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Response to the "Capacity Mechanism Project: High Level Design Paper, June 2022". Energy Security Board, Australia.

With the recent National Electricity Market (NEM) failure, and subsequent market suspension by AEMO on 15 June 2022, it is very timely that the ESB released in June 2022 a capacity mechanism high-level design paper and with the associated raft of questions (74-page report) to address short and medium-term energy security and reliability with a focus on South-East Australia.

In addition, AEMO released in July 2022 the "2022 Integrated System Plan for the National Electricity Market" (104-page report).

The market suspension has resulted in significant costs to various parties and will no doubt be subject to long duration legal determinations over the attribution of these costs.

This response to the ESB capacity mechanism is from the consumers' perspective in the NEM and is based on over 40 years of combined experience in engineering infrastructure projects and operations with a particular focus on the energy sector.

It is considered that the following summary of the macro issues are relevant to the capacity mechanism design paper to address energy security and reliability.

1. STRATEGIC CAPACITY MECHANISM

The current AEMO market mechanism of the five-minute spot market bidding cycle, for kilowatt-hours generated, was introduced in October 2021.

This short-term approach can lead to bids as low as the marginal cost of generation which does not allow sufficient revenue or predictability for many. The very high cost of energy infrastructure investments, typically $ 500m+ AUD, and the extensive maintenance costs for some traditional generators, is the subject of both modelling of likely revenues from the spot market with a myriad of competitors and the market rules e.g., curtailments. That is, it is a high-risk process for investors to get some form of surety on their returns.

Alternatively, with the ruling price being set by the highest bid enables windfall gains flow to parties that own either renewable energy generation and/or retail operations. That is, the costs savings are not flowing down to consumers.

Currently, the system is being 'gamed' for various reasons, and some may call it "dysfunctional behaviours", as the ruling price during any 5-minute period is set at the highest successful bid price, when many prices bid are much lower than that. This creates an incentive to 'game' the system by withholding cheaper capacity and pushing the price up into the higher cost technologies. Usually, the highest price bid comes from gas turbines, which have the advantage of being able to start up and achieve full power in a few minutes whilst traditional coal generators struggle to compete.

This is currently the situation in a time of high fossil fuel prices and becomes very visible on the pricing front.

A more strategic approach to a capacity mechanism is required which can ensure that energy security is real now for millions of residential consumers and businesses.

2. SINGLE COMMODITY MARKET

The problems of energy security and pricing can be overcome, where generators, renewable and traditional, are paid at the prices that they bid, and where both power (MW) and energy (kwh) are paid for explicitly.

The current market is based on bidding for energy generation, in kilowatt-hours (kWh), every 5 minutes. The notion is that if there was a shortfall in generation, then the price per kwh would rise, and more generators would be attracted into the market. This market signal often results in prices being bid down to marginal cost, leaving insufficient income to support new investment.

On the other hand, when capacity is in short supply, prices can quickly rise to very high levels.

The combined effects of these two extremes results in a great deal of uncertainty, and a very unfavourable climate for investment.

The marginal-cost based bidding (for kwh) tends not to allow enough revenue for longer term maintenance work, and so results in existing assets being run down, and rendered unusable before they are technically obsolete. Hence, existing traditional generation assets have been and currently forecast to be retired 'early', resulting in shortfalls of capacity.

3. STRATEGIC TRANSITION PLAN

As noted above, the 5-minute bidding cycle tends to produce bids as low as marginal cost of energy generation (kwh), which would not allow sufficient revenue to pay for capital invested. A twin element payment system, including payment for MW of capacity, would provide a mechanism to pay for the capital invested. As capital is paid off and retired from the books, the capital (capacity) charge could be reduced accordingly.

This would provide greater advantage for renewable energy investments, which would be able to produce a very competitive bid in the second five-year period of market testing of bids (see below).

Tenders for the above mechanisms could be established very quickly on a high priority, staged approach and should focus on alliance/partnering type contracting or similar models. Five-year contracts would allow the industry to be strategic in their offering to the market and recalled every five years as the technologies available at that time have evolved. To allow for the different forms of energy supply and being technology agnostic, tender assessment could be based on the total of dollars for electrical capacity (MW) and electrical energy dollars at 100% output (kwh). A multi-criteria assessment could also include the emissions profile on offer.

The forecast demands on the network at major strategic nodes or zones can be estimated and contracted, in part at least say 20% for over five-year periods, increasing progressively to 100% penetration, as successful performance of the system is demonstrated. This allows an orderly transition of ageing fossil fuel generators to be operational and appropriate levels of investment in scheduled maintenance. These contracts can be recalled every five years and will then be based on the best array of technologies at that time, although contracts will be technology agnostic.

Contracts can reflect the various imperatives required by the market, such as 24 hour per day availability with 100% reliability, peak period availability, emergency availability, ‘casual availability’ with energy provided when available but with no guarantees, or specialist services such as frequency control.

Once the ‘gaming’ is eliminated, it becomes possible to pass on to the consumers the low costs that are available from renewable energy.

The super profits currently accruing to the ‘middleman’ can be eliminated, providing that the retailers as well are subject to competitive bidding for the right to be retailers, based on the mark-up they can offer to the final customer.

4. IMPLEMENTATION PLAN

The ESB has been active over recent time running a collaborative process that has resulted in the "Capacity Mechanism High-Level Design Paper, June 2022".

The ESB process proposed from here is that responses are received by the end of July 2022 and with a final design capacity mechanism position put to the Energy Ministers by February 2023. Thence, a three-year implementation program before that proposal (currently unknown) for a revised capacity mechanism is put in place through AEMO in mid-2025.

This is very peculiar and high risk for consumers and commercial energy companies that does not solve any immediate or short-term problems in the market. That is, we will have the summer of 2022/23, winter 2023, summer of 2023/24, winter of 2024, and summer of 2024/25 before any improvements in the energy security market would be realised.

Alternatively, contracts can be implemented at high priority strategic nodes or zones in the NEM with forecast requirements starting immediately. Strategic alliances or partnerships of energy generators be they solar, wind, hydro and/or traditional fossil fuel generators can bid for that capacity.

The contracts could be technology agnostic for guaranteed energy supplied and last for five years. Thence, a new round of contracts is repeated for the following five years with the technologies available at that time.

5. STRUCTURAL REFORM:

There are many players in the national energy management space from Federal to State to Territory entities. These include regulators, boards, commissions, operators, and the like, too many to list here. As a result, there is no one national Agency that has responsibility for the holistic functionality and reliability of the National Electricity Market including the planning, forecasting, integration of supply, energy security, interconnections, new generator connections, energy storage and retailers.

In addition, there is no national single point of accountability nor market mechanism for short term and medium-term energy security. That is, for example there are numerous jurisdictional inputs both Federal and State that make the solutions even more complex when a simple solution can be predicted and implemented.

An administrative national structural reform process is urgently required that includes single point accountability much like other national utilities e.g., railways, telecommunications.

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