

What is ZeroGen?

ZeroGen is at the forefront of global efforts to produce smarter, cleaner power from coal. The first-of-a-kind project is integrating the technologies of Integrated Gasification Combined Cycle (IGCC) and Carbon Capture and Storage (CCS) to produce low-emission, baseload electricity.

It will develop a 530 megawatt (MW) commercial-scale IGCC power plant with CCS, to be deployed in Queensland in 2015. The project is a world first, and will play a crucial role in demonstrating the technology at commercial scale to accelerate its uptake in Australia and around the world.

The widespread deployment of IGCC with CCS has the potential to deliver significant cuts in greenhouse gas emissions from coal-based power generation. At maturity, the technology has the potential to capture up to 90 percent of carbon dioxide (CO₂) emissions from a commercial-scale power plant for safe storage underground.

The first-of-a-kind ZeroGen Project will be a critical milestone in the commercialisation of IGCC with CCS. Deployed on a global scale, the technology has the potential to make the deep cuts in greenhouse gas emissions required to mitigate climate change, while at the same time supporting the future of Australia's \$24.4 billion coal industry.



Fast facts about ZeroGen

- Deployment date late 2015
- 530 MW (gross) power plant
- Estimated project cost of A\$4.3 billion
- Location to be determined through a pre-feasibility study, investigating several suitable sites in Queensland
- At maturity, has the potential to capture up to 90 percent of CO₂ emissions for full sequestration

Timing

Pre-feasibility study completion	June 2010
Feasibility study completion	Sept 2011
Plant operational	2015

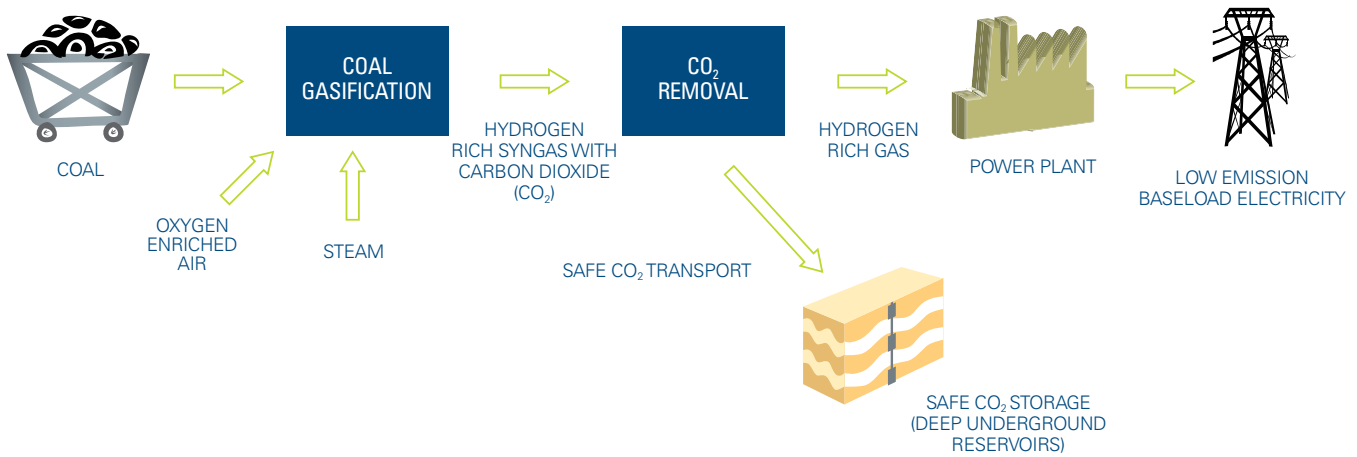


Project benefits

ZeroGen will:

- Develop and deploy a new generation, low-emission coal technology needed to make the deep cuts in greenhouse gas emissions required to mitigate climate change
- Improve the environmental performance of coal as an energy source
- Be first in the world to construct and operate a fully integrated IGCC + CCS power generating facility at commercial-scale
- Reduce risks and costs to accelerate the commercial deployment of IGCC plants with CCS in Australia and around the world
- Preserve the long-term viability of Australia's \$24.4 billion coal export industry and the 130,000 jobs it supports
- Develop specialist Australian skills and expertise in IGCC with CCS technology, currently in global demand.

WHAT ARE THE TECHNOLOGIES?



INTEGRATED GASIFICATION COMBINED CYCLE (IGCC): a power generation process that integrates coal gasification with a combined cycle power plant. The process allows CO₂ and other impurities to be separated and captured before combustion in turbines, thereby preventing their release into the atmosphere. A clean syngas is produced, which is used to generate electricity.

CARBON CAPTURE AND STORAGE (CCS): involves the pre-combustion capture of CO₂ from syngas generated by the IGCC power plant. Once captured, the CO₂ is compressed and safely transported for long-term storage in deep underground reservoirs.

Both IGCC and CCS are commercially-proven technologies in their own right and have been used in various applications around the world for many years. ZeroGen will be first in the world to combine the technologies for power generation.

Technology partners

IGCC: MITSUBISHI HEAVY INDUSTRIES (MHI)

MHI has gained significant experience in IGCC technology over the past 25 years through the deployment of pilot and demonstration plants. It has successfully constructed and started the operation of a 250 MW IGCC demonstration plant in Nakoso, Japan. ZeroGen will utilise MHI technology for the IGCC power plant and carbon capture.

Royal Dutch shell continues to support ZeroGen's CO₂ injection testing program as part of its global efforts to develop and deploy CCS technology.

Project background

The ZeroGen project previously involved first building a demonstration-scale plant to prove the technology, before building the commercial-scale plant.

Time and technology risks are the greatest concerns for ZeroGen. Following discussions with project stakeholders, a new opportunity emerged to accelerate the development of the commercial-scale facility, thereby negating the need for the smaller demonstration plant and enabling a quicker and more cost-effective strategy to deployment.



A ZeroGen drill rig on location in the Northern Denison Trough in Central Queensland

