



SCIENCE AND
INDUSTRY
ENDOWMENT
FUND



Generation STEM Community Partnerships Program

Campbelltown local scenario

Energy

Energy powers our daily lives and global demand for energy is forecast to grow at a rapid rate. It is suggested that the world's appetite for this valuable resource could lift by more than 70 per cent by the year 2040¹. The single largest energy source, coal, is near its end, thus a secure and affordable electricity supply is crucial for Australia to maintain a strong economy and preserve our quality of life.

Although we are certain that our energy needs will grow, we are still uncertain about what sort of fuel sources we will use to generate it or how to store it more efficiently. Harnessing renewable energy to reduce Australia's dependence on fossil fuels is one of our biggest challenges. Additionally, as lowering emissions becomes more important for industry and homeowners, we need new ways of generating energy and storing it. As the demand and use of renewable energy technologies in both commercial and residential environments increase, it is critical to understand how electricity generated by these sources can be integrated into future grid designs.

Camden Gas Project has been producing natural gas from coal seams throughout the Camden and Campbelltown local government areas since 2001. This is important source of energy for Sydney and beyond but it is not a long term solution. There are plans to close the facility in 2023.

Research is being undertaken into a wide variety of alternative energy sources, from solar and wind, through to harnessing the energy of ocean waves. CSIRO is developing new materials to produce thin, flexible and semi-transparent solar cells, based on printable inks. Campbelltown Council has installed solar photovoltaic cells on the Civic Centre, Arts Centre, and Greg Percival Library and Community Centre. This means that these facilities have reduced running costs and make a significant contribution to reducing CO₂ emissions.

How your Council tackles the complexity of this issue will impacts you now and future generations.



Greg Percival Library solar system

(Photo courtesy of Todae Solar <https://www.todaesolar.com.au/portfolio/campbelltown-city-council-100kw-solar-installation/>)

Your task

Your task is to use the information above, and resources provided below as a start to identify a local problem and design a STEM-focussed solution.

(Question, Design, Explore, Communicate)

Resources

CSIRO research

- Virtual Power Station: <https://www.csiro.au/en/Research/EF/Areas/Electricity-grids-and-systems/Intelligent-systems/Virtual-power-station>
- Energy: <http://www.csiro.au/en/Research/EF>
- Renewables and Energy: <http://www.csiro.au/en/Research/Energy>
- Fossil Fuel Energy: <http://www.csiro.au/en/Research/Energy/Fossil-fuel-energy>
- Renewable Energy Integration Facility: <https://www.csiro.au/en/Research/EF/Areas/Electricity-grids-and-systems/REIF>
- Intelligent Systems: <http://www.csiro.au/en/Research/EF/Areas/Electricity-grids-and-systems/Intelligent-systems>
- Economic Modelling: <http://www.csiro.au/en/Research/EF/Areas/Electricity-grids-and-systems/Economic-modelling?ref=/CSIRO/Website/Research/Energy/Electricity-grids-and-systems/Economic-modelling>
- Supercritical Steam: <http://www.csiro.au/en/Research/EF/Areas/Solar/Solar-thermal/Supercritical-steam?featured=BBB2A00C3650417BBE355DF04B8244BB>
- Photovoltaics: <http://www.csiro.au/en/Research/EF/Areas/Solar/Photovoltaics?featured=BBB2A00C3650417BBE355DF04B8244BB>
- eFuture Energy Modelling: <http://www.csiro.au/en/Research/EF/Areas/Electricity-grids-and-systems/Economic-modelling/efutures>
- Mapping Energy Consumption in Our Cities: <https://www.csiro.au/en/Research/LWF/Areas/Resilient-cities-21C/Energy-cities/Mapping-energy-use>

Reports

- Sustainability at Campbelltown City Council: <https://www.campbelltown.nsw.gov.au/LocalEnvironment/Sustainability/WhatisCouncildoingtoencouragesustainability?BestBetMatch=energy|3ba77b09-4cae-4136-bd37-52774df911aa|7bc3c57c-c215-45ea-96d0-8d97f6884eea|en-AU>
- Reimagining Campbelltown CBD: <https://www.campbelltown.nsw.gov.au/Business/ReimaginingCampbelltown>
- Camden Gas Project: <https://www.resourcesandgeoscience.nsw.gov.au/landholders-and-community/coal-seam-gas/information-on-petroleum-titles/camden-gas-project>
- World Energy Needs and Nuclear Power: <http://www.world-nuclear.org/information-library/current-and-future-generation/world-energy-needs-and-nuclear-power.aspx>
- World Energy Outlook 2015: http://www.worldenergyoutlook.org/media/weowebbsite/2015/WEO2015_Factsheets.pdf

- ¹CSIRO Global Megatrends Report Overview, 2012:
<https://publications.csiro.au/rpr/download?pid=csiro:EP126135&dsid=DS2>
- Hajkowicz, Stefan 2015, *Global megatrends : seven patterns of change shaping our future*, CSIRO Publishing, Victoria, Australia

Articles

- CSIRO News Blog, A Salty Solution to Solar after Dark: <https://blog.csiro.au/salty-solution-solar-dark/>
- Woolondilly Advertiser article: <https://www.wollondillyadvertiser.com.au/story/5693841/campbelltown-councils-renewable-energy-deal-earns-praise/>

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