Unlocking the Cooper Basin’s Resource Potential
Oil and Gas Processing
Australia has Enormous Natural Gas Potential

Western Australia

- 298 Tcf
- 159 Tcf

Conventional: 298 Tcf
Unconventional: 159 Tcf

Eastern Australia

- 363 Tcf
- 120 Tcf

Conventional: 363 Tcf
Unconventional: 120 Tcf

Shale Gas Estimates (Tcf)

1. China 1,275
2. United States 862
3. Argentina 774
4. Mexico 681
5. South Africa 485
6. Australia 396

1. Total demonstrated resources
2. Technically recoverable resources

Source: BREE 2012 Gas Resource Assessment & EIA World Shale Gas Resources 2011
Santos’ Eastern Australia Resource Footprint

Portfolio of multiple play types spread across eastern Australia

**McArthur Basin**
- Liquids-rich shale play

**Amadeus Basin**
- Conventional oil and gas
- Evaluating unconventional potential

**Today’s focus**

**Cooper Basin**
- Conventional
- Tight gas
- Shale
- Deep coal

**Surat/Bowen Basin**
- Coal seam gas

**Gunnedah Basin**
- Coal seam gas

*Porfolio of multiple play types spread across eastern Australia.*

*Santos* We have the energy.
Cooper Basin: Location and Infrastructure

- Exploration area 40,000 sq kilometres
- 100 – 150 gas fields, 650 - 750 wells
- 60 – 80 oil fields, 400 – 500 wells
- 15 major satellite facilities
- 100 satellite/nodal compressors
- 50 wellhead compressors
- 6,000+ kilometres of pipelines/flowlines
- Gas storage facilities

... in the centre of the Eastern Australian integrated gas market
Domestic and Export Demand Driving Growth

Export scale has reinvigorated investment in the Cooper Basin

- Extending 50+ years of operating in the basin
- Underpinned upgrade of Moomba facility and ongoing field development expenditure
- Production decline arrested
- Safeguarded over 3,000 direct jobs
- Investment by international majors (Chevron & BG Group)

1. Source: ACIL Allen Consulting
Cooper Infrastructure Expansion Project

$5B investment over next 10 years on drilling and infrastructure …

DRILLING/ GATHERING
- Infill PAD Drilling Technology
  - 4 new drilling rigs over 15 years
- 600 wells / 110 pads
- 300km of Gathering Network Infrastructure

COMPRESSION
- Expansion of five Field Satellite Compression Stations
- Additional Field Gas Compression 50,000 Hp

PROCESSING & TRANSPORT
- Moomba Gas Processing Plant
- Increased CO2 Processing capacity
- Steam / Power Gen upgrade
- Sales Gas export facilities

... delivering sales gas to meet new contracts from 2015
Cooper’s Unconventional Resource Opportunity

Market demand accelerating commercialisation of three potential multi-tcf plays

- BCG tight sands
  - Regionally extensive over-pressured gas system
  - Heterogeneous stacked tight fluvial sands

- Shale
  - Over-pressured gas system
  - Tight formations requiring fracture stimulation

- Deep coal
  - Porous coals, over-saturated with free gas
  - Thick and regionally extensive
  - Similar reservoir quality to successful US plays

Cooper Basin, South Australia
## Our Exploration Program Is On Track

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<th>Progress</th>
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<td>Drill <strong>Van der Waals-1</strong></td>
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<td>In-wellbore projects (5)</td>
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<td>Drill &amp; multi-frac <strong>Moomba-192</strong></td>
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<td>Drill <strong>Moomba-194</strong></td>
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<td>Multi-frac <strong>Moomba-194</strong></td>
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<td>Drill &amp; multi-frac <strong>Roswell-2H</strong></td>
<td>(horizontal well)</td>
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<td>Drill &amp; multi-frac <strong>Moomba-193H</strong></td>
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Servicing the Cooper Basin

- 1200 staff (600 Santos + 600 Contractors)
- Primarily 2 week on / 2 week off roster
- 9 fixed camps plus mobile camps
- 3000+ meals per day
- 5000km+ roads maintained
- Aviation service ex Adelaide and Brisbane
- Light aircraft / helicopter services on site
- Emergency, Fire & Medical response
- Waste Management
- Landholder & Tourist emergency response
Potential industry resource requirements - Drilling

**Current annual activity**
- 5 – 6 Drilling Rigs;
  - 80 – 100 wells
  - 480 – 600 frac stages
  - 15 – 20k tonnes proppant
  - 480 – 600 km tubular
  - 200–300 people + services
    (trucking, flowlines, camps etc...)
  - ~1000 trailer loads

**Potential annual activity**
- 10 – 15 Drilling Rigs;
  - 200 – 300 wells
  - 3000 – 4000 frac stages
  - 500k – 800k tonnes proppant
  - 2500 – 3500 km tubular
  - 700 – 1000 people + services
  - 3500 – 6000 trailer loads
Surface Facilities – Major Projects

CIEP – Big Lake Upgrade + Fuel Gas Pipeline

**Fuel Gas Pipeline**
- 20Km 6” pipeline completed ahead of schedule
- End of line facilities Complete

**Big Lake Satellite Upgrade**
- Significant Upgrade to Gas Satellite
- 1st Machine Commissioning in progress (Comp 6)
- Fuel Gas line and gas supply system completed and handed over.
- Existing Comp 4 & 5 converted to new FG system and running.
CIEP – New CO2 Removal Plant (Train 8)

**Engineering**
- 90% model reviews commenced

**Procurement**
- Vessels will be on site in January 2015
- Other LLI’s on schedule

**Construction**
- GRE pipework installation commenced
- CSMP contractor for OSBL mobilised
- Tank fabrication commenced
- Module fabrication and assembly contract awarded
CIEP Project Contracts & Procurement Update

Major Australian contracts recently awarded:
- Satellites & CO₂ Front End Engineering Design + EPCm (Engineering/Procurement/Management)
- Satellites & CO₂ Engineering Procurement Construction Management (EPCM)
- Civil Works – (Supply/Construct/Install)
- Structural Mechanical Piping – (Fabricate/Install/Erection)
- Fuel Gas Pipeline – (Install/Construct)
- Tank Construction – (Fabricate/Supply)
- Compressor Installation & Commission – (Install/Commission)
- Demolition & Earthworks – (Install/Construct)
- Site Preparation for CO₂ – (Fabricate/Install/Erection)
- Module Fabrication – Whyalla – (Fabricate/Construct)
- Electrical & Instrumentation – (Install/Construct)
- Logistics (Sea, Air & Road) – (Service Provider/Transport)
- Heavy Haulage - (Service Provider/Transport)

Major Australian contracts pending:
- CO₂ Site Heavy Lift Cranes @ $4m – (Craneage)
- CO₂ Structural Mechanical Piping @ $12m – (Fab/Install)

Major Australian contracts forecast:
- CO₂ Elect & Instrumentation @ $11m – (Install/Construct)

Australian Purchase Orders awarded to date:
- Approximately $76m (Piping, Mechanical, Valves)

Australian Purchase Orders forecast to be awarded:
- Approximately $8m – (Electrical Bulks, gas detectors)
Surface Facilities – Eastern Australia

› Circa $150M of surface facilities work planned next year on projects with a TIC of circa $300M

› Work consists of multi discipline project work across all project phases.
  › Engineering Design
  › Procurement
  › Fabrication
  › Electrical
  › Instrumentation
  › Construction

› Represents some 42 projects at various stages of implementation

› Majority of spend within Australia

› Expect similar spend profile to CIEP
Cooper Basin Well Positioned For Success

Enormous resource potential
- Unprecedented demand drives higher prices
- Incentivises investment in multiple Cooper resource plays

Eastern Australian market access
- Ability to supply gas to EA or export markets
- Comprehensive infrastructure

Established Australian service providers
- Service industry well represented in basin
- Industry experience & know-how from decades of operations

Early technical successes
- M191 REM shale and M194 follow-up
- Nappamerri Trough Basin Centred Gas Play
- Encouraging Deep Coal results