

## Let us assume

***The Australian Government is highlighting the costs of climate action as estimated in a new economic modelling study. The study, by coal industry consultants BAEconomics, is not transparent and relies on unrealistic assumptions. This report is an outlier in the large literature on economic costs of climate policy. It should not be relied on for policy making purposes.***

March 2019

### Where did the report come from?

BAEconomics is a consultancy headed by Brian Fisher. Fisher has consulted to the Minerals Council of Australia and coal companies since leaving a public service career.

It is unclear why the Morrison Government, with the resources of the entire public service at its disposal, is choosing to highlight the work of a consultant to the Minerals Council. It is unclear whether the report has been commissioned by BAEconomics' clients in the coal industry and there is no disclosure in the report.

The study has been reported as having been "peer-reviewed", however it is unclear what the review process consisted of. The report itself thanks a Stanford Professor (John Weyant) but does not credit him for peer-reviewing. This is usually a blind exercise; peer reviewers are not normally known to the author. It is unclear why no Australian economists with backgrounds in climate and energy were asked to review the study. Weyant is being paid US\$650 an hr (AU\$916) as an expert witness for the Trump Administration to support the claim that the transition from fossil fuels is not possible, and to defend the Trump administration's lack of action.<sup>1</sup>

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<sup>1</sup> Parkinson (2019) *Coalition ramps up scare campaign against climate action, renewables*  
[https://reneweconomy.com.au/coalition-ramps-up-scare-campaign-against-climate-action-renewables-42086/?fbclid=IwAR0MMIH0HpsEG63OL-uzI3htWdLttRbr5wIVgMf4H\\_7CefinZW1-lyewc8U](https://reneweconomy.com.au/coalition-ramps-up-scare-campaign-against-climate-action-renewables-42086/?fbclid=IwAR0MMIH0HpsEG63OL-uzI3htWdLttRbr5wIVgMf4H_7CefinZW1-lyewc8U)

## Questionable assumptions

A thorough examination will be carried out in due course, but *prima facie* The Australia Institute has identified the following issues:

- Models like the one used in this exercise are not good at dealing with changing technology. This is particularly problematic in looking at the energy sector where technologies like renewable energy, storage, electric vehicles and demand response are changing rapidly. BAEconomics assume:
  - Fossil fuel electricity generation from existing, aging and unreliable plants are assumed to become more efficient by half a percent per year (when The Australia Institute's Gas & Coal Watch has revealed they only become more efficient at breaking down<sup>2</sup>).
  - "Learning-by-doing gradually reduces" costs for renewables, but this is not reflected in the actual cost reduction rates, and there is no learning for hydro, despite opportunities for development and learning in new forms of pumped hydro.
  - Costs of firming renewable energy of up to \$200 per MWh by 2030 - well above existing government estimates.
- The reference scenario assumes Australia and all other countries take no additional measure to reach their pledged 2020 emission targets which is completely implausible. It is unclear what international action is assumed in the policy scenarios, except scenarios 3 and 6. In these scenarios Fisher assumes action in line with NDCs (Paris pledges). This is also implausible, given the ambition ratchet mechanism in the Paris Agreement.
- The reference scenario assumes Australian thermal coal production grows 0.6% per year to 2030. Australian thermal coal production peaked in 2015 and has not returned to the same level.<sup>3</sup> Assuming the coal industry grows in the base case which then exaggerates the policy impacts in the other scenarios.
- The reference scenario assumes non-combustion emissions from mining, agriculture and some manufacturing improve by 1.5% per year. This has not been the case to date.<sup>4</sup> Overstating the base case emissions reductions in these sectors exaggerates the other scenarios like the policy impacts of 45%.

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<sup>2</sup> The Australia Institute (2018), *Gas & Coal Power Plants: 135 Breakdowns in 2018*  
<http://www.tai.org.au/content/gas-coal-power-plants-135-breakdowns-2018>

<sup>3</sup> Office of Chief Economist (2018) *Resources and Energy Quarterly - December 2018, Historic Data*,  
<https://publications.industry.gov.au/publications/resourcesandenergyquarterlydecember2018/index.html>

<sup>4</sup> Government data shows a long term trend for increasing emissions each of these sectors.

- Labour market assumptions are not properly disclosed. For example, the report finds a scenario incorporating a 14% change in renewable penetration leads to changes of employment of over half a million. This is unusual and should be discussed at length. Places like South Australia have had bigger changes occur and yet have never seen an impact on employment of this magnitude.
- No transparency on gas prices. Gas is a big winner under all BAEconomics scenarios, yet there are few real world proposals for major gas generation investment. This is partly because Australian gas prices are now linked to world prices and also due to other technology looking to outcompete gas in peak price periods and ancillary service markets.
- In the model, “intermittency and integration costs are assumed” to peak at \$200 MWh at 75% variable renewables (VRE). (This is despite the modelling limiting VRE to 50% in the policy scenarios.) Fisher claims these figures come from a report by ITP for ARENA. This report does not show integration costs of up to \$200/MWh (see Figure 1).<sup>5</sup>
  - The ITP report contains one reference to \$200/MWh. This is the maximum cost during limited periods each year when long term storage would be needed. This would be offset by periods of low cost solar and wind power.<sup>6</sup>
  - The report finds *total* costs – generation plus firming requirements – reaching around \$120/MWh LCOE on average even at 100% penetration.<sup>7</sup>
  - Meanwhile, Government owned Snowy Hydro is offering firmed renewable contracts at \$70MWh, and recent CSIRO analysis finds “new-build renewable generation to be least cost, including when we add the cost of two or six hours of energy storage to wind and solar”.<sup>8</sup>

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Department of Environment and Energy (2017) *National Greenhouse Gas Inventory - Kyoto Protocol classifications* <http://ageis.climatechange.gov.au/NGGI.aspx>

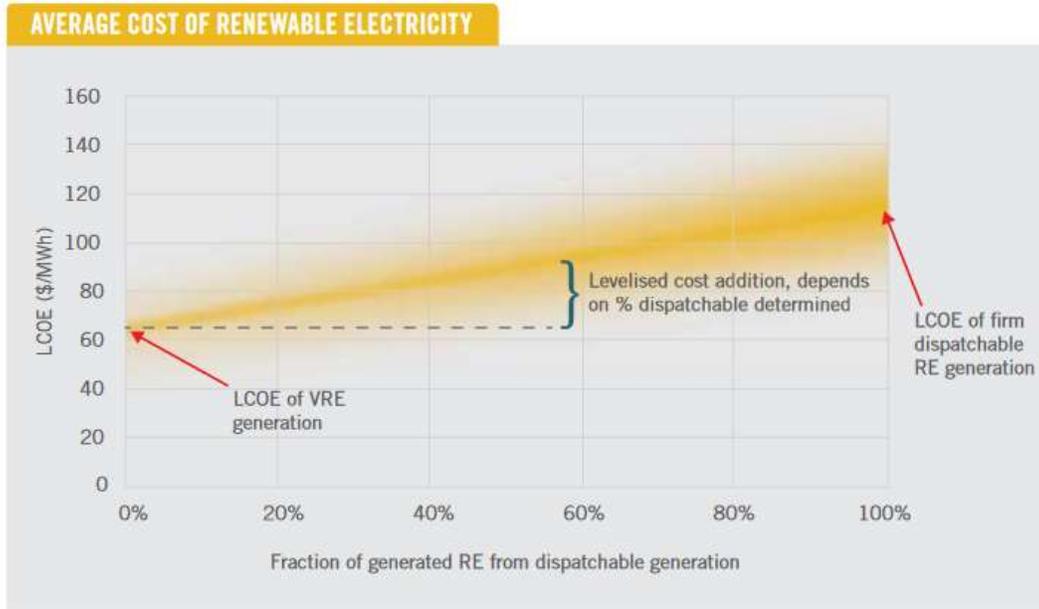
<sup>5</sup> ITP (2018) *Comparison Of Dispatchable Renewable Electricity Options ITP* <https://arena.gov.au/assets/2018/10/Comparison-Of-Dispatchable-Renewable-Electricity-Options-ITP-et-al-for-ARENA-2018.pdf>

<sup>6</sup> ITP (2018) *Comparison Of Dispatchable Renewable Electricity Options ITP* p xv

<sup>7</sup> ITP (2018) *Comparison Of Dispatchable Renewable Electricity Options ITP* p xiii

<sup>8</sup> CSIRO (2018) *Annual update finds renewables are cheapest new-build power* <https://www.csiro.au/en/News/News-releases/2018/Annual-update-finds-renewables-are-cheapest-new-build-power>

**Figure 1: Average cost of renewable electricity (ITP report for ARENA)**



Source: ITP (2018) *Comparison Of Dispatchable Renewable Electricity Options ITP*

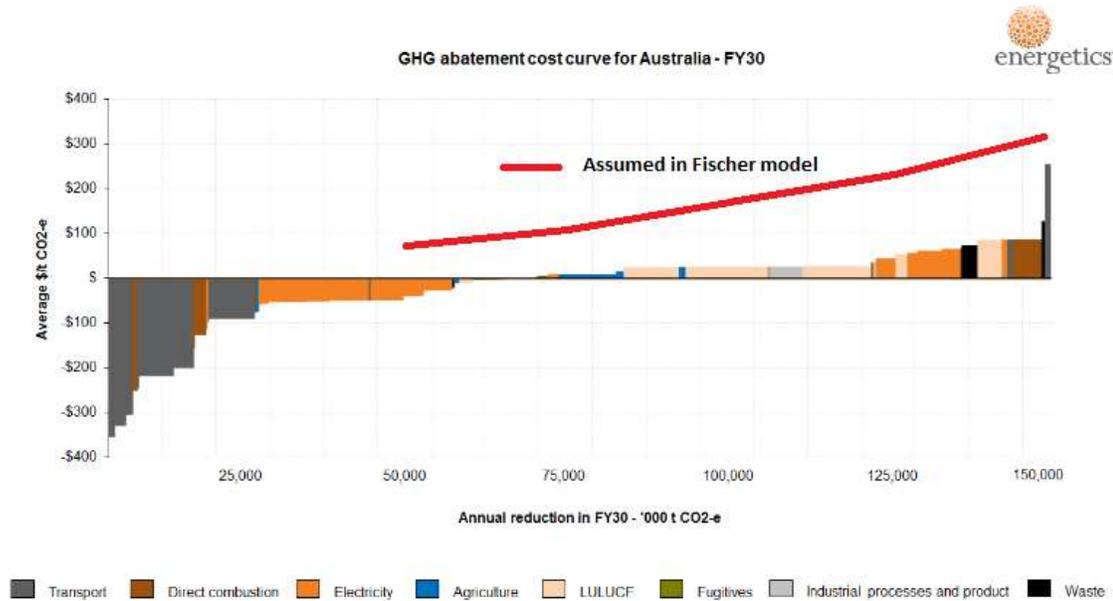
## Marginal abatement costs

The report produces a “marginal abatement cost function” – which reflects its assumptions about the cost of cutting emissions.

The report assumes very high carbon prices are needed for abatement. The report’s abatement costs also ignore ‘negative cost’ abatement – where money is saved by cutting emissions.

A 2016 Energetics report for the Department of Environment stands in stark contrast to Fisher’s study.

**Figure 2 – Energetics 2016 abatement cost curve vs Fisher 2019**



Source: Energetics (2016) *Modelling and analysis of Australia's abatement opportunities - Report to the Department of the Environment*, Fisher (2019) *Economic consequences of alternative Australian climate policy approaches*

Energetics found large negative cost abatement opportunities of around 70 million tonnes of CO<sub>2</sub>e out to 2030, mostly in the transport sector. This is ignored in Fisher's curve. Energetics finds a further 50 million tonnes of CO<sub>2</sub>e abatement at around \$25/tonne and another 30 million tonnes at less than \$100/tonne.<sup>9</sup>

## Out of step with other studies

Other studies show that BAEconomics' report is an outlier. There is a large literature on the cost and benefits of action on climate change, generally showing that strong action on climate change can be achieved at a modest cost, while the benefits of avoided climate change are substantial.

In 2016, modelling by consultants Jacobs and Victoria University for the Government's Climate Change Authority found policies to drive decarbonisation in the electricity

<sup>9</sup> Energetics (2016) *Modelling and analysis of Australia's abatement opportunities - Report to the Department of the Environment* <https://www.environment.gov.au/system/files/resources/b8540c8a-8a31-4aba-a8b5-63cc46466e33/files/modelling-and-analysis-australias-2030-abatement-opportunities.pdf>

Fisher (2019) *Economic consequences of alternative Australian climate policy approaches* <http://www.baeconomics.com.au/wp-content/uploads/2019/03/Climate-Policy-Report-14March19.pdf>

sector, in line with a 2C goal, would still see economic growth of 2.8% a year – 0.1 percentage points lower than the growth rate in BAEconomics’ reference case<sup>10</sup>.

In 2015, DFAT commissioned well-known Australian economist Warwick McKibbin to look at the impact of different levels of climate policy ambition. It found a 26% reduction target would see annual GDP growth go from 2.21% to 2.14%, while a 45% reduction target would see GDP growth of 2.09%.<sup>11</sup> This was assuming high technology costs – impacts were even smaller without this assumption.

In 2014, ANU and Climate Works looked at ‘deep decarbonisation’, halving emissions by 2030 and 82% reductions by 2050.<sup>12</sup> It found GDP growth would go from 2.6% a year to 2.46% a year, from 2020 to 2030.

Fisher report’s contains a section titled ‘literature review’. This section cites reports with dramatically different results to Fisher’s own results. For example:

“Vandyck et al. (2016) ... use a global model coupled with a partial equilibrium energy system model to examine the impacts of both the Paris Agreement and a more ambitious 2°C scenario. They find that global GDP losses under both scenarios are small”<sup>13</sup>

The Vandyck et al report gives results for Australia specifically. In the “more ambitious 2°C scenario”, Australia experiences a 0.25% change in GDP in 2030, compared with the reference case.<sup>14</sup> BAEconomics provide no direct comparison with this result and no explanation as to why their conclusion appears to be so different.

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<sup>10</sup> Note – the reference case assumes Australia and other countries take no additional measure to reach their pledged 2020 emission targets (p7) which is completely implausible.

<sup>11</sup> McKibbin Software Group (2015) *Report 2: 2015 Economic Modelling Of Australian Action Under A New Global Climate Change Agreement* p23

<sup>12</sup> ANU and Climate Works (2014)

[https://www.climateworksaustralia.org/sites/default/files/documents/publications/climateworks\\_pdd\\_2050\\_technicalreport\\_20140923.pdf](https://www.climateworksaustralia.org/sites/default/files/documents/publications/climateworks_pdd_2050_technicalreport_20140923.pdf) p14, p144, p165

<sup>13</sup> Fisher (2019) *Economic consequences of alternative Australian climate policy approaches* <http://www.baeconomics.com.au/wp-content/uploads/2019/03/Climate-Policy-Report-14March19.pdf> p2

<sup>14</sup> Vandyck et al (2016) *A global stocktake of the Paris pledges: Implications for energy systems and economy* in *Global Environmental Change* <https://www.sciencedirect.com/science/article/pii/S095937801630142X> p54

## Ignores the benefits of avoiding climate change

The Fisher report ignores all climate damages. It focuses on the costs without considering the benefits.

Yet Fisher's 'literature review' cites a recent major study that finds "benefits of compliance with Paris [at] around US\$17,489 billion per year in the long run (year 2100)."<sup>15</sup> This report finds long run GDP impacts of 0.64% each year in the 2C scenario, and long run GDP impacts of 1.59% each year in the 4°C scenario – more closely reflecting current emissions trajectories.

A recent study for the Brookings Institute (co-authored by Warwick McKibbin) found co-benefits for Australia significantly offset the costs:

if we account for the monetized climate and domestic co-benefits of emissions reductions, those countries, including Australia, are worse off if they unilaterally withdraw from the Paris Agreement than if they participate. Thus, although we find there are gross costs to participating, doing so generates net benefits for the individual country participants.<sup>16</sup>

## Criticised by others

The report has already been roundly criticised by some of Australia's leading climate economists. It is unclear why this report was not reviewed in Australia, where local economists are best placed to assess the credibility of local assumptions.

The ANU's Frank Jotzo said

"Brian Fisher's "modelling" of emissions targets uses absurd cost assumptions. An abatement cost curve like this would have looked very high 20 years ago, now it's simply ridiculous."<sup>17</sup>

Warwick McKibbin rejected comments that Fisher's results line up with his:

"The results for GDP and wages for the 26% target line up BUT the carbon price (not reported when I commented) is way too high. We did not examine the

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<sup>15</sup> Kompas et al (2018) *The Effects of Climate Change on GDP by Country and the Global Economic Gains From Complying With the Paris Climate Accord*

<https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2018EF000922>

<sup>16</sup> Liu et al (2019) *Global Economic And Environmental Outcomes Of The Paris Agreement*

[https://www.brookings.edu/wp-content/uploads/2019/01/ES\\_20190107\\_Paris-Agreement.pdf](https://www.brookings.edu/wp-content/uploads/2019/01/ES_20190107_Paris-Agreement.pdf) page 3

<sup>17</sup> <https://twitter.com/frankjotzo/status/1107742351139602432>

Labor policy but our 2015 report examined a 45% target and they [GDP impacts] are a factor of 10 less than Fisher"<sup>18</sup>

## Conclusion

The BAEconomics report presents results that are out of step with similar studies. It is not transparent around key assumptions and many assumptions that are discussed are flawed. Its results have been rejected by prominent academic and commercial economists. Coming from a regular consultant to the coal industry, it is difficult to see this report as anything more than another shot from big polluters and their representatives in Australia's ongoing climate policy war.

If Minister Taylor was committed to having a "serious and credible" discussion around climate policies, as he told Radio National Breakfast on 19 March, then he would be much better served with the advice of his own department rather than this flawed study from the coal consultants at BAEconomics.

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<sup>18</sup> <https://twitter.com/WarwickMcKibbin/status/1107760678096515073>