

Renewable Energy and Climate Change

It is a truism that we cannot continue forever consuming the earth's finite energy resources. In the long term, the world's energy system will be supplied completely by renewable energy sources. Unfortunately 'in the long term' isn't good enough. Although the renewable energy sector is growing rapidly, the climate change imperative dictates that we begin the wholesale transformation of our energy system now, if we are to have any possibility of avoiding the worst of dangerous climate change by keeping global mean temperature rise well below 2° C above pre-industrial levels.

In today's world, there are many other reasons to support a massive uptake of renewable energy and to move away from conventional fossil fuel and nuclear sources:

- Air pollution from the transport and power sectors has made our cities hazardous to our health, particularly to our children's;
- A distributed system of generation from a variety of renewable sources provides a much more robust energy system much less susceptible to interruptions of supply;
- Relying on largely indigenous renewable sources of energy can protect local economies from the massive economic disruptions caused by speculation-driven swings on global commodities markets;
- A dispersed system of renewable generating systems is much more physically secure from attack;
- As the growing renewable energy industry has demonstrated, the sector is a fast-growing supplier of high quality jobs, much more so than the capital-intensive conventional energy sector.

The renewable energy industry is booming worldwide, attracting almost 40 billion USD in investment in 2005, with most technologies growing at double-digit rates. Total installed electrical generation capacity passed 180 GW by the end of 2005, with nearly half of that in the developing world. The REN21 Global Status Report estimates that at least 85 renewable energy companies or divisions have market valuations greater than USD 40 million, up from 60 companies or divisions in 2004.¹

What Can Renewables Deliver?

Wind - Greenpeace has been working with the renewable energy industry for many years, seeking to promote the benefits of the technology in both ecological and economic terms. The wind industry has been the leading success story to date, with a global industry now worth more than €13 billion (2006), employing about 150,000 people. Greenpeace and the Global Wind Energy Council's latest scenario, the Global Wind Energy Outlook², foresees continued rapid growth of the industry. After a record year in 2005 during which 11,531 MW of new capacity was installed, total wind power capacity worldwide was at 59,084 MW. The report outlines 3 scenarios for installed capacity against two different projections of future electricity demand.

While well on target to meet our previous projections of providing 12% of global electricity supply by 2020, the report goes on to outline future scenarios where wind's contribution tops out between 17 and 34% of global electricity supply by 2050, saving up to almost 5 billion tons of CO₂ annually by that date.

Solar Photovoltaics - There is enough energy from the sun reaching the earth to supply total global energy needs many thousand times over. Learning to harness this energy efficiently and economically, however, has taken some time. The solar photovoltaic industry (solar PV – converting sunlight into electricity) continues to grow at about 35% per year, even faster than the wind industry, with grid-connected PV growing at 55% last year. It now represents a €5

¹ See REN 21 Global Status Report on Renewables <http://www.ren21.net/globalstatusreport/issueGroup.asp>

² <http://www.greenpeace.org/international/press/reports/globalwindenergyoutlook>

billion/year industry in Europe alone. As detailed in our joint report with the European Photovoltaic Industry Association, "The Solar Generation³", solar PV can supply more than 1% of total global electricity supply by 2020, and as much as 24% by 2040. There really is no limit to the growth of this technology.

Greenpeace and the German Aerospace Center (DLR) have developed a scenario where which shows how energy efficiency and renewable energy technologies can be employed to help us meet rigorous climate targets, reaching an 80% reduction in fossil-fuel related CO₂ emissions for the EU-25 by 2050. The 'Energy Revolution' Scenario⁴ achieves these targets while at the same time phasing out nuclear power.

Renewable energy is not the whole solution to the climate change problem. Energy efficiency measures have extraordinary potential to reduce our greenhouse gas emissions in the energy sector, and much of this could be achieved at a net negative cost, i.e., we would save money. Renewable energy will not stop deforestation, nor stop emissions of methane or industrial greenhouse gases. But it can and must play the major role in combating climate change. Renewable energy and energy efficiency technologies are ready now-existing industries with proven technologies, which with the right support can move us rapidly towards a sustainable energy future.

Some Governments and industry keep talking about how we need 'new technologies' with which we can meet the climate challenge, usually some combination of 'clean coal' with carbon capture and storage, nuclear power, and hydrogen. New technologies are certainly needed and welcome, but the climate will not wait.

Carbon capture and storage (CCS): The pursuit of CCS as a 'solution' is unwise given its lack of technological maturity and the absence of commercial viability. The construction of 'capture ready' power plants places hope in an end-of-pipe solution that may or may not be realised in time to effectively reduce CO₂ emissions from the power sector. Reliance on CCS is veiled in uncertainty as to whether CO₂ can be permanently stored in an environmentally-sound manner. Even if CCS could significantly reduce CO₂ emissions, it would not solve other problems which are inherent to the combustion of dirty fuels.

Nuclear: After having received untold billions in direct government subsidies, nuclear power remains very expensive, presents both proliferation risks and health hazards, not to mention the radioactive waste problem, which the industry has been unsuccessfully trying to 'solve' for at least four decades. The long lead times needed for nuclear plant construction mean that it is unlikely that nuclear will play any substantial role in the coming two or three decades in meeting the climate challenge.

Hydrogen: Hydrogen is an energy carrier, not an energy source, and commercially viable and robust fuel cells remain many years off, assuming we had sufficient renewably generated electricity which needed to be stored as hydrogen.

If Governments were serious about combating climate change, the focus would be on supporting the massive uptake and deployment of existing, market-ready renewable energy and energy efficiency technologies. They would not be chasing future technological rainbows supported by massive R&D budgets while continuing to spend hundreds of billions per year subsidizing conventional energy technologies.

Conclusion

We urgently need a clean energy system based on the efficient use of renewable energy sources, that has at its heart protecting us from climate change, the protection of the environment and the delivery of sustainable development. We need an energy system, which does not render our cities uninhabitable; increase the radioactive burden for future generations; and which does not lead to the proliferation of nuclear weapons.

We seek a world in which the manifest benefits of energy services, such as light, heat, power and transport are equitably available for all: north and south, rich and poor. Only in this way can we create true energy security, as well as the conditions for true human security.

³ See: <http://www.greenpeace.org/international/press/reports/solargen3>

⁴ See: <http://www.greenpeace.org/international/press/reports/energy-revolution-a-sustainab>