

**“WWF HAS A VISION
OF A WORLD THAT
IS POWERED BY 100
PER CENT RENEWABLE
ENERGY SOURCES BY
THE MIDDLE OF THIS
CENTURY”**

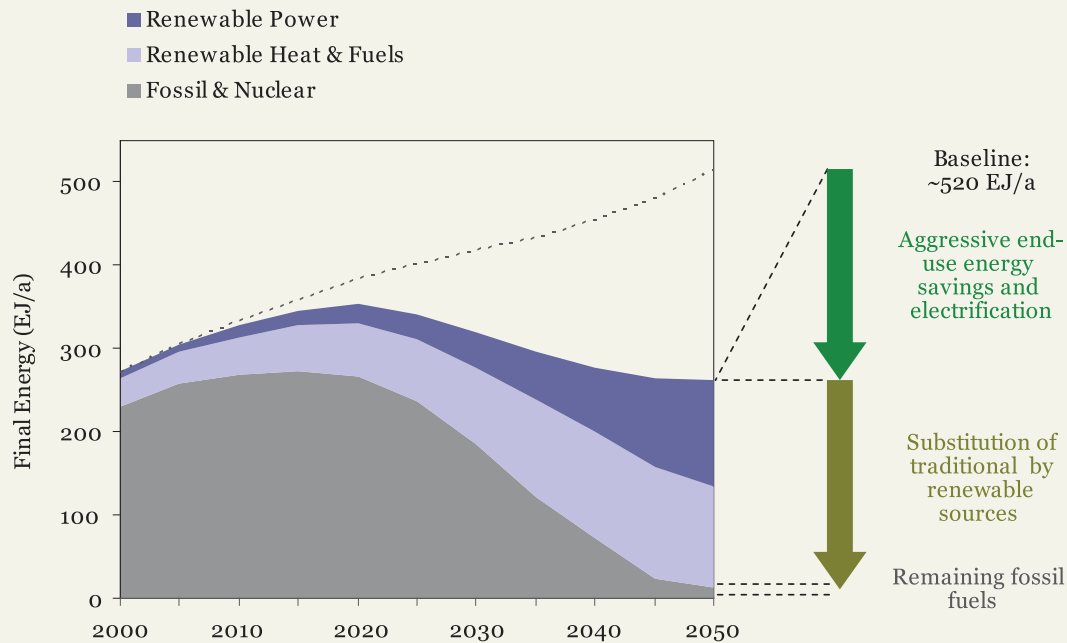


Figure 1
Evolution of energy supply in the Energy Scenario, showing the key developments.
Source: The Ecofys Energy Scenario, December 2010.

100 PER CENT RENEWABLE ENERGY BY 2050

WWF has a vision of a world that is powered by 100 per cent renewable energy sources by the middle of this century. Unless we make this transition, the world is most unlikely to avoid predicted escalating impacts of climate change.

But is it possible to achieve 100 per cent renewable energy supplies for everyone on the planet by 2050? WWF called upon the expertise of respected energy consultancy Ecofys to provide an answer to this question. In response, Ecofys has produced a bold and ambitious scenario - which demonstrates that it is technically possible to achieve almost 100 per cent renewable energy sources within the next four decades. The ambitious outcomes of this scenario, along with all of the assumptions, opportunities, detailed data and sources, are presented as Part 2 of this report.

The Ecofys scenario raises a number of significant issues and challenges. The Energy Report investigates the most critically important political, economic, environmental and social choices and challenges – and encourages their further debate.

How are we going to provide for all of the world's future needs, on energy, food, fibre, water and others, without running into such huge issues as: conflicting demands on land/water availability and use; rising, and in some cases, unsustainable consumption of commodities; nuclear waste; and regionally appropriate and adequate energy mixes?

The world needs to seriously consider what will be required to transition to a sustainable energy future, and to find solutions to the dilemmas raised in this report. Answering these challenges - the solutions to the energy needs of current and future generations – is one of the most important, challenging and urgent political tasks ahead.



**“1.4 BILLION
PEOPLE HAVE
NO ACCESS
TO RELIABLE
ELECTRICITY”**



A RENEWABLE ENERGY FUTURE: WHY WE NEED IT

Switching to renewable energy isn't just the best choice. It's our only option.

The way we produce and use energy today is not sustainable. Our main fossil fuel sources – oil, coal and gas – are finite natural resources, and we are depleting them at a rapid rate. Furthermore they are the main contributors to climate change, and the race to the last 'cheap' fossil resources evokes disasters for the natural environment as seen recently in the case of the BP oil spill in the Gulf of Mexico. In the developing world, regional and local desertification is caused by depletion of fuelwood and other biomass sources that are often used very inefficiently causing substantive in-door pollution and millions of deaths annually. A fully sustainable renewable power supply is the only way we can secure energy for all and avoid environmental catastrophe.

ENERGY FACTS WE HAVE TO FACE

1.4 billion people have no access to reliable electricity¹.

While most of us take energy for granted as a basic right, a fifth of the world's population still has no access to reliable electricity – drastically reducing their chances of getting an education and earning a living. As energy prices increase, the world's poor will continue to be excluded.

At the same time, more than 2.7 billion people are dependent on traditional bioenergy (mainly from wood, crop residues and animal dung) as their main source of cooking and heating fuel². This is often harvested unsustainably, causing soil erosion and increasing the risk of flooding, as well as threatening biodiversity and adding to greenhouse gas emissions. Traditional stoves are also a significant health problem: the World Health Organization (WHO) estimates that 2.5 million women and young children die prematurely each year from inhaling their fumes³. With many developing societies becoming increasingly urban, air quality in cities will decline further.

Finite and increasingly expensive fossil fuels are not the answer for developing countries. But renewable energy sources offer the potential to transform the quality of life and improve the economic prospects of billions.

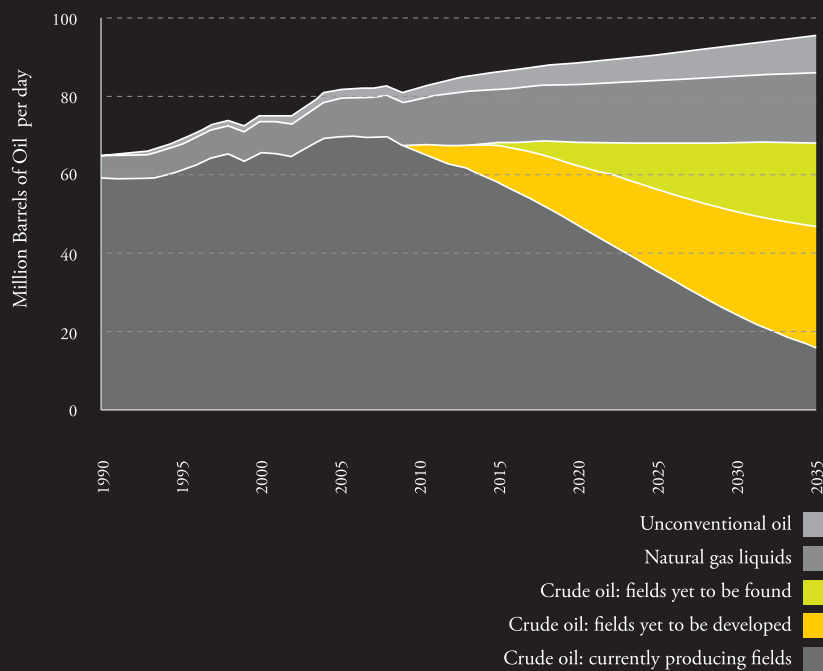
1. IEA, World Energy Outlook (WEO) 2010, Paris

2. IEA, World Energy Outlook (WEO) 2010, Paris.

3. <http://www.iaea.org/Publications/Magazines/Bulletin/Bull442/44204002429.pdf>

© Cat Holloway / WWF-Cannon





“IF EVERYONE CONSUMED AS MUCH ENERGY AS THE AVERAGE SINGAPOREAN AND U.S. RESIDENT, THE WORLD’S OIL RESERVES WOULD BE DEPLETED IN 9 YEARS”*

Figure 2: World oil production by type
http://www.worldenergyoutlook.org/docs/weo2010/key_graphs.pdf



OIL AND GAS ARE RUNNING OUT

Supplies of cheap, conventional oil and gas are declining while our energy demands continue to increase. It is clear that our reliance on fossil fuels cannot continue indefinitely. With the world’s population projected to increase to over nine billion over the next 40 years, “business-as-usual” is not an option.

According to the International Energy Agency (IEA)⁴, production from known oil and gas reserves will fall by around 40-60 per cent by 2030. Yet the developed world’s thirst for energy is unabated, while demand is rocketing in emerging economies, such as China, India and Brazil. If everyone in the world used oil at the same rate as the average Saudi, Singaporean or U.S. resident, the world’s proven oil reserves would be used up in less than 10 years⁵. Competition for fossil fuel resources is a source of international tension, and potentially conflict.

Energy companies are increasingly looking to fill the gap with unconventional sources of oil and gas, such as shale gas, oil from deep water platforms like BP’s Deepwater Horizon, or the Canadian tar sands. But these come at an unprecedented cost – and not just in economic terms. Many reserves are located in some of the world’s most pristine places – such as tropical rainforests and the Arctic – that are vital for biodiversity and the ecosystem services that we all depend on, from freshwater to a healthy atmosphere. Extracting them is difficult and dangerous, and costly to businesses, communities and economies when things go wrong.

Processing and using unconventional oil sources produces large quantities of greenhouse gasses and chemical pollution, and puts unsustainable demands on our freshwater resources, with severe impacts on biodiversity and ecosystem services.

4. IEA, World Energy Outlook (WEO), 2009, Paris.
 5. Per capita oil consumption in the U.S. and Canada is about 3 tons annually, in Saudi Arabia about 5 tons and in Singapore 10 tons. Proven oil reserves are estimated at about 205 billion tons in 2010 (BP, Statistical Review, 2010)

*Proven oil reserves are estimated 1,349 billion barrels. Oil consumption in the U. S. 18.86 million barrels per day. World population is 6.9 billion.



**FOSSIL FUEL
SOURCING**

Map 2: Oil Claims in Africa : P. Hearn, Jr., T. Hare, et. al., Global GIS Database: Complete Global Set, 2002 © AMO