

# **GLOBAL CLIMATE JOBS**

Draft

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## INTRODUCTION

We have to stop climate change, and we have to do it quickly. To do it, we will need 150 million new jobs globally for at least twenty years.

There are now campaigns in several countries fighting for mass government programs for climate jobs. Most of them started with union support, and all of them are trying to build an alliance of unions, environmentalists, NGOs, and faith groups. This booklet has been produced by several of these campaigns, because we want people in other countries to do the same.

The first half of this booklet explains the idea of climate jobs in broad strokes. But each country is different, so the second half of this booklet sketches what climate jobs would mean in South Africa, Norway, Canada, New York State, and Britain.

This report is a work in progress. As our movement grows, we will revise it and add new case studies.

## CLIMATE JOBS

Jonathan Neale

About three quarters of the warming of the world comes directly from burning fossil fuels – coal, oil and gas. To limit climate change, we need to stop burning those fuels. To do that, we need to have another way to heat and power the world. So we need to:

Cover the world with renewable energy like wind and solar power to make all our electricity.

Switch from cars to buses and trains, and run almost all transport on renewable energy.

Insulate and convert all homes and buildings to use less energy and to heat and cool using renewable energy.

Convert and redesign industry to use less energy and to use renewable electricity wherever possible.

(We say 'renewable' energy because the world will never run out of sun, wind, waves and tides.)

There are thousands of other things we need to do. But these four things will make the biggest difference in cutting emissions from fossil fuels. These measures will require many new workers – our estimate is about 120 million jobs globally, each year for twenty years. Most of these jobs will be in renewable energy, construction, and transport.

About a quarter of global emissions come not from burning fossil fuels but from farming and changes in land use. To cut these emissions we need to change the way we farm, preserve old forests, and plant new forests. Here too many jobs will be needed.

It is not realistic to wait for the market to 'create' those jobs. The

scale of what needs doing is too big, and we need action quickly. Instead, we will need massive government programs in each country. These programs will be different from what politicians usually mean when they talk about 'green jobs'. There are four differences that are essential to understand:

**CLIMATE JOBS.** A green job can be anything environmental, from a park ranger to a sewage worker. When we say climate jobs, we mean only those green jobs that make a direct difference to greenhouse gas emissions.

**NEW JOBS.** When we say 150 million jobs globally, we are not counting all the existing jobs in public transport and renewable energy. We mean new jobs. And we want those jobs to last at least 20 years.

**GOVERNMENT PROGRAMS.** We don't want governments to wait forever for the market. We want governments to start hiring workers immediately, and hire all of them within a year.

**REPLACEMENT JOBS.** We want governments to guarantee a new climate job to people like coal miners and refinery workers who will eventually lose their old jobs in a low carbon economy.

### **Change: not sacrifice, but doing things differently**

This is a new way of thinking about climate change. For many years there was a tension between unions and environmentalists. Unions wanted jobs and good wages. Many environmentalists said that in order to stop climate change we will all have to sacrifice.

This is a false choice. We cannot solve the problem of climate change through sacrifice. The reason is that the cuts we have to make in emissions are too big. We have to cut our emissions by at least 80%. To do that through sacrifice would mean cuts of 90% in the standard of living in rich countries. It would mean cuts of 75% in

countries like China. And it would mean leaving the poor countries poor forever.

These are not serious ideas. No one is going to put up with that. Instead, we have to do things differently. So we do not want to 'increase the contribution of renewables'. Instead, we want to stop burning oil, coal and gas.

We are talking about the opposite of sacrifice. There are over 200 million unemployed people in the world. Hundreds of millions more are underemployed on farms, or working in part-time, precarious and insecure jobs. Government climate jobs programs can transform their lives, the lives of their families, and the future of their communities.

This will be politically hard to do, because it means breaking from austerity politics. But the politics of austerity have failed – in Africa in the 1980s, in Latin America and Eastern Europe in the 1990s, in the rest of Europe in the last decade. Instead, we need governments to increase spending to get stalled economies moving again.

Climate jobs will not keep the poor countries poor. There are many countries now, like Mozambique, Kenya, Nepal, Laos and Afghanistan, where greenhouse gas emissions are so small they make almost no difference. We want massive programs of climate jobs in those countries so that industry and the economy grow – but grow in a new way.

This is only fair. But it is also necessary. The leaders of the world are not doing what needs to be done. It will take a mass, global movement to make governments act. That movement will not succeed without the active and passionate support of workers and small farmers in China, India and African countries.

This is the same reason we have to promise new climate jobs to coal miners and oil workers globally, who would otherwise lose out. Without those promises, we will simply split the unions and communities down the middle. We need a united movement, and a vision of a better world.

## The Jobs

This section explains what the climate jobs would be, and roughly how many we will need to cut emissions by at least 80% in twenty years. We start with where the emissions come from now. The total global emissions each year are about 52 billion tons of CO<sub>2</sub> equivalent. [2]

Three quarters of the total, 38.5 billion tons, come mainly from fossil fuels:

Electricity from coal, oil and gas	13 billion tons
Industry	8.5
Transport	7
Mining and refining oil, coal and gas	5
Heating homes and buildings	3

Another quarter – the equivalent of 13.5 billion tons of CO<sub>2</sub> – come mainly from a mixture of other greenhouse gases:

Farming	6 billion tons
Changes in land use and forestry	6
Waste and wastewater	1.5

Climate jobs will be jobs reducing emissions from those sectors. We will start with sectors that emit carbon dioxide. Here we need to do two things:

First, we need to **reduce** the amount of energy we use to get the same effects. For example, we need to insulate houses so it takes less energy to keep them warm.

Second, we need to **change** from using oil, coal and gas to using electricity from renewable energy. For example, we need to use renewable electricity to heat houses, and run buses and trains on electricity.

We can do all of this with the technology we have now. We don't need to invent anything new. All of our estimates of jobs and emissions cuts in this report are based on present technology.

Of course, there will actually be a lot of innovation and inventions if we put 150 million people to work. However, there will also be some economic growth over 20 years. So in our calculations, we have assumed that inventions and growth will balance each other out.

## Electricity

We will take electricity generation as our first example. We estimate that, with climate jobs programs all over the world:

- 50 million workers each year for twenty years,
- Can replace all electricity with renewable electricity,
- Can triple the amount of electricity generated,
- Can bring electricity to almost every home,
- And can cut CO<sub>2</sub> emissions from electricity to almost nothing.

How will this work? We can find ways to reduce the amount of electricity we use now by about half, and still have the same results. For example, regulations can require very low energy light bulbs, office machines and household appliances.

But we will still need much more electricity than we use now. One reason is that we will require renewable, non-carbon electricity for transport, industry and heating buildings. The other reason is that the poor countries of the world will need much more renewable electricity to escape from poverty.

So we assume that by the end of a 20 year program of climate jobs, we will need almost three times as much electricity as we produce now. [3] That will require a mixture of many kinds of renewable energy. The three most important forms of renewable energy are wind power, solar photovoltaic (PV) cells, and

concentrated solar power (CSP).

Wind power comes from the wind turbines, usually in rows, in a 'wind farm'. Steady, strong wind makes an enormous difference in productivity, so the turbines are mostly placed on hilly ridges, windy plains and out to sea. [4]

Solar PV cells are arrays of panels that absorb sunlight on roofs or on the ground. They can work in any country, but work best in the sunniest places.

Concentrated solar power (CSP) uses mirrors that focus the light of the sun on one spot to heat solids like salt or mercury into very high temperature gases. CSP also works best in very sunny places.

Wind power, solar PV cells and concentrated solar power between them can generate all the electricity we need from a very small part of the earth's surface. [5] The difficulty, however, is that the supply is not steady in any one place. The wind only blows sometimes. The sun only shines in the day. So several strategies are needed to provide a rich mix of renewable energy around the clock.

We will need to use many other forms of renewable energy as well. Wave power and tidal power rely on turbines in the sea. Hydropower relies on dams. Geothermal taps heat stored beneath the ground.

We also need extensive grids to mix all the different sources of electricity over long distances. When the wind is not blowing in Scotland, it is probably blowing in France or Turkey. When demand for electricity is highest in New York at 7 pm, the sun is still shining in California. When there is no sun in Mali, the wind is probably blowing off the shores of Nigeria. And so on.

Luckily, it is now possible to build long distance high voltage cables that can carry electricity for thousands of miles, across land and under seas. We also need ways to store electricity, like batteries in homes, cars, and factories. We can also pump water up behind dams for use in turbines later.

It is often said that renewable energy has the great advantage of being local, and locally controlled. This is sometimes true. For

example, solar PV cells on roofs are ideal for air conditioning. You need the air conditioning when the sun is shining. But in general, renewable energy needs large scale connections. So we will depend on each other over great distances.

For the first ten years, the majority of renewable energy jobs will be in factories and shipyards making turbines, solar cells, solar machines, parts and cables. Many of the other jobs will be in installation. After the first ten years, there will also be many jobs in maintenance. But there are also largely industrial jobs, mostly blue collar, many of them skilled, with a lot of technicians, engineers and seafarers needed as well. [6]

We estimate that in 20 years, 35 million workers can cut CO<sub>2</sub> emissions from electricity generation to almost nothing. Electricity generation accounts for about a third of CO<sub>2</sub> emissions globally, and about a quarter of all greenhouse emissions. So those 35 million workers could eliminate 25% of all greenhouse gas emissions in 20 years. [7]

## **Industry**

Industry accounts for three different kinds of emissions. First, there are the emissions that are the result of using electricity to run machines, lighting, pumps, and the like. We have already considered these emissions under the more general heading of renewable electricity.

A second kind of emissions from industry are also important. Some industries use a great deal of energy to heat materials to high temperatures in order to use them properly. The heating is usually done by burning coal or gas in the factory or steel plant. The burning produces CO<sub>2</sub>.

The largest users of energy in this way globally are steel plants and cement factories. Several other industries use substantial amounts of energy for heating materials: the paper industry, chemicals, aluminium, and building materials. [8]

The third kind of emissions come from carbon dioxide emitted as

a by-product of industrial processes. The largest emissions here come from making cement. This is because to make cement you heat limestone to get rid of the carbon, which then joins with the oxygen in the air to make CO<sub>2</sub>.

Heating materials produces a bit more than 5 billion tons of CO<sub>2</sub> emissions globally each year. By-products of industrial processes produce 3.5 billion tons a year. [9]

Each industry is different, but there is space for reductions in emissions of at least half. For example, steel can be made using renewable electricity for electrolysis, and then for heating with an electric arc process. It takes a lot of electricity (and a lot of jobs) but it can be done.

However, renewable electricity will not solve the problems with cement. And cement has large emissions both from heating materials and as a by-product of the process. But other building materials, like wood, stone, adobe and newly developed materials can replace cement. In fact, such buildings are easier to heat and cool.

Cement is only necessary for very tall buildings. These buildings are in effect greenhouses – just look at the windows. And they use huge amounts of energy for cooling and for moving goods and people in elevators. We can phase out most uses of cement. [10] Again, using traditional materials will require more jobs, in making the materials and building the houses.

We estimate that we can reduce industrial emissions from heating and processes by almost half in twenty years, from 8.5 billion tons to 4.5 billion tons. [11]

### **Transport**

Globally, transport accounts for 7 billion tons of emissions, almost all CO<sub>2</sub> from burning oil. This is 14% of total emissions, and over a fifth of CO<sub>2</sub> emissions. The largest sector is road transport – especially cars. The solution here is to move most passengers out of cars and into buses and trains.

The switch to buses can be done in a year. Building railways takes longer. But the Chinese government just built a new national high speed rail network within six years. [12]

Public transport uses only about half the energy of cars. Fill most of the seats, and you cut energy use in half again. Run all buses, trains and cars on renewable electricity, and you reduce emissions to almost nothing. [13]

The next biggest user of oil is trucking. Here we need a combination of smaller trucks and vans running on renewable electricity with rail freight, which uses much less energy and can be electrical. [14]

We cannot replace oil with electricity in shipping and air travel. New kinds of sails, and other design changes, can help with ships. But the key with shipping is that if you cut the speed of container ships by half, then fuel use falls by three quarters. So emissions also fall by three quarters. Cut the speed of the ship by three quarters, and fuel use and emissions fall are cut by 94%. [15] Of course much slower ships require many more seafarers – and, again, more jobs.

Slower speeds help with air travel too, though not as much. Here we also need a switch to rail travel. A train travelling only 200 kph (125 mph), not a high speed train, would take:

43 hours Paris to Delhi  
36 hours Johannesburg to Nairobi  
25 hours New York to Los Angeles  
23 hours Mexico City to Montreal  
36 hours Moscow to Beijing

And you could sleep in couchette bunks, spend time in the food car, arrive rested, see the land change, and walk up and down the train. Again, though, this would require more jobs.

We estimate that, with these kinds of changes, 35 million workers could reduce transport emissions from 7 billion tons to 2 billion tons. [16] Most of these jobs would be working on and building buses,

trains and ships. This is particularly important because transport is the fastest growing sector for emissions now. Many of these jobs would be in making bigger, and better, public transport networks in poor and middle income countries.

**Mining and Refining and Heating Buildings**

Mining and refining coal, oil and gas creates about 5 billion tons of greenhouse gas emissions. Most of that comes from refineries. But after 20 years we will only be using small amounts of these fossil fuels, mainly in aviation, shipping, making plastics and heating materials in industry. We won't need the rest. So we can cut emissions in this sector from 5 billion tons to 0.5 billion tons, simply because we will be mining and refining so much less. This is a cut of 90%.

**Heating Buildings**

Another 3 billion tons of CO<sub>2</sub> emissions now comes from burning oil, coal, gas, wood and other biomass to heat homes and buildings, and to cook. The solution here is partly energy efficiency. Most of the jobs here would be insulating and converting old homes and buildings. And we would have to convert from heating by oil, coal and gas to heating with renewable electricity.

In the longer term, the more important measure is immediate regulations to require all new homes, and most new buildings, to be 'passive houses', which require almost no energy to heat. Different versions can be built all over the world, often using traditional materials and designs. [18]

**Total Cuts in CO<sub>2</sub>**

We can now summarise the cuts we can make in CO<sub>2</sub> emissions in billion tons:

	Billion tons	Now	After
Electricity		13	0.5
Industry		8.5	4.5
Transport		7	2
Mining and Refining		5	0.5
Heating		3	0.5
TOTAL		38.5	8 billion tons

That is a cut of just over 79% in CO<sub>2</sub> emissions.

**Other Emissions**

That still leaves emissions from waste, wastewater, farming, land use change and forestry. These are mainly emissions of methane, nitrous oxide and fluorocarbons from industry.

These are complex processes. We have space only to outline some of the possible changes. And many changes will come from doing things differently, rather than employing more workers. Some of the necessary changes include:

Converting all landfill waste dumps to burn off methane. [19]

Less waste of food and less packaging of everything.

Recycling more materials.

Changes, and care, in the processing of wastewater. [20]

A change in diet to consume less beef and sheep.

Changes in ways of growing rice and feeding animals.

Much more careful use of both synthetic and organic fertilisers.

Banning the use of all fluorocarbons in industry – there are alternatives.

A shift to careful, small scale, mixed farming. [21]

The change that will require the most workers on government programs is forestry. At the moment emissions from 'land use change and forestry' are mainly emissions from vegetation and the soil when forests are cut down. We have to reverse this process, so

tree cover increases more each year.

The tropical rainforests will make the most difference, because they are so dense and rich in carbon. This will require not monoculture plantations of one kind of fast growing tree, quickly harvested, but dense mixed forests. Brazil, Indonesia, and DR Congo will be the most important countries here.

In addition, a switch to intensive small farms will create more jobs, but not necessarily as part of a government program.

It is difficult to make precise estimates for waste, forestry and farming. The largest changes possible would be in land use and forestry. This is because preserving forests and planting trees can, in theory, actually reverse emissions and take carbon from the atmosphere into trees and the soil. Our rough estimate is that we could reduce emissions from 14 billion tons to about 6 billion tons, a cut of more than half:

	Before	After
Farming	6	4 billion tons
Land use and forestry	6	1.5
Waste and wastewater	1.5	0.5
TOTAL	13.5	6 [22]

**This would give us a total of:**

79% cuts in emissions from electricity, industry, transport, mining and refining, and heating buildings.

56% cuts in other emissions from farming, land use changes, forestry, waste and wastewater.

For a 74% cut in total emissions.

That is a cut of about three quarters in twenty years.

**How Many Jobs?**

We cannot be precise about the number of jobs that would be required. For electricity generation and transport we have already made rough estimates:

<u>Estimated new jobs globally</u>	
Renewable energy and electric grid	35 million jobs
Transport	35 million jobs

Estimates for the other sectors are more difficult. To be anything close to accurate, we would need careful studies country by country to build a picture from the bottom up. We don't have those studies now. That will be part of the work of new climate jobs campaigns in different countries. What we can say with confidence is that we will probably something in the region of 120 million workers, worldwide, to cut greenhouse gas emissions by three quarters in twenty years.

These are 'direct jobs'. There would be about 60 million more 'indirect jobs' in the supply chain making parts, buses, materials, computers and so on. [23]

**The Consequences of Climate Change**

So, we can cut emissions by three quarters. We can do it in twenty years. And we can do it with the technology we have now.

Now let's look at the bad news – why we have to act swiftly and deeply. There are two main reasons: manmade capitalism and natural feedback effects.

Climate change will happen in the economic and political system we have now – global capitalism. That system turns natural disasters into human catastrophes. [24] So, for example, warming temperatures will change the patterns of rainfall. In many places there will be less rain, and the crops will fail. Or the rains will be so hard they lead to floods, or they will happen in the wrong time of year. In the present economic system, in some places that will mean famine.

Or take another example. Powerful storms, floods and famines will create hundreds of millions of refugees. In the present system those refugees will come up against border guards, soldiers, naval ships and machine guns. On the other side of the border there will be an explosion of racism to justify keeping those desperate people desperate. And there will be war. Change the geography, and the great powers and the small will go to war to change the balance back in their favour. This is not science fiction. Look at Darfur, Chad, Mali and Somalia now. In 1969 the rains failed in Darfur and Chad because of climate change. They have never recovered. People have lived with crop failures, recurrent famine, refugee camps and wars for more than two generations. [25]

There will also be devastation in the cities. Cyclones and hurricanes will spread north and south, and increase in intensity. They bring hurricane surges – great waves like tsunamis, ten meters tall or more, that can flood whole cities.

All over the world now we see how governments react to natural disasters. [26] After earthquakes in Nepal and Turkey, tsunamis in Indonesia and Sri Lanka, and hurricanes in Haiti, New Orleans and New York, it is the same story. The government does nothing. The army and police try to 'restore order'.

There will also be great economic devastation as Shanghai, Manhattan and Saigon go under water. Populations will be quite rightly enraged. Governments will send in the army and the tanks, accompanied by rhetoric that will sound green – 'This is a planetary emergency, and we must all sacrifice together'. Then we will sacrifice, the rich will not, and repression will be brutal.

### **Feedbacks**

The second reason we have to act swiftly and deeply is that at some point there will be a shift to much faster climate change. This has happened often with warming in previous eras of geological time. This time we are forcing the speed of change in an unprecedented way. [27]

Feedbacks will be crucial here. For example, as the world warms, forests will die back and release large amounts of carbon dioxide from the vegetation and soil into the air. That will warm the air more, so more forests will die.

Another example of feedback involves methane, a powerful greenhouse gas. As the tundra melts in the far north of Siberia, methane locked in the permafrost is released into the air. That warms the world, which melts more tundra, and so on.

Scientists have identified several other feedbacks, such as the melting of undersea methane deposits and the albedo effect when snow and ice melt. Each of these feedbacks reinforces the others. At some point, they will lead to a decisive shift in the speed of warming. That will put an enormous strain on governments, economies and communities.

We cannot know the timing of such runaway change. Maybe we have fifty years, and maybe ten. Hundreds of millions will die, but there is no way of estimating more exact numbers.

### **How to Pay for the Jobs**

So we can do it, and we have to do it. But can we pay for it? Yes. The ways of paying will be different in rich countries and poor countries – but not very different.

In rich countries there are three different ways of paying for the jobs. One study for the United Kingdom [28] calculated that the money could be raised in the following ways:

**Bills and tickets:** The climate jobs project would not be throwing money away. It would be making electricity and providing public transport. Electricity bills and bus and train tickets would cover about one-third of the total cost of all new climate jobs. This is assuming that the government will still subsidise about half of the costs of renewable electricity and public transport.

**Taxes and benefits:** Each time an unemployed person takes a job,

they start paying taxes and they stop claiming many benefits. These savings to the government would cover another third of the cost. (The government could save a bit more than this in Sweden, with high taxes and good benefits, and a bit less in the US. But the differences are less than you might assume.)

**Taxing the rich:** That still leaves a third of the cost to be raised. The UK report suggests six ways of raising this money – all of them are some form of taxing the income or wealth of the rich.

The reason for taxing the rich is not to punish them. The reason is that we also want to expand the economy. If we tax the 99%, then they will just stop spending money on other things – housing, clothing, food or something else. The people providing those things will then lose their jobs. So overall, there will be no new jobs. But if we tax the 1%, or just stop their tax evasion, we will be putting money into the economy that would otherwise remain in back accounts, property values, and the value of shares. Instead, we could get that money working to make jobs.

### **Paying for the jobs in poorer countries**

Paying for the jobs in poorer countries will be similar to paying for them in richer countries. Poor countries are full of rich people, and the governments can tax them. And people in poor countries will also buy tickets and pay electricity bills. Of course, many will need subsidised electricity or transport, just as in richer countries.

However, poor countries typically have lower benefits for people out of work, and lower taxes. So the government will save less money by giving people new jobs. All in all, governments in poor countries will find it harder to raise about a third of the cost of a climate jobs program on the same scale as in the rich countries. Realistically, they will need help from people in the rich countries.

But the cost will be very cheap for people in the rich countries. The reason is simple – incomes and wages are much higher in the rich countries. The average incomes in high income countries are

more than 20 times as much as the incomes in poorer countries.

Half of humanity live in what the World Bank calls low and lower middle income countries. Let's assume those countries raise money by taxing the local rich and selling tickets and electricity, but they still need aid for to cover a third of the cost of climate jobs. That aid would cost people in Europe, the US, Canada and Japan about 50 cents out of every \$100 in national income. This is a tiny proportion. In fact, the money could be raised easily by a very small tax on the wealth of the richest 1% of people in the richest countries. [29]

### **It will not be easy**

So we can do it, we have to do it, we can pay for it, we will get many more jobs, and the poor countries can start to leave poverty behind. Climate jobs are not about sacrifice.

That does not mean the struggle will be easy. We face enormous corporate power in the oil, coal, gas and power industries. And the leaders of the world are not doing what is necessary now. Action would require them to break with neoliberalism, and it would mean the end of austerity.

But we will have a much better chance of success if we build campaigns for climate jobs in every country. In the end, we have to change what humanity does all over the globe. But the decisive, and most difficult moments, will be the first victories, country by country.

If we win climate jobs on a large enough scale in one important country, or several smaller countries, everyone all over the world will see what we have done. They will have the courage and inspiration to do likewise.

But each country is different – in terms of its economy, industry, union organisation, geography, sun, wind, tides, forests, food, wealth and political traditions. That means climate jobs campaigns will necessarily vary too. To give you some idea of how a campaign might develop in your country, and the kinds of jobs you would fight for, we will turn now to look at different emerging climate jobs campaigns in different countries.

**CANADA**  
**Tony Clarke**

The movement for climate jobs and a new economy in Canada began in the run-up to COP 15 in Copenhagen in 2009. By that time, Canada was already receiving 'fossil-of-the-year' awards primarily because of the mega tar sands development in northern Alberta – labelled the 'world's fastest growing global warming machine.'

There was a standoff over the tar sands between some labour unions and environmental groups. It was the traditional jobs vs. the planet split found in many countries. But in Canada it was particularly acute because of the tar sands' sheer size and its key role in the Canadian economy. Moreover, Canada already had relatively high greenhouse gas emissions because of the acute winter cold, the size of the country, and the weakness of public transport.

However, there was also a growing recognition by many, inside and outside the unions, that the climate crisis was real and intensifying. In the fall of 2009, two formative events brought together union activists and environmentalists. The Canadian Labour Congress [CLC] hosted a national gathering of leaders from a variety of labour union and civil society organizations to discuss a report and strategy proposal from the Polaris Institute. And the labour council in Toronto, Canada's largest city, convened a conference on green jobs which involved over 600 union and community-based groups. Both events were pivotal in the formation of what was later called the Green Economy Network [GEN].

Composed of 25 member groups, the GEN includes the country's largest private and public sector unions, Unifor and CUPE, along with the CLC --- plus unions of postal workers, steel workers, provincial and federal government employees, machinists and aerospace workers --- working together with environmental groups like Greenpeace, Sierra Club, and the Climate Action Network; youth associations like the Canadian Federation of Students; public interest

entities like the Council of Canadians; plus faith-based groups and Indigenous peoples movements.

The GEN steering committee was formed to map out plans of action. Canada is a very big country, so we used video conferencing to reduce CO<sub>2</sub> emissions and travel costs. By mid-2010, we had a vision statement, and in 2011 we launched a common platform, *making the Shift to a Green Economy*. We set up a website, produced fact sheets for general education, and introduced our program at conventions and congresses of our member organizations. [For more details, documents, and a full list of member organizations, see [www.greeneconomynet.ca](http://www.greeneconomynet.ca)].

However, throughout this period the GEN steering committee also reflected on the deeper underlying issues. In that reflection, we realized that the climate crisis is interwoven with the economic crisis, to the point where one cannot be resolved without the other. On the one hand, climate change is creating a world where today's children will have to cope with a 4-6 degree increase in the planet's temperature before the end of the century. On the other hand, the driving force causing climate change is the same economic system – global capitalism – that causes increasing unemployment, precarious work and the widening gap between rich and poor.

In short, today we urgently need 'system change' not 'climate change.' As a society, we can no longer afford an economic model that treats the natural environment and human beings as disposable goods. Instead we must start to collectively build a new economy, one based on much more sustainable modes of production and consumption while transforming the economic and social inequalities that plague and overburden society.

Encouraged by our international allies, we took up this challenge by focusing our attention on what it would mean to change various sectors of our economy to create 'climate jobs.' By climate jobs we mean jobs that directly contribute to preventing climate change and global warming. One way to do so is to develop new economic strategies for creating decent paying and secure jobs

that contribute directly to the reduction of carbon and greenhouse gas emissions which cause the heating of the planet. In doing so, we emphasized that these climate jobs provide more secure forms of employment that would ensure greater social equity for marginalized peoples such as the unemployed and working poor, including Indigenous peoples and people of colour.

Our common platform outlined three strategic priorities for creating climate jobs now:

Increasing public investments in, and community ownership of, **renewable energy** development --- wind, solar, and geothermal --- to facilitate the urgent and necessary transition from fossil fuels.

Developing a **green buildings** strategy to reduce energy waste by retrofitting our residential, public and commercial building stock for energy efficiency. This is especially important in Canada because of our rather unique conditions of extreme heat and cold.

Improve and expand **public transit** within cities and high speed rail between cities in urban corridors, to reduce urban traffic congestion, pollution and stress.

In organizing our 'one million climate jobs' campaign around these three pillars, GEN realizes that the political will to act must be ignited by a groundswell of grassroots demand for action. After all, much of the impetus for creating climate jobs is going to come from local and regional economies where people live and work in closer relationship with their environment.

For these reasons, GEN has begun to organize roundtable strategy sessions with union and community activists in cities and towns across the country.

Today, we are now seeing **local and regional campaigns**

beginning to gell around:

Improving and expanding public transit;

Linking community support for higher speed rail transport between cities;

Developing community-owned wind, solar and geothermal power projects;

And retrofitting the residential building stock of neighbourhoods, towns and cities for zero energy waste.

In addition, there is a growing recognition in GEN that combating climate change requires taking on the austerity agenda as well. Governments and the public sector have a major role to play finding real solutions. But over the last forty years government capacities to intervene and shape their economies have been largely stripped away. In the name of austerity, decades of cuts to public services have also made us more vulnerable to climate disasters. And workers have been made more vulnerable and insecure due to persistent high unemployment and precarious work.

Indeed, a good climate jobs strategy is imperative for developing an effective just transition for workers from a fossil fuelled industrial economy to a new low carbon economy of the future. Moreover, a collective focus on climate jobs provides real opportunities for cultivating new solidarities, not only between unionists and environmentalists, but uniting all people of good will, around a common purpose to build a new economy that is truly environmentally sustainable and economically equitable.

**SOUTH AFRICA**  
**Sandra van Neikerk**

The One Million Climate Jobs Campaign was formed in 2011 as an alliance of labour, social movements, community organizations and environmental NGOs. It has been almost unique in being able to draw together such a diverse range of organizations, united around the two crises facing South Africa – climate change and extremely high unemployment. The campaign has developed well-researched solutions for how South Africa can immediately begin a just transition towards a low-carbon economy. By placing the interests of workers and the poor at the forefront of strategies to combat climate change, we can simultaneously halt climate change and address our job bloodbath.

The unemployment rate in South Africa is staggeringly high. The broad unemployment rate, which includes discouraged work seekers, is close to 40%. The narrow unemployment rate has been sitting between 24 and 26% for over a decade. What this means in reality is that almost 7 million people cannot find work.

South Africa is one of the most unequal countries in the world, with more than 12 million people living below the food poverty line. It is not surprising then, that South Africa faces a massive problem of social disintegration with high levels of rape, domestic violence, child and women abuse, crime, substance abuse and gangsterism.

There is a desperate need for a shift to an economy that prioritizes job creation and people's basic needs. The One Million Climate Jobs Campaign is as much about the right to work, and the demand for the creation of decent jobs, as it is about the creation of climate jobs. And it is as much about free or affordable access to basic services such as housing, electricity, water and waste removal, as it is about renewable energy, zero waste and sustainable water sources.

The research carried out by the One Million Climate Jobs Campaign has shown that there exists the very real possibility for at

**least** a million climate jobs to be created through renewable energy, retrofitting existing buildings to be more energy efficient, and building thousands of desperately needed new houses in working class communities that are decent and zero carbon emitting. Job possibilities also exist through expanding public transport, producing food through organic small-scale agro-ecological methods, protecting our water, soil and biodiversity resources, and moving to zero waste.

In 2014 the focus of the campaign was on collecting 100,000 signatures from women, youth, the unemployed and workers in communities and workplaces across the country. From Lepalele in Limpopo, Emalaheni in Mpumlanga, Thembisa in Gauteng, and Khayelitsha in Cape Town, campaign activists engaged with thousands of the poor and working class on the dangers of climate change, how it is already affecting them, and the possibilities for climate jobs in their areas.

The signature campaign allowed us to build local structures of the Campaign outside of the main urban centres of the country, and connect with local issues and struggles around essential services. The issue of food security and increasing food prices is one of the most stark impacts that climate change is already having on people's lives in many communities – it is affecting food production and therefore harming food security and causing food prices to rise.

For many communities, particularly in the north of the country, mining, specifically coal mining, and its impact on the environment, food production, and the health of workers and communities, is a major issue that the campaign is increasingly focusing on. This focus on the impact of coal mining is important in the light of the government's ongoing commitment to an energy sector largely driven by coal-generated electricity, and its announcement that it envisaged additional capacity being provided by shale-gas fracking and nuclear. We are aware that our task in building the campaign will not be made easier by the vested interests who make super-profits from the existing mining and energy-intensive system in

South Africa.

At the same time as opposing the development of new coal-generated plants, a major focus of the million jobs campaign has always been on renewable energy. The campaign has brought together activists, academics and organisations to explore ways in which renewable energy can be introduced at a faster rate, and in a way that allows for greater energy democracy. Not only is renewable energy an important means for mitigating against climate change, it also opens up possibilities for increasing access to electricity through local solar plants, wind farms, roof-top PV panels, and other innovations within a socially-owned renewable energy sector. Renewable energy needs to power a sophisticated industrial, mining and business sector, as well as meet the desperate energy needs of poor, working class communities.

By March 2015, 100,000 people had signed the petition calling on government to take climate change seriously and create at least 1 million climate jobs by a range of different public measures. The huge pile of petitions collected was handed over to a government representative at a Renewable Energy Festival held at the end of March 2015 – a festival organized to highlight and celebrate the possibilities of renewable energy in increasing access to electricity and reducing carbon emissions.

In 2015 the focus of the campaign is on a ‘Long March’ that will draw in thousands of activists in physical demonstrations of the crisis of climate change and unemployment and the solutions posed by the campaign. The march will culminate in a mass rally in front of the Union Buildings in Pretoria, to demonstrate support for our demand for a million climate jobs, while COP 21 is in progress in Paris.

## NORWAY

**Asbjørn Wahl and Andreas Ytterstad**

Climate jobs campaigns are growing in many countries for two reasons. First, in order to fight unemployment in an environmental sustainable way. And second, to secure a necessary transition from fossil fuel to renewable energy. In Norway, which, because of its “oil adventure”, has become one of the richest countries in the world, the unemployment rate has been very low for a long time – around 3 per cent. The focus of the Norwegian campaign has therefore been how to develop climate jobs in order *to put a brake on, or cool down,* oil and gas.

For non-Norwegian climate activists the following is probably obvious: to stop runaway global warming, a rich country like Norway should leave its fair share of fossil fuels in the ground. For most Norwegians, however, it is more complicated. The Norwegian government took control of the oil and gas resources from the very beginning of the oil adventure in the 1970s. So most of the revenues have gone into the public purse and made little Norway the owner of the world’s biggest sovereign wealth fund. This abundance of public wealth has made it possible to keep public services and the welfare state in a far better condition than has been the situation in most other countries, at the same time as hundred thousands of new jobs have been created in the fossil fuel industry, and real wages have steadily increased across the economy.

### **Green Norwegian oil and gas?**

The oil industry and oil-addicted politicians are therefore quite creative in developing all kinds of arguments for continuing this “oil adventure” unrestricted. However, the Norwegian economy’s increasing dependence of oil and gas also contains a number of contradictions and problems. First, almost all of our own electricity is provided through hydropower, which means that most of oil and gas is exported and thus not part of Norway’s carbon footprint. This dual

luck of hydropower and emission accountancy has made it possible to greenwash Norway. While forgetting that our exports of oil and gas is also an export of global warming, we can indulge ourselves with abundant, clean and sustainable domestic energy.

Second, politicians tell us that Norwegian oil and gas are part of the solution to global warming. If we do not export gas to Europe, Europe will use Polish or German coal instead, and that will be even worse. [1]

Third, and along the same line, since Norway is at the technological forefront of extracting oil and gas, the argument goes that this extraction is carried out in a much more environmentally friendly way in Norway than in any other country. Fourth, because of the well-filled public purse, the Norwegian government can buy quotas on the international carbon market and thus avoid cutting emissions back home.

The central position of oil in Norwegian economy and politics, as well as the dominant political narrative described above, explains both the obstacles and the early successes of the climate jobs campaign, known in Norway as the *Bridge to the future* alliance. This campaign has hosted two incredibly successful conferences in 2014 and 2015. [2] 10,000 signatures were collected in the build up to the last of them, with the key demand “Put a brake on Norwegian oil: 100,000 climate jobs now!”

### **50,000 jobs in offshore wind – and building Norway anew**

The story of clean and green Norwegian oil and gas, however, has lost some of its credibility over the last couple of years. An important change came in 2013, when a new Climate Election Alliance developed a platform that demanded a brake on Norwegian oil extraction. Of particular importance was the participation of the Norwegian Church in this alliance.

A broader opposition to excessive Norwegian oil extraction was also helped by the publication of two books in 2013 by the climate jobs campaign. The first one demanded 100,000 climate jobs, of

which 50,000 were specified within offshore wind. [3]

A second book, entitled *Norwegian Oil and Climate*, detailed a sketch for cooling down Norwegian oil production. [4] Both books argued for offshore wind not primarily because the wind blows steadily outside the Norwegian coast, but because only such a large scale investment in renewable energy can provide the concrete bridge to the future for current oil and gas workers. To talk about just transition without public investments in offshore wind outside of Norway, therefore, is just to talk the talk.

If we are to walk the walk of transition, we must aim towards becoming an exporter of renewables, instead of oil and gas – provided we keep the energy sector under national and democratic control. By exchanging stable energy from dams with the unstable energy of wind and sun, Norway could also contribute to stabilizing the provision of energy in Europe.

### **Stronger and bolder together**

The organisational and political backbone of the climate jobs campaign has come from trade unions, environmental organisations and the Norwegian Church. [5] The unions which organise most of the oil and gas workers have not joined the campaign. There is no doubt that in order to win their support, our campaign has to be complemented by a strong guarantee of their economic and social interests. Although we have begun a dialogue with some unionists in oil and gas, we are not there yet. The question of jobs in the fossil fuel industry has become even more pressing since the recent decline in oil prices has contributed to increasing the unemployment rate to around 4 per cent. Our Government, which talks a lot about transition, has not offered anything to those workers.

The demand for climate jobs is spreading, though. “100,000 climate jobs now!” was an official demand of the May Day parades in 2015 in Oslo, Trondheim and Bergen. The Norwegian Children and Youth Council, an umbrella organization for more than 90 NGOs, runs a campaign called “The step into the renewable age” centred

on demands for climate jobs. The Bridge to the future alliance launched an anthology in August 2015, in which about half of the 20 contributors are representatives of national or international trade unions.

Our main ambition is to build unity between trade unions in the public and the private sector – including the energy sector, in alliances with environmental organisations, the Church and other NGOs. Only by mobilising broad social forces will we be able to turn the good idea of climate jobs into real action.

Together we are stronger, but together we can also be bolder.

## **NEW YORK STATE**

**J. Mijin Cha, Josh Kellermann and Lara Skinner**

In 2014-2015, the New York labor movement and its allies in other movements launched two Climate Jobs initiatives. In New York City, Climate Works for All is a coalition of over 40 community, labor, environmental justice, faith and other organizations. And a New York State initiative, coordinated by The Worker Institute at Cornell, brings together unions in the building, energy and transport sectors to develop a comprehensive climate jobs plan for New York State.

Most international Climate Jobs campaigns have been proposed at the country or national level. In the U.S. climate policy is near impossible to move at the Federal level within our current political context. However, three main factors have opened a political space in New York and pushed labor to drive a Climate Jobs campaign.

First, Hurricane Sandy slammed New York on October 29, 2012. This storm brought the reality of the climate crisis home to many New Yorkers, making very clear the link between warmer air and sea temperatures and more frequent and intense storms in the North Atlantic.

The New York labor movement – the strongest in the country with 25% union density – was on the frontlines of responding to and repairing and rebuilding the city in the aftermath of Hurricane Sandy.

For example, members of the Utility Workers Union of America (UWUA) Local 1-2 worked 24/7 to restore electricity to NY and NJ communities, following a month long lockout by the private utility, Con Ed, and years of staffing and equipment cuts that left the region particularly ill-prepared for Hurricane Sandy.

Members of the Nurses Association, Service Employees International Union 1199 and the American Federation of State, County, Municipal Employees reported to their flooded hospitals by wading through water and carried their patients by hand down stairs to evacuate them to safety.

Transport Workers Union Local 100 members were readying the region's transit infrastructure for Sandy's storm surge, moving trains and buses to safety, as the public was warned to stay inside because of the dangerous conditions. AFSCME members who work in NY's public housing, walked door-to-door in buildings without electricity and running water to make sure residents were safe.

DC 37 Local 1501 members, representing zookeepers and wildlife specialists, slept at their zoos and aquariums during the storm, to ensure the safety of the animals. Members of the worker organization, Restaurant Opportunities Center (ROC), lost their jobs or didn't receive paychecks for months.

Many union members also experienced the impact of Sandy as their homes were damaged or destroyed; some union members lost their lives trying to protect their homes from flooding and fire.

Second, the People's Climate March in September 2014 brought 300,000 onto the streets of New York. Environmental justice organizations (rather than big mainstream environmental organizations who do mostly top-down, legislative climate work) led the planning and organizing of the march. So a firm link was made early on between social justice and the climate crisis – we can't have one without the other. Quickly, the PCM was branded as a "climate justice" march, not a climate march. One of the main mottos of the march was: "Two Crises (Jobs and Climate Crises), One Solution."

Only about 10,000 of the 400,000 march participants were union members but labor played a big role in organizing the march, had a labor rally before the march, and had a strong presence at the march (colorful union t-shirts and banners).

Then the grassroots environmental movement forced NY State Governor Cuomo to ban fracking in 2014. The Governor was reluctant to ban fracking because many communities in upstate NY are economically depressed with high rates of unemployment and poverty, and the gas industry argued fracking would produce thousands of new jobs. Once Governor Cuomo banned fracking, it became more important politically for social movements in NY to

present a viable, alternative jobs plan, one based on creating good union jobs, tackling the climate crisis, and strengthening NY communities.

Finally, NY State has the fourteenth largest economy in the world. A climate jobs plan would make a major dent in U.S. emissions and would set a precedent for other states and countries.

New York is the "home" of the New Deal, too. Franklin Delano Roosevelt first implemented massive public jobs programs during the Great Depression when he was governor of New York in 1929. More recently, NY has been at the center of discussions about growing inequality. There was Occupy Wall Street. Then the American strikes of fast food and car wash workers started in NY. In July 2015, NY Governor Cuomo passed legislation to pay all fast food workers \$15 an hour (a \$7 increase for most of them).

### **The Plans: Climate Works for All**

NYC's iconic skyline is made up of over one million buildings. These buildings are responsible for over 70% of our city's emissions and 94% of our total electricity use. We must reduce energy demand in these buildings, and replace the remaining demand with renewables. So the Climate Works for All coalition decided that our primary work in 2015 needed to address NYC's building stock. And much of the building stock is owned by the 1% who should be required to bear the cost of addressing NYC's climate crisis. Conversely, those that are least responsible but most impacted by climate change – low-income, people of color – should be given priority in jobs created by this work, and the jobs should be career-track with good pay. To this end, we are advocating to expand a targeted local hire program that provides training opportunities and a clear jobs pipeline for disadvantaged workers.

We are also fighting to pass legislation that would mandate that all privately-owned buildings in NYC undergo energy efficiency retrofits when they engage in substantial renovations or are bought and sold, and that all new buildings are built to Zero-Net-Energy

standards by 2030 – creating 16,000 jobs each year.

We want the city to install solar roofs on 100 schools in climate-vulnerable communities – creating 3,000 jobs – and to replace sixty boilers damaged in Hurricane Sandy that serve 110 NYC Public Housing Authority buildings.

### **NYS Climate Jobs**

At the state level, the Worker Institute at Cornell and its union allies are currently developing a full climate jobs program for NYS that will result in a 100% reduction in NY emissions by 2050. This report and plan will be released in Fall 2015.

At the same time, we're developing specific climate jobs policy recommendations that we will push to implement in 2016. These recommendations are meant to move the green jobs debate from "rhetoric to reality" by developing very specific policies that we can begin advocating for right away and can be implemented quickly to secure some immediate and tangible "climate job victories." A few of the specific "climate job" policies we're developing are:

We want the New York's public power authority to retrofit all public schools across the state to reduce energy consumption by 40% and to 3 GW of solar on the rooftops of public schools in the next 10 year. This would create 12,800-18,400 jobs.

New York State's great capacity for renewable energy generation is largely untapped. In 2014, the state of California installed 30 times more solar than NY installed. We propose that the New York Power Authority install 1 GW of utility-scale solar energy in the next ten years.

The combination of NYPA installing 3 GW of solar on NY's public schools and 1 GW of utility-scale solar will total 4 GW, roughly one quarter of all electricity demand in NYS.

NY's transit systems were badly damaged during Hurricane Sandy.

This means a lot of work is required to repair the existing transportation infrastructure, restore and improve service, and then further expand the network to areas with the fastest growing populations – mostly the areas immediately outside of NYC where housing is cheaper.

We feel hopeful that we can succeed in implementing strong "climate jobs" policies in the next couple of years, and at the same time build a broad, inclusive and dynamic movement for economic and climate justice that is powerful enough to demand a massive public sector program to tackle the climate crisis, create good union jobs, and reverse growing inequality.

**BRITAIN**  
**Tabitha Spence**

Our story began in 2008 at a workshop in a conference organised by the Campaign against Climate Change. While the Campaign against Climate Change (CCC) is a grassroots environmental organization, 25 climate activists in this particular workshop discovered that they were all members of unions. They quickly formed a Trade Union Group within the CCC. In order to see how other trade unionists felt about organising to address climate change, the group held two conferences of concerned TU members over the next year. Each conference attracted two hundred people, most of whom the organisers had never met before.

Participants argued that our shared position as workers of many different stripes meant we needed to struggle to protect our collective interests as working people, both in need of job security as well as in terms of protecting ourselves from the horrendous effects of climate change. Climate jobs emerged as a means for both ends that would also challenge the false narrative that jobs and addressing the climate crisis are mutually exclusive.

So the climate jobs project in the UK started with trade union members who were also already part of a campaigning climate group.

**Strategy**

Four national unions supported the campaign from the beginning – the civil servants, the postal workers, the university teachers, and one of the rail unions. In three of these unions there was a senior national official personally concerned about climate change, and very active in the campaign.

As some of our members are academics from the education union and others are seasoned union organisers with campaigning experience, some among our group were confident in interpreting the scientific research, analysing economic and policy data, and

translating it all into clear language so we could formulate our campaign.

In order to attract support from other unionists and the broader public, we published our calculations and strategy for how the UK can transition to a low-carbon economy by providing one million jobs over the next 20 years into a booklet in 2009. In 2010 and 2014, we produced updated editions of the booklet, modified to include the latest scientific and economic data available. We decided to sell the booklets for £2.50 to cover the printing costs, but also because when people pay for something, they read it. We also have a downloadable version on the web. So far we have sold roughly 18,000 booklets, and around 10,000 have been downloaded.

Today we have the support of 8 national unions, including the bakers, the firefighters, UNITE (the U.K.'s largest union) and the National Union of Students. Our support was built from the bottom up in some unions, and from the top down in others.

We started with unions. While we continue gaining even broader support of unions and union members, today we are also working to gain the support of environmental groups, NGOs, and direct action groups. We have the support of the Green Party, and are building support in Labour, the largest opposition party.

Many in the CCCTU Group have spoken at hundreds of meetings, both within and beyond traditional union circles, to explain and share the idea. The campaign has also reached people due to a long tradition in Britain of alliances on a particular issue between some of the unions, the Labour left, and some NGOs.

At the same time, we find ourselves at a particular moment in which the Tories are in power, whose climate and energy agendas involve ending subsidies for wind farms and accelerating shale gas extraction (even planning to frack beneath national parks). Yet the Tory victory has stimulated the fractured British left to find ways to consolidate and strengthen itself in order to form a capable opposition to neoliberal and exploitative policies. The reconfiguration taking place in the left has opened up space to

develop and promote an alternative plan.

The One Million Climate Jobs campaign is widely considered a great idea, and holds the opportunity to justly and rapidly address the climate and job crises simultaneously. Our challenge now is to turn the support for this plan into government action.

### **Campaign**

There are many specificities to the blueprint we lay out in our climate jobs plan for the British context, but we only touch upon the highlights here.

The overall aim of our campaign is to reduce the UK's GHG emissions by what is deemed scientifically necessary. Our calculations tell us that a million climate jobs could reduce our emissions by 80 percent in two decades. That is a lot of work, and a drastic and rapid transition, so we want the government to create a National Climate Service, much like the National Health Service, which is widely supported and used by everyone. The National Climate Service would be a government program funded through federal taxes. Our estimates are that the program would cost £66 billion a year. This is less than the money spent on bailing out the banks during the financial crisis and less than the amount of money that evades taxes every year.

The National Climate Service would have a training dimension, to ensure people who lose high carbon jobs could be retrained in the necessary jobs.

The first major type of job that would be required is retrofitting buildings to make them more energy efficient, and thus cut emissions by about 40 percent. This is particularly important in the UK, because our buildings are so badly insulated.

The second major type of work needed is alternative energy production to supply 720 terawatt hours of electricity required each year. Britain has the advantage of famously bad weather, which means enormous wind resources, especially offshore in the North Sea. It would take about 400,000 jobs to set up onshore and offshore

wind turbine systems, and wave and tidal power, all connected to a national and international grid.

The final major work required is renovating and extending the public transport system to reduce emissions from unnecessary private travel. Here we have the advantage of a small and densely populated country.

There is much work to be done, and many people who need work. The UK can easily transition to a low-carbon society in two decades, while providing jobs, better public transportation, affordable electricity, and insulated housing along the way.

## CONCLUSION

Andreas Ytterstad

Naomi Klein begins the final chapter of her magnificent book *This Changes Everything* with a story of a complex systems researcher called Brad Werner. In a scientific paper with the title “IS Earth F\*\*ked?” he says popular resistance “that does not fit within capitalist culture” is the geophysical force that provides hope for the future of the earth.

When we start or continue building climate jobs campaigns, we do it as part of that geophysical force. That force is real. The Peoples Climate March in New York and across the world in September 2014 assembled hundreds of thousands in the streets for the climate for the first time in history. The papal letter by Pope Francis on climate change lambasted “An economic centered on the god of money” in May 2015. In August 2015 Islamic leaders gathering in Istanbul called for 1.6bn Muslims around the world to work towards phasing out greenhouse gas emissions by 2050 and a 100% renewable energy strategy.

Unlike the build-up to the Copenhagen Climate Summit in 2009, there is a much broader understanding across the world that world leaders will not deliver in Paris this year. As the International Trade Union Confederation put it in a statement for the Lima Summit in 2014: “only a massive demand from citizens will be able to correct the current unambitious path”.

But the early success of the campaigns reported on in this booklet, also demonstrates the popularity and power of the idea of climate jobs. In Norway, the links with Church organizations have been particularly strong, and crucial for the ideological impact of the Bridge to the Future alliance. [1]

In the UK, the demand for One Million Climate Jobs was endorsed by that most unlikely incarnation of youthful hope, Jeremy Corbyn (aged 66), electrifying a Labour party that was supposed to be New 20 years ago. Naomi Klein herself, commends the “bold coalition in

South Africa...going under the banner of One Million Climate Jobs”. She also spells out the reason for the popularity of climate jobs, by saying “there is no more potent weapon in the battle against fossil fuels than the creation of real alternatives”, underlining that this is something that applies all over the world: “the most powerful lever for change in the Global South is the same as in the Global North: the emergence of positive, practical, and concrete alternatives to dirty development that do not ask people to choose between higher living standards and toxic extraction.” [2]

There are differences in organizations, methods and studies of which climate jobs are most necessary in each country. Although campaigns exist in only a small number of countries so far, we believe there are lessons to be learned from the differences in each campaign. One general lesson is to be inclusive, both in the choice of partners and related issues, like climate justice, just transition, energy democracy, the greening of existing workplaces and the various campaigns against fossil fuels. The 10,000 strong March for Jobs, Justice and the Climate in Toronto Canada on July 5<sup>th</sup> this year is a promising illustration of the need to be broad and inclusive [<http://jobsjusticeclimate.ca/>].

At the same time we must stress the clarity and simplicity of climate jobs. They are jobs which cut emissions. They are new jobs we demand whether there is a market for them or not, from Governments whether national or local. The God of Money can neither ensure just transition nor save the planet from climate catastrophes. Climate jobs are just what we need in The Leap Years, as Klein puts it, the time we have left to salvage what we can salvage of civilization on Mother Earth.

This booklet was written and translated to several languages in order to inspire individuals to start climate jobs campaigns in more countries. But even the campaigns that have been running for several years, are only at a preparatory stage for the struggles ahead. It is very important not just to spread the general powerful idea of climate jobs to new places, but also to do studies of which jobs will

help most to cut emissions where you are. Many unions, faith groups, indigenous groups and environmentalists will begin by endorsing the simplicity and clarity of a climate jobs solution. But those climate jobs in renewable energy, in buildings, in transport, in farming and fisheries will only be created by governments if workers and the climate alliances built to support those workers, fight for them together.

If you feel impatient about talking and talking with people, in order to get your first pamphlet on climate jobs published in your country or part of the country, do not underestimate the creativity of such future struggles. When people start fighting in earnest about jobs, justice and a better world, they will thank you for laying the groundwork. We who put together this pamphlet would like to thank all our readers in advance, for reading this. We invite you to help us put together and give direction to a campaign for global climate jobs.

## NOTES

### Climate Jobs

[1] For useful earlier studies of climate jobs, green jobs and renewable energy, see Jonathan Neale, ed., *One Million Climate Jobs: Tackling the Environmental and Economic Crises*, Campaign Against Climate Change, 2014; Jonathan Neale, ed., *Online Companion to One Million Climate Jobs*, Campaign against Climate Change, 2014; Michael Renner, Sean Sweeney and Jill Kubit, *Green Jobs: Towards decent work in a sustainable, low-carbon world*, United Nations Environmental Program 2008; ITF Climate Change Working Group and Global Labor Institute, *Transport Workers and Climate Change*, International Transport Workers Federation, 2010; Jonathan Neale, *Our Jobs, Our Planet: Transport Workers and Climate Change*, a report for the European Transport Workers Federation, [www.climateandcapitalism.com](http://www.climateandcapitalism.com), 2011; *One Million Climate Jobs: A just transition to a low carbon economy to combat unemployment and climate change*, One Million Climate Jobs Campaign, Capetown, [www.climatejobs.za](http://www.climatejobs.za), 2011; *Agroecology and climate change in South Africa: The contribution agriculture can make to reversing global warming*, One Million Climate Jobs, Capetown, [www.climatejobs.za](http://www.climatejobs.za), 2013; Paul Allen et al, *Zero Carbon Britain: Rethinking the Future*, Centre for Alternative Technology, 2013; Christine Brown, et al, *Pathways to 2050: Three Possible UK Energy Strategies*, British Pugwash Working Group, [www.britishpugwash.org](http://www.britishpugwash.org), 2013; Mark Z Jacobson and Mark Delucchi, 'Providing all global energy with wind, water and solar power,' Parts 1 and 2, *Energy Policy*, 39 (2011) 1154-1190; Mark Z Jacobson et al, 'Examining the feasibility of converting New York State's all-purpose energy infrastructure to one using wind, water and sunlight', *Energy Policy*, 57 (2013) 585-601; Mark Z Jacobson et al, 'A roadmap for empowering California for all purposes with wind, water and sunlight', *Energy Policy*, 73 (2014) 875-889; Sven Taske, *Energy [r]evolution: a sustainable world energy outlook*, Greenpeace International, 2012; and *Making the Shift to the Green Economy*, Green Economy Network, Canada, 2011.

[2] The estimates in the two tables are for 2010. See IPCC, 2014: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working*

*Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 42, and see also 46, 81, 86, 383-385, 752-753; and *Trends in Global CO<sub>2</sub> Emissions, 2103 Report*, PBL Netherlands Environmental Assessment Agency and European Commission Joint Research Centre, 35.

[3] World electricity production was 22,668 TWh in 2012; see International Energy Agency, *2014 Key World Energy Statistics*, 26. For our calculations we assume global production of 68,000 TWh after twenty years of climate jobs programmes.

In careful calculations for the UK case, we had assumed that electricity production will double, and that climate jobs programmes and government regulation will increase energy efficiency by about 100%, so that the total electricity supplied will be able to do about four times the work of current supply. (See Neale, *Online Companion*, 41-57.) And simply doubling the supply should work reasonably for a rich country like Britain. But in much of the developing world, we will need substantial increases over twenty years in electricity to supply increases in domestic and industrial use. So for a global estimate, we have settled on a threefold increase, made up of a doubling in rich countries and larger increases in developing countries.

[4] The amount of electricity produced by a wind turbine is a function of the cube of the wind speed and the square of the length of the blade. This means that if you double the average wind speed and double the length of the blade, you increase the electricity generated sixteen fold. Hence big turbines in windy places.

[5] There are many estimates of the space needed, all of which agree that there is far more than enough space available. The only dissenting voice is David MacKay, *Sustainable Energy – Without the Hot Air*, Cambridge, 2008. But MacKay is writing about the UK, a small and densely populated country. Mackay does not include offshore wind (the main source of any large scale renewable energy in the UK), he includes only sites which are 'economically viable' at current prices (which rules out most sites, because viable means profitable), and his arithmetic is open to question. See John Cowsill, *Safe Planet: Renewable Energy plus Workers Power*, Earth Books, London, 2014. Moreover, the most intensive use of land is for Concentrated Solar Power, for which the UK is relatively unsuitable.

[6] Calculations for the UK suggest that the proportion of jobs in operations and maintenance will grow from almost nothing in the first year to about half of the jobs after twenty years. See Neale, *Online Companion*, 41-57.

[7] For all our calculations here on jobs and electricity generation, we assume that technology and standard of living in rich countries will remain the same over a twenty year period. In practice, of course, the technology will improve greatly, which means that fewer jobs will be required, but the standard of living will increase, which means that more jobs will be required. For our projections we assume these two processes will offset each other.

We have reasonable estimates for the number of jobs needed in the UK in renewable energy (Neale, *Online Companion*, 41-57). There we estimate that we would need 400,000 jobs every year for 20 years to produce 720 TWh of renewable electricity each year at the end of the project. This estimate includes the jobs needed in extending the grid. We can assume that on a global level, slightly fewer jobs would be needed, because the UK case relies heavily on offshore wind, and the sun is less productive in the UK than in many countries. So we will assume a global average of 400,000 jobs for 800 TWh, or 500 jobs each year for 1 TWh at the end of the period. If we triple current global electricity generation to 68,000 TWh, that would require 34 million jobs each year. We round to 35 million.

[8] IPCC, 2014: *Climate Change 2014: Mitigation of Climate Change*, 753.

[9] IPCC, 2014: *Climate Change 2014: Mitigation of Climate Change*, 752. The figure for byproducts of industrial processes includes both CO<sub>2</sub> and non-CO<sub>2</sub> emissions.

[10] For the emissions consequences of tall cement buildings, see Sure Roaf, David Chricton and Fergus Nicol, *Adapting Buildings and Cities for Climate Change*, Routledge, London, 2009. The other great demand for cement, besides buildings, is in making new roads. However, a massive switch away from cars to public transport is also part of our plans. Of course, this would still leave demand for cement in building bases for new wind turbines.

[11] This is a rough estimate, and it is not possible to be more precise.

[12] Gerald Ollivier, Jitendra Sondhi and Nanyan Zhou, *High-Speed Railways in China: A Look at Construction Costs*, World Bank Office, Beijing, 2014.

[13] For more on transport, see Neale, *Online Companion*, 59-87 and Neale, *Our Jobs, Our Planet*, 14-49.

[14] For cuts to shipping emissions, and the particular importance of cuts in speed, see Philippe Crist, *Greenhouse Gas Emissions Reduction Potential from International Shipping*. Joint Transport Research Centre, OECD and International Transport Forum, Discussion Paper No. 2009-11, 2009; Oyvind Buhag et al, *Prevention of Air Pollution from Ships: Second IMO GHG Study*, International Maritime Organization, 2011; Neale, *Our Jobs, Our Planet*, 42-45.

[15] We calculate the number of jobs needed in transport as follows. We start with the figures for transport emissions from the tables in International Energy Agency, *CO<sub>2</sub> Emissions from Fuel Combustion Highlights, 2014 Report*, 48-55, and we add the emissions in OECD Europe and non-OECD Europe for aviation bunkers, marine bunkers, and other transport. The sum total is 1.605 billion tons of CO<sub>2</sub>. The global total for transport, from the same tables, is about 7.187 billion tons. Neale, *Our Jobs Our Planet*, pp. 64-82, estimates that 7 million new direct transport workers could cut European emissions by 80%. Scaling up, we would require 31 million new directly employed transport workers to cut global transport emissions to just under 1.5 billion tons. However, cuts on this scale are harder to make in developing countries, where a smaller proportion of the population travels by car, and there are many unmet transport needs. Taking both these factors into account, and being conservative in our estimates of possible reduction, we adjust our totals from 31 million workers cutting emissions to 1.5 billion tons to 35 million workers.

[16] See Roaf, et al, *Adapting Buildings and Cities*; and Justin Bier, *An Introduction to Passive House*, Royal Institute of British Architects, London,

2013.

[17] This has been done extensively in many richer countries, and it works, but there are alternatives. For more detail see Edenhoffer, et al, *Climate Change 2014, Mitigation of Climate Change*, Intergovernmental Panel on Climate Change, 2014, 785-793; Suzanne Jeffrey, 'Waste and Agriculture', in Neale, *Online Companion*, 97-104; Anna MacGillivray, *More Jobs, Less Waste*, Friends of the Earth, London, 2010.

[18] For wastewater, see Edenhoffer, et al, 790-791.

[19] *Agroecology and climate change in South Africa: The contribution agriculture can make to reversing global warming*, One Million Climate Jobs Campaign, Capetown, [www.climatejobs.za](http://www.climatejobs.za), 2013.

[20] For reductions in emissions from farming, we are assuming improved technology, techniques and considerable care on a global level. We are also assuming changes in diet in the richer countries so that people eat less meat, and much less beef and lamb, but that these changes will be offset by increased meat consumption in poorer countries. And we are assuming small scale agriculture and great care with fertilisers. These are large assumptions, so we have been conservative, and assumed a fall in emissions of a third over twenty years. For forestry and land use changes, the possible cuts in emissions are much larger. Theoretically, changing land use back to forests, particularly dense tropical forests, could even lead to a net fall in emissions. This would depend however, on the planting of mixed forests left undisturbed for many years, not monoculture of swiftly harvested tree plantations. So we have assumed cuts of three quarters in emissions over twenty years, which is ambitious, but certainly possible.

[21] We start with an estimate of 70 million workers in renewable energy and transport. The calculations for the UK suggest 700,000 workers in energy and transport out of a total of a million. This is probably at least half of the workers will be needed globally, for several reasons. Energy and transport account for a substantial proportion of total emissions. A carbon free economy will also require large amounts of renewable energy to replace oil, gas and coal in transport, heating buildings, and heating

industrial materials. Indeed, the calculations for the UK suggest that energy and transport would account for 700,000 workers out of a total of one million. Regulations, laws and design changes will be relatively more important, and jobs relatively less important, for changes in land use, changes in agriculture, energy efficiency in industry, and long term changes in emissions from buildings. However, there is still ample room in all these sectors for new jobs. So on balance, we would suggest slightly more jobs in energy and transport than in other sectors, for a total of about 120 million jobs. The estimate of another 60 million jobs in the supply chain is approximate, and is based on various estimates for different industries – see Neale, *Online Companion* and *Our Jobs, Our Planet*.

[22] The key work here is Naomi Klein, *The Shock Doctrine: The Rise of Disaster Capitalism*, Allen Lane, London, 2007. See also Jonathan Neale, *Stop Global Warming*, Bookmarks, London, 2008.

[23] See Neale, *Stop Global Warming*; Jerome Tubiana, 'Darfur: A War for Land', in Alex de Waal, ed., *War in Darfur and the Search for Peace*, Global Equity Initiative, Harvard, Cambridge, 2007; Alex de Waal, *Famine that Kills: Darfur, Sudan*, Oxford University Press, Oxford, 2005; and Mohammed Osman Akasha, *Darfur: A Tragedy of Climate Change*, Anchor Academic, New York, 2013. For war and climate change more generally, see Christian Parenti, *Tropic of Chaos: Climate Change and the New Geography of Violence*, The New Press, New York, 2011.

[24] A particularly good study is Eric Klinenberg, *Heat Wave: A Social Autopsy of Disaster in Chicago*, Chicago University Press, Chicago.

[25] In 1750, CO<sub>2</sub> levels in the atmosphere were 278 parts per million (ppm), and had remained reasonably steady around that level since the last ice age. In the next 210 years, up until 1960, they grew by 42ppm to 302 ppm. Between 1960 and 1995 they grew by another 40 ppm to 360 ppm. In the twenty years since then they have grown by another 40 ppm to 400 parts per million of CO<sub>2</sub> in the atmosphere. That is to say, a third of the total rise in CO<sub>2</sub> levels since the end of the last ice age has come in the last twenty years, and the pace of the rise in CO<sub>2</sub> is increasing. See IPCC,

*Climate Change 2013, The Physical Science*, Intergovernmental Panel on Climate Change, p.166; and *Mauna Loa Annual Mean Data* at National Oceanic and Atmospheric Administration, Earth System Research Laboratory, <http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo>.

## Norway

[1] Y. Nilsen, *En felles plattform? Norsk oljeindustri og klimadebatten i Norge fram til 1998*, PhD thesis, University of Oslo, 2001; Helge Ryggvik, *Norsk olje og Klima: en Skisse til nedkjøling*, 2013; Andreas Ytterstad, ed., *Broen til framtiden*, 2013.

[2] For more information see <http://broentilframtiden.com/english/>

[3] Andreas Ytterstad, [100 000 klimajobber og grønne arbeidsplasser nå! For en klimaløsning nedenfra](#), 2013. The calculations for these jobs were done in a separate technical paper, available in Norwegian at <http://klimavalg2013.no/norge-trnever-mange-nye-klimajobber/>

[4] Helge Ryggvik, *Norsk olje og Klima: en Skisse til nedkjøling*, 2013.

[5] Some of these unions were involved in developing a joint statement on climate change in 2012, *The Climate Struggle – a Struggle for Social Power*, [http://www.velferdsstaten.no/tema/verden/klima/?article\\_id+96528](http://www.velferdsstaten.no/tema/verden/klima/?article_id+96528)

## Conclusion

[1] See Sharon Burrow and Kumi Naidoo's comments after their visit to Oslo in March 2015 at <http://www.equaltimes.org/civil-society-will-build-a-bridge#.Vdbjo5cXZj>

[2] Naomi Klein, *This Changes Everything*, 2014, 127, 397-8 and 413.

[3] <http://jobsjusticeclimate.ca/>