South Australian update and investment opportunities

PESA Deal Day
14 May 2018, Adelaide

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South Australian Department of the Premier and Cabinet
State of play in SA

- SA and Qld Cooper-Eromanga basins remain Australia’s largest onshore oil and gas producer
- Huge potential for gas in Cooper Basin unconventional reservoirs, including the world’s deepest coal seam gas
- Work program bidding in Cooper & Otway
- Over-the-counter applications elsewhere
Gas and Oil Production Trends

**Cooper Basin**
- 2007-08: 60
- 2008-09: 70
- 2009-10: 80
- 2010-11: 90
- 2011-12: 100
- 2012-13: 110
- 2013-14: 120
- 2014-15: 130
- 2015-16: 140
- 2016-17: 150

**Otway Basin**
- 2007-08: 1
- 2008-09: 2
- 2009-10: 3
- 2010-11: 4
- 2011-12: 5
- 2012-13: 6
- 2013-14: 7
- 2014-15: 8
- 2015-16: 9
- 2016-17: 10

**Crude oil sales (ML)**
- 2007-08: 200
- 2008-09: 300
- 2009-10: 400
- 2010-11: 500
- 2011-12: 600
- 2012-13: 700
- 2013-14: 800
- 2014-15: 900
- 2015-16: 1000
- 2016-17: 1100

**Price ($/bbl)**
- 2007-08: 150
- 2008-09: 120
- 2009-10: 90
- 2010-11: 60
- 2011-12: 30
- 2012-13: 0
- 2013-14: 120
- 2014-15: 90
- 2015-16: 60
- 2016-17: 30
Upcoming Cooper Basin PEL expiries

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<th>Expiry year</th>
<th>2019</th>
<th>2020</th>
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<td>Production</td>
<td>Retention</td>
<td>Exploration – application</td>
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<td>National Park – no petroleum access</td>
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Western Flank Oil play trend
Gas plays

Western Flank Oil play trend
Gas plays
Cooper Basin Oil

- Discoveries continue on the Western Flank oil play trend
- 3D seismic - structural & stratigraphic traps (‘hose on nose’)
- Excellent sandstone reservoirs
- ~ 50% success finding average 2.5 mmbbo recoverable

Case study - Bauer Oil field

- Subtle anticline (pre-drill mean recoverable resource 0.5 mmbbl)
- Mapped on 3D & drilled in 2011
- Reservoir 1400m, 45 API oil, recovery factor ~75%
- Production 6,900 bopd
- Bauer 26 is first horizontal well in a new oil pool - 350m net oil pay
- In 2017 - 26 wells, 2P EUR ~20 mmbbl

The Bauer Field, Cooper/Eromanga Basin: Case Study of a Low-Relief, High-Productivity Oil Field.
Glen Buick. AAPG Search and Discovery Article #110225 (2016)
Cooper Basin Gas

Conventional Gas Plays
- Structural and structure-stratigraphic traps, sandstone reservoirs, coal and shale source (6.5 TCF produced)
- Sustained historical success rate of ~40% for exploration wells.

Unconventional Dry to Wet Gas Plays
- Deep self-sourcing coal – world’s deepest CSM
- Mixed reservoirs with coal and shale source
- Tight sandstone reservoirs
- Strong focus on deep coal play

DSD 2016 assessment of in place unconventional reservoirs in the Cooper Basin:
- 669 TCF C1-C5 Sales Gas-in-Place
- 80 billion C6+ Bbls Gas Liquids / Oil-in-Place
Recent Initiatives

- **A$48 m PACE (Plan to ACcelerate Exploration) Gas Grants** to deliver more gas soonest to SA power generators. Two grant rounds have resulted in a diverse portfolio – from plant optimisation to free up gas to market, pipelines for stranded gas, to drilling Haselgrove 3 ST1 gas discovery.

- The nine projects will realise a total investment from industry of $271 million. These projects are targeting 217PJ of gas with 1957PJ of follow up potential.
Otway Basin

- No applications for OT2017-A release (targeting northern Early Cretaceous Troughs).
- Vacant acreage subject to work program bidding.
- Conventional oil & gas plays.
- Connected to SE Australian gas market, local gas plant currently mothballed.
- PEL 629 granted to Ouro Preto Resources (Cabot Energy Plc) in 2014.
- PELs 494 - Beach Energy Jolly 1 ST1 & Bungalow 1 (2014) targeted conventional reservoirs + deeper unconventional targets.
- Beach Haselgrove 3 ST1 gas discovery
- Caroline 1 – Air Liquide CO₂ well to be decommissioned. Produced up to ~60 bbl heavy oil/yr.
- New vacant acreage with recent relinquishment of PPL21 (excluding 1km² for Caroline CO₂ Plant) – potential for Late Cretaceous Waarre Sst oil play. No seismic since 1990 over PPL21.
Haselgrove 3 ST1 gas discovery

- New Otway Basin gas discovery
- Made possible by a $6m PACE Gas grant
- Announced by Beach Energy Jan 2018
- Constrained flow rate ~ 25 mmscfd - Sawpit Sst.
- Estimated gross gas column 104 m Sawpit Sandstone, net pay 25.6 m (TVT)
- Estimated gross gas column 11.6 m Pretty Hill Sandstone, net pay 8.5 metres (TVT)
- Initial production testing conducted in February/March 2018
- Resource assessment in progress
Otway Basin Recent Initiatives

**PACE Gas**

**Round 1**
- $6 million for the Beach Energy Haselgrove 3 ST1 well targeting conventional reservoirs

**Round 2**
- $5.26 million for the Beach Energy/Cooper Energy Dombey 1 well
- $4.95 million Vintage/Rawson Nangwarry 1 well

**GAP Grant for Katnook Gas Processing Facility**
- In March 2018 the Federal Government awarded a $6 million Gas Acceleration Program (GAP) grant to Beach Energy to construct a new $22.6 million Katnook Gas Processing Facility

**South Australian Government partners with CSIRO on South East Gas study**
- On 7 February 2018 the South Australian Government partnered with the CSIRO to conduct research into the social and environmental impact of the gas industry in the South East
- The partnership will enable CSIRO’s Gas Industry Social and Environmental Research Alliance, or GISERA, to conduct studies on the impacts of key issues of concern to communities in the region
Roundtable for Oil & Gas in SA

Designed to inform industry strategies, government policies, and regulations to facilitate oil & gas projects in ways that SA communities welcome.

>2,000 members, >1000 organisations & ~30 individuals.

8 working groups addressing priorities ranked by Roundtable membership:

- Training – Tonsley Centre of Excellence;
- Cooper Basin supply hubs, roads & air strips;
- Cooper Basin water use;
- Transport – minimise cross border red tape;
- GHG detection;
- Supplier forum;
- Gaseous fuels for transport & heavy machinery;
- Sharing Information.

New members are welcome

Easy access to data

- Downloadable WCRs - including scanned mudlogs and composite logs
- Digital well logs + images
- 2D & 3D seismic data
- Field, edit tapes, cased hole, digital mudlogs, image logs – free web access to logs via PEPS online in future
- Maps, GIS - Cooper isolith, isopach, gas wetness etc.
- Core and cuttings available for viewing and sampling (new Core Library)
- Core & thin section photo databases via free downloads
- SARIG
South Australia’s door is open.

Rated most attractive petroleum jurisdiction in Australia by Fraser Institute

Bight Basin attracting billions in exploration investment

Cooper Basin remains Australia’s largest onshore oil and gas province

A framework placing local companies into a global supply chain

Australia’s first roadmap for unconventional gas projects

Oil and gas roundtable with hundreds of members working to address priorities

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