



BUSINESS RESEARCH AND INNOVATION INITIATIVE

Turning office trash into energy treasure

Fact sheet

Challenge summary

The Australian Renewable Energy Agency (ARENA) is seeking a way to conduct an analysis of waste streams from an office building in order to design and build an energy recovery pilot facility. The critical innovation is to demonstrate a step-change in resource recovery rates by combining innovations in technology and onsite waste management practices.

Potential themes

Waste management, including energy recovery, recycling, material re-use and composting.

Overview of challenge

Australia generated 54 million tonnes of waste in 2016-17, of which 21.7 million tonnes was disposed of in landfill. The Australian Government spends approximately \$450 million per year on energy and generates over 2 million tonnes of carbon dioxide equivalent (CO₂e).

While there have been some leading pilots, energy recovery from food waste is not yet commercial at an individual building level in Australia. The implementation of energy recovery and waste management practices could provide a blueprint for large office buildings to offset energy use whilst avoiding landfill emissions.

Food waste that goes to landfill decomposes to methane, which has approximately 20 times the negative impact of carbon dioxide. The methane produced from the decomposition of organic waste can be captured as biogas. Australia's biogas potential is equivalent to almost nine per cent of Australia's total energy consumption of 4,247 petajoule (PJ) in 2016-17.

Solution requirements

Solving this challenge will require innovative thinking related to resource recovery, implementing new strategies and implementing energy recovery technologies to revolutionise existing waste management practices. The challenge will include the technical and economic feasibility study of a pilot-scale energy recovery facility for an office building. It should also consider education and training, as well as strategies for demonstrating the social and environmental benefits of waste management, including energy recovery. The proof of concept stage should include developing and building a prototype energy recovery facility.

Developed solutions could have applicability in a range of other locations, such as defence bases and remote townships. They could also pave the way for uptake in airports, food courts and shopping centres.

As the need to reduce emissions intensifies, new strategies and technologies will be needed. Implementation of building-scale technologies will expand the range of options available to support industry learning and cost reductions.

A solution should also have scope for commercialisation on a national or global scale.

Benefits of the solution

The value of activities in the waste and resource recovery sector in Australia in 2014-15 were about \$15.5 billion, comprising \$12.6 billion from service provision and \$2.9 billion from the sale of recovered materials. These markets are expected to grow due to a range of factors, including government support, recycling incentives and increased education, as well as new technologies to deal with recycling products.

By demonstrating waste to energy at the individual building level, the Commonwealth could inform and influence building design and waste management policies, and demonstrate new strategies for business and agencies to reduce emissions and reliance on landfill.

The social benefits from energy recovery and recycling are in the reduction of greenhouse gas emissions to help limit global warming and reducing pollution and negative environmental impacts from landfill. Waste management can also be a focal point for management seeking to align business practices with worker values.

How to apply

For information on how to apply, visit business.gov.au/BRIL