



ZeroGen
smarter, cleaner power

Challenges for Early Movers

The ZeroGen Experience

Presentation to the

Expert Meeting on Financing Carbon Capture and Storage

by Dr Anthony Tarr, Chief Executive Officer, ZeroGen Pty Ltd



Challenges for Early Movers



- Global and national setting
- Project overview
- Project deployment challenges
- Some important `open` issues



ZeroGen - global and national setting



- Ratified Kyoto Protocol – 2010 emission trading scheme
- Climate change - public policy and business decision makers
- State energy policies – new coal-fired power stations w/o CCS
- Funding – Federal, State and industry funding commitments
- Australian coal industry
- Integrated Gasification Combined Cycle (IGCC) + Carbon Capture and Storage (CCS), in the future energy mix

Project Overview



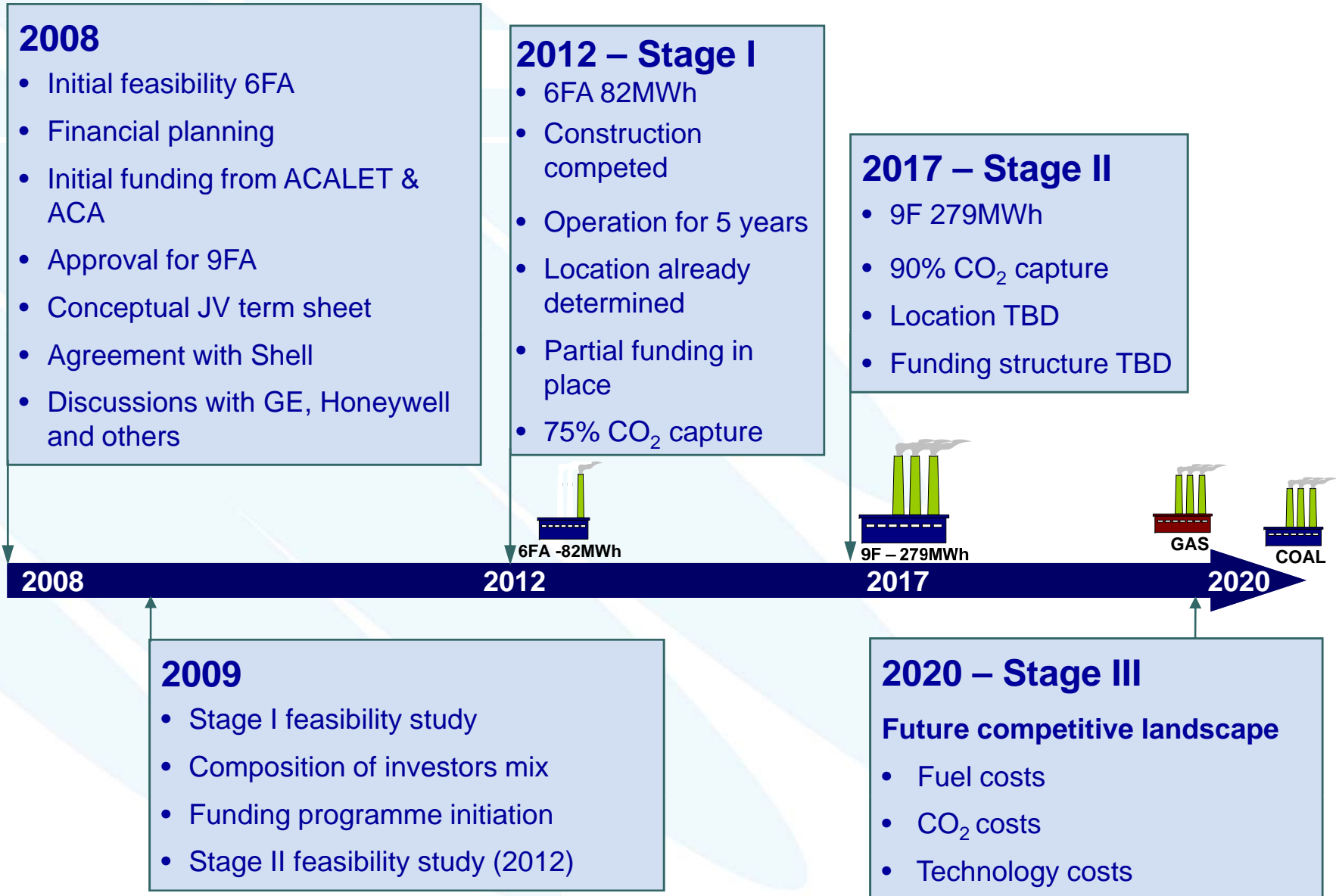
- **Location:** Queensland, Australia
- **Current structure:** owned by Queensland Government
- **Technology approach:** IGCC + CCS
- **Timeline:** Stage I - 2012, Stage II -2017
- **Substantial industry support:** ACALET, ACA, Shell



Project Overview – Project Participants



Project Overview



Project deployment challenges



- ZeroGen IGCC + CCS identified by Australian coal industry as priority technologies for development
- Challenges for deployment exist in relation to:



Project deployment challenges



Political, Legal and Regulatory

- Permits and regulatory framework
- Consensus and joint undertakings
- Approvals issued for IGCC / CCS
- Fragmented global CO₂ policy
- Globally relevant regulations

Technology

Community
&
Stakeholder

Financial,
Commercial
& Economic

Project deployment challenges



Technology

- IGCC technology
- CCS
- Geosequestration
 - Exploration
 - Injection
 - Well design

Location and technology integration

- Site selection
- Construction
- O&M

Political,
Legal &
Regulatory

Community
&
Stakeholder

Financial,
Commercial
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Project deployment challenges



Political,
Legal &
Regulatory

Technology

Financial,
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Community & Stakeholders

- Investment and public community confidence in CCS
- Over 200 interest and stakeholder groups
- Current support from
 - Government
 - Public
 - Industry
 - Commercial
 - Union

Project deployment challenges



Financial, Commercial & Economic

Financial: Revenue and profitability dependent on:

- carbon pricing
- government subsidies
- technology efficiency improvements (CapEx, OpEx)

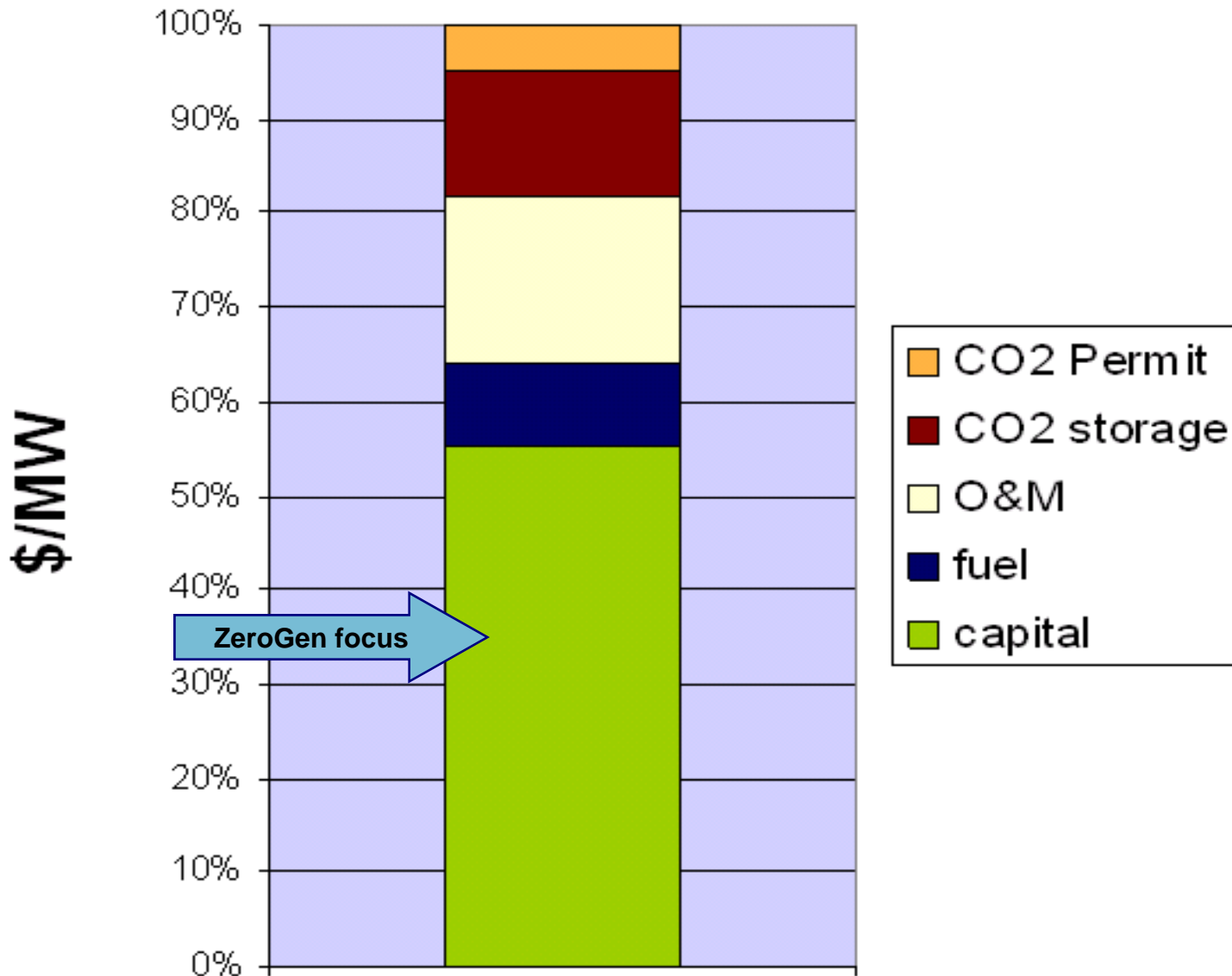
Financial risk: Technical, Financial (loan & interest, bankability)

Commercial: Identifying L-T investor

Economic: Input optimisation of Australian economy and coal industry

Project deployment challenges


IGCC with CCS cost breakdown



Some important `open` issues



Investment structuring - funding options and schemes

- Grants enhanced ETS credits
 - Industry participants
 - Loan guarantees
 - Private parties
 - ETS for direct investment
 - Clean Development Mechanism (CDM) credits
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- Funding options will be discussed with Government funds, and commercial banks
 - Need for innovative ideas to address bankability of demonstration projects



Thank you

