



*The Changing Face of Australian Coal
New Development and Investment Opportunities*

Clean Coal Day in Japan 2018 - International Symposium
10 - 11 September 2018

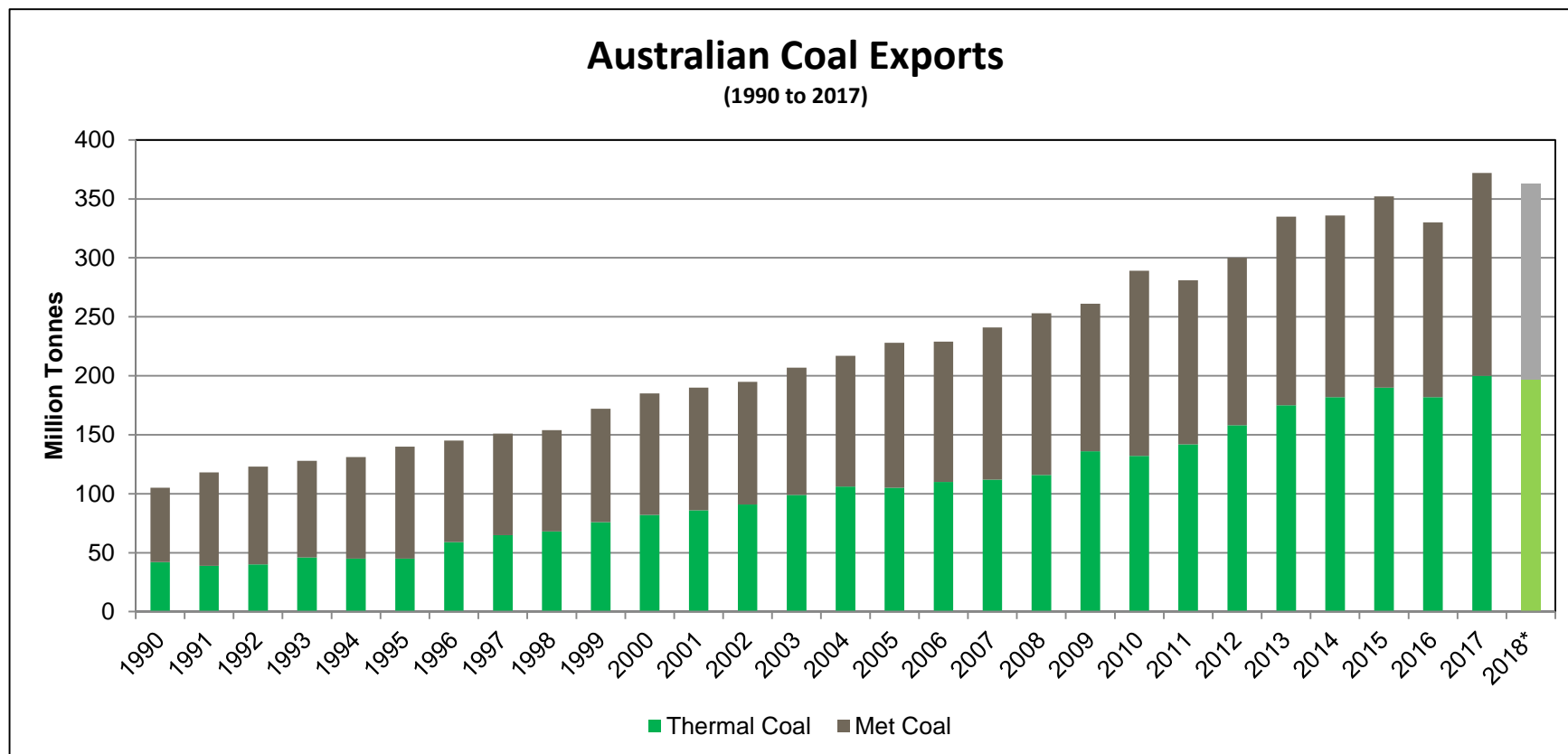
1. The Current State of Play

- A short recent history of Australian Coal exports
- Mine openings and closings
- The changing nature of coal investors
- The changing economics of Australian Coal

2. The Forward Strategy

- What are the challenges for new development?
- Where is the future development?
- Who are the future producers and investors?
- What are the opportunities?

Australian Coal Exports

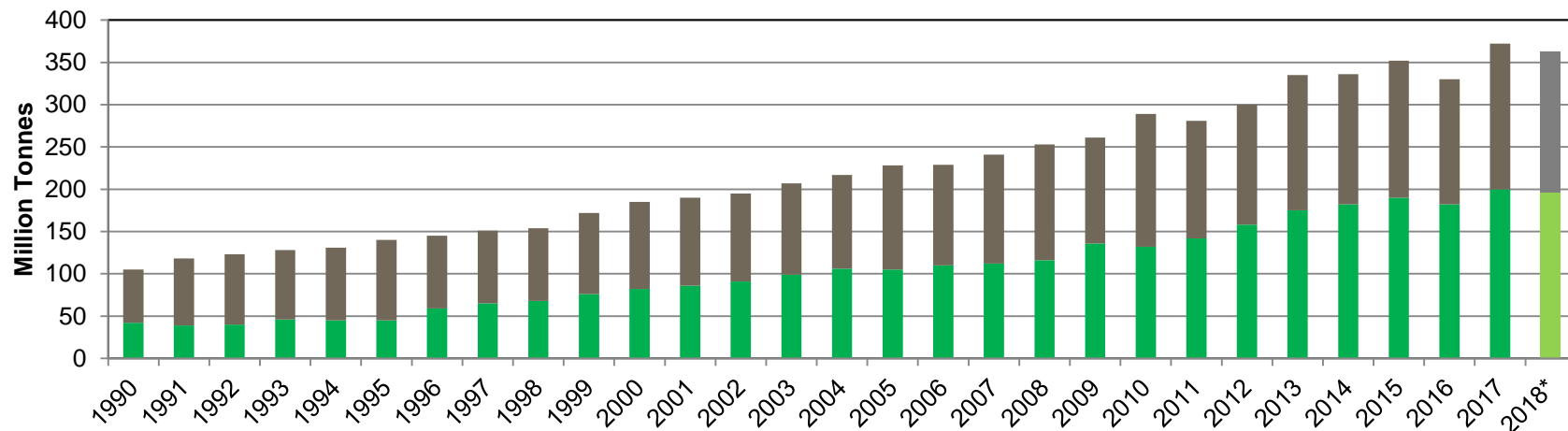


Source: Qld Government, NSW Government - 2018

- Over the last 28 years, exports of Australian coal have grown steadily at approximately 10%pa
- Since 2013, exports have grown at less than 3%pa

Australian Coal Supply – Market Update

Australian Coal Exports (1990 to 2016)

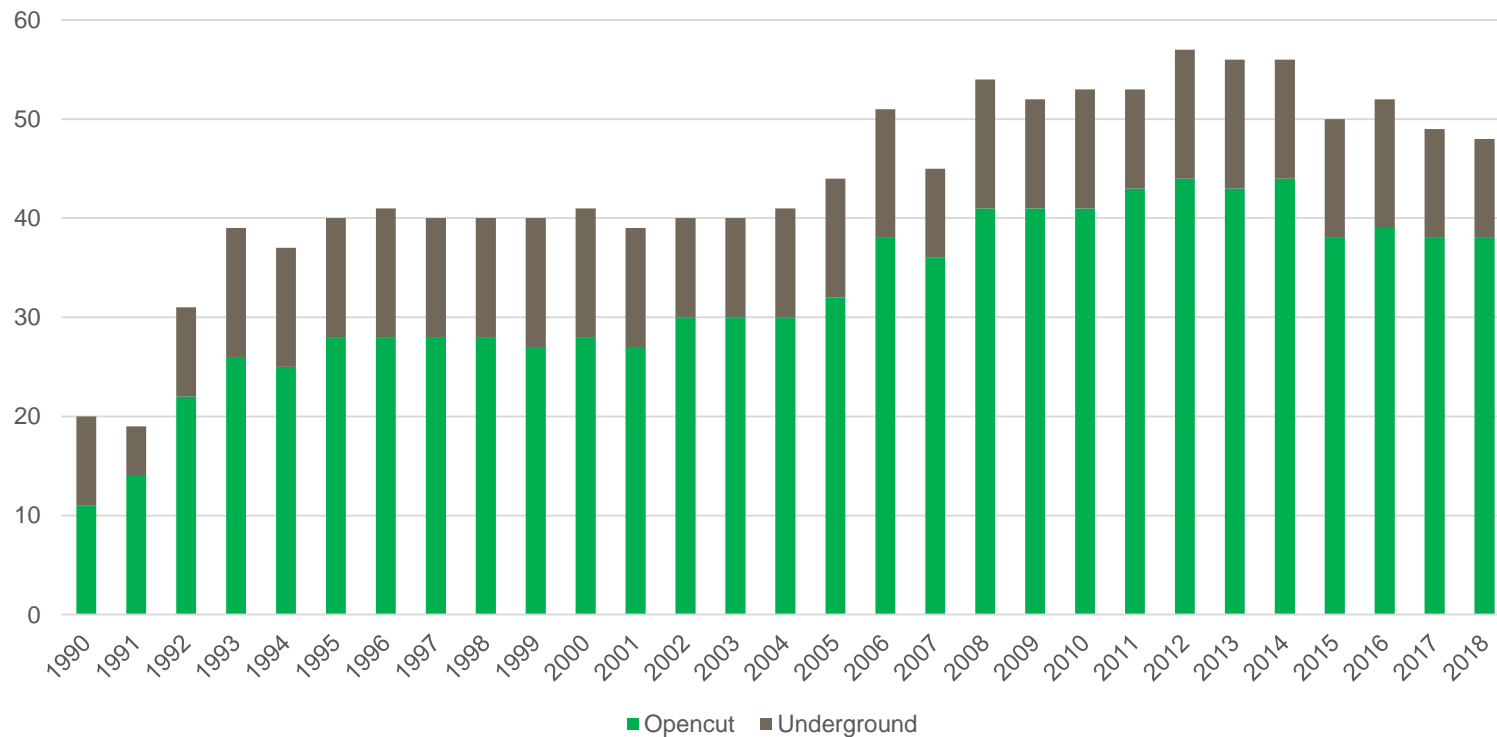


Australian Coal Mine Openings and Closures



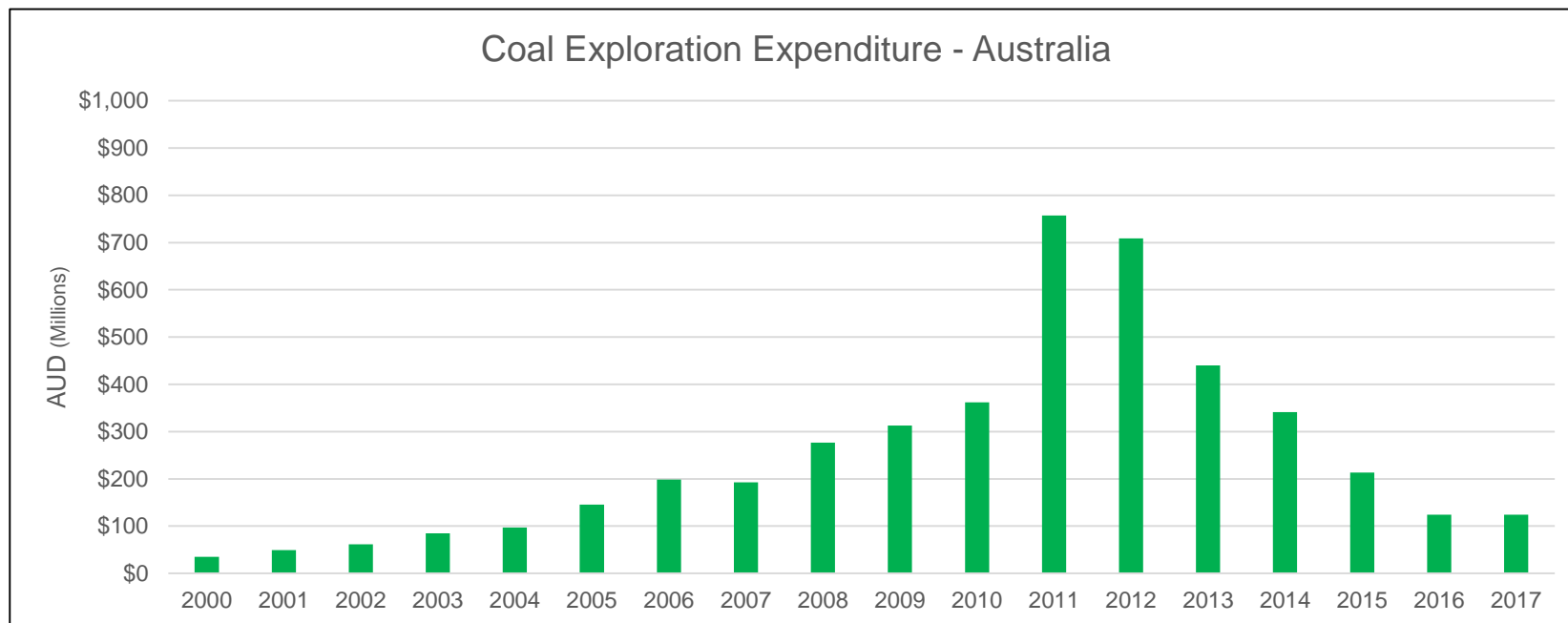
Australian Coal Exports

Queensland - Number of Operating Coal Mines



- The long-term growth in exports masks underlying changes to the structure of the Australian Coal industry
- The number of operating mines peaked in 2012 and since then mine closures have exceeded mine openings

Australian Coal Exploration Expenditure



Source: Australian Bureau of Statistics - 2018

- Exploration expenditure is a 'leading indicator' of new mine development
- Expenditure on exploration for coal has fallen dramatically since a peak in 2011
- Given the increasing lead-time to develop new projects, it is apparent that there is likely to be limited new production from Greenfield development in the short to medium term

Coal Mine Openings - Queensland

Mine	Year	Original Developer	Current Owner
Foxleigh	2000	Foxleigh Coal	Anglo Coal (then Realm)
New Acland	2002	New Hope	New Hope
Rolleston	2003	Xstrata	Glencore
Moorvale	2004	Macarthur Coal	Peabody
Minerva	2005	Felix	Yancoal
Poitrel	2005	BHP	BHP
Baralaba	2005	Cockatoo	Closed (Liberty to reopen)
Broadlea	2005	AMCI	Closed
Carborough Downs	2005	AMCI	AMCI (via Vale)
Millenium	2006	Excel	Peabody
Isaac Plains	2007	AMCI	Closed (reopened by Stanmore)
Sonoma	2008	Q-Coal	Q-Coal
Lake Vermont	2009	Jellinbah	Jellinbah
Cameby Downs	2010	Syntech Resources	Yancoal
Clermont	2010	Rio Tinto	Glencore
Middlemount	2011	Macarthur Coal	Peabody/Yancoal
Daunia	2013	BHP	BHP
Caval Ridge	2014	BHP	BHP
Grosvenor	2015	Anglo	Anglo
Byerwen	2017	Q-Coal	Q-Coal
Meteor Downs	2018	Sojitz/U&D	Sojitz/U&D

- More than 80% of new greenfield mines were developed by “Independent or Junior” Producers
- The majority of those mines were subsequently acquired by the “Major” Producers

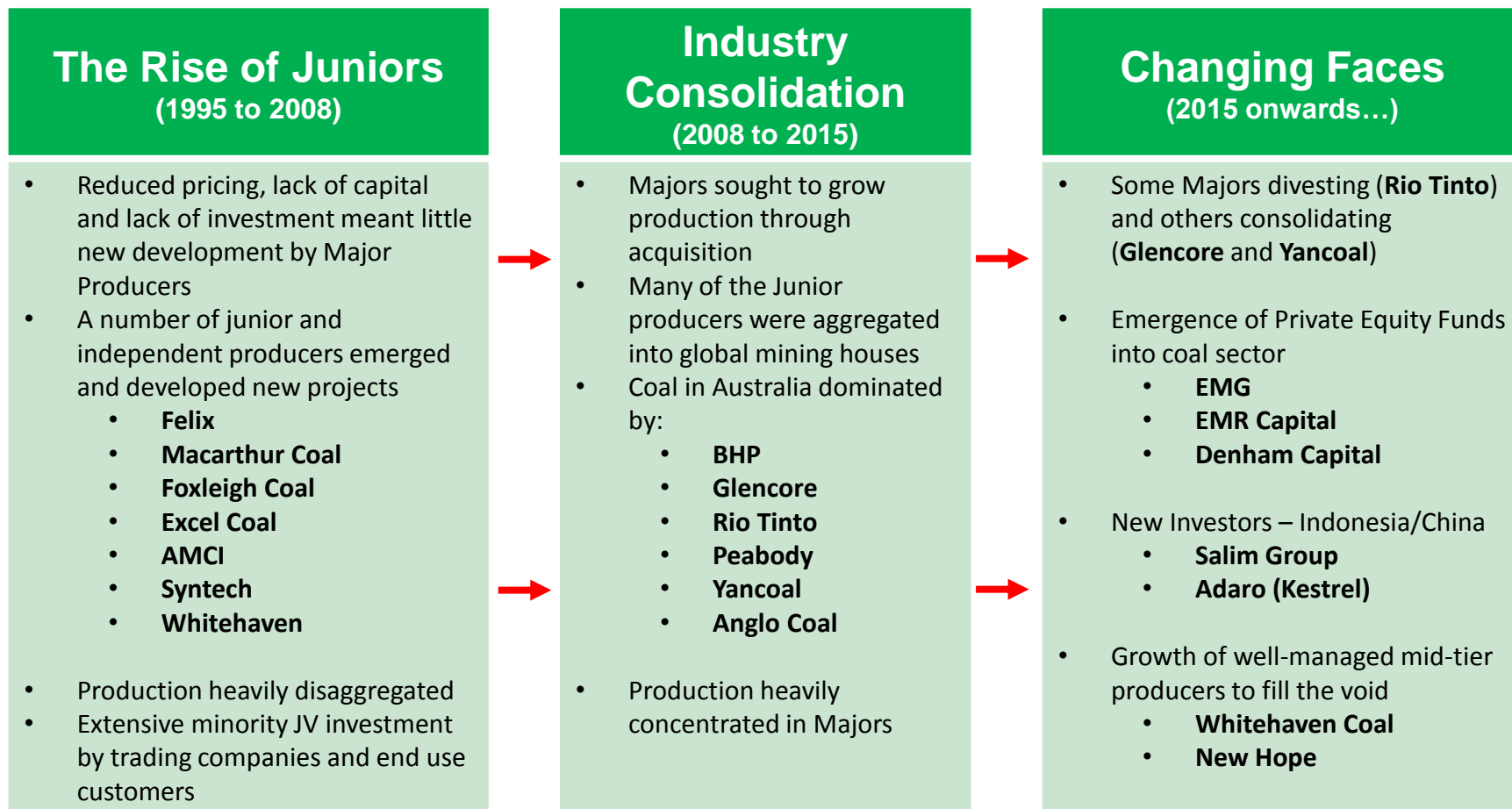
Coal Mine Closure - Queensland

Mine	Year	Reason	Status (<i>new owner</i>)
Ebenezer	2002	Resource Depleted	Closed
Jeebropilly	2008	Resource Depleted	Closed
Broadlea	2011	Resource Depleted	Closed
Norwich Park	2011	Uneconomic	Closed
Blair Athol	2013	Uneconomic	Restarted 2017 (<i>Terracom</i>)
Isaac Plains	2013	Uneconomic	Restarted 2016 (<i>Stanmore</i>)
Wilkie Creek	2013	Uneconomic	Closed
Gregory/Crinum	2015	Uneconomic	Restarting 2019 (<i>Sojitz</i>)
Burton	2015	Resource Depleted	Restarting 2019 (<i>New Hope</i>)
Newlands UG	2015	Resource Depleted	Closed
Baralaba	2016	Financial Issues (WICET)	Restarted 2018 (<i>Liberty</i>)
Cook	2016	Financial Issues (WICET)	Restarted 2018 (<i>Bounty</i>)
Millenium	2017	Resource Depleted	Closing

- The majority of mine closures were due to full depletion of resource or resource becoming uneconomic due to increased depth
- A number of mines have restarted under different ownership. Typically, the new owners are smaller independent or junior producers with reduced overhead

The changing face of Australian coal

- The structure of the Australian Coal industry has changed substantially over the last 20 years in response to changes in market conditions, changes in corporate strategy and availability of capital



The changing role for Trading Companies

- The role of the “sogo shosha” Trading Companies is also changing with the transition of coal marketing to index and quarterly pricing mechanisms
- The traditional role as cornerstone minority investor with marketing rights is less relevant than it was historically
- Improved communications means Producers and JPU and JSM Customers have developed far closer direct relationships. As a result, the need for intermediaries is becoming less critical than it was historically
- In recent years, Japanese strategic investors have broadened their role in coal projects in Australia:
 - **Sojitz** – initially a minority investor, now an independent coal producer
 - **Idemitsu** - transition from minority investor to major producer with more than 14Mtpa of production
- *With the emergence of Private Equity Investors, the role for trading companies and other minority investors is less clear...*

Summary of current situation

The Current State of Play

- ✓ Recent record export levels beginning to fall as limited growth from Greenfield projects
- ✓ Increased mine closures from 2012 to 2017 have been partially offset through brownfield expansion at existing operations
- ✓ Lack of investment in exploration, pre-strip and capital development is beginning to lead to increasing costs, falling production and/or reduced mine-life at some existing operations
- ✓ Reduced exploration expenditure is leading to declining Resource/Reserve inventories at existing mines
- ✓ Current high asset prices mean investment or acquisition of operating assets is prohibitively expensive
- ✓ Limited further options for acquisition of operating assets
- ✓ Limited interest in Greenfield development from Major Producers

Future Development

- ✓ Current export volumes are not sustainable long term without investment in Greenfield development to replace mines which are depleted or become uneconomic
- ✓ Urgent need for more investment in exploration and greenfield development
- ✓ Lead times are long but the potential rewards for investment are substantial

**Future Development
and
Investment Opportunities**

The Challenges for New Development

Challenge	Response
Reduced Exploration activity in last 5 years	<ul style="list-style-type: none"> • <i>Target previously identified quality Resources</i> • <i>Target existing producer basins</i>
Complex regulatory regime	<ul style="list-style-type: none"> • <i>Need to carefully plan approvals process and community engagement</i>
Limited access to capital <ul style="list-style-type: none"> • Greenfield Thermal coal projects extremely difficult to secure debt funding • Difficult to justify infrastructure investment for small projects 	<ul style="list-style-type: none"> • <i>Focus on Metallurgical coal projects</i> • <i>Seek options for use of shared infrastructure or underutilised infrastructure</i>
Complexity of market access	<ul style="list-style-type: none"> • <i>Engage with end-users to support project development initiatives</i>

Identifying Project Opportunities



- Need to assess all project opportunities to identify priority projects for development
- More than 250 potential coal projects in Australia

Project	Company	Resource	OC/BC	Proven	Coal Type	Infrastructure	Proposed Port	Status	General
Each Brook Park Basin Coal (BC)	Agilis Resources (EEF / Vyle Resources) (BC)	HL190B	UG	4.6Mtpa	soft/seam	Basin	VIC/ET/BCCT	Pre-proposal: HL190B (VLE) (BC)	Patented
Windsor South	Rio Tinto (PL) (PL) (PL) (PL) (PL) (PL)	HL190C	OC	Unknown	soft/seam, PCI	Basin	BCCT	Feasibility: Approved	Patented
Millstream (BC)	Windsor Coal Pty Ltd	HL190E	UG	9Mtpa Stage 1	soft/seam, Normal	Basin	Windsor Coal (BCCT)	Pre-proposal: HL190E (Windsor Coal) (BC)	Patented
Windsor (BC)	Agilis Resources (HL190B) (Windsor Coal)	HL190A	OC	6.6Mtpa	soft/seam	Basin	VIC/ET	Pre-proposal: HL190A (Windsor Coal) (BC)	Geotechnical challenge
Old Man (Windsor) (BC)	Pradley Energy Ltd	HL191H	OC	xx	soft/seam	Basin	BCCT	Feasibility: 2021-22, 23-24, 25-26	Geotechnical challenge
Eastlyn (Windsor) (BC)	Pradley Energy Ltd	HL191I	OC	xx	soft/seam	Basin	BCCT	Feasibility: 2021-22, 23-24, 25-26	Geotechnical challenge
Billet (Windsor) (BC)	New Central Coal (HL190B) (Eastlyn From Rio Tinto)	HL190H	OC	4.5 to 4.8Mtpa	Normal	Billet/Billet	Adelaide/Pal	Pre-proposal: 2021-22, 23-24	Geotechnical challenge
Victoria Coal	Rio Tinto (PL)	OC	OC		Soft Seafly Thermal	Basin			Exploration challenge
Windsor West	RHP Oilfield (HL190C) (BC)	HL190G	UG			Basin			New/BCP
Fossil Hill (Windsor) (BC)	Fossil Hill Coal Pty Ltd	HL190K	OC	xx	soft/seam, Normal	Basin	Goldhar	Pre-proposal: HL190K (Fossil Hill Coal) (BC)	Geotechnical challenge
Coal Ridge Project (BC)	Aracis Coal Ltd	HL190L	OC	2.5Mtpa (Stage 1, 2, 3, 4, 5)	PCI	Basin	Goldhar	Pre-proposal: HL190L (Aracis Coal) (BC)	Geotechnical challenge
Colville (OC)	Pradley Energy Ltd	HL190M	OC	3.2Mtpa	soft	Basin	Goldhar	Pre-proposal: HL190M (Pradley Energy) (OC)	Geotechnical challenge
Willie Creek Project (BC)	Willie Creek Coal Pty Ltd	HL190N	OC	xx	soft/seam, Normal	Basin	Goldhar	Pre-proposal: HL190N (Willie Creek Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190P	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190P (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190Q	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190Q (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190R	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190R (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190S	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190S (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190T	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190T (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190U	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190U (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190V	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190V (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190W	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190W (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190X	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190X (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190Y	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190Y (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190Z	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190Z (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AA	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AA (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AB	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AB (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AC	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AC (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AD	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AD (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AE	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AE (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AF	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AF (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AG	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AG (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AH	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AH (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AI	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AI (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AJ	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AJ (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AK	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AK (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AL	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AL (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AM	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AM (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AN	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AN (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AO	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AO (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AP	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AP (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AQ	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AQ (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AR	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AR (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AS	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AS (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AT	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AT (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AU	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AU (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AV	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AV (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AW	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AW (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AX	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AX (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AY	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AY (Windsor Coal) (BC)	Geotechnical challenge
Chin Coal (Windsor Coal) (Windsor) (BC)	Windsor Coal Pty Ltd	HL190AZ	OC/BC	10Mtpa	Normal	Goldhar	Adelaide/Pal	Pre-proposal: HL190AZ (Windsor Coal) (BC)	Geotechnical challenge



Project Assessment Criteria

- Coal Quality
- Resource/Reserve size and status
- Exploration and geological history
- Geotechnical conditions
- Approvals status
- Proximity to existing infrastructure
- Availability of infrastructure capacity
- Capital cost intensity
- Expected Cost of production
- Speed of development/production
- Market awareness of product
- Status of mine planning or feasibility studies
- Upside potential for Reserve
- Upside potential for productivity improvement
- Potential synergy with neighbouring projects

Current Development Projects - Qld

Project	Proponent
Comet Ridge	Springsure Creek Coal
Carmichael	Adani
Springsure Creek	Springsure Creek Coal
Dysart East	Bengal Coal
Minyango	Bounty
Broadlea	Fitzroy
Wilton	Wilton Coal
Walton	Aquila Coal
Valeria	Glencore
South Burnett	Moreton Resources
Bluff	Carabella Resources
Lenton	New Hope
Olive Downs South	Pembroke
Gregory Crinum	Sojitz
Eagle Downs	South 32 / Aquila
Hutton	Valiant Resources
Karin Basin	Vitrinite Coal
Dawson West	CMR Coal
Winchester South	Whitehaven

Source: Qld Government - 2018

- With the recovery in coal markets, extensive effort is now being focussed on greenfield projects due to the reduced M&A options for operating assets
- Limited investment from existing major producers
- Limited interest from private equity due to the long lead time for development
- Increasing investment from mid-tier and/or emerging producers:
 - *Whitehaven*
 - *New Hope*
 - *South32*

Case Study – The Bluff Coal Project

Conclusion

- Current Australian Coal export volumes can only be sustained in the long term through the development of new Greenfield projects
- There remains options for expansion of brownfield projects but ultimately new production will be required to replace depleted or uneconomic operations
- Reduced exploration expenditure over the last 5-7 years increases the lead time for developing new projects
- The changing nature of investors is such that Major Producers and Private Equity Investors are unlikely to commit to Greenfield development
- Greenfield projects will likely be developed by Junior and Independent Producers and developers in collaboration with end use customers and strategic investors
- The role of strategic investors to provide “seed funding” to smaller developers will be critical in advancing project development.

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