

POWERING UP AGAINST POVERTY

WHY RENEWABLE ENERGY IS THE FUTURE



OXFAM
Australia



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Cover image: Peace Dratery, eight years old (left on front cover) and her classmates are doing their homework with a solar powered light. Photo: Sven Torfinn/Oxfam.

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EXECUTIVE SUMMARY

Electricity for lighting, refrigeration, cooking and heating is something that most people in Australia take for granted. Yet, more than one billion people around the world live without electricity. Governments, non-government organisations and the private sector are working hard to increase energy access in the world's poorest countries.

The coal industry, faced with the rapid decline in the value of its assets and an accelerating global transition to renewable energy, has been aggressively promoting coal as the main solution for increasing energy access and reducing poverty around the world. And it has found a loyal champion in the Australian Government.

However, coal is ill-suited to meeting the needs of the majority of people living without electricity, and increasing coal production is doing little to increase energy access. 84% of people without electricity live in rural areas, which are often not connected to a centralised energy grid. The cost of connecting to the grid and buying grid-based electricity typically exceeds the cost of local solutions such as small-scale solar and wind energy. Even for rapidly growing urban populations, the past advantages of coal are diminishing as the cost of renewable energy falls and the harmful effects of coal become more and more evident.

Burning coal poses significant health risks through air pollution — a major driver of China's shift away from coal — and is leading to hundreds of thousands of premature deaths around the world.

Coal mines are displacing some of the world's poorest communities, forcing them off their land and leaving them with less access to water, decreased food security and struggling to make a living.

Most significantly, burning coal is the single biggest contributor to climate change. As such, it is creating havoc for many of the world's poorest people, who are already feeling the impacts of climate change through decreased crop yields, increased risk of disasters, and loss of land.

Developing countries carry far less historical responsibility for climate change than the advanced economies like Australia. As the world comes together to meet the twin challenges of climate change and poverty reduction, the overwhelming responsibility for reducing emissions lies with developed countries. Nonetheless, while recognising that many developing countries will need to utilise all of their energy options in the near term, claims by the Australian Government and coal industry about coal's role in reducing poverty must not go unchallenged. They come at a time when developing country governments are appealing for greater support and cooperation on climate compatible development and renewable energy, both to reduce poverty and inequality, and to help avoid catastrophic impacts from climate change. Australia, as a wealthy developed country, has a responsibility to provide financial and technological support to developing countries in tackling climate change, including avoiding dependence on fossil fuels.

Estimates suggest that in order to limit global warming to the internationally agreed goal of no more than 2°C, more than 90% of Australian coal reserves will remain unburned.

Meanwhile, we are seeing rapid and profound changes in the way the world produces electricity. Global investment in renewable energy has already surpassed investment in fossil fuels, and the coal industry has become one of the poorest performing sectors in the global economy. Renewable energy will become the world's leading source of electricity in the very near future.

The Australian Government's preoccupation with coal risks putting Australia out of sync and off-side with the rest of the world and harming our economic future. If we are to make a fair contribution to tackling global climate change and reducing poverty, and ensure our own future prosperity, Australia must rapidly shift its focus from coal and become part of the renewable energy revolution.

The future can be brighter for both Australia and for poorer communities around the world. But only if we wake up to the changing global realities, stand up to vested interests, and begin embracing our non-fossil assets.

Key points

- Climate change impacts us all but is hitting poorer communities hardest. (p6)
- Coal is a major threat in the fight against hunger and poverty. Burning coal is the biggest single contribution to climate change. (p6)
- Increasing coal consumption is incompatible with protecting the rights and interests of poor communities in developing countries. (p6)
- The world is shifting from fossil fuels to renewable energy faster than most had predicted. (p8)
- Addressing climate change and reducing poverty can, and indeed must, go hand in hand. (p14)
- Renewable energy is a cheaper, quicker and healthier way to increase energy access. It provides communities with greater self-sufficiency and security, and with benefits more equitably shared. (p14)
- The Australian Government has uncritically bought into misleading industry propaganda about the benefits of coal. (p23)
- Australia's first responsibility is to phase out coal from our own energy supply and shift to a renewable energy economy. We must have a concrete plan for the managed and equitable transition away from coal towards renewables. (p24)
- As a developed country, Australia must also do its part to support developing countries with their own renewable energy plans. We have a responsibility to provide finance and technological support to help developing countries tackle climate change. (p24)
- Australia is basing its economic future on unrealistic projections for global coal consumption. By hedging our future on coal, we risk falling behind the curve and harming our future prosperity. The world is acting on climate change, affecting demand for Australian coal. (p24)
- Australia has all it needs to change course and become part of today's climate and energy solutions, creating a brighter future for Australians and the world at large. (p27)

1 INTRODUCTION

Access to affordable and reliable electricity is a key factor in quality of life, health and the wellbeing of communities. Renewable energy, such as solar, wind, geothermal, biogas and ocean energy, offers a key to increasing energy access, reducing inequality and improving lives and livelihoods around the world.

Governments, non-government organisations (NGOs), communities and the private sector are working to bring electricity to the more than one billion¹ people who still live without it, the majority living in Sub-Saharan Africa and South Asia. Significantly, none of the major programs aimed at increasing energy access, such as the United Nations and World Bank's Sustainable Energy for All initiative, promote the use of coal. The reasons are both practical and economic: renewable energy consistently offers more affordable and sustainable solutions and carries none of the health and livelihood impacts associated with coal. The good news is that addressing climate change and reducing poverty can, and indeed must, go hand in hand.²

Nonetheless, the coal industry, faced with the rapid decline in the value of its assets and an accelerating global transition to renewable energy, has been aggressively promoting coal as the main solution for increasing energy access and reducing poverty around the world. And it has found a loyal champion in the Australian Government.

In making their case, the industry and government conveniently ignore the fact that climate change is a major threat in the fight against poverty and hunger, and places decades of hard-won development gains in jeopardy. This fact aside, coal can do little to increase energy access around the world. Since many of those without electricity live beyond the reach of the conventional, centralised energy grid, coal offers a slower and more expensive option, if indeed it is an option at all.

2015 will be a defining year for the global development agenda and international action on climate change. In September, the international community will adopt the Sustainable Development Goals. In December, governments will come together in Paris to finalise a new global climate agreement. The argument that coal is a solution to poverty, while it may seem compelling on the surface, is a dangerous and misinformed position driven by vested interests.

This brief report seeks to unravel the myth that "coal is good for humanity". Drawing on existing data we look at the real impact of coal, the rapidly changing global energy landscape, what really works for communities, what lies behind the industry spin, and how Australia must shift its focus if it's to help deliver results for poor communities around the world, and play its part in the global climate challenge.

"This exploitation of an urgent humanitarian need to promote more coal-burning in poor countries is extremely misleading. If ever implemented, it would actually significantly worsen the condition of the 1.3 billion people mired in energy poverty."

— Al Gore, former United States vice-president, and David Blood, Generation Investment Management.³

"Climate change demands that we rethink the relationship between energy and development."

— Kofi Annan, former Secretary General of the United Nations, chair of the Africa Progress Panel.⁴

2 COAL, CLIMATE CHANGE AND POVERTY

“Left unchecked, climate change will wipe out all development gains of the last 25 years.”

— Christiana Figueres, Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC)⁵

Climate change affects us all. But it is hitting poorer communities — those with the least responsibility for greenhouse emissions — the hardest.

The current level of warming — just under 1°C — poses severe challenges for vulnerable communities around the world. Already, people are faced with shifting seasons and an increase in damaging extreme weather events including heat-waves, droughts, floods and destructive cyclones. Allowing temperatures to rise by as much as 2°C will have serious impacts on lives and livelihoods in all countries, and push many beyond their ability to adapt. This reality has prompted renewed calls for limiting warming to 1.5°C.⁶

Achieving the internationally agreed goal of limiting warming to no more than 2°C above pre-industrial levels — let alone the 1.5°C limit that many countries rightly demand — will mean leaving the vast majority of known fossil fuel reserves in the ground. To have a 75% chance of achieving the 2°C goal, 77% of the world’s fossil fuels must be left unburned, including 88% of coal reserves.¹¹ It is likely that more than 90% of Australian coal reserves are unburnable, even under a generous carbon budget.¹²

The negative impacts of coal are not limited to the ravages of climate change. Tackling air pollution is a major driver of China’s shift away from coal. A recent Oxfam study documents the impact of coal mining on communities in Mozambique, including forcing families off their land, resulting in the loss of means to make a living.¹³ By one estimate, coal-fired power in India may be causing more than 100,000 premature deaths annually, costing the country about USD \$4.6 billion.¹⁴

These striking facts lead us to an inescapable conclusion: increasing coal consumption is incompatible with protecting the rights and interests of poor communities in developing countries. To put this in perspective for Australia, burning all of our known Australian coal would produce emissions equivalent to two-thirds of all the emissions the world as a whole can afford to produce while still having a 75% chance of meeting the 2°C goal.¹⁵ Opening up Australia’s Galilee Basin, which could produce emissions equivalent to more than Australia’s entire domestic emissions each year, appears extraordinarily reckless in this regard.¹⁶

Fortunately, as we will see in the next two chapters, with the cost of renewable energy in free-fall and with the natural advantage of renewable energy in increasing energy access, there need be no trade-off between improving lives and tackling climate change.

Australia’s first responsibility is to phase out coal from our own energy supply and shift to a renewable energy economy. But as we will explore in the final chapter, we must also do our part to support developing countries with their own renewable energy plans.

“We’re not going to be able to burn it all.”

— Barrack Obama, US President⁸

“The science is very clear — there is no space for new coal.”

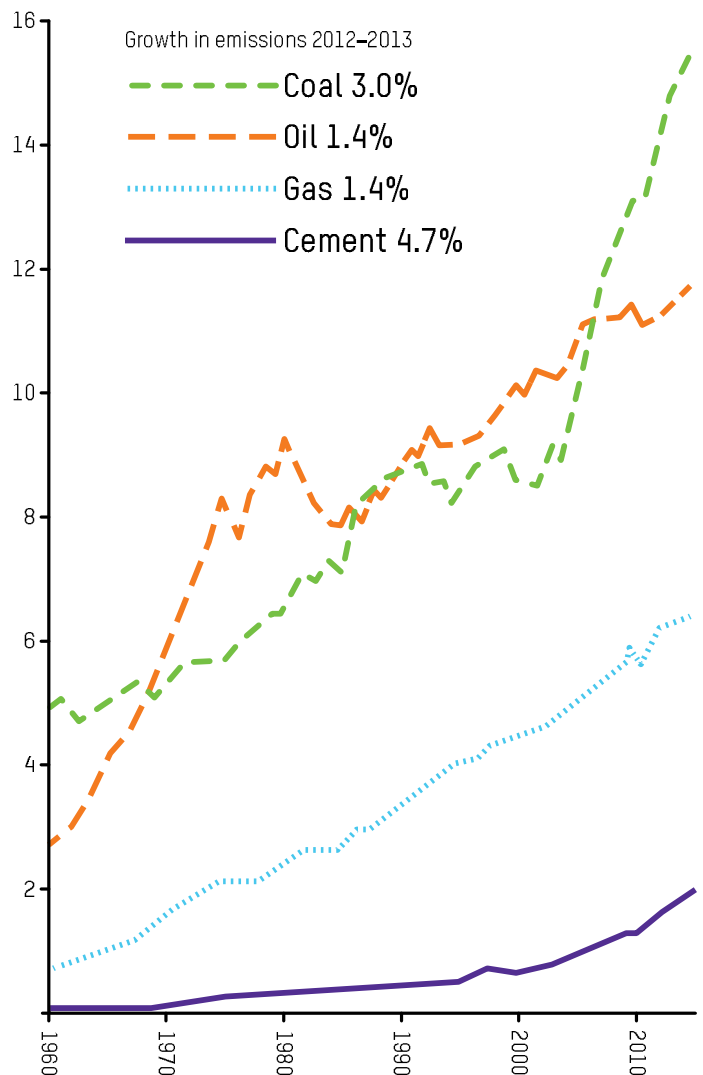
— Christiana Figueres⁹

“The vast majority of reserves are unburnable.”

— Mark Carney, Governor of the Bank of England¹⁰

Fig1: Coal is the most polluting of fossil fuels and the major source of growth in global emissions⁷

Comparing CO₂ emissions (Gt/CO₂/yr) from selected sources.



IMPACTS OF CLIMATE CHANGE ON HUNGER, POVERTY AND DEVELOPMENT

Food production, hunger and malnutrition

Climate change is already reducing yields of some staple crops. Globally, crop yields are likely to decline by 2% per decade from the 2030s.¹⁷

Even under a 2°C scenario, there could be a drop of between 40% and 60% in yields for fisheries at tropical latitudes by 2055.¹⁸

There could be 25 million more malnourished children under the age of five in 2050, compared to a world without climate change — that's the equivalent of all children under five in the United States and Canada combined, or twenty times the number of children under five in Australia.¹⁹

Women

Women are disproportionately affected by climate change. Making up a large share of the agricultural workforce in developing countries²⁰ and playing a vital role in food production and preparation around the globe, women feel the impact of climate change on food particularly sharply.

Health

Direct health effects of climate change include increased heat stress. Indirect effects are complex and far-reaching, including changes in the spread of diseases.²¹ However, with the solutions to climate change, including a rapid phase-out of coal, offering many health co-benefits, the 2015 Lancet Commission on Climate Change and Health concludes that responding to climate change "could be the greatest global health opportunity of the twenty-first century."²²

Economic growth

Analysis by the Asian Development Bank shows that annual economic losses in the Pacific as a result of climate change could range from 2.9% to as high as 12.7% of GDP by 2100.²³



Rebuilding after Cyclone Pam in Vanuatu.
Photo: Vlad Sokhin/Panos/OxfamAUS.

In March 2013 Cyclone Pam, one of the strongest cyclones ever recorded in the South Pacific, brought devastation to Vanuatu, the Solomon Islands, Kiribati and Tuvalu. In Vanuatu, which suffered a direct hit from Cyclone Pam, three out of four people rely on farming and fishing to feed their families. Cyclone Pam destroyed crops and homes, leaving a trail of hunger and homelessness. While the Ni-Vanuatu are an extraordinarily resilient people, it will take a mammoth effort to rebuild and recover.²⁴ Climate change is increasing the destructive power of tropical cyclones. It is likely that both wind speed²⁵ and amount of rainfall²⁶ associated with tropical cyclones will increase. At the same time, storm surges and coastal flooding are exacerbated by sea level rise and damage to reefs from climate change.²⁷

3 THE CHANGING GLOBAL ENERGY LANDSCAPE

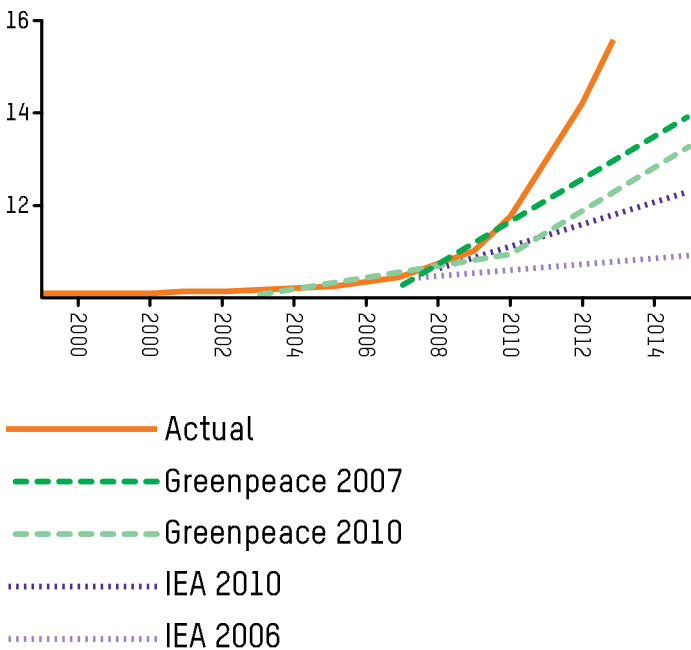
With the cost of renewable energy plummeting, the world is shifting from fossil fuels to renewable energy faster than nearly all had predicted. Many are calling it an ‘energy revolution’.

“Forecasts for the deployment of renewable energy have consistently been broken as costs fall faster than expected. Likewise, coal markets in the USA and in China have been contracting faster than expected, severely impacting share evaluations. This materiality will accentuate in the years ahead as investors recognise that unabated coal has no place in the future energy mix.”

—Christiana Figueres, 24 March 2015.²⁸

Fig2: Growth in renewable energy installations has consistently passed expectations²⁹

Comparing projections of global growth in renewable energy prepared by Greenpeace in 2007 and 2010, and the International Energy Agency in 2006 and 2010, against actual growth (Installed solar PV capacity, GW).



“The energy world is undergoing massive transformation. Installations of renewable energy have skyrocketed around the world, exceeding most predictions from less than a decade ago.”

—Meister Consultants Group³⁰

While the imperative of reducing emissions is clearly a factor, the shift to renewable energy is also driven by hard-nosed economics,³¹ along with a desire to increase energy security and efficiency.

Investment in renewables first surpassed fossil fuels in 2011, with investments in wind, sun, wave and biomass energy drawing USD \$187 billion over that year, compared to USD \$157 billion for natural gas, oil and coal.³⁷ In 2013 another milestone was reached when the world began adding more generating capacity from renewable energy than fossil fuels, adding 143GW of renewables compared to 141GW in new fossil fuel plants, and prompting Bloomberg Business to declare: “Fossil fuels just lost the race to renewable: This is the beginning of the end.”³⁸ Analysts are forecasting a continued drop in the cost of renewable energy over the years and decades to come.

In its New Energy Outlook 2015, Bloomberg New Energy Finance predicts the continued decline in the cost of solar PV technology will prompt USD \$3.7 trillion in investment over the next 25 years, split evenly between small and utility-scale installations.³⁹

THE RISE AND RISE OF RENEWABLE ENERGY

Developing countries are installing renewable energy at almost twice the rate of developed nations.³²

In India, coal projects shelved or cancelled since 2012 outnumber projects completed by six to one.³³

In the US and China, large-scale solar power is now cost-competitive with fossil fuels.³⁴

Since 2010, the world has added more solar PV³⁵ capacity than over the previous four decades combined.³⁶

“The cost of renewables are expected to fall significantly over the Outlook, due to technological advances, learning-by-doing, and economies of scale. Both solar PV and wind appear to be following well-established learning curves, with costs falling rapidly as production increases.”

—BP⁴¹

“The costs of all the alternative energy sources are falling more rapidly than anticipated in my modeling seven years ago.”

—Professor Ross Garnaut⁴²

Fig3: Global average cost of solar PV cells (USD per Watts peak)⁴⁰



While the cost of renewable energy continues to fall, the biggest game changer may come through progress in batteries and storage solutions. Skeptics of renewable energy have long pointed to the intermittency of solar and wind energy as disadvantages, particularly when a renewables source is not part of a large grid system, in which the diversity of power inputs ensures there is adequate power coming from somewhere at all times. Deutsche Bank predicted in February 2015 that storage — “the missing link of solar adoption” — would be sufficiently developed and cheap enough to be deployed on a large scale within the next five years.⁴³ Ken Munson, founder of Sunverge Energy, has suggested that storage costs will fall three times faster than solar generation costs have been falling.⁴⁴

Advancements in energy efficiency are also reducing demand for coal, just as they are reducing costs for families and communities.

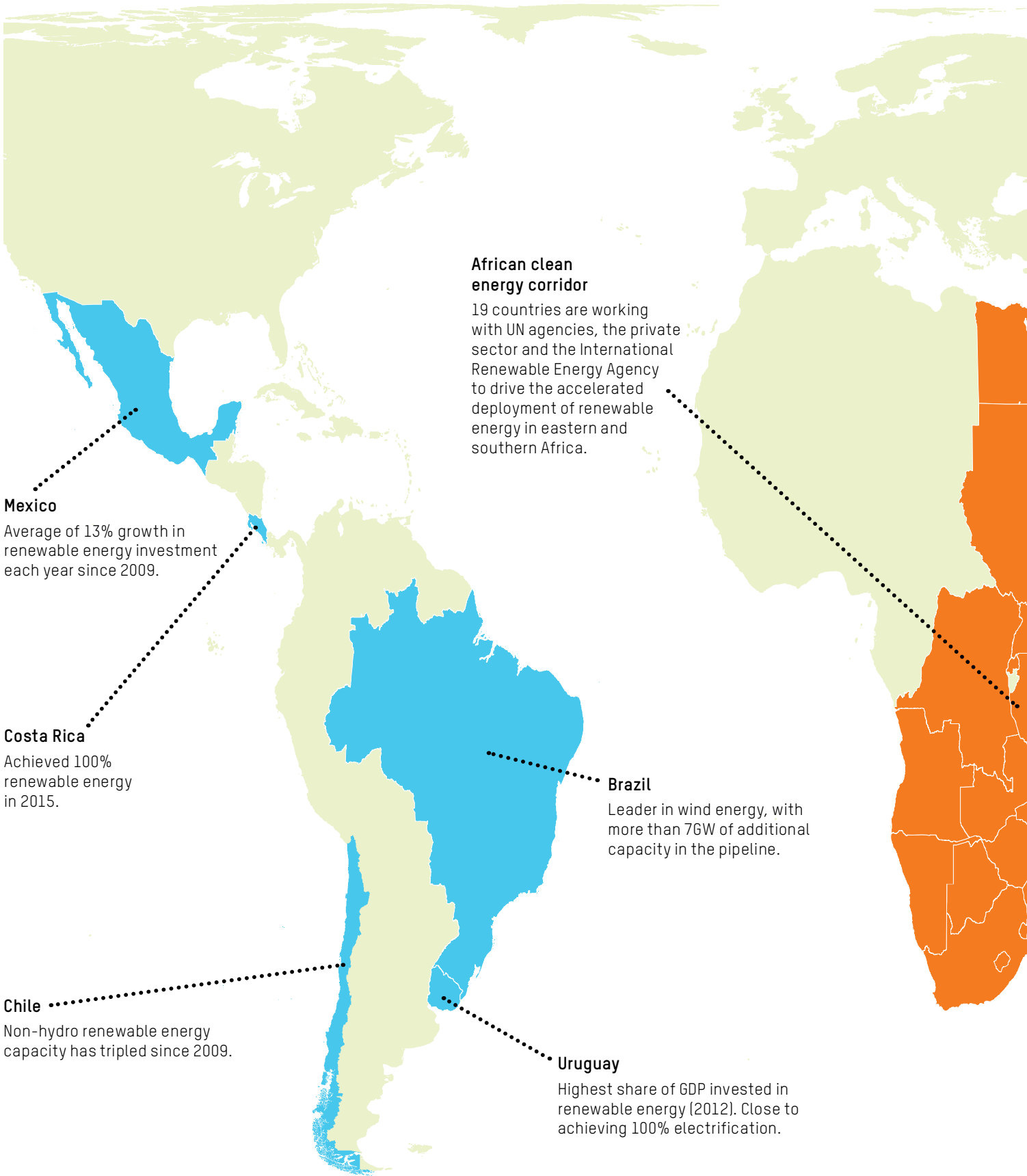
“It is becoming increasingly difficult to avoid the reality that the days of coal as a source of energy are numbered.”

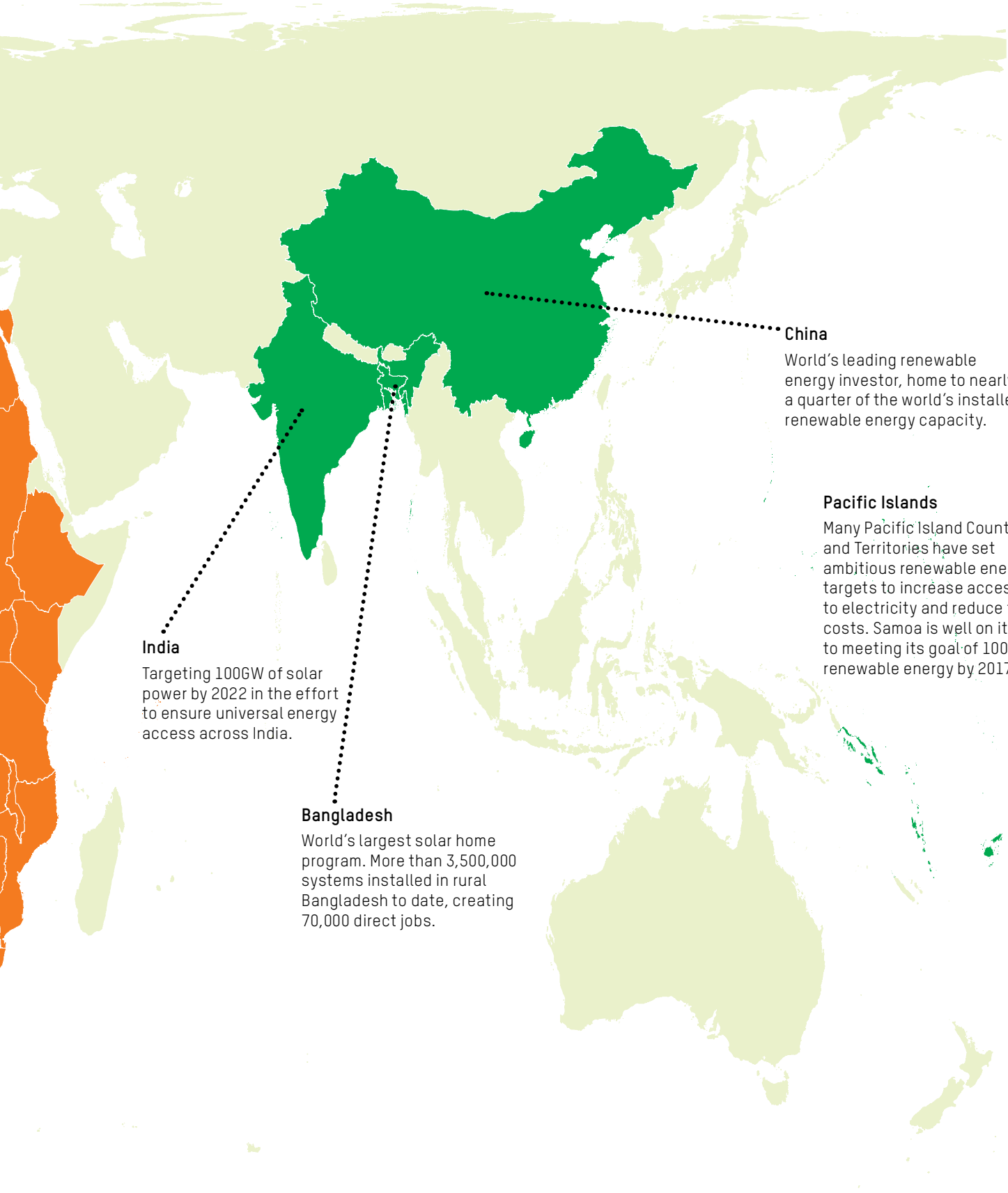
—Al Gore and David Blood⁴⁵

In stark contrast to renewables’ meteoric rise, in May 2015 the Institute for Energy Economics and Financial Analysis concluded “the coal industry is arguably the poorest-performing sector in today’s global economy and is in a state of structural decline.”⁴⁶

According to the International Renewable Energy Agency, as of mid-2015 some 164 countries have adopted at least one type of renewable energy target — almost a four-fold increase since 2005.⁴⁷ In its New Energy Outlook 2015, Bloomberg New Energy Finance predicts that over 60% of the nearly 10TW of new generating capacity likely to be installed over the next 25 years, and two-thirds of the predicted USD \$12.2 trillion of investment, will be in renewable energy.⁴⁸ After analysing the contributions that countries have already submitted or signalled ahead of Paris climate negotiations, the International Energy Agency concluded that their implementation would see renewable energy become the leading source of electricity by 2030.⁴⁹

Fig4: Renewable energy hotspots in the developing world⁵⁰





India

Targeting 100GW of solar power by 2022 in the effort to ensure universal energy access across India.

Bangladesh

World's largest solar home program. More than 3,500,000 systems installed in rural Bangladesh to date, creating 70,000 direct jobs.

China

World's leading renewable energy investor, home to nearly a quarter of the world's installed renewable energy capacity.

Pacific Islands

Many Pacific Island Countries and Territories have set ambitious renewable energy targets to increase access to electricity and reduce fuel costs. Samoa is well on its way to meeting its goal of 100% renewable energy by 2017.



3.1 FOCUS ON INDIA

“We need a saffron revolution that focuses on renewable energy sources such as solar energy, to meet India’s growing energy demand.”

—Narendra Modi, Prime Minister of India ⁵¹

In 2014, India surprised everyone by increasing its target for solar energy to a staggering 100GW by 2022.⁵² It is expected 40GW will be generated from rooftop installations and 60GW from larger, grid-connected projects.⁵³ This places India’s solar energy ambitions on a scale comparable to China, which has a current goal to install 100GW of solar power by 2020. India also plans to reach 60GW of wind power by 2022, along with 10GW of biomass and 5GW of small hydroelectric projects.

Prime Minister Narendra Modi, who pioneered solar energy in his home state of Gujarat, has said that India has the potential to lead the world in renewable energy,⁵⁴ the primary motivation being to ensure universal energy access for India’s poor people.⁵⁵ More than 230 million Indians live on less than USD \$2 a day.⁵⁶ India’s ambitious Energy Minister Piyush Goyal, who is tasked with delivering energy to the more than 300 million Indians living beyond the reach of the grid, has echoed Modi’s calls for a “paradigm shift” in the Indian electricity system.⁵⁷

India’s dramatic ratcheting up of its solar energy ambitions was followed in December 2014 by a strengthened partnership with the US on climate and clean energy, including accelerating clean energy finance.⁵⁸ In July 2015 Modi urged the New Development Bank (previously referred to as the BRICS Development Bank) to fund renewable energy.⁵⁹

While India will continue to rely on coal in no small part in the short term, it is clear that developing renewable energy has become its priority. Further, when it comes to coal, India is likely to rely increasingly on its own reserves rather than imports.⁶⁰

Deutsche Bank has said that solar energy could make up a quarter of India’s total electricity generation by 2022, representing 60% of new installed capacity.⁶¹ Energy Minister Piyush Goyal has stated that USD \$250 billion needs to be spent across India’s power sector. More than USD \$100 billion will go directly to renewable energy, USD \$50 billion will be spent on transmission and distribution, and only USD \$60–\$70 billion will be spent on new coal projects.⁶²



3.2 FOCUS ON CHINA

In 2014, China’s coal consumption fell 2.9% — the first annual drop in more than a decade.⁶³ Recent analysis suggests an even steeper decline over the first four months of 2015, with a fall of almost 8% compared to the same period last year.⁶⁴ Official statistics also suggest a continued sharp decline in China’s own coal production, with April’s output down 7.4% from the same point in 2014.⁶⁵

While today China is the world’s largest energy consumer, it is also leading the world in renewable energy investment. In 2014, China spent USD \$83.3 billion on renewable energy projects — more than all of Europe (USD \$57.5 billion) and more than twice the US (USD \$38.3 billion).⁶⁶ China is home to approximately a quarter of the world’s installed renewable energy capacity.⁶⁷ Since 2013, investments in new renewable energy capacity in China have been greater than those in fossil fuels and nuclear power.⁶⁸

While in the past many countries have pointed to China to justify their own inaction, it is now clear that China is serious about tackling climate change. China has piloted emissions trading schemes in seven provinces,⁶⁹ and plans to move to a national scheme.⁷⁰ It has committed to radical reductions in the carbon intensity of its economy,⁷¹ to ensuring its emissions peak by around 2030,⁷² and to capping coal use by 2020.⁷³ Following recent falls in both coal use and carbon emissions, there are reasons to believe China will exceed some or all of these commitments.⁷⁴

Around 70 million people in China still live on less than USD \$2 a day.⁷⁵ As in other countries, renewable energy investment in China appears to be driven as much by economic and practical motives as by climate change. The central government has ordered some regions to draw up plans to reduce coal consumption to improve air quality,⁷⁶ and Beijing will shut the last of its four major coal-fired power plants in 2016.⁷⁷

The true financial cost of coal

The claim that coal is a cheap energy source was further challenged by a recent estimate by the International Monetary Fund (IMF) of the true cost of fossil fuels. The IMF concluded that fossil fuel companies are benefitting from USD \$5.3tr a year — USD \$10m a minute — in direct and indirect subsidies. The vast sum reflects the fact that companies are not paying for the enormous health costs, environmental damage and climate change impacts associated with fossil fuels. Coal, as the largest source of both greenhouse emissions and particulate air pollution, is the biggest beneficiary of these subsidies.⁷⁸

“Coal is not cheap.”

— Angel Gurría, OECD Secretary General.⁷⁹

In a June 2015 report — Under the rug: How governments and international institutions are hiding billions in support to the coal industry — WWF, Oil Change International, and the National Resources Defense Council revealed how more than USD73 billion in public finance was approved for coal between 2007 and 2014.⁸⁰

3.3 CARBON CAPTURE AND STORAGE — A SOLUTION?

“We are skeptical about the prospect of a large-scale carbon capture and storage industry, an initiative oft cited as the path to securing coal’s future in the energy mix.”

— Citigroup⁸¹

Mitigating the climate-busting effect of burning coal means capturing and storing the carbon that would otherwise be released into the atmosphere. However, whereas many renewable energy technologies are falling rapidly in cost, developing “Carbon Capture and Storage” (CCS) technology for coal is proving very slow. CCS for coal is yet to prove workable at a commercial scale and the cost of capturing emissions is likely to remove any cost advantage that coal may otherwise have over renewables.⁸²

3.4 WHAT ABOUT GAS?

While greenhouse emissions from natural gas, in particular obtained by new techniques including hydraulic fracturing (fracking), have likely been underestimated,⁸³ natural gas is usually cleaner than coal in electricity generation. However, many have warned that gas is a detour and a distraction,⁸⁴ and that growing use of natural gas may actually result in an overall rise in emissions rather than a decrease.⁸⁵ Gas carries many of the shortfalls of coal examined in the next chapter, including dependence on imported fuels and volatile markets. Furthermore, while renewable energy costs are steadily falling, gas prices are likely to rise as the more easily accessed reserves become exhausted. While there may be a role for some gas in some instances, by and large the solutions for both the near and long term lie in renewables.

3.5 EIGHT REASONS COAL IS LOSING THE RACE TO RENEWABLES

- The world is acting on climate change (p24).
- There are major shifts in energy and climate policy in China, India and other major economies (p12).
- Renewable energy is taking hold in developing countries (p8).
- The price of renewable energy is falling fast (p9).
- New technologies, including advanced batteries, are overcoming renewable energy’s remaining shortfalls (p9).
- Coal can do little to help improve energy access (p14–17).
- Coal has too many negative impacts on communities (p14–17).
- Investors are shifting their focus away from coal towards renewables (p25).

4 WHAT REALLY WORKS FOR COMMUNITIES?

“To us, it looks almost like an ‘everything but coal’ scenario.”

—Citigroup⁸⁶

The claim that coal is a solution to increasing access to electricity, raising living standards, and reducing poverty, is predicated above all on the notion that coal is the cheapest way of providing electricity to the more than one billion people who live without it.

In the first chapter of this report we explained how coal, by contributing to climate change, is already hitting poor communities hard. We will now examine how coal, even setting aside the costs to the climate, can do little to meet the needs of those living without electricity. And conversely, how renewables can be at the heart of a more equitable and sustainable model of development, and are increasingly the energy sources of choice for many in developing countries.

Over the past year, Carbon Tracker,⁸⁷ Vasudha Foundation,⁸⁸ The Australia Institute,⁸⁹ Overseas Development Institute,⁹⁰ Oxfam and many other organisations have explored the challenge of increasing energy access, with each providing robust evidence that distributed, renewable energy solutions are best suited to tackling energy poverty.

AT A GLANCE: THE ADVANTAGES OF DISTRIBUTED RENEWABLE ENERGY OVER COAL IN IMPROVING ENERGY ACCESS

Cheaper (p15)

For rural areas, the additional investment needed in extending electricity grids eliminates any remaining cost advantage that coal may have. In addition, there are no ongoing fuel costs associated with using renewable energy.

These price advantages of renewables apply even before we account for the full cost of coal power, in terms of health costs, liability under carbon pricing, and more.

Quicker (p15)

Solar energy is available worldwide and quick to install. By contrast, building coal plants and grid extensions is expensive and takes time.

Healthier (p16)

The numbers of premature deaths associated with particulate pollution from coal-burning are staggering.

By contrast, renewable energy entails no particulate or greenhouse pollution during operation.

More self-sufficient and secure (p16)

Renewable energy is liberating communities from expensive fuel imports. To be dependent on coal and other fossil fuels is to be at the mercy of fluctuations in the market and uncertainty of future supply. As it entails no such risks, renewable energy also improves energy security.

More equitable — benefits for all! (p17)

Centralised electricity generation, including coal-fired power, benefits wealthier citizens and industry before it benefits poorer communities. At worst, communities may be displaced from their land and see their livelihoods destroyed. By contrast, local, decentralised renewable energy is far better suited to meeting the needs of poorer communities.

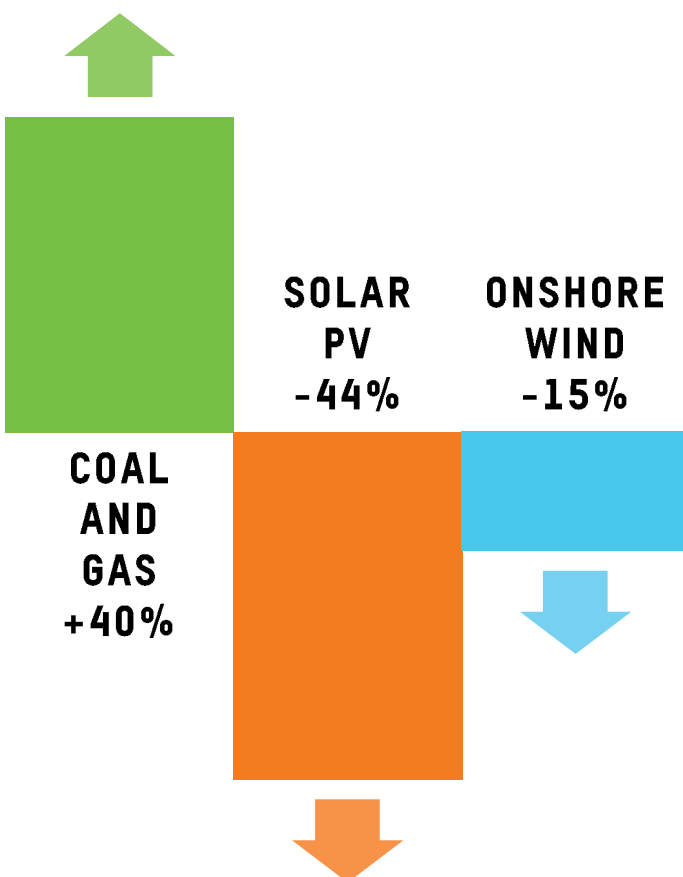
4.1 RENEWABLES ARE CHEAPER

According to the International Energy Agency in 2011, 84% of people living without electricity live in rural areas.⁹¹ Such areas are often not connected to a centralised energy grid. The cost of connecting to the grid and buying grid-based electricity, often exceeds the cost of local solutions such as small-scale solar and wind energy.⁹²

While there are upfront expenses and maintenance costs to be considered, there are no fuel costs associated with using renewable energy. While in some (but increasingly fewer) cases the upfront costs of renewable energy may be greater, the fuel savings over the longterm can offset these costs. Moreover, international climate finance, along with innovation in financing, can overcome these upfront costs (see p. 26).

While the advantages of renewable energy in bringing power to rural and remote communities have been much discussed,⁹⁴ even for providing large-scale generation to feed central grids, coal's cost advantage is rapidly disappearing. While the average cost of new renewable energy plants has declined sharply in recent years and is set to decline further, the average cost of new coal and gas plants is on the rise. In some countries, large-scale solar and onshore wind energy is already cost-competitive.⁹⁵ Within just over a decade, wind will be "the least cost option almost universally", with utility-scale solar PV likely to gain that title by 2030.⁹⁶

Fig5: Change in global average cost of new electricity plants 2009–2013⁹³



4.2 SMALL RENEWABLE ENERGY SYSTEMS CAN BE DEPLOYED QUICKLY

Around the world, a large number of government, non-government and private sector organisations are working to increase energy access. The largest program is the Sustainable Energy for All initiative (SEE4ALL), which has partnered with more than 85 developing countries.⁹⁷ Revealingly, none of the major international programs aimed at increasing energy access for poor people promote the use of coal.⁹⁸

While building a coal plant takes a long time and massive capital investment, small renewable energy systems can be deployed quickly. Solar home systems can provide households with their first step on the ladder of energy access. Connection to a renewable-powered mini-grid may offer the next step, and prove more cost effective than either a standalone home system or connection to the main grid. Coal mining also involves considerable costs. These are often subsidised by governments, reducing money for other objectives.⁹⁹

“Solar power can also reach remote villages faster and cheaper than sending pylons striding across the land. The country needs more decentralised power, like rooftop solar, to reach the large parts of the country that the grid has not reached.”

—Pranav Mehta, Chair of the National Solar Energy Federation of India¹⁰⁰

The International Energy Agency projects that by 2030, around half a billion people who currently do not have access to electricity, could obtain the equivalent of 200W per capita of solar PV capacity.¹⁰¹

Many developing countries are already leapfrogging the polluting and expensive technologies of the past as they set about building prosperous clean energy economies. Just as mobile and wireless technologies are enabling poorer countries to enter the information age without need of landlines.

4.3 RENEWABLES ARE HEALTHIER

While estimates may vary, there can be little doubt that coal burning exacts an enormous toll on people's health. One recent study suggests that particulate pollution from coal burning was linked to 670,000 premature deaths across China in 2012.¹⁰²

The use of coal for electricity generation has negative impacts that subtract from the health gains that come from access to electricity.¹⁰³ While increasing electricity consumption is associated with reduced infant mortality and higher life expectancy (among those countries starting from a low base), increasing coal consumption is associated with increased infant mortality and reduced life expectancy after accounting for electricity consumption.¹⁰⁴ In June 2015 a major new study in *The Lancet*, the world's preeminent medical journal, highlighted the negative impact of coal burning, both directly through local air pollution and indirectly through climate change. The study urged the rapid phase out of coal, claiming, "the global transition towards clean energy will help prevent the seven million premature deaths that occur every year as a result of air pollution."¹⁰⁵

The coal industry is correct to point out that indoor air pollution from open fires and primitive stoves used for cooking is also a major cause of ill health and premature death. The number of people lacking access to clean cooking facilities is even greater than those without access to electricity, with more than a third of the world's population using wood, animal dung, charcoal and other polluting solid fuels.¹⁰⁶ Demand for wood and other biomass for cooking is also causing deforestation and contributing to climate change.

However, the coal industry is wrong to suggest that more coal solves this problem. Firstly, coal itself contributes to air pollution. Secondly, the coal industry can do little to allay communities' reliance on polluting fuels for cooking as it has limited potential to supply electricity to these communities. The answer again lies in renewable energy, along with other available technologies including solar cooking and cleaner cook stoves.¹⁰⁷

4.4 RENEWABLES ARE MORE SELF-SUFFICIENT AND SECURE

"Coal and oil are only cheap ways to power a nation in the very near term ... But if you look a little further down the road, you begin to see an entirely different story."

—John Kerry, US Secretary of State ¹⁰⁸

Renewable energy does not tie communities to expensive fuel imports or the pressures of a volatile market. Consider that 93% of people in Sub-Saharan Africa without electricity live in countries that do not produce coal. If we assume for a moment that it were possible to meet their energy needs through coal-fired power, they would nonetheless be left dependent on imported fuel and vulnerable to market fluctuations. In one of the following case studies, we see how solar power in the Pacific is freeing communities from expensive diesel imports.

"Developing countries have the most to gain from moving towards clean energy investment quickly and vice versa the most to lose from carbon lock-in."

—International Energy Agency¹⁰⁹

At the global scale, reduced dependence on fossil fuels will reduce risks of conflict.

"We need a 'global clean energy community' to free us from dependence on fossil fuels and the related risks of conflict. Reducing carbon intensity improves security — energy security and security in general — as it equalises access to energy. A country that develops its own solar- or wind-energy production takes nothing from anyone: the light and wind that it uses are not only renewable; they belong to all. We should not underestimate the major contribution this could make to peace and security."

—Laurent Fabius, Conference of Parties (COP21) President¹¹⁰

4.5 RENEWABLES ARE MORE EQUITABLE

Were coal the secret to energy access and reducing poverty, we could reasonably expect communities across India's coal belts to be enjoying cheap, reliable electricity and prosperity. But as Chaitanya Kumar, a New Delhi-based campaigner for 350.org, explains:

“Coal is mired in deep social inequities. Travel to any major coal belt in India and the people living around a coal plant face regular power outages. The cruel irony is explained by the fact that the power generated is often for the cities, the energy guzzlers, while the negative residual impacts of coal are to be borne by those living next to it. The industry is often set up on the pretext of providing jobs, greater compensation for land and adequate rehabilitation and resettlement for displaced communities. None of these promises have ever been satisfied and the coal belts of India stand testimony to that fact.”¹¹¹

This claim is overwhelmingly supported by evidence. As India's Vasuhda Foundation attests:

“Some of the areas with the densest concentrations of coal power plants also have the lowest rates of household electrification. Despite the fact that thermal electricity generation capacity increased by more than 100% between 2002 and 2013, the number of rural households reached by electricity increased by only 6.4% during the same period.”¹¹²

By contrast, in the case study on Bangladesh, we see how renewable energy is creating opportunities for remote and rural communities and can benefit traditionally disadvantaged groups.

4.6 MINING, RESETTLEMENT AND LOST LIVELIHOODS

In a detailed study released in May 2015, Oxfam presented the experiences of individuals, households and groups who had been involuntarily displaced by the Benga coal mine in Tete province, Mozambique.

Despite a planned resettlement program, those displaced have been significantly disadvantaged, facing the loss of livelihoods and economic opportunities, the fracturing of their community, and uncertainty about their future. 3,600 people have been resettled by the mine's various owners — first the Australian company Riversdale Mining, then Rio Tinto, and now Indian company International Coal Ventures Limited. They've had no choice but to move from their homes on the fertile banks of the Revuboe River to remote and arid Mualadzi. Poor soil quality and an insecure supply of water have meant people cannot grow enough food to feed their families. According to a member of the community, “there is not enough water for the animals, or sometimes even for us.” Mualadzi's remoteness and poor transport has reduced access to employment and other economic opportunities. Children have to walk a ten kilometre round trip to attend school.

Successive companies involved in the Benga mine have all failed to adequately respond to the known social and human rights risks. Despite efforts to set and apply standards, people displaced by large-scale mining and development typically are left worse off, a fact recently confirmed by the President of the World Bank.¹¹³ Most families resettled by the Benga mine have gone from having a steady supply of food year-round, access to enough water for all their daily needs, and a reliable source of income, to struggling every day to make ends meet.

As Oxfam notes, it is not just the companies that need to do better. Governments need to improve their monitoring and oversight, and include communities in development decisions that impact on their land and livelihoods. Despite efforts to set and apply standards, people who are displaced by mining and large-scale development are typically left worse off.

See the full report — Mining, Resettlement and Lost Livelihoods: Listening to the voices of resettled communities in Mualadzi, Mozambique — at: www.oxfam.org.au/resettlement

CASE STUDY: SOLAR ENERGY IN THE PACIFIC

The advantages of renewable energy over fossil fuels are no more obvious than in the Pacific.

Like everywhere, access to electricity is important: from providing lighting so that children can study in the evenings, to powering health clinics and refrigerating fresh food. Coal-fired power, which requires large-scale plants and grid infrastructure, is a non-starter for small islands. Many communities rely on diesel generators. But diesel and other fuels are expensive throughout the Pacific, as they must be imported from far afield.

From the Marshall Islands to Niue, solar power is already providing an affordable, long-term solution for many island communities, freeing them from expensive diesel imports and allowing people to tap into their own local energy sources.

Recent assessments of the renewable energy opportunities in Vanuatu, Fiji and the Marshall Islands, undertaken with the International Renewable Energy Agency, affirmed that local renewable energy sources, including solar, wind, geothermal, and biomass, could not only meet local energy needs, thereby boosting energy independence and reducing exposure to volatile fuel markets, but also decrease energy costs and increase energy access.¹¹⁴

CASE STUDY: SOLAR HOME SYSTEMS IN BANGLADESH

Bangladesh aspires to be the world's first "solar nation".¹¹⁵ And with its rapid rollout of solar home systems, Bangladesh is showing how renewable energy is not only a solution to energy access but also a catalyst for jobs, local economic growth, and a more equitable model of development.

As of 2015, around 15 million Bangladeshis (3.5 million households or about 10% of the country's total) have their homes powered by solar home systems. Working with the World Bank and other development partners, the government aims to provide electricity to all households by 2021.¹¹⁶

Access to electricity is giving Bangladeshis new ways to increase their income and improve their lives. Children can study longer, solar energy is powering irrigation pumps, lighting is improving safety at night (especially for women and children) and remote families can receive weather information — important for farmers and for a country that faces severe weather hazards.¹¹⁷

In Bangladesh, solar energy is not only replacing more expensive energy sources, it is also a tool of social change, in particular boosting opportunities for jobs, training and entrepreneurship among women.¹¹⁸

CASE STUDY: POWERING AFRICA

In a landmark report in June 2015, Kofi Annan’s Africa Progress Panel presented a compelling vision for improving energy access, reducing energy costs, and laying the foundations for a prosperous low-carbon energy future for the African continent.¹¹⁹

The report — *People, Power, Planet: Seizing Africa’s energy and climate opportunities* — rejects outright any notion that Africa must “choose between growth and low-carbon development,” and while recognising that Africa needs to utilise all of its energy assets in the short term, centres squarely on unlocking Africa’s clean energy potential.¹²⁰

No region has contributed less to global greenhouse emissions than Sub-Saharan Africa. Electricity consumption per capita in Sub-Saharan Africa is about one twentieth of that in Australia.¹²¹ 621 million Sub-Saharan Africans — one in two people, or over 25 times the population of Australia — have no access to electricity at all.¹²² Relying on costly and inefficient fuels including kerosene, poor households in Africa pay around 50 times as much per unit of energy used as Australians.¹²³ Over 65% of primary schools and over 30% of health facilities in Sub-Saharan Africa lack electricity.¹²⁴

While many are rightly calling for efforts to dramatically increase the region’s electricity generating capacity, recent work by Oxfam and the Overseas Development Institute concludes that tackling energy poverty, and poverty more generally, depends less on increasing overall capacity and more on orienting policy and efforts towards delivering electricity to those who need it most. The report — *Speaking truth to power* — affirms that distributed, clean-energy solutions are best suited to closing the energy access gap.¹²⁵

“Africa can break the link between energy and emissions by leap-frogging over the damaging, carbon-intensive energy practices that have brought the world to the brink of catastrophe.”

— Kofi Annan, former Secretary General of the United Nations, chair of the Africa Progress Panel ¹²⁶

Several African countries are already taking steps towards fulfilling this vision. Djibouti, in pursuing the twin goals of improving energy access and energy security, is aiming to meet 100% of domestic electricity demand through renewable energy by 2020. Presently, the country remains heavily dependent on imported fossil fuels, exposing it to fluctuating oil prices and using up precious funds that could otherwise be spent on addressing urgent development challenges. An evaluation of the country’s renewable energy potential, undertaken in 2015 with the assistance of the International Renewable Energy Agency, revealed how renewable energy development will also help to overcome the country’s very high unemployment rate. The renewable energy sector employs more people per unit of electricity than the conventional energy sector.¹²⁷

In Zimbabwe, solar initiatives are changing lives for the better: transforming healthcare, lighting schools, and improving livelihoods. Recent case studies show how solar power is improving lives — enabling remote schools to enter the internet age and light up classrooms for study in the evenings,¹²⁸ helping to save lives through providing lighting, refrigeration and clean water to health clinics,¹²⁹ and improving livelihoods and incomes from labour-saving irrigation systems to refrigeration for fresh produce.¹³⁰

While realising a sustainable, renewable energy future for Africa and breaking the link between carbon and development will depend to some extent on domestic reforms, it will also depend on international support and cooperation, and on countries including Australia following through on their international climate finance commitments (see p. 26).

Fig6: Across the region, local communities are fighting the coal industry's expansion¹³¹

“Take it from us in India: the world needs more renewables, not more Australian exported coal.”

—Debi Goenka, Founder of India's Conservation Action Trust¹³²

Mahan, India

Indigenous communities have won the battle to prevent coal mining in the Mahan forest.

Palawan, Philippines

People in the island province of Palawan are resisting a plan to build two coal-fired power plants and campaigning for sustainable energy solutions. Construction of the power plants is on hold.

Krabi, Thailand

Plans for a large coal-fired power plant in Krabi province are facing fierce local resistance.

Pacific

In 2014 the Pacific Climate Warriors, representing 12 Pacific nations, symbolically blockaded the port of Newcastle — the world's largest coal export port — to protest against the expansion of Australia's coal industry and raise awareness of climate impacts across the Pacific.



The Pacific Climate Warriors' blockade of Newcastle coal port in 2014.
Photo: Jeff Tan/350 Pacific.

5 BEHIND THE SPIN

In 2014, Peabody Energy began a major push to “build awareness and support to eliminate energy poverty”. The campaign — Advanced Energy for Life¹³³ — includes a website, social media campaign, paid advertisements, and presentations at influential conferences.¹³⁴ According to its website, the campaign aims to “elevate discussions around the use of today’s advanced coal technologies to eliminate energy poverty, increase access to low-cost electricity and improve emissions”.¹³⁵

Peabody is not alone in aggressively promoting coal as the solution to energy poverty. The Minerals Council of Australia,¹³⁶ Adani, Whitehaven and New Hope Coal are among the many other coal companies and industry groups that have been mounting a similar case.

While Peabody is a loud voice in debates about energy poverty, analysis by The Australia Institute concluded that Peabody’s activities “go no further than public relations campaigns and political lobbying in their own commercial interests”¹³⁷ and that the company has no direct involvement in energy poverty alleviation projects. Revealingly, while some coal companies including Adani, BHP Billiton, Rio Tinto and Anglo American do support projects to alleviate energy poverty, none of these projects involve coal.¹³⁸

A recent media investigation traced Peabody’s long history of attacking climate science.¹³⁹ In July 2015, a major study by the Union of Concerned Scientists revealed how many of the world’s largest fossil fuel companies, including Peabody, have worked for decades to spread disinformation about the realities and risks of climate change.¹⁴⁰ On 25 June, credit rating agency Moody’s issued a negative outlook for Peabody Energy, downgrading the company’s rating across several metrics.¹⁴¹

While many of the arguments used by Peabody and other coal companies in presenting their case have been criticised and debunked,¹⁴² the industry’s central claim that coal is key in the fight against poverty has been championed by the Australian Government, with the Prime Minister and other Cabinet Ministers regularly echoing the industry’s lines (see opposite). The coal industry retains firm support from leaders of both major parties. At a time when the mining industry is pushing for curbs on the ability of environmental organisations to engage in advocacy, analysis by The Australia Institute revealed that mining companies had been claiming at least AUD \$20 million in tax deductions for lobbying fees.¹⁴³

A recent report by conservative think tank the Institute of Public Affairs (IPA), which claimed “increasing the supply of Australian coal to India could allow at least 82 million Indian people each year to access a regular and reliable source of electricity”¹⁴⁴ was categorically rejected by the Vasudha Foundation. Sirinivas Krishnaswamy, CEO of the Indian NGO, concluded that the arguments put forward by the IPA “simply do not stand up to even the most basic scrutiny.”¹⁴⁵

5.1 FAKING IT?

Not long after being reprimanded by the United Kingdom’s Advertising Standards Authority for a misleading advertisement,¹⁴⁶ Peabody Energy made the astonishing claim during the 2014 G20 Summit in Brisbane that “approximately a half-million citizens from 48 countries had urged G20 leaders to place greater focus on advancing policies to alleviate energy poverty”.¹⁴⁷ The “half-million citizens” refers to the number of “likes” and “follows” across the social media channels for the Advanced Energy for Life campaign (see left) and Lights On Project. The organisation TckTckTck noticed a suspicious surge in the campaign’s social media followers in the lead up to the G20 Summit and on closer analysis concluded that Peabody had bought a large number of followers¹⁴⁸ — a common but controversial practice among companies and organisations looking to boost their profile and credibility. Peabody has denied the allegations.¹⁴⁹

Fig7 (right): Singing from the same song-sheet: the coal industry and the Australian Government on coal and poverty¹⁵⁰

Tony Abbott,
Prime Minister
of Australia.

"Coal is good
for humanity."

"The earlier we hit
the ground to get
the coal out the
better."

Jeyakumar Janakaraj,
CEO Adani Australia.

Adani mining donated
\$50,000 to the Liberal
Party in 2013–2014.

Joe Hockey,
Treasurer of
Australia.

"We are exporting coal so
that nations can lift their
people out of poverty."

"I urge shareholders and all people
associated with the coal industry
to communicate to our political
leadership and the media the
importance of a strong coal industry
in Australia, not only to assist in
countering world poverty, but to
maintain our own standard of living."

Robert Millner,
Chairman of New
Hope Coal.

New Hope Coal
donated \$250,000
to the Liberal Party
in 2013–2014.

Greg Hunt, Australian Minister
for the Environment.

"Coal will be a main
energy source for
decades and decades."

"It's pretty strange that,
globally, not only the UN,
but developed country
leaders are spending so
much time on, quote,
climate change."

Greg Boyce, Chairman and
Chief Executive Officer of
Peabody Energy.

Peabody Energy donated
\$50,000 to the Liberal Party
in 2013–2014.

Bill Shorten, Leader
of the Opposition.

"Labor supports our
coal industry."

"Well, I can get a group
of scientists together and
pay them whatever I want
to and come up with a
solution."

Clive Palmer,
mining magnate
turned politician.

"I've always said I support
the responsible and
sustainable development
of the Galilee Basin and
Abbot Point."

Annastacia Palaszczuk,
Queensland Premier.

6 A NEW ROLE FOR AUSTRALIA

“[Australia’s] blind spot on climate change makes it possible to overlook a lot of important things that other countries are doing that affect demand for our coal ... Reality will intrude on the dreams in due course.”

—Professor Ross Garnaut, former climate change advisor for the Australian Government¹⁵¹

If Australia is to do its part towards tackling global climate change and contributing to sustainable development, poverty elimination and reducing inequality worldwide, it must move rapidly to a renewable energy-based Australian economy and support renewable energy rollout in other countries.

Our first responsibility is to phase coal out of our own energy mix.¹⁵² Australia has a particularly high proportion of coal in its energy mix,¹⁵³ is among the wealthiest countries on earth, and has the highest emissions per person of any developed country.¹⁵⁴ We must have a concrete plan for the managed and equitable transition away from coal towards renewables, including removing billions of dollars in subsidies¹⁵⁵ to the coal industry and ramping up support to the renewables sector.

But as a wealthy developed country, Australia also has a responsibility to help developing countries implement their own low-carbon development plans. Helping finance climate compatible development overseas is both part of meeting our share of what’s required globally to reduce emissions and an important contribution to helping people in poorer countries have access to a better life.

6.1 FALLING BEHIND THE CURVE

In June 2015, G7 leaders committed to the “decarbonisation of the global economy over the course of this century” and to “accelerate access to renewable energy in Africa and developing countries in other regions with a view to reducing energy poverty”.¹⁵⁶ While still short of the commitments necessary to ensure a strong chance of meeting the internationally agreed 2°C goal and adequate support to developing countries, the statement provided one of the strongest signals yet of the coming end of the fossil fuel era. Two weeks earlier, 25 worldwide business networks representing over 6.5 million companies from more than 130 countries pledged to lead the global transition to a low-carbon, climate resilient economy.¹⁵⁷

On 18 June 2015 Pope Francis’ extraordinary encyclical —Laudato Si’— added further momentum as the international community heads towards Paris in December. Affirming unequivocally the links between climate change, inequality and poverty, Pope Francis acknowledged that “technology based on the use of highly polluting fossil fuels — especially coal, but also oil and, to a lesser degree, gas — needs to be progressively replaced without delay.”¹⁵⁸

While much more remains to be done, mid-2015 has delivered encouraging signs of genuine momentum in international responses to climate change. It has also seen Australia come under increasing pressure to lift its game. At the Bonn Climate Change Conference in June, Australia faced an unprecedented number of questions during its review under the UNFCCC’s Multilateral Assessment Process. Many of the questions came from key trading partners, with China openly questioning the fairness of Australia’s emissions reduction targets.¹⁵⁹ In its People, Power, Planet report (discussed on p19), Kofi Annan’s Africa Progress Panel singled out Australia, along with Canada, Japan and Russia, as “freeriders”. Australia, the report claimed, “appears to have withdrawn entirely from constructive international engagement on climate change” and “must adopt a more credible and constructive stance.”¹⁶⁰

Australia risks more than its international reputation. Professor Ross Garnaut has warned of risks for the Australian economy through failing to recognise significant changes in climate and energy policy in other countries. By predicating its future on unrealistic scenarios, the Australian Government risks leaving the Australian economy exposed, out of step with global trends, and ill-equipped to prosper in a new global energy landscape.

“For a number of years, the Australian authorities, like the Australian mining industry, have been failing to take account of changes in thinking about policy — both structural economic policy and environmental policy — in the major Asian countries. That circular elite communication across government agencies, the mining companies, has led to over-optimistic views being sustained when the realities have been changing fundamentally.”

—Professor Ross Garnaut¹⁶¹

One example of the government’s failure to see over the horizon is its selective use of International Energy Agency (IEA) projections. The government has placed heavy emphasis on the New Policies Scenario, citing it in both its issues paper for consultations on Setting Australia’s post-2020 target for greenhouse gas emissions,¹⁶² and its 2015 Energy White Paper.¹⁶³ Despite its name, the New Policies Scenario only takes account of policies, commitments and plans that countries have already announced, and does not account for likely developments.¹⁶⁴ The New Policies Scenario, were it to come to pass, would put the world on track for a temperature rise of 3.6°C.¹⁶⁵ However, all 196 parties to the UN Framework Convention on Climate Change (195 countries plus the European Union) remain committed to the goal of limiting to 2°C, and together are taking progressively stronger action. As Garnaut asserts, “What China is doing in structural change and adjustments of its energy mix has already gone well beyond anything contemplated in the IEA’s ‘new policies’ scenario.”¹⁶⁶

A recent report from the Australian Government’s Department of Industry and Science — Coal in India¹⁶⁷ — commits a similar error, relying on year-old IEA assumptions and failing to account for India’s dramatic increase in its renewable energy ambitions (discussed on p12.)

To increase the chances of achieving the 2°C goal, more and more countries are pushing to ensure that, in addition to capturing countries' commitments for the next five or ten years, the Paris climate agreement includes a long-term emissions reduction target. Options presented within the negotiating text for the Paris agreement, to be finalised in December 2015, include "carbon neutrality", and "full decarbonisation by 2050 and/or negative emissions by 2100 [for developed countries]".¹⁶⁸ At time of writing, nearly 130 countries have voiced support for including such a long-term target within the agreement.¹⁶⁹ In May, 120 investor CEOs from around the world managing funds worth more than USD \$12 trillion wrote an open letter to 67 finance ministers urging them to support the inclusion of a long-term emissions reduction target in the Paris agreement.¹⁷⁰ To contribute to a strong chance of keeping the temperature rise below 2°C, a highly developed country like Australia would need to achieve zero emissions as soon as possible and well before mid-century.¹⁷¹

In a recent detailed study, Beyond Zero Emissions points out that the Australian Government is setting up the Australian economy to be reliant on increasing fossil fuel exports, despite the fact that Australia's key trading partners are shifting away from fossil fuels and towards less emissions-intensive economies.¹⁷² The shift to a 2°C pathway would see annual export revenue from coal, gas and iron ore fall to AUD \$100 billion less than the Australian Government's current projections.¹⁷³ The case aligns with the fact that "non-resource" states of Victoria and New South Wales are in a relatively stronger budget position than the highly resource-driven economies of Queensland and Western Australia.¹⁷⁴

In a May 2015 visit to Australia, Christiana Figueres, Executive Secretary of the UNFCCC, noted how other resource-driven economies, facing an inevitable decline in fossil fuel exports, are taking pro-active steps to diversify their economies. Figueres noted that even Saudi Arabia — whose economy has been based overwhelmingly on oil exports — understands that it will not be able to use all its oil and is taking steps to diversify its economy. Australia must have an honest conversation about how it will replace coal export revenue and take greater advantage of assets beyond coal and other carbon-intensive resources.¹⁷⁵

"You represent a huge potential to lead the world into a very healthy economic diversification path. You haven't figured out yet how to do it, but, my friends, that is your homework."

— Christiana Figueres¹⁷⁶

6.2 STRANDING THE AUSTRALIAN ECONOMY

"Stranded assets are those that lose value or turn into liabilities before the end of their expected economic life. In the context of fossil fuels, this means those that will not be burned — they remain stranded in the ground. We believe the risks of this occurring are growing."

— HSBC¹⁷⁷

Global financial giant HSBC is among the many powerful voices warning of the economic liability of coal and other high-carbon assets. In a recent briefing, HSBC identifies three stranding risks facing coal and other fossil fuels.

Stranded by climate change regulation

The world is committed to limiting the average temperature rise to 2°C. Many countries are already putting in place stronger policies to help them meet their share towards this goal. Regulation consistent with the 2°C goal will largely regulate coal out of the market and leave the vast majority of reserves unburned.

Stranded by economics

The market value of coal companies is falling at the same time as renewables are becoming cheaper and investment in renewables is rising sharply. Carbon pricing and the removal of fossil subsidies will exacerbate the pace of coal's economic stranding.

Stranded by energy innovation

Advancements in energy efficiency and renewables technology are already impacting demand for coal, with this trend set to accelerate.

Overseas, major banks have begun to reduce their exposure to coal.¹⁷⁸ Several banks have explicitly ruled out funding coal mines and associated infrastructure in the Galilee Basin.¹⁷⁹ For both economic and ethical reasons, an increasing number of businesses, universities, foundations and other organisations are making a conscious decision to divest their funds from fossil fuels. The global divestment movement has gathered significant momentum in a short amount of time, and there is every sign that this momentum will continue building.

In June 2015, Norway's parliament voted to reduce coal investments through its USD \$900 billion sovereign wealth fund, selling off shares in companies that generate more than 30% of their turnover or activity from coal. Estimates suggest the fund will drop more than USD \$8 billion of coal investments as a result.¹⁸⁰ In December 2014 the Australian Government's Mid-Year Economic and Fiscal Outlook presented a negative outlook for thermal coal prices, recording a 15% fall since the 2014/15 Federal Budget and predicting no recovery.¹⁸¹

6.3 EXPORT MORE IDEAS AND INNOVATION, FEW EMISSIONS

According to the traditionally conservative International Energy Agency, solar energy (including both solar PV systems and solar thermal electricity from concentrated solar power plants) could soon be the world's largest source of electricity.¹⁸² A bright economic future awaits those who are investing now in the knowledge, expertise and innovation that will continue to drive the world's energy revolution.

“If you look at our strategic advantage one might argue we have even more advantages in a renewable-energy economy than in a fossil-fuel one.”

—Brian Schmidt, Nobel laureate¹⁸³

Economists, the renewable energy industry, climate campaigners and ordinary Australians who have embraced renewable energy have looked on in bafflement as the Australian Government has dismantled, weakened or attempted to abolish key programs to support renewable energy research, development and rollout; weakened the Renewable Energy Target; attempted to abolish the Australian Renewable Energy Agency and the profitable Clean Energy Finance Corporation (both designed to help develop commercial renewable energy projects); stalled on the “million solar roofs initiative”;¹⁸⁴ maintained fossil fuel subsidies;¹⁸⁵ and launched rhetorical attacks on renewable energy.¹⁸⁶

In March 2015 the Climate Council outlined how, despite our excellent renewable energy resources, Australia is missing out on the renewable energy boom.¹⁸⁷ In 2014 investment in renewable energy grew 32% in China, 8% in the US, 12% in Japan, 3% in Germany, and 3% in the UK. In Australia it fell by 35%.

In April 2015, Bloomberg New Energy Finance reported that investment in large-scale renewable energy in Australia had fallen by 90% over twelve months.¹⁸⁸ While jobs in renewable energy have surged internationally,¹⁸⁹ official figures from the Australian Bureau of Statistics show that the renewable energy sector lost almost 2,500 jobs over two years.¹⁹⁰

A myopic focus on coal, at the expense of maintaining Australia's knowledge and expertise in the burgeoning field of renewable energy, is both harming Australia's national interest and our ability to play our part in building the sustainable, clean economies of the future.

6.4 SUPPORTING SUSTAINABLE DEVELOPMENT AND POVERTY REDUCTION

“All the pieces are in place now for developing countries to choose a clean energy path that is cheaper, faster and healthier than coal. It would be nice if the Australian Government focused on this, rather than exporting dirty, out-dated coal.”

—Debi Goenka¹⁹¹

There's no doubt that the upfront costs of renewable energy are offset by fuel savings over time, and that renewable energy can be an important tool for social change, sharing benefits across communities and laying the foundations for sustainable, equitable development. However, the upfront costs of renewable energy can still in some cases present a challenge.

As a developed country, Australia has a responsibility to provide finance and technological support to help developing countries tackle climate change. A large proportion of this finance must go to supporting climate change adaptation initiatives, for which it is more difficult to attract private investment.¹⁹² Adaptation measures include vital programs to develop community resilience in the face of climate impacts and to manage future uncertainties, including through building on traditional coping strategies and local knowledge.¹⁹³ These may include supporting communities to diversify their crops in order to build food security in a changing climate, and better preparing for climate-related disasters such as cyclones, floods and droughts. Climate finance must also help overcome the capital cost of renewable energy and support low-carbon development in poorer countries.

Australia's contribution to the Green Climate Fund in 2014 was a welcome step, though marred by the fact it was drawn from a rapidly diminishing aid budget.¹⁹⁴ As a next step, Australia must have a transparent strategy for scaling up its overall contribution to reach a fair share of the international goal to provide USD \$100 billion a year by 2020. This strategy will need to include national budget contributions that are in addition to existing aid commitments, supporting new sources of finance, and principles to guide private investment.

Australia must also support and contribute to strong finance provisions for the post-2020 period under the Paris agreement. This future climate finance regime needs to see adequate support from both the public and private sector flow to developing countries for climate change adaptation and low-carbon development — in particular renewable energy and reduced dependence on fossil fuels.¹⁹⁵

7 CONCLUSION

As we approach the adoption of the Sustainable Development Goals in September and the Paris climate negotiations, appeals are growing louder for international cooperation on financing, technology and capacity building.¹⁹⁶ In a major report produced in cooperation with the International Energy Agency — *Aligning policies for a low-carbon economy* — the OECD urges a scale-up in sustainable low-carbon investment and finance.¹⁹⁷ Secretary General Angel Gurría said that financing from rich countries to support renewable energy in developing nations should form a key part of discussions ahead of Paris.¹⁹⁸

Australia's potential role in supporting energy access, reduced fossil fuel dependence, and sustainable development overseas is not limited to our international financing obligations under international climate agreements or the support we provide through Australia's aid program.

In January 2015, Indian Prime Minister Narendra Modi called for a "consortium of all nations who have the greatest solar energy potential" to "join hands with India for innovation and cutting-edge research".¹⁹⁹ By investing in technological innovation, Australia can both enhance its own prosperity and help meet the energy and development needs of other nations, at the same time contributing to the global climate challenge.

Improving energy access is also a matter of financial innovation and entrepreneurship. New models of financing can allow people to pay as they go, rather than have to raise a large amount of capital upfront.

Organisations such as Pollinate Energy,²⁰⁰ led by young Australians, are helping communities overcome barriers to energy access.

Climate change is both the greatest challenge and greatest opportunity of our times. Australia has all it needs to lead the global transition to a sustainable, prosperous and more equitable future: phasing out coal from its own energy mix and supporting climate compatible development in developing countries.

By continuing to hedge its future on coal, remaining blind to the scope of international climate action, ignoring increasing calls for international cooperation on renewable energy, and failing to develop its non-fossil assets and enormous renewable energy potential, Australia is both harming its own future prosperity and working against the interests of poor people in developing countries. Rather than dwell on past advantages of coal, Australia must recognise both its own enviable renewable energy assets, as well as the natural advantages of renewable energy in reducing poverty and inequality around the world.

2015 will be a defining year for sustainable development and international climate action. Australia must choose whether to continue down a self-defeating path, clinging to the technologies and ways of the last century, or change course to become part of today's climate and energy solutions, helping create a brighter future for Australians and the rest of the world.

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Members of the Gomba Agro-Business Centre showing off their solar lanterns. Gomba is on its way to becoming a solarised green community off the grid and a model for what other communities in Zimbabwe could achieve. They raise funds primarily by selling solar lanterns and also by charging for mobile phone recharging. Since they formed in August 2011 they have raised \$16,685 (as of May 2015), which they have ploughed back into making their community a better place to live and work. They bought a solar suitcase for their nearest clinic at Mazura and they have fitted out their energy kiosk, built toilet blocks and purchased a fridge, which will be used as their fish farming enterprise scales up. Photo: John Magrath/Oxfam.





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