

CASE STUDY / MANUFACTURING

CSR CEMINTEL

Learn how Shell Energy helped CSR Cemintel achieve substantial gas efficiencies, cost savings and emission reductions.



CEMINTEL®

Shell
ENERGY





ABOUT CSR CEMINTEL

CSR Cemintel is a New South Wales - based manufacturer of innovative fibre cement panel products. Like many Australian manufacturers, CSR Cemintel has felt the pinch of upward-trending energy costs over the last decade, which has impacted on its operating costs and margins. Partnering with Shell Energy, CSR Cemintel has addressed its energy challenges through targeted energy efficiency projects, resulting in substantial gas, cost and emissions savings for the manufacturer.

BUSINESS CHALLENGES

Improving energy performance is a sector-wide challenge for Australian manufacturing. As the third largest consumer of energy in Australia, the sector accounts for almost 17% of Australia's total consumption¹, coming at a significant cost for manufacturing businesses.

Beyond consumption and cost, lowering carbon emissions is a challenge for the sector, with many Australian manufacturers striving to lower emissions to achieve environmental goals, meet customer expectations, and decarbonise their business operations.

To reduce cost impacts and improve business resilience in the face of these energy challenges, CSR Cemintel recognised the need to improve the energy efficiency of its operations. In particular, it needed to focus on its high gas consuming 8-megawatt (MW) steam boiler, an asset that is instrumental in CSR Cemintel's operation.

Shell Energy has worked with CSR Cemintel over the last five years to accelerate its energy performance, with significant gains achieved for the business towards their energy goals.

¹ The Australian Energy Update 2020, Department of Industry, Science, Energy and Resources (2020), p. 11

KEY PROJECT OUTCOMES

ACHIEVED
\$260,000
in annual gas savings
through energy efficiency
improvements



GENERATED
\$373,000
in environmental
certificates



**REDUCED CARBON
EMISSIONS BY**
1,675 TONNES
2030 emissions target
reached in 2022



BUSINESS DRIVERS

CSR Cemintel has three defined business drivers, which are the focus of its partnership with Shell Energy.



Reducing gas consumption
(per unit of product)



Managing energy-related
operating costs



Reducing carbon emissions

TECHNICAL SOLUTIONS

Since 2016, CSR Cemintel and the Shell Energy team have worked together on a range of energy efficiency projects that have culminated in significant savings for the manufacturer. Five phases of upgrades have now been completed and each project has driven down gas consumption, costs and emissions. CSR Cemintel has accessed government grants and environmental certificates to reduce project costs and payback periods, and save on operating costs.

The Shell Energy team draws on its energy engineering and market expertise to deliver value for CSR Cemintel in the following ways:



Analyse data to pinpoint
wastage and opportunities



Develop business cases to
ensure project feasibility



Identify and design technical
solutions to improve efficiency



Source available grants and write
compelling grant applications



Acquire environmental certificates
to reduce or offset costs

SOLUTION OVERVIEW

PROJECT: PHASE 1 PROJECT

COMPLETED: SEPTEMBER 2016

Our energy team, along with an installation partner (Tru Steam Boilers and Service), approached CSR Cemintel about a NSW Government grant program that was offering up to \$40,000 for gas efficiency upgrades.

Due to the year-on-year rising gas prices, many Australian manufacturers saw this incentive as a feasible way to drive down consumption and costs. CSR Cemintel agreed, and the funding contributed to the success of its first energy efficiency project with Shell Energy.

This project was focused on two main improvements: upgrades to metering and to CSR's steam boiler.

The metering upgrade involved installation of a dedicated steam flow meter to accurately measure the steam production from the boiler. This metering helped to more accurately gauge the energy savings from this project.

The boiler optimisation included replacing the existing electronic fuel/air ratio controller with an Autoflame Mk8 boiler management control system, complete with Autoflame patented Exhaust Gas Analyser for multi-parameter combustion trim and a variable speed drive to vary the speed of the fan motor for combustion air.

KEY PROJECT OUTCOMES:

- Capital cost of \$94,100
- Grant funding of \$37,325
- 5.6% and \$34,475 in gas savings a year
- Energy Saving Certificate (ESC) value to customer: \$72,495
- 1.65-year simple payback period
- Immediate payback with grant funding and ESCs

PROJECT: PHASE 2 PROJECT

COMPLETED: MARCH 2019

After implementing the phase 1 project, CSR Cemintel realised a 5.6% reduction in energy on site and was keen to explore further opportunities for energy savings with Shell Energy, leading to this phase 2 project opportunity.

Phase 2 saw Shell Energy further review the combustion efficiency and performance of the previously optimised boiler, leading to burner performance becoming the focus of the next upgrade. This involved removing the integral burner and replacing it with a Limpsfield high efficiency burner, which guaranteed low oxygen performance throughout the firing range and delivered better combustion performance. Shell Energy designed, sourced and implemented a bespoke burner solution, with a smaller fan motor (22kW versus 55kW), specifically designed for the furnace pressure and volume.

KEY PROJECT OUTCOMES:

- Capital cost of \$105,830
- 6.4% and \$45,296 in gas savings a year
- Energy Saving Certificate (ESC) value to customer: \$83,985
- 2.34-year simple payback period
- 0.48-year payback with ESCs

SOLUTION OVERVIEW

PROJECT: PHASE 3 PROJECT

COMPLETED: SEPTEMBER 2019

Upgrade of the boiler blowdown controls in the phase 3 project improved reliability of the new burner, allowing for continuous surface blowdown measurement and Total Dissolved Solids (TDS) management. This introduced continuous measurement of the TDS in the boiler and reduced the overall blowdown of the system. By reducing the blowdown, CSR Cemintel reduced heat wastage and chemical requirements.

This phase also included an upgrade to the Programmable Logic Controller (PLC) controls and integration with the sites' supervisory and data acquisition (SCADA) system.

The Autoflame Mk8 controller (delivered as part of the phase 1 project) had been developed since installation to incorporate full boiler controls (not simply a burner control system). This allowed for the inclusion of high integrity water controls by Spirax Sarco, removing the mechanical float and dunk controls to improve water level control and maintain the optimum water level in the steam drum and maximising steam output and quality.

KEY PROJECT OUTCOMES:

- Capital cost of \$30,400
- 5.3% and \$30,752 in gas savings a year
- Energy Saving Certificate (ESC) value to customer: \$64,960
- 0.99-year simple payback period
- Immediate payback with ESCs

PROJECT: PHASE 4 PROJECT

COMPLETED: AUGUST 2020

The phase 4 Project saw a steam services review and subsequent repairs and operational changes to improve the site's steam performance. The project was completed by the CSR Cemintel team, with steam specialist services company, Spirax Sarco (engaged by Shell Energy).

This project saw failed steam traps and steam leaks repaired, steam curtains on the autoclaves replaced to reduce energy losses, and a number of additional improvements made to the boiler system. Shell Energy acquired \$111,400 in ESCs on behalf of CSR Cemintel.

KEY PROJECT OUTCOMES:

- Capital cost of \$75,000 (approx)
- 13.9% and \$115,248 in gas savings a year
- Energy Saving Certificate (ESC) value to customer: \$111,400
- 0.65-year simple payback period
- Immediate payback with ESCs

PROJECT: PHASE 5 PROJECT

COMPLETED: SEPTEMBER 2020

Shell Energy identified another funding opportunity for CSR Cemintel through the Manufacturing Efficiency Funding grant scheme. The Shell Energy team worked with the manufacturer to identify the optimal efficiency improvement that would meet CSR Cemintel's commercial and energy objectives, and the scheme's criteria. The team prepared the application and CSR Cemintel was awarded the \$62,250 grant.

The project saw an economiser installed on to the steam boiler, which takes the heat from exhaust gases (previously exhausted into the atmosphere) and uses it to pre-heat the water from the feed water tank, raising the temperature of the water coming into the boiler. This project reduced the amount of gas required in the process, delivering a 4.2% gas saving for the operation.

KEY PROJECT OUTCOMES:

- Capital cost of \$124,500
- Grant funding of \$62,250
- 4.2% and \$34,165 in gas savings a year
- 1.82-year simple payback period

SOLUTION COMPONENTS

The solution components for the CSR Cemintel multi-phase energy efficiency upgrades are as follows:

COMPONENT	PURPOSE
PHASE 1 UPGRADES	
Installation of a dedicated steam flow meter	To accurately measure the boiler's steam production
Installation of Autoflame Mk8 boiler management control system and combustion trim control	To control and optimise boiler performance and achieve natural gas savings
PHASE 2 UPGRADES	
A new bespoke Limpsfield high efficiency burner	To guarantee low oxygen performance throughout the firing range and deliver better combustion performance
PHASE 3 UPGRADES	
Upgrade of the boiler blowdown controls	To improve the reliability of the new burner to reduce heat wastage and chemical requirements
Upgrade of the boiler PLC controls, improved water level controls and integration to site SCADA	To optimise water level control and quality of steam to site
Addition of high integrity water controls, removing the mechanical float and dunk controls	To improve water level control
PHASE 4 UPGRADES	
Steam system upgrades: - Improvements to the steam reticulation system - Repair of failed steam traps and steam leaks - Replacement of steam curtains on autoclaves	To reduce energy losses through the processes and from failed components
Operational changes to the boiler	To improve boiler system efficiency
PHASE 5 UPGRADES	
Installation of an economiser on the boiler	To pre-heat the feed water supply, requiring less gas consumption



YOUR BUSINESS ENERGY EXPERTS

WHO ARE WE

Shell Energy is Australia's largest dedicated supplier of business electricity and a leader in energy innovation.

We take the time to understand your business energy needs, creating innovative products and delivering personalised service that adds value to your business. And we make it easy for businesses like yours to take control of your energy usage.

We are experts in energy and your trusted energy partner.

WHAT WE DO

We make it easier for you to take control of your energy usage to meet your commercial and sustainability goals and make your business more resilient.

Utilising our energy expertise and market insights, we work closely with you to optimise energy efficiencies, drive cost savings and advance your future-facing goals like net-zero emissions.

Choose Shell Energy for innovative energy solutions that are tailored to your business and can help you reduce consumption, cost and emissions.

CONTACT US TODAY TO DISCUSS MAKING YOUR BUSINESS MORE ENERGY EFFICIENT

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