

# Energy [R]Evolution scenario 2015

## 100% Renewable Energy for All

### Key Messages

September 2015

**100% renewable energy for all is achievable by 2050, and is the only way to ensure the world does not descend into catastrophic climate change.** Dynamic change is taking place in the energy sector. Renewable energies have become mainstream in most countries, and prices have fallen dramatically. The report shows we could transform our energy supply, switching to renewables, which would mean a stabilization of global CO<sub>2</sub> emissions by 2020, and bringing down emissions towards near zero emissions in 2050.

#### **Fossil fuels should be phased out in stages**

The Energy [R]evolution 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 exploration for new fields should be seen as high-risk investment as the “assets” may be stranded.

#### **The renewable energy sector is proving it can transform power generation.**

- Renewables contributed 60% of new power generation worldwide in 2014
- This expansion has meant huge falls in costs, so that solar PV and wind power is now cost-competitive with new coal in most regions
- Renewables are pushing ahead despite a global subsidy system weighted in favour of fossil fuels, which receive an annual subsidy of \$550 billion, more than twice the subsidy for renewables (IEA figures)
- Within the next 15 years, renewables’ share of electricity could treble from 21% today to 64%, so nearly two thirds of global electricity would come from renewable energy

#### **Heating and transport are the big challenge**

- Oil for heating will be replaced by solar collectors, geothermal and heat from renewable hydrogen
- Gas will be the last fossil fuel in use, but is replaced by hydrogen generated by renewable electricity by 2050
- Transport is the most challenging sector, and requires a technical revolution and more R&D – particularly in aviation and shipping. But planes and ships could be powered using biofuels, hydrogen and synthetic fuels produced using electricity. So electricity demand will go up, but it will be generated with renewable energy.

#### **The switch to 100% renewable energy will create jobs**

- At every stage in the transition to 100% renewable energy, there are more energy sector jobs. 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
- Solar PV will provide 9.7 million jobs, equal to the number of people working in the coal industry today. Jobs in wind power will grow to over 7.8 million, which is twice as many as are employed in oil and gas today

- There is a just transition, not an overnight change. There will be 2 million people still working in the coal industry in 2030, so there is time to re-train

**The costs are huge, but the savings are even bigger.**

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 between 2025 and 2030.

**There is growing support for 100% renewables**

More scientists, engineers and activists support the view that 100% renewable energy is not only achievable, but also essential.

At local government and business level, there is a growing commitment to renewables. 164 countries around the world have targets for renewable electricity, and some cities have committed to 100% renewables – most recently Fukushima in Japan, and Maui County, Hawaii. On Monday Sept 21<sup>st</sup>, we expect New York City to announce it will move to 100% renewables.

**The transformation to 100% renewables needs to start with a strong agreement in Paris**

The Paris climate agreement must deliver a long term vision for phasing out coal, oil, gas and nuclear energy by mid-century.

**There are no major economic or technical barriers to moving towards 100% renewable energy by 2050. It just requires the political will to make the change.**

The report was researched and published by Greenpeace in collaboration with the scientific community, in particular the German Aerospace Centre (DLR).

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