

Exporting climate change, killing the Reef:

Australia's post-Paris contributions



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GREENPEACE

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"To be true to its commitments in the Paris agreement the Australian government needs to stop its support for the coal industry, invest in renewable energy and thus protect our natural wonders such as the Great Barrier Reef."

Jennifer Morgan, Greenpeace International Executive Director

Clouds of smoke billow from under the haze in the gloomy sky in China, Shanxi province.

This year, Australia will produce nearly twice as much carbon dioxide (CO₂) emissions through the coal it exports than it emits domestically, worsening its overall contribution to climate change.

Since 1990, Australia's CO₂ exports through coal have increased by a massive 253%

Australia's economic and climate policies contravene its international obligation to safeguard the World Heritage-listed Great Barrier Reef, which is under severe threat from climate change.

Executive summary

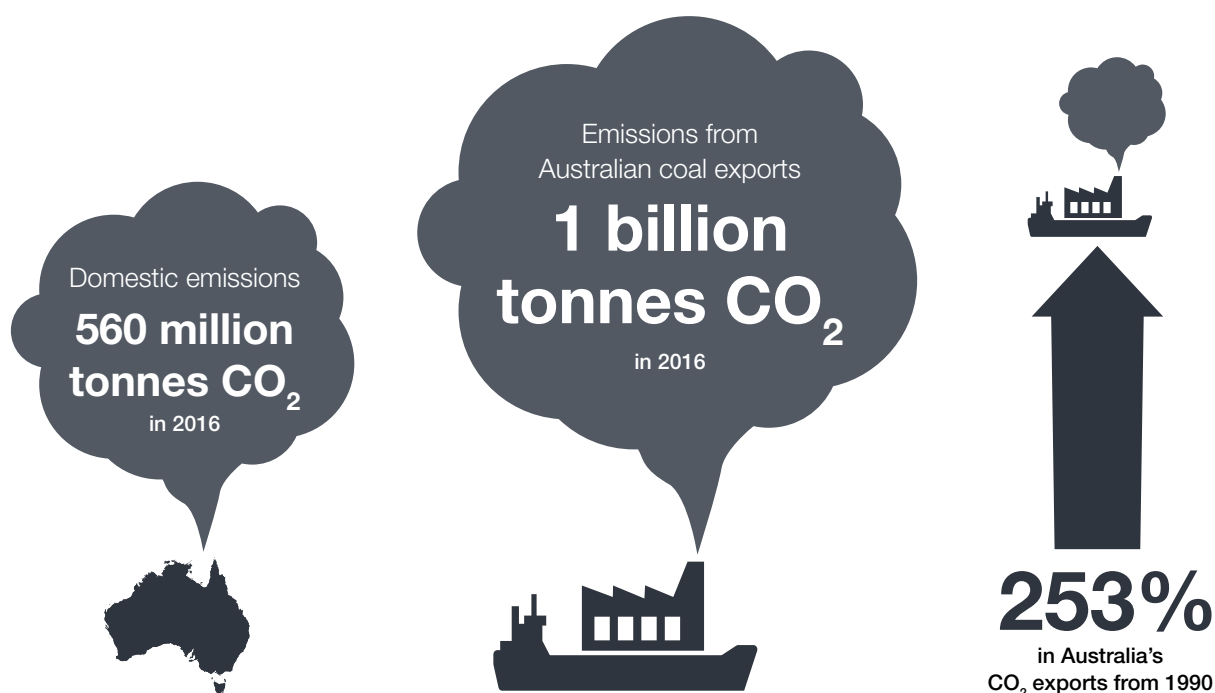
Australia represents itself as an overachiever in global efforts to combat climate change¹ but despite its commitment to the Paris Agreement, the rapid growth in its fossil fuel exports show Australia's **overall contribution to global climate change is getting worse, not better.**

This year, Australia will export a billion tonnes of carbon dioxide (CO₂) in its coal—more than it plans to save domestically between 2020 and 2030.² If its coal exports grow by over 60%, as the Australian Government projects, the resulting increase in carbon emissions will erase the benefit of Australia meeting its Paris target nearly seven times over.³

By refusing to acknowledge its full contribution to global carbon emissions, Australia is ignoring the most serious long-term threat to its World Heritage-listed Great Barrier Reef—climate change. The Reef is currently experiencing its worst coral bleaching event in history along 1,000 kilometres of its northern section because of warming waters.

With scientists forecasting that coral bleaching may become an annual event as global temperatures rise⁴, Australia's climate change policy weaknesses have serious implications for the world's natural environment.

In these circumstances, Australia's response to climate change cannot be credible so long as it sends more carbon emissions abroad than it saves at home. The rapid expansion of coal exports is incompatible with effective global action to curb climate change and prevent the devastation of the Great Barrier Reef and other environmental treasures.



2

Exporting carbon emissions

Despite Australia's commitment under the Paris Agreement to reduce its greenhouse gas emissions by 26 to 28 per cent from 2005 levels by 2030, its overall contribution to climate change is worsening through its determined expansion of fossil fuel exports, especially coal.

For most countries ratifying the Paris Agreement, national commitments to cut emissions guarantee a reduced contribution to climate change. This is not the case for Australia, where increasing carbon exports – mainly in coal – dwarf emission savings promised domestically.

Because the global carbon accounting system that the Paris Agreement operates under counts emissions where they occur, fossil fuel exporters like Australia can increase production with impunity, knowing the combustion emissions count elsewhere, and are not subject to their national commitments.

Since the early 1990s, when global climate negotiations began, Australia has sought to make the most of this opportunity – growing its coal exports and disowning the consequences. This has helped to suppress coal prices, making the dirtiest option more competitive for longer in electricity generation and in steelmaking.

The scale of carbon dioxide (CO₂) now being exported in Australian coal becomes clear when it is compared with domestic emissions over time.

In 1990, the year against which Australia's Kyoto Protocol target was measured, total emissions within Australia were 551 million tonnes of CO₂.⁵ At the time, Australia exported 113 million tonnes of coal.⁶ On average, for every Australian tonne of coal exported, 2.5 tonnes of CO₂ is emitted elsewhere when it is used.⁷

So, in 1990, Australia's seaborne coal export industry was effectively creating 283 million tonnes of CO₂ in its coal.

Today, Australia's domestic CO₂ emissions are 560 million tonnes – not much higher than in 1990, mainly because reduced land clearing has offset emissions growth.⁸ However, coal exports have risen to 400 million tonnes.

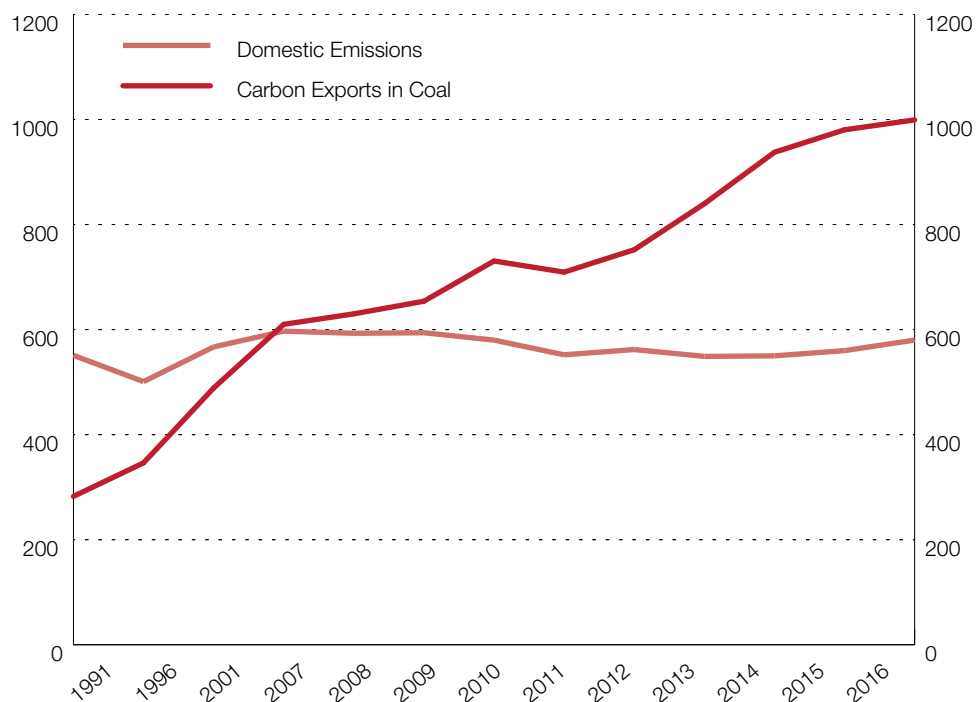
As a result, and almost completely unnoticed, 1 billion tonnes of CO₂ will be generated offshore by Australian coal this year.⁹ This represents a massive increase of 253% in Australian CO₂ exports from 1990.

Today, Australia is exporting nearly twice as much CO₂ as it is producing domestically.¹⁰

In the next five years, the emissions Australia exports in coal could overtake the CO₂ currently exported in Saudi Arabian oil.¹¹ For that to occur, it would take just one or two of the larger new coal mines being proposed in Australia to be built.¹² At last count, the Australian Government identified 49 new coal projects that are either publicly announced, or at the feasibility stage.¹³

Australia: Domestic Emissions vs Carbon Exports in Coal

(million tonnes CO₂-e per annum)



Sources: National Greenhouse Gas Inventory Trend (2016); Energy In Australia 2015 (Data Charts), (2015) Office of the Chief Economist, Department of Industry, Innovation and Science; Resources & Energy Quarterly – December 2015 (2015) Office of the Chief Economist

Race to the bottom

Globally, many financial analysts believe coal is in structural decline.¹⁴ The Australian coal industry is struggling with oversupply, stagnant demand, low prices and investor uncertainty. However, low prices have devalued the Australian dollar, helping to maintain competitiveness, and stave off the bankruptcies seen in the United States and elsewhere.

Unlike much of the world, Australia's government is betting on a bright future for coal, not on structural decline. It is working assiduously to prop up the industry and extend its longevity. Australia's aim is to ride out the downturn, and emerge with an even bigger share of a growing coal market.

While official government forecasts have diminished somewhat since the commodities boom waned, Australia still expects a substantial increase in coal exports.

As coal demand peaks and starts falling in OECD countries and China, it's a 'race to the bottom' strategy

that depends on selling more coal to developing countries, particularly in Asia, while there is still time. It also depends on some of the largest coal mines in history being built, the emissions consequences of which are staggering.

The two largest Australian mines proposed – including the Carmichael mega coal mine in the state of Queensland – would generate more CO₂ offshore than all of Australia's power stations and all the cars on its roads put together.¹⁵

By 2030, government projections suggest that coal exports could reach nearly 650 million tonnes, nearly two-thirds higher than today.¹⁶

Should that occur, Australia will be exporting 1.63 billion tonnes of CO₂ in coal each year – more than three and a half times what it generates domestically.¹⁷

**Canary in the coal mine:
bleaching on the Great Barrier Reef**

The Abbot Point coal terminal on the shores of the Great Barrier Reef is the site of a proposed expansion to export coal from the Carmichael mega mine.



Canary in the coal mine: bleaching on the Great Barrier Reef

As they stand, Australia's economic and climate change policies directly contradict the country's international obligations to safeguard the World Heritage-listed Great Barrier Reef. By refusing to acknowledge Australia's contribution to climate change through coal exports and weak domestic emissions reductions policies, the government is choosing to ignore what is known to be the greatest threat to the Great Barrier Reef's survival.¹⁸

Covering an area of 348,000 square kilometres along Australia's northeast coast, the Great Barrier Reef is the world's largest coral reef ecosystem and one of the few living structures visible from space. It is a globally unique treasure trove of marine biodiversity, home to thousands of species of marine animals, including more than 1,500 species of fish, about 400 species of hard coral, and one-third of the world's soft corals.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1981 put the Great Barrier Reef on the World Heritage list for its outstanding universal value, recognising that **'no other World Heritage property contains such biodiversity.'**¹⁹



Colour and diversity on the Great Barrier Reef

However, the health of the Great Barrier Reef is severely under threat, with anthropogenic climate change directly contributing to its degradation. The most pristine northern regions of the Reef are currently experiencing the worst coral bleaching on record due to climate change, and exacerbated by the El Niño weather system.

Canary in the coal mine: bleaching on the Great Barrier Reef

Severe coral bleaching at Lizard Island
in the northern Great Barrier Reef.



©The Ocean Agency

Climate change and the Great Barrier Reef

Bleaching

The Reef is currently undergoing **the worst coral bleaching event in recorded history**. Due to high ocean temperatures in the northern region of the Reef, partly caused by the current El Niño weather system, many sections of coral are bleaching and some are dying. The Great Barrier Reef Marine Park Authority (GBRMPA) in March 2016 issued the **highest possible response of level 3**, indicating that there is severe regional bleaching occurring.²⁰

Coral bleaching occurs when ocean temperatures stay at an elevated level. The warming causes the coral to expel zooxanthellae, the algae that live on them. Losing these algae places stress on the coral and turns it completely white. A reef is able to recover from bleaching, but only if the event is not too severe and does not last for more than eight weeks.

Many of the currently bleached corals are likely to die if the situation does not improve soon. Bleaching events on the Reef like the current one will become more frequent in the future and it is estimated that **bleaching could start occurring annually as soon as 2030**.²¹



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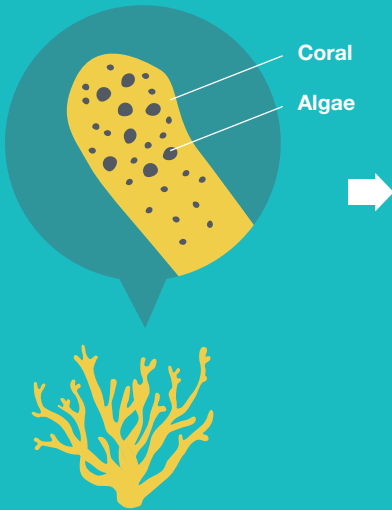
There are forty species of Sea Anemone on the Great Barrier Reef which are also prone to bleaching.

"Given the globally accepted link between carbon emissions, climate change and reef bleaching, the decision to approve the Carmichael coal mine in Queensland right next to the Great Barrier Reef really is adding insult to injury."

Prof. Justin Marshall, University of Queensland

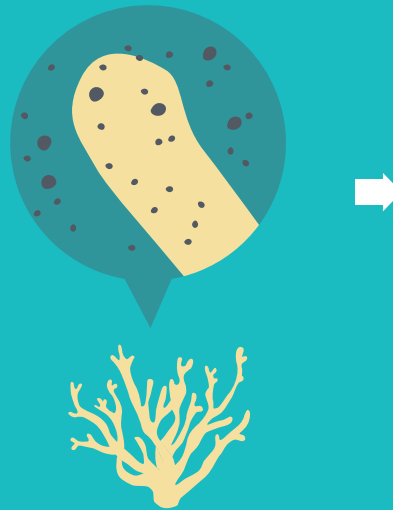
How does coral bleaching occur?

- 1 Healthy coral**
Coral and algae depend on each other to survive



Coral have a symbiotic relationship with the microscopic algae that live in their tissues. These algae are the coral's primary food source and give them their colour.

- 2 Stressed coral**
If stressed, algae leaves the coral



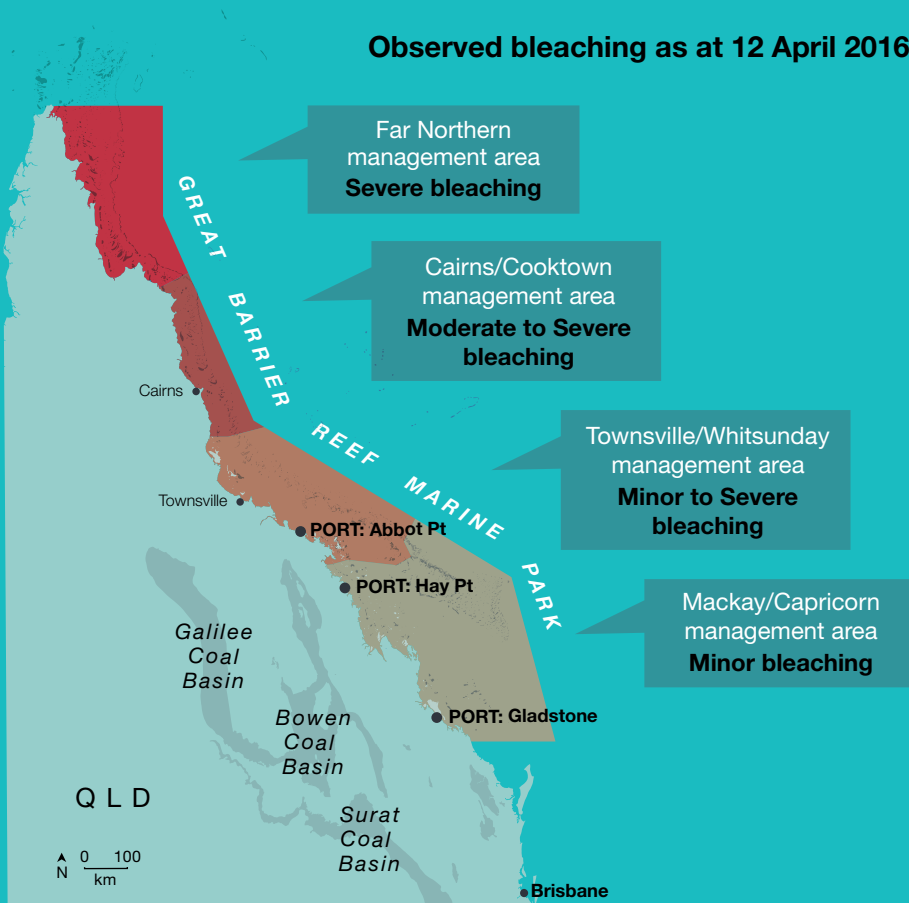
When this symbiotic relationship becomes stressed due to increased ocean temperature or pollution, the algae leave the coral's tissue.

- 3 Bleached coral**
Without algae, coral is left bleached and vulnerable



Without the algae, the coral loses its major source of food, turns white or very pale, and is more susceptible to disease.

Observed bleaching as at 12 April 2016



Mean sea surface temperatures for February and March 2016 over the Great Barrier Reef were the highest on record since 1900.

Canary in the coal mine:
bleaching on the Great Barrier Reef



More than 1500 species of fish rely on a healthy Great Barrier Reef.

©Dreamstime.com

Acidification

As greenhouse gases accumulate in the atmosphere, the oceans too are being affected. Oceans absorb carbon dioxide and it is estimated they have soaked up about 25% of the excess CO₂ that has been released by humans.²² Absorbing the CO₂ causes chemical changes to occur in the water and the oceans to become more acidic.

In fragile locations like the Great Barrier Reef, even small increases in acidity could lead to large impacts, such as entire areas of the Reef dying. This is because calcification, the process during which corals make their skeletons and shells, is greatly impacted by changes in acidity.

Current predictions indicate that the pH of waters on the Reef will fall from 8.2 to 7.8 by 2100, a level that would cause drastic damage.²³ It could take **more than 700 years** for the effects of acidification to be reversed.²⁴

Cyclones

Natural disasters directly threaten ecosystems like the Reef. When a cyclone passes through the Reef, corals break and seagrass meadows are impacted by flood plumes.²⁵ Losing these meadows impacts populations that rely on them, such as dugongs and turtles.

Warming temperatures caused by climate change will **increase the frequency and intensity** of cyclones over the next century. The worst example in recent history occurred in 2011, when Cyclone Yasi tore through the Reef, damaging about 13% of it.²⁶



©Greenpeace/Sewell

Widespread flooding across Queensland in 2011 led to open cut coal mines being submerged in water. Millions of litres of water was discharged from flooded coal mines and tailings dams into river systems, which flowed into the Great Barrier Reef. This created toxic blooms that stretched hundreds of kilometres across the Reef's pristine waters.

Reef or coal?

In 2007, the Australian Government flagged the threat of climate change to the Reef in announcing its five-year *Great Barrier Reef Climate Change Action Plan*. This plan recognised climate change as the greatest long-term threat to the Great Barrier Reef, and noted that:

“The high sensitivity of coral reef ecosystems to climate change creates opportunities for linking emission reduction strategies to improvements in the long-term health of the GBR.”²⁷

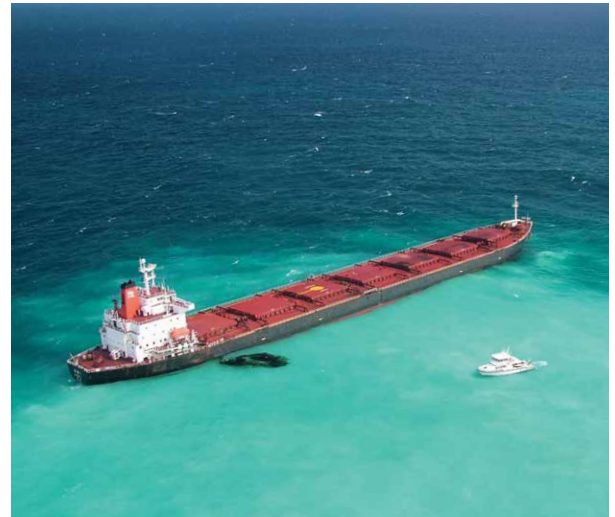
Strategies to mitigate and prepare for the impacts of climate change on the Reef included support for initiatives to reduce emissions.

In spite of this plan, the government has since persistently underplayed the threat to the Reef posed by the export of fossil fuels, the key driver of climate change.

Australia’s current Reef 2050 Long-Term Sustainability Plan, released in 2015 and delivered to UNESCO, aims to improve water quality, maintain biodiversity and minimise the impact of port development and shipping on the Reef.²⁸

However, in discussing the mitigation of climate change impacts on the Reef, the 2050 plan only refers to Australia’s domestic emissions target and makes a vague commitment to review its emissions targets post-2020. The plan still allows for growth in coastal development and an increase in coal ports and associated dredging activity, which would severely degrade the Reef.

The recent grant of federal and Queensland state environmental approvals for the Carmichael mega coal mine illustrates the lack of commitment to mitigating climate change and the direct, physical threats to the Reef. If Carmichael becomes operational, it is estimated that the mining and burning of its coal offshore will **generate 4.7 billion tonnes of greenhouse gas emissions** over its proposed 60-year operation.²⁹



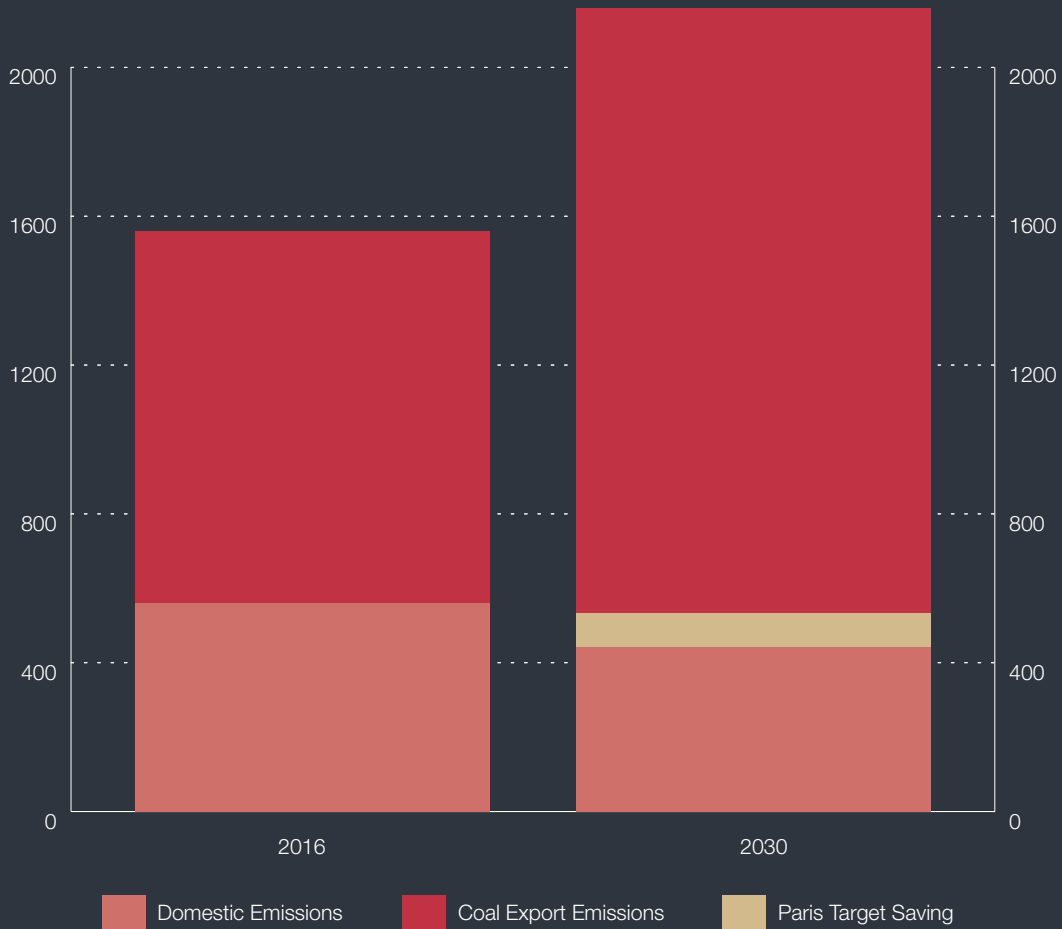
The coal carrier Shen Neng 1 ran into the Great Barrier Reef in 2010, severely damaging 115,000 square metres of reef. The ship owners have still not paid for the site to be cleaned-up.

Carmichael is slated to have a footprint ten times larger than the City of Sydney³⁰ and consume 12 billion litres of water every year.³¹ The mine would also demand an expansion of the Abbot Point Coal Terminal, on the Great Barrier Reef coast. This would involve dredging 1.1 million cubic metres of sea floor in the World Heritage Area and dumping it next to nearby wetlands that are nationally important.³² The expansion would increase the number of ships travelling through the Reef’s waters by up to 560 each year,³³ thereby increasing the chance of maritime accidents such as oil spills from ships, impacting on the Reef.

Highly toxic paint has not been removed from the Great Barrier Reef off of Gladstone six years after a coal ship crashed into the reef.

Australia: Paris Agreement 26-28% Emission Reduction Target vs Carbon Exports in Coal

(million tonnes CO₂-e per annum)



Sources: Resources & Energy Quarterly – December 2015 (2015) Office of the Chief Economist Australian Energy Projections to 2049-50 (2014) BREE; Australia's 2030 Emission Reduction Target – Factsheet, (2016) Commonwealth of Australia

Australia's climate change policy failures

Besides retarding global progress to mitigate climate change, Australia's efforts to disown the emission consequences of expanded coal production negate the benefit of its domestic climate response.

The Australian Government promotes its Emissions Reduction Fund – an AUD\$2.55 billion program through which it has purchased 92 million tonnes of emission reductions – as the centrepiece of its response to global climate change. Yet, the benefit of these purchases has already been erased **14 times over** by the increase in annual coal exports and the resulting emissions since the current government was elected in 2013.³⁴

The integrity of Australia's claim to honour its Paris Agreement emissions target is similarly compromised.

Australia aims to cut annual emissions from 533 million tonnes in 2020 to 441 million tonnes in 2030 – an annual saving of 92 million tonnes.³⁵ Yet, if annual coal exports expand from around 400 million tonnes towards the levels proposed by the government, carbon exports will increase and erase the benefit of Australia meeting its Paris target nearly 7 times over.³⁶

In these circumstances, Australia's response to climate change cannot be credible so long as it sends more carbon emissions abroad than it saves at home. The rapid expansion of coal exports is simply incompatible with effective global action against climate change.

Own goal

Although the Australian Government has committed to signing the Paris Agreement, it has yet to outline any meaningful policies for achieving its 2030 domestic emissions reduction goal.

While Australia is likely to have already met its own target of a 5% reduction on 2000 levels by 2020, this is by virtue of Australia's generous allowance under the Kyoto agreement and the carrying over of emissions reductions under that agreement. Instead, Australia's actual domestic emissions until 2020 are forecast **to rise by 6% on today's levels.**³⁷

While Australia's Emissions Reductions Fund could meet the country's Paris Agreement obligations, it would require a massive increase in this programme's budget. The Australian Industry Group estimates that cost to be AUD\$100-250 billion.³⁸ This would be both inefficient and prohibitively expensive for the Australian taxpayer, making it unlikely to ever be realised.

Coral reefs are highly vulnerable to the effects of climate change, and the Great Barrier Reef is not immune from this threat.

Malcolm Turnbull, Minister for the Environment and Water Resources, 2007

Recommendations

Heart Reef in the Whitsunday region of the Great Barrier Reef.



Recommendations

The most credible and efficient way to achieve Australia's Paris Agreement commitments is to halt any new coal mining or drilling for oil and gas, and to phase out all fossil fuels by 2050.


A suite of tools remains the best approach for reaching Australia's targets:

- Put an immediate halt on all new coal developments, including the proposed Galilee Basin projects and associated coastal infrastructure
- Adopt an emissions and climate change policy consistent with the Paris Agreement which ensures over 90% of known Australian coal reserves remain in the ground
- Include the emissions generated overseas from Australian fossil fuel exports alongside Australian domestic emissions when assessing the nation's contribution to climate change
- Increase Australia's climate policy ambition to a 40-60% reduction in emissions by 2025 from 2000 levels, followed by a 60-80% reduction by 2030 from 2000 levels³⁹
- Adopt a vision for transitioning rapidly away from coal which ceases mining and phases out coal-fired electricity generation.

References

- 1 *Matter of Public Importance—Climate Change*, Speech by Greg Hunt, Minister for the Environment, Hansard—House of Representatives, 26 November 2015. p.13,914.
- 2 See "Figure 6.4 – Australia's Black Coal Exports", *Energy In Australia 2015* (Data Charts), 2015, Office of the Chief Economist, Department of Industry, Innovation and Science, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Energy-in-Australia.aspx#>> See also: *Tracking to 2020: An interim update of Australia's greenhouse gas emissions projections*, (2015) Department of the Environment, p.5, <<http://www.environment.gov.au/climate-change/publications/tracking-to-2020>>
- 3 Australia's annual coal exports are projected to rise by nearly 250mt by the early 2030s—a 625mt increase in annual carbon exports; 6.8 times the 92 mt domestic emissions saving targeted if Australia achieves a 28% reduction by 2030. See: *Australian Energy Projections to 2049-50*, 2014, BREE, Canberra, November. Pp.42-3, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/aep/aep-2014-v2.pdf>>
- 4 Salleh, Anna. 'Annual bleaching could threaten some species of coral,' *ABC*, 2015, accessed 14 April 2016, <<http://www.abc.net.au/news/2015-11-18/annual-bleaching-could-have-coral-reefs-in-hot-water/6948254>>
- 5 *National Greenhouse Gas Inventory Trend*, 2016, <<http://ageis.climatechange.gov.au/NGGITrend.aspx>>. See also: Figure 1: 'Business as Usual' and 'With Measures' emissions estimates – Tracking to the Kyoto Target: Australia's Greenhouse Emissions Trends 1990 to 2008–2012 and 2020, 2007, Department of Climate Change. p.4
- 6 See Figure 6.4 – Australia's Black Coal Exports, *Energy In Australia 2015* (Data Charts), 2015, Office of the Chief Economist, Department of Industry, Innovation and Science, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Energy-in-Australia.aspx#>>
- 7 Average calculation from "Table 1: Fuel Combustion Emission Factors" *National Greenhouse Accounts Factors*, 2014, Australian Government Department of the Environment, <<http://www.environment.gov.au/system/files/resources/b24f8db4-e55a-4deb-a0b3-32cf763a5dab/files/national-greenhouse-accounts-factors-dec-2014.pdf>>
- 8 *Tracking to 2020: An interim update of Australia's greenhouse gas emissions projections*, 2015, Department of the Environment. p.5, <<http://www.environment.gov.au/climate-change/publications/tracking-to-2020>>
- 9 According to the December 2015 forecast by the Office of the Chief Economist – thermal coal exports are expected to be 207mt, metallurgical coal exports are expected to be 193mt in 2015-16. See: *Resources & Energy Quarterly – December 2015*, 2015, Office of the Chief Economist, Department of Industry, Innovation and Science. p.24, 31 <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/req/REQ-December-2015.pdf>>
- 10 1bt of coal export emissions today is 179% of 560mt of domestic emissions. For domestic emission figures, see: *National Greenhouse Gas Inventory Trend* (2016) – <<http://ageis.climatechange.gov.au/NGGITrend.aspx>> See also: *Energy in Australia 2004* (2004) ABARE, Department of Industry, Tourism and Resources. p.12
- 11 With every tonne of coal burnt producing 2.5 tonnes of carbon dioxide, Australia's 400mt of coal exports equates to 1 billion tonnes of CO₂. Saudi oil exports today are currently around 7.4 million barrels a day. This amounts to 2.701 billion barrels a year which equates to 1.161 billion tonnes of CO₂ produced annually, based on the conversion factor: 430 kilograms of CO₂ per barrel of crude oil. An increase of more 65mt of coal exports would take us past current carbon exports in Saudi oil. See: US EPA, <<http://www.epa.gov/cleanenergy/energyresources/refs.html>>. See also: <<http://www.bloombergenews.com/news/articles/2015-12-20/saudi-crude-exports-rose-in-october-to-highest-in-four-months>> and <<https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html>>
- 12 Greenpeace Australia Pacific, *Cooking the Climate, Wrecking the Reef – The global impact of coal exports from the Galilee Basin*, 2012, p.8, <[http://www.greenpeace.org/australia/GLOBAL/australia/images/2012/Climate/Galilee%20Report4.2\(MB\).pdf](http://www.greenpeace.org/australia/GLOBAL/australia/images/2012/Climate/Galilee%20Report4.2(MB).pdf)>
- 13 *Resources and Energy Major Projects – October 2015*, 2015, Office of the Chief Economist, Australian Government—Department of Industry, Innovation and Science. p.21, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/rempp/REMP-October-2015.pdf>>
- 14 Paton, James. "Goldman sees Indian coal worsening glut in world awash in fuel", *Bloomberg Business*, 2016, accessed 26 February 2016, <<http://www.bloombergenews.com/news/articles/2016-02-16/goldman-sees-indian-coal-worsening-glut-in-world-awash-in-fuel>>
- 15 Greenpeace's assessment for the combustion emissions of individual projects found that Meijin Energy's China Stone project would produce 128.4mtpa CO₂-e, and Carmichael Mine would generate 128.4mtpa CO₂-e for a combined total of 256.8mt CO₂; The Australian stationary energy sector generates around 190 million tonnes of CO₂-e. This includes all coal fired power stations, plus gas fired power and other sources; Cars are responsible for 43mtpa a combined total of 233mt CO₂. See *Tracking to 2020: An interim update of Australia's greenhouse gas emissions projections*, 2015 Department of the Environment., p.7,12, see also: <[http://www.greenpeace.org/australia/GLOBAL/australia/images/2012/Climate/Galilee%20Report4.2\(MB\).pdf](http://www.greenpeace.org/australia/GLOBAL/australia/images/2012/Climate/Galilee%20Report4.2(MB).pdf)> p.8
- 16 *Australian Energy Projections to 2049-50*, 2014, BREE, Canberra, November, p.42-3, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/aep/aep-2014-v2.pdf>>. See also: Figure 6.4 – Australia's Black Coal Exports, *Energy In Australia 2015* (Data Charts), 2015, Office of the Chief Economist, Department of Industry, Innovation and Science, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Energy-in-Australia.aspx#>>
- 17 1.63 trillion tonnes of exported carbon is 3.7 times the the 441mt target for domestic emissions in 2030 under a 28% cut. See: *Australia's 2030 Emission Reduction Target – Factsheet*, 2016, Commonwealth of Australia. p.3-4, <<https://www.dpnc.gov.au/sites/default/files/publications/Summary%20Report%20Australia%202030%20Emission%20Reduction%20Target.pdf>>
- 18 Great Barrier Reef Marine Park Authority, *Great Barrier Reef Outlook Report 2014*, p. 267, <<http://www.gbrmpa.gov.au/cdn/2014/GBRMPA-Outlook-Report-2014/>>.
- 19 UNESCO, 'Great Barrier Reef,' accessed 14 April 2016, <<http://whc.unesco.org/en/list/154>>
- 20 Robertson, Joshua. 'Great Barrier Reef coral bleaching threat raised to highest level,' *The Guardian*, 2016, accessed 15 April 2016, <<http://www.theguardian.com/environment/2016/mar/21/great-barrier-reef-coral-bleaching-threat-raised-to-highest-level>>
- 21 Union of Concerned Scientists, 'Great Barrier Reef, Australia,' Climate Hot Map, accessed 15 April 2016, <<http://www.climatehotmap.org/global-warming-locations/great-barrier-reef-australia.html>>
- 22 Great Barrier Foundation, 'Ocean Acidification,' accessed 15 April 2016, <<http://www.barrierreef.org/our-science/research-we-support/ocean-acidification>>
- 23 Great Barrier Reef Marine Park Authority, 'Impacts of ocean acidification on the Reef,' accessed 12 April 2016, <<http://www.gbrmpa.gov.au/managing-the-reef/threats-to-the-reef/climate-change/how-climate-change-can-affect-the-reef/ocean-acidification>>
- 24 Osborne, Hannah, 'Reversing ocean acidification with aggressive CO₂ removal will take more than 700 years,' *International Business Times*, 2015, accessed 15 April 2016, <<http://www.ibtimes.co.uk/reversing-ocean-acidification-aggressive-co2-removal-will-take-more-700-years-1513897>>
- 25 Great Barrier Reef Marine Park Authority, 'Extreme weather,' accessed 12 April 2016, <<http://www.gbrmpa.gov.au/managing-the-reef/threats-to-the-reef/extreme-weather>>
- 26 Great Barrier Reef Marine Park Authority, 'Cyclone Yasi impacts on the Great Barrier Reef assessed,' accessed 12 April 2016, <<http://www.gbrmpa.gov.au/media-room/latest-news/climate-change/2011/cyclone-yasi-impacts-on-the-great-barrier-reef-assessed>>
- 27 *Great Barrier Reef Climate Change Action Plan*, p.12, 2007, Great Barrier Reef Marine Park Authority, Townsville, Australia.
- 28 Great Barrier Reef Marine Park Authority, *Reef 2050 Long-Term Sustainability Plan*, Australian and Queensland Government, 2015, accessed 13 April 2016, <<http://www.environment.gov.au/system/files/resources/d98b3e53-146b-4b9c-a84a-2a22454b9a83/files/reef-2050-long-term-sustainability-plan.pdf>>
- 29 Joint Report to the Land Court of Queensland on "Climate Change – Emissions," p.8, <<http://enr.law.com.au/wp-content/uploads/carmichael14.pdf>>
- 30 Mitchell, Thom. 'Queensland Labor Has Turned Its Back On The Climate, The Reef, And The Electorate,' *New Matilda*, 2016, accessed 14 April 2016, <<https://newmatilda.com/2016/04/04/queensland-labor-australias-largest-ever-coal-mine-is-sustainable>>
- 31 Pearson, Ben. 'Carmichael coal mine's impacts will be felt for generations,' *ABC Environment*, 2015, accessed 14 April 2016, <<http://www.abc.net.au/environment/articles/2014/07/28/4025069.htm>>
- 32 North Queensland Bulk Ports Corporation, 'Port of Abbot Point,' accessed 14 April 2016, <<http://www.nqbp.com.au/abbot-point>>
- 33 Adani, "Abbot Point Coal Terminal 0 EIS Section 3.16 Shipping, accessed 13 April, <http://www.adaniaustralia.com/wps/wcm/connect/www.adaniaustralia.com/30789/45fac925-ec02-4c9c-9c13-bbc832185c6/85_eisdoc_shipping.pdf?MOD=AJPERES>
- 34 Coal exports have increased from 347.3mt in the 12 months immediately prior to the 2013 election to 400mt today. See December 13 edition at <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Resources-and-energy-quarterly.aspx>>. <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/presentations/2014/australia-japan-coal-conference.pdf>> p.19-20 The additional 52.7mt equates to 130mt per annum in emission increases. The government claims a 92mt emission saving through the ERF – but this a cumulative saving spread over a decade. Over a decade the 52mt increase in coal exports to 2016 adds a cumulative 1,300 mt of CO₂ – 14.3 times the ERF saving. See also: *Tracking to 2020: An interim update of Australia's greenhouse gas emissions projections*, Department of the Environment, December 2015, p.5 and <<https://www.dpnc.gov.au/sites/default/files/publications/Fact%20Sheet%20-%20Emissions%20Reduction%20Fund.pdf>> p.1
- 35 *Australia's 2030 Emission Reduction Target – Factsheet*, 2016, Commonwealth of Australia. p.5.; Available at: <<https://www.dpnc.gov.au/sites/default/files/publications/Summary%20Report%20Australia%202030%20Emission%20Reduction%20Target.pdf>>
- 36 Australia's coal exports are projected to rise by nearly 250mt per annum by the early 2030s—a 625mt increase in carbon exports; 6.8 times the 92 mt domestic emissions saving targeted if Australia achieves a 28% reduction by 2030. See: *Australian Energy Projections to 2049-50* (2014) BREE, Canberra, November, p.42-3, <<http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/aep/aep-2014-v2.pdf>>
- 37 Reputex, 'No peak in sight as national emissions climb through 2020-2030,' 2016, accessed 15 April 2016, <<http://www.reputex.com/knowledge-centre/market-update-no-peak-in-sight-as-emissions-climb>>
- 38 Reed, Tennant, 'How does the new emissions reduction target impact manufacturers?' Ai Group, 2015, accessed 15 April 2016, <<http://blog.aigroup.com.au/how-does-the-new-emissions-reduction-target-impact-manufacturers>>
- 39 Greenpeace Australia Pacific, 'Submission to the Climate Change Authority special review into Australia's climate policy options,' 2016, accessed 15 April 2016, <<http://www.climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/submissions/2016/SpecialReport2/Greenpeace%20Australia%20Pacific.pdf>>





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