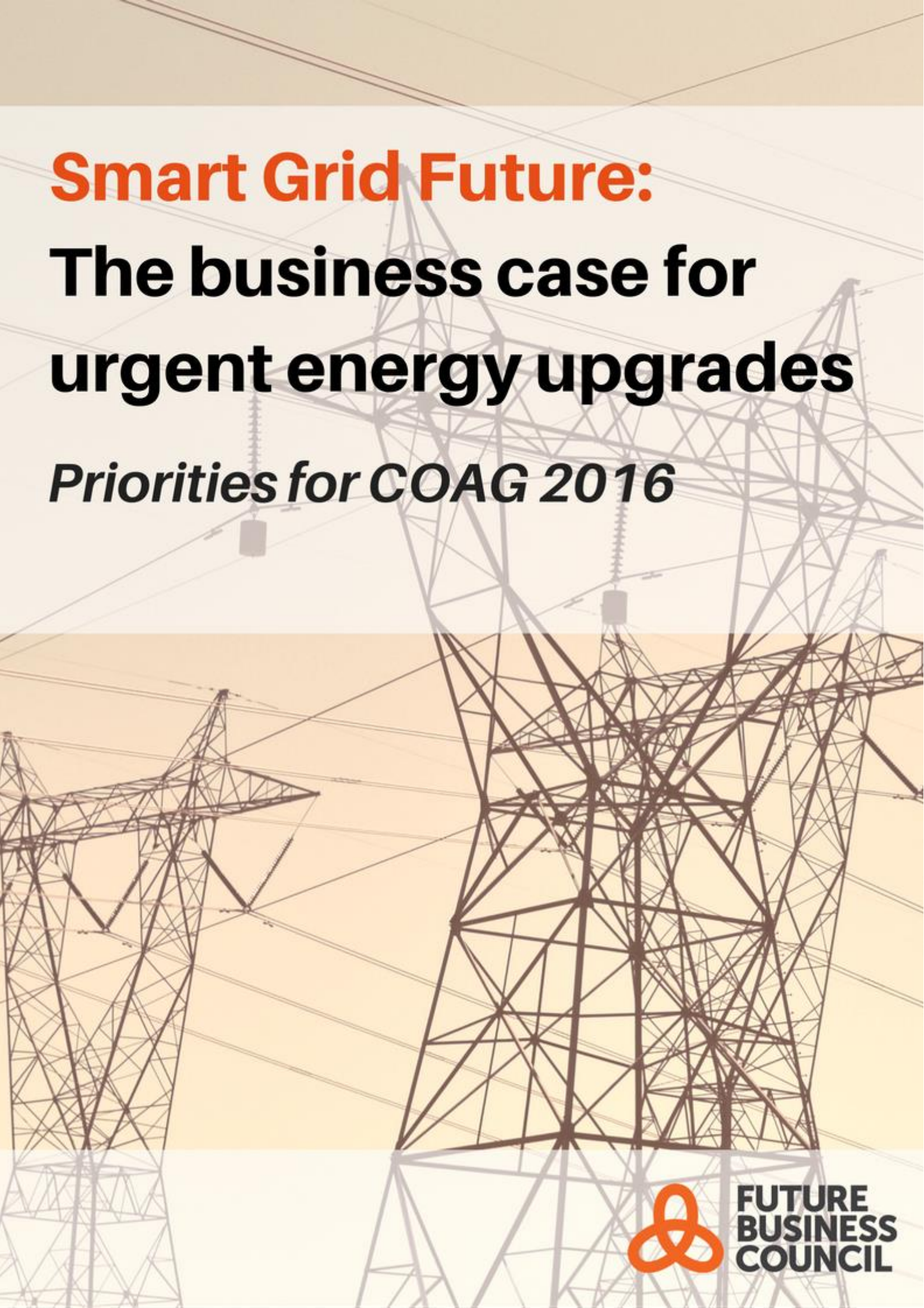
# Smart Grid Future:

# The business case for urgent energy upgrades

## *Priorities for COAG 2016*



FUTURE BUSINESS COUNCIL

# Executive Summary

South Australia's business community is paying the price for a grid that is no longer fit for purpose.

The meeting of COAG's Energy Council on 19 August must take action to start the transition from the current 'Dumb Grid' based on an increasingly outdated and costly centralised distribution model, to a 21st century 'Smart Grid' to overcome the challenges the Australian energy system is facing, unlock new investment and reduce electricity costs.

The future of the national energy market is 100 per cent renewable. The grid must be reimagined with this reality in mind and build to enable diversified generation and simple import and export throughout the national energy market. The sooner the renewable energy transition is achieved, the sooner the business community benefit from lower prices.

The following changes must be a priority to fix the grid, support the business community and enable the transition to a future powered by renewable energy.

**The Future Business Council calls on COAG to commit to the following actions:**

- *Build a second interconnector between South Australia and Victoria, and a direct connection between South Australia and New South Wales;*
- *Incentivise investment in a complementary mix of renewable energy and battery storage. Investment must be increased in large scale solar farms, solar thermal towers, and tidal energy to better levelise generation, alongside work to accelerate the uptake of energy storage including battery's, electric vehicles and pumped hydro projects;*
- *Restart the national rollout of electricity smart meters informed by the lessons from the Victorian experiment.*

Australia's energy future is bright. The country has the world's richest renewable energy resources and the opportunity to create the lowest cost base of energy for industry in the world. But there's a risk this will be missed without work to reimagine the structure of the grid and enable rapid investment growth in renewable energy.

A smart grid reflexive to a diversified energy market, capable of meeting the needs of "prosumers" (companies and households that both produce and consume energy), and that supports Australia's ability to achieve its Paris Climate Conference commitments is critical.

Australia must prioritise the transition from the current 'Dumb Grid' based on an increasingly outdated centralised distribution model, to a 21st century 'Smart Grid' that unlocks new investment, jobs and an affordable energy future.

We look forward to supporting COAG's Energy Council as it embarks on the greatest transformation of the grid since its inception.

Tom Quinn, Executive Director, Future Business Council

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# Overview

Australia's National Energy Market is hamstrung by an out-dated, 'dumb' grid, and must be updated to face the realities of low carbon, low marginal cost energy generation.

- Greater inter-connectivity is the first critical step needed to ensure sufficient competition in the market to drive down prices, and allow the continuity of supply in periods of low renewable generation.
- A diversified energy mix is required to ensure continuity of low carbon energy supply and growth of investment opportunities. Continual and increasing investment in increasing efficiency of wind and solar photovoltaic power, as well as in alternative methods of generation such as bioenergy, geothermal, concentrated solar power, and tidal power is required.
- Sufficient advances in smart grid and energy storage technologies must accompany advances in generation capacity.
- Cost reflective price signals should be implemented to ensure efficient use of energy and assets.

# Background

The price spikes in the South Australian electricity market, claims of market manipulation and challenges of better integrating distributed generation into grid has placed the spotlight on Australia's National Energy Market. A proactive, future focussed response at COAG is needed to ensure the grid is fit for purpose in the 21st century and enables Australia to capitalise on the investment and job creation opportunities of the growing share of renewable generation in the energy mix.

The grid needs urgent work to transform it from the current 'dumb grid' based on last century's centralised generation model, to an adaptive smart grid the enables the nation to meet the energy needs of this century and supports Australian business and residents to benefit from the billions being invested in the shift to a low carbon economy.

The following challenges need to be addressed by COAG when considering the national energy system and the future shape of the grid:

- Declining aggregate peak demand and consumption
- Widespread uptake of rooftop solar panels

- An increasing focus on greenhouse gas abatement
- Decreasing costs of low carbon generation and energy storage technologies
- Outdated grid designed on centralised generation principles
- Anti-competitive behaviour by existing generators

Uncertainty over future energy prices and the capacity of the national energy market to adequately integrate the increasing penetration of renewable power generation is limiting Australian businesses ability to prosper in a low carbon world.

A transition from the current 'Dumb Grid' based on an increasingly outdated centralised distribution model, to a 21st century 'Smart Grid' is required to overcome the challenges the Australian energy system is facing.

The following principles must be incorporated into COAG's considerations on the future shape of a smart grid that is fit for purpose this century.

# Distributed generation

A diversified energy mix is required to ensure continuity of low carbon energy supply.

Continual and increasing investment in improving efficiency of wind and solar photovoltaic power, as well as in alternative generation methods such as bioenergy, geothermal, concentrated solar power, and tidal power will be required.

UNSW research [Centre for Energy and Environmental Markets, 2016] suggests that a significant increase in synchronous generation capacity will be required to transition to 100% renewable energy at least cost, involving significant increases in generation capacity of hydro, concentrated solar thermal with storage, and biogas turbines.

# Energy Storage

Advances in smart grid and energy storage technologies must accompany advances in generation capacity. New technologies are increasing the capacity for storage technologies to be economically deployed at utility-scale and network locations. Decreasing lithium-ion battery cost and an uptake of electric vehicles allow further energy storage to occur at the on-site consumer scale. The network, as currently designed, is ill equipped to effectively integrate these developments.

# Demand management

The electricity market system primarily relies upon volume-based pricing, rather than cost-based pricing, where consumers pay for the volume of electricity used at a set price, rather than at a price that adequately reflects the differing costs of generation across peak and non-peak periods.

The current system provides little incentive for consumers to reduce consumption in peak periods, resulting in higher prices, excessive levels of network infrastructure and reliance on non-renewable sources of electricity.

Cost reflective price signals in a smart grid would allow consumers to adjust behaviour according to price signals and smooth demand across the network, and make electricity prices fairer and cheaper for consumers in the long run.

# Expansion and management of grid assets

Significant increases in transmission capacity both inter and intra-region will be required in the new smart grid. Some of the best solar and wind sites in Australia are located far away from places of demand, necessitating a certain level of transmission investment.

More importantly is the necessity of increasing interconnectors between states to facilitate sufficient competition in the market to drive down prices, and to allow spatially diverse renewable generation loads to be linked across the national electricity market, overcoming some of the problems associated with wind and solar generation variability.

Historically, investment in grid assets has been non-optimal. Energy prices have increased across Australia due to perverse incentives that have resulted in overinvestment in surplus infrastructure based on exaggerated demand forecasts.

The costs of the unnecessary infrastructure are passed on to customers. All new investment should be based upon up-to-date scientific and economic information, with clear accountability for costs of non-optimal investments established.

# Recommendations for COAG

A smart grid is needed to meet Australia's 21st energy needs and provide certainty for the local business community. Appropriate policy frameworks need to be implemented by COAG that take into account the changes outlined and that will enable the transition towards a low carbon energy system at least cost.

Importantly, bipartisan support for transforming the grid to ensure it meets the needs of energy producers and consumers this century.

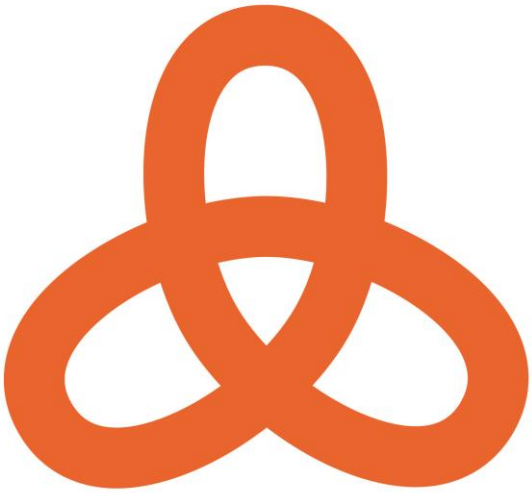
The Future Business Council recommends COAG prioritise the following actions to address the changing energy market, Australia's global commitments and the needs of the business community.

- *Build a second interconnector between South Australia and Victoria, and a direct connection between South Australia and New South Wales to enable competition, facilitate interstate trading and better access to inland renewable energy resources;*

- *Incentivise investment in a complementary mix of renewable energy and battery storage. Investment must be increased in large scale solar farms, solar thermal towers, and tidal energy to better levelise generation, alongside work to accelerate the uptake of energy storage including battery's, electric vehicles and pumped hydro projects;*

- *Restart the national rollout of electricity smart meters informed by the lessons from the Victorian experiment.*

The Future Business Council strongly supports a commitment from COAG to prioritise investment in a smart grid that meets the needs of business and the community.



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