COMMUNITY ENVIRONMENT PARK

ENERGY

Energy and Society

(YEARS 7-12)

The following activities are offered in the CERES Energy and Society Program. This program explores energy generation, conservation and associated issues. Content and presentation are adjusted according to age, ability and language skills with each activity lasting approximately 50 minutes.

4 Session Program	3 Session Program	2 Session Program
Choose 4 activities 10.00 - 2.30pm	Choose 3 activities 10.30 - 2.00pm	Choose 2 activities 10.00-12.15pm or 12.30-2.45pm

FOSSIL FUELS

- Visit the Energy Education Centre to re-discover how electricity is generated. Handle samples of coal, see oil & natural gas. Operate a model power station to explain energy transfers and transformations.
- Have a go at operating human-powered generators & ride a bike to run a television and a hair dryer.
- Investigate fossil fuel formation also the problems and challenges associated with its overuse then propose viable practical and personal solutions.

RENEWABLE ENERGY

- Participate in hands-on renewable energy activities in the Energy Park. Depending on the weather, investigate a range of photovoltaic panels, solar powered appliances, solar hot water, multi-powered appliances, solar thermal collectors, wind power, nuclear energy and our 'new' micro-hydro model.
- Learn about the CERES grid-interactive renewable energy systems that supply 'zero emissions' electricity to CERES and the national electricity grid.
- Consider & discuss the challenge and potential of implementing broad scale renewable technologies.

ENERGY EFFICIENT HOUSING

- Explore the EcoHouse: designed as a fully functioning example of energy-efficient housing.
- Participate in a variety of hands-on activities focusing on appliance power & 'stand-by' power use, double glazing, compact fluorescent, eco(?) halogen and LED lighting, downlights, insulation, water efficient shower heads, draught proofing and the embodied energy of materials and food.
- Learn about design features of the EcoHouse such as passive solar design, solar water heating, the grid-interactive photovoltaic system and the CERES Zero Emissions, electric vehicle when available.

AUSTRALIA 2030 (Australia 2050: fully redesigned & updated, coming soon!)

- Make important decisions as individuals based on the lifestyle and population we want. The survey results lead to one of the twelve future social and environmental scenarios for the year 2030.
- How do your decisions contribute to global warming and climate change?
- Explore which choices will have the greatest environmental and social impacts and how, considering these, we can make a real difference.

ECOLOGICAL FOOTPRINTS

- Is it possible to balance the 8 sectors of the economy using nature as a foundation? Discover how precariously the Global Economy perches on the environment.
- Measure sustainability by calculating your ecological footprint. Consider your demands on the planet for food, transport, shelter, goods and services and absorption of wastes we produce.
- How does Australia's average ecological footprint compare with other nations? What can each of us do to reduce it?

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SUSTAINABLE BUILDING DESIGN

- Investigate the principles of Environmentally Sustainable Design (ESD)of Buildings.
- Assess CERES buildings with activities aimed at testing the effectiveness, comfort, environmental performance and sustainability of each building due to its design.
- Draw cross-sections that re-create a building's design. These highlight principles which apply to any building, anywhere in the world. Can our designs be improved?
- Begin to assess the (un)suitability of design of other buildings where we live, work, play and visit.

FUTURE TRAVEL

- Explore human transport changes through time leading to our current transport machines and systems.
- Investigate Electric Vehicles (EV's), cars and bikes, as future transport options available now.
- Learn about technical reality of EV's, pro's and con's, history, issues, emissions, myths, batteries.
- Visit Australia's only dedicated EV Solar Charging Station to highlight Zero Emissions transport.
- Do 'black balloon' style testing on a fossil fuelled vehicle's exhaust emissions (if not otherwise done).

CO_2 MONITORING (7 - 9)

- Test how CO_2 concentrations vary in the atmosphere. Use a CO_2 meter to measure CO_2 levels in our breath and air samples around CERES then compare the findings with global trends.
- Explore our personal actions that produce and reduce greenhouse gas emissions.
- Introduce the potentials and issues associated with Carbon Offsetting and Sequestration.
- Do 'black balloon' style testing on vehicle exhaust emissions and discuss links to the carbon cycle.

CO_2 MONITORING & MITIGATION (10 - 12)

- Test how CO_2 concentrations vary in the atmosphere. Use a CO_2 meter to measure CO_2 levels in our breath and air samples around CERES then compare the findings with global trends.
- Discuss our personal actions that produce and reduce greenhouse gas emissions.
- Explore and propose various strategies that individuals and society can use to mitigate, stabilise and reduce atmospheric carbon levels such as Energy Efficiency, Transport, Land Clearing, Carbon Taxes or Trading, Agriculture, Fugitive Emissions, Aluminium Refining and Renewable Energy.
- Consider how these compare to a 'business as usual' scenario.
- Do 'black balloon' style testing on vehicle exhaust emissions and discuss links to the carbon cycle.

FUTURE SPARK- HUMAN POWERED CLASSROOM

- Explore energy concepts of power, Watts, joules etc and how these relate to appliance energy use.
- Everybody rides the human powered bikes that generate 'grid-feed' electricity while monitoring individual power outputs and total group energy production.
- Can the group produce enough electricity to run common appliances like lights, kettle, music and run a microwave oven long enough to cook some popcorn for a re-energising snack?
- Compare the human powered energy output with that of a fossil fuelled vehicle. How far could you ride with the equivalent energy that a car uses to drive you to school???