FACT SHEET

Energy resources overview

What is energy?

Energy makes the world go round.

Its classical definition is the capacity to do work which is usually explained by a force moving a mass. This is obvious in kinetic energy, which is possessed by a moving object like a car or rocket, or potential energy, which an object acquires because of its position (eg, a compressed spring or a lifted mass).

But energy exists in other forms as well - heat is thermal energy which has the capacity to do work on and change the state of materials; radiation including light is radiant energy held in electromagnetic fields that fill space and time; the petrol in the tank and the battery under the bonnet of a car contain chemical energy; and so on.

The first human beings relied on the power of their own bodies which were fuelled by the food they ate. When they discovered fire, the energy stored in wood and similar fuels gave them a source of heat and light they could control and use as they

wanted. In time they also learned to harness (literally) the muscle power of other animals and to tap into the power of wind and water.

Our use of energy has accelerated in the last 300 years with the invention of the steam engine and then the internal combustion engine. These new machines created an enormous demand for energy resources, the implications of which we have only now started to realise. Whether we continue to rely on finite supplies of fossil fuels or learn to harness renewable sources such as wind, water, and sunshine will have serious implications for our survival.

It's a fundamental law of physics that energy can neither be created nor destroyed. We can't create energy but it has many different sources. It can be stored in a fuel such as wood or coal or collected by the sails of a windmill or the photovoltaic cells of a solar array. Some forms of energy such as fossil fuels are very useful but once used are gone forever. Others tap into an effectively limitless resource such as solar energy but are not as concentrated as fossil fuels. Whatever the source of energy, significant capital investment is required to develop resources and convert the energy into a form that we can use.

Energy resources

Australia has a variety of energy resources including coal, natural gas, oil, wood, wind, sunshine, waves, tides and uranium. Some of these are currently used as energy sources while others remain undeveloped. We are fortunate to be very rich

in nearly all of these resources, and Australia is already the world's largest exporter of coal and a significant exporter of liquefied natural gas and uranium.

Acknowledgements

The Future Sparks educational materials project is being undertaken by CSIRO Education for Green Cross Australia.

These educational resources are designed to introduce teachers and students to Australia's use of 'clean energy' as one of the carbon dioxide mitigation options available for achieving significant reductions in atmospheric carbon dioxide emissions. Whilst not an exhaustive educational resource, it is intended to raise the awareness of school-aged students about our changing climate, clean energy practices and applications and the other alternative energy technologies that reduce greenhouse gas emissions.

The materials in this educational resource have been developed by Angela Colliver from CSIRO Education.

For more CSIRO school resources visit csiro.au/carbonkids