STANDING COMMITTEE ON THE ENVIRONMENT AND ENERGY

Inquiry into modernising Australia's electricity grid

Discussion paper

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Introduction

The House of Representatives Standing Committee on the Environment and Energy is conducting an inquiry into modernising Australia's electricity grid.

The purpose of this discussion paper is to provide background to the inquiry, outline the matters about which the Committee is seeking comment and information, and assist individuals and organisations to participate in the inquiry.

Background to the inquiry

The electricity transmission and distribution networks, which deliver electricity from generators to consumers, are vital to Australia's economy and society. The networks and the markets that support them—referred to as 'the grid' in the current inquiry—enable essential services and modern amenities, and supports vibrant industries and communities around the country.

However, as in other countries around the world, the electricity system in Australia is entering a significant period of transition. This transition is driven by:

- the evolving mix of electricity generation, from traditional, synchronous energy generation (such as coal, gas, and hydro) to non-synchronous, variable energy generation (such as wind and solar photovoltaic);
- increasing adoption of new technologies in the electricity sector (such as battery storage and smart meters); and
- changing and less predictable patterns of demand from households and industry.

Recent events—including price volatility and load shedding associated with extreme weather events, and the announcement of the closure of Hazelwood power station—have highlighted the need for this period of transition to be managed effectively.

In this context, the House of Representatives Standing Committee on the Environment and Energy is undertaking an inquiry into modernising the electricity grid. The Committee is seeking to identify stakeholders' expectations of the grid, examine challenges and opportunities involved in the modernisation of the grid, and learn from the experiences of other jurisdictions.

Drawing on this evidence, the Committee will consider the critical question of how to safeguard the security and reliability of the electricity system and ensure that the system can facilitate the transition to a lower-emissions economy, all while keeping electricity prices for households and businesses as low as possible.

The Committee acknowledges that electricity generation is an important aspect of the electricity system, and notes the uncertainty about how the generation mix will evolve into the future. This is likely to be influenced by a range of factors, including federal and state government policies and the rate of adoption of new technologies. The Committee is aware of the ongoing debates in this area and does not see its role as duplicating these efforts.

As such, in this inquiry the Committee will consider the extent to which the electricity transmission and distribution system has sufficient flexibility to integrate a broad mix of electricity generation—both now, and into the future. While the appropriate mix of electricity generation and the emissions intensity of the electricity sector are worthy issues for consideration, these matters are outside the scope of the current inquiry.

Ultimately, regardless of how electricity is generated and how it is consumed, the electricity grid will continue to occupy a central role in our economy and society. The Committee encourages all stakeholders to share their views on how the electricity system can be best placed to meet the needs of all Australians.

Terms of reference

The Committee will inquire into and report on the adequacy of the current electricity transmission and distribution networks to support Australia's future needs, giving particular consideration to:

1. the means by which a modern electricity transmission and distribution network can be expected to ensure a secure and sustainable supply of electricity at the lowest possible cost;
2. the current technological, economic, community and regulatory impediments and opportunities to achieving a modern electricity transmission and distribution network across all of Australia, and how these might be addressed and explored; and
3. international experiences and examples of electricity grid modernisation in comparable jurisdictions.

Guidance to stakeholders

This section provides some additional background and guidance on each of the inquiry's terms of reference. Key terms are explained in the context of this inquiry, and—without wishing to limit the scope of evidence to the inquiry—some questions are posed to assist stakeholders in formulating their contributions.

1. *The means by which a modern electricity transmission and distribution network can be expected to ensure a secure and sustainable supply of electricity at the lowest possible cost.*

The modernisation of the electricity grid provides an opportunity to reconsider what the system should seek to achieve, and how the different priorities of stakeholders should be balanced.

The Committee has initially identified the following issues for consideration:

- **security**—the electricity grid is able to continue operating in the event of the disconnection of a major system element and/or during a severe weather event;
- **reliability**—the grid has sufficient capacity to meet demand;
- **sustainability**—the grid anticipates and meets the changing needs and expectations of consumers, provides certainty for current and future electricity generators, regardless of scale, and is able to facilitate the transition to a low-emissions economy; and
- **affordability**—the system provides universal access to electricity services at the lowest practicable cost to consumers.

The Committee welcomes evidence on the relationship between these and any other relevant aspects of the grid, and to what extent a modern electricity system can simultaneously achieve acceptable outcomes in each of these areas.

Questions for stakeholders to consider:

- How are the objectives of security, reliability, sustainability, and affordability interrelated?
- What should be the highest priority objectives of a modern grid in Australia?
- What are appropriate standards for the security and reliability of the electricity system?

2. ***The current technological, economic, community, and regulatory impediments and opportunities to achieving a modern electricity transmission and distribution network across all of Australia, and how these might be addressed and explored.***

Given the complexity of the electricity system, and its central role in our economy and society, the modernisation of the grid presents a diverse range of challenges and opportunities. The terms of reference identify the following areas of focus:

- **technological issues**—ways in which the system could be designed to integrate the features and limitations of a diverse mix of electricity generation, while ensuring compatibility with other emerging technologies;
- **economic issues**—the cost of grid modernisation, barriers to investment in the system, and the cost of not keeping pace with the evolving demands on the grid;
- **regulatory issues**—benefits of and impediments to creating an integrated, nationally consistent system, and changes that may be required to federal legislation, policies, and administrative arrangements to facilitate the modernisation of the system; and
- **community issues**—ensuring the needs of all consumers (including households, business, industry, and vulnerable consumers) are met by the system.

The Committee welcomes evidence on any weaknesses or shortcomings within the present electricity system, any impediments to modernising the system, and how these impediments could be overcome. The Committee also encourages stakeholders to identify opportunities associated with grid modernisation across each of the areas listed above.

Questions for stakeholders to consider:

- What are the costs associated with an 'outdated' grid?
- What might be the role of new technologies in improving system security, reliability, sustainability, and affordability? What is the potential for new technologies to alter the inter-relationships between these objectives?
- How can the grid better accommodate the rapid pace of technological change, including an increasing level of variable electricity generation?
- What possibilities are there for alternative pricing models (for example, cost-reflective pricing) to better reflect the true cost of services provided by a modern grid?
- What opportunities are there to improve governance and regulation in the grid?
- What opportunities are there for consumers to benefit from the modernisation of the grid? How can we ensure that these benefits are able to be shared equitably by all consumers?
- What sort of community attitudes or concerns will need to be addressed in order to successfully modernise the electricity grid?

- What options are there for addressing geographical barriers to achieving a truly national grid?

3. ***International experiences and examples of electricity grid modernisation in comparable jurisdictions.***

The Committee welcomes evidence on the progress of grid modernisation (including the integration of variable electricity generation) in comparable countries, and any lessons that could be applied to the Australian context.

Questions for stakeholders to consider:

- What are the key similarities and differences between the electricity system in Australia and those of other countries?
- How does Australia compare with other countries in the rate of adoption of variable electricity generation and other new technologies?
- How does Australia compare with other countries in progress towards electricity grid modernisation?
- What are examples of best-practice governance and regulation in other countries?

How to participate in the inquiry

The Committee invites individuals and organisations to make a submission to the inquiry. Although this paper contains questions being considered by the Committee, submissions addressing any matters relevant to the terms of reference would be welcome.

Submissions should be lodged via the online portal, which can be accessed through the inquiry web page, at www.aph.gov.au/moderngrid. The due date for submissions is **28 April 2017**. Further instructions on preparing a submission, including information about parliamentary privilege and requests for confidentiality, can be found at www.aph.gov.au/makesubmission.

In addition, the Committee is undertaking an online questionnaire to gather information about how individuals, families, and businesses currently interact with the electricity system, and about their expectations of the system into the future. The questionnaire can be accessed via the inquiry web page, at www.aph.gov.au/moderngrid. The Committee encourages stakeholders to forward the link to the questionnaire to interested members of the community.