CREATING JOBS – CUTTING POLLUTION

THE ROADMAP FOR A CLEANER, STRONGER ECONOMY

AUSTRALIAN CONSERVATION FOUNDATION

ACTU
australian council of trade unions

Photo above & back cover: Workers prepare the foundation for a wind turbine at Waubra windfarm. Photo courtesy of Acciona Energy.

Photos: Front & back cover courtesy of the CFMEU National Office. *This report has been produced with the support of Szencorp Pty Ltd*

AUSTRALIAN CONSERVATION FOUNDATION

FLOOR ONE, 60 LEICESTER STREET MELBOURNE VIC 3053
email ■ acf@acfonline.org.au
web ■ acfonline.org.au
tel ■ 03 9345 1111

ACTU
australian council of trade unions

LEVEL 6/365 QUEEN STREET MELBOURNE VIC 3000
email ■ help@actu.asn.au
web ■ actu.org.au
tel ■ 1300 362 223 (local call cost)

Contents

Disclaimer: The macro – economic scenarios, as well as the combinations of clean energy technologies and policies utilised in the NIEIR report represent just some of the possible pathways to a cleaner economy and world in the 2010–30 period. As such, their use in the NIEIR report should not be construed as a specific endorsement of all such approaches by ACF or the ACTU.

FOREWORD

Action to reduce pollution can go hand-in-hand with job creation and a prosperous and environmentally healthy Australia.

As this report *Creating Jobs – Cutting Pollution* demonstrates, Australia could create more than 770,000 extra jobs by 2030 by taking *strong action* now to reduce pollution.

The jobs identified are not just "green collar" jobs, but new jobs in traditional industries such as agriculture, mining, manufacturing and the services sector.

Using extensive economic modelling, the report shows that every region of Australia – even those dependent on coal, electricity generation, or heavy industry – can benefit from more jobs – but only if we act decisively now.

While action must include a price on pollution, a range of other policy tools must also be utilised for the best possible outcome.

Failure to grasp the challenge will put a brake on Australia's economic growth and limit the potential for new job creation.

Too often, public discussion about improving our environment lapses into a false choice between saving jobs or saving the environment. On a global scale, action has also been stalled by those claiming Australia is in danger of doing "too much, too soon".

The real debate, however, is about the cost to Australian jobs, our economy and planet if we do "too little, too late".

The choice is simple: invest and innovate now to secure our long-term future or pay the price in extra economic costs, job losses and an increasingly damaged environment if Australia doesn't act.

Creating Jobs – Cutting Pollution, commissioned by the Australian Council of Trade Unions (ACTU) and the Australian Conservation Foundation (ACF) from the National Institute of Economic and Industry Research, follows the 2008 report, *Green Gold Rush*, which found that ambitious environmental and industry policy could create an additional 500,000 jobs in six sectors by 2030.

Creating Jobs – Cutting Pollution again demonstrates in more detail that *strong action* to clean up pollution will create jobs across all regions, generating higher and cleaner living standards as well as a healthier environment as we shift to a cleaner economy.

Don Henry

Sharan Burrow

EXECUTIVE SUMMARY

Climate change is a major risk to Australia's future prosperity. We've known pollution is bad for our health and environment for a long time. Now greenhouse pollution is threatening our wellbeing: the core of our quality of life. Rising global temperatures place our water supply at risk, change weather patterns, affect our health and harm our environment. And all this impacts on our economy.

But risks to our economy are not solely related to health and physical impacts of pollution. We currently risk missing the next global wave of innovation in clean energy technologies and industries as the world moves to take advantage of new markets.

Already, China and California are staking their claim on the global solar industry, Asia is rapidly becoming a leader in affordable electric vehicle manufacture and Europe leads the globe in wind generation technologies, staking their claim in what is shaping up to be a US$2.3 trillion clean energy industry by 2020.[1]

What will be Australia's role in clean energy industries?

It is critical to decide now how best to avert the worst health, environmental and economic impacts caused by pollution, and capture the economic opportunities available to those early moving countries.

In light of these challenges and opportunities, ACF and the ACTU commissioned economic modelling to assess how best to protect jobs across all regions of Australia, along with the environment. This report clearly shows that there will be more jobs in all regions of Australia whilst the nation takes *strong action* to clean up pollution.

This report clearly shows that there will be more jobs in all regions of Australia whilst the nation takes strong action to clean up pollution.

The modelling

The National Institute of Economic and Industry Research conducted integrated economic modelling based on two scenarios – *Weak Action* and *Strong Action*.[2]

The *Weak Action* scenario is a "markets only" approach. It assumes a price on greenhouse pollution (using an emissions trading scheme) as the sole instrument to reduce Australia's pollution levels. Under this scenario, Australia imports vast amounts of international permits to achieve reductions in greenhouse pollution, while domestic greenhouse pollution levels remain stable.

The *Strong Action* scenario is a "markets plus" approach. It assumes a price on greenhouse pollution (using an emissions trading scheme) along with a targeted suite of complementary policies to reduce greenhouse pollution domestically, without reliance on imported international permits.

1 Berger, R., (2009) *Clean Economy, Living Planet: Building strong clean energy technology industries*, WWF-Netherlands, Amsterdam, November 2009

2 The full NIEIR technical report is available via www.acfonline.org.au

These policies are targeted geographically across Australia to capitalise on competitive advantage and mitigate negative impacts on vulnerable regions. Policies include:

- *Energy efficiency strategies for households, industry and commercial buildings*. Across Australia, there are opportunities to improve the energy efficiency of our homes, buildings and factories, to save money on electricity bills while cutting pollution. These strategies require a large and skilled labour force.

- *Rapid expansion of clean energy infrastructure*. A cleaner economy involves a massive investment in renewable energy projects across Australia where our renewable resources are in abundance. Whether wind, tides, waves, sun, biomass or geothermal, these projects are likely to be placed in rural and regional Australia providing new employment and a diversification of economic activity.

- *Cleaner vehicle fleet and public transport infrastructure plan*. Australia has started an investment program to strengthen and clean up our automotive manufacturing industry. This is the first component that can be complemented and ramped up with expanded, environmentally appropriate biofuel production and a significant investment in public transport infrastructure servicing our population centres.

- *Targeted regional investment and industry planning*. With the policies above, the Government can target investments to those regions vulnerable to the impacts of a changing climate and assist in the transition of pollution-intensive industries to a cleaner economy.

These two scenarios, *Strong Action* and *Weak Action*, explore different approaches for achieving the Australian Government's current conditional policy of a reduction in pollution of 25 per cent by 2020, with results projected out to 2030.

The results

A stronger economy…

The results of the modelling are clear: a *Strong Action* response to reducing Australia's pollution – that includes both a pollution price and a suite of targeted policies – results in far superior outcomes for jobs across all Australian regions, and a stronger economy including economic welfare, gross domestic product, and national debt.

Importantly, these conclusions hold true across any pollution reduction target range. Whether Australia adopts a five per cent greenhouse pollution reduction target, a 25 per cent or a 40 per cent target, jobs and the economy will be better off where government implements both a price on pollution and a suite of policy measures, rather than relying solely on a price on pollution.

Weak Action (as opposed to *Strong Action*) will allow our near neighbours to out-compete us on global markets and result in jobs leaching abroad to countries with smarter, more modernised clean energy economies.

with more jobs…

Strong Action results in 770,000 more jobs than *Weak Action* by 2030.

Consistent with other studies that have modelled deep cuts in pollution across the Australian economy[3], this study finds 3.7 million jobs will be created across the Australian economy by 2030 under *Strong Action* (compared with 3.0 million under *Weak Action*). The growth is in part a continuation of business as usual, but is then supplemented by the effects of policies underlying *Strong Action*.

Modelling results show that under both *Weak Action* and *Strong Action* scenarios, employment across the economy is approximately 1.5 per cent higher than would otherwise occur.

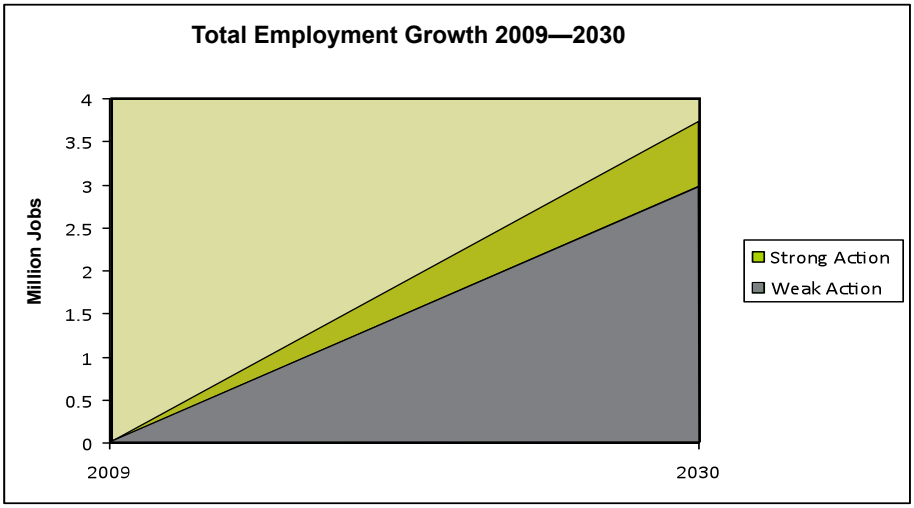


Photo courtesy of Pacific Hydro.

across all regions…

Strong Action versus Weak Action:

Importantly, jobs results are better across all regions of Australia under *Strong Action* compared to *Weak Action*.[3] This applies from the earliest years of reductions in pollution right through to 2030. In total, additional jobs under *Strong Action* compared to *Weak Action* number 771,164.

For full regional results of *Strong Action* vs *Weak Action* employment outcomes, refer table on page 9.

2009 versus 2030:

When comparing employment growth from 2009 to 2030, all regions except one show a growth in jobs numbers under *Strong Action* to reduce pollution.

3 CSIRO report between 2.65 and 3.3 million additional jobs would be created by 2025 under deep emissions reductions of 60 to 100 per cent by 2050. As reported in the same CSIRO report, Treasury's 2007 Intergenerational Report projects around 2.5 million jobs would be created over the 20 years to 2025. Hatfield-Dodds, S., G. Turner, H. Schandl and T. Doss (2008), *Growing the green collar economy: Skills and labour challenges in reducing our greenhouse emissions and national environmental footprint.* Report to the Dusseldorp Skills Forum, June 2008. CSIRO Sustainable Ecosystems, Canberra

All regions of Australia have better jobs outcomes under *Strong Action* compared to *Weak Action*.

In one region of Australia, the NSW Far West, jobs decline by 13 per cent or 5,400 jobs. However, this coincides with a continuing structural decline in the region for the wool and mining industries. Importantly, it helps to highlight where government action should be directed to mitigate the decline, in particular through the support of renewable energy or biofuel production if appropriate.[4]

Consistent with the findings of this report, the jobs outcomes are still better under *Strong Action* than *Weak Action* in the NSW far west region (*Weak Action* results in 18 per cent or 7,237 fewer jobs) indicating that a comprehensive response to reducing pollution will still deliver better results for jobs in the region.

Results in all other regions show more new jobs being created under *Strong Action* than *Weak Action*.

In total jobs grow by 28 per cent under *Weak Action* and 36 per cent under *Strong Action* between 2009 to 2030.

The table below gives full results of 2009 to 2030 employment outcomes and highlights jobs outcomes across a selection of Australian regions. Full definition of regions is provided in the appendix to the report.

Region	Total jobs % change from 2009 to 2030 (*Strong Action*)	Total jobs actual increase from 2009 to 2030 (*Strong Action*)	Total jobs additional jobs created from *Strong Action* compared to *Weak Action*
ACT	39%	74,589	9,496
NSW Illawarra and Hunter	28%	111,582	31,449
NSW Far West	-13%	-5,410	1,828
NSW Sydney Outer South West	68%	102,447	17,680
NT Darwin	73%	55,185	3,120
QLD South East West Moreton	125%	126,107	12,436
QLD Resource Region (includes western QLD and Cape York)	14%	6,614	4,228
SA Adelaide	21%	131,360	40,757
TAS Hobart & South	22%	25,665	7,353
VIC Gippsland (including La Trobe Valley)	29%	29,680	10,193
VIC Melbourne Central	48%	301,019	26,282
WA Pilbara Kimberley	37%	21,968	5,404

4 Modelling for this report did not assume any such investment in the NSW Far West.

and all sectors...

Jobs grow across all sectors of the economy under *Strong Action* to reduce pollution. This evidence supports the conclusion of previous work that the "*green jobs* story is not about shutting down dirty industries, but re-skilling to enable them to become clean industries".

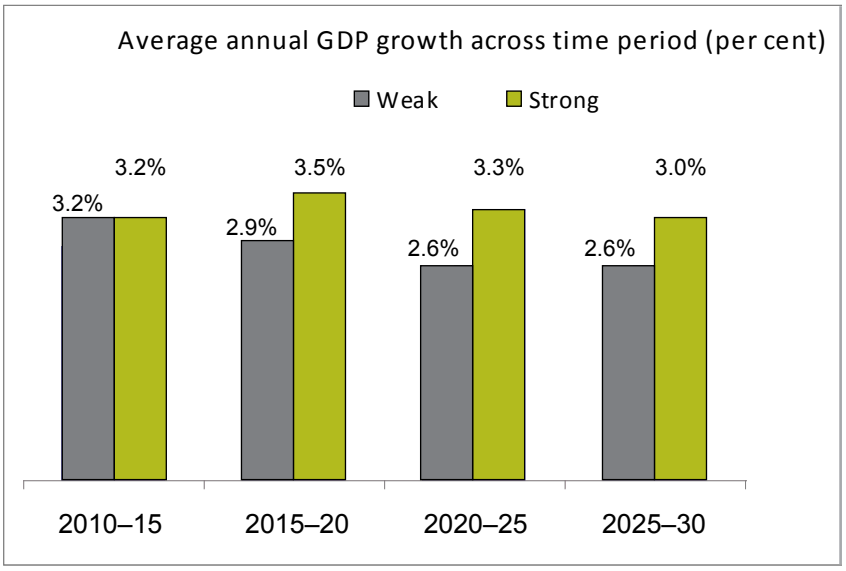
Increase in employment by sector: Jobs created by 2030 under *Strong Action* compared to *Weak Action*	
Industry	**Additional jobs with *Strong Action***
Primary industry (agriculture, mining, forestry and fisheries)	+102,422
Manufacturing	+140,684
Construction	+115,532
Services	+412,525
Total	+771,163

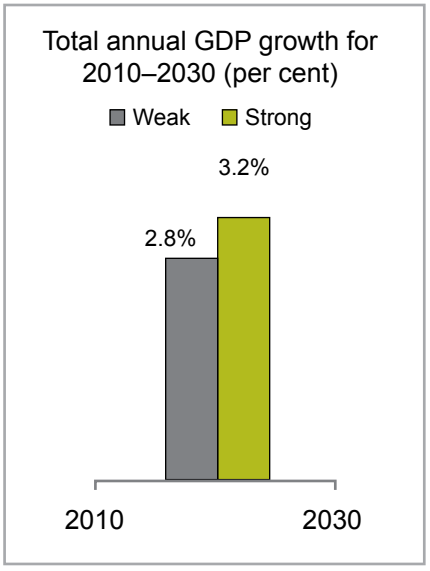
Australians will be better off…

The living standards of Australians (as measured by household and government consumption rates) will be higher under the comprehensive policies of *Strong Action*. In fact, compared to *Weak Action,* Australians will be nearly 10 per cent better off in economic welfare terms in the period to 2030.

The economy will be stronger…

In terms of Gross Domestic Product (GDP), the economy as a whole will be better off when *Strong Action* is taken. Both scenarios demonstrate solid growth in GDP across the 2010 to 2030 period, but the economy is stronger under the *Strong Action* scenario with an average 3.2 per cent GDP in the 2010–2030 period compared with 2.8 per cent under *Weak Action*.





Australia will have less debt…

Under *Weak Action*, Australia's balance of payments deteriorates over time due to the high reliance on importing international carbon permits and the continued high level of oil imports, which comes with the failure to invest in a cleaner vehicle fleet and public transport infrastructure.

Strong Action results in significant additional benefits to Australians through:

- lower imports of international permits (cumulative savings of $240 billion by 2030);
- lower imports of oil (cumulative savings of $181 billion by 2030); and
- improved energy efficiency (cumulative savings of $53 billion to households alone by 2030).

Importing permits costs almost $50 billion each year by 2030 under *Weak Action* – a direct leakage from Australia's economy that misses an opportunity for investment in domestic pollution abatement.

Strong Action creates a cumulative increase in consumption opportunities of $650 billion above *Weak Action*.

A price on pollution is essential…

An additional scenario was undertaken to model a reduction in greenhouse pollution by 25 per cent without a price on pollution. The results show that Australia would see a reduction in benefits of $126 billion by 2030 compared to a scenario with a price on pollution.

Without a price on pollution, increases in taxation or interest rates would have to replace the revenue-raising role of the pollution price. The incentive effects of pollution pricing, in stimulating modernisation and design, would also be lost.

A price on pollution is therefore critical to maximise benefits to Australians. International evidence shows the early introduction of mandatory pollution pricing is indispensable in supporting action to reduce pollution.[5]

Conclusions

Our economy and our standard of living will suffer if we do not reduce the pollution from our economy with a range of policy measures across industry including a price on pollution.

For any national greenhouse pollution reduction target, whether five per cent, 25 per cent, or 40 per cent, a suite of targeted policy measures is necessary for the best economic and environmental outcomes.

A targeted investment program to reduce Australia's pollution and build our competitiveness in a global clean energy economy delivers more jobs, lower debt, savings for households from lower energy costs, a higher standard of living and a healthier and more resilient environment.

Australia has a history of losing competitiveness and key industries to other countries. History could easily be repeated by choosing the "too little, too late" option. Business as usual will inevitably leave us stuck in the past.

We must take decisive action now to capture the current opportunities to create jobs and clean energy industries to ensure a prosperous economy, healthy planet and resilient Australia.

5 Countries with a price on carbon or developing a price on carbon include: 27 European Union member states, New Zealand, Japan, South Korea and the United States, alongside separate efforts by 24 US States and 4 Canadian provinces. Additional carbon taxes are in place across Scandinavia and Ireland.

REGIONAL JOBS RESULTS

Regional Employment Results 2009 to 2030

Employment Results by Region						
	Industry employment 2009	*Weak Action*		*Strong Action*		Additional jobs with *Strong Action*
		Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	
Australian Capital Territory	189,278	65,093	34	74,589	39	9,496
Sydney Central	819,600	202,988	25	232,533	28	29,545
Sydney Eastern Beaches	88,327	19,758	22	23,723	27	3,965
Sydney Northern Beaches	103,283	18,581	18	23,750	23	5,169
Sydney Old West	104,892	25,558	24	31,734	30	6,176
Sydney Outer North	152,866	25,516	17	36,800	24	11,284
Sydney Outer South West	150,851	84,767	56	102,447	68	17,680
Sydney Outer West	216,175	81,405	38	100,999	47	19,594
Sydney Parramatta-Bankstown	347,377	97,352	28	116,853	34	19,501
Sydney South	135,561	22,012	16	29,952	22	7,940
NSW Central Coast	109,955	28,345	26	33,060	30	4,715
NSW Central West	121,415	-2,656	-2	8,247	7	10,903
NSW Far West	40,950	-7,237	-18	-5,410	-13	1,827
NSW Hunter	282,545	42,013	15	64,320	23	22,307
NSW Illawarra	157,122	38,120	24	47,262	30	9,142
NSW Mid North Coast	114,293	16,797	15	23,160	20	6,363
NSW North	82,226	-11,600	-14	1,372	2	12,972
NSW Richmond Tweed	97,592	15,180	16	20,441	21	5,261
NSW Riverina	105,591	-2,925	-3	7,374	7	10,299
NSW Southern Tablelands	91,215	10,306	11	19,030	21	8,724
NT Darwin	75,205	52,065	69	55,185	73	3,120
NT Lingiari	43,961	-1,500	-3	3,433	8	4,933
SEQ Brisbane City	741,226	253,611	34	289,852	39	36,241
SEQ Brisbane South	150,730	68,102	45	82,092	54	13,990
QLD Cairns	109,155	21,120	19	29,760	27	8,640
QLD Darling Downs	105,103	29,959	29	39,272	37	9,313
QLD Fitzroy	102,729	39,978	39	50,052	49	10,074
QLD Mackay	90,229	31,298	35	40,974	45	9,676
QLD North	117,020	23,993	21	40,892	35	16,899
QLD Resource region	48,267	2,386	5	6,614	14	4,228
QLD Wide Bay Burnett	106,308	30,118	28	42,242	40	12,124
SEQ Gold Coast	248,086	94,652	38	109,543	44	14,891
SEQ Moreton Bay	112,180	39,431	35	48,570	43	9,139
SEQ Sunshine Coast	140,701	56,581	40	64,384	46	7,803
SEQ West Moreton	100,587	113,670	113	126,107	125	12,437
Adelaide Inner	307,041	42,674	14	53,468	17	10,794
Adelaide North	212,965	36,138	17	57,818	27	21,680
Adelaide South	99,264	11,791	12	20,074	20	8,283
SA Mallee South East	47,017	3,166	7	11,399	24	8,233
SA Mid North Riverland	57,541	1,604	3	7,482	13	5,878
SA Spencer Gulf	51,499	-305	-1	4,282	8	4,587
TAS Hobart-South	118,099	18,313	16	25,665	22	7,352
TAS North	62,409	10,320	17	17,194	28	6,874
TAS North West	48,012	8,872	18	15,238	32	6,366

Employment Results by Region continued...						
	Industry employment 2009	*Weak Action*		*Strong Action*		Additional jobs with *Strong Action*
		Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	
Melbourne Central	632,659	274,737	43	301,019	48	26,282
Melbourne East	253,366	69,404	27	87,500	35	18,096
Melbourne North	211,781	93,384	44	120,236	57	26,852
Melbourne North East	181,403	61,589	34	75,662	42	14,073
Melbourne Outer South East	172,404	50,730	29	66,590	39	15,860
Melbourne South East	311,515	87,326	28	115,180	37	27,854
Melbourne West	214,755	139,419	65	166,291	77	26,872
VIC Ballarat	67,373	24,777	37	32,016	48	7,239
VIC Bendigo	96,025	36,250	38	45,011	47	8,761
VIC Geelong	99,947	31,040	31	34,378	34	3,338
VIC Gippsland	103,927	19,487	19	29,680	29	10,193
VIC Mallee Wimmera	62,509	-3,561	-6	5,795	9	9,356
VIC North East	101,790	17,812	17	24,819	24	7,007
VIC West	71,905	16,024	22	26,541	37	10,517
Perth Central	487,045	131,837	27	151,809	31	19,972
Perth Outer North	182,548	53,106	29	67,595	37	14,489
Perth Outer South	174,116	40,073	23	56,061	32	15,988
WA Gascoyne Goldfields	64,600	7,985	12	13,856	21	5,871
WA Peel South West	111,886	42,244	38	51,781	46	9,537
WA Pilbara Kimberley	58,947	16,564	28	21,968	37	5,404
WA Wheatbelt Great Southern	60,349	12,877	21	24,061	40	11,184
TOTAL	**10,527,297**	**2,980,518**	**28%**	**3,751,682**	**36%**	**771,164**

Job increases by State						
	Industry employment 2009	*Weak Action*		*Strong Action*		Additional Jobs in *Strong Action*
		Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	
ACT	189,278	65,093	34%	74,589	39%	9,496
NSW	3,321,836	704,280	21%	917,647	28%	213,367
Northern Territories	119,166	50,565	42%	58,618	49%	8,053
Queensland	2,172,321	804,899	37%	970,354	45%	165,455
South Australia	775,327	95,068	12%	154,523	20%	59,455
Tasmania	228,520	37,505	16%	58,097	25%	20,592
Victoria	2,581,359	918,418	36%	1,130,718	44%	212,300
Western Australia	1,139,491	304,686	27%	387,131	34%	82,445
Total	10,527,297	2,980,518	28%	3,751,682	36%	771,164

Job increases by Capital City						
	Industry employment 2009	*Weak Action*		*Strong Action*		Additional Jobs in *Strong Action*
		Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	Change 2009 to 2030 (no.)	Change 2009 to 2030 (%)	
Adelaide	619,270	90,603	15%	131,360	21%	40,757
Brisbane	891,956	321,713	36%	371,944	42%	50,231
Canberra (All ACT)	189,278	65,093	34%	74,589	39%	9,496
Darwin	75,205	52,065	69%	55,185	73%	3,120
Hobart (and South TAS)	118,099	18,313	16%	25,665	22%	7,352
Melbourne	1,977,883	776,589	39%	932,478	47%	155,889
Perth	843,709	225,016	27%	275,465	33%	50,449
Sydney	2,118,932	577,937	27%	698,791	33%	120,854
Capital City Totals	6,834,332	2,127,329	33%	2,565,477	39%	438,148

INTRODUCTION

Photo courtesy of the CFMEU National Office.

Climate change is a major risk to Australia's future prosperity. We've known pollution is bad for our health and environment for a long time. Now greenhouse pollution is threatening our wellbeing: the core of our quality of life. Rising global temperatures place our water supply at risk, change weather patterns, affect our health and harm our environment. And all this impacts on our economy.

It is clear that action must be taken to reduce the rising levels of pollution. We need to shift from a pollution-dependent economy to a cleaner economy, and create new jobs for Australians in the process.

More than 120 countries, including the world's largest polluters, China and the US, support the need to reduce pollution via the Copenhagen Accord that aims to prevent global temperatures from increasing by more than two degrees Celsius.

This ACF/ACTU report takes the next step and looks at the best way to restructure our economy to meet that challenge while maintaining a prosperous economy and healthy planet.

The report considers the impact of action to reduce Australia's greenhouse pollution by 25 per cent by 2020, focusing on jobs across all regions of Australia, household welfare and GDP impacts.

The economic modelling underpinning this research, undertaken by National Institute of Economic and Industry Research (NIEIR)[6], looked at how to best undertake the necessary restructuring of the economy to deliver a cleaner economy.

The world is taking action

The Federal Government has committed to adopting a minimum five per cent reduction in greenhouse pollution and move to a 25 per cent target below the year 2000 levels as part of an ambitious international agreement capable of stabilising greenhouse pollution gases at 450ppm carbon dioxide equivalent (CO_2-e) or lower. The Federal Opposition has said it will also adopt a 25 per cent target in the context of an international agreement. The Greens' policy is for a target of at least 40 per cent.

A 25 per cent reduction in greenhouse pollution is the minimum amount that would allow the Government to stand by its recent commitment to ensure that global temperatures do not rise more than two degrees Celsius, the threshold for avoiding the worst impacts of a changing climate.[7]

6 The full NIEIR report is available via www.nieir.com.au

7 The Stern Review reported the probability of exceeding a 2 degree temperature rise was in the range of 26 to 78 per cent if CO_2-e is stablised at 450ppm.(Stern Review (2006), The Economics of Climate Change, HM Treasury, London.)

Clean energy will be one of the world's largest industries, totalling as much as US$2.3 trillion.

Growing evidence that the world is moving towards dangerous changes in climate has motivated many countries to take action.

- Governments from around the world have supported the Copenhagen Accord to keep temperatures from rising more than two degrees Celsius – more than 120 countries now support the Accord;
- Fifty-five countries, accounting for over 78 per cent of global greenhouse pollution emissions, have submitted targets to the United Nations to limit their pollution ;[8]
- Targets to cut greenhouse pollution by 2020 have been made by Japan (25 per cent), the EU (20-30 percent), the UK (34 per cent), and Norway (40 per cent); the United States has pledged a 17 per cent reduction from 2005 levels by 2020 and 30 per cent by 2025;
- Major developing countries, including Mexico, China, India, Indonesia and Brazil, have demonstrated that they are on target to significantly reduce their greenhouse pollution below business as usual by the 2020s.[9]

Many countries see reducing pollution as an opportunity, not just a necessary cost.

Globally, governments committed US$432 billion for green stimulus investments in 2009 (including more than US$128 billion in the US).[10]

North Asian economies, China in particular, are spending hundreds of billions of dollars annually to gain a competitive advantage in a wide range of energy efficient and lower pollution intensity technologies such as renewable energy, public transport and electric vehicles.

Worldwide investment in clean energy totalled US$162 billion in 2009, but only US$1 billion of this investment was in Australia. China ranked number one for clean energy investment out of the G20 countries with $34.6 billion. Australia was ranked 14th, behind Turkey, Mexico, Canada and others.[11]

The opportunity is further evidenced by projections that, in 2020, clean energy will be one of the world's largest industries, totalling as much as US$2.3 trillion.[12]

Already, some nations are staking their place in the clean energy economy. Critically, strong government commitments have delivered certainty underpinning private sector advances in these industries. A 2009 study provided evidence that developed countries that ratified the Kyoto Protocol – and subsequently set a legally binding target to reduce

8 UNFCCC Press release 1 February 2010, Accessed: http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/pr_accord_100201.pdf

9 EcoFys, Climate Analytics and Potsdam Institute for Climate Impact Research (2009), Climate Action Tracker, 6 November 2009.

10 HSBC (2009), *The Green Rebound: clean energy to become an important component of global recovery plans*,19 January 2009.

11 Pew Charitable Trusts (March 2010) Who's Winning the Clean Energy Race? http://www.pewglobalwarming.org/cleanenergyeconomy/g20.html <http://www.pewglobalwarming.org/cleanenergyeconomy/g20.html>

12 Berger, R. (2009), *Clean Economy, Living Planet: Building strong clean energy technology industries*,WWF-Netherlands, Amsterdam, November 2009

their greenhouse pollution – saw a rise of 33 per cent in green technology patents. The US and Australia, however, being the developed nations that didn't initially ratify Kyoto, conversely had no change in their share of total green technology patents over the same time period, indicating that we in Australia are already falling behind the rest of the world.[13]

Even ahead of a formal international treaty beyond the Kyoto Protocol, a coalition of countries is emerging that is taking aggressive action to reduce pollution.

Against this background, it is clear Australia needs to decide the most effective way to reduce its pollution in order to remain competitive in a global clean energy economy.

Actions to reduce pollution

Policies to reduce pollution in developed countries are generally underpinned by a price on pollution. Most are combined with additional complementary measures to support an effective and equitable transition to a cleaner economy and to provide incentives to build the clean energy industries required.

This research compared a price on pollution only (*Weak Action* scenario) against a price on pollution combined with a suite of additional and targeted complementary measures (*Strong Action*). These scenarios are set out in the following section, and in more detail in the NIEIR technical report.

Pricing pollution

The world has woken up to the fact that pollution has a cost. To date that cost has been passed on as a liability to future generations. Policies to set a price on pollution are crucial to providing a substantial incentive to change the way we produce and use goods and services.

Emissions trading schemes are the most commonly accepted way to do this and already operate in 32 countries. ACF and ACTU believe a good pollution pricing scheme should invest a significant proportion of revenues from the sale of permits into clean energy development and cleaner industry innovation hubs. Wise re-investment of pollution permit revenue will help Australia make the shift to the clean energy future, securing national prosperity for coming generations. During early years, schemes need to provide appropriate compensation for lower income households and pollution intensive trade-exposed industries as the economy is restructured.

Additional measures to reduce pollution

The following seven key policy drivers were modelled alongside an emissions trading scheme to test the impacts on jobs and economic indicators under the *Strong Action* scenario.[14] Many of these or similar policies are already being implemented in countries as diverse as China, the US, EU member countries, South Korea and many others:

- **Household energy efficiency strategy** – roll out a new, comprehensive national residential retrofitting program that reduces pollution and household bills, and results in thousands of safe new jobs with the appropriate training and enforced standards;
- **Commercial building and industrial energy efficiency strategy** – use existing and expanded programs to achieve significant savings from energy efficiency in buildings, large and small industry, and community organisations with additional transitional financial incentives;

13 Dechezleprêtre, A. et al.(2009), Invention and Transfer of Climate Change Mitigation Technologies on a Global Scale: A Study Drawing on Patent Dat, CERNA and Mines ParisTech, Paris, February 2009, cited by Gordon, K.,Wong, J.L. and McLain, J.T. (2010) Out of the Running? How Germany, Spain, and China Are Seizing the Energy Opportunity and Why the United States Risks Getting Left Behind, Center for American Progress, Washington, March 2010. Accessed: http://www.americanprogress.org/issues/2010/03/pdf/out_of_running.pdf

14 More detail is provided in the full NIEIR technical report available via www.acfonline.org.au

- **Rapid expansion of low pollution-intensive energy infrastructure** – with incentives such as an expanded renewable energy target, an effective emissions trading scheme, investment in a smart grid and funding for research, development and deployment of clean energy;
- **Targeted regional investment and industry planning** – including investment in clean industry and innovation hubs particularly focused on regional areas together with substantial up-skilling of the workforce;
- **Investment in a cleaner vehicle fleet** – including expansion of hybrid and electric cars and shifting more freight to cleaner energy transport and environmentally appropriate biofuel production;
- **Federally led clean energy transport infrastructure plan** – Federal Government investment into clean energy powered public and active transport infrastructure;
- **A national land sector initiative** – to reduce pollution arising from land use and build climate change resilience in Australian ecosystems through improved land management practices.

The research

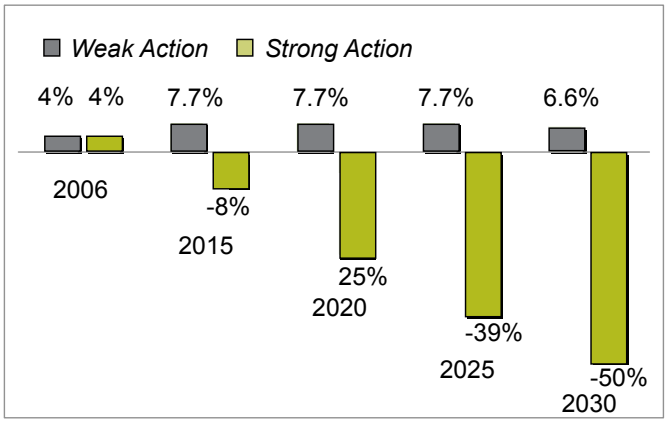
The economic modelling undertaken for this research examined the costs and benefits for Australia of two comparative scenarios over the 2010–2030 period.

Comprehensive dynamic input-output economic modelling was undertaken by the National Institute of Economic and Industry Research (NIEIR) in Melbourne. The modelling provides a macro-economic assessment based on evidence of how businesses and households respond to policies from bottom-up modelling.

The research modelled two comparative scenarios:

- *Weak action* – Australia signs up to a 25 per cent reduction by 2020 and adopts a price on pollution, but takes little further action. The approach relies heavily on market forces, with a large import of international permits resulting in order to reach the target. Domestic greenhouse pollution levels remain above 1990 levels.
- *Strong action* – Australia takes strong and early action to reduce greenhouse pollution by 25 per cent by 2020. A price on pollution is introduced, along with a suite of additional measures including industrial development, energy efficiency strategies, clean transport programs, green up-skilling and land sector initiatives. Import of international permits is not required. The additional measures are purposefully directed to offset negative macro-economic aspects of the *Weak Action* scenario.

Pollution reduction in the scenarios



Domestic pollution levels in the *Weak Action* scenario stabilise at around today's level by 2030. The target of 25 per cent by 2020 is met by importing pollution permits.

In the *Strong Action* scenario, Australia reduces domestic greenhouse pollution by 25 per cent below 1990 levels by 2020 and 50 per cent by 2030[15], as shown to the left.

15 The reduction levels assume the inclusion of emissions from land use, land use change and forestry.

The model presented regional projections from the *Weak Action* and *Strong Action* scenarios to compare the impact of alternative approaches to pollution reduction on the Australian economy. National figures from the models were allocated to the regions based on current patterns of expenditure, pollution intensity and investment in reducing pollution along with existing and projected capacity for renewable energy and industry demand. Regional development initiatives were modelled for regions adversely affected by pollution pricing, including effects from domestic markets and foreign drivers such as loss of export markets.

The results of this modelling are presented in the following section.

Results

Australia creates more economic wealth and more jobs by taking *Strong Action* to reduce pollution than by *Weak Action*.

The modelling shows that a stronger economy, higher employment and higher living standards result from a comprehensive package of policy measures to reduce domestic pollution combined with a price on pollution. Importantly, reduction of domestic pollution, rather than a reliance on international permits, is critical to strong economic outcomes for Australia.

Importantly, these conclusions hold true across any target range – whether Australia adopts a five per cent greenhouse pollution reduction target or a 25 per cent or a 40 per cent target. Jobs and the economy will be better off where government implements both a price on pollution and a suite of policy measures, rather than relying solely on a price on pollution.

The modelling also shows that policies to reduce pollution without a price on pollution result in lower effectiveness, efficiency and employment.

Simply put, the cost to Australia of not putting a price on pollution now, at the start of the second decade of the 21st century, is very substantial and decidedly negative.

More jobs

The study finds there will be 3.7 million new jobs created by 2030 under *Strong Action* compared to 3.0 million under *Weak Action*. The growth is in part a continuation of business as usual, but is then supplemented by the effects of policies underlying *Strong Action*.

This is 770,000 more jobs by 2030 through *Strong Action* to reduce domestic pollution with a pollution price and suite of additional measures than through *Weak Action*.

The creation of more jobs applies from the earliest years of pollution reduction right through to 2030.

Specifically, the *Weak Action* scenario delivers 2,980,518 jobs above and beyond today's levels by 2030. *Strong Action* results in 3,751,682 jobs above current levels by 2030.

All regions of Australia have more jobs with Strong Action

Strong Action versus Weak Action:

All regions have higher employment under *Strong Action* than *Weak Action*. Regional impacts on employment will be positive if the government sets proactive policies that act in harmony to generate economic activity from reductions in greenhouse pollution and develops targeted industry development policies that are carefully designed to assist those regions most susceptible to pollution pricing.

For full regional results of *Strong Action* vs *Weak Action* employment outcomes, refer to table on page 9.

Jobs in 2009 versus jobs in 2030:

When comparing employment growth from 2009 to 2030, all regions except one see a growth in jobs numbers under *Strong Action* to reduce pollution.

In one region of Australia, the NSW Far West, there will be 13 per cent or 5,400 fewer jobs. However, this coincides with a continuing structural decline in the region for the wool and mining industries. Importantly, it helps to highlight where government action should be directed to mitigate the decline, in particular through the support of renewable energy or biofuel production if appropriate.[16]

Consistent with the findings of this report, the jobs outcomes are better under *Strong Action* than *Weak Action* in this region (*Weak Action* results in 18 per cent or 7,237 fewer jobs) indicating that a comprehensive response to cutting pollution still delivers the better results for jobs in the region.

Results in all other regions show more jobs being created under *Strong Action*.

In total jobs grow by 28 per cent under *Weak Action* and 36 per cent under *Strong Action* between 2009 to 2030. For full regional results of 2009 to 2030 employment outcomes, refer to table on page 9.

Case studies

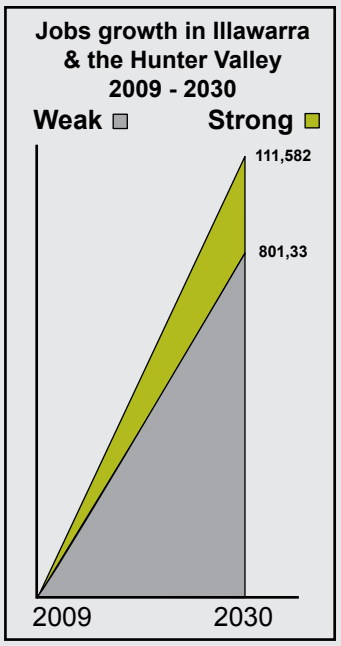
Case Study 1: Illawarra and the Hunter Valley – NSW

(Maitland, Newcastle and Wollongong) Jobs growth in this region occurs in all sectors, with mining jobs continuing to grow and a significant increase in the services sector. There were 439,667 jobs in the area in 2009. There will be 18 per cent more in 2030 under the *Weak Action* scenario and 25 per cent more under *Strong Action*.

There will be 30,000 more jobs under the *Strong action* than the *Weak action*. These jobs primarily grow from policies including:

- household and industry energy efficiency improvement
- transport infrastructure investment and benefits
- industry policies to maximise local content of expenditure on reduction of pollution in order to stimulate production of transport equipment and construction materials
- employment created from higher living standards

Additional jobs created from *Strong Action* compared to *Weak Action* in 2030	
Agriculture, mining, forestry and fisheries	1,577
Manufacturing	6,257
Construction	6,795
Services	16,821
Total	31,450



16 Modelling for this report did not assume any such investment in the NSW Far West.

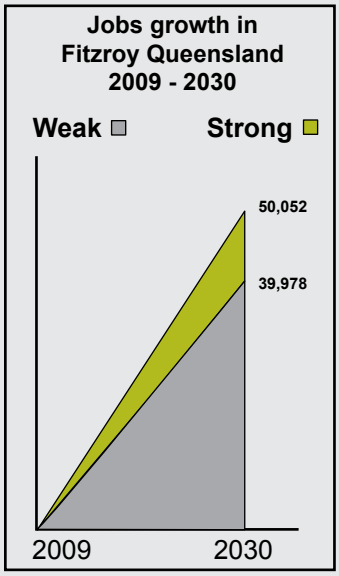
Case Study 2: Fitzroy – Queensland

(Gladstone and Rockhampton) Jobs growth in this region occurs across all sectors, including key sectors for the region. There were 102,729 jobs in the area in 2009. This is set to increase by 39 per cent under *Weak Action* and 49 per cent under *Strong Action*.

The additional 10,000 jobs under the *Strong Action* scenario are predominantly due to benefits from policies including:

- cleaner electricity production (gas)
- biodiesel production and enhanced agriculture supply
- enhanced industrial capacity in chemicals to support expansion of Australian manufacturing industry

Additional jobs created from *Strong Action* compared to *Weak Action* in 2030	
Agriculture, mining, forestry and fisheries	1,836
Manufacturing	1,651
Construction	2,207
Services	4,379
Total	10,073



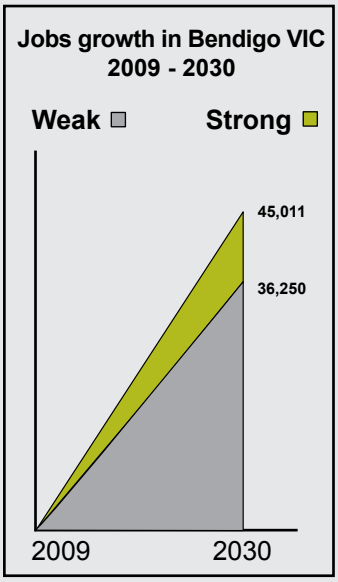
Case Study 3: Bendigo – Victoria

Includes Greater Bendigo. Jobs continue to grow in the key sectors of the region. With jobs totalling 96,025 in 2009, *Weak Action* shows a 38 per cent improvement and *Strong Action* a 49 per cent improvement by 2030.

The additional 9,000 jobs under a *Strong Action* scenario are predominantly due to benefits from policies including:

- clean energy infrastructure investment
- biomass agriculture on marginal farming land
- land management to minimise emissions
- commercial services activities supporting expansion of agriculture and renewable energy in wider Victorian region

Additional jobs created from *Strong Action* compared to *Weak Action* in 2030	
Agriculture, mining, forestry and fisheries	1,513
Manufacturing	1,383
Construction	1,561
Services	4,304
Total	8,761



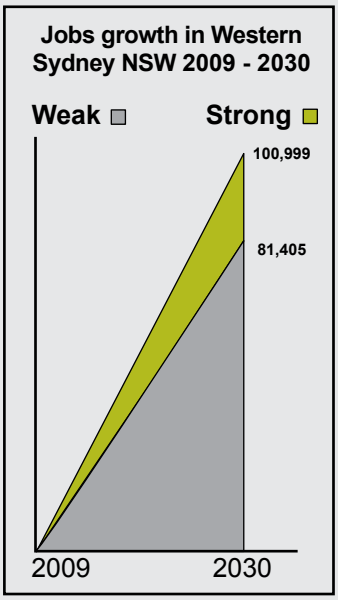
Case Study 4: Western Sydney – NSW Outer West

There are 20,000 more jobs under *Strong Action* scenario for Western Sydney, with an additional 12,000 jobs in the services sector. Manufacturing continues to play a key role in this region, with an additional 5,000 jobs. There were 216,175 jobs in this region in 2009. The modelling shows 38 per cent more jobs under the *Weak Action* scenario and 47 per cent under *Strong Action* in 2030.

The main drivers of employment growth are:

- employment created from higher expenditures stemming from higher living standards
- general energy efficiency programs (industrial, commercial and residential)
- strengthening of manufacturing
- research and development activities

Additional jobs created from *Strong Action* compared to *Weak Action* in 2030	
Agriculture, mining, forestry and fisheries	640
Manufacturing	5,256
Construction	1,525
Services	12,174
Total	19,594



All sectors of the economy have more jobs

Additional jobs are not confined to one or two sectors. Indeed, all sectors of the Australian economy continue to grow if comprehensive action is taken to reduce pollution. This evidence supports the conclusion of previous work that "the *green jobs* story is not about shutting down dirty industries, but re-skilling to enable them to become clean industries."[17]

The table on page 7 shows increases in employment by sector under *Strong Action*, on top of *Weak Action* in 2030.

These sectoral job increases are to be found in all regions of Australia. State and capital city totals are included in the tables below and full regional results are shown in the Appendix.

Job increases by State						
	Agri/Mining employment	Manufacturing employment	Construction employment	Service industry	Total	Additional Jobs in Strong Action
ACT	449	847	869	7,331	9,496	9,496
NSW	26,551	33,199	28,791	124,828	213,367	213,367
NT	2,912	737	1,840	2,563	8,053	8,053
QLD	28,083	23,982	20,940	92,448	165,455	165,455
SA	10,425	13,443	10,229	25,359	59,455	59,455
TAS	3,742	2,260	6,816	7,775	20,592	20,592
VIC	18,308	53,533	27,015	113,442	212,300	212,300
WA	11,951	12,683	19,031	38,779	82,445	82,445
Australia	102,422	140,684	115,532	412,525	771,164	771,164

Job increases by Capital City						
	Agri/Mining employment	Manufacturing employment	Construction employment	Service industry	Total	Additional Jobs in Strong scenario
Adelaide	1,593	11,640	4,343	23,182	40,757	40,757
Brisbane	1,429	8,376	5,245	35,181	50,231	50,231
Canberra (All ACT)	449	847	869	7,331	9,496	9,496
Darwin	157	333	310	2,320	3,120	3,120
Hobart (and South Tas)	839	640	2,045	3,829	7,352	7,352
Melbourne:	3,808	44,578	12,739	94,763	155,889	155,889
Perth:	1,681	9,784	7,871	31,113	50,449	50,449
Sydney:	3,110	21,171	10,745	85,827	120,854	120,854
Capital City Totals	13,066	97,369	44,167	283,546	438,148	438,148

17 Dusseldorp Skills Forum and Australian Conservation Foundation, Op. cit

Industry policies to promote 'cleantech' industries in Australia

Australia must take advantage of the high-wage, high-skill jobs that can be won by designing appropriate industry development policies to complement the necessary first step of putting a price on pollution now.

This report shows public and private incentives must build on existing efforts to tap the full potential of a cleaner economy future.

Current initiatives include:

- The $5.1 billion Clean Energy Initiative, that includes a significant contribution to renewable energy and carbon capture and storage research, under two 'flagship' initiatives. Additional funding has been directed to establish Renewables Australia to support leading edge technology research and bring it to market.
- The Commercialisation Australia program provides $196 million over four years (and more than $80 million a year thereafter) for researchers, entrepreneurs and start up firms with new technologies.
- A $1.4 billion per annum tax credit scheme where firms with a turnover of less than $20 million (over 99 per cent of cleantech firms in Australia are in this category) will be eligible for a 45 per cent refundable tax credit to undertake their research and development and build their businesses.

These resources are an important start but will need to be supplemented in the years ahead.

Just as the government developed a 10 year $6.2 billion dollar plan for the automotive manufacturing industry (which included the green car initiative), cleantech industry development strategies are now also required. Agencies like Austrade, Enterprise Connect and the Industry Capability Network need to work together to help develop the supply chains for cleantech industries, attract investment from offshore into new manufacturing and services businesses here in Australia and help our new cleantech firms win international business opportunities in global markets.

Higher standards of living for Australians

Australians' living standards will be higher under the comprehensive policies of *Strong Action*. This was measured by household and government consumption rates as an indicator of welfare.

Under *Strong Action*, Australians are nearly 10 per cent better off in the 2010 to 2030 period. By 2030, Australian households are more than $153 million better off every year.

By 2030, Australian households are more than $153 million better off every year.

Photo courtesy of the CFMEU National Office.

Stronger economy

Both scenarios demonstrate solid growth in GDP, but the economy is more robust under *Strong Action* with its comprehensive suite of policies to reduce pollution. This difference kicks in quickly and is most apparent in the 2020s. From 2010 to 2030, the average GDP under the *Strong Action* scenario is 3.2 per cent versus 2.8 per cent under the *Weak Action* scenario.

Improved savings and lower debt for Australia

The economy remains healthier under *Strong Action* due to improved balance of payments, largely as a result of increased investment to reduce pollution in the domestic economy rather than relying on importing pollution permits (as is the case under the *Weak Action* scenario).

In total, foreign debt is more than $180 billion lower by 2030 under *Strong Action* than it is under *Weak Action*.

By 2030, the reliance on imported permits under the *Weak Action* scenario costs almost $50 billion each year – a direct leakage from Australia's economy with little domestic benefit in terms of preparing Australia for a clean energy future. *Strong Action* creates a cumulative increase in consumption opportunities.

Predicted growth under *Strong Action* is not far short of the 1990s average of 3.5 per cent.[18] The accelerated benefits of pollution reduction under *Strong Action* come from:

- lower imports of permits (cumulative savings of $240 billion by 2030);
- lower imports of oil (cumulative savings of $181 billion by 2030); and
- improved energy efficiency (cumulative savings of $53 billion to households alone by 2030).

It is also worth remembering the economic impact of climate change. In his 2006 review, former World Bank chief economist Sir Nicholas Stern estimated that the "costs and risks" of uncontrolled climate change are equivalent to a loss in global GDP of at least 5 per cent and up to 20 per cent or more, "now and forever."[19]

These findings apply to any national target

The conclusions for the *Strong Action* versus *Weak Action* scenarios hold true across any national greenhouse pollution reduction target range. Whether Australia chooses a five per cent, a 25 per cent or 40 per cent cut in greenhouse pollution, employment growth and welfare outcomes will be stronger where the government implements a suite of complementary policy measures plus a price on pollution, rather than relying solely on a price on pollution.

18 Based on figures from ABS catalogue number 5206.0.
19 Stern Review (2006), The Economics of Climate Change, HM Treasury, London, Executive Summary

We must put a price on pollution

The research provides further evidence of the inefficiency of reducing pollution without a price on pollution. An additional scenario was run which compared action to achieve a 25 per cent domestic reduction with and without a price on pollution. This showed the failure to set a price on pollution would cost $96 billion in lost consumption by 2020, extending to $126 billion by 2030. Failure to introduce a price on pollution increases the cost of adjustment. The full outcomes are given in the table below.

Acting without a price on pollution requires more real resource expenditure to achieve the same greenhouse pollution reduction target. General taxation increases or interest rate increases would need to replace the revenue-raising role of the price on pollution. The incentive effects of placing a price on pollution, in stimulating modernisation and design, would be lost.

Accumulated loss in consumption expenditures with no price on pollution (in $2007 billions)

2015	-55
2020	-96
2025	-117
2030	-126

Comparisons with other studies

This research shows that higher GDP growth is possible than that modelled by Treasury[20] and Professor Garnaut. This is most apparent when comprehensive targeted policies are undertaken to reduce pollution and support industries alongside the introduction of a price on pollution.

NIEIR and treasury scenarios

	2020		2010-20	2030		2020-30
Scenario	**CO_2-e* price per tonne ($2007)**	**Domestic emissions (Mt)**	**GDP growth rate (per cent)**	**CO_2-e* price per tonne ($2007)**	**Domestic emissions (Mt)**	**GDP growth rate(per cent)**
Treasury CPRS -5	38	600	2.7	60	580	2.3
Treasury CPRS -15	55	530	2.7	75	500	2.2
Garnaut -10	38	600	2.7	55	580	2.3
Garnaut -25	65	500	2.6	90	490	2.2
NIEIR *Weak Action*	55	585	3.0	158	579	2.7
NIEIR *Strong Action*	87	410	3.3	159	273	3.1

* $C0_2$-e stands for carbon dioxide equivalent, the standard measure of major greenhouse pollution gases including carbon dioxide, methane and others

Source:Treasury 2008 (approximate – some numbers can only be read from graphs) and NIEIR calculations.

20 Treasury (2008) Australia's Low Pollution Future: The Economics of Climate Change Mitigation, Commonwealth of Australia, Canberra.

The pollution pricing in this study is based on assumptions from other international studies considering comparable scenarios. The scenarios assume import parity carbon dioxide equivalent (CO_2-e) pricing by 2030.

The relative difference results in more investment in capacity and capital improvements to reduce pollution rather than increased international debt through importing permits.

The UK Department of Energy and Climate Change, for example, states a desired median CO_2-e price for 2030 of US$130, and a high of US$192 in 2009 prices for investment evaluation purposes.[21] Under a 50 per cent CO_2-e reduction target, the International Energy Agency indicates a minimum pollution price of US$200 and as much as US$500 by 2050.[22]

The pollution price profile adopted here is therefore well within the range of current scenario assumptions for aggressive CO_2-e reduction, as AU$159 a tonne CO_2-e domestic price reached in the models by 2030 is equivalent to $US136 a tonne.

Creating jobs by cutting pollution

The results from the modelling make it clear that pollution pricing is essential, but not enough.

Allowing businesses to trade-off between domestic pollution reductions and the importation of permits has major ramifications for the Australian economy. Cutting pollution within Australia results in substantial investment in domestic industry and positive employment outcomes across all regions of Australia. It produces better economic results for Australia by spending on pollution reductions at home, rather than investment occurring offshore.

The key to achieving better outcomes across all regions is a careful reallocation of resources towards complementary industrial and pollution reduction programs. The benefits of this reallocation, as shown in the previous section, are substantial.

Benefits of Strong Action

By acting in a coordinated manner under *Strong Action*, Australia reaps the benefit of smart and strategic investment of revenues from its emissions trading scheme, as well as the dividend from the current "once in a generation" mining boom.

The modelling shows that Australia generates excellent returns on investment through *Strong Action*. Every $100 invested in import replacement effort (money that would have gone overseas in the form of international permit imports under *Weak Action*) returns $180. Importantly, this is an investment in a competitive, clean energy economy for Australia, rather than buying international permits – an investment in the pollution reductions of another country.

These positive results can be achieved across sectors and across Australia. Even in coal-dependent regions like the Hunter and La Trobe Valleys, jobs in all sectors grow under *Strong Action*.

While this research is based on economic models, the policies modelled are being adopted right now across the globe. The level of resource investment in the *Strong Action* scenario mirror the strategies currently being implemented in North Asian economies, many of the EU member states and many US states.

The *Strong Action* scenario delivers lower imports of oil and improved energy efficiency which lowers costs for households and businesses.

21 UK Department of Energy and Climate Change (2009), *Carbon Appraisal in UK Policy Appraisal: A Revised Approach - A brief guide to the new carbon values and their use in economic appraisal*

22 IEA (2008), Energy Technology Perspectives: Scenario and Strategies to 2050. Other IEA studies quote estimates of around US$180 a tonne of CO_2 by 2030.

Expansion in jobs occurs due to the comprehensive and efficient nature of the *Strong Action* response. The economy becomes more efficient as part of the expenditures to reduce pollution. The creation of new industries will lift productivity and, more importantly, drive future growth. Better balance of payments and private sector financial stability will free up financial resources to support investment and thereby lift employment.

The other core driver of the outcomes is the benefits that accumulate over time from gains in energy efficiency. The energy efficiency enhancement component of pollution reduction expenditures represents a one-off investment in reducing energy and transport costs well into the future. Although energy and transport costs are part of private consumption expenditure, they make no contribution to economic welfare per se, provided the same tasks (heating, cooking, mobility) can be maintained. Hence, lowering energy and transport costs allows other expenditures which directly increase welfare, (e.g. entertainment, health and education) to be increased. That means freeing up money to spend on the things that really improve our quality of life

The debate is not about doing "too much, too soon", but rather the cost to Australian jobs of doing "too little, too late".

Risks of Weak Action

The debate is not about doing "too much, too soon" to reduce our pollution. The debate is about how much it will cost Australian jobs, our economy and the quality of life in this country if we do "too little, too late".

The modelling provides evidence that a "wait-and-see" approach to a changing climate has severe, negative outcomes for Australia, environmentally and economically. Now is the time to institute a suite of targeted pollution reduction programs to maximise environmental, economic and employment outcomes.

A recent report by the International Energy Agency highlights this risk in the global context. The IEA found each year of delay in implementing the investment required to avoid climate change, "adds an extra US$500 billion to the investment needed between 2010 and 2030 in the energy sector".[23]

Australia will also face these significant costs of delay including worse outcomes on jobs and living standards across the nation, as the results demonstrate.

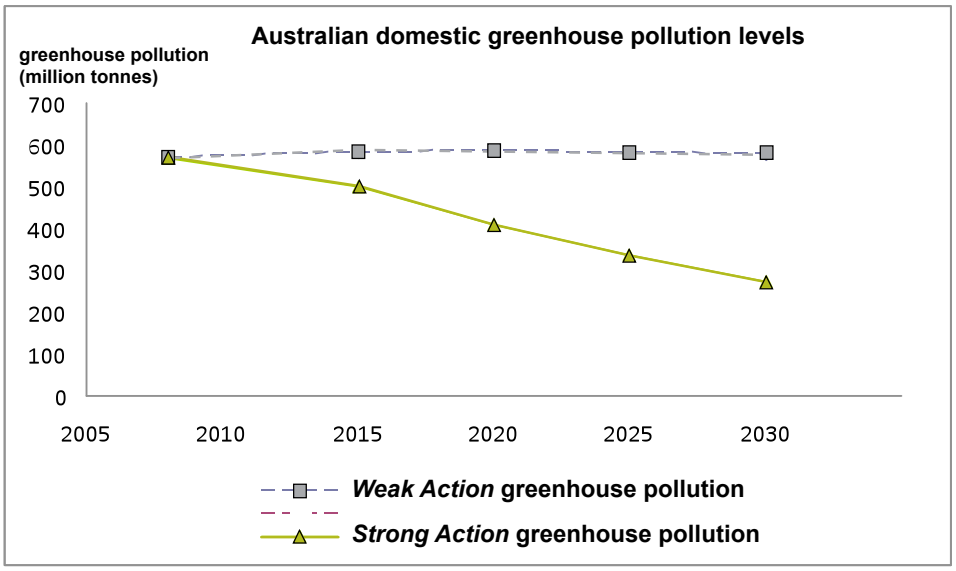
Relying on international emissions trading is not the most effective way for Australia to respond to the economic imperatives created by climate change.

If Australia fails to cut its domestic pollution levels, the results show we will expose ourselves to substantial declines in welfare[24] by the 2020s, along with higher unemployment rates. This is because purchasing imported permits results in Australian money going to improve the industries of other countries rather than our own.

23 IEA (2009), World Energy Outlook 2009, OECD/IEA, Paris. Quote from IEA Press Release, 6 October 2009, Accessed: http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=290

24 As measured by private and public consumption expenditures per capita

The scale of the reliance on imported permits under the *Weak Action* scenario is shown in the graph below. The gap in Australia's domestic greenhouse pollution between the *Weak Action* and *Strong Action* scenarios must be filled by pollution permit imports.



In the modelling, this cost takes the form of Australia spending hundreds of billions of dollars to buy pollution permits from other countries. Indeed the reliance on permit imports costs almost $50 billion each year by 2030 under *Weak Action* – a direct drain on Australia's economy with little domestic benefit. This contributes to a cumulative decrease in welfare expenditures of $650 billion compared to the comprehensive response which makes the most of opportunities for new industries.

It may or may not be economically more efficient at a global scale to rely on the international market, but Australia relying heavily on pollution permit imports will be to the detriment of our industry and jobs. And we will also pay with our standard of living.

There are three more macro-economic reasons why Australia should not rely on imported permits.

Firstly, permit imports do not yield goods or services, and are hence more akin to interest payments on debt than they are to regular imports. In order to pay for them, either export production must be increased or imports of goods and services must be curtailed. In other words, they can depress living standards.

Secondly, Australia has accumulated a high level of international debt. This debt can only be financed if overseas lenders are confident that Australia can service its debts, which means that they are continually looking for evidence that export revenues are likely to increase and that import expenditures are under control. A heavy reliance on imported permits to the extent of the *Weak Action* scenario does nothing to reassure these lenders

Thirdly, if other countries take a *Weak Action* approach, this could result in significant upward pressure on the international pollution permit price. This could lead to a significantly worse outcome for Australia resulting in an even larger future expense burden.

While the price and availability of internationally acceptable pollution permits is highly uncertain, especially in the absence of a treaty, we know quite clearly the cost of abatement opportunities in Australia, and they therefore represent a much more predictable expense.

The recent Climate Works Australia report, for example, demonstrates that Australia can reduce greenhouse pollution by 25 per cent by 2020 at a cost of $185 per household. Almost one third of the identified abatement opportunities offer a net savings to society, with the remaining two thirds having a weighted average cost of $41 per tonne of CO_2-e.[25]

Post 2030

Importantly, the gap between the benefits of *Strong Action* and the costs of *Weak Action* will widen after 2030.

With weak action, wealth and jobs that come from the new technologies for generating clean energy and more environmentally friendly goods and services will continue to be forfeited and the gap between actual pollution levels and international expectations will continue to grow.

Catching up in the clean energy race

Many countries around the world have already realised the costs of inaction. Our competitors in China, South Korea and increasingly the US, are cleaning up their economies and cashing in on clean energy technologies. Australia risks being left behind and left out of the global transition to a cleaner economy. Without *Strong Action*, (a pollution price plus complementary measures), we face a greater risk of losing the chance to develop our own industries to build our own capabilities and to grow jobs in a clean energy economy.

Already Australia has witnessed many renewable energy companies moving offshore due to a lack of domestic support, taking with them technologies and expertise developed in Australia.[26] If this trend is allowed to continue, Australia is likely to become a net importer, rather than exporter, of clean energy technologies in the future.

25 Climate Works Australia (2010), *Low Carbon Growth Plan for Australia*, March 2010
26 See for example: Ausra, Suntec, Ceramic Fuel Cells, Vestas and Solar Systems.

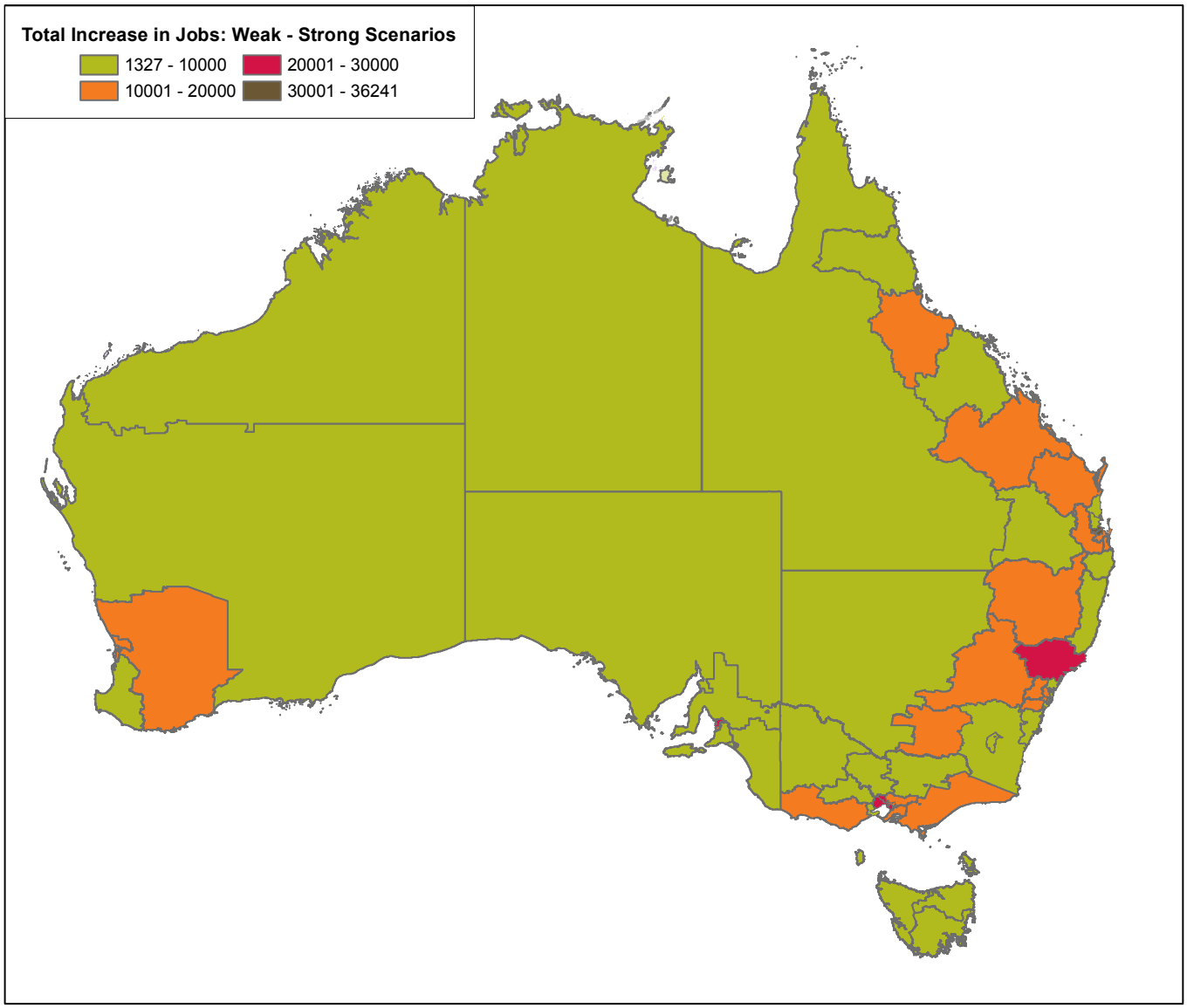
This report arrives at similar conclusions to the UK's Aldersgate Group, a high level coalition of business and environmental groups. The Aldersgate Group said:

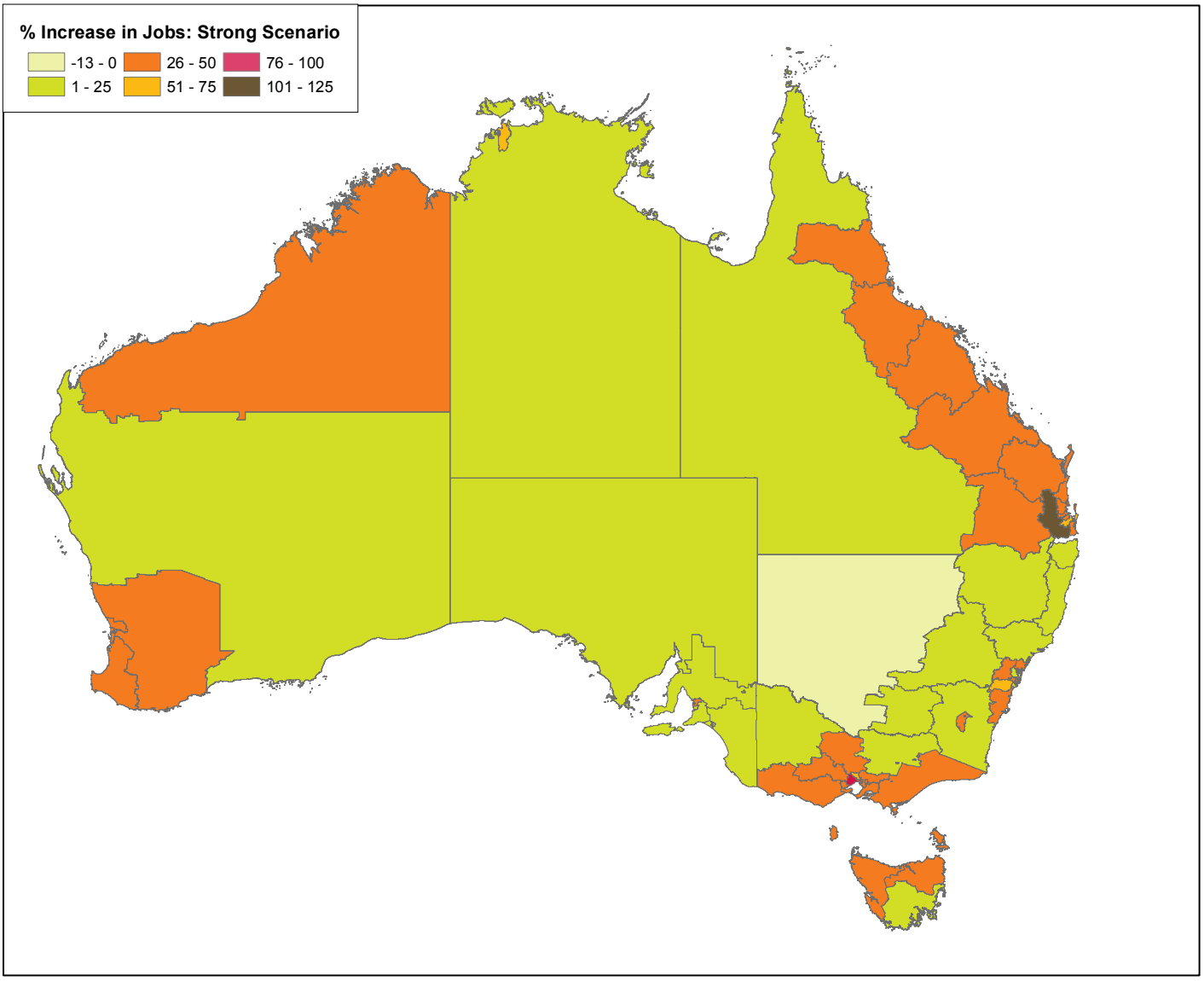
> *"It is important to note that the vast capital flows required to finance the low carbon transition should be regarded as an investment rather than a cost. If well managed, the transition would strengthen the UK's manufacturing base, leading to extensive job creation and competitive advantage in high growth low carbon sectors. Furthermore, the costs of inaction or delay would be considerably greater and there are substantial savings (up to GBP 12.6 bill a year) in terms of reduced imports of fossil fuels".*[27]

The results show a targeted investment program to reduce Australia's pollution and build our competitiveness in a global clean energy economy delivers more jobs, lower debt, savings for households from lower energy costs, a higher standard of living and a healthier and more resilient environment.

We must take decisive action now to capture the current opportunities to create jobs and new industries to ensure a prosperous economy, healthy planet and resilient Australia.

27 Aldersgate Group (2009), Financing the Transition: A strategy to deliver carbon targets, October 2009. Accessed: http://www.aldersgategroup.org.uk/reports


Total Increase in Jobs: Weak - Strong Scenarios
1327 - 10000
10001 - 20000
20001 - 30000
30001 - 36241


% Increase in Jobs: Strong Scenario
-13 - 0
26 - 50
76 - 100
1 - 25
51 - 75
101 - 125

Regional and Sector Employment Results - *Strong Action* verses *Weak Action*

EMPLOYMENT NUMBERS *STRONG ACTION* VS *WEAK ACTION*		Increase agri/mining employment	Increase manufacturing employment	Increase in construction employment	Increase in service industry	Total employment increase
ACT:	ACT	449	847	869	7,331	9,496
NSW:	NSW Central Coast	227	664	1,373	2,451	4,715
	NSW Central West	3,721	974	2,274	3,935	10,904
	NSW Far West	3,550	302	919	-2,943	1,828
	NSW Hunter	1,113	5,132	5,350	10,712	22,307
	NSW Illawarra	464	1,125	1,445	6,108	9,142
	NSW Mid North Coast	828	659	710	4,166	6,363
	NSW North	7,190	1,009	790	3,983	12,972
	NSW Richmond Tweed	635	463	789	3,374	5,261
	NSW Riverina	3,788	969	916	4,627	10,299
	NSW Southern Tablelands	1,925	733	3,480	2,587	8,724
	Sydney Central	504	2,282	3,713	23,045	29,544
	Sydney Eastern Beaches	73	327	303	3,262	3,965
	Sydney Northern Beaches	215	536	402	4,016	5,169
	Sydney Old West	108	728	443	4,897	6,175
	Sydney Outer North	561	1,972	491	8,260	11,284
	Sydney Outer South West	584	5,237	1,107	10,752	17,680
	Sydney Outer West	640	5,256	1,525	12,174	19,594
	Sydney Parramatta-Bankstown	289	3,925	1,719	13,568	19,502
	Sydney South	136	907	1,044	5,853	7,940
NT:	NT Darwin	157	333	310	2,320	3,120
	NT Lingiari	2,755	404	1,531	243	4,933
QLD:	QLD Cairns	2,346	752	1,945	3,597	8,640
	QLD Darling Downs	3,621	1,223	852	3,617	9,313
	QLD Fitzroy	1,836	1,651	2,207	4,379	10,073
	QLD Mackay	3,049	1,233	1,106	4,288	9,676
	QLD North	7,234	1,516	1,590	6,559	16,899
	QLD Resource region	1,880	342	1,972	34	4,228
	QLD Wide Bay Burnett	3,860	1,130	1,847	5,288	12,125
	SEQ Gold Coast	429	2,328	1,479	10,655	14,891
	SEQ Moreton Bay	513	1,709	602	6,314	9,138
	SEQ Sunshine Coast	695	1,009	588	5,511	7,803
	SEQ West Moreton	1,191	2,713	1,507	7,025	12,436
	SEQ Brisbane City	925	4,867	4,308	26,142	36,241
	SEQ Brisbane South	505	3,509	937	9,039	13,990
SA:	SA Mallee South East	4,177	607	1,172	2,277	8,233
	SA Mid North Riverland	3,298	514	1,142	924	5,878
	SA Spencer Gulf	1,356	682	3,572	-1,023	4,588
	Adelaide Inner	276	1,067	1,421	8,030	10,795
	Adelaide North	519	8,803	1,714	10,644	21,680

EMPLOYMENT NUMBERS *STRONG ACTION* VS *WEAK ACTION*		Increase agri/mining employment	Increase manufacturing employment	Increase in construction employment	Increase in service industry	Total employment increase
	Adelaide South	798	1,770	1,208	4,507	8,283
	Adelaide South	798	1,770	1,208	4,507	8,283
TAS:	TAS Hobart-South	839	640	2,045	3,829	7,353
	TAS North	1,526	736	2,203	2,410	6,874
	TAS North West	1,377	884	2,569	1,536	6,366
VIC:	VIC Ballarat	1,190	1,404	1,506	3,140	7,239
	VIC Bendigo	1,513	1,383	1,561	4,304	8,761
	VIC Geelong	111	2,952	465	-190	3,338
	VIC Gippsland	1,485	867	5,370	2,472	10,193
	VIC Mallee Wimmera	5,024	743	310	3,278	9,355
	VIC North East	1,458	713	1,660	3,177	7,007
	VIC West	3,719	894	3,405	2,499	10,517
	Melbourne Central	504	2,011	2,217	21,550	26,282
	Melbourne East	247	4,653	857	12,339	18,096
	Melbourne North	422	10,921	2,298	13,212	26,851
	Melbourne North East	761	2,571	1,416	9,326	14,073
	Melbourne Outer South East	904	3,228	1,546	10,183	15,860
	Melbourne South East	417	10,869	1,711	14,856	27,854
	Melbourne West	554	10,325	2,696	13,296	26,872
WA:	WA Gascoyne Goldfields	2,080	504	3,542	-255	5,871
	WA Peel South West	1,302	1,141	3,293	3,800	9,536
	WA Pilbara Kimberley	831	467	2,937	1,169	5,404
	WA Wheatbelt Great Southern	6,057	787	1,388	2,952	11,184
	Perth Central	498	1,987	3,332	14,154	19,972
	Perth Outer North	576	4,089	1,398	8,425	14,489
AUSTRALIA TOTALS:		102,422	140,684	115,532	412,525	771,164

Index of Region Membership

Region	Local Government Area
ACT	Unincorporated ACT
Adelaide Inner	Adelaide (C)
	Burnside (C)
	Holdfast Bay (C)
	Marion (C)
	Mitcham (C)
	Norwood Payneham St Peters (C)
	Unley (C)
	Walkerville (M)
	West Torrens (C)
Adelaide North	Campbelltown (C)
	Charles Sturt (C)
	Gawler (T)
	Playford (C)
	Port Adelaide Enfield (C)
	Prospect (C)
	Salisbury (C)
Adelaide South	Adelaide Hills (DC)
	Alexandrina (DC)
	Mount Barker (DC)
	Onkaparinga (C)
	Tea Tree Gully (C)
	Victor Harbor (C)
	Yankalilla (DC)
Melbourne Central	Glen Eira (C)
	Melbourne (C)
	Port Phillip (C)
	Stonnington (C)
	Yarra (C)
Melbourne East	Boroondara (C)
	Knox (C)
	Maroondah (C)
	Whitehorse (C)
Melbourne South East	Bayside (C)
	Greater Dandenong (C)
	Kingston (C)
	Monash (C)
Melbourne North	Darebin (C)
	Hume (C)
	Moonee Valley (C)
	Moreland (C)
Melbourne North East	Banyule (C)
	Manningham (C)
	Nillumbik (S)
	Whittlesea (C)
	Yarra Ranges (S)
Melbourne Outer South East	Cardinia (S)
	Casey (C)
	Frankston (C)
	Mornington Peninsula (S)

Region	Local Government Area
Melbourne West	Brimbank (C)
	Hobsons Bay (C)
	Maribyrnong (C)
	Melton (S)
	Wyndham (C)
NSW Central Coast	Gosford (C)
	Wyong (A)
NSW Central West	Bathurst Regional (A)
	Bland (A)
	Blayney (A)
	Cabonne (A)
	Cowra (A)
	Dubbo (C)
	Forbes (A)
	Gilgandra (A)
	Lithgow (C)
	Mid-Western Regional (A)
	Narromine (A)
	Oberon (A)
	Orange (C)
	Parkes (A)
	Warrumbungle Shire (A)
	Weddin (A)
	Wellington (A)
NSW Far West	Balranald (A)
	Bogan (A)
	Bourke (A)
	Brewarrina (A)
	Broken Hill (C)
	Carrathool (A)
	Central Darling (A)
	Cobar (A)
NSW Far West	Coonamble (A)
	Deniliquin (A)
	Hay (A)
	Jerilderie (A)
	Lachlan (A)
	Murray (A)
	Unincorporated NSW
	Wakool (A)
	Walgett (A)
	Warren (A)
	Wentworth (A)
NSW Hunter	Cessnock (C)
	Dungog (A)
	Gloucester (A)
	Great Lakes (A)
	Lake Macquarie (C)
	Maitland (C)
	Muswellbrook (A)
	Newcastle (C)
	Port Stephens (A)

Region	Local Government Area
	Singleton (A)
	Upper Hunter Shire (A)
NSW Illawarra	Kiama (A)
	Shellharbour (C)
	Shoalhaven (C)
	Wingecarribee (A)
	Wollongong (C)
NSW Mid North Coast	Bellingen (A)
	Clarence Valley (A)
	Coffs Harbour (C)
	Greater Taree (C)
	Kempsey (A)
	Nambucca (A)
	Port Macquarie-Hastings (A)
NSW North	Armidale Dumaresq (A)
	Glen Innes Severn (A)
	Gunnedah (A)
	Guyra (A)
	Gwydir (A)
	Inverell (A)
	Liverpool Plains (A)
	Narrabri (A)
	Tamworth Regional (A)
	Tenterfield (A)
	Uralla (A)
	Walcha (A)
NSW Richmond Tweed	Ballina (A)
	Byron (A)
	Kyogle (A)
	Lismore (C)
	Richmond Valley (A)
	Tweed (A)
NSW Riverina	Albury (C)
	Berrigan (A)
	Coolamon (A)
	Cootamundra (A)
	Corowa Shire (A)
	Greater Hume Shire (A)
	Griffith (C)
	Junee (A)
	Leeton (A)
	Lockhart (A)
	Murrumbidgee (A)
	Narrandera (A)
	Temora (A)
	Urana (A)
	Wagga Wagga (C)
NSW Southern Table-lands	Bega Valley (A)
	Bombala (A)

Region	Local Government Area
	Boorowa (A)
	Cooma-Monaro (A)
	Eurobodalla (A)
	Goulburn Mulwaree (A)
	Gundagai (A)
	Harden (A)
	Palerang (A)
	Queanbeyan (C)
	Snowy River (A)
	Tumbarumba (A)
	Tumut Shire (A)
	Upper Lachlan Shire (A)
	Yass Valley (A)
NT Darwin	Coomalie (S)
	Darwin (C)
	Darwin Rates Area
	Litchfield (S)
	Palmerston (C)
NT Lingiari	Alice Springs (T)
	Barkly (S)
	Belyuen (S)
	Central Desert (S)
	East Arnhem (S)
	Katherine (T)
	MacDonnell (S)
	Roper Gulf (S)
	Tiwi Islands (S)
	Unincorporated NT
	Victoria-Daly (S)
	Wagait (S)
	West Arnhem (S)
Perth Central	Belmont (C)
	Cambridge (T)
	Canning (C)
	Claremont (T)
	Cottesloe (T)
	East Fremantle (T)
	Fremantle (C)
	Mosman Park (T)
	Nedlands (C)
	Peppermint Grove (S)
	Perth (C)
	South Perth (C)
	Stirling (C)
	Subiaco (C)
	Victoria Park (T)
	Vincent (T)
Perth Outer North	Bassendean (T)
	Bayswater (C)
	Joondalup (C)

Region	Local Government Area
	Mundaring (S)
	Swan (C)
	Wanneroo (C)
	Cockburn (C)
	Gosnells (C)
	Kalamunda (S)
	Kwinana (T)
	Melville (C)
	Rockingham (C)
QLD Cairns	Cairns (R)
	Cassowary Coast (R)
	Tablelands (R)
	Yarrabah (S)
QLD Darling Downs	Western Downs (RC)
	Goondiwindi (R)
	Southern Downs (R)
	Toowoomba (R)
QLD Fitzroy	Banana (S)
	Central Highlands (R)
	Gladstone (R)
	Rockhampton (R)
	Woorabinda (S)
QLD Mackay	Isaac (R)
	Mackay (R)
	Whitsunday (R)
QLD North	Burdekin (S)
	Burdekin (S)
	Hinchinbrook (S)
	Palm Island (S)
	Townsville (C)
QLD Resource region	Aurukun (S)
	Balonne (S)
	Barcaldine (R)
	Barcoo (S)
	Blackall Tambo (R)
	Boulia (S) Bulloo (S)
	Burke (S)
	Carpentaria (S)
	Cloncurry (S)
	Cook (S)
	Croydon (S)
	Diamantina (S)
QLD Resource region	Doomadgee (S)
	Etheridge (S)
	Flinders (S)
	Hope Vale (S)
	Kowanyama (S)
	Lockhart River (S)
	Longreach (R)
	Mapoon (S)
	McKinlay (S)

Region	Local Government Area
	Mornington (S)
	Mount Isa (C)
	Murweh (S)
	Napranum (S)
	Northern Peninsula Area (R)
	Paroo (S)
	Pormpuraaw (S)
	Quilpie (S)
	Richmond (S)
	Roma (R)
	Torres (S)
	Torres Strait Island (R)
	Weipa (T)
	Winton (S)
	Wujal Wujal (S)
QLD Wide Bay Burnett	Bundaberg (R)
	Cherbourg (S)
	Fraser Coast (R)
	Gympie (R)
	North Burnett (R)
	South Burnett (R)
SA Mallee South East	Grant (DC)
	Kangaroo Island (DC)
	Karoonda East Murray (DC)
	Kingston (DC)
	Mount Gambier (C)
	Murray Bridge (RC)
	Naracoorte and Lucindale (DC)
	Robe (DC)
	Southern Mallee (DC)
	Tatiara (DC)
SA Mallee South East	The Coorong (DC)
	Wattle Range (DC)
SA Mid North Riverland	Barossa (DC)
	Barunga West (DC)
	Berri and Barmera (DC)
	Clare and Gilbert Valleys (DC)
	Copper Coast (DC)
	Goyder (DC)
	Light (RegC)
	Loxton Waikerie (DC)
	Mallala (DC)
	Mid Murray (DC)
	Northern Areas (DC)
	Orroroo/Carrieton (DC)
	Peterborough (DC)
	Renmark Paringa (DC)
	Wakefield (DC)
	Yorke Peninsula (DC)
SA Spencer Gulf	Anangu Pitjantjatjara (AC)

Region	Local Government Area
	Ceduna (DC)
	Cleve (DC)
	Coober Pedy (DC)
	Elliston (DC)
	Flinders Ranges (DC)
	Franklin Harbour (DC)
	Kimba (DC)
	Le Hunte (DC)
	Lower Eyre Peninsula (DC)
	Maralinga Tjarutja (AC)
	Mount Remarkable (DC)
	Port Augusta (C)
	Port Lincoln (C)
	Port Pirie City and Dists (M)
	Roxby Downs (M)
	Streaky Bay (DC)
	Tumby Bay (DC)
	Unincorporated SA
	Whyalla (C)
SEQ Brisbane City	Brisbane (C)
SEQ Brisbane South	Logan (C)
	Redland (C)
SEQ Gold Coast	Gold Coast (C)
SEQ Moreton Bay	Moreton Bay (R)
SEQ Sunshine Coast	Sunshine Coast (R)
SEQ West Moreton	Ipswich (C)
	Lockyer Valley (R)
	Scenic Rim (R)
	Somerset (R)
Sydney Central	Botany Bay (C)
	Canada Bay (A)
	Hunters Hill (A)
	Lane Cove (A)
	Leichhardt (A)
	North Sydney (A)
	Ryde (C)
	Sydney (C)
	Willoughby (C)
Sydney Eastern Beaches	Randwick (C)
	Waverley (A)
	Woollahra (A)
Sydney Northern Beaches	Manly (A)
	Mosman (A)
	Pittwater (A)
	Warringah (A)
Sydney Old West	Ashfield (A)
	Burwood (A)
	Canterbury (C)
	Marrickville (A)

Region	Local Government Area
	Strathfield (A)
Sydney Outer North	Baulkham Hills (A)
	Hornsby (A)
	Ku-ring-gai (A)
Sydney Outer South West	Camden (A)
	Campbelltown (C)
	Liverpool (C)
	Wollondilly (A)
Sydney Outer West	Blacktown (C)
	Blue Mountains (C)
	Hawkesbury (C)
Sydney Parramatta-Bankstown	Auburn (A)
	Bankstown (C)
	Fairfield (C)
	Holroyd (C)
	Parramatta (C)
Sydney South	Hurstville (C)
	Kogarah (A)
	Rockdale (C)
	Sutherland (A)
TAS Hobart-South	Brighton (M)
	Central Highlands (M)
	Clarence (C)
	Derwent Valley (M)
	Glamorgan/Spring Bay (M)
	Glenorchy (C)
	Hobart (C)
	Huon Valley (M)
	Kingborough (M)
	Sorell (M)
	Southern Midlands (M)
	Tasman (M)
TAS North	Break O'Day (M)
	Dorset (M)
	Flinders (M)
	George Town (M)
	Launceston (C)
	Meander Valley (M)
	Northern Midlands (M)
	West Tamar (M)
TAS North West	Burnie (C)
	Central Coast (M)
	Circular Head (M)
	Devonport (C)
	Kentish (M)
	King Island (M)
	Latrobe (M)
	Waratah/Wynyard (M)
	West Coast (M)
VIC Ballarat	Ararat (RC)

Region	Local Government Area
	Ballarat (C)
	Central Goldfields (S)
	Hepburn (S)
	Moorabool (S)
	Pyrenees (S)
VIC Bendigo	Campaspe (S)
	Greater Bendigo (C)
	Loddon (S)
	Macedon Ranges (S)
	Mitchell (S)
	Mount Alexander (S)
VIC Geelong	Greater Geelong (C)
	Queenscliffe (B)
VIC Gippsland	Bass Coast (S)
	Baw Baw (S)
	East Gippsland (S)
	Latrobe (C)
	South Gippsland (S)
	Wellington (S)
VIC Mallee Wimmera	Buloke (S)
	Gannawarra (S)
	Hindmarsh (S)
	Horsham (RC)
	Mildura (RC)
	Northern Grampians (S)
	Swan Hill (RC)
	West Wimmera (S)
	Yarriambiack (S)
VIC North East	Alpine (S)
	Benalla (RC)
	Greater Shepparton (C)
	Indigo (S)
	Mansfield (S)
	Moira (S)
	Murrindindi (S)
	Strathbogie (S)
	Towong (S)
	Wangaratta (RC)
	Wodonga (RC)
VIC West	Colac-Otway (S)
	Corangamite (S)
	Glenelg (S)
	Golden Plains (S)
	Moyne (S)
	Southern Grampians (S)
WA Gascoyne Goldfields	Carnamah (S)
	Carnarvon (S)
	Chapman Valley (S)
	Coolgardie (S)
	Coorow (S)

Region	Local Government Area
	Cue (S)
	Dundas (S)
	Esperance (S)
	Exmouth (S)
	Geraldton-Greenough (C)
	Irwin (S)
	Kalgoorlie/Boulder (C)
	Laverton (S)
	Leonora (S)
	Meekatharra (S)
	Menzies (S)
	Mingenew (S)
	Morawa (S)
	Mount Magnet (S)
	Mullewa (S)
	Murchison (S)
	Ngaanyatjarraku (S)
	Northampton (S)
	Perenjori (S)
	Ravensthorpe (S)
	Sandstone (S)
	Shark Bay (S)
	Three Springs (S)
	Upper Gascoyne (S)
	Wiluna (S)
	Yalgoo (S)
WA Peel South West	Augusta-Margaret River (S)
	Boddington (S)
	Boyup Brook (S)
	Bridgetown-Greenbushes (S)
	Bunbury (C)
	Busselton (S)
	Capel (S)
	Collie (S)
	Dardanup (S)
	Donnybrook-Balingup (S)
WA Peel South West	Harvey (S)
	Mandurah (C)
	Manjimup (S)
	Murray (S)
	Nannup (S)
	Serpentine-Jarrahdale (S)
	Waroona (S)
WA Pilbara Kimberley	Ashburton (S)
	Broome (S)
	Derby-West Kimberley (S)
	East Pilbara (S)
	Halls Creek (S)
	Port Hedland (T)
	Roebourne (S)
	Wyndham-East Kimberley (S)
WA Wheatbelt Great Southern	Albany (C)

Region	Local Government Area
	Beverley (S)
	Brookton (S)
	Broomehill-Tambellup (S)
	Bruce Rock (S)
	Chittering (S)
	Corrigin (S)
	Cranbrook (S)
	Cuballing (S)
	Cunderdin (S)
	Dalwallinu (S)
	Dandaragan (S)
	Denmark (S)
	Dowerin (S)
	Dumbleyung (S)
	Gingin (S)
	Gnowangerup (S)
	Goomalling (S)
WA Wheatbelt Great Southern	Jerramungup (S)
	Katanning (S)
	Kellerberrin (S)
	Kent (S)
	Kojonup (S)
	Kondinin (S)
	Koorda (S)
	Kulin (S)
	Lake Grace (S)

Region	Local Government Area
	Merredin (S)
	Moora (S)
	Mount Marshall (S)
	Mukinbudin (S)
	Narembeen (S)
	Narrogin (S)
	Narrogin (T)
	Northam (S)
	Nungarin (S)
	Pingelly (S)
	Plantagenet (S)
	Quairading (S)
	Tammin (S)
	Toodyay (S)
	Trayning (S)
	Victoria Plains (S)
	Wagin (S)
	Wandering (S)
	West Arthur (S)
	Westonia (S)
	Wickepin (S)
	Williams (S)
	Wongan-Ballidu (S)
	Woodanilling (S)
	Wyalkatchem (S)
	Yilgarn (S)
	York (S)

Authorised by Don Henry, Australian Conservation Foundation, Level 1, 60 Leicester St, Carlton VIC 3053

Printed by PrintTogether. 771 Nicholson Street, Carlton North 3054

AUSTRALIAN CONSERVATION FOUNDATION

FLOOR ONE, 60 LEICESTER STREET MELBOURNE VIC 3053
email ■ acf@acfonline.org.au
web ■ acfonline.org.au
tel ■ 03 9345 1111

ACTU
australian council of trade unions

LEVEL 6/365 QUEEN STREET MELBOURNE VIC 3000
email ■ help@actu.asn.au
web ■ actu.org.au
tel ■ 1300 362 223 (local call cost)