

The solution to the climate crisis: a just transition to 100% renewable energy for all by 2050

Towards a universally accessible, affordable, and zero emissions energy system.

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Summary

- To avoid the worst impacts of climate change and keep global warming below 2 or even 1.5 degrees Celsius, **we need to phase out carbon emissions** from coal, oil and gas to **zero by mid-century**. That's in 35 years.ⁱ
- To get there in time **and** secure energy access for all, we need to speed up the ongoing **transition to clean and affordable renewable energy**.
- This transformation will create huge numbers of jobs. Greenpeace in cooperation with the German Aerospace Center estimates 20 million new jobs in the next 15 years.¹
- The Paris Protocol must mark **the end of the fossil fuel era** and accelerate the transition to a future with 100% renewable energy for all by 2050. It must send a clear signal to **citizens, companies and investors** that the world is moving away from fossil fuels, so that new energy investment is focused on renewables.
- The agreement needs to include a **long-term goal** of reducing carbon emissions to zero by mid-century. The goal should be further strengthened with a strong reference to a fossil fuel phase out and a just transition to **100 % clean, renewable energy for all by 2050**.
- Countries' **short-term actions and commitments** must be aligned with this goal and support transformational change, fairness and solidarity. Rich countries must take the lead in reaching zero emissions, and provide poorer countries with the support they need to get there.

Managing emissions is no longer sufficient – they need to be phased out

Climate change is here, and it is showing alarming signs of acceleration. This year global mean temperatures will have reached 1°C above pre-industrial levels. According to the IPCC, the risk of large-scale singular events such as ice sheet disintegration, methane release from clathrates, and onset of long-term droughts remains moderate until about 1.6°C. But it increases disproportionately between 1.6°C and 2.6°C warming compared to pre-industrial levels, due to the danger of large and irreversible sea-level rises from ice-sheet loss.ⁱⁱ

¹¹ <http://www.greenpeace.org/international/Global/international/publications/climate/2015/Energy-Revolution-2015-Full.pdf>

World governments have agreed to limit warming to less than 2°C, but more than 100 countries, worried about their future, are urging the goal to be tightened to less than 1.5°C. For both goals, the amount carbon that can be released to the atmosphere is very limited, which means we need to get rid of fossil fuels fast, and we need to protect our forests, peatlands and other carbon sinks.

“There is a huge tide flowing and you can decide which direction you want to swim ... in the next 12 months, you will see most (energy) companies more or less go the same way”.
– Francesco Starace, CEO Enel, October 2015 ⁱⁱⁱ –

Keeping below 2C = zero carbon by 2050 = phase out fossil fuels

The UNEP^{iv}, drawing from the IPCC scenarios^v, suggests that “to stay within the 2°C limit, global carbon neutrality will need to be achieved sometime between 2055 and 2070”. This timeline, however, assumes only a 2/3 chance of staying below 2°C. Furthermore, it assumes the use of so-called negative emissions (i.e. removing carbon from the atmosphere) to compensate for the prolonged burning of fossil fuels. With the same assumptions, total global greenhouse gas neutrality would need to be achieved sometime between 2080 and 2100.

Given how risky 2°C warming already is, and how speculative, untested and contested negative emissions are (which the UNEP also cautions about), Greenpeace urges countries to apply precautionary principle and aim for zero carbon emissions earlier, by 2050 at the very latest. Other emissions will need to be brought as close to zero as possible, soon after that.

More than 90% of the anthropogenic CO₂ emissions result from fossil fuels, cement and flaring. So it is fossil fuel emissions, really, that need to get to zero by 2050, which de facto means getting rid of fossil fuels. Carbon Capture and Storage technology, that the fossil fuel industry hoped would become their saviour, has not taken off and will not.

Solution = transition to 100 % renewable energy

A world free of fossil fuels can be achieved through a transition to 100 % renewable energy by 2050. The Energy [R]evolution scenario^{vi} by Greenpeace in cooperation with the German Aerospace Center shows how to get there. Over the years, the Energy [R]evolution scenarios have become recognized as the most authoritative and accurate predictor of the growth of renewables, praised by organizations as diverse as Vox and Meister Consultants Group.

The blueprint in the 2015 scenario proposes a phase-out of fossil fuels starting with lignite (the most carbon intensive) by 2035, followed by coal (2045), then oil and then finally gas (2050). The rate of phase-out of oil and gas matches the rate of depletion of existing oil and gas fields, so no new fields should be opened. The transformation is driven by dramatically shrinking costs for renewable energies.

What is phased in is efficiency measures across all sectors; a plethora of renewable energy technologies from wind and solar to geothermal and ocean energy; and smart grid and storage solutions that guarantee energy security for all needs.

The investment costs for the switch to 100% renewables by 2050 is about US \$1 trillion a year. But because renewable energies don't need fuel, the average fuel cost savings are US \$1.07 trillion a year. So the investment over the period is met in full by fuel cost savings, with the cross-over happening in little over ten years, between 2025 and 2030.

More jobs, better health, more access to energy

At every stage in the transition to 100% renewable energy, there are more energy sector jobs. While the IEA predicts the number of jobs falling after 2020, the Energy

[R]evolution sees them increasing, by nearly 20 million between now and 2030, because of strong growth and investment in renewables. This amounts to a 60% increase by 2025 compared to today. By 2030, 86% of all energy sector jobs will be in renewables. Solar PV alone will provide 9.7 million jobs by 2030, equal to the number of people working in the coal industry today.

Renewable energy is also the fastest and safest way to provide universal access to energy by 2030 so meeting the needs of the poor. The shift to renewables will mean less air pollution, less impact on water resources, and more local ownership of energy supply.

The transition has already started - and will be fueled by economics

The renewable energy industry is flourishing around the world, and energy systems are evolving. Between 2009 and 2014, 38% of all newly built power plants worldwide have been designed to supply renewable energy. In 2014 alone it was 60%.

In many parts of the world, renewables are now the most affordable source of power. In just five years, the cost of solar PV panels has dropped 75 percent, while onshore wind is now one of the most competitive sources of electricity available. At the same time, fossil fuels are becoming more difficult and expensive to extract, and external costs like pollution and damage to health, are increasingly being taken into account.

It's the future people want

More and more regional governments, some states, cities and municipalities are committing to a future powered by 100% renewable energy for reasons ranging from climate concerns to pure economic or development gains. Civil society organizations and a global coalition of trade unions and social movements, as well as indigenous, environmental, gender and youth groups from the South and the North, are calling on governments to accelerate this transition. Major global companies such as Google, Apple and IKEA have already set their own renewable energy targets and aim to have their businesses run on 100% renewable energy.

The Paris Protocol must speed up the transition

World leaders talk about the seriousness of climate change, but continue subsidizing fossil fuels with hundreds of billions of dollars a year and expanding their oil, coal and gas extraction further. In Paris, things will have to change.

The Paris Protocol must send a clear and convincing signal to citizens, companies and investors that the world is moving towards renewable energy and away from fossil fuels.

This must be done in a way which delivers certainty for investors and meets the world's energy needs. Greenpeace is calling for the Paris Protocol to include:

- A global goal to phase out fossil fuel and related emissions by mid-century, in the context of a just transition to a 100% renewable energy future for all.
- Strong commitments for short-term action that accelerate the transition to renewable energy, and that are strengthened in five-year cycles.
- Technological and financial support for those in need, for the fastest possible uptake of clean, sustainable renewable energy.
- Additional measures to redirect all financial flows from fossil fuels to renewable energy (including through a subsidy reform).

Governments must ensure that the transition to clean, sustainable energy is fair to workers and communities, and that more opportunities are created than lost.

If we can achieve the ambition of renewable energy for all by 2050 and the phase-out of fossil fuels we would be handing the next generation the greatest gift we can give - the security of living without facing the menace of an environmental calamity created by us. And we'd make life better for ourselves.

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ⁱ The ask for a zero carbon by 2050 is derived from the IPCC science, applying the 2/1.5 degrees maximum warming goal and precautionary principle. For a summary of the IPCC carbon budgets and related emission reduction trajectories, see the analysis: "What does the IPCC's latest report say on phasing out greenhouse gas emissions?" at <http://goo.gl/vLR7aS>

ⁱⁱ IPCC 5th Assessment Report. Working Group II. Summary for Policymakers. Box SPM.4.

ⁱⁱⁱ <http://www.theguardian.com/environment/2015/oct/22/former-foes-greenpeace-and-energy-giant-enel-stand-together-in-low-carbon-push>.

^{iv} UNEP Emissions Gap Report 2014

^v RCP2.6 scenarios of the IPCC Fifth Assessment Report

^{vi} <http://www.greenpeace.org/international/en/publications/Campaign-reports/Climate-Reports/Energy-Revolution-2015/>

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