Economic consequences of Labor's Climate Change Action Plan

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Abstract

The Australian Federal election has been called for 18 May 2019. A key differentiator between the two major political parties is their announced approach to climate and energy policy.

The incumbent Coalition government will seek to honour its Paris Agreement commitment of 26-28 per cent emissions reduction by 2030 relative to 2005 levels, primarily through direct action via an extended Emissions Reduction Fund.

The Labor Opposition has committed to reduce Australia's emissions by 45 per cent by 2030 compared to 2005 levels, and to reach net zero emissions by 2050. Labor recently released a Climate Change Action Plan laying out its proposed policies on climate and energy. This paper extends the previous analysis undertaken by BAEconomics, 'Economic consequences of alternative Australian climate policy approaches', to examine the domestic economic impacts of Labor's newly announced climate policy proposal. Results across the two papers are directly comparable.

Using the BAEGEM Computable General Equilibrium Model, cumulative GNP losses associated with Labor's Climate Change Action Plan are estimated at between A$264 billion and A$542 billion by 2030, depending on the level of access to international permit trading allowed under the policy.

The paper also examines the projected outcomes under the Plan with respect to the carbon price, the wholesale electricity price, sectoral output, wages and employment at the national level. The electricity sector bears a disproportionate burden under all scenarios assessed in response to the combined effects of the abatement target and the renewable energy target. Sectoral output declines across the board except where protections for emissions intensive trade exposed industries are applied. Jobs growth and growth in real wages are less than they otherwise would have been under all policy scenarios, with better outcomes arising from unrestricted trade in international permits.

Allowing a minimum 50 per cent of the abatement task to come from internationally traded permits is shown to greatly reduce the negative economic consequences of Labor's Climate Change Action Plan, with unrestricted access to international permits providing some additional benefits.

Keywords: Labor climate policy, baseline and credit, economic consequences, policy flexibility, permit trading

1. Introduction

The Australian Labor Party accepts Australia's commitment under the Paris Agreement to keep global warming to well below 2 degrees above pre-industrial levels but believes that to achieve Australia's share of this commitment, domestic emissions should be reduced by 45 per cent on 2005 levels by 2030. This reduction goes well beyond the pledge the current government has made to decrease Australia's emissions by 26-28 per cent by 2030.

Under the Climate Change Action Plan, Labor proposes several key policy initiatives to reduce emissions, including:

- Adopting a 50 per cent renewable electricity target by 2030, supported through extending funding of $10 billion to the Clean Energy Finance Corporation (CEFC), creating a $5 billion independent Energy Security and Modernisation Fund, and encouraging the uptake of household solar and batteries;

- Extending the Safeguard Mechanism to cap industrial pollution from facilities emitting more than 25,000t of CO_2e per year, such that total emissions from this source will be reduced by 45 per cent relative to 2005. Facilities covered by this scheme will be allowed to sell permits if their actual emissions fall below established baselines, and to purchase offsets from international sources, the domestic electricity sector, or the Carbon Farming Initiative should their emissions exceed allocated baselines. Emission Intensive Trade Exposed Industries (EITEs) will be shielded from the scheme to maintain international competitiveness;

- Extending the land offset market by strengthening the Carbon Farming Initiative and reviewing land clearing regulations;

- Setting a national electric vehicle target of 50 per cent of new cars by 2030, electrifying the national road network and introducing vehicle emission standards; and

- Driving increased energy efficiency to reduce emissions, cut costs and raise competitiveness.

Labor has also stated that it will not allow the use of the so-called Kyoto carryover toward meeting its emission reduction targets.

2. Methodology

The Computable General Equilibrium Model, BAEGEM, is used to estimate the economic outcomes of Labor's suite of climate policy initiatives. A full description of the BAEGEM model together with the results from previous modelling is provided in Fisher (2019).[1]

Following the methodology used in Fisher (2019) an identical reference case has been adopted in the present paper to enable direct comparison of the results from the earlier analysis with the simulations reported here. The reference case assumes that current climate change mitigation policies continue to 2030 with no new international agreement on mitigation targets from 2020. Prior to 2020, developed countries including Australia implement measures to reach their pledged 2020 emission targets. Developing countries continue their existing mitigation policies but do not aim to meet specific emission reduction targets.

1 Fisher, B.S. 2019. Economic consequences of alternative Australian climate policy approaches, BAEconomics Report, Canberra, March, http://www.baeconomics.com.au/wp-content/uploads/2019/03/Climate-Policy-Report-14March19.pdf.

3. Policy scenarios

Extending the earlier analysis, this paper examines several additional emissions reduction scenarios in line with Labor's recently announced climate policy.

In scenarios 1-4, it is assumed that domestic emissions are reduced by 45 per cent by 2030 compared to 2005 and fall to net zero emissions by 2050. Under each of these scenarios, a baseline and credit scheme is implemented, and a renewable energy target of 50 per cent by 2030 is adopted. The scenarios vary by way of the level of access to international permit trading allowed in meeting the emission reduction goal, and also with respect to the shielding of emissions intensive trade exposed sectors (EITEs).

Scenario 1 examines the economic impacts associated with the emissions and renewable energy targets where it is assumed that up to 25 per cent of the emissions target can be met on average over the decade by the purchase of permits from overseas at the world permit price. In scenario 2 it is assumed that 50 per cent of the abatement task can be met using international permits. In scenario 3 it is assumed that there is no restriction on international permit trade and as a consequence the international and domestic carbon prices approximately equilibrate given that Australia is a small player in the overall global carbon market.

The emissions trading scheme modelled in this paper is efficient in the sense that emitters are allowed to buy and sell permits to ensure that the marginal tonne of abatement is undertaken at the lowest possible cost in the domestic economy and that, subject to the restriction on purchasing overseas permits, permits generated in other countries can be used in Australia if it is cheaper to do so. To calculate the world permit price, it is assumed that all countries with NDCs under the Paris Agreement fully meet those commitments by the years specified in their individual NDCs. Further, it is assumed that the United States reaches its NDC whether or not it remains a member of the Paris Agreement. In all scenarios it is assumed that domestic permit trading, including with the electricity and agriculture sectors, is allowed with no restrictions.

These scenarios are intended to provide context to the potential implications of international permit trading for contributing to an emissions target, versus attempts to meet the target solely within Australia's borders. The simulations reflect any trade effects resulting from Australia and other countries meeting their respective Paris commitments together.

In addition to ratcheting the allowance for international permit trading, scenarios 1-3 assume Australia protects its EITEs. Shielding of EITEs is intended to limit the impacts of the baseline and credit scheme on the competitiveness of industries that are heavily export-oriented, particularly where international competitors are not subject to similar climate policies. Assumptions regarding the level of EITE shielding at 2020 are stated in Table 2. It is assumed that protection levels fall at a rate of 1.3 per cent to 2030, with the exception of the agricultural sector which remains indefinitely fully protected. At this stage, it is unclear from the current policy proposal if or how the agriculture sector will be shielded from the proposed ban on land clearing or electricity price increases related to other elements of the Climate Change Action Plan. It should also be noted that the assumed levels of EITE shielding are only indicative and if such a scheme were to be introduced in the future the levels of protection will be subject to negotiation.

Scenario 4 models the same levels of ambition on emissions reduction and the renewable energy target and allows 25 per cent of the abatement target to be met through purchase of international permits, but removes all shielding of EITEs. The characteristics of each of the policy scenarios are summarised in Table 1.

Table 1: Policy scenarios assumption summary

SCENARIO	ASSUMPTIONS
Reference case	Without new policy beyond 2020 and Australian emissions calibrated to 2018 DEE projections
Scenario 1:	-45% on 2005 by 2030; 50% renewables; 25% international permit trading; EITE shielding
Scenario 2:	-45% on 2005 by 2030; 50% renewables; 50% international permit trading; EITE shielding
Scenario 3:	-45% on 2005 by 2030; 50% renewables; no restriction on international permit trading; EITE shielding
Scenario 4:	-45% on 2005 by 2030; 50% renewables; 25% international permit trading; No EITE shielding

Table 2: EITE shielding assumptions

SECTOR	2020 PROTECTION LEVEL
Gas incl LNG	33%
Textiles, wood, paper, printing	33%
Coal and petroleum products	94.5%
Chemicals, rubber, plastics	66%
Non metallic mineral products	66%
Iron and steel	94.5%
Alumina and aluminium	94.5%
Other metals	80%
Agriculture	100%

4. Results

In this section the results of the BAEGEM modelling are described with a focus on emissions pathways, carbon prices, GDP, GNP, the electricity market, sectoral output changes, real wages and employment effects associated with each of the policy scenarios described above, relative to the reference case at 2030. All prices are in A$2016 unless otherwise stated.

4.1 Emissions reductions

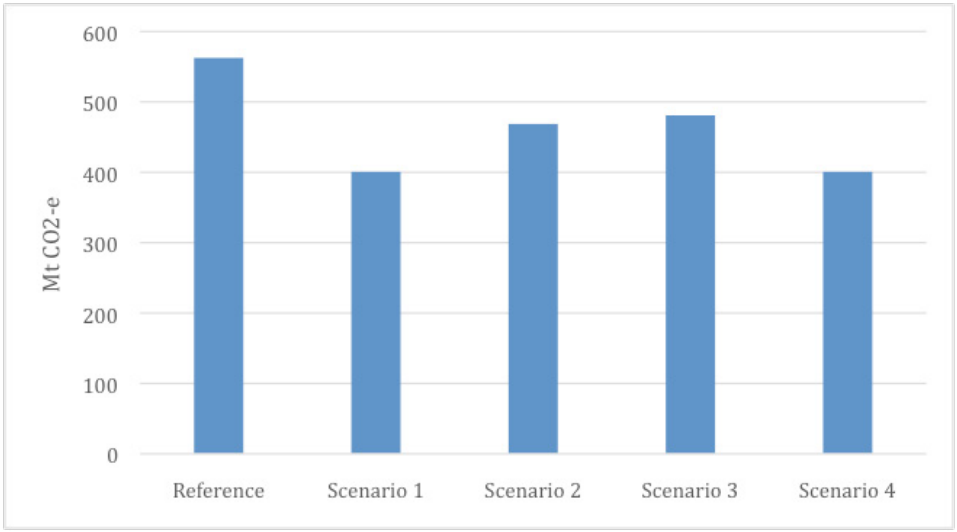
Reference case emissions for Australia are projected to reach 563Mt CO_2e by 2030. To achieve a 45 per cent emissions reduction off 2005 levels by 2030, Australia's net emissions must drop to 333Mt CO_2e by 2030.

The highest level of domestic abatement for the scenarios modelled will occur where the cap on international permits is tightest. That is, Australia's 2030 emissions will be limited to 401 Mt CO_2e under scenario 1, with an additional 68 Mt CO_2e of the abatement task met using international emissions permits. By contrast, domestic emissions are expected to be 481 Mt CO_2e in 2030 if unlimited international permit trading is allowed, and 468 Mt CO_2e if a 50 per cent cap on international permits applies (Figure 1).

Domestic emissions reductions come primarily from the electricity sector, followed by fugitive, combustion and transport emissions. Agricultural, LULUCF and waste emissions vary only marginally between policy scenarios. This reflects the exemption of agriculture from Labor's climate policy and the limited capacity of the waste sector to meaningfully reduce emissions given its small size. While LULUCF contributes to mitigation under all policy scenarios, the sector is limited as to the amount of sequestration it can provide in the short timeframe to 2030, particularly without having a negative impact on agricultural land availability. Industrial emissions decline according to the level of restriction on international permits. However, the results reflect a higher degree of difficulty in structural adjustment in this sector.

The baseline and credit scheme that forms part of Labor's announced policy is a type of emissions trading scheme and hence will result in an explicit carbon price. This price is the result of a restriction being placed on the amount of emissions that can be produced in a given timeframe and is a function of the cost and availability of abatement options. Access to international permits will invariably reduce the cost of abatement, by opening the market to a wider range of global abatement opportunities at a lower marginal cost.

Figure 1: Australia's domestic greenhouse gas emissions, reference case and policy scenarios



Results indicate that the carbon price can be reduced from $405/t CO2e to $67/t CO_2e in 2030 by increasing access to trade in international emissions permits from 25 per cent to unrestricted access (Table 2). This analysis also shows that the cost of EITE shielding in conjunction with a 25 per cent cap on international permits is around $89/t CO2e or almost 30 per cent higher than a scenario in which trade exposed industries are not protected.

Table 2: Carbon price, $A/t CO_2e in 2030

Year	Scenario 1 25% trade, EITE	Scenario 2 50% trade, EITE	Scenario 3 100% trade, EITE	Scenario 4 25% trade, no EITE
Carbon price	405	99	67	316

4.2 Gross Domestic Product

In concert with the earlier findings on the economic consequences of alternative Australian climate policies (Fisher 2019), each of the scenarios modelled here produce a negative effect on GDP relative to the reference case at 2030.

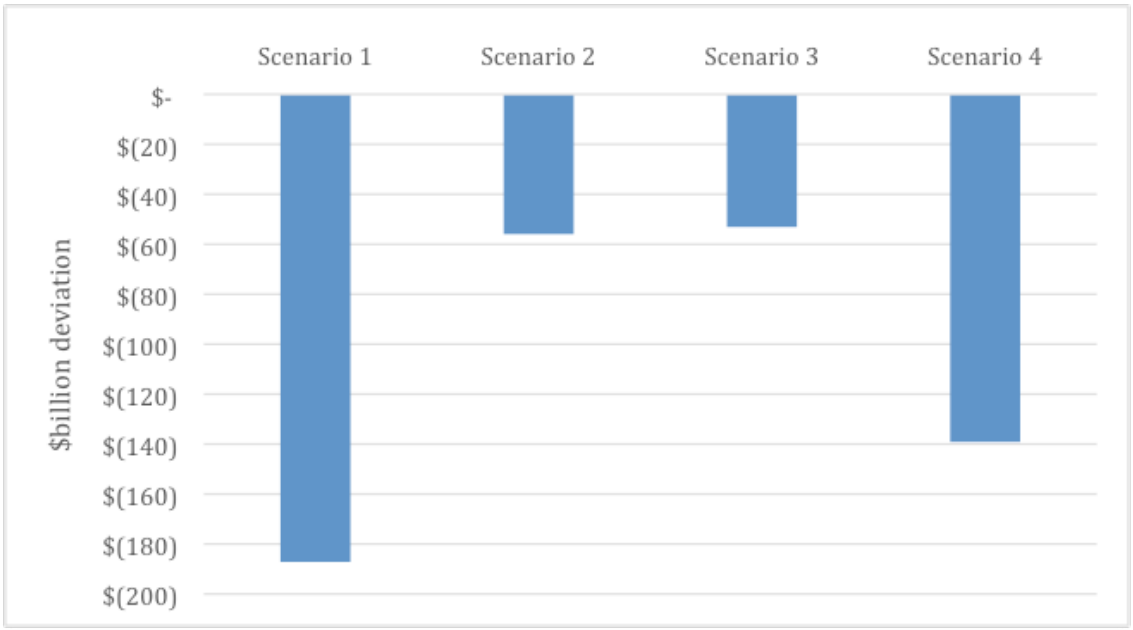
It is important to note however that no attempt has been made here to model the economic effects of physical climate change itself. The current exercise is intended to highlight the baseline economic effects of different policy choices with respect to access to international emissions permit trading and shielding of EITEs. The complex issue of how physical climate change outcomes might affect domestic economic activity in the future is beyond the scope of this paper.

The clear finding across the scenarios modelled is that the negative economic consequences of adopting stringent emissions reductions can be substantially ameliorated through greater trade in international permits. Figure 2 indicates that achieving Labor's 45 per cent emission reduction target alongside a 50 per cent renewable energy target by 2030, with protection for EITEs and only one-quarter of abatement supplied through international permit trading, would cost Australia over $187 billion in GDP in 2030 relative to a reference case where no policy changes occur. This impost on economic growth can be mitigated to $53 billion under a scenario with open access to international permits. Scenario 2, in which Australia can purchase up to 50 per cent of its emissions reductions from overseas sources, results in an economic loss of $56 billion in 2030.

Naturally, any abatement scheme utilising internationally traded emissions permits would need to be carefully designed and overseen by an independent body. An emission permit retains real value only if the emissions to which it pertains can be independently measured, monitored and verified. The government would need to ensure that all imported and domestically traded emissions permits adhered to a rigorous common standard.

Under scenario 4, which differs from scenario 1 only by the protection of EITEs, GDP falls $140 billion relative to the reference case scenario in 2030. Comparing these scenarios provides an estimate of the GDP benefit accruing from EITE shielding – approximately $47 billion in 2030.

Figure 2: Real GDP deviation from the reference case, 2030



4.3 Gross National Product

The projected net present value (NPV) of the loss of GNP over the decade from 2021-2030, relative to the reference case, ranges from $542 billion (scenario 1) to $264 billion (scenario 3) under the modelled scenarios (see Table 3). Consistent with the projected impacts on GDP, the results suggest that the more policy flexibility that is allowed, the lower the GNP impacts.

Table 3: NPV* of cumulative real GNP loss from 2021-2030, relative to the reference case

Year	Scenario 1 25% trade, EITE	Scenario 2 50% trade, EITE	Scenario 3 Unrestricted trade, EITE	Scenario 4 25% trade, no EITE
Real GNP ($b)	-542	-276	-264	-496

*Applied with a social discount rate of 2.6 per cent a year

4.4 Electricity market

Australian electricity generation is projected to grow around 1.6 per cent a year from 2021 to 2030 in the reference case, reaching 300 TWh by 2030. Total electricity consumption is lower than reference case levels under each of the policy scenarios modelled. The constraint on emissions via a baseline and credit scheme produces a carbon price which adds to the cost of production, restricts economic activity, and thereby lowers total energy use.

Within aggregate energy consumption however, the scenarios drive very different outcomes for the electricity fuel mix. In the reference case, coal comprises 40 per cent of the generation mix. In the most restrictive of the policy scenarios (scenario 1), coal contributes just 16 per cent to the fuel mix in 2030.

While protecting EITEs results in coal retaining a similar share in the fuel mix (scenario 4), the effect of allowing international permit trading results in less deviation from the reference case, with coal retaining 25-27 per cent of the mix depending on whether the international tradable permit cap is set at 50 per cent or trading is unrestricted respectively.

Unsurprisingly, the role of gas in the fuel mix moves inversely with coal. As coal exits the system, gas and renewables replace it. Since there is a 50 per cent floor on the renewables share (including hydro power) in alignment with Labor's announced policy, the share of gas may be expected to fluctuate inversely with the contribution from coal.

Shielding of domestic emissions intensive trade exposed industries has a limited effect on the domestic electricity fuel mix, as evidenced by comparing results across scenarios 1 and 4.

Table 4: Electricity generation mix in 2030, Australia (%)

	Reference	Scenario 1 25% trade, EITE	Scenario 2 50% trade, EITE	Scenario 3 Unrestricted trade, EITE	Scenario 4 25% trade, no EITE
Coal	40	16	25	27	18
Gas	23	33	21	18	30
Renewables	36	50	52	53	51
Other	1	1	2	2	1
Total	100	100	100	100	100

The wholesale electricity price in Australia is projected to increase from $69/MWh in 2016 to around $81/MWh by 2030 in the reference case. This represents an increase of about 1.5 per cent a year in real terms. For comparison, the GSP weighted average wholesale price in the National Electricity Market (NEM) from 2005-2016 rose about 3.2 per cent a year in nominal terms. The low growth in the wholesale electricity price throughout the projection period reflects the low LCOE of the existing generation capacity with limited further depreciation value and the rising competition from renewable energy.

Each of the policy scenarios considered here results in a far greater growth rate in electricity prices. The higher the carbon price associated with a given policy formulation over the projection period, the faster the transition away from fossil-based generation will be. If existing coal and gas generation exit the system before the end of their effective lives and are replaced with new renewable electricity generation technologies, the cost of wholesale electricity will rise earlier in the projection period, particularly as additional intermittency costs are factored in.

By 2030, Australian wholesale electricity prices are projected to increase by 36 per cent if no limits are placed on the level of international emissions permits contributing to the abatement target (scenario 3), and by as much as 67 per cent where only a quarter of the abatement task can be met using overseas permits (scenario 1). Hence the chosen level of international emission permit trading is projected to have the capacity to roughly halve the electricity price effects of Labor's climate policy on Australian households and businesses.

By contrast, the effect of EITE protection has little impact on the wholesale electricity price (scenario 1 versus 4), reflecting that the electricity sector would not benefit from this protection and hence the electricity fuel mix and cost base are expected to be very similar under the two scenarios. However, shielding of EITE industries does affect overall costs and their distribution, with protection of trade exposed industries shifting greater cost onto non-protected industries and households.

Table 5: Impacts on wholesale electricity price in Australia in 2030, $/MWh

	Reference	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Wholesale electricity price ($/MWh)	81	135	113	110	128

Electricity sector outcomes, and particularly the wholesale electricity price, hold significant weight with respect to flow-on to other sectors. Since many sectors are electricity intensive, rising prices directly affect the output of a range of industries, and consequently employment and wages.

4.5 Sectoral output

The sectoral output effects of the policy scenarios are presented in Table 6. Results are presented as percentage deviations in output by sector relative to the 2030 projected reference case levels.

Under the reference case, Australia's mining sector is projected to grow to 2030. Thermal coal production is projected to increase by around 0.6 per cent a year from 2021 to 2030 which represents a lower growth rate than that experienced in the past decade. Gas is projected to grow after 2020 but the growth rate will slow. Oil production is projected to remain flat to 2030.

The imposition of a carbon constraint curtails the output of all sectors involved in producing fossil fuels. It also reduces the growth of intensive users of fossil energy and/or electricity, and those sectors that are indirectly affected by lower investment in emissions intensive trade exposed industries. Since electricity market results are discussed above, this section focusses on the output results for other sectors.

As expected, thermal coal is the hardest hit sector under all scenarios modelled in BAEGEM, particularly since large scale carbon capture and storage is assumed to be non-commercial over the next decade. Thermal coal output is reduced more than 50 per cent under scenario 1, reflecting high demand on the domestic economy to transition away from fossil fuels. If the market is opened to a higher proportion of overseas emissions permits, the effects on domestic

thermal coal output are substantially reduced. However, the greatest benefit to thermal coal arises from a movement from 25 per cent to 50 per cent international permit trading. Increasing the quota of international permits from a 50 per cent cap to an unrestricted contribution has a far less marked effect on the sector.

While the carbon prices under scenarios 2 and 3 differ significantly, the variation in thermal coal output between the two scenarios is only marginal. This is because while thermal coal plays an important role in emissions reduction and does much of the heavy lifting on abatement under scenarios 1 and 2, its marginal abatement curve rises steeply as the carbon price increases. Hence, international permits and other sectors contribute a growing share of abatement as the carbon price rises under scenario 3. However, even where unlimited access to international permit trading is allowed, thermal coal output falls by 25 per cent, relative to what it would have been under the 2030 reference case.

Table 6: Industry output projections, percentage deviation from reference case, 2030

	Scenario 1 25% trade, EITE	Scenario 2 50% trade, EITE	Scenario 3 Unrestricted trade, EITE	Scenario 4 25% trade, no EITE
Crops	1.2	0.8	0.7	-2.6
Livestock	1.4	-1.3	-1.3	-2.7
Forestry	3.0	-1.3	-1.5	-1.7
Fishing	0.4	-0.8	-0.8	-8.4
Thermal Coal	-52.1	-28.1	-24.6	-43.6
Metallurgical Coal	-19.1	-6.0	-4.4	-12.9
Oil and Gas	-2.6	1.0	0.8	-1.6
Oil refinery	-17.0	-4.0	-2.7	-16.5
Iron Ore	3.5	-0.2	-0.4	3.6
Other mining	-5.8	-2.3	-2.1	-12.7
Food processing	-2.7	-2.0	-1.8	-3.1
Chemicals, rubber and plastic	-10.6	1.3	2.1	-15.2
Manufactures non-metallic mining products	-7.1	-1.5	-1.1	-9.0
Other manufactures	-7.4	-1.9	-1.9	-4.4
Iron and Steel	-5.9	2.0	2.2	-10.6
Non-ferrous metal	-12.9	-2.3	-2.0	-36.3
Electricity	-13.0	-7.1	-6.5	-13.6
Construction	-7.2	-2.3	-2.1	-5.6
Land Transport	-11.3	-2.8	-2.1	-8.9
Water and Air Transport	-8.0	-2.5	-1.8	-6.4
Services	-4.9	-2.1	-2.1	-3.6

*Other mining includes mining services

The impacts of the policy scenarios on oil and gas are small compared with thermal coal. This is because substitution between coal and gas offsets the negative impacts brought about by emissions reductions under all scenarios. Policy flexibility by way of tradable international permits further limits any negative effects from the policy, as does removal of EITE shielding.

Other sectors substantially affected by the introduction of this policy include metallurgical coal, oil refining, non-ferrous metals, and chemicals, rubber and plastic. In scenarios 1-3, these sectors are negatively affected because they either directly or indirectly use fossil fuels and/or electricity intensively in their production processes, and more so relative to other sectors. These declines in sectoral output are ameliorated by policy flexibility on international permit trading, since greater access to the international market effectively lowers the amount of abatement that must be undertaken domestically and hence reduces the adjustment needed from domestic activity.

Where trade exposed emissions intensive industries receive no protection and emitters can purchase only 25 per cent of permits from international sources (scenario 4), greater output reductions are projected in primary production including cropping, livestock, and fishing. Clearly, when these sectors are shielded from the impacts of climate policy, they will perform better relative to the case with no protection. Sectors that are negatively affected under scenario 1 remain so under scenario 4, but to a lesser extent because the removal of EITE protection reduces the abatement burden on non-protected industries. Primary production increases under scenario 1 because limits to tradable international permits make domestic permits more attractive, and these sectors are key contributors to the Carbon Farming Initiative.

The transport sector in aggregate, and particularly land-based transport, undergoes not only downward adjustment to its output relative to the reference case, but also significant structural change. The share of hybrid and electric vehicles must increase substantially while the share of internal combustion vehicles must correspondingly decline. This aligns with Labor's target that 50 per cent of new vehicles must be electric by 2030. Under scenario 1, this represents thirteen per cent of the total vehicle fleet and reflects strong uptake relative to the 4 per cent EV share under the reference case at 2030. Substantial investment in infrastructure would be needed to support such a shift.

4.6 Employment and wages

The labour market in BAEGEM is assumed to be neither fully flexible nor fully sticky, with the adjustment in real wages and employment bounded by the adjustment in real GDP in percentage terms. Actual labour market outcomes will be a function not only of the policies examined here but also labour market policies. The results reported here attempt to isolate the labour market effects associated only with the climate policy under consideration.

Real wages in Australia are projected to increase by 1.95 per cent a year during the next decade under the reference case. In all modelled policy scenarios, falling sector output leads to falling employment and real wages compared with what otherwise would have occurred (Figures 3 and 4). The lower the allowable quota on international permits, the greater the decline in employment and real wages by 2030.

Protection of EITEs produces a more nuanced result. While real wages fall by over 8 per cent in scenario 4 relative to what they otherwise would have been, which is less than the 10 per cent decline under scenario 1, the reduction in full time equivalent jobs is in fact worse under scenario 4 than scenario 1.

Under scenario 4, no protection of EITEs occurs and hence these industries must undergo significant productivity transformations to remain internationally competitive. This process results in higher job losses as workers are laid off than under scenario 1 where EITE industries are offered protection from the impacts of climate policy. As such, wages must adjust to a greater extent under scenario 1 than under scenario 4.

Figure 3: Australia's real wage relative to the reference case, 2030

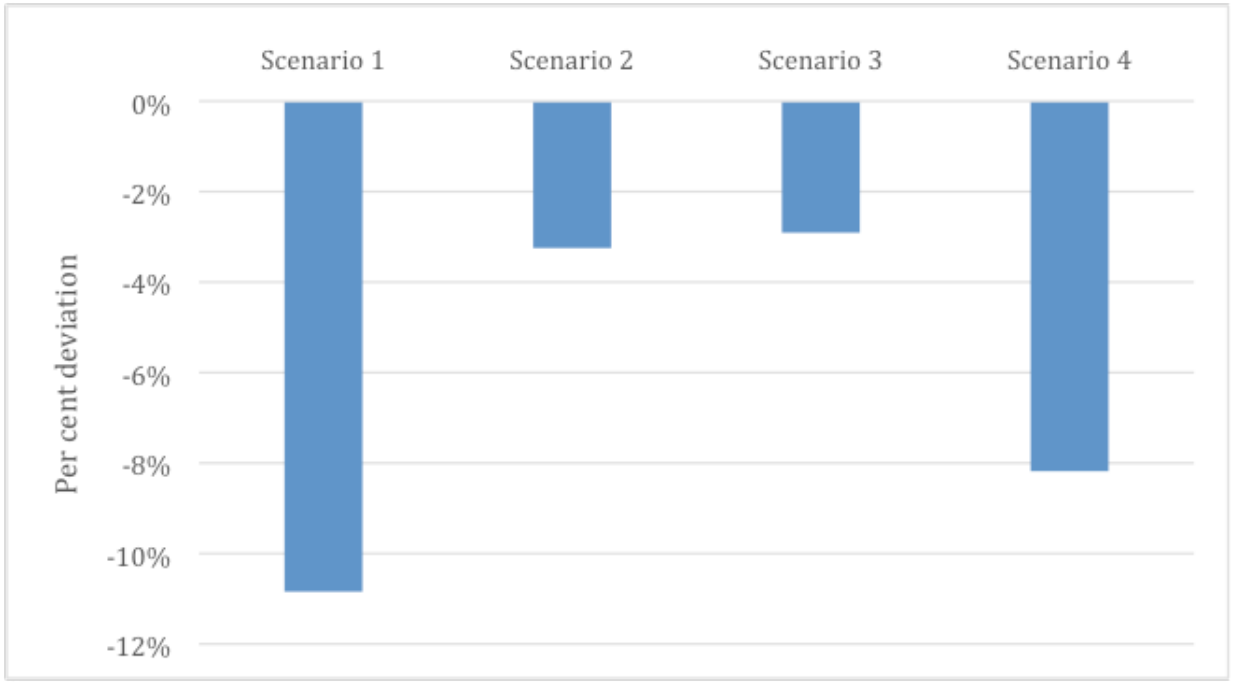
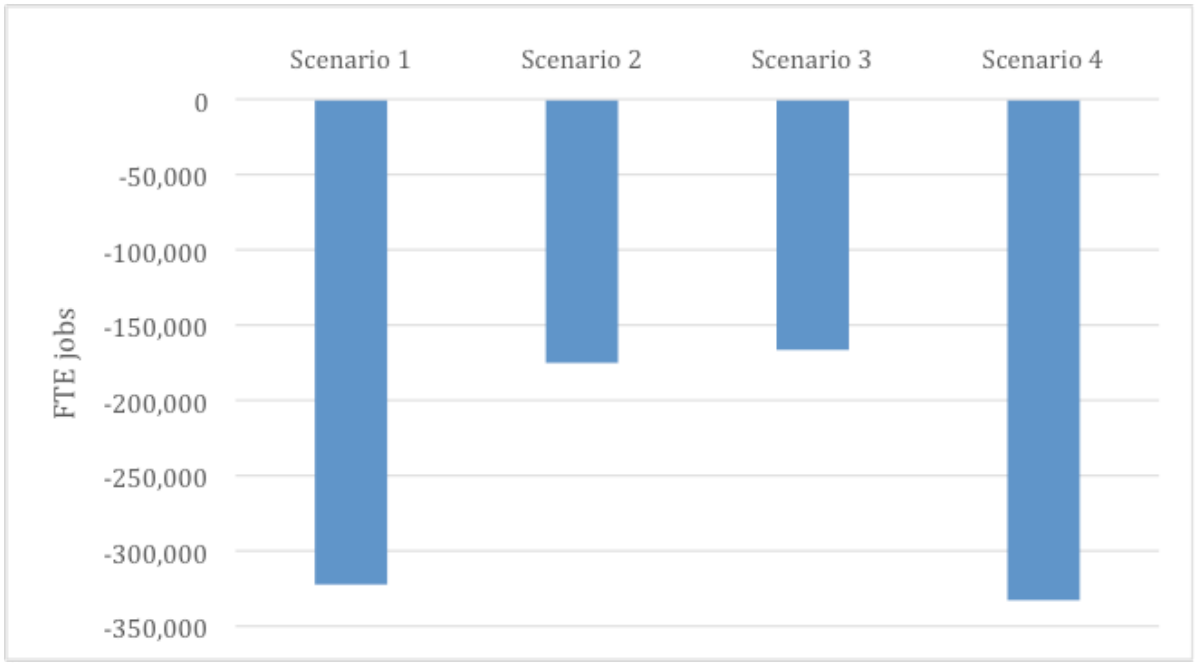


Figure 4: Full time equivalent jobs relative to the reference case, 2030



5. Conclusions and Policy Implications

Climate and energy policy will likely be a significant factor in the outcome of the upcoming Federal election. In the approach to the election, it is germane to explore the economic consequences of the Coalition's announced policy and Labor's Climate Change Action Plan. This paper updates and extends BAEconomics' earlier analysis 'Economic consequences of alternative Australian climate policy approaches' to include an assessment of Labor's recently announced policy. The paper does not attempt to examine the economic impacts associated with physical climate change itself.

Under the Climate Change Action Plan, Labor intends to reduce Australian emissions by 45 per cent on 2005 levels by 2030, adopt a 50 per cent renewable energy target and a 50 per cent new electric vehicle target by 2030, and strengthen the Carbon Farming Initiative. It also intends to protect emissions intensive trade exposed industries from the effects of the Plan. Labor has further established that it will not allow any carry-over resulting from over-achievement of Australia's Kyoto goals toward meeting Labor's intended Paris commitment.

Four scenarios are modelled using the BAEGEM computable general equilibrium model, in addition to a reference case which assumes no new policy beyond that already in place from 2020. The key differences between the policy scenarios relate to the allowable contribution from tradable international emissions permits toward the domestic abatement target, and the existence or absence of protections for emissions intensive trade exposed sectors (EITEs).

Under all policy scenarios, Gross National Product declines compared with the reference case. These economic losses occur as a result of the carbon price attached to restricting emissions via a baseline and credit scheme. The greater the targeted emissions reduction, the higher the carbon price will be, all else equal. Adding policy flexibility with respect to how emissions reductions may be met reduces the economic consequences of mitigation.

The carbon price attached to achieving Labor's Climate Change Action Plan ranges from A$67/t CO2e to $405/t CO2e in 2030, depending on the volume of international permits allowed to contribute to meeting the target.

Cumulative GNP losses from 2021-30 are estimated at A$542 billion for a scenario in which Labor pursues its climate policy by restricting trade in international emissions permits to 25 per cent of the abatement task while protecting EITEs. These losses can be more than halved, to A$264 billion under a scenario in which there are no restrictions on trade in international permits, while still protecting EITEs. Hence greater policy flexibility, achieved through allowing a higher share of international permits to meet the abatement target, significantly ameliorates the economic impacts of Labor's climate policy. Any scheme involving the use of international emissions permits will need to stand up to best practice standards of independent measurement, verification and audit.

The cumulative GNP loss associated specifically with EITE protection under a 25 per cent international permit scenario is around A$45 billion between 2021 and 2030. Protecting trade exposed industries from the effects of domestic policies that would otherwise make them internationally uncompetitive has two key consequences: first, sector output reductions will be much smaller than what would occur without such protection; and second, the burden of the abatement task is shifted onto unprotected sectors and households.

Output falls in most sectors as a result of the Plan. The emissions target generates a price on carbon which raises electricity prices. This higher input cost then flows through to all sectors that directly or indirectly use electricity. The sectors most adversely affected by the Plan are electricity, thermal coal, metallurgical coal, oil refining, non-ferrous metals, and chemicals, rubber and plastic.

Negative consequences for real wages and employment are projected under all scenarios, with a minimum 3 per cent reduction in real wages and 167,000 less jobs in 2030 compared to what otherwise would have occurred.

The methodology and reference case used in this analysis allow for direct comparison with scenarios modelled in Fisher (2019), which included an examination of the economic consequences of the Coalition's policy on climate change. Comparing results with that study, a key finding is that the projected 2030 carbon price associated with Labor's Climate Action Plan under a scenario of unrestricted international permit trading with protection for EITEs approximates the carbon price resulting from a Coalition policy designed to achieve 27 per cent emissions reduction

by 2030 while allowing for Kyoto carry-over and international emissions permit trading. Whether unrestricted international emissions trading could ever be agreed under the United Nations Framework Convention on Climate Change or domestically is an open question.

The impacts on GNP at 2030 vary markedly between these policies. Labor's Plan results in a cumulative GNP loss over the period from 2021-30 that is over three times larger than that occurring under the Coalition policy. This result reflects the more substantial volume of international emission permits that would need to be purchased by Australia under Labor's policy, assuming unfettered access to their use and the more ambitious target under the Labor plan. Labor's proposed higher abatement target drives greater structural adjustment and greater need for low cost international permits. Hence the carbon price under the two policies is similar, while the international transfers associated with overseas purchase of permits results in a greater reduction in GNP, compared to what otherwise would have occurred, under Labor's policy.

Turning to other results, the wholesale electricity price under Labor's climate policy is around 20 per cent higher than that resulting from the Coalition policy, while wage and employment effects under the Coalition policy are less than half those projected under Labor's Climate Plan at 2030 conditional on the modelling assumptions.