

EQUITY

Everyone has the right to energy. So how are we going to provide it?

Historically, the world's energy consumption has not been fairly balanced. Rich countries have built their economies on cheap, plentiful fossil fuels, and continue to consume the vast majority of global energy supplies. With fossil fuel supplies dwindling, the rest of the world will not have this resource to fuel its own development. Adding to this inequity, poorer countries will suffer most from climate change, which is largely driven by the fossil fuel use of wealthier countries.

A sustainable energy future must be a fair one, in which the equal right of every person to benefit from the world's energy resources is recognized. The scale of the challenge is daunting. Around 1.4 billion people – a fifth of the world's population – have no access to reliable electricity²¹. And the population of developing countries continues to rise rapidly. Investments required for universal access to clean cooking for those 2.7 billion in developing countries who have no access to these services will be around €43 billion in total, or around €2 billion annually between 2010 and 2030, less than 0.005 per cent of global GDP²².

In the absence of alternative sources of energy, hundreds of millions of people today use biomass as their primary source of fuel for cooking and heating. As a result, trees are cut down at unsustainable rates, leading to biodiversity loss, increasing carbon emissions, harming soil quality and leaving communities vulnerable to flooding. Biomass stoves are also a major health problem. Fumes from traditional cooking fires kill almost as many people in the developing world than malaria²³ – about two million women and children die prematurely each year from indoor pollution.

To move to a fully renewable future, in which people live in harmony with nature, we must end unsustainable biomass use. But we cannot do this without providing people with better alternatives. Efficient cookstoves are one simple, cost-effective

way to significantly reduce the amount of biomass people use, and the carbon and “black soot” emissions and health impacts this causes. Planting fast-growing tree species for energy production also reduces the need to cut down or degrade primary forests – WWF's New Generation Plantation Initiative outlines sustainable management practices for doing this. These are, though, only part of the solution.

From solar power across Africa, to geothermal power in Indonesia, developing countries have great potential to power economic growth with renewable energy. Large-scale wind, solar and geothermal plants are beginning to appear. Renewables also offer hope to the hundreds of millions of people trapped in energy poverty. WWF is just one of many organizations helping to develop renewable energy projects across the developing world – particularly in rural areas, where approximately 85 per cent of people who have no access to reliable electricity live. As a result of these initiatives, thousands of communities now benefit from electricity from solar power, wind turbines, micro-hydro, and biogas plants fuelled by farming residues and manure.

Access to reliable energy can make a phenomenal difference. Electric pumps provide clean water. Refrigerators store food and medicines. Farms run more productively. Women who used to spend many hours every day collecting firewood and water have more time to devote to education, childcare or advancing their own livelihoods. Children get a better education through access to learning resources like the Internet, or simply

by having electric lighting to read in the evenings. Historically, women's emancipation, better education and secure livelihoods have coincided with increased family incomes and hence falling birth rates, so access to sustainable renewable energy can also contribute to curbing population growth.

Biofuels can offer opportunities for developing countries – but they also pose a threat. Grown sustainably and traded fairly, they can provide a valuable cash crop for farmers and jobs for local communities. Without proper safeguards, however, they may displace food crops and drive deforestation, as well as compete for increasingly scarce water. We cannot abide a situation where developing countries grow large amounts of biofuel crops to support the lifestyles of the rich, while their own people do not have enough food to eat.

Renewable energy has tremendous potential to end poverty and transform lives for hundreds of millions of people. Ending energy poverty is at the heart of our energy vision.

WHAT NOW?

Developing countries need investment to develop their own renewable energy capacity. Countries with advanced renewable energy technology need to share their knowledge and expertise with developing countries. They should also support them to develop their own renewable industries and innovations.

WWF and other NGOs have demonstrated ways in which communities can successfully generate their own electricity from renewable sources. Governments, aid agencies and investors should provide support to replicate projects like these on a much larger scale. Experience suggests that schemes are more successful when communities also pay some of the costs, as this increases their ownership of the project. Microfinance schemes and other financial innovations are needed to enable this.

The world needs to begin phasing-out the unsustainable use of biomass. Where communities still use traditional biomass inefficiently as a source of fuel, they need support to switch to modern clean energy solutions. These include solar cooking, more efficient cookstoves, biogas from digesters and improved charcoal-burning techniques. They should also use biomass sources with less environmental impact, such as crop residues or fast-growing tree species. This should form part of a wider programme to enable people to benefit from managing their own forests and natural resources in a sustainable way.

If land in developing countries is used to meet a growing demand for biofuels, we need to tackle the issues of food security, land-use planning, governance, water use, deforestation, loss of biodiversity, and the resulting loss of ecosystem services. We need a fair and sustainable system of trade and investment. Biofuels must not be grown where they threaten people's food and water supplies, or cause biodiversity loss.

Poorer countries need financing to move to a renewable energy future. Multi- and bilateral agreements must include support from richer countries to help poorer countries develop sustainable energy projects. Renewable energy must be at the heart of sustainable development policy and international aid programmes.

21. IEA, World Energy Outlook (WEO), 2010
22. IEA, World Energy Outlook (WEO), 2010
23. Global Alliance for Clean Cookstoves, UN Foundation, <http://www.unfoundation.org/assets/pdf/global-alliance-for-clean-cookstoves-factsheet.pdf>, retrieved 21 December 2010

CASE STUDY



**“WWF HELPED
INSTALL SOLAR PV
AND WIND POWER,
WHICH HAS IMPROVED
THE LIVELIHOODS AND
HEALTH OF LOCAL
PEOPLE”**

SOLAR PV AND WIND POWER

There is no grid access in the remote coastal outpost of Kiunga, Kenya, where WWF supports a marine reserve protected area conservation programme. In 2009, WWF helped install solar PV and wind power, which has improved the livelihoods and health of local people. Benefits include a freezer for storing fish, electricity for health centres and charging points for cell phones.

LAND AND SEA USE

Our energy needs require land and sea surfaces. What can we do to limit the impact on people and nature?

Sustainability means living within the capacity of humanity's one and only planet, without jeopardising the ability of future generations to do the same. We need space for buildings and infrastructure, land to grow food and fibres and raise livestock, forests for timber and paper, and seas for food and leisure. More importantly, we need to leave space for nature – and not just because the millions of other species that inhabit our planet are important in themselves. We need healthy ecosystems to supply our natural resources, provide clean air and water, regulate our climate, pollinate our crops, keep our soils and seas productive, prevent flooding, and much more. The way we use our land and sea is key to securing a renewable energy future and perhaps the hardest challenge we face.

Over the coming decades, we will need to develop an extensive renewable energy infrastructure, and it will be essential that we put the right technologies in the right places. Solar farms, for example, can make use of unproductive desert areas, but it is important that no water is used merely for cooling solar power plants in arid areas. Geothermal fields are often found in unspoilt areas, so we need to choose sites carefully to minimize the environmental and social impact, and make sure surrounding areas are well protected. As discussed above, we need to assess all new hydropower plants especially rigorously, and should choose sites for offshore wind and ocean power carefully to minimize the impact on marine life. We

also need to carefully plan the routes of the long-distance, high-voltage power lines and undersea cables we will need to transmit electricity from new production centres.

The thorniest issue, however, is the role of bioenergy²⁴. The Ecofys scenario for a near-complete phase-out of fossil fuels relies on a substantial increase in the amount of bioenergy. In the absence of alternative technologies, this is based on organic waste, biomass from existing forests and biofuel crops on agricultural land. We



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The Ecofys analysis suggests that it is technically possible to do this in a sustainable way. According to the scenario, we can meet the increased need for solid biomass by taking more wood from forests than is already used commercially. If people in the developed world ate half as much meat as they do today, we would need less land for growing animal feed and grazing. That would free-up enough land to grow enough biofuel crops without threatening food security, clearing forests, increasing irrigation or losing biodiversity.

On a global level, there may be enough agriculture and forest land available to grow biofuels sustainably. Ecofys estimates that we would need around 250 million hectares of agriculture land, which is equivalent to about one-sixth of the total global cropland today, as well as 4.5 billion cubic metres of biomass from already disturbed forests. But what is possible on paper, even after the most rigorous analysis, is a different matter in practice. We have yet to identify where this land is, and how it is being used at the moment. We need to consider the rights of communities, including indigenous people, the movements of migratory species, the effect on water supplies, the type of infrastructure and governance systems in place, and a host of other constraints. In fact, the huge pressure we're placing on our planet means we need to take these considerations into account with all agriculture and forestry, and not only with bioenergy.

The land availability in the Ecofys scenario also rests on the assumption of a constrained growth in meat consumption. To achieve this equitably, people in richer countries would need to cut their meat consumption in half, with the rest of the world eating no more than 25 percent more meat than they do now. A diet that is high in animal protein requires far more land than a largely vegetarian diet – it is more efficient to eat plant protein directly than to feed it to animals first. Today, nearly a third of global land area (excluding Antarctica) is used for feeding livestock, either through grazing or growing animal fodder.

As the global population grows, the world is going to need to produce and consume food more efficiently and fairly: this will become even more urgent if our demand for biofuels grows too. Ecofys' calculations are based on crop yields rising by 1 per cent per year. This is less than the 1.5 per cent growth that the UN Food and Agriculture Organization predicts; however, climate change will increase the likelihood of crop failures.

Extracting more wood from forests will have an impact on biodiversity. Many of the world's commercial forests are already intensively used, so expansion will have to happen in areas with untapped sustainable potential. There is the potential to increase yields by using fertilizers and fast-growing species, although this too has implications on wildlife habitats, and water and soil quality. Some privately owned plots could sustainably provide more biomass, but there are economic and logistical hurdles. Any increase in forest biomass use must be coupled with efforts to reduce emissions from deforestation and degradation, and promote more forest growth. In other words, we must not release more forest carbon than we replace, even in the short term.

Because of the concerns bioenergy raises, WWF believes we need to take urgent action to reduce the demand for liquid fuels that the Ecofys scenario predicts, and to pursue alternatives. Further reductions in meat consumption, aviation and long-distance freight transport would help to reduce demand. Bioenergy from algae and hydrogen produced with renewable electricity are potential sustainable fuel technologies. In the meantime, better land-use planning, from the local to the global level, will be vital in securing a sustainable energy supply.

24. For more information on WWF's position on bioenergy, see www.panda.org/renewables

“THE WAY WE USE OUR LAND AND SEA IS KEY TO SECURING A RENEWABLE ENERGY FUTURE, AND PERHAPS THE HARDEST CHALLENGE WE FACE”

WHAT NOW?

- All large-scale energy infrastructure developments must satisfy independent, in-depth, social and environmental impact assessments. They should also meet – or exceed – the best social and environmental management practices and performance standards. The Gold Standard for best practice in projects delivering carbon credits provides a good example. For hydropower, WWF has participated in the development of the International Hydropower Association Sustainability Guidelines.
- To safeguard habitats and food supplies, water supplies and ecosystem services, world governments must stop the scramble for land for biofuels. “Land-grabbing” – where rich countries buy or lease large tracts of land, especially in Africa, to grow biofuels or food – should be outlawed. Instead, we need to carefully analyze, country by country, what land and water is available for bioenergy, taking into account social, environmental and economic issues.
- Forestry companies, governments and conservationists need to identify areas of idle land (forests that have been cleared already but are no longer in use) where it may be possible to increase yields of biomass with the least impact on biodiversity. South East Asia, Russia and the Americas hold the most potential. WWF is supporting the Responsible Cultivation Area concept, which aims to identify land where production could expand without unacceptable biodiversity, carbon or social impacts. WWF is also helping to identify areas that should be maintained as natural ecosystems and primarily managed for conservation purposes through schemes such as the High Conservation Value Framework.
- We need to offset increased forest carbon emissions by stopping unsustainable fellings and deforestation. Schemes such as REDD (Reducing Emissions from Deforestation and Degradation), which offer developing countries incentives to conserve their forest carbon, will play an important role in this. We also need to promote and adopt community forest management and other sustainable forestry practices.
- Bioenergy production has to be based on sustainability criteria with strong legal controls – binding legislation and strict enforcement – at national and international levels. Voluntary standards and certification schemes, along the lines of the Forest Stewardship Council, the Roundtable on Sustainable Biofuels and the Better Sugarcane Initiative, also have a role to play. Because much bioenergy will be produced in developing countries, they will need support to develop and implement these standards effectively.
- As individuals, we need to make more considered choices about the food we eat, the transport we use, and other lifestyle factors that influence global land use. Public policy should help to guide these choices.
- We should limit growth in areas that depend on liquid fuels – notably aviation, shipping and heavy goods vehicles – at least until we have established a secure and sustainable supply of bioenergy. That means finding smarter ways to transport goods and people. These include using modes of transport that don’t depend on liquid fuels, and reducing the length and number of journeys, for example by producing more goods locally or working remotely instead of commuting. We also urgently need to research and develop energy alternatives for sectors that rely on bioenergy as the only alternative to fossil fuels.