PNFA FACT SHEET

RENEWABLE ENERGY SOURCES

- There is scope for Australia to lead the world in renewable energy developments, as the associated technology becomes increasingly economically competitive.

- In Australia, about 9 per cent of Australia's electricity is generated using renewable resources (mostly hydroelectricity).

  Renewable energy includes sources of power that are replaceable or non-depletable. These include power sources such as wind, solar, plant and animal material (biomass), heat stored underground (geothermal) and hydro-energy.

- **Wind**

  Presently there are 27 wind farms operating in Australia. In 2003 enough wind power was generated in Australia to supply electricity to the equivalent of every house in Canberra.

  A recent study by Stanford University in the U.S, which collated more than 8000 wind records from every continent, found a potential global wind power resource of 72 terrawatts – forty times the amount of electricity used by all countries in 2000. If just 20% of this wind energy were to be tapped, all energy needs of the world could be satisfied (one terrawatt of electricity would power 10 billion 100-watt light bulbs).

  Wind power is already used extensively in Europe. In 2004 wind power globally outpaced nuclear power sixfold in annual capacity additions and threefold in annual output additions. It's development has short lead times, its mass production is economically very efficient, its technological development is rapid, and it is easy to site wind mills on available land. Wind power is fast becoming the energy of the future.

- **Solar**

  Solar energy is obtained directly from the sun. It can be captured and stored as heat energy (solar thermal), or be used to produce electricity from photovoltaic cells (solar electric systems).

  Sunlight can be concentrated by solar collectors – best sited in a desert. These focus sunlight from a large area on to a central vessel in which water is heated to become very high temperature steam. The expanding steam can power a turbine and generate electricity on a sufficiently large scale that it can be sent across a power grid. The world's largest, free-standing, steerable solar concentrating dish

is in Canberra, where it forms part of the Australian National University's solar research program.

If Australia developed and installed a massive solar-generating electricity network it would not only supply our country with most of its electricity needs, but will create employment opportunities, while providing an export market to energy-hungry countries to our immediate north such as Indonesia, India and China.

- **Biomass**

  Biomass is plant and animal material that can be used for energy. This includes using wood from trees, waste from other plants, and manure from livestock. Biomass can be used to generate electricity, light, heat, motion and fuel.

  Biomass may be converted into solid, liquid or gaseous fuels by burning, or a number of other complex scientific techniques.

  An increasing number of renewable energy projects using biomass have been developed. Most of these use waste products from agriculture, so they solve a waste disposal problem and, at the same time, create energy for use in homes, farms and factories.

- **Geothermal**

  'Geothermal' means heat stored in underground rock. Energy from hot dry rocks produces no greenhouse gases or other pollutants and has a very small 'footprint' on the landscape.

  Geothermal electricity generation involves pumping water down into the hot granite through a bore-hole that may be several kilometres deep. The water is heated by the hot rocks below and is converted to steam, which is piped back to the surface to drive turbines, producing electricity.

  Some scientists say that Australia has enough hot dry rock resources – particularly in the Hunter Valley near Newcastle and the Eromanga Basin near the South Australia/Queensland border – to provide all our energy needs for centuries. A pilot project in the Hunter Valley is now underway.

- **Hydroelectric**

  Hydroelectricity is produced from falling water. The movement of the water spins turbines, which generate electricity.

  In Australia about 8 per cent of electricity is produced from hydroelectricity. Most of this is from the Snowy Mountains Scheme in New South Wales.

  Most hydroelectricity projects require the building of large dams on rivers, which

can be very expensive. When large dams are built the flow of the dammed river is changed radically and large areas of land are flooded, including wildlife habitats and farming land.

Because of the environmental impact of traditional hydroelectric schemes, there has been increasing interest in alternative hydro schemes.