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The Energy [R]evolution

The Greenpeace *Energy [R]evolution* is a detailed, practical blueprint for cutting carbon emissions while achieving economic growth by replacing fossil fuels with renewable energy and energy efficiency technologies.

This phase-out of fossil fuels offers substantial benefits such as energy security, independence from world market fuel prices, reduction in pollution-related illnesses and most of all, it is an urgently needed solution to reduce greenhouse gas emissions and to halt runaway climate change phenomenon.

Climate change and the Philippines

Climate change refers to a change in the planet’s climate system which is attributed directly or indirectly to human activity. Climate change alters the composition of the global atmosphere and which, in addition to natural climate variability, is observed over comparable time periods.¹

Disruption in the climate system is manifesting itself around the world through more frequent floods, droughts and heat waves whose severity are expected to increase in the coming years. Seven of ten disasters are now climate change-related. More than 20 million people were displaced by sudden climate-related disasters in 2008 alone. By 2050, an estimated 200 million could be displaced as a result of climate impacts.²

Due to poor infrastructure and lack of resources, developing countries are expected to bear the brunt of climate change. Moreover, the increase in the frequency and intensity of extreme weather events caused by climate change will continue to undermine the achievement of the Millennium Development Goals (MDGs).

A 2009 study by the Asian Development Bank (ADB),³ suggests that on average Southeast Asia “is likely to suffer more from climate change than the rest of the world, if no action is taken.” Climate and economic modeling covering four countries in the region (Indonesia, Thailand, the Philippines and Vietnam), shows that “the potential economic cost of inaction is huge—if the world continues the “business-as-usual” emission trends—considering market and non-market impacts and catastrophic risks of rising temperatures—the cost to these countries each year could be equivalent to a loss of 6.7% of their combined GDP by 2100, more than twice the world average.”

The Philippines is particularly vulnerable to climate change impacts, notably extreme weather events. The country faces around 20 typhoons annually, and is prone to weather-related disasters such as floods and landslides. The long-term Climate Risk Index (CRI) produced by German Watch ranks the Philippines at number 8 among the 10 countries most affected by climate change disasters from 1990 to 2008.⁴

To avoid the worst impacts of climate change, including widespread drought, flooding and massive population displacement caused by rising sea levels, scientists identified the need to keep global temperature rise below 2°C (compared to pre-industrial levels).⁵

To do this, global greenhouse gas emissions must peak by 2015 and from there go down to zero. Fossil fuels, such as coal, formed by long-dead plants and animals, are the single biggest source of humanity’s greenhouse gas emissions. Burning coal, oil and natural gas releases billions of tons of carbon every year

that would otherwise have remained hidden in the Earth's crust, as well as large amounts of methane and nitrous oxide.

The solution: phasing out fossil fuels

A third of all carbon dioxide emissions come from burning coal. Coal is used to produce nearly 40 percent of the world's power. But because of shortsighted energy planning by governments, and a strong coal industry lobby, hundreds of new coal plants are planned over the next years.

The Energy [R]evolution – a fundamental change in the way the world produces, distributes and uses energy – entails cutting CO₂ emissions. The underlying premise is that the energy sector which includes power generation and transport and is currently the largest source of human-induced climate change, must be transformed to respond to this global challenge. To do so makes sound environmental and economic sense.

The phase-out of fossil fuels offers substantial benefits such as independence from world market fossil fuel prices as well as the creation of millions of new green jobs. It also means providing energy to the two billion people currently without power.

Our future and the future of the planet is rooted in the investment in people and local communities in terms of installing and maintaining renewable energy sources, rather than further subsidizing the dirty fossil fuels which are harmful as well as finite.

Three key aspects of the Energy [R]evolution

1. Renewable energy

We need to change how our energy is produced: from fossil fuels such as coal to renewable energy.

Renewable energy technologies vary widely in their technical and economic maturity, but there are a range of sources which offer increasingly attractive options. These include wind, biomass, photovoltaics, solar thermal, geothermal, ocean and hydroelectric power. Their common feature is that they produce little or no greenhouse gases, and rely on virtually inexhaustible natural elements for their 'fuel'. Some of these technologies are already being harnessed in a major way by some countries, and are already competitive. The wind power industry, for example, continued its explosive growth in the face of a global recession and a financial crisis in 2008 and 2009, and is a testament to the inherent attractiveness of renewable technology.

2. Decentralized energy

We need to change how energy is distributed: from centralized grids to decentralized smart and flexible grids.

With decentralized energy infrastructure such as interconnected smart grids, it is technically possible to operate a power system with over 90% renewables and guarantee a security of supply 24 hours a day, seven days a week 365 days a year.

The grid network of cables and sub-stations that brings electricity to our homes and factories was designed for large, centralized generators running at huge loads, usually providing what is known as 'baseload' power. Renewable energy has had to fit in to this system as an additional slice of the energy mix and adapt to the conditions under which the grid currently operates. For renewable energy to be massively utilized, this grid system must undergo a transformation.

Some critics of renewable energy say it is never going to be able to provide enough power for our current energy use, let alone for the projected growth in demand. This is because it relies mostly on natural resources, such as the wind and sun, which are not available 24/7. Existing practice in a number of countries has already shown that this is wrong, and further adaptations to how the grid network operates will enable the large quantities of renewable generating capacity to be successfully integrated.

3. Energy efficiency

We need to change how we use energy: reducing energy wastage by shifting to energy efficient technologies.

Energy efficiency is the intelligent use of energy: it is a very broad term referring to the many different ways we can get the same amount of work (light, heat, motion, etc.) done with less energy. It covers efficient cars, energy saving lights, improved industrial practices, better building insulation and a host of other technologies. Efficiency measures such as improved designs of buildings and homes, and mandatory efficiency standards for appliances, not only reduce greenhouse gas emissions but also lessen energy costs to consumers.

The Energy [R]evolution is based on five founding principles:

- Increase human well-being without fossil fuels.
- Fair energy access for all, including the 2 billion people that are left without power in our current fossil-fuel based energy system.
- Respect for natural limits: use no more resources the Earth can provide us and don't emit more than the Earth and the atmosphere can take back (in particular CO2 emissions).
- Phase out dirty, dangerous fuels like coal and nuclear.
- Use proven, existing renewable energy. Every technology described in the scenario already exists and has been proven to work.

How it works

In this scenario, an ambitious energy efficiency program along with massive development of renewable energy happen in parallel, so that by 2050, the global energy system is 95% powered by renewable energy. Energy will move towards a decentralized system using local renewable sources such as wind, solar and geothermal.

How it helps

If governments apply the Energy [R]evolution scenario, it becomes possible to reduce CO2 emissions sufficiently to stop dangerous climate change. It also gives access to electricity to communities who currently don't have any, ensuring a just and sustainable transition for developing countries. It also provides secure and affordable energy supply to take into account economic growth.

Creating jobs

The Energy [R]evolution is also creating a green jobs revolution. Globally, by 2015 the global power supply sector under the Energy [R]evolution scenario could create up to 4.5 million more jobs than if business continues as usual. By 2020 over 8 million jobs in the renewables sector would be created due to a much faster uptake of renewables - four-times more than today. By 2030 the Energy [R]evolution scenario will create about 12 million jobs – 8.5 million in the renewables sector alone. Without this fast growth in the renewable sector global power jobs would be a mere 2.4 million. By implementing the Energy [R]evolution, there will be 3.2 million more jobs by 2030 in the global power supply sector.

In the Philippines, the Wind Developers Association of the Philippines (WEDAP) are confident that the RE subsector could add not only clean generating capacity but also more than 15,000 technical jobs.

Affordable energy

By moving away from fossil fuels and reducing carbon emissions, we can stabilize energy costs for consumers. Between 2015 and 2020, most renewable energy sources are expected to become cheaper than coal.

If the world continues with the massive use of fossil fuel and with nuclear energy, electricity supply costs will nearly double by 2020. Unchecked growth in energy demand increases in fossil fuel prices and the cost of CO2 emissions result in total electricity supply costs rising from today's US\$1,450 billion per year to more than US\$2,800 billion in 2020, and US\$5,300 billion by 2050.

A Philippine Energy [R]evolution is possible

In his address to the US Congress in 2009, President Barack Obama declared, "We know that the country that harnesses the power of clean, renewable energy will lead the twenty-first century."

As an archipelago and a developing country, the Philippines is known to be most vulnerable to climate change. But what is lesser known is the fact that the Philippines could lead the rest of the developing world by harnessing its enormous renewable energy potential. Data from the Department of Energy shows that the country's total wind power potential is at 70,000 megawatts (MW), and solar power potential is at 5.1 kilowatt hours per square meter. Currently, the Philippines is utilizing only a miniscule fraction of this potential.⁶ <http://www.doe.gov.ph/ER/BioOSW.htm>

Greenpeace has mapped out an Energy Revolution Scenario for the Philippines and has established that the country can source 50% of its energy needs from renewable energy by 2020. This includes 8,000 MW from wind and 1,000 MW from solar, a staggering leap from the country's current installed capacity of 33 MW and 1 MW from wind and solar power respectively.⁷

50% renewable by 2020

For the Energy [R]evolution to happen for the Philippines, we need to start looking at fully maximizing our renewable energy potentials now. With the passage of the Renewable Energy (RE) Law last October 2008 the first step has already happened. The RE Law is a landmark legislation and the first step towards building a low carbon economy.

The intentions of the RE Law are fourfold:

1. Accelerate the exploration and development of renewable energy resources;
2. Increase the utilization of renewable energy by institutionalizing the development of national and local capabilities in the use of renewable energy systems;
3. Encourage the development and utilization of renewable energy resources as tools to effectively prevent or reduce harmful emissions and thereby balance the goals of economic growth and development with the protection of health and the environment; and
4. Establish the necessary infrastructure and mechanism to carry out the mandates specified within the Act and other existing laws.

The law has already generated new investments in the renewable energy sector. But to fully maximize both the letter of the law and the RE potential of the country, Greenpeace is calling upon the Philippine government to commit to sourcing 50% of the country's energy needs from renewable sources.

Because electricity demand is still growing there will be a large demand for investment in new capacity over the next 10 years. As investment cycles in the power sector are long and tedious, decisions for re-structuring the Philippine supply system need to be taken now.

In terms of energy distribution, the Philippines' geographical spread as an archipelago makes the decentralized/smart energy grid framework an ideal scenario especially for solar photovoltaic and biomass based plants.

The first phase of the Energy [R]evolution will involve decentralizing the energy grid, and gradually phasing out the country's old coal plants while shifting investments marked for new coal fired power plants to boosting the capacity of the existing geothermal power plants, building new solar photovoltaic (PV) and biomass based energy production systems to meet local demands.

It is important to note that nuclear energy does not figure into the Energy [R]evolution pathway. Nuclear energy is the most expensive source of electricity. It does not solve energy security and it will be a distraction in solving the climate crisis. Investment placed in nuclear energy is investment taken away from the much-needed development of clean, renewable power. Nuclear energy is also plagued with unsolved problems such as the absence of solutions to the disposal of high-level, harmful radioactive waste.

What the Philippine government must do

- Establish legally binding target of sourcing 50% of the country's energy demands from renewable energy and energy efficiency measures by 2020.

- Scrap all new proposals for coal-fired and nuclear energy power plants and shift those investments towards development of energy efficiency measures and the renewable energy sector.
- Phase-out subsidies to the fossil fuel industry and create financial and regulatory conditions that incentivize a green economy.
- Fast-track Feed-in tariff mechanisms for RE sector to guarantee returns for investors.
- All energy-consuming appliances, buildings and vehicles must be subject to strict efficiency standards and better labelling would be required to inform consumers about the environmental performance of products.

¹ http://unfccc.int/press/fact_sheets/items/4987.php

² Stern, N. (Ed.) (2006). *The Economics of Climate Change: The Stern Review*, Cambridge University Press, Cambridge

³ Asian Development Bank (2009). *The economics of climate change in Southeast Asia: a regional review*, Asian Development Bank, Mandaluyong City, Philippines

⁴ Harmeling, S. (2009). *Global Climate Risk Index 2010*, Germanwatch, eV., Bonn

⁵ B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds.) (2007). *Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁶ <http://www.doe.gov.ph/ER/BioOSW.htm>

⁷ Greenpeace. 2008. *Energy [R]evolution: A Sustainable Philippine Energy Outlook*