Economic life of Eraring Power Station and Vales Point Power Station

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Introduction

Frontier Economics has been asked by the Independent Pricing and Regulatory Tribunal (IPART) to provide advice on the economic life of Eraring Power Station and Vales Point Power Station. In particular, we have been asked by IPART whether we consider that the economic life of Eraring Power Station and Vales Point Power Station is likely to extend beyond 2039 and, alternately, beyond 2044.

At this stage, we have not been asked to model a specific set of assumptions and results. Rather, we have been asked to provide advice on the economic life of these power stations based on our general experience modelling outcomes in the National Electricity Market (NEM).

We have considered a range of factors that are key determinants of the economic lives of these power stations and we conclude that under the assumptions that are currently most realistic, the economic life of Eraring Power Station is likely to extend beyond 2044.

Economic life

Our understanding is that IPART is seeking advice on the economic life of Eraring Power Station and Vales Point Power Station in order to assess the period over which the power stations are likely to continue to operate. Economic life is generally defined to be the period over which an owner of an asset will derive economic benefit from the use of the asset, and is therefore an important consideration in assessing the period over which the asset is likely to continue to operate.

When modelling the economic life of power stations we define the economic life as the period over which the power station is able to cover its fixed operating and maintenance costs, variable operating and maintenance costs and fuel costs (as well as any variable carbon costs faced by the power station). This definition of economic life does not take into consideration the extent to which a power station recovers any debt related charges (which are not avoidable).
Factors affecting economic life

Factors that affect the revenues earned by a power station, or the avoidable costs faced by a power station, will also affect the economic life of the power station. Some of the key determinants of economic life include:

- **Relative fuel costs.** The lower the fuel costs faced by a power station, relative to the fuel costs faced by other power stations, the more competitive that power station will be and, other things being equal, the longer the power station's economic life. In the case of Eraring Power Station and Vales Point Power Station, the cost of coal in NSW relative to coal in other states, and the cost of coal relative to gas, are important determinants of the economic lives of the power stations.

- **Relative carbon costs.** The lower the carbon costs faced by a power station, relative to the carbon costs faced by other power stations, the more competitive the power station will be and, other things being equal, the longer the power station's economic life. In the case of Eraring Power Station and Vales Point Power Station, the price of carbon is an important determinant of the economic lives of the power stations: since these coal-fired power stations have higher emissions intensities than gas-fired power stations or renewable power stations, a higher carbon price makes these power stations less competitive.

- **Investment in new power stations.** Investment in new power stations means that existing power stations will need to compete with these newer, more efficient, power stations. Reductions in power station capital costs due to technological improvements, or support for investment in new technologies through schemes like the Large-Scale Renewable Energy Target (LRET), will result in Eraring Power Station and Vales Point Power Station facing greater competition from new power stations.

We have modelled a range of realistic scenarios for each of these key determinants of economic life:

- **Relative fuel costs.** Our modelling of outcomes in the NEM typically makes use of fuel cost forecasts either developed through our own modelling of gas and coal markets or sourced from modelling work for AEMO's National Transmission Network Development Plan (NTNDP). The various fuel price scenarios that we have modelled and that are reported in AEMO's NTNDP documents provide a range of forecasts of future fuel prices. For gas prices, for instance, we have modelled scenarios that have incorporated long-term prices ranging from around $8/GJ to around $14/GJ. For coal prices, we have modelling scenarios that have incorporated long-term prices ranging from below $2/GJ to around $3/GJ.
Carbon costs. Our modelling of outcomes in the NEM has made use of a wide range of carbon price forecasts. We have modelled scenarios with no carbon price, scenarios with a carbon price based on recent low international prices (with starting prices of around $5/tonne to $10/tonne and long-term prices that remain below $30/tonne) and scenarios based on forecasts of the carbon price that would occur in the event of strong international action on carbon prices (including scenarios with long-term prices in excess of $100/tonne).

Investment in new power stations. Our modelling of outcomes in the NEM typically makes use of capital costs and operating costs either developed through our own analysis and forecasting of these costs or sourced from forecasts developed for AEMO's NTNDP. This provides a range of different estimates of the relative economics of continuing to maintain existing power stations or investing in new power stations.

Given the range of realistic future outcomes for these relative costs over the long term, as well as uncertainty about other factors that affect the economic lives of power stations, there is also uncertainty about the exact economic lives of Eraring Power Station and Vales Point Power Station. Nevertheless, it is possible to draw some general conclusions about the economic lives of these power stations.

Our view on the economic lives of Eraring Power Station and Vales Point Power Station

In our view, the greatest uncertainty about the economic lives of Eraring Power Station and Vales Point Power Station is caused by uncertainty about future carbon prices. For this reason, it is useful to think about the economic lives of these power stations under different assumptions about future carbon prices:

Under current law, a carbon pricing mechanism applies to Australia's largest carbon emitters, including power stations. The carbon price faced by power stations under this arrangement is currently a fixed price, but will become a flexible price from 1 July 2015. Once this happens, the carbon price is expected to converge to international carbon prices. These international carbon prices are currently quite low. Our recent modelling of outcomes in the NEM with these low international carbon prices suggests that it is most likely that the economic life of Eraring Power Station would extend beyond 2044 and possible that Vales Point Power Station would extend beyond 2044.

The Government has introduced legislation to repeal the carbon price from 1 July 2014. In the event that this legislation passes, and no other carbon pricing mechanism is introduced, the economics of the operation of Eraring Power Station and Vales Point Power Station will improve. Our recent
modelling of outcomes in the NEM without a carbon price suggests that it is most likely that the economic life of Eraring Power Station would extend beyond 2044 and possible that Vales Point Power Station would extend beyond 2044.

In order for a carbon price to make Eraring Power Station and Vales Point Power Station uneconomic prior to 2044, our modelling suggests that the carbon price would have to be significantly higher than the current international carbon price. Indeed, the carbon price would likely have to be at a level that is consistent with strong international action on carbon emissions (around $50/tonne to $100/tonne, or higher).

We would reiterate that when modelling economic life we consider the period over which the power station is able to cover its fixed operating and maintenance costs, variable operating and maintenance costs and fuel costs (as well as any variable carbon costs faced by the power station). Estimates of the power stations operating and maintenance costs included in our modelling reflect the estimated cost of continuing to maintain the power station for operation in the long-term; some of the fixed operating and maintenance will include the costs of major scheduled maintenance, and might alternatively be characterised as stay-in-business capital expenditure. As long as these costs are recovered, power stations will be able to fund the ongoing operation of the power station.

We also note that there are other combinations of circumstances that could make Eraring Power Station and Vales Point Power Station uneconomic prior to 2044 - such as higher coal prices for these power stations than for other power stations, or rapid reductions in the capital costs of renewable generation technologies. On the whole, however, we consider these combinations of circumstances less likely to occur.