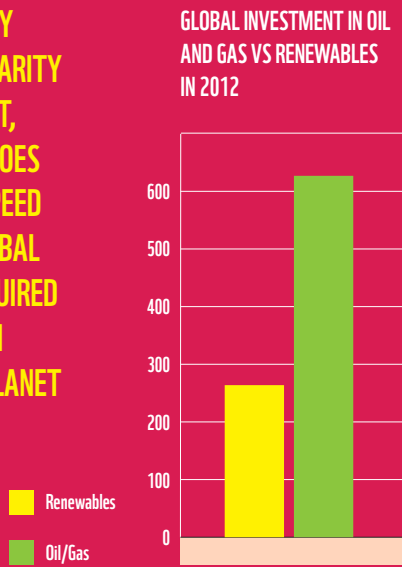


Busting the myths on Renewable Energy

The world is consuming more energy than ever before and yet we are straddled with the gargantuan task of providing first access of electricity to at least one fifth of the world population. 2.7 billion people still rely on traditional biomass for their energy needs- lighting, cooking and space heating. Fossil fuels, that have been the boon for industrialisation, are today the main cause of rising emissions and worsening climate change. Renewable energy and energy efficiency are pivotal to a future that ensures sustainable and clean energy for all. In the recent years, renewables have grown rapidly, supplying almost 10% of all global energy and more than 20% of world electricity. Worldwide, major economies such as the USA, China, Germany, Denmark and the Philippines are progressively increasing their investments in renewable energy. Even developing countries such as South Africa and oil rich countries like Saudi Arabia are slowly migrating towards renewable energy solutions.

Despite all this, renewable energy is still subject to common misconceptions that are based on public misinformation, prejudices, old data, weak science, ignorance or propaganda promoted by vested interests. WWF aims to demystify some of the most popular myths surrounding renewable energy relative to its economic viability, sustainability and technological reliability.

RENEWABLE ENERGY HAS GAINED POPULARITY IN THE RECENT PAST, BUT ITS GROWTH DOES NOT MATCH THE SPEED WITH WHICH A GLOBAL TRANSITION IS REQUIRED TO SECURE A CLEAN FUTURE FOR THE PLANET AND ITS PEOPLE.



Myth 1: Renewables are too expensive.

One of the biggest dissuaders of renewable energy is their capital intensive nature. Renewables have higher levelised cost of electricity (LCOE) production than conventional energy. LCOE is the cost per unit of energy over the average lifetime of the technology, including costs for initial investments, fuel, maintenance and operations. An LCOE analysis does not factor in important costs such as environmental externalities, fluctuating fuel prices and high subsidies, therefore misrepresenting conventional energy as cheaper than renewables. If these factors were accounted for in the analysis, conventional energy such as coal or fossil power would be more expensive than renewables in many countries already.

Some renewables are the lowest cost options in regions with good resource availability, including islands for off-grid options and hence ideal for electrification of remote villages. Also, with time, technological advances and further efficiency is expected to improve cost competitiveness for all renewables. Wind and solar are expected to achieve LCOE declines of 35% and 50% respectively by 2050.



SOLAR POWER IS NOW AT PAR WITH COAL POWER IN PARTS OF INDIA, WHILE NEW WIND POWER IS CHEAPER THAN COAL IN AUSTRALIA.

Myth 2: Producing renewables consumes more energy than it delivers.

It is believed that renewable technologies take longer to produce the same amount of energy as it took to produce that technology and therefore consume more energy than they deliver. In reality, renewables take less or equal time to produce energy as conventional technologies.

The only exception is solar electricity, and this is often taken as evidence that all renewables cannot payback their energy input under a reasonable timeframe.

True, solar may take longer to payback energy input, but their useful lifetime is virtually infinite, as no major structural changes are needed for safety or economic reasons. Solar PVs can last for 60 or more years, while the useful lifetime of conventional technologies is usually 10 to 20 years.

Myth 3: Renewables are as harmful to the environment as conventional electricity.

There is a public perception that renewables can create negative environmental effects of similar magnitude, during their lifecycle, as compared to conventional technologies, as activities such as manufacturing, transporting and assembling renewable energy technology involves greenhouse gas emissions, water consumption and land use.

The truth is that all renewables show emissions between 14 to 134 times lower than their fossil fuelled counterparts.

Solar and wind technologies emit zero GHG while in use. Also, compared to fossil fuels, renewables do not emit any air pollutants such as sulphur dioxide (SO₂), nitrous oxides (NO_x), heavy metal, dust, ashes or black carbon. In fact, nuclear power plants worldwide generate 12,000,000 kgs of radioactive waste per year!

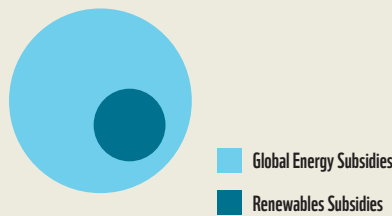
Myth 4: Renewable energy does not need economic incentives to develop.

Renewables have been receiving financial support over the years. True, but precisely because they have higher upfront capital needs compared to conventional technologies. The World Energy Outlook 2012 of the IEA states that the total global subsidies to renewables was 24% higher in 2011 than the previous year, most of these generally paid to electricity producers as support schemes that encourage taking up renewables at higher costs to the economy.

The International Monetary Fund (IMF, 2013) estimates that global subsidies to fossil fuels would exceed \$ 1.9 trillion a year, amounting to almost 10% of the world's governmental state budgets.

This shows that the energy market tips heavily in favour of fossil fuel based power. Without policy incentives, renewables cannot compete against conventional energy. To ensure sustained deployment of renewables, investors' confidence in the future must be maintained through policy certainty.

ACCORDING TO THE IEA 2012, WORLDWIDE FOSSIL FUEL CONSUMPTION SUBSIDIES AMOUNTED TO \$US 523 BILLION IN 2011, 6 TIMES MORE THAN SUBSIDIES TO RENEWABLES IN THE SAME YEAR.



Myth 5: Renewable technology requires too much land for setting up.

The land required to set up renewable technology may be higher than conventional technology if only the area occupied is considered. However, when factors such as extracting resources, infrastructure needs, generating electricity, disposing waste and both direct and indirect land transformation are considered, renewables require equal or less land than conventional technologies.

Renewables such as solar PV and wind are less land intensive as they are fuel free, and do not require further extraction of resources. Distributed solar PV can be put on rooftops, installed along highways and roads, while wind plants can be located on seas.



<1% OF THE REGIONS TOTAL LAND IS REQUIRED TO RUN A POWER SECTOR ENTIRELY ON 100% PV IN COUNTRIES LIKE INDONESIA, MEXICO, MADAGASCAR, SOUTH AFRICA.

Myth 6: Hydropower is mostly bad for nature and people.

It is true that hydropower has the potential to be economically, socially and environmentally damaging, but it is entirely possible to minimize or even largely mitigate these threats if a sustainable and multi-focused project design and development plan is implemented. This means, while planning, it is important to consider factors such as reservoir creation, water quality, barriers to fish migration and navigation, people displacement, cultural heritage and public health.

Hydropower can produce reliable, low-cost and carbon -free electricity. It creates infrastructure such as canals, tunnels, dams, and reservoirs that remain usable for future generations. It also assists in flood control, improves freshwater supply, irrigation for agriculture, and creates cleaner eco-systems.



IF DEVELOPED SUSTAINABLY, HYDROPOWER CAN PROVIDE CLEAN ENERGY THAT POSITIVELY BENEFITS NATURE AND PEOPLE.

Myth 7: Renewables cannot replace fossil fuels in the transport and built environment sectors.

Common perception is that renewables are best fit only for electricity production, that they cannot replace fossil fuels for transport, industrial steam and residential heat demand, and therefore a future powered by 100% renewable energy is near impossible.

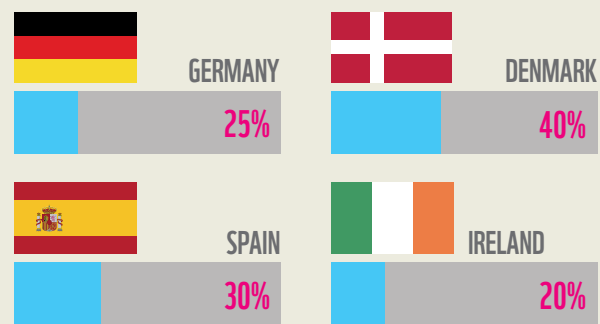
By implementing energy efficiency measures and advanced technology, energy demand can be significantly reduced, and then met through renewable sources.

In the residential sector, energy saving options for existing buildings, and designing new buildings with near-zero energy use will reduce energy demand. Similarly, the industrial sector can replace inefficient technologies and adopt best available equipment. The transportation sector can switch light duty vehicles with electrically powered vehicles, thereby reducing global energy demand.

Myth 8: Renewables do not deliver reliable energy on demand.

Renewable energy production is negatively influenced by unpredictable seasonal and daily weather changes, but bottlenecks can be overcome by implementing the right mix of renewable power generation and storage technologies, which can guarantee reliability in electricity supply during fluctuating production and demand. Studies shows that 99.9% of the time, electricity can be delivered on demand if the right mix of wind and solar power, and electrochemical storage is used, that too at minimal cost. Many countries and regions today are successfully producing a significant percentage of electricity from renewables, proving that variability in demand can be managed through best practices.

ELECTRICITY PRODUCED FROM RENEWABLES BY COUNTRIES BY 2012



Myth 9: Production of bioenergy has negative effects on nature, climate and food security.

Bioenergy is the energy produced from burning all forms of biomass such as timber, agricultural products, residues, animal dung and all organic waste. It is a sustainable alternative to fossil fuels, but arguments based on false facts and misconceptions make it a widely criticized technology.

Impact on food security: All liquid biofuels are produced from crops that are also used for food production, such as corn, sugarcane, soybean, coconut and palm oil. Therefore, increase in demand for biofuels can result in increased food prices, and aggravate food security. Recent studies have shown that several other factors such as rising fuel prices, increased fertilizer prices and transportation costs have a much larger impact on food prices in the agricultural commodity market, than increased production of biofuels.

Impact on nature: Contrary to popular belief, bioenergy produced by sustainable management practices can reduce impacts on land use, ecological habitats and natural resources. Bioenergy crops can work as a buffer to surrounding environments by enriching the soil carbon content, improving land conditions and reducing desertification.

Carbon emissions: Production of liquid biofuels such as ethanol from sugarcane, sugar beet, corn or wheat emit less GHG emissions during its full lifecycle than production of gasoline or petroleum diesel from coal.



ETHANOL BIOFUEL PRODUCED FROM SUGARCANE EMITS 78% LESS GHG EMISSIONS IN COMPARISON TO GASOLINE PRODUCED FROM COAL.

Myth 10: Renewable energy is infinite.

Renewable resources, especially the sun and wind, have no limits. However, the hardware used to harness energy from these sources requires materials that are not freely available, have to be mined, and consume water and energy inputs that may not be sustainable. Rare earths used in wind turbine technologies, rare metals used in photovoltaics and high density batteries, are all non renewable sources that can face supply bottlenecks in the future. It is imperative to ensure general resource efficiency as renewable energy technologies expand in the future.

A FUTURE POWERED BY RENEWABLES

A key barrier in the growth of renewable is common misconceptions and myths that underestimate their real value. In order to make the transformational change required to avert the risks of fossil fuelled power, we need a shift in public choices and positive perceptions towards renewables, that will ultimately enable a shift in the energy paradigm across all sectors.

ENERGY EFFICIENCY IS A KEY

Energy efficiency is a key requisite to meeting global future energy needs from sustainable renewable sources.

ABUNDANT RENEWABLE ENERGY RESOURCES

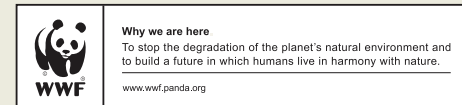
Total technical renewable energy potential can exceed 100 times present global energy consumption.

RENEWABLE ENERGY REDUCES CO₂ EMISSIONS

Quadrupling current renewable energy consumption by 2035 could avoid up to 23% of the CO₂ emissions abatement needed to be on track with the 2°C target.

RENEWABLE ENERGY CREATES JOBS

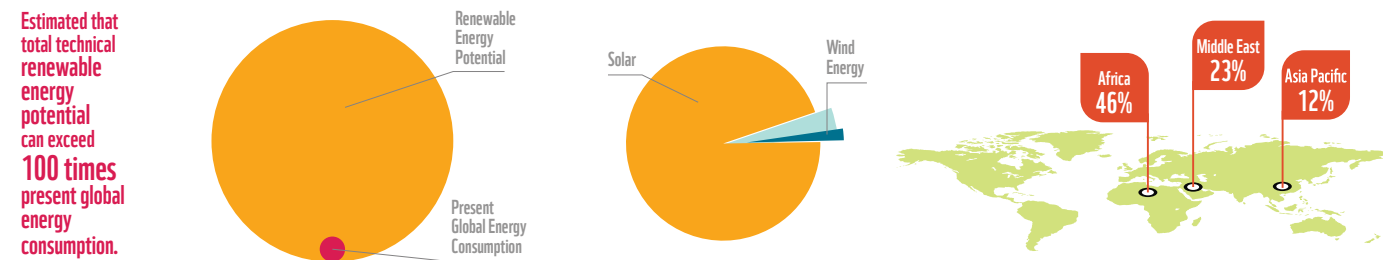
More than 5.7 million people worldwide work directly or indirectly in the renewable energy industry.



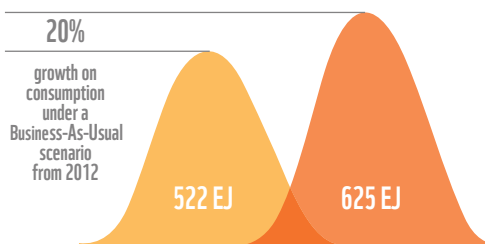
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RENEWABLES IN NUMBERS

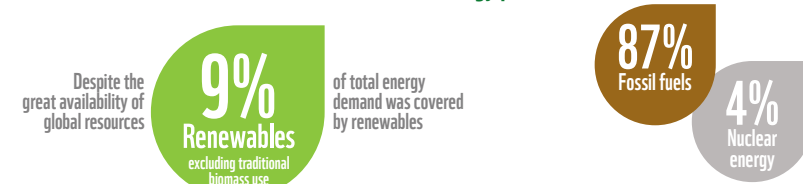
The world has abundant renewable energy resources



The world is increasing its energy demand

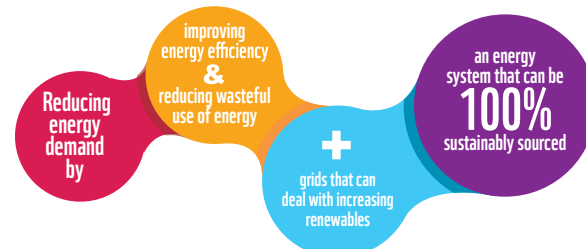
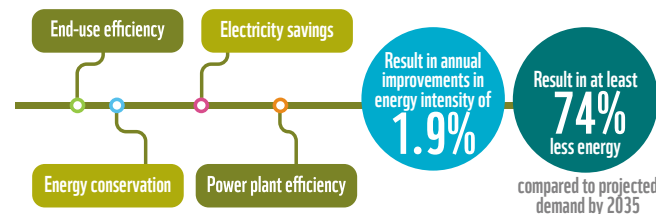


The world is far from using its technological and economic renewable energy potential



Energy efficiency is key requisite

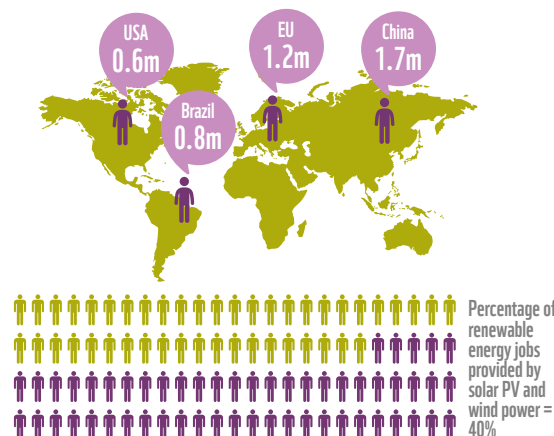
to meeting global future energy needs from sustainable renewable sources



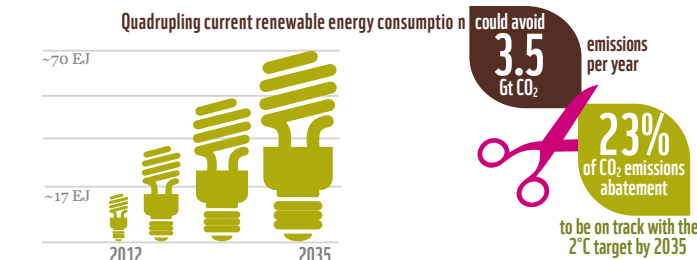
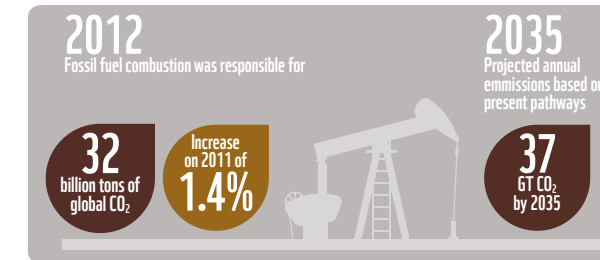
Renewable energy creates jobs



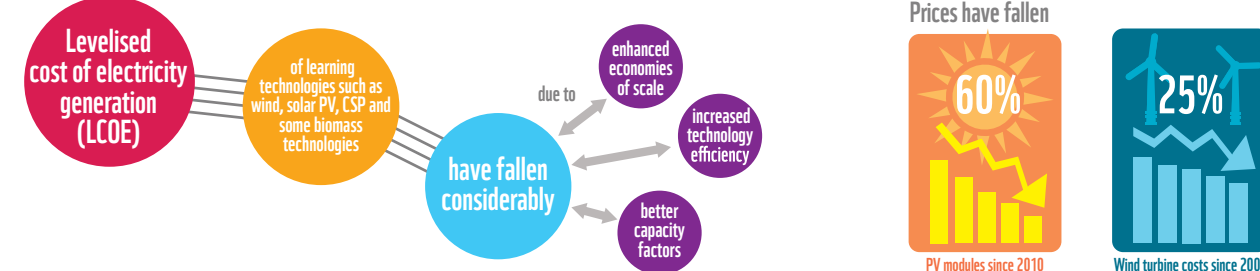
Renewable energy (compared to fossil fuels) creates more jobs per year



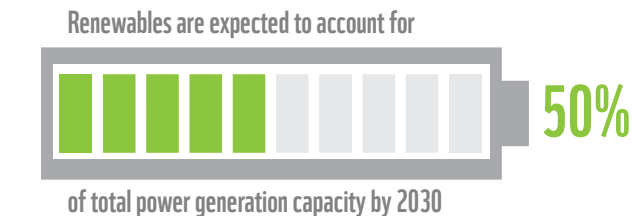
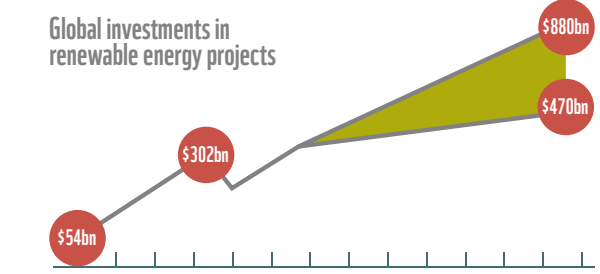
Renewable energy reduces CO₂ emissions



Renewable power generation is becoming increasingly competitive

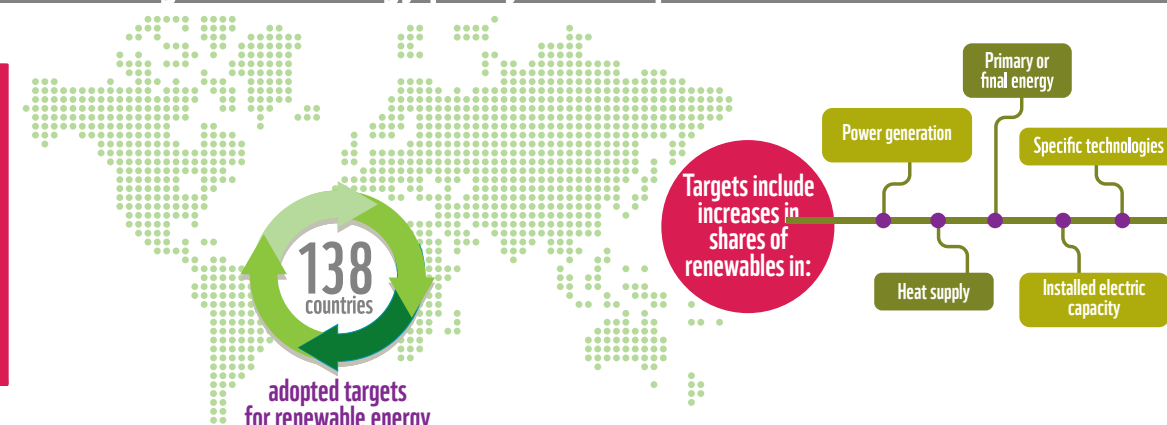


Investments in renewable power generation may increase rapidly



The world is building a clean energy policy landscape

Though speed of renewable energy and energy efficiency implementation are not sufficient, policy instruments and packages to support renewable energy are nevertheless increasing.



BUSTING THE MYTHS
Debunking myths about Renewable Energy