



Energy Efficiency

Giving Australia's metal manufacturing a clean edge

Manufacturing is a vital part of Australia's economy contributing substantially to exports and employment. Playing a pivotal role in this sector is metals manufacturing, with direct impacts on other key industries such as mining, automotive production, medical devices, marine and aerospace.

The Australian manufacturing sector also has a key role to play in helping our nation meet its targets in emission reduction and energy consumption. With intense pressure from the strong Australian dollar and rising input costs, one of the major challenges is in achieving all this while remaining globally competitive.

Since its beginnings 18 years ago as a Cooperative Research Centre (CRC), CAST has established a solid reputation in industry research, developing ground-breaking new technologies, and working directly with Australian manufacturers, both large and small, to deliver practical, competitive solutions.

"CAST has already embraced life-cycle analysis as a key element in measuring the effectiveness of new technologies. We're extending this analysis to the economic, environmental and social impacts of materials processes in metals manufacturing to meet the challenges faced by modern industry," said CAST Chief Executive Officer, Dr George Collins. "An overall systems approach is crucial if we are to ensure the successful implementation and commercialization of these technologies, and meet the Commonwealth Government's Clean21 goals," he added.

Clean manufacturing – delivering benefits for every Australian

As CAST builds further momentum in the clean manufacturing sector, its research will have far-reaching impacts throughout the supply chain. With research in clean and efficient manufacturing processes, high-performance products, and energy efficiency, the benefits from CAST's work will flow on to the community, and the environment, as well as across the manufacturing sector as a whole.

The following section highlights an example of this initiative. CAST, in conjunction with a number of other stakeholders, embarked on an energy efficiency project amongst a number of die casting companies. The overall aim of the work was to improve the energy efficiency of a number of energy intensive businesses, without the need for intensive capital expenditure.

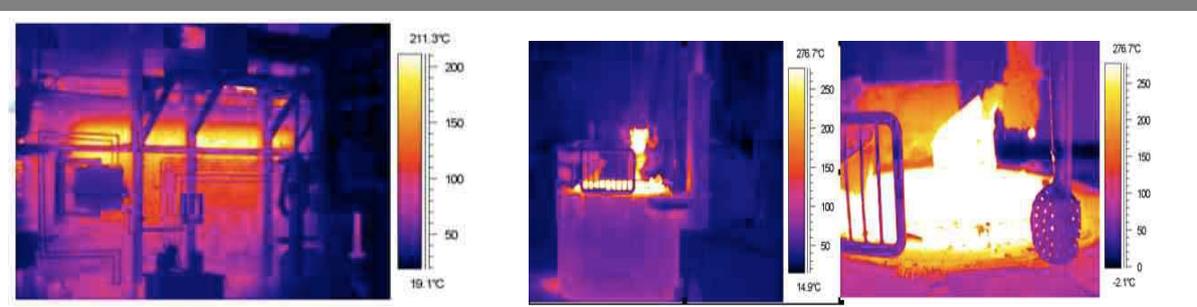
Energy Efficiency Case Study

Energy Efficiency in the Die Casting Sector

In conjunction with Sustainability Victoria, the Australian Die Casting Association (ADCA), and Morris Murray and Associates, CAST undertook a project aimed at improving the energy efficiency in the die casting sector.

The project started with a benchmarking study across a sample of ADCA members, and compared their energy usage per tonne of casting, with a significant range of international data. The benchmark results suggested that the Australian die casting operations energy use was comparable with international benchmarks, but that there was also a large variation in average energy efficiency numbers (GJ/tonne) in Australia and internationally. From the data, three companies were chosen to pilot measures for improving energy efficiency in die casting, each representing a different segment of the die casting sector.

Thermal images of Reverberatory and crucible furnaces.



By measuring energy use at the equipment level, a range of measures was developed to improve the overall energy efficiency of the plant. The key areas of improvement developed included;

- Maintaining lids on key furnaces,
- Maintaining correct burner tuning,
- Reducing furnace temperatures during non-production periods,
- Re-scheduling production in order to lower overall energy usage,
- Improving furnace insulation and seals and maintaining good efficiency in compressors.

With the application of the above techniques, energy savings of up to 20% were possible without the need for significant capital expenditure. Further work with significant capital expenditure would be required to achieve greater gains for the industry.

For further technical information, contact:

Bruce Gunn
Program Manager
CAST CRC
Deakin University
E: bruce.gunn@deakin.edu.au
P: +61 3 9251 7707
M: +61 403 192 088