



# ZeroGen: low emission power

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**Dr Anthony Tarr**  
**CEO, ZeroGen Pty Ltd**



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# ZeroGen overview

## ▶ Objectives

- ▶ *the accelerated development and rapid deployment of low-emission coal technology*
- ▶ *ensuring continued mining, export and use of Australian coal in a carbon constrained future*

## ▶ Location

- ▶ *Queensland, Australia*

## ▶ Technology approach

- ▶ *IGCC with CCS*

## ▶ Features

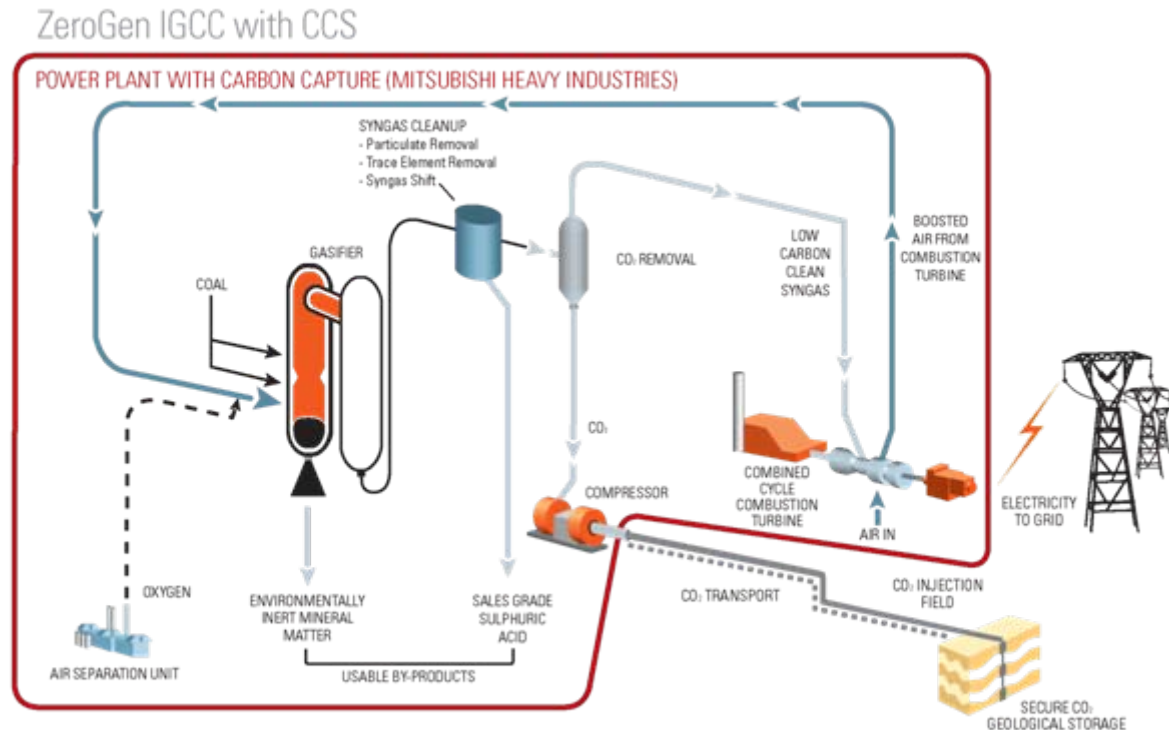
- ▶ *530MW (gross) IGCC power plant*
- ▶ *CO<sub>2</sub> capture 65-90%*
- ▶ *location TBA – 7 sites being examined*
- ▶ *estimated project cost of A\$4.3B*
- ▶ *CO<sub>2</sub> captured 2,000,000 tonnes per year (at 65%)  
3,000,000 tonnes per year (at 90%)*

# ZeroGen overview



- ▶ **Current structure**
  - ▶ *owned by Queensland Govt*
- ▶ **Pre-Feasibility funding**
  - ▶ *Queensland Govt*
  - ▶ *Australian Coal Association (ACALET)*
  - ▶ *Mitsubishi Corporation (MC) / Mitsubishi Heavy Industries (MHI)*
- ▶ **Timing**
  - ▶ *Pre-feasibility study completion June 2010*
  - ▶ *Feasibility study completion Sept 2011*
  - ▶ *Plant operational Oct 2015*

# ZeroGen: IGCC with capture partner



## ► Desired delivery model

- *single point responsibility*
- *assumption of integration risk*
- *make good obligations*
- *significant elements committed to lump sum pricing*

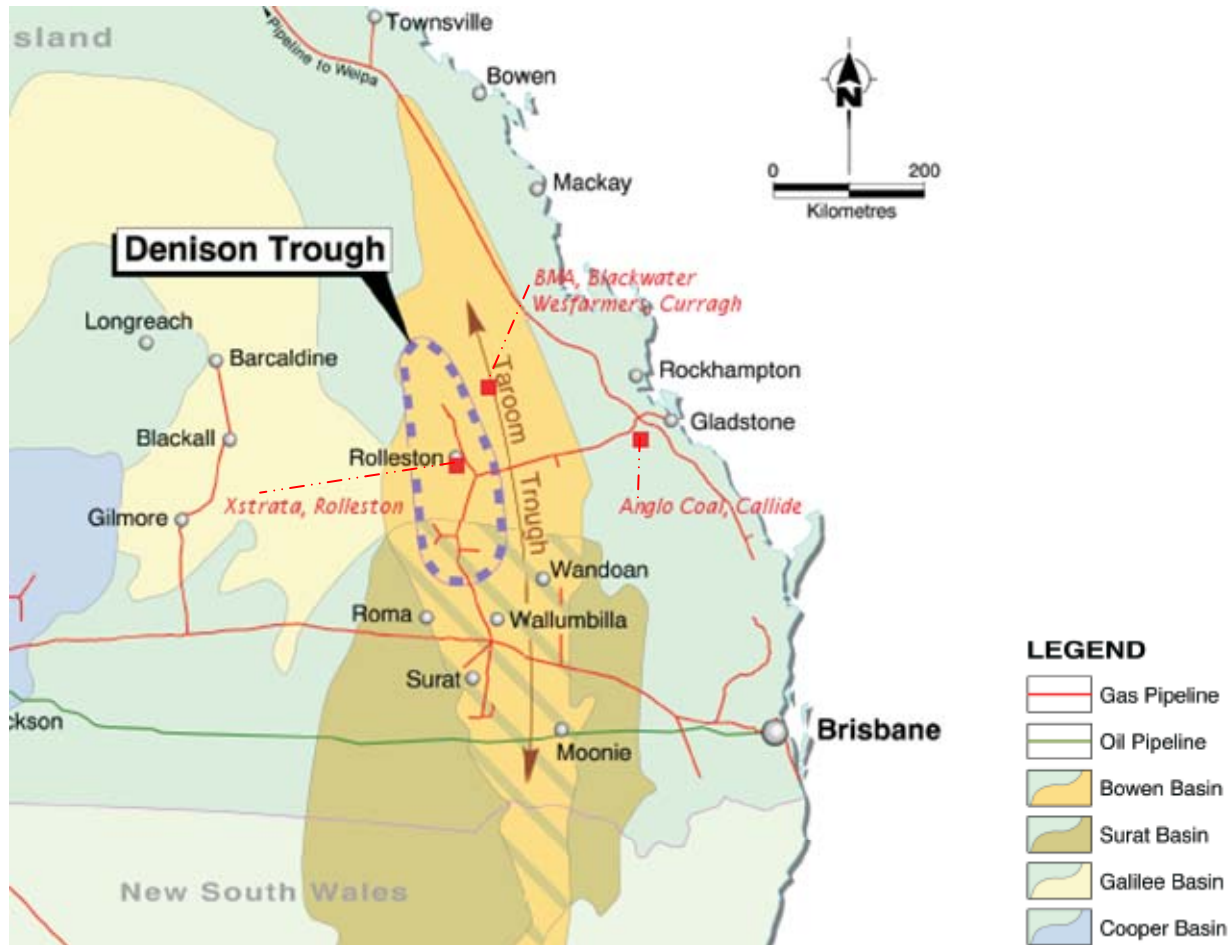
# Clean Coal Power's (CCP) IGCC Nakoso Plant



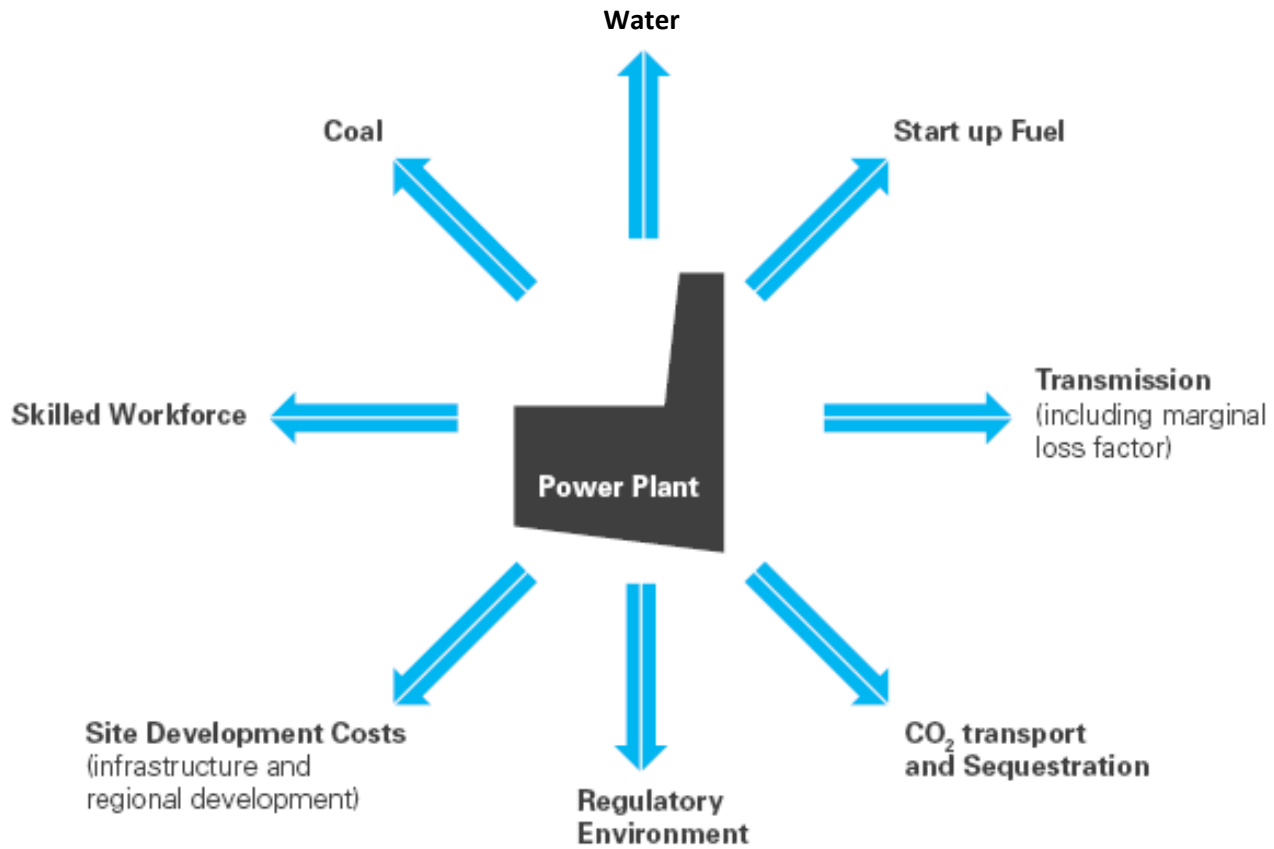
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# Queensland Central / Southern potential plant sites &



# ZeroGen: site selection criteria



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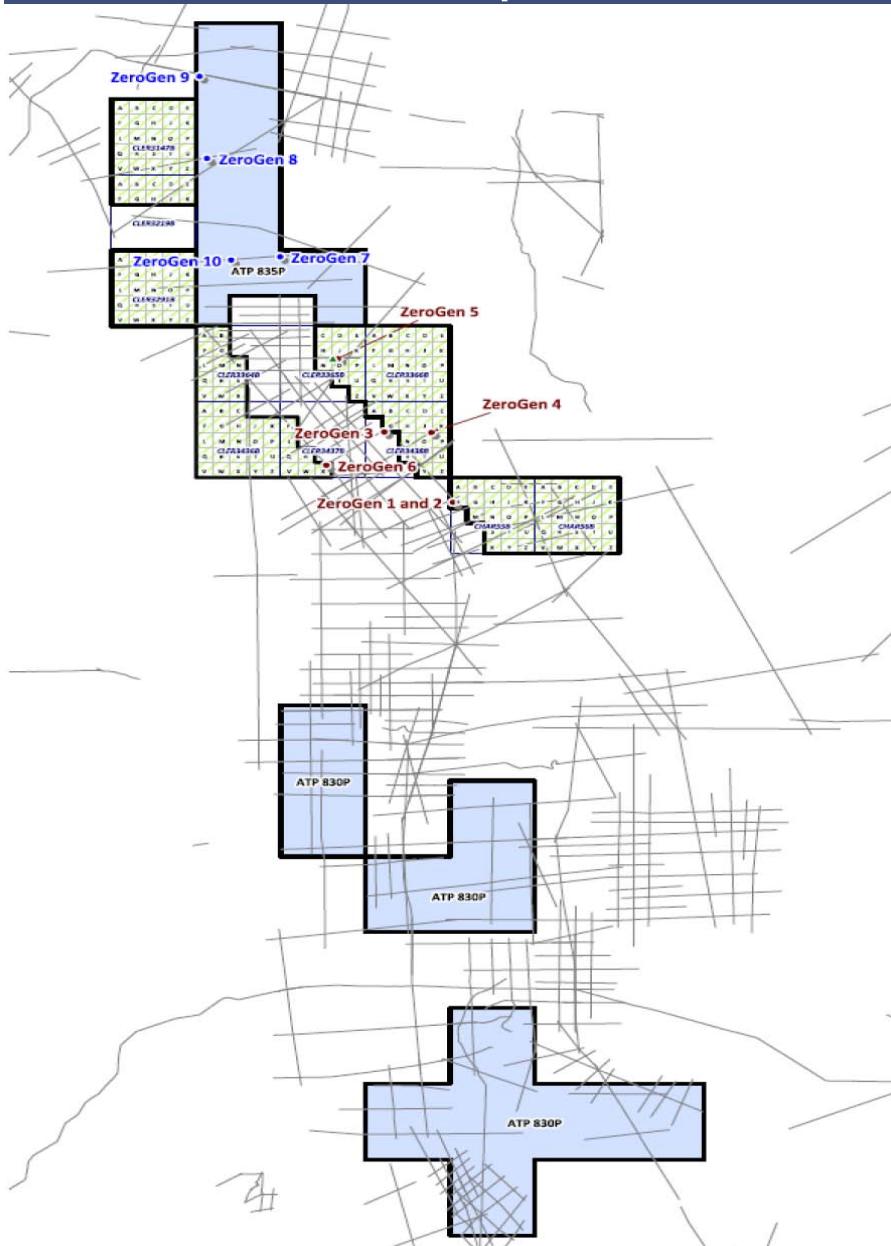
# ZeroGen: CO<sub>2</sub> storage

- ▶ Critical risk issue is to identify, prove and develop CO<sub>2</sub> storage capacity to store at least two million tonnes per annum for 30 years (60 MT, for \$50 per tonne @ P75 probability)
- ▶ Focus at present on Denison Trough with a storage potential for 100 million tonnes if adjacent depleting gas fields are also available for storage
- ▶ Concurrently with additional delineation work in Denison ZPL will collaborate with Commonwealth and State authorities (such as the Carbon Geostorage Initiative Qld) to investigate other sites
- ▶ Queensland *Greenhouse Gas Storage Act 2009* in force, ZeroGen received tenements under transition provisions





# ZeroGen GHG exploration tenements



- ▶ Tenements are essential to progress any exploration program
- ▶ Under the new *Greenhouse Gas Storage Act*, ZeroGen has acquired Greenhouse Gas Exploration Permits
- ▶ ZeroGen is the only organisation at present to hold these permits under Queensland legislation
- ▶ Total area of tenements
  - ▶ **1,225.5km<sup>2</sup>**

# ZeroGen: Denison exploration program

- ▶ **DP1 (Drilling Program 1): *completed***
  - ▶ *Two wells (ZG1, ZG2) drilled to identify and better understand the geology of the Northern Denison Trough and confirm its potential to safely store injected CO2 long term. (Completed)*
- ▶ **DP2a (Drilling Program 2a): *completed***
  - ▶ *Four stratigraphic (ZG3–6) wells drilled to delineate reservoirs on ATP722P.*
  - ▶ *Total of 3000m of core extracted and analysed.*
- ▶ **DP2b (Drilling Program 2b): *in progress***
  - ▶ *An additional four stratigraphic wells (ZG7–10) to confirm the geology over the Northern tenement ATP835P and further delineate reservoirs. Drilling commenced on 6 March 2009.*
  - ▶ *ZeroGen will also conduct a short-term CO2 injection to calibrate reservoir models and confirm injectivity.*
  - ▶ *Program for 2010 will be refined based on 2009 results.*

# ZeroGen Conclusion

- ▶ **Mature project – expert staff, significant preparatory engineering conducted, extensive drilling and exploration, very experienced power plant technology provider**
- ▶ **Strong partnership with MC and MHI**
- ▶ **Project management, project engineering and geosequestration knowledge sound basis for commercial-scale project**
- ▶ **Strong local, state, national and international support including government and ACA**
- ▶ **Diverse support – World Coal Institute, CFMEU, WWF**





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