities for greater collaboration on shared issues. The Australia-Indonesia Centre (AIC) and CSIRO have been investigating these shared issues for four research Clusters: **Agriculture and Food, Health, Infrastructure and Energy.**



AIC Foresighting Project

CSIRO has been invited by the AIC to apply its 'foresighting' approach to assist research planning for the Energy Cluster. By identifying 'megatrends' and 'megashocks' towards 2030 and beyond, foresighting enables the Cluster to be evidence-based and anticipatory, and to identify a clear pathway to market, adoption and application. The overarching goal of the AIC Foresighting Project is to *'support the development of priority research areas of shared interest between Australia and Indonesia, and to promote integration, synergy and learning amongst the Cluster teams'*.

In November 2014 – January 2015 the project engaged with Cluster teams during their planning workshops to identify shared issues, underlying drivers and potential megashocks. In February – May 2015 megatrend narratives were developed around the shared issues, and then tested and refined through discussion and validation with Cluster researchers and the AIC. Based on the shared issues and drivers, overlapping megatrends were identified for each Cluster. These are summarised here for the Energy Cluster. The full megatrend report is available from the AIC website, www.austriaiindonesiacentre.org.

Megatrend summaries

- Energy efficiency, consumer awareness and service-based economies will alter energy demand.
- Opportunities for deep de-carbonisation will improve through renewable energy innovation.
- Windows of opportunity for investment into renewable energy will increase.
- Growing geo-political uncertainty and tension will undermine long term investment in sustainable energy.

More Affluent, More Informed Consumers

This megatrend describes the changing nature of the increasing demands for energy in Indonesia and Australia. Energy production in Australia and Indonesia is projected to continue increasing to 2050 as populations, economies, incomes and consuming classes continue growing and substantial investments are made in infrastructure and electricity provision. The rate of per capita growth in energy demand in Indonesia will slow and Australia's will continue its decline which started about 50 years ago. In both cases, the decline in energy demand is due to new technologies and stricter regulations improving the intensity and efficiency of energy use, increasing energy literacy and environmental awareness, and economies shifting to service industries. The speed at which the growth in demand for energy slows will depend on the policy and investment decisions made by both governments around infrastructure, education, efficiency, technology R&D, and city design.

Green Energy's Quiet Take Over

This megatrend projects that the recent rapid global increases in development and adoption of renewable energy technologies, battery storage and electric vehicles will continue and that these could be rapidly and widely adopted within Indonesia and Australia.

The main drivers of these trends are rapidly growing global pressures to mitigate climate change – reflected in carbon prices and strict carbon emissions targets – and the continual improvement in affordability, scalability, and reliability of renewable energy and battery storage technologies. Substantial opportunities are projected for both countries to cost-effectively achieve deep decarbonisation, due to their large renewable energy endowments. Policy support and financial investments into renewable energy have improved over the last decade in both countries, but these efforts are not yet comprehensive. Trends in regulatory uncertainty related to climate mitigation and renewable energy are projected to delay and possibly prevent the realisation of potential benefits from renewable resources.

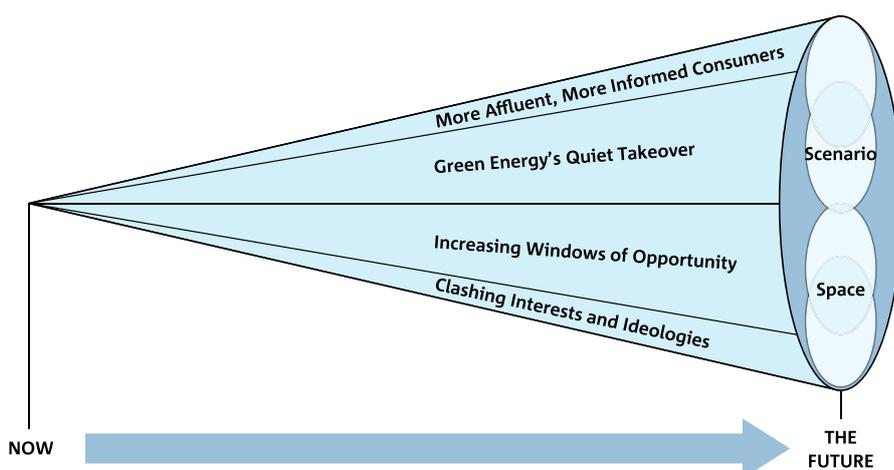
Increasing Windows of Opportunity

'Windows of opportunity' are short periods of time during which an otherwise unattainable opportunity exists. The combination of the growing global trends in climate change mitigation, geo-political instabilities in energy-exporting nations, increasing risks from climate change, bottom-up collaborative efforts to enhance environmental and energy security, and affordability of renewable energy are projected to create increasing windows of opportunity for Indonesia and Australia to reduce their exposure to the growing social costs of fossil fuels,

and to achieve benefits from generating energy domestically using their substantial renewable energy resources. These opportunities are being enhanced by rapid advances in complementary technologies such as smarter grids, Big Data, 3D printing, electric vehicles, and Direct Current cables for long distance energy transmission. However, the opportunities will be missed unless Indonesia and Australia rapidly build cooperation and coordination.

Clashing Interests and Ideologies

In this megatrend the global trends of increasing income and wealth inequality, marginalisation of large populations, religious radicalism and intolerance, and ideological divides will drive growing intolerance, uncertainties and tensions. If these trends emerge in Indonesia and Australia they will undermine the consensus required to commit to long-term investments in appropriate energy resources needed for long-term economic, social and climate security. The stimulation of positive and consensus-based policy development will be critical for overcoming the potential barriers to sustainable energy development. Promising signs are President Joko Widodo's priorities to provide electricity for all, and Australia's commitment to provide over \$1 billion for R&D and demonstration of renewable energy, and \$0.5 billion to low emission fossil fuel projects.



THE FOUR MEGATRENDS IDENTIFIED FOR THE ENERGY CLUSTER

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