



Successive droughts in Chad's Bahr el Gazel region have reduced food and pasture. Climate change is set to make survival even more difficult for vulnerable communities. Chad, 2013. Photo: Ella Dickinson/ Oxfam

# LET THEM EAT COAL

Why the G7 must stop burning coal to tackle climate change and fight hunger

Climate change is already affecting what we all eat, and is the biggest threat to winning the fight against hunger. Coal is the biggest single cause of climate change, yet the G7 countries are still burning huge amounts, despite efficient, affordable, renewable alternatives being available. G7 coal power stations emit twice as much fossil fuel CO<sub>2</sub> as the whole of Africa, and their contribution to global warming will cost Africa alone more than \$43bn per year by the 2080s and \$84bn by 2100, and lead to several million tonnes of staple crops lost worldwide. To set the tone for a successful climate agreement at the UN talks in Paris in December 2015, the G7 must lead the world in setting out clear plans for a just transition away from coal. With the right mix of regulatory and policy measures, some countries can move to coal-free electricity grids within the next decade.

## ENDORSEMENTS FOR 'LET THEM EAT COAL'

### **Prof. Olivier De Schutter**

Former UN Special Rapporteur on the right to food (2008–14)

*'Coal-fired power stations increasingly look like weapons of destruction aimed at those who suffer the impacts of changing rainfall patterns as well as of extreme weather events.'*

### **Sharon Burrow**

General Secretary, International Trade Union Confederation (ITUC)

*'The G7 can lead the way with a commitment to no new coal and fossil fuel exploration, a plan for a just transition in phasing out polluting energy with investment in clean energy, community renewal and jobs.'*

### **Nick Molho**

Executive Director, Aldersgate Group

*'A clear programme to close the G7's coal plants, which tend to be old and have already made their return on investment, is a cost-effective first step to reducing the G7's carbon emissions and an absolute necessity if the rest of the world is to follow suit and increasingly invest in low-carbon forms of energy generation.'*

### **Dr Saleemul Huq**

Director of the International Centre for Climate Change and Development, Bangladesh

*'Every tonne of coal that is burnt adds to the climate change burden on Bangladesh and other vulnerable nations – stealing land with sea level rise and making food harder to grow.'*

### **Dr Michael Grubb**

Professor of International Energy and Climate Change Policy at University College London

*'The G7 can strongly influence how much action the rest of the world takes by matching its words with hard action.'*

**Dessima Williams**

Former Chair of the Alliance of Small Island Developing States (2009–2011)

*‘Oxfam International has gotten it right and the report should be heeded. Phasing out coal must commence now.’*

**Wael Hmaidan**

International Director, Climate Action Network (CAN)

*‘The science is clear – to keep the climate safe we need to reduce carbon pollution from the power sector to zero by the middle of the century. The first step in making that happen is for the richest countries, like those in the G7, to form a credible plan to phase out dirty coal power.’*

**Farhana Yamin**

Founder and CEO, Track 0

*‘All countries must pledge themselves to a zero carbon pathway, but as this timely Oxfam report makes clear, the G7 have the responsibility and the capacity to lead the way.’*

**Steve Howard**

Chief Sustainability Officer, IKEA Group

*‘This Oxfam report provides more evidence that the prosperity of communities everywhere depends on a rapid transition to a low carbon economy and a move away from fossil fuels. At IKEA Group, we’re committed to going 100% renewable, and by 2020 we aim to produce as much renewable energy as all the energy we use.’*

# SUMMARY

This year will see crucial new climate talks in Paris in December. Clear leadership on climate from the G7 at their meeting in Germany could lead to a breakthrough in Paris. Clear leadership from the G7 means concrete plans to reduce their own emissions and to mobilize climate finance.

## Why the G7 must kick their coal habit

Coal is the single biggest driver of catastrophic climate change – responsible for one-third of all CO<sub>2</sub> emissions since the industrial revolution.<sup>1</sup> Moving beyond it is the first acid test of whether we will win the fight against runaway climate change.

Each coal power station can be seen as a weapon of climate destruction – fuelling ruinous weather patterns, devastating harvests, driving food price rises and ultimately leaving more people facing hunger. With these climate impacts falling disproportionately on the most vulnerable and least food-secure people, the burning of coal is further exacerbating inequality. Without urgent action, climate change could put back the fight against hunger by several decades.<sup>2</sup>

Using new modelling from Climate Analytics and the AD-RICE2012 model, Oxfam estimates that on current policies, G7 coal emissions will be responsible for total climate change-related costs in Africa of approximately \$43bn per year by the 2080s and \$84bn per year by the end of the century. This is sixty times what G7 countries give Africa in agricultural and rural development aid and more than three times what G7 countries give Africa in total bilateral aid.<sup>3</sup> Global costs of G7 coal emissions will be \$260bn per year by the 2080s and \$450bn per year by the end of the century.<sup>4</sup>

With current levels of G7 action, G7 coal emissions would reduce yields of staple crops by around 0.5 percent globally and 1 percent in the poorest countries by the 2080s compared with 1980 levels, meaning less food in the context of a rising population. This is equivalent to seven million tonnes of crops lost every year.<sup>5</sup>

While more than half of today's coal consumption is in developing countries, the scale of G7 coal burning is considerable. If G7 coal plants were a single country, it would be the fifth most polluting in the world.<sup>6</sup> G7 coal plants emit twice as much fossil fuel CO<sub>2</sub> as the entire African continent,<sup>7</sup> and ten times as much as the 48 least developed countries.<sup>8</sup>

Five of the G7 countries (including the 2015 Chair, Germany) are actually burning more coal since 2009, the year of the Copenhagen climate summit.<sup>9</sup> G7 countries must switch from a 'do as we say' approach to 'do as we do' by phasing out their own coal pollution.

The best way for the G7 to inspire ambition from others, including from higher-emitting and rapidly growing developing countries, is to make clear that a low-carbon future is a political priority, and demonstrate that it is possible to phase out coal and maintain a healthy economy.

*G7 coal emissions could cost Africa \$43bn per year by 2080s and \$84bn by the end of the century. This is sixty times what G7 countries give Africa in agricultural and rural development aid.*

*G7 coal emissions could mean millions of tonnes of crops lost per year by the 2080s.*

*Five G7 countries have been burning more coal since 2009, the year of the Copenhagen climate summit.*

Rich industrialized countries must stop hiding behind countries like China and take the lead in kicking their own coal habit.

### **How the G7 can kick their coal habit**

Current G7 policies, like emissions trading schemes and carbon pricing, have so far failed to dent coal emissions in G7 countries. It is not enough to assume that coal will be edged out through renewable energy targets or overall emission reduction targets. As can be seen in Germany and the UK, without direct government action targeted at coal in particular, it remains a stubborn problem, with persistent coal emissions threatening to undermine existing climate targets.<sup>10</sup>

*With the right national coal phase-out plans, some countries can move to coal-free electricity grids in the next decade.*

Oxfam commissioned the think-tank E3G to review the current coal situation in all G7 countries, identifying the market dynamics and policy measures in place and the timelines under which coal use could feasibly be ended. With the political will to confront the vested interests in the fossil fuel industry, and concrete plans, it is clear that this transition can be made quickly – some countries can move to coal-free electricity grids within the next decade.

*650,000 new green jobs would be created in the US and 430,000 in the EU if policies to implement a just transition to 100% renewable energy were implemented.*

What is more, a fair and well-planned transition from coal will have economic, health and employment benefits. For example, 650,000 new green jobs would be created in the US, and 430,000 additional green jobs generated in the EU, if a just transition to 100 percent renewable energy were implemented.<sup>11</sup>

### **Recommendations**

G7 leaders should:

1. Commit to an urgent transition away from unabated coal. Some countries will be able to do this faster than others, given different energy mixes and starting points. Country-specific plans and policies should ensure this transition is complete in:

- Canada: by 2030
- France: by 2020
- Germany: by 2040
- Italy: by early 2020s
- Japan: by 2035
- UK: by 2023
- US: by 2030

2. Stand by existing commitments to mobilize \$100bn per year by 2020 for tackling climate change in developing countries. G7 countries should commit to a transparent roadmap to significantly scale up public finance before 2020 and increase the proportion of funds flowing to adaptation.

# 1 WHAT IS AT STAKE? CLIMATE CHANGE AND GLOBAL HUNGER

## INTRODUCTION

This is a critical year for international action to tackle climate change and poverty. Governments are working towards a new global climate change agreement due to be finalized at the UN climate summit in Paris in December 2015. A fair and ambitious global climate deal is long overdue. While there are encouraging signs that carbon dioxide (CO<sub>2</sub>) emissions stalled last year,<sup>12</sup> scientists are clear that we are still heading towards catastrophic global warming of 4°C this century.<sup>13</sup>

It is fitting that the G7 host, German Chancellor Angela Merkel, has put climate change and hunger on the agenda for the G7 summit in June 2015. As a group of the leading rich industrialized nations, the G7 has a special responsibility to stop doing harm – by phasing out climate polluting fossil fuels, and to start helping – through delivering the promised \$100bn finance for the world's poorest people to adapt to the climate impacts that they have done little to cause and to develop along a low-carbon pathway.

The German Presidency has also proposed a headline initiative on food security for this year's summit. Climate change is the biggest threat to our chances of winning the fight against hunger. The level of commitment to tackle climate change is therefore a key test of any such G7 food security plan.

Now is Merkel's opportunity to reclaim her 'Climate Chancellor' mantle, and for the G7 to make clear their ambition and set the scene for success in Paris.

*There are encouraging signs that CO<sub>2</sub> emissions stalled last year, but scientists are clear that we are still heading towards catastrophic global warming of 4°C this century.*

*Climate change is the biggest single threat to our chances of winning the fight against hunger. The level of commitment to tackle climate change is therefore a key test of any G7 food security plan*

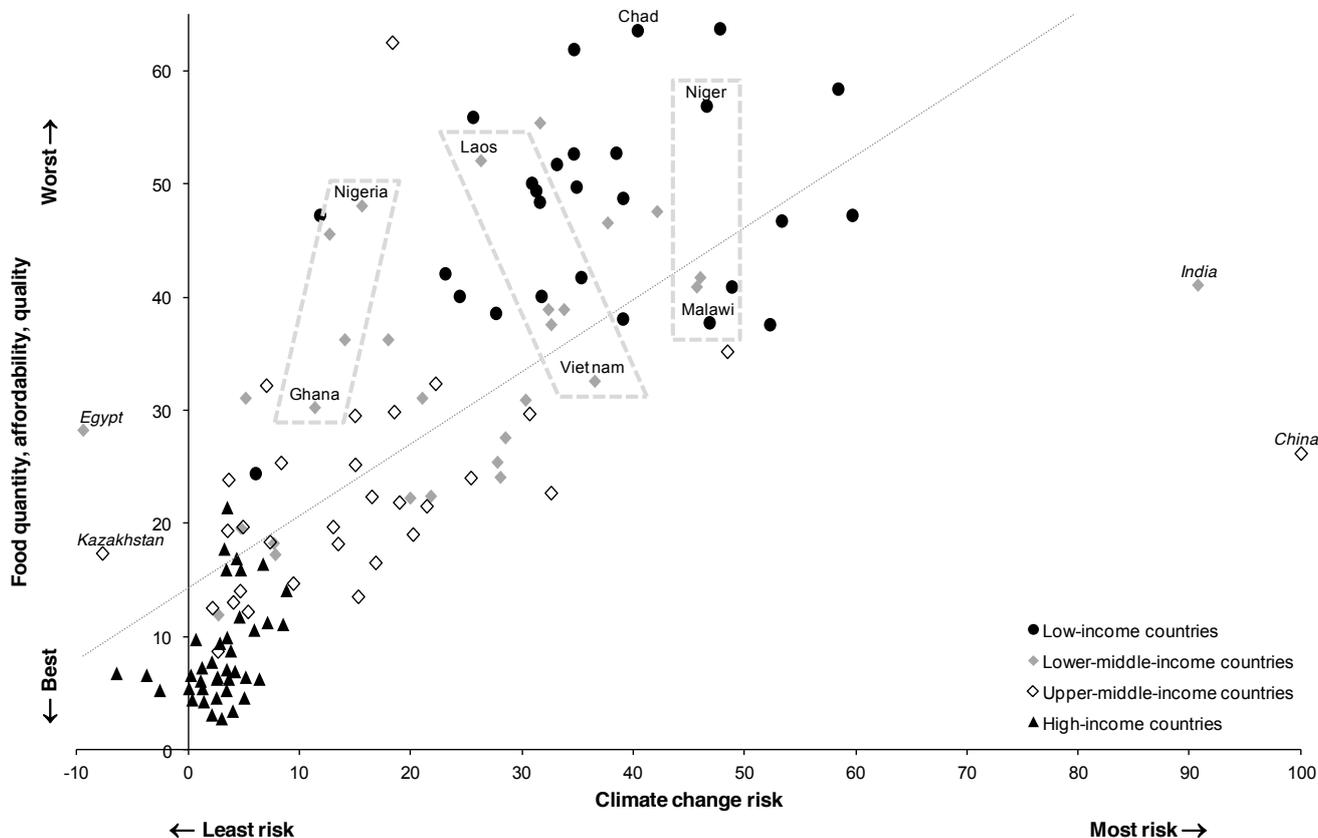
## INEQUALITY IN THE FACE OF CLIMATE CHANGE

Climate change is already costing lives and making the fight to end hunger ever harder. Its impacts are happening now, contributing to storms, floods, droughts and shifting weather patterns that ruin crops, kill livestock and lead to devastating food shortages and price hikes. By 2050, on current trends of burning fossil fuels, climate change threatens to put back the fight against hunger by several decades.<sup>14</sup>

The most extreme weather changes, sea-level rises and agricultural losses tend to be concentrated among poorer countries with the least capacity to cope. It is women and men already struggling with the everyday burdens of poverty, without safety nets, who are most exposed to changes in the climate, and for whom it is most difficult to cope and recover from more frequent disasters.

Over the last decade, 77 percent of lives lost from climate-related disasters and 98 percent of people dramatically affected were in developing countries.<sup>15</sup> But climate change's most savage impact on humanity this century is likely to be the increase in hunger, with those countries which face the highest food insecurity among the most vulnerable.

**Figure 1: Food insecurity and climate change risks**



Source: Oxfam 2014 'Hot and Hungry: How to stop climate change derailing the fight against hunger', <https://www.oxfam.org/sites/www.oxfam.org/files/mb-hot-hungry-food-climate-change-250314-en.pdf>

The Fifth Assessment Report of the IPCC indicates that global yields for major staple crops could decline by 2 percent per decade by 2030, while demand is due to grow by 14 percent,<sup>16</sup> meaning that harvests will struggle to keep pace with a larger population. Africa's food production systems are highly vulnerable to climate change, with declines likely in cereal crop yields across the continent of up to 35 percent by mid-century.<sup>17</sup>

Tropical oceans are losing their fish – even under a 2°C warming scenario, by 2055 there may be a drop of 40–60 percent in yields for fisheries in tropical latitudes.<sup>18</sup> Fish is the primary source of animal protein in some developing small-island states, as well as in Bangladesh, Cambodia, the Gambia, Ghana, Indonesia, Sierra Leone and Sri Lanka.<sup>19</sup>

There could be an extra 25 million malnourished children under the age of five by 2050 compared with a world without climate change – which is the same as the total number of children under five in the EU.<sup>20</sup> Irreversible stunting (due to malnutrition at a young age) is projected to increase by 23 percent in Central Africa and 62 percent in South Asia compared with a world without climate change.<sup>21</sup>

It is in this context that the continued burning of coal to provide energy in rich countries must be assessed. There is a price to pay for every tonne of CO<sub>2</sub> emitted, and it is paid in dollars and in lives and livelihoods ruined in communities far from the security and safety nets of the rich world.

**Box 1: Climate change testimony: Azima Begum from West Gabgachi, Northern Bangladesh**



Photo: Tom Pietrasik/Oxfam

'I've lived in West Gabgachi for two and a half years. Before, I lived on another *char* [sandy river island], but I had to leave because the land we lived on was disappearing due to river erosion. I settled here with my husband and four children.

'But two years ago I lost my house along with my five chickens when the flood came. I came back to collect the corrugated tin walls and roof, and salvage one or two things. It took 15 days for everything to dry out. There was, of course, no food. My father sent some rice from my old village. We just about got by, by eating a little twice a day. It was not enough for my children but it was the best I could do.

'The land my house is built on was raised, and when the floods came again [Aug/Sept 2014] I did not have to relocate or lose any livestock. But when it floods all the crops are destroyed and there's no work for my husband.

'We save up rice and money for these times, along with hay for the livestock. There's nothing to do during a flood. All you do is sit on top of the bed, cook and eat if you have rice. When the flood recedes, we have to clean the house and then fix the mud plinth on which our home sits. It takes us time to recover.'

*Azima is part of a programme to help communities prepare for and recover from the flooding, for example by building plinths to raise homes above flood levels, and facilitating access to government-sponsored flood-resilient seeds.*

Source: Oxfam interview, November 2014

**Box 2: Climate change testimony: Ipaishe Masvingise from Gutu, Zimbabwe**



Photo: Annie Bungeroth/Oxfam

'Farming is the only livelihood we have. The food we produce makes us healthy and strong, and the surplus food we grow we can sell for money for school fees and hospital fees.

Over the last 10 years, the climate has changed. We had a time when there was a lot of rain and all of our crops were destroyed, so we couldn't harvest any food. Another time, the rains came as normal but went very early, and the crops wilted and died due to the heat.

If we look into the skies and see that there isn't going to be much rain, we are frightened because of the fear that we'll be forced to ration our food. Rationing to those levels affects the health of our children.

We feel belittled. We feel the rich countries are always getting a better life, and using their money to step on us and cause these crises in our lives. My message to those who haven't seen the climate changes, I say to them come out and unite with others and learn more about it and then they will come to understand.'

*Passionate and energetic, Ipaishe and other women in her community are part of an irrigation project, trying to adapt and continue to grow crops despite the decreasing and erratic rainfall. They use their experience to campaign for adaptation techniques to be more widely adopted.*

Source: Oxfam interview October 2011

### Box 3: Experiencing extreme weather events: Grace Kalengor, Vanuatu



Photo: Sokhin/Panos

The terrible impact of Cyclone Pam on the people of Vanuatu, Tuvalu and Kiribati in March 2015 is an example of how increasingly ferocious storms can have a devastating impact on development. Grace Kalengor, 23, an English teacher at the Eton Secondary School in Vanuatu is trying to dry out the school books that survived the cyclone. Locals lost most of their cash crops and were left with only a few weeks' food supplies, while thousands lost their homes across the island nation.

Source: Sokhin/Panos/Oxfam Australia, 2015

# 3 WHY COAL?

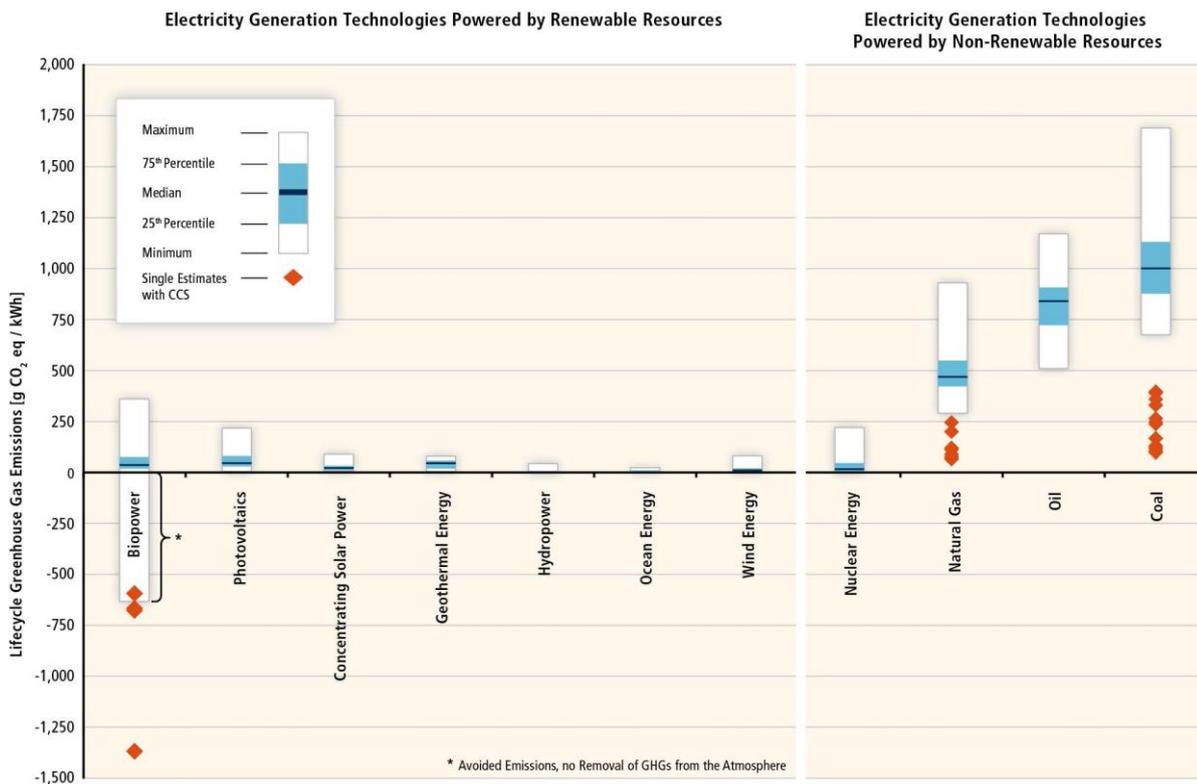
## THE DIRTIEST FUEL

While all fossil fuels need to be phased out, coal must be the first to go, because it is the dirtiest and can be replaced by an array of better, cleaner and economically competitive alternatives.

Coal-fired power stations are the largest single contributors to the climate change we are experiencing right now.<sup>22</sup> Coal provides 41 percent of the world's power, but 72 percent of power-sector emissions.<sup>23</sup> Even the most modern so-called 'clean coal' plants emit significantly more CO<sub>2</sub> than the average gas plant, and infinitely more CO<sub>2</sub> than renewable energy.

*Coal provides 41% of the world's power, but 72% of power-sector emissions.*

**Figure 2: The carbon footprint of coal power vs other sources**



Count of Estimates	222(+4)	124	42	8	28	10	126	125	83(+7)	24	169(+12)
Count of References	52(+0)	26	13	6	11	5	49	32	36(+4)	10	50(+10)

This figure shows lifecycle emissions – i.e. direct emissions from the operation of the power plant, as well as indirect emissions from plant construction, and mining and transport of fuel etc.

Source: IPCC (2011) 'Special Report on Renewable Energy Sources and Climate Change Mitigation', prepared by Working Group III of the Intergovernmental Panel on Climate Change, <http://srren.ipcc-wg3.de/report>.

## COAL COSTS – LIVES AND DOLLARS

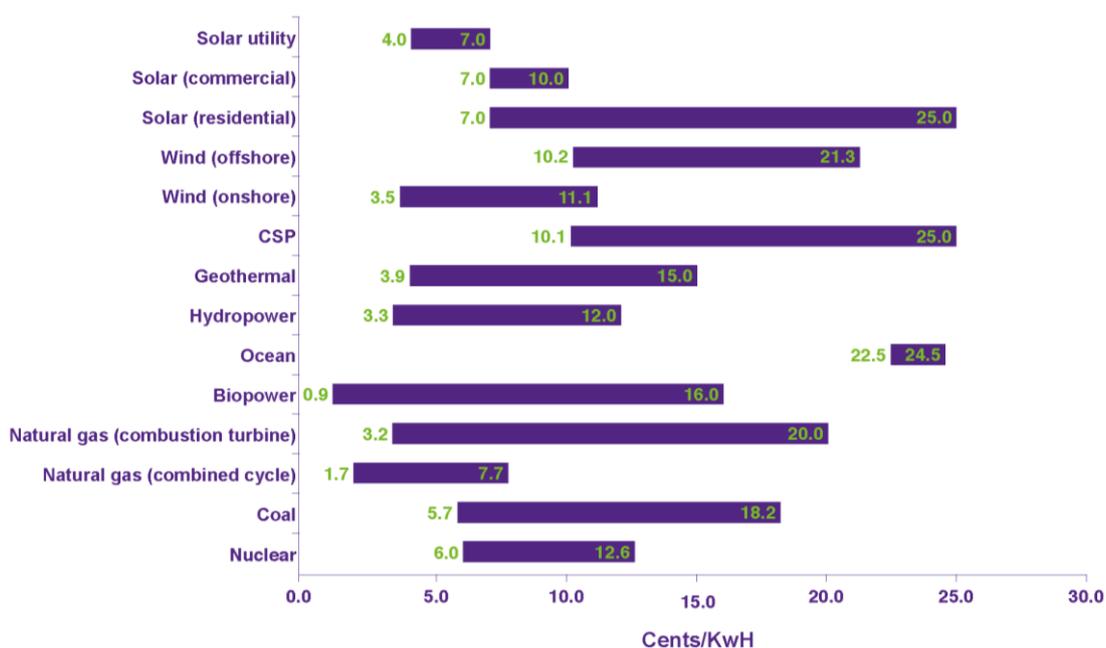
Based on short-sighted accounting, coal is often touted as ‘cheap’, but this is to neglect the falling costs of renewables, the growing human and environmental costs associated with coal and the potential future costs of stranded assets – should climate regulation force coal plants to cut short their operating lifetime.

For instance, the coal-driven pollution crisis has reached critical proportions in India and China, where it has been termed an ‘airpocalypse’. Air pollution caused 1.2 million premature deaths in China in 2010, and it reduces life expectancies by months in the US and the EU.<sup>24</sup>

Thirsty coal mines and coal power plants worsen water stress in countries from South Africa to China: a pending coal-related water crisis threatens to hold back further Chinese growth.<sup>25</sup> In the US, 72 percent of toxic water pollution comes from coal-fired power plants.<sup>26</sup>

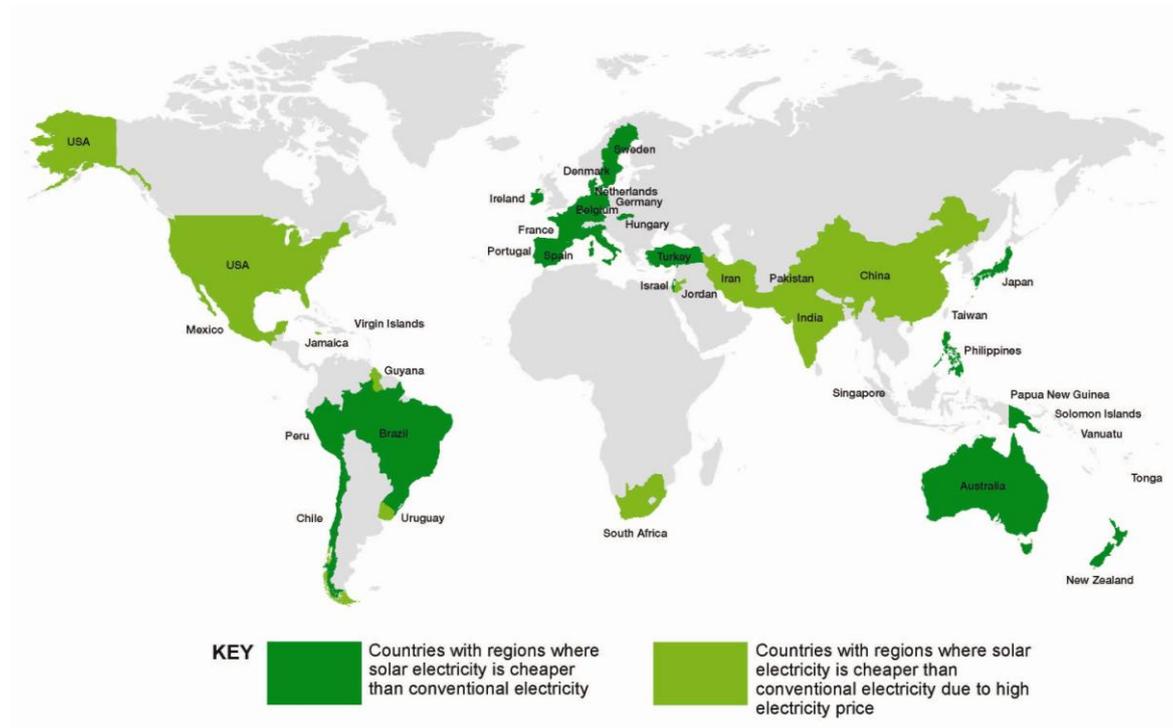
Yet the costs of renewable energy have fallen so substantially that in many places they are now comparable to, or cheaper than, coal. Half of the 60 countries surveyed by Deutsche Bank early this year have regions where the cost of solar power is the same as or less than buying conventionally generated electricity from the grid (‘grid parity’), including France, Germany, Italy, Japan, and the US.<sup>27</sup> Deutsche Bank expects that solar power could be at grid parity in 80 percent of the world by 2017.<sup>28</sup> In the US, wind is already cheaper than coal, and often cheaper than gas.<sup>29</sup>

**Figure 3: Costs of electricity generation in countries surveyed by Deutsche Bank (cents per kWh)**



Source: V. Shah and J. Boream-Phelps (2015) ‘Crossing the Chasm’, Deutsche Bank, [https://www.db.com/cr/en/docs/solar\\_report\\_full\\_length.pdf](https://www.db.com/cr/en/docs/solar_report_full_length.pdf) p12. Costs are straight financial costs, and do not include environmental or health externalities.

**Figure 4: Where solar electricity is as cheap as or cheaper than conventional electricity**



Source: Deutsche Bank (2015) 'Solar Grid Parity in a Low Oil Price Era', <https://www.db.com/cr/en/concrete-deutsche-bank-report-solar-grid-parity-in-a-low-oil-price-era.htm>

## THE BIGGEST THREAT IN THE FUTURE

The Intergovernmental Panel on Climate Change (IPCC) says that to meet the internationally agreed target to limit warming to below 2°C, global emissions in the electricity sector would have to reach zero before 2050.<sup>30</sup> Reductions will have to be much faster in the rich countries most responsible for climate change in order to be fair. To keep warming below the much safer 1.5°C level – a level to which most, although not all, countries can adapt – reductions would have to happen even faster.

The reserves of coal held on mining companies' books are sufficient to meet 113 years of current global use. There is more coal than any other fossil fuel.<sup>31</sup> We can only afford to burn 20 percent of coal reserves if we want to keep warming below 2°C<sup>32</sup> – and even less to keep it to the safer level of 1.5°C. But, unfortunately, demand for coal is projected to grow.

According to the International Energy Agency's (IEA) current policies scenario, the world's coal-fired power stations will have burned half of the world's entire remaining 2°C emissions allowance (or 'carbon budget') by about 2045.<sup>33</sup> Unless further action is taken, coal-fired power generation will put us on a fast-track to catastrophic climate change. But while most of today's coal is consumed in developing countries, the move away from coal must begin in the rich world, and it is the G7 that should show the way.

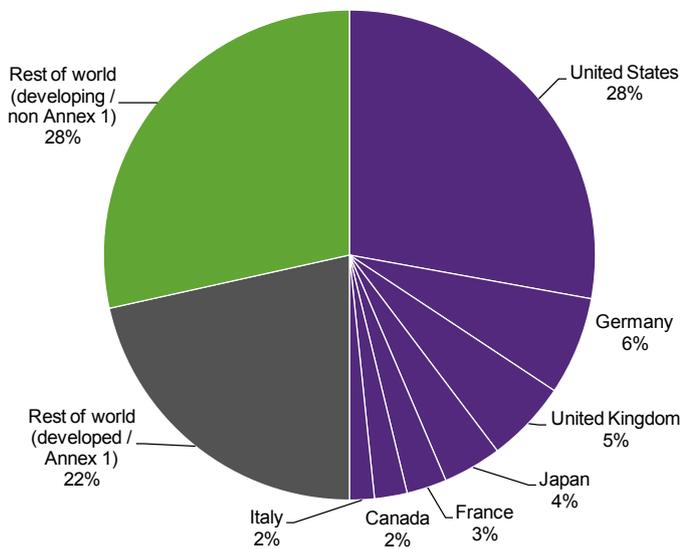
*We can only afford to burn 20% of coal reserves if we want to keep warming below 2°C – and even less to keep it to the safer level of 1.5°C.*

# 4 WHY FOCUS ON THE G7 – AND WHY NOW?

## THE G7'S RESPONSIBILITY FOR CAUSES OF CLIMATE CHANGE

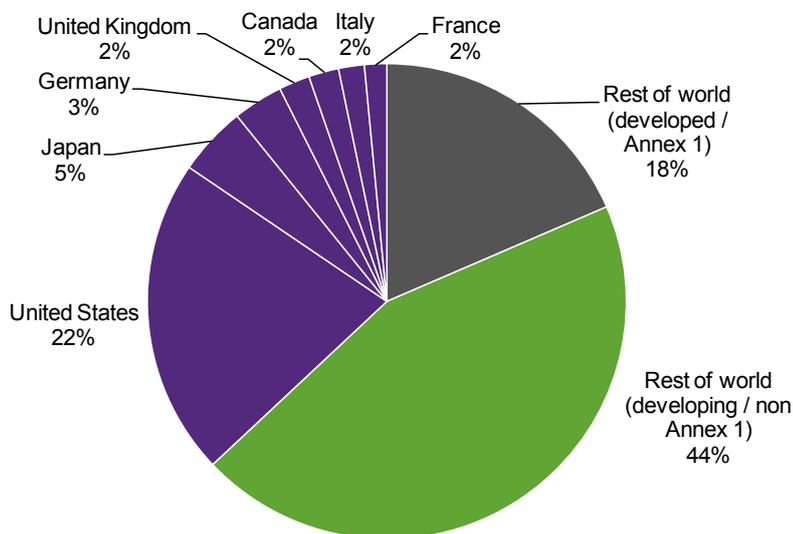
There is an inherent inequality in the causes of climate change. Just seven of the richest, most powerful economies – the G7 – have been collectively responsible for half of all CO<sub>2</sub> emissions since the Industrial Revolution.<sup>34</sup> It is these past emissions which have caused the climate change being experienced now.<sup>35</sup>

**Figure 5: Responsibility for cumulative CO<sub>2</sub> fossil fuel emissions, 1850–2011**



Source: Oxfam calculations, based on CAIT, <http://cait.wri.org/wri>

**Figure 6: Responsibility for cumulative CO<sub>2</sub> fossil fuel emissions, 1990–2011**



Source: Oxfam calculations, based on CAIT, <http://cait.wri.org/wri>

## THE G7'S CAPACITY TO ACT

As well as the greatest responsibility for climate change, wealthy countries also have the greatest capacity to take action. Once the incomes of the poorest classes have been exempted – so that only incomes earned by people living above a global poverty line of \$9,000 per person are counted towards a country's capacity – the G7 countries hold 67 percent of global capacity.<sup>36</sup> They can therefore decarbonize, and finance mitigation and adaptation, more easily than poorer countries. For comparison, China holds 7 percent of global capacity, while India holds 0.03 percent.

*The G7 countries hold 50% of historic responsibility for causing climate change, and 67% of global capacity to help to tackle it.*

The challenge with renewable energy is its higher up-front investment costs: choosing solar over coal requires more capital in the short term, even if initial investment costs are declining, and lower running costs mean savings over time.<sup>37</sup>

Drawing on their greater financial and technological capacity, the G7 must not only move first and fastest to cut their carbon emissions, they must also meet their obligations to incentivize low-carbon development in poorer countries.

## G7 COAL EMISSIONS REMAIN STUBBORNLY HIGH

While more than half of today's coal consumption is in developing countries,<sup>38</sup> the G7's coal emissions remain stubbornly high. The G7's continued reliance on coal-fired electricity generation acts as a major break on their climate ambition. Rich industrialized countries must stop hiding behind newly industrializing countries like China and get to grips with their own addiction to coal.

*Five G7 countries have actually increased their coal use since the 2009, the year of the Copenhagen climate summit.*

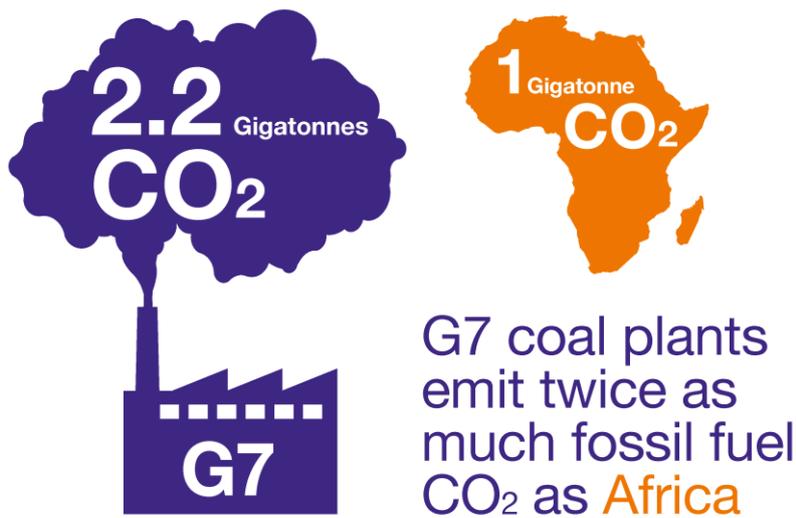
Each G7 country has a different energy mix, but coal is still the single largest source of power sector emissions in each of the G7 countries. France relies heavily on nuclear power at home; however, its coal footprint abroad is substantial because of the operations of French government-controlled energy companies GDF and EDF.

Despite their greater capacity and responsibility for leading the energy transition, rich countries are not phasing out coal fast enough. Since 2009, the year of the Copenhagen climate change conference, most of the G7 continue to plan to build new coal plants (even though two out of three proposed plants are shelved), as Figure 8 shows. Five of the G7 countries (including the 2015 Chair, Germany) have actually increased their coal use since 2009.

The scale of burning coal in the G7 countries is considerable. If G7 coal plants were a single country, it would be the fifth most polluting country in the world.<sup>39</sup> G7 coal plants emit twice as much fossil fuel CO<sub>2</sub> as the African continent,<sup>40</sup> and ten times as much as the 48 Least Developed Countries.<sup>41</sup> As Box 3 describes, the impacts of these G7 coal emissions on the poorest and most vulnerable countries and communities are considerable.

*G7 coal plants emit ten times as much energy-related CO<sub>2</sub> every year as the world's 48 least developed countries, and twice as much as all of Africa.*

**Figure 7: G7 coal plants emit twice as much CO<sub>2</sub> every year as all of Africa's power plants, vehicles, houses and factories**



**Box 3: The economic and hunger costs of the rich world's addiction to coal**

Oxfam commissioned Climate Analytics to calculate the contribution of G7 coal emissions to global temperature increase and the corresponding estimated economic costs due to adaptation to climate change and residual damages globally and in major regions.

Assuming governments fully implement laws already on their books to tackle climate change, emissions from G7 coal power stations will be responsible for total global costs of approximately \$260bn per year by the 2080s and \$450bn per year by the end of the century.<sup>42</sup>

G7 coal-driven global warming will cost Africa approximately \$43bn per year by the 2080s and \$84bn per year by the end of the century. This is sixty times what G7 countries give Africa in agricultural and rural development aid and more than three times what they give Africa in total bilateral aid.<sup>43</sup>

These costs are conservative estimates that assume every country invests in an optimum level of climate change adaptation; hence total damage is assumed to be minimal. In reality, partly due to insufficient finance for adaptation, much greater damage and much higher costs are likely, and will continue to increase year on year past 2100. On a per capita basis, each G7 citizen costs the world 50% more in climate change damage due to coal burning than each citizen of a developing country.

The temperature increase driven by these G7 coal emissions will also have major negative impacts on crop production globally, and especially in developing country regions.

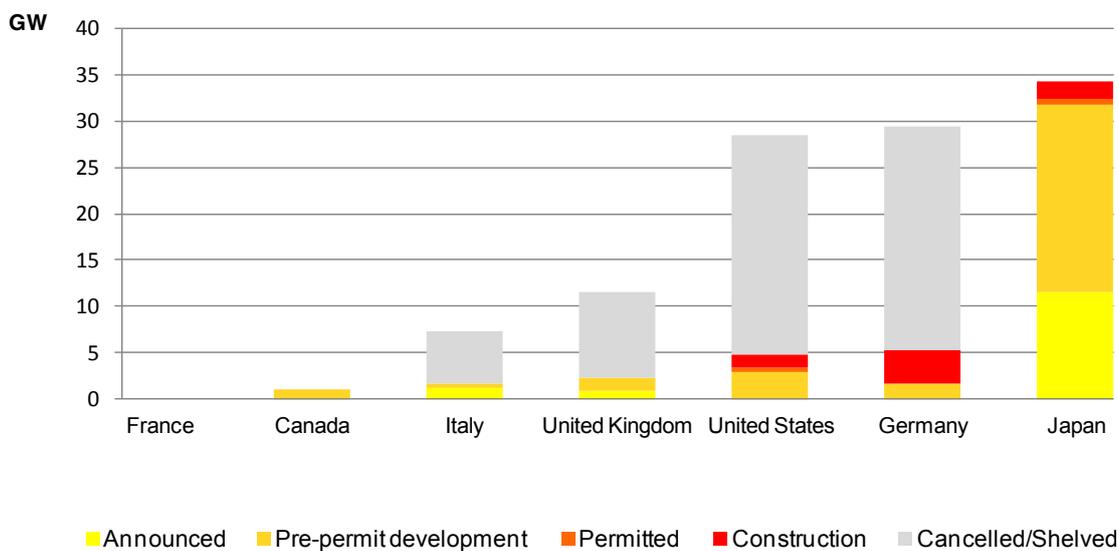
Oxfam estimates that on current policies, G7 coal emissions will be responsible for cutting yields of staple crops like wheat and maize by around 0.5% globally and around 1% in the poorest countries by the 2080s compared with a 1980 baseline. That is the equivalent of seven million tonnes of crops lost every year – a significant brake on crop production in the context of fast-growing demand.<sup>44</sup>

## The best decarbonization strategy is action to phase out coal

At the G7 summit, leaders are set to discuss long-term 2050 decarbonization targets and strategies; they must recognize that the single most effective decarbonization strategy is a plan and specific policies to phase out coal.

Emissions trading schemes and carbon pricing have so far failed to dent coal emissions in G7 countries. And it is not enough to assume that coal will be edged out through renewable energy targets or overall emission reduction targets. As can be seen in Germany and the UK, without direct government action, coal remains a stubborn problem, and persistent coal emissions threaten to undermine existing climate targets.<sup>45</sup>

**Figure 8: G7 coal expansion plans since 2010<sup>46</sup>**



Source: Global Coal Plant Tracker, with Japan figures from Kiko Network .

Planning decisions taken now to allow new coal plants, or extend the lifetime of already ageing plants, will lock in emissions for decades to come and put at risk a safe climate. Every dollar, euro or yen invested today in new fossil fuels infrastructure is money that is diverted from sustainable energy – postponing and making more expensive the energy transition and betting against the futures of the world’s poorest people.

*If policies to implement a transition to 100 percent renewable energy were implemented, 650,000 green jobs would be created in the US, and 430,000 additional green jobs generated in the EU.*

### Missing out on jobs

If the G7 put in place plans to transition urgently away from coal and toward 100 percent renewable energy, they would grow their economies and generate substantial jobs in the process. Recent analysis from the New Climate Institute shows that in the US, 650,000 new jobs would be created in the renewable energy sector and 430,000 in the EU, if policies to implement a transition to 100 percent renewable energy were implemented.<sup>47</sup> The International Labour Organization finds that the transition to a low carbon economy can generate an additional 60 million jobs over the next two decades – even taking into account job losses in carbon-dependent sectors.<sup>48</sup> To ensure that no one is left behind in the

transition from old industries – such as coal – to industries with jobs growth, it is vital to put in place plans for a just transition. The ITUC defines a just energy transition as one that secures

- time-bound wage and job certainty to workers;
- pension funds for older workers beyond this timespan;
- skills development and redeployment with decent work alternatives for younger workers;
- investment in community renewal and new jobs, including the construction and services associated with renewable energy.<sup>49</sup>

## G7 HIDING BEHIND EMERGING ECONOMIES

There is a tendency among rich, polluting countries to hide behind fast-emerging economies, especially China, as an excuse for lack of action.

China now burns almost the same amount of coal as the rest of the world combined. This is in the context of China having nearly 20 percent of the world's population, of which approximately 400 million people live on less than \$2.50 a day.<sup>50</sup> Also significant is China's role as the 'factory of the world': a large portion<sup>51</sup> of China's carbon footprint is a result of producing goods that are destined for G7 shop shelves. When responsibility for emissions is attributed to the end consumer, the average US citizen has a lifestyle that is three times more carbon intensive than the average Chinese citizen.<sup>52</sup>

Despite facing development challenges, China has taken the initiative to curb its coal use. The government is closing existing plants that do not meet efficiency standards:<sup>53</sup> in 2014 China overhauled or scrapped 3.3GW of small, carbon-intensive plants.<sup>54</sup> It has also banned new coal plants in the three key economic regions – home to one-third of current coal-fired capacity – because of air pollution.<sup>55</sup> Chinese air pollution standards for new and existing coal plants are stricter than those currently being considered in the EU.<sup>56</sup> And Beijing has committed to non-fossil fuels generating 40–45 percent of the electricity mix by 2030.<sup>57</sup> In the context of all these measures, China's coal consumption may already have peaked: in 2014 China's coal consumption fell by 2.9 percent while the economy grew at 7.3 percent.<sup>58</sup>

There is still more that China could do to limit and reduce coal use – which would benefit public health, the environment and employment, without detrimentally affecting economic growth and poverty reduction. But China should not be used as an excuse for the current lack of action in the G7. As outlined in this paper, the G7's coal problem is considerable in its own right. The rich, industrialized countries of the G7 need to stop saying 'do as we say' and start saying 'do as we do' by demonstrating that it is possible to phase out coal and maintain a healthy economy.

## TACKLING COAL WILL BOOST AMBITION IN PARIS

The G7 summit comes six months before world leaders meet to finalize a global agreement on climate change in Paris in December 2015.

G7 countries taking tangible action to tackle the single biggest driver of climate change and agreeing specific policies to make this happen would send an important signal of willingness to the rest of the world, and help to create the right kind of momentum for Paris.

### **Box 4: A fair long-term mitigation goal in Paris**

At the UN climate talks in December 2015, governments will be discussing a new long-term mitigation goal as part of the Paris agreement. Recent studies suggest fossil fuel emissions must reach zero by around the middle of the century.<sup>59</sup> It is clear that all countries must be part of the transition to renewable energy if we are to avoid catastrophic warming.

As this paper makes clear, rich countries have the responsibility and capacity to phase out fossil fuels first and fastest. Rich countries also have the responsibility to provide finance for poor countries to follow a low-carbon development pathway.

In the paper, 'Breaking the Standoff',<sup>60</sup> Oxfam identified that countries that exceed a responsibility and capacity threshold should pay for their own pathway to phase in renewable energy and have an obligation to provide finance for poorer countries to do the same.

A long-term mitigation goal in the Paris agreement should therefore make clear that rich countries will move fastest to reach zero fossil fuel emissions – starting as suggested in this paper by rapidly phasing out their consumption of coal – and provide finance for poor countries to do the same.

## 5 COUNTRY-SPECIFIC PLANS FOR MOVING BEYOND COAL

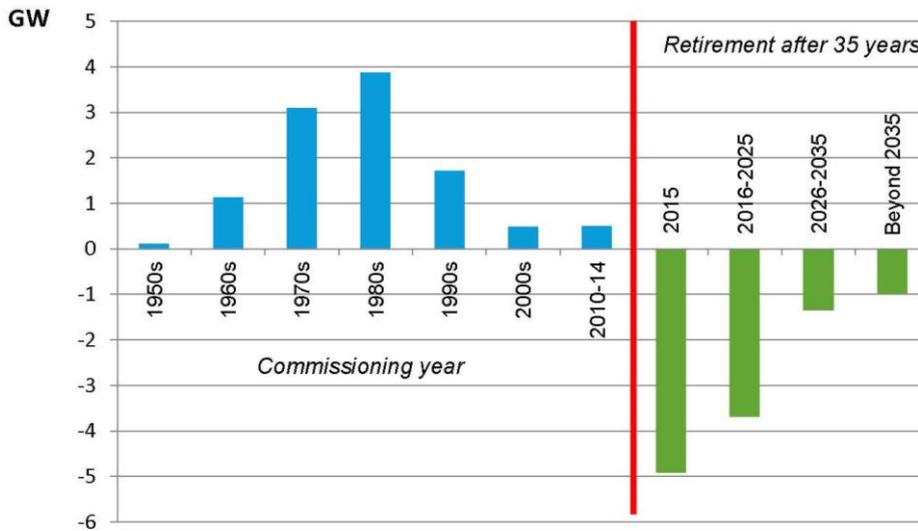
Oxfam commissioned the think-tank E3G to review the current coal situation in all G7 countries, identifying the market dynamics and policy measures in place and the timelines under which coal use could be feasibly ended. Based on these studies, Oxfam has drawn out country-specific coal exit recommendations. The full reports for each country are available on the E3G website: <http://e3g.org/>

### CANADA

<b>Coal consumption since Copenhagen?</b>	Decreased
<b>Size of coal fleet</b>	15 coal plants (11GW)
<b>Average age of coal fleet</b>	34 years
<b>New coal pipeline</b>	Canada has ruled out new unabated coal plants.
<b>Current coal trajectory</b>	Canada has an explicit policy in place to tackle new coal and require the shutdown of older plants – one of the few areas where the Federal Government has taken proactive action to address climate change in recent years. Unfortunately it fails to bite sufficiently strongly or quickly enough to have a significant impact on Canada’s increasing GHG emissions. <sup>61</sup> And it comes in the regrettable context of Canada pursuing greenhouse gas-intensive tar sands production  The majority of Canada’s electricity comes from hydropower, and the country has significant potential for other renewable energy technologies.
<b>What would happen if existing coal plants were shut down after their investment costs had been recouped*?</b>	Almost all coal plants would be phased out by 2030 with just 1GW remaining.

\* As coal plants typically recoup their original investment costs well within 35 years, these assessments show the effect of a hypothetical policy where G7 governments would intervene to close coal plants after a generous 35 year period – rather than allow them to continue to pollute and profit from doing so. While coal phase-out pathways should not be determined by commercial investment decisions, the resulting retirement curve is useful in providing another lens for assessing the problem.

**Figure 9: Canada coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity became operational by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

## Opportunities to speed up the transition away from coal

**Federal regulation:** The Canadian government needs to take further action to accelerate the retirement of existing power plants – the new Emissions Performance Standard (EPS) law entering into force in July 2015 prevents the construction of new unabated coal and limits the lifetime of existing plants. However, it enables the majority of coal plants to continue emitting until they reach 50 years old, meaning it will not phase out the last of Canada’s coal plants until 2062.<sup>62</sup>

**Provincial efforts:** Provinces are showing greater urgency to address emissions from coal, and the success of Ontario’s coal phase-out in 2014 is a great example of what can be achieved. Remaining coal use in Canada is now concentrated in three provinces: Nova Scotia, Saskatchewan and Alberta. Even in Alberta – the largest coal user in Canada, a cost-effective transition away from coal can be achieved by around 2030.<sup>63</sup>

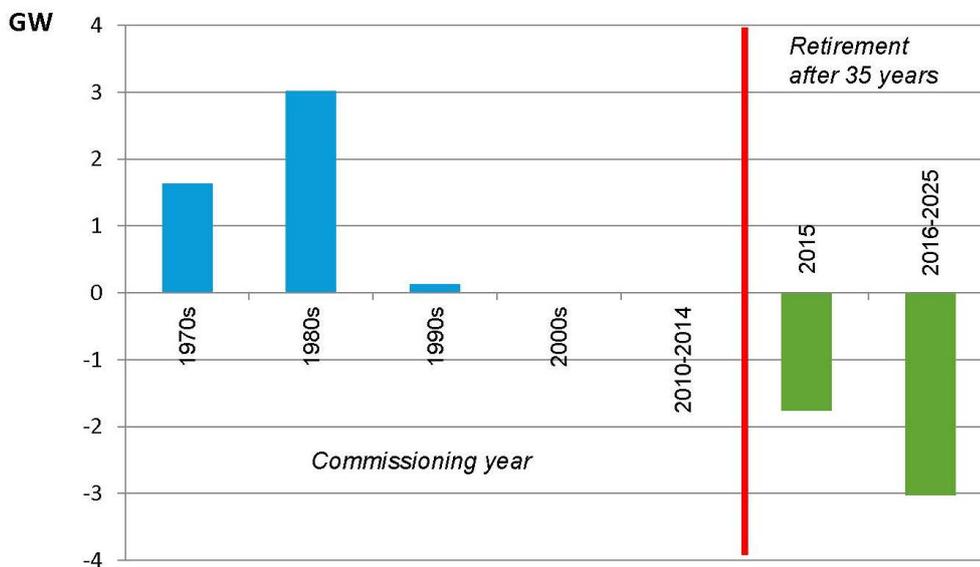
### Recommendations:

- The Federal Government should commit to phasing out coal emissions by 2030, by legislating the same emissions standards for coal plants over 35 years old as those in place for new coal plants.
- Other provinces should follow Ontario’s lead and put in place clear phase-out plans.

## FRANCE

<b>Coal consumption since Copenhagen?</b>	Slight increase
<b>Size of coal fleet</b>	Smallest in the G7. Shutdowns due to the impact of EU air quality rules mean that only 4 coal plants will remain after 2015 (3GW).
<b>Average age of coal fleet</b>	32 years
<b>New coal pipeline</b>	None (though there is a question mark over a potential new plant in New Caledonia). <sup>64</sup>
<b>Current coal trajectory</b>	France's energy mix is characterized by its high dependence on nuclear energy.  The new French Energy Transition Law (soon to be adopted by Parliament) is likely to set targets to reduce nuclear from 75 percent to 50 percent by 2025, as well as boost renewables, reduce fossil fuel use, and cut overall energy demand in half by 2050 on 2012 levels. The aim is to put France on a path to reduce emissions by 40 percent on 1990 levels by 2030, and 75 percent by 2050. <sup>65</sup>
<b>Coal footprint abroad</b>	France's coal footprint abroad is seven times the size of its coal footprint at home, via its state-controlled companies EDF and Engie (formerly GDF); and French banks invest heavily in coal. Between 2005 and 2014, they invested €30bn, which makes French banks the fifth biggest coal investor during this period. <sup>66</sup>

**Figure 9: France coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity became operational by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

### Opportunities to speed up the transition away from coal

**Regulation:** The completion of a transition out of coal use for electricity production in France is within sight, but requires further government action

to ensure the timely retirement of the last four power plants. Two are operated by German company E.ON, and are intended to close in 2025; the other two are operated by French state-owned company EDF, which has announced an intention to stay open until 2035.<sup>67</sup> One reason why France's coal plants still exist is to cover peak heating needs during particularly cold winters, due to inefficient electric heating systems installed in draughty homes.<sup>68</sup> The country is lagging behind in efforts to insulate houses – but if France steps up to meet its 2020 energy efficiency goals, this will help render coal redundant, while aiding those low-income families in France who live in energy poverty.

#### **Box 5: France's coal footprint abroad <sup>69</sup>**

France's coal footprint abroad is larger than its coal footprint at home – due to the global coal operations of its state-controlled energy companies EDF and Engie. With an 84 percent stake in EDF, the French government controls major decisions at Europe's biggest power generator. EDF owns 11 coal plants in Europe (the UK, France, Belgium and Poland), with one more planned in Serbia. The company is also a key investor in 5 coal plants in China, with one new one in the pipeline.

Though a smaller shareholder in Engie (the French government owns a 33.3 percent stake), the government has extra voting rights – meaning that they have one of the loudest voices at AGMs. The majority of Engie's coal portfolio is in the global North, with 18 coal plants throughout Europe, the USA, and Australia, and another 12 coal plants spread across Indonesia, Thailand, China, India, Peru, Brazil, Chile, and Panama. The combined emissions from EDF and Engie's global coal fleet were about 150Mt in 2013 – more than seven times the emissions from France's domestic coal fleet, and half as much as France's total domestic CO<sub>2</sub> emissions. In the year of the Paris climate conference, with the French government leading efforts to broker a global climate change agreement, President Hollande has the opportunity to act as a climate-responsible shareholder, and use the French government's considerable influence in EDF and Engie to ensure a rapid phase-out of coal – setting an example to other state-controlled energy companies like Vattenfall and ENEL who have already taken steps in this direction.

### **Recommendations**

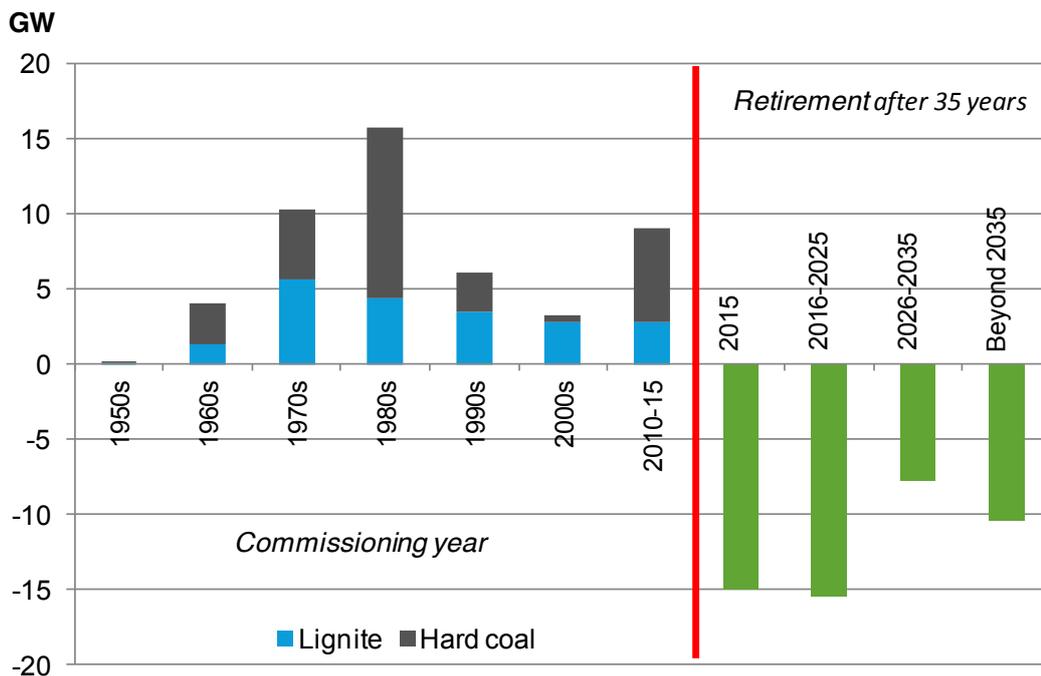
The French government should:

- Make the small, yet symbolic commitment to phase out domestic use of coal in France by 2020. Announcing this small step ahead of the Paris COP, in conjunction with bigger steps to boost energy savings and renewable energy, would send the right signal to the rest of the world.
- Use its position as major shareholder in EDF and Engie to influence the companies to put in place detailed plans to close down their coal operations in Europe, the US and Australia by the early 2020s, and to stop bankrolling harmful new plants across the developing world;
- Make it mandatory for banks to publish their carbon footprint, and stop them investing in coal.

## GERMANY

<b>Coal consumption since Copenhagen?</b>	Increased
<b>Size of coal fleet</b>	49GW
<b>Average age of coal fleet</b>	30 years
<b>New coal pipeline</b>	Several new plants remain under construction, following ill-fated decisions to invest in 2007–09. The few remaining in planning are unlikely ever to be built. <sup>70</sup>
<b>Current coal trajectory</b>	Germany is in the midst of one of the most ambitious energy transformations in the world: a nuclear phase-out (by 2022), a minimum 80 percent renewable energy phase-in (by 2050); and a long-term goal to cut emissions by 80–95% on 1990 levels (by 2050)  Yet Germany’s coal use has increased since 2009. And worse: much of it is the dirtiest form of coal – lignite. This is putting at risk Germany’s flagship climate target to reduce emissions 40 percent on 1990 levels by 2020.
<b>What would happen if a generous 35 year retirement policy was implemented – and new plants were stopped?</b>	There would be a gradual retirement of plants over the next two decades. Several of the newest plants would still be operating beyond 2040.

**Figure 10: Germany coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity became operational by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

### **Box 6: Pledging climate action with one hand, building new coal plants with the other**

The newest coal-fired power plant in Germany – Moorburg – came on-stream in the week that Germany, along with the rest of the EU, tabled its offer for the Paris climate talks in early 2015. This kind of development undermines emissions targets and sends the wrong signal to the rest of the world. It is also a terrible investment: given the rise in renewables, the plant is never expected to generate enough electricity to recoup its costs. Even the CEO of Vattenfall has been forced to admit that the investment in the new Moorburg power plant was a '€3bn mistake'.<sup>71</sup>

## **Opportunities to speed up the transition away from coal**

**Market forces:** Renewable energy has grown more than the use of nuclear energy has fallen. The cause of the recent increase in Germany's use of coal is that lignite-fired power is cheap (helped by an inadequate carbon price) –pushing gas off the grid, and increasing electricity exports to neighbouring countries.

The EU Emissions Trading Scheme (ETS) carbon price will not deliver an accelerated phase-out of coal under current or foreseeable settings. The carbon price would have to increase from €6/tonne to around €30/tonne in order for the ETS to trigger a shift from coal electricity to gas and would have to increase even further to trigger a shift from lignite to gas generation.<sup>72</sup>

**Regulation:** The German government has recognized that direct policies are needed to tackle the coal problem – if it is to deliver on its emissions reduction target of 40 percent by 2020. A proposed new law aims at reducing emissions from the oldest and therefore the most inefficient coal and lignite plants by 2020 by making it more expensive for them to emit above a certain threshold, providing a stepping stone towards an accelerated coal phase-out; and studies have shown that this move would not raise electricity prices for consumers.<sup>73</sup> More should be done, however, to help set the direction and to shore up the Energiewende further into the future – a recent Ecofys study shows that a lignite phase-out by 2030, and a hard coal phase-out by 2040 would be feasible.

## **Recommendations**

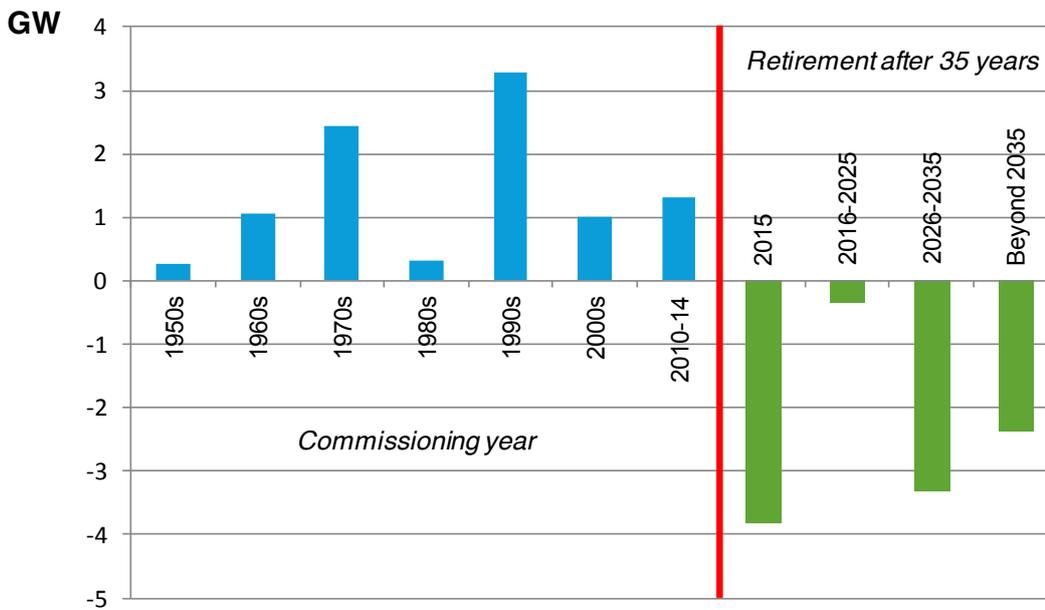
The German government should:

- Legislate to shut down the oldest and most inefficient coal plants by 2020, to ensure that Germany meets its 2020 emissions reduction target; and introduce a policy framework for a complete coal phase-out by 2040 and a 100 percent renewables phase-in by 2050;
- Ensure a socially fair implementation of the 'Energiewende' and a just transition away from coal without compromising the ambition of the mitigation targets.

# ITALY

<b>Coal consumption since Copenhagen?</b>	Increased
<b>Size of coal fleet</b>	10GW. Italy burns less coal than all G7 members bar France.
<b>Average age of coal fleet</b>	37 years
<b>New coal pipeline</b>	Three plants
<b>Current coal trajectory</b>	No firm policy in place to discourage coal and the government is sending the wrong signals.
<b>What would happen if a generous 35 year retirement policy was implemented – and new plants were stopped?</b>	All but one coal plant (Torrevaldaliga) would close by 2030.

**Figure 11: Italy coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity was commissioned by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

## Opportunities to speed up the transition away from coal

**Regulation:** The Italian government has lacked leadership in phasing out coal. It has no firm policy in place to discourage coal, and worse, is sending the wrong signals. It has permitted new plants as recently as 2010; given subsidies to individual plants; and plans to bring in a capacity market mechanism – which would effectively give subsidies to coal. A few of the oldest and smallest coal plants are being shut down due to the impact of the EU Industrial Emissions Directive. However, almost 8GW is compliant and is not likely to close without action by the Italian government or ENEL.

**Market dynamics:** Coal is being squeezed on a number of fronts. Italy has a structural over-capacity problem: there is about twice as much capacity in the Italian energy system as is needed to meet the peaks in demand.<sup>74</sup> Because of the high price of electricity generated in Italy, however, the country still imports electricity: in 2014, Italy imported 14 percent of its electricity. All this means that coal and gas power plants are often running at partial capacity. Recent record growth in renewables, combined with a decline in electricity demand, is further eroding the profitability of coal plants: in 2013, the share of coal in the Italian electricity mix dropped from 17 to 14.6 percent.<sup>75</sup>

**State-controlled energy companies:** The state-controlled<sup>76</sup> Italian company ENEL owns 70 percent of Italy's coal capacity, and could almost single-handedly bring about a coal phase-out in Italy. In March 2015, ENEL announced a reorientation towards renewables as part of a commitment to go carbon-neutral by 2050.<sup>77</sup> The company plans to close 23 fossil fuel plants by 2019, but only three are coal power plants – and these are the oldest (and smallest) coal plants.<sup>78</sup> As a result, this will barely impact its coal portfolio in Italy in the short term. ENEL's coal fleet is on the whole young<sup>79</sup> – and so risks becoming a stranded asset, meaning that coal plants may end up being prevented from operating if governments follow through their words with actions and regulate more decisively to address climate change risk.

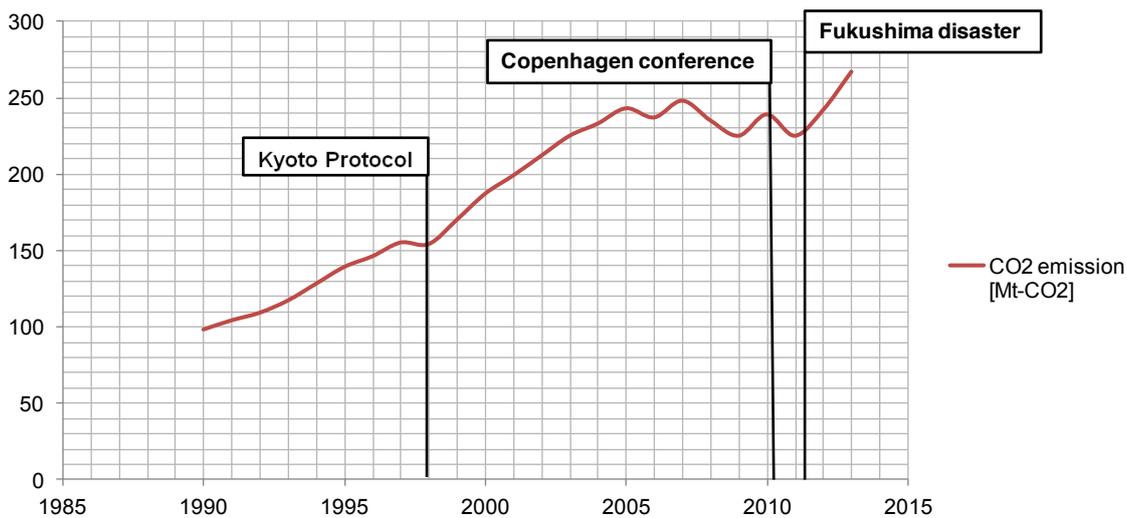
## **Recommendations**

- The Italian government needs to introduce a clearer policy framework to secure a full coal phase-out over the next 10 years.
- As part of this plan, the government must urgently review its proposal for a capacity market mechanism to ensure that no coal plants receive subsidies. Renewable energy and energy savings should receive increased support.
- As the controlling shareholder in ENEL, the government should require the company to start delivering on its promise to clean up its act by winding down its coal power portfolio – which is already looking like a stranded asset – by the early 2020s.

## JAPAN

<b>Coal consumption since Copenhagen?</b>	Increased
<b>Size of coal fleet</b>	More than 60 coal plants: 41GW
<b>Average age of coal fleet</b>	24 years – the youngest in the G7
<b>New coal pipeline</b>	There are 52 new plants in the pipeline, which would almost double Japan's already large coal fleet.
<b>Current coal trajectory</b>	After the Fukushima disaster the Kan government shut down nuclear power plants making up 30 percent of Japan's energy supply virtually overnight. Since then, the government has been pursuing an increasingly high-carbon pathway.  Even before Fukushima, Japan was expanding its coal use.
<b>What would happen if a generous 35 year retirement policy was implemented – and new plants were stopped?</b>	Half of the existing Japanese fleet will still be online by 2030, and a quarter by 2040 – putting them at severe risk of becoming stranded assets.

**Figure 13: Japan's coal power emissions since 1990**



### Opportunities to speed-up the transition away from coal

**Regulation:** Rather than leading the transition away from fossil fuels, the government has been actively encouraging coal expansion through coal-friendly policies; from weakening legislation in order to fast-track the approval of new coal, to providing subsidies and financial guarantees, without which the new plants would not be financially viable. Japan's coal plans are acting as a brake on the country's climate targets – with climate ambition playing second fiddle to a fossil fuelled energy policy.<sup>80</sup> As well as locking Japan into a high-carbon future, the move will also lock Japan into further dependency on coal imports

There is still a chance for Japan to turn the tide and avoid funnelling massive amounts of money into unsustainable investments that will contribute to runaway climate change. A recent study has shown that with

further reforms to electricity markets and interconnection between different electricity grids it is possible for Japan to phase out almost all coal by 2030 using only existing technologies and without relying on nuclear power.<sup>81</sup>

**Combat vested interests:** Japan's incentive scheme for renewables has led to 73MW being approved (including almost double the solar capacity of Germany),<sup>82</sup> yet many of these projects are not expected to materialize, and those that have face opposition from Japan's energy companies. These utilities are regional monopolies, controlling both generation and distribution, and have capped the amount of solar power that can access their grids.<sup>83</sup> As the owners of competing coal plants and the shuttered nuclear power plants – some of which the government is beginning to re-start – the utilities have an interest in opposing competing supplies of electricity.<sup>84</sup>

Japan's utility and heavy industry enjoys huge agenda-setting powers. The government runs a number of schemes to help its domestic industry export coal plants, including a bilateral offset programme which allows Japan to offset emissions at home by incentivizing its companies to build 'efficient' (yet still hugely polluting) coal power stations in developing countries. These exports are subsidized by public funds through Japan's export credit scheme, as well as worse, through Japan's climate finance budget; displacing scarce funds to help the poorest people protect themselves from climate change.<sup>85</sup>

## Recommendations

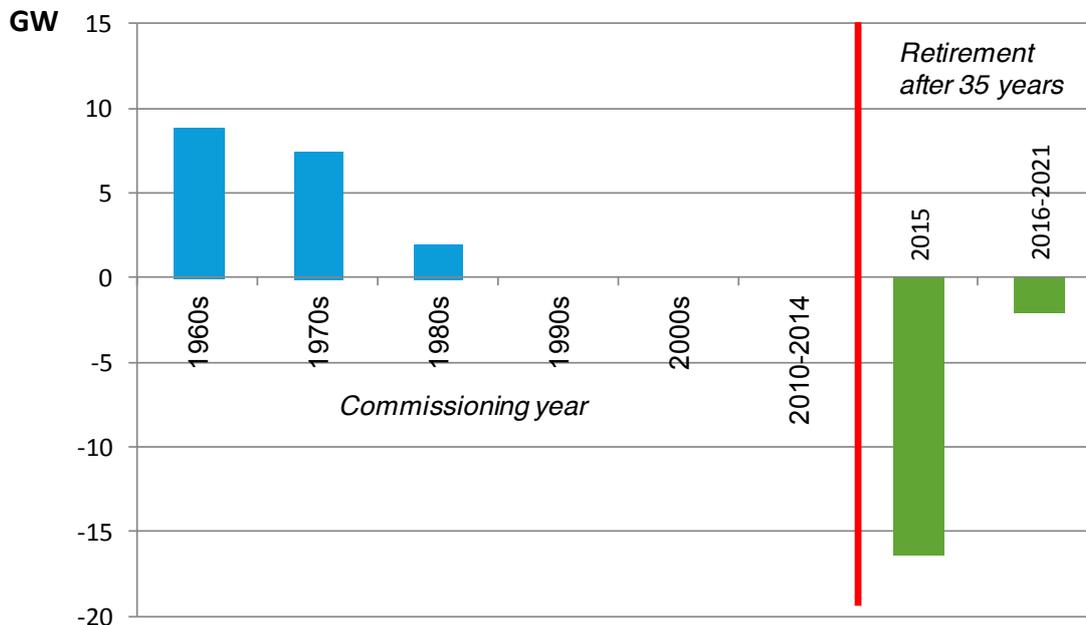
The Japanese government must:

- Urgently stop the construction of new coal plants, and put in place a plan to phase out coal power by 2035;
- Prioritize the Japanese high-tech energy-saving and renewables industries over coal and nuclear interests;
- Ensure that the renewable energy scheme is working effectively, and that projects that are approved under it deliver the maximum amount of power to the grid, rather than being curtailed to benefit coal or nuclear power;
- Ensure that the renewable energy scheme is working effectively, and that projects that are approved under it deliver the maximum amount of power to the grid, rather than being curtailed to benefit coal or nuclear power.

## UK

<b>Coal consumption since Copenhagen?</b>	Increased
<b>Size of coal fleet</b>	10 power plants, totalling 18GW
<b>Average age of coal fleet</b>	41 years
<b>New coal pipeline</b>	The UK has ruled out new unabated coal plants, and must now tackle its substantial existing coal problem.
<b>Current coal trajectory</b>	<p>Prior to the 2015 general election, all three party leaders committed to phase out unabated coal as part of power sector decarbonization.</p> <p>The government and the independent Committee on Climate Change all foresee an end to unabated coal by the mid 2020s. Yet conflicting policy incentives under the previous government have thrown coal a lifeline in the form of capacity market subsidies and backtracking on carbon pricing policies – meaning the future cost of emissions is unclear and not guaranteed to bring an end to coal generation.<sup>86</sup></p>
<b>What would happen if a generous 35 year retirement policy was implemented – and new plants were stopped?</b>	All would close by 2021.

**Figure 14: UK coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity was commissioned by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

### Opportunities to speed up the transition away from coal

**Regulation:** The incoming government can draw on cross-party support to confirm the prompt retirement of the UK's ageing coal plants through a concrete and credible plan to phase out coal by the early 2020s. The plan could comprise measures to:

- Extend the UK's Emissions Performance Standard (which bans new unabated coal plants) to existing power plants by the early 2020s. Studies have shown that – in conjunction with retaining the freeze on the carbon price floor – this option could actually save consumers money on energy bills;<sup>87</sup>
- Strengthen existing policies, for example, enforcing the incoming EU air pollution rules to full effect could provide up to nine out of ten of the UK's remaining coal plants with a path to retirement by 2023;
- Reel in the lifelines thrown to coal plants by stopping the capacity market subsidies to coal.

A coal phase-out by the early 2020s is entirely compatible with keeping the lights on and bills affordable. Studies have shown that even if all the coal plants were closed overnight, the UK would still have enough power to cover all but the highest and rarest peaks in demand.<sup>88</sup> Putting in place a plan to phase out coal plants by the early 2020s allows plenty of time to develop a plan to cover these rare spikes. This could be through investing in smarter energy storage, reducing demand, or incentivizing people or businesses to wait until demand is low to turn on their machines. Prioritizing replacements for coal that benefit people living in poverty – like measures to improve energy efficiency – and targeting these measures at the poorest households, is a way of tackling inequality. For example, insulation to keep heat within draughty homes will bring immediate benefits for those struggling to pay energy bills.

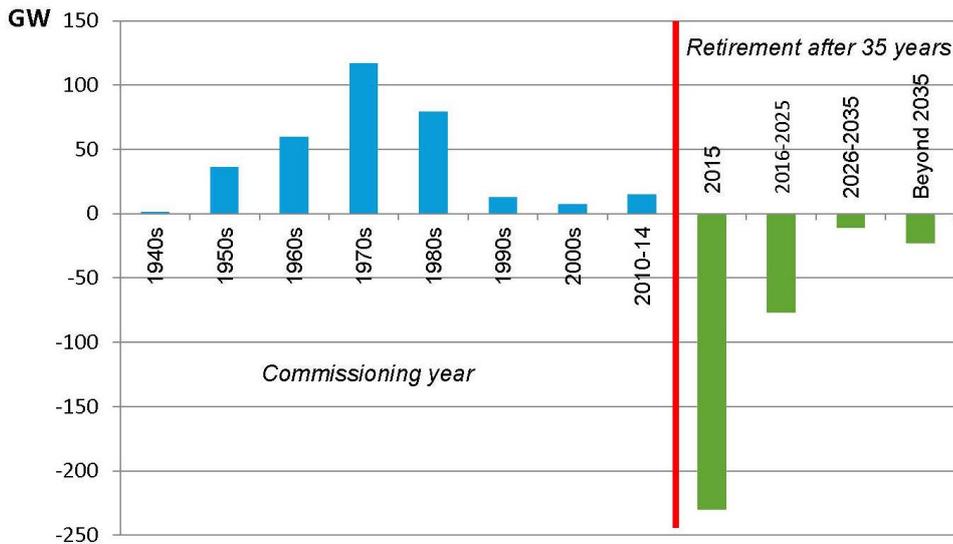
### **Recommendations**

- The new UK government must draw up a clear roadmap before the Paris COP, to ensure that the promised coal phase-out is achieved by 2023. As part of the roadmap, the government should identify a clear plan to support coal-industry workers in the just transition to new industries with jobs growth. This should be embedded within a wider employment plan to grow jobs in the UK renewable energy and energy efficiency industries.
- The government should announce it will end subsidies for fossil fuels and especially coal under the capacity market mechanism.

## USA

<b>Coal consumption since Copenhagen?</b>	Decreased
<b>Size of coal fleet</b>	>320GW. The US is still the world's second-biggest coal consumer
<b>Average age of coal fleet</b>	45 years
<b>New coal pipeline</b>	About 5GW new coal in the pipeline, but likely all will be cancelled before coming online. <sup>89</sup>
<b>Current coal trajectory</b>	A successful grassroots opposition movement is retiring plants faster than expected. And the federal government is planning a landmark Clean Power Plan to explicitly tackle the dirtiest power plants. But there is a concerted effort from the fossil fuel industry and those it supports to derail these efforts.
<b>What would happen if a generous 35 year retirement policy was implemented – and new plants were stopped?</b>	Almost all coal capacity in the US would retire by 2030 (with just 25GW remaining).

**Figure 15: US coal retirement profile – if plants were closed after investment costs have been recouped**



This chart shows when the existing coal capacity was commissioned by decade (blue bars); and retirement by decade under a 35-year limited lifetime policy (green bars)

### Opportunities to speed up the transition away from coal

**Grassroots opposition movement:** The transition away from coal in the US is overwhelmingly a story of people power. A decade ago the Bush Administration proposed more than 200 new coal plants. Since then, an astonishingly successful grassroots campaign has prevented these new plants from being built – it has contributed to the closure or scheduled retirement of 189 existing plants since 2010 (one-third of the size of the US coal fleet).<sup>90</sup> Campaigning group Sierra Club aims at securing the retirement of half of the coal fleet by 2017, and moving to a coal-free grid by 2030.

**Regulation:** The federal government has proposed new emission standards for existing power plants under the Environmental Protection Agency (EPA) Clean Power Plan, which will take effect in 2020. This is expected to lead to a 30 percent decline in US emissions on 2005 levels by 2030 – by incentivizing cleaner energy sources and energy conservation over the dirtiest form of power generation. However, while the Clean Power Plan is important to make sure that the energy transition sticks, it is not expected to be the limiting factor in US coal use, given the speed of the transition already underway. Under the proposed rule, more than half of the current coal capacity could remain on the grids in 2030.<sup>91</sup> The missing capacity is filled with increased energy conservation and non-hydro renewables.<sup>92</sup> A more ambitious measure would give greater certainty to investors in the energy savings, and in renewable energy industries; helping to harness their full potential in terms of public health benefits, job creation, and lower energy bills.<sup>93</sup> Many organizations are asking for the EPA rule to be strengthened to reflect this. Yet fossil fuel interests are mounting a sustained attack against the proposed rule. It faces multiple challenges in court before it has even been published – an attempt by industry to buy itself more pollution time.<sup>94</sup> And there have been attempts to block the rules in Congress by members whose top campaign donors are overwhelmingly representing the coal industry.<sup>95</sup>

## **Recommendations**

- The US administration should press ahead with implementing the Clean Power Plan.
- The US administration should direct the EPA to examine how to strengthen the measure to ensure that the power sector achieves emissions reductions of at least 35–40 percent by 2020 (the level needed to achieve the existing 17 percent economy-wide goal),<sup>96</sup> and then identify ways to increase these reductions in preparation for the US contributing its fair share to a global agreement. In doing so, they should recognize the speed of the shift away from coal that is already happening – which sets the US on a pathway to a largely coal-free grid by 2030.
- Given the speed of the shift already underway, the US should prioritize policies to:
  - Support the continued growth of renewable energy and energy savings industries, so that they can replace coal power;
  - Support workers in the transition to cleaner, more sustainable industries with jobs growth.
- Politicians should have to declare the financial support they receive from the fossil fuel industry.

## 6 CONCLUSION

Around the world, the effects of climate change are making it harder for more people to buy and grow enough to eat, and burning coal takes much of the blame. Coal power plants are the biggest obstacle standing between us and the internationally agreed target to limit warming to 2 degrees. And it is an obstacle that threatens to grow.

G7 leaders meeting in 2015 can signal the beginning of the end of the coal era. By doing so, they can establish new momentum towards this year's crucial UN climate talks in Paris and create thousands of new jobs in the clean technologies of the future. As the country-specific coal exit plans outlined in this paper make clear, this is not a pipe dream – it is a clear political opportunity that G7 governments can and must seize.

## RECOMMENDATIONS

To demonstrate a new commitment to climate action on the road to Paris, G7 leaders in Bavaria should:

1. Commit to an urgent transition away from coal as a centrepiece of long-term national decarbonization plans. Country-specific plans and policies should ensure this transition is complete in:

- Canada: by 2030
- France: by 2020
- Germany: by 2040
- Italy: by early 2020s
- Japan: by 2035
- UK: by 2023
- US: by 2030

2. Stand by existing commitments to jointly mobilize \$100bn per year by 2020 for tackling climate change in developing countries. G7 countries should commit to a transparent roadmap to significantly scale up public finance before 2020, and increase the proportion of funds flowing to adaptation.

## NOTES

All URLs were last accessed in May 2015 unless otherwise stated.

- 1 Coal is responsible for 34% of cumulative CO<sub>2</sub> emissions (fossil fuels, cement and land-use change) from 1750 to 2012. Source: Shrink that Footprint, <http://shrinkthatfootprint.com/carbon-emissions-and-sinks>.
- 2 A study by International Food Policy Research Institute finds price increases as a result of climate change will lead to calorie availability in 2050 being lower than in 2000 throughout the developing world – effectively putting the fight against hunger back by
- 3 G7 countries gave Africa \$1.4bn in bilateral agricultural and rural development Official Development Aid (ODA) and more than \$24bn in total bilateral ODA in 2013. These figures do not include aid channelled through multilateral institutions, as country breakdowns are not available. Source: OECD-DAC reporting, found at <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>
- 4 Based on new calculations commissioned from Climate Analytics, using their “current policies” scenario, which assumes that all governments implement existing climate policies - leading to global mean warming of 3.7 degrees by 2100. This model was run eliminating emissions from coal power generation in the G7 from 1970 onwards (i.e. assuming coal power plants were replaced by a carbon-neutral technology), to isolate the warming that can be attributed to G7 coal plants. Climate Analytics then calculated the adaptation costs and residual damage costs (together these are total climate change-related economic costs) for the proportion of warming caused by G7 coal plants.
- 5 Ibid. Declines in crop yield, and total tonnes lost for maize and wheat were calculated by Oxfam on the basis of the Climate Analytics modelling and using a recent crop modelling study which shows change in global and regional crop yield by the 2080s relative to a 1980s baseline. Deryng et al, ‘Global crop yield response to extreme heat stress under multiple climate change futures’, Environmental Research Letters, March 2014 [http://iopscience.iop.org/1748-9326/9/3/034011/pdf/1748-9326\\_9\\_3\\_034011.pdf](http://iopscience.iop.org/1748-9326/9/3/034011/pdf/1748-9326_9_3_034011.pdf)
- 6 G7 coal plants emitted a total of 2.2Gt CO<sub>2</sub> in 2012. Source: International Energy Agency (IEA) (2014b) ‘CO<sub>2</sub> Emissions From Fuel Combustion 2014’. Country comparisons are for all GHG emissions including LULUCF in 2011 (the latest year on record). Source: WRI’s Climate Analysis Indicators Tool, CAIT, <http://cait2.wri.org/>
- 7 Ibid; the continent of Africa emitted just over 1Gt CO<sub>2</sub> in 2012, source op. cit. IEA 2014b.
- 8 Ibid; LDCs emitted 0.2Gt CO<sub>2</sub> in 2011 (not including LULUCF). Source CAIT, op cit.
- 9 Comparing 2009 coal consumption with 2013 (the latest figures at the time of publication). Figures from BP ‘Statistical Review of World Energy’, June 2014, p33 <http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf>.
- 10 Oxfam commissioned the think-tank E3G to review the current coal situation in all G7 countries. The full reports for each country are available on the E3G website: <http://e3g.org/>
- 11 New Climate Institute (2015), ‘Assessing the missed benefits of countries’ national contributions’, <https://newclimateinstitute.files.wordpress.com/2015/03/cobenefits-of-indcs-2015-03-30.pdf>
- 12 International Energy Agency (2015) ‘Global energy-related emissions of carbon dioxide stalled in 2014’, 13 March 2015, <http://www.iea.org/newsroomandevents/news/2015/march/global-energy-related-emissions-of-carbon-dioxide-stalled-in-2014.html>
- 13 Climate Action Tracker (2014) ‘China, US and EU post-2020 plans reduce projected warming’, 8 December 2014, [http://climateactiontracker.org/assets/publications/briefing\\_papers/CAT\\_Briefing\\_10122014.pdf](http://climateactiontracker.org/assets/publications/briefing_papers/CAT_Briefing_10122014.pdf)
- 14 Oxfam, March 2014 op cit.
- 15 Oxfam analysis of EM-DAT database, <http://www.emdat.be/>, summing total people affected in Non-Annex 1 countries for 2005–2014. ‘Dramatically affected’ means killed, injured, made homeless, or requiring emergency assistance; and the following disasters are classified as climate-related: droughts, extreme temperatures, wildfires, storms, floods. The larger toll on developing countries reflects the more limited capacity of poorer people to cope with disasters.
- 16 IPCC (2014) ‘Executive Summary: Chapter 7. Food Security and Food Production Systems’, ‘Climate Change 2014: Impacts, Adaptation, and Vulnerability’, Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, New York: IPCC, [https://ipcc-wg2.gov/AR5/images/uploads/WGIIAR5-Chap7\\_FINAL.pdf](https://ipcc-wg2.gov/AR5/images/uploads/WGIIAR5-Chap7_FINAL.pdf)

- 17 Ibid, Chapter 22: Africa; p 1218 [https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap22\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap22_FINAL.pdf)
- 18 Ibid 'Chapter 6. Ocean Systems'
- 19 Food and Agriculture Organization of the United Nations (FAO) (2014), 'The State of World Fisheries and Aquaculture, Food and Agriculture Organization of the United Nations', <http://www.fao.org/3/d1eaa9a1-5a71-4e42-86c0-f2111f07de16/i3720e.pdf>
- 20 G.C. Nelson et al. (2009) 'Climate Change: Impact on Agriculture and Costs of Adaptation', Washington DC: International Food Policy Research Institute, <http://www.ifpri.org/sites/default/files/publications/pr21.pdf>; data for under-five populations of EU from UNICEFs statistical tables, [http://www.unicef.org/statistics/index\\_24183.html](http://www.unicef.org/statistics/index_24183.html)
- 21 IPCC (2014) op.cit ' Chapter 7. Food Security and Food Production Systems', p7, Ibid. Projected impacts are for a 4 degrees by 2100 scenario.
- 22 Figures taken from IEA (2014), International Energy Agency (IEA) (2014) 'World Energy Outlook 2014'. Power generation from coal was responsible for 9.5 GtCO<sub>2</sub> in 2012. This was three times as much as the next dirty form of power generation (gas). And larger than the next most highly emitting sector, transport, which accounted for 6.9 Gt (8Gt including bunkers). 2012 CO<sub>2</sub> emissions from land-use change were estimated at 3.4Gt by the Global Carbon Project.
- 23 Ibid.
- 24 New Climate Economy (2014). Clean Air Task Force, 'The Toll from Coal', September 2010, [http://www.catf.us/resources/publications/files/The\\_Toll\\_from\\_Coal.pdf](http://www.catf.us/resources/publications/files/The_Toll_from_Coal.pdf); Greenpeace, 'New draft coal plant pollution limits leave EU trailing behind China', 7 April 2015, <http://www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2015/20150407%20BR%20coal%20air%20pollution%20FINAL.pdf>;
- 25 A water crisis associated with large-scale coal-fired power exploitation is emerging in China's arid western regions. Greenpeace, <http://www.greenpeace.org/eastasia/Global/eastasia/publications/reports/climate-energy/2014/The-End-of-Chinas-Coal-Boom-Briefing.pdf>
- 26 <http://content.sierraclub.org/coal/disposal-plant-water-pollution>
- 27 Deutsche Bank, 'Solar grid parity in a low oil price era', March 2015, <https://www.db.com/cr/en/concrete-deutsche-bank-report-solar-grid-parity-in-a-low-oil-price-era.htm>
- 28 Giles Parkinson (2015), 'Solar at grid parity in most of world by 2017', Renew Economy, 12 January, <http://reneweconomy.com.au/2015/solar-grid-parity-world-2017>
- 29 Lazard, 'Levelized cost of energy analysis – Version 8.0', September 2014, <http://www.lazard.com/PDF/Levelized%20Cost%20of%20Energy%20-%20Version%208.0.pdf>, p2
- 30 IPCC (2014) op. cit Figure SPM.7 in the WGIII SPM illustrates how in 450 ppm CO<sub>2</sub>eq scenarios, emissions from electricity generation would have to reach zero before 2050 – and move to negative emissions thereafter.
- 31 BP (2014) op cit
- 32 C. McGlade and P. Ekins (2015) 'The geographical distribution of fossil fuels unused when limiting global warming to 2°C', Nature (517):187–90, <http://www.nature.com/nature/journal/v517/n7533/full/nature14016.html>
- 33 Oxfam calculations, using data from the 2014 IEA World Economic Outlook for projected world CO<sub>2</sub> emissions from coal used in power generation – under the current policies scenario. In the years 2012–2045, global coal emissions in power generation are estimated to be approximately 480Gt (with the caveat that projected data is available only for 2020, 2030 and 2040, so some extrapolation is required). This is almost half the IPCC's remaining carbon budget of 1010Gt CO<sub>2</sub> for a 66 percent chance of a 2°C increase in global temperatures. It is more than half of the Stockholm Environment Institute's 'strong 2°C' carbon budget of 785Gt CO<sub>2</sub>, which is consistent with a 'considerably greater than 66 percent chance' of meeting the 2°C target, and a 50 percent chance of meeting a 1.5°C target, and does not involve negative emissions. More details are available at: <http://gdrights.org/gdrs-scorecard-calculator-information/mitig-path-overview/>
- 34 Shares are for total cumulative fossil fuel CO<sub>2</sub> emissions (excluding land-use change and forestry).
- 35 CO<sub>2</sub> can persist for hundreds, if not thousands, of years in the atmosphere. M. Imran (2008) 'Carbon is forever', Nature Reports Climate Change, 20 November 2008, <http://www.nature.com/climate/2008/0812/full/climate.2008.122.html>
- 36 Oxfam calculations, based on 2015 figures from the EcoEquity/SEI Climate Equity Reference Calculator at: <http://www.climateequityreference.org/calculator/>. The incomes

of the poorest classes living below a global development threshold of \$9,000 PPP per person per year have been exempted - so that only dollars earned by the middle and richer classes are counted towards a country's capacity. Every dollar earned by people with incomes above the development threshold is progressively weighted up to an income ceiling of \$50,000 PPP – above this "wealthy threshold", every dollar earned counts 100%, towards a country's capacity. Looking to the future, the projected capacity figures for 2020 are largely unchanged: China's capacity goes up to 8.6%, and G7 capacity declines to 64.8%.

- 37 Deutsche Bank (2015), 'Solar Grid Parity in a Low Oil Price Era', <https://www.db.com/cr/en/concrete-deutsche-bank-report-solar-grid-parity-in-a-low-oil-price-era.htm>. In 50% of the 60 countries studied, Deutsche Bank found that renewables were cheaper than coal.
- 38 Figures from the International Energy Agency (IEA) (2014) 'World Energy Outlook 2014'. Emissions from non-OECD coal power plants were 6.2Gt in 2012, compared to OECD coal fleet emissions of 3.3Gt.
- 39 Source: International Energy Agency (IEA) (2014) 'CO2 Emissions From Fuel Combustion 2014, and CAIT. See note 6.
- 40 Ibid. See note 7.
- 41 Ibid. See note 8.
- 42 \$450bn is about forty times what developing countries receive in agricultural and rural development aid (\$11.9bn in Official Development Aid (ODA) from all donors in 2013), and it is more than one hundred times what the G7 gives developing countries in agricultural and rural development ODA (\$3.9bn in bilateral agricultural and rural development ODA in 2013.) Source OECD-DAC reporting, found at <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>
- 43 G7 countries gave Africa \$1.4bn in bilateral agricultural and rural development Official Development Aid (ODA), and over \$24bn in total bilateral ODA in 2013. These figures do not include aid channelled through multilateral institutions, as country breakdowns are not available. Source: Ibid
- 44 Ibid. See note 4.
- 45 Oxfam commissioned the think-tank E3G to review the current coal situation in all G7 countries. The full reports for each country are available on the E3G website: <http://e3g.org/>
- 46 In Canada and the UK, all of the coal plants in the development pipeline have integrated CCS. In the USA, the only project to break ground since 2008 has been a demonstration CCS plant, though the remaining development pipeline includes both unabated coal and CCS projects.
- 47 Ibid. See note 10
- 48 [http://unfccc.int/files/documentation/submissions\\_from\\_observers/application/pdf/international\\_labour\\_organization\\_\(ilo\)\\_to\\_the\\_adp.pdf](http://unfccc.int/files/documentation/submissions_from_observers/application/pdf/international_labour_organization_(ilo)_to_the_adp.pdf)
- 49 [http://www.ituc-csi.org/IMG/pdf/ituc\\_frontlines\\_climate\\_change\\_report\\_may\\_en.pdf](http://www.ituc-csi.org/IMG/pdf/ituc_frontlines_climate_change_report_may_en.pdf)
- 50 World Bank, World DataBank, Poverty and Inequality Database, Number of poor in China at \$2.50 per day purchasing power parity in 2011: 361 million, in 2010: 428 million. <http://databank.worldbank.org/data/views/reports/tableview.aspx>
- 51 Researchers have attributed between 14% and 33% of China's emissions to goods produced for consumption outside of China. Sources: <http://www.carbonbrief.org/blog/2014/10/how-much-of-china-carbon-dioxide-emissions-rest-of-the-world-responsible-for/> and <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/1646/1646.pdf> (Figure 1, p71).
- 52 Author calculations from the Global Carbon Atlas, <http://www.globalcarbonatlas.org/>
- 53 Sylvie Cornot-Gandolphe (2014), 'China's Coal Market: Can Beijing Tame 'King Coal'?', Oxford: Oxford Institute for Energy Studies, <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/12/CL-1.pdf>
- 54 Bloomberg (2015), 'Here's What China Closing Coal-Power Plants Means for Emissions', 19 April, <http://www.bloomberg.com/news/articles/2015-04-19/here-s-what-china-closing-coal-power-plants-means-for-emissions>
- 55 L. Myllyvirta (2015a) 'Comment: New coal power plants in China – a (carbon) bubble waiting to burst', Energydesk, Greenpeace, 23 February, <http://energydesk.greenpeace.org/2015/02/23/comment-new-coal-power-plants-china-carbon-bubble-waiting-burst/>

- 56 Industrial air pollution performance standards currently being considered by EU member states under the IPPC Directive are weaker than the standards in force in China for nitrous oxide, sulphur dioxide and other pollutants. L. Myllyvirta (2015b) 'Smoke & Mirrors: How Europe's biggest polluters became their own regulators', Brussels: Greenpeace, <http://www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2015/Smoke%20and%20Mirror%20final%20report.pdf>
- 57 China's commitment to boost the share of non-fossil fuels in its primary energy mix to 15% by 2020, and 20% by 2030 translates into a target of 33–35% in the electricity sector by 2020, and 40–45% by 2030, from 22% in 2013.
- 58 Christine Shearer et al. (2015), 'Boom and Bust : Tracking the global coal plant pipeline', Washington D.C.: Sierra Club, [http://action.sierraclub.org/site/DocServer/Coal\\_Tracker\\_report\\_final\\_3-9-15.pdf?docID=17381](http://action.sierraclub.org/site/DocServer/Coal_Tracker_report_final_3-9-15.pdf?docID=17381) p.14
- 59 [http://climateactiontracker.org/assets/publications/briefing\\_papers/CAT\\_Bonn\\_policy\\_update\\_final.pdf](http://climateactiontracker.org/assets/publications/briefing_papers/CAT_Bonn_policy_update_final.pdf)
- 60 Oxfam (2014), 'Breaking the standoff: Post-2020 climate finance in the Paris agreement', Briefing Paper 201, Oxford: Oxfam International, [https://www.oxfam.org/sites/www.oxfam.org/files/file\\_attachments/bp201-breaking-standoff-climate-finance-011214-en.pdf](https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp201-breaking-standoff-climate-finance-011214-en.pdf)
- 61 <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=FBF8455E-1>
- 62 CAN Canada Summary Note on reducing emissions from coal, February 2015.
- 63 The full report is available on the E3G website: <http://e3g.org/>
- 64 WWF, 'La France et le charbon dans le monde : mythes et réalités', 18 September 2014, <http://www.wwf.fr/?3360/La-France-et-le-charbon-dans-le-monde-mythes-et-realites>
- 65 Le Monde, 'Projet de loi sur la Transition Energétique : où en est-on après l'examen en commission spéciale?', 16 April 2015, <http://www.lemoniteur.fr/article/projet-de-loi-sur-la-transition-energetique-ou-en-est-on-apres-l-examen-en-commission-speciale-28325169>
- 66 French commercial banks rank as the fifth biggest investor in coal compared to banking sectors in other countries <http://www.amisdela terre.org/IMG/pdf/argentsalebanquesfr.pdf>
- 67 The full report is available on the E3G website: <http://e3g.org/>
- 68 Que Choisir, 'Etude Chauffage Electrique', <http://www.quechoisir.org/media/fichiers/etudes/etude-chauffage-electrique>
- 69 Oxfam, 'Emissions d'Etat : Comment les centrales à charbon d'EDF et Engie réchauffent la planète', 19 May 2015
- 70 Plants in planning are unlikely to be built due to overcapacity in the system, the rise of renewables, and high risk that plants will not be able to recoup costs. Oxfam/E3G Germany briefing, <http://e3g.org/>
- 71 Ibid.
- 72 International Energy Agency Coal Industry Advisory Board (2014), 'The Impact of Global Coal Supply on Worldwide Electricity Prices', Paris: International Energy Agency, [https://www.iea.org/publications/insights/insightpublications/ImpactGlobalCoalSupply\\_WorldwideElectricityPrices\\_FINAL.pdf](https://www.iea.org/publications/insights/insightpublications/ImpactGlobalCoalSupply_WorldwideElectricityPrices_FINAL.pdf) and <http://www.oeko.de/oekodoc/1995/2014-015-de.pdf>
- 73 Oxfam/E3G Germany briefing, <http://e3g.org/> A 2014 study conducted by the German Institute for Economic Research (DIW) found that measures to close 9GW of old coal and lignite plants by 2020, saving 23Mt in avoided CO2 emissions, would not lead to a rise in consumer bills, due to concurrent declines in renewable levies.
- 74 Oxfam/E3G Italy briefing <http://e3g.org/> In 2013, peak electricity demand didn't even reach half of Italy's generation capacity.
- 75 Ibid. The share of coal in the Italian electricity mix has dropped in the face of the rise of renewables and an overall decline in electricity demand. In 2014, renewables accounted for a record 35% of the electricity mix, up from 28% in 2012. This was in the context of a 3% drop in power consumption.
- 76 Enel (2014), 'Enel – report on corporate governance and ownership structure for year 2013', Rome: Enel, [http://www.enel.com/en-GB/doc/report2013/corporate\\_governance\\_report\\_for\\_year\\_2013.pdf](http://www.enel.com/en-GB/doc/report2013/corporate_governance_report_for_year_2013.pdf) See section 3.4 for details of special powers of Italian government
- 77 Financial Times, 'Enel pledges to tackle climate change', 17 March 2015, <http://www.ft.com/intl/cms/s/0/4cd63116-cc8d-11e4-b5a5-00144feab7de.html#axzz3UfyfcQZg>

- 78 Oxfam/E3G Italy briefing op.cit.
- 79 Ibid. All but two of the coal power stations that came online after 1990 belong to ENEL.
- 80 B. Buckheit (2015) 'Japan's Path to Sustainable Electricity Supply', [http://www.kiconet.org/wp/wp-content/uploads/2015/04/Japans-SEP-review-en\\_April-2015.pdf](http://www.kiconet.org/wp/wp-content/uploads/2015/04/Japans-SEP-review-en_April-2015.pdf)
- 81 Kiko network analysis as cited in Oxfam/E3G Japan briefing, op. cit.
- 82 Financial Times, 'Japan renewable energy curbs could spark nuclear restart close', 29 September 2014, <http://www.ft.com/cms/s/0/8a0823dc-457e-11e4-ab86-00144feabdc0.html#ixzz3YMPKNg00>
- 83 Financial Times, 'Outlook cloudy for Japan's renewable energy drive', 20 April 2015, <http://www.ft.com/cms/s/0/dae47c8c-d927-11e4-b907-00144feab7de.html#ixzz3YMR8fo1h>
- 84 Ibid.
- 85 <http://www.theguardian.com/environment/2015/mar/29/un-green-climate-fund-can-be-spent-on-coal-fired-power-generation>
- 86 Oxfam/E3G UK briefing <http://e3g.org/>
- 87 IPPR report, 'Scuttling Coal', shows that extending the current EPS to existing plants by 2025 would bring down bills by about £8 a year – and more if the capacity market subsidies are removed for coal – in a scenario where the carbon price support remains frozen at its current level through to 2030. This is compared with a scenario with no EPS and where the carbon price support continues to rise as originally intended. Jimmy Aldridge and Will Straw (2015), 'Scuttling coal: How ending unabated coal generation can stimulate investment, cut bills and tackle carbon pollution', London: Institute for Public Policy Research, <http://ippr.org/read/scuttling-coal-how-ending-unabated-coal-generation-can-stimulate-investment-cut-bills-and-tackle-car>
- 88 UK Committee on Climate Change, '2014 Progress Report' p106, [http://www.theccc.org.uk/wp-content/uploads/2014/07/CCC-Progress-Report-2014\\_web\\_2.pdf](http://www.theccc.org.uk/wp-content/uploads/2014/07/CCC-Progress-Report-2014_web_2.pdf)
- 89 The chances that planned coal plants will come online are decreasing significantly as federal and state policies strengthen and grassroots activists put pressure on upcoming new coal plants to upgrade technologies and install better pollution controls, Oxfam/E3G US briefing, <http://e3g.org/>
- 90 <http://content.sierraclub.org/coal/victories>
- 91 According to the official EPA impact assessment 191GW of coal power generation would be left (compared with today's total of 330GW). EPA impact assessment <http://www.epa.gov/ttn/ecas/regdata/RIAs/111dproposalRIAfina10602.pdf>
- 92 Ibid .
- 93 Ibid. Benefits could be up to \$49bn to \$84bn (2011\$) for 2030 – ten times more than the costs to energy companies to comply.
- 94 <http://insideclimatenews.org/carbon-copy/15042015/Legal-oddities-mark-coal-industry-case-against-EPA-clean-power-plan>
- 95 <http://influenceexplorer.com/politician/david-b-mckinley/b290e7531b31446883253332fad1f693>
- 96 Sierra Club (2014), 'Sierra Club Frequently Asked Questions: EPA's Clean Power Plan', [http://content.sierraclub.org/creative-archive/sites/content.sierraclub.org/creative-archive/files/pdfs/0800\\_CPP\\_FAQ\\_04.pdf](http://content.sierraclub.org/creative-archive/sites/content.sierraclub.org/creative-archive/files/pdfs/0800_CPP_FAQ_04.pdf)

© Oxfam International June 2015

This paper was written by Kiri Hanks and Julie-Anne Richards. Oxfam acknowledges the assistance of Tim Gore, Anna Coryndon, Richard King, Ruth Martin, Alastair Haynes, Climate Analytics, E3G, and Dave Jones in its production. It is part of a series of papers written to inform public debate on development and humanitarian policy issues.

For further information on the issues raised in this paper please e-mail [advocacy@oxfaminternational.org](mailto:advocacy@oxfaminternational.org)

This publication is copyright but the text may be used free of charge for the purposes of advocacy, campaigning, education, and research, provided that the source is acknowledged in full. The copyright holder requests that all such use be registered with them for impact assessment purposes. For copying in any other circumstances, or for re-use in other publications, or for translation or adaptation, permission must be secured and a fee may be charged. E-mail [policyandpractice@oxfam.org.uk](mailto:policyandpractice@oxfam.org.uk).

The information in this publication is correct at the time of going to press.

Published by Oxfam GB for Oxfam International under ISBN 978-1-78077-868-6 in June 2015.

Oxfam GB, Oxfam House, John Smith Drive, Cowley, Oxford, OX4 2JY, UK.

## OXFAM

Oxfam is an international confederation of 17 organizations networked together in more than 90 countries, as part of a global movement for change, to build a future free from the injustice of poverty:

Oxfam America ([www.oxfamamerica.org](http://www.oxfamamerica.org))  
Oxfam Australia ([www.oxfam.org.au](http://www.oxfam.org.au))  
Oxfam-in-Belgium ([www.oxfamsol.be](http://www.oxfamsol.be))  
Oxfam Canada ([www.oxfam.ca](http://www.oxfam.ca))  
Oxfam France ([www.oxfamfrance.org](http://www.oxfamfrance.org))  
Oxfam Germany ([www.oxfam.de](http://www.oxfam.de))  
Oxfam GB ([www.oxfam.org.uk](http://www.oxfam.org.uk))  
Oxfam Hong Kong ([www.oxfam.org.hk](http://www.oxfam.org.hk))  
Oxfam India ([www.oxfamindia.org](http://www.oxfamindia.org))  
Oxfam Intermón (Spain) ([www.oxfamintermon.org](http://www.oxfamintermon.org))  
Oxfam Ireland ([www.oxfamireland.org](http://www.oxfamireland.org))  
Oxfam Italy ([www.oxfamitalia.org](http://www.oxfamitalia.org))  
Oxfam Japan ([www.oxfam.jp](http://www.oxfam.jp))  
Oxfam Mexico ([www.oxfammexico.org](http://www.oxfammexico.org))  
Oxfam New Zealand ([www.oxfam.org.nz](http://www.oxfam.org.nz))  
Oxfam Novib (Netherlands) ([www.oxfamnovib.nl](http://www.oxfamnovib.nl))  
Oxfam Québec ([www.oxfam.qc.ca](http://www.oxfam.qc.ca))

Please write to any of the agencies for further information, or visit [www.oxfam.org](http://www.oxfam.org).