



Australian Government



# Manufacturing and clean energy



Manufacturing is vital to the Australian economy, contributing more than \$100 billion to gross domestic product each year, and supporting more than 900,000 jobs.

CEFC research has identified a range of practical and proven strategies that can deliver energy and cost savings across manufacturing. The benefits can go well beyond energy and emissions savings, through reduced maintenance costs, improved equipment life expectancy, reduced water consumption and improved site conditions.

The CEFC is an active financier to manufacturing, working closely with the sector to identify where clean energy technologies can deliver substantial benefits for business productivity and competitiveness.

## Australian manufacturing

\$358b  
industry

\$118b  
exports

5.7%  
GDP

47,500  
employing businesses

>914,000  
jobs

Source: Australian Industry Group, 2019

## Australian Manufacturing: Gas Efficiency Guide

The *Australian Manufacturing: Gas Efficiency Guide*, developed by the CEFC, the Energy Efficiency Council and the Australian Industry Group, is a comprehensive resource identifying practical and proven strategies to deliver energy and cost savings.

The guide identifies a range of proven technologies with the potential to cut gas consumption by 25 per cent. In the majority of cases, upfront investment was \$50,000 or less, with the costs recovered within just five years.

If the initiatives were all implemented at once, they would reduce greenhouse gas emissions by as much as 10 million tonnes a year, equivalent to taking more than two million passenger vehicles off the road, or meeting the electricity needs of 1.5 million homes.

This CEFC industry snapshot brings together key elements from the guide. To download a full copy of the *Australian Manufacturing: Gas Efficiency Guide*, please visit [cefc.com.au](http://cefc.com.au)

### Where to act

Manufacturing is an energy intensive sector, with a pronounced reliance on the use of gas as an energy source to produce steam, hot water and process heating systems.

Manufacturers can expect a clean energy transition to deliver major improvements through fuel shifting from gas to solar thermal, solar PV, bioenergy, hydrogen and low emissions electricity; equipment maintenance improvements; and smart redesign to improve industrial processes.

Enabling technologies, including sub metering and analytics platforms, are central to identifying energy efficiency opportunities to lower energy consumption.

Renewable energy options can further reduce or eliminate gas dependency, increasing energy diversity and minimising the business risk associated with the gas market. These options include bioenergy, such as biomass and biogas, as well as solar PV, solar thermal and heat pump technology.

### Getting started

Understanding and changing the energy intensity of any manufacturing process is complex. The key steps to achieving continuous improvement in energy use include:

- 1 Measurement and data analysis**  
It is important to look at the overall consumption of the system, aided by the installation of sub meters for each major appliance.
- 2 Establish baseline and targets**  
Support measurement of energy content with secondary factors related to energy performance and efficiency to provide visibility into energy productivity.
- 3 Identify and rank opportunities**  
Rank unit operations based on the size of energy consumption, the quality of the available data and the potential for energy efficiency improvements.
- 4 Implement opportunities**  
Take a staged approach to system upgrades, starting with energy efficiency improvements to unit operations that consume the most energy.
- 5 Ongoing measurement and verification of effectiveness**  
A range of energy management systems can provide managers with an easy to interpret summary of energy use and performance to provide enhanced ongoing measurement.







## Understanding the clean energy benefits

Manufacturers can capture multiple benefits from clean energy, including much needed energy cost savings, improved productivity and competitiveness, and lower greenhouse gas emissions.

1

**Reduced maintenance requirements and costs:** reducing the heat load on industrial systems may reduce the maintenance costs on large plant assets such as boilers.

2

**Improved equipment life expectancy:** reduced operating hours and reduced thermal stresses may allow plant equipment to last longer before requiring replacement or major overhaul.

3

**Reduced water consumption and water treatment costs:** many steam systems and heat recovery efficiency initiatives will also result in a reduction in water consumption and less water requiring chemical treatment prior to use.

4

**Improved energy visibility and understanding:** installation of sub metering and energy management systems are critical to the longevity of savings and can provide ongoing value and understanding of plant operations.

5

**Improved process control:** often energy reduction initiatives utilise automatic controls with smaller error bands than traditional control systems. This can allow for smoother and more automated control of connected systems.

6

**Improved site safety and working conditions:** eliminating waste heat can provide a safer work environment where staff are at a reduced risk of exposure to high temperature equipment or uncomfortable work environments.

## Clean energy and broader business gains

Clean energy technologies offer significant gains to manufacturers, which can go well beyond energy cost and emissions savings:

- Decreasing the heat load on industrial systems can reduce maintenance costs on large plant assets such as boilers
- Manufacturers can also improve the life expectancy of plant equipment from reduced operating hours and thermal stresses
- Further gains can be made in water consumption and treatment costs, with efficiency improvements in steam system and heat recovery operations.





## Investing in energy efficient manufacturing

The CEFC has a strong association with the manufacturing sector in Australia. We provide tailored investment in large-scale projects, usually from \$20 million and above, where they are commercial, draw on renewable energy, energy efficiency and/or low emissions technologies and contribute to emissions reduction.

Through our co-finance programs, we also support investment in smaller-scale transactions to enable manufacturers to benefit from clean energy technologies while lowering their carbon footprint. Projects range from \$10,000 to \$5 million, with an average investment of some \$100,000.

The co-finance programs are an efficient and effective way to encourage investment in clean energy technologies, incentivising borrowers to preference best-in-class clean energy assets when considering new equipment purchases.

## About the CEFC

The CEFC has a unique mission to accelerate investment in Australia's transition to net zero emissions. We invest to lead the market, operating with commercial rigour to address some of Australia's toughest emissions challenges. We're working with our co-investors across renewable energy generation and energy storage, as well as agriculture, infrastructure, property, transport and waste. Through the Advancing Hydrogen Fund, we're supporting the growth of a clean, innovative, safe and competitive hydrogen industry. And as Australia's largest dedicated cleantech investor, we continue to back cleantech entrepreneurs through the Clean Energy Innovation Fund. With \$10 billion to invest on behalf of the Australian Government, we work to deliver a positive return for taxpayers across our portfolio.