

Renewable energy is clean and sustainable, and does not cause greenhouse gas emissions. It already supplies 18% of the world's electricity, and we can use renewable energy for everything – electricity, transport, industry, heating, cooling and cooking.

What is renewable energy?

Renewable energy comes from sources like the sun, wind and waves. Energy from solar panels or wind farms is renewable energy.

Fossil fuels – gas, coal and oil – are responsible for 60% of the world's greenhouse emissions, and are the main reason the climate is changing. If we are to reduce emissions enough to stop climate change, we need to replace fossil fuels with renewable energy.

This is a challenge – but it also brings great opportunities. Renewable energy is a booming industry world wide, employing more than 1.6 million people.

In NSW we could get 25% of our electricity from renewable sources by 2020 through a combination of wind, solar, bioenergy and hydro power.

Wind energy

The power of the wind is used to generate electricity by turning the blades on a wind turbine. Wind energy is growing rapidly and could supply as much as 29% of the world's electricity by 2030. NSW currently has less than 1% wind energy, compared to 11% in South Australia. Germany is about half the size of NSW and has more than 16,000 wind turbines. About 1500 wind turbines, or 35 medium sized wind farms, could supply 10% of NSW electricity.

Solar photovoltaic panels

Solar photovoltaic (PV) panels convert sunlight directly into electricity. Solar panels can be installed on rooftops or any part of a building exposed to the sun. Homes with solar panels can have power even when the sun isn't shining by storing power in large batteries or connecting to the



electricity grid. Grid-connected solar panels can sell power back to the electricity grid when they generate more power than is being used. Solar PV may also be used in large centralised power stations.

Solar PV is the fastest growing energy technology in the world, with an average of 60% extra capacity each year since 2000. Australia is one of the sunniest countries in the world and an ideal place for solar power. Yet Germany has 10 times more solar PV installed than Australia.

Bioenergy

Bioenergy comes from organic materials derived from plants and animals. For example, methane is produced as organic waste breaks down in landfill can be used to make electricity. Bioenergy supplies about 11% of energy needs world wide, including traditional heating and cooking, and electricity generation. The NSW government has identified enough bioenergy resources in the state to supply 16% of NSW electricity use, that's 1.5 million homes.

It is critical that organic matter for bioenergy comes from a sustainable source; using old growth forests for bioenergy is not sustainable.

Hydro

Hydro power uses the force of water running downhill to generate electricity. Large hydro schemes usually use dams, while small hydro schemes temporarily divert water from rivers to drive a turbine. Hydro power currently generates 16% of world electricity and 7.6% of NSW electricity (mainly from the Snowy Mountains scheme). There is still potential for development of small hydro schemes in NSW, however building new large dams destroys river ecosystems and is unsustainable.

New technologies

New technologies with enormous potential are emerging, including geothermal power from hot rocks under the earth's surface. It has the potential to supply Australia's whole electricity demand many times over. Solar thermal technology using heat from the sun and wave power using the energy of ocean waves may also play a big role in the future. These new technologies deserve government and industry support for research and development.

Renewable energy in NSW

Around 90% of electricity in NSW comes from burning coal. NSW is lagging behind other states with only 8% of electricity coming from renewable energy. For example, between 2001 and the end of 2005 South Australia installed 215 wind turbines while NSW installed two.

NSW could easily get 25% of our electricity from renewable energy by 2020.

As well as dramatically reducing our greenhouse emissions, this would bring other benefits, including;

- around 4,000 permanent jobs,
- around \$9 billion new investment in NSW, and
- enough renewable electricity to power every household in NSW.



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