

The Adaro Group's Coal Resources and Reserves

Sumber Daya dan Cadangan Batubara Grup Adaro

Reported according to JORC Code 2012 Edition
Dilaporkan sesuai Laporan JORC tahun 2012

Adaro Group's (Equity Adjusted) Consolidated Coal Resources
Konsolidasi Sumber Daya Batubara Grup Adaro (Disesuaikan per Ekuitas)

Group and Operating Company Grup dan perusahaan	Resources Estimated as at 31 st Dec 2018 Perkiraan Sumber daya per 31 Des 2018				Resources Estimated as at 31 st Dec 2017 Perkiraan Sumber daya per 31 Des 2017				Calculated Changes 2018 vs 2017 Perubahan 2018 vs 2017	
	Total Measured, Indicated & Inferred (Mt) Total Terukur, Terkira & Tereka (Mt)	Measured (Mt) Terukur (Mt)	Indicated (Mt) Terkira (Mt)	Inferred (Mt) Tereka (Mt)	Total Measured, Indicated & Inferred (Mt) Total Terukur, Terkira & Tereka (Mt)	Measured (Mt) Terukur (Mt)	Indicated (Mt) Terkira (Mt)	Inferred (Mt) Tereka (Mt)	Measured, Indicated & Inferred change (Mt) Perubahan Terukur, Terkira & tereka (Mt)	Measured, Indicated & Inferred % change Perubahan Terukur, Terkira & Tereka (%)
Adaro Total Sub-bituminous Coal: PT Adaro Indonesia, PT Semesta Centramas, PT Paramitha Cipta Sarana, PT Laskar Semesta Alam, PT Mustika Indah Permai	4,997	3,027	951	1,019	5,097	3,098	971	1,028	-99	-2%
Adaro Total Metallurgical Coal Resources: Adaro MetCoal Companies, Kestrel Coal Mine, Australia	1,506	192	360	954	1,343	188	236	919	163	12%
Adaro Total Bituminous Coal Resources: PT Maruwai Coal	9.5	-	-	9.5	8.4	-	-	8.4	1	13%
Adaro Total Low-rank Coal: PT Bhakti Energi Persada	7,161	3,480	2,885	797	7,161	3,480	2,885	797	0	0%

Note: Differences may occur due to rounding
Perbedaan dapat terjadi karena pembulatan

Adaro Group's (Equity Adjusted) Consolidated Coal Reserves
Konsolidasi Cadangan Batubara Grup Adaro (Disesuaikan per Ekuitas)

Group and Operating Company Grup dan perusahaan	Resources Estimated as at 31 Dec. 2018 Perkiraan Cadangan per 31 Des 2018			Reserves Estimated as at 31 Dec 2017 Perkiraan Cadangan per 31 Des 2017			Calculated Changes 2018 vs 2017 Perubahan 2018 vs 2017	
	Total Proved & Probable (Mt) Total Terbukti & Terkira (Mt)	Proved (Mt) Terbukti (Mt)	Probable (Mt) Terkira (Mt)	Total Proved & Probable (Mt) Total Terbukti & Terkira (Mt)	Proved (Mt) Terbukti (Mt)	Probable (Mt) Terkira (Mt)	Change to Proved & Probable Total (Mt) Perubahan Total Terbukti & Terkira (Mt)	% Change on Proved & Probable Total Perubahan Total Terbukti & Terkira (%)
Adaro Total Sub-bituminous Coal Reserves: PT Adaro Indonesia, PT Semesta Centra Mas, PT Paramitha Cipta Sarana, PT Mustika Indah Permai	1,109	986	123	1,151	1,036	115	-42	-4%
Adaro Total Bituminous Coal Reserves: PT Lahai Coal	0.25	0.25	-	-	-	-	0.25	100%
Adaro Total Metallurgical Coal Reserves: PT Lahai Coal, PT Maruwai Coal, Kestrel Coal Mine, Australia	112.0	46.6	65.4	54.4	41.0	13.4	57.6	106%

1) Kestrel Coal Mine Coal Resources and Reserves were estimated as at 1st Dec 2018.

1) Sumber Daya dan Cadangan Batubara Kestrel Coal Mine diestimasi pada tanggal 1 Des 2018

Adaro Group Coal Resources Quantity¹
Kuantitas Sumber Daya Batubara Grup Adaro¹

Operating Company/Project Perusahaan	Locality Lokasi	Mining Method Metode Penambangan	Coal Resources as Estimated at 31 st Dec 2018 Perkiraan Sumber Daya Batubara per 31 Des 2018					Adaro Group ownership equity (%) Kepemilikan Saham Grup Adaro (%)	Coal Resources as Estimated at 31 st Dec 2017 Perkiraan Sumber Daya Batubara per 31 Des 2017				Adaro Group Ownership Equity (%) Kepemilikan Saham Grup Adaro (%)	Adaro Group Attributable Total Measured, Indicated & Inferred (Mt) Porsi Terukur, Terkira & Tereka Grup Adaro (Mt)	Calculated Changes to Adaro Group's Coal Resources 2018 vs. 2017 Perubahan perhitungan 2018 vs 2017			
			Total Measured, Indicated & Inferred (Mt) Total Terukur, Terkira & Tereka (Mt)	Measured (Mt) Terukur (Mt)	Indicated (Mt) Terkira (Mt)	Inferred (Mt) Tereka (Mt)	Adaro Group ownership equity (%) Kepemilikan Saham Grup Adaro (%)		Total Measured, Indicated & Inferred (Mt) Total Terukur, Terkira & Tereka (Mt)	Measured (Mt) Terukur (Mt)	Indicated (Mt) Terkira (Mt)	Inferred (Mt) Tereka (Mt)			Adaro Group Ownership Equity (%) Kepemilikan Saham Grup Adaro (%)	Adaro Group Attributable Total Measured, Indicated & Inferred (Mt) Porsi Terukur, Terkira & Tereka Grup Adaro (Mt)	Changes to Operating Company Total Measured, Indicated & Inferred (Mt) Perubahan Total Terukur, Terkira & Tereka Perusahaan (Mt)	Changes to Operating Company Total Measured, Indicated & Inferred (%) Perubahan Total Terukur, Terkira & Tereka Perusahaan (%)
PT Adaro Indonesia ²	Tutupan	OC	2,851	1,560	593	698	88.5%	2,523	2,891	1,599	593	699	88%	2,557	-39	-1%	-35	-1%
	North Paringin	OC	469	291	86	92		415	476	298	86	92		421	-7	-1%	-6	-1%
	South Paringin	OC	104	21	39	44		92	104	21	39	44		92	0	0%	0	0%
	Wara I	OC	1,363	799	270	294		1,206	1,370	806	270	294		1,212	-7	-1%	-6	-0.5%
	Wara II	OC	397	355	26	16		351	397	355	26	16		351	0	0%	0	0.0%
	Total Adaro Indonesia	OC	5,184	3,026	1,014	1,144	88.5%	4,587	5,238	3,079	1,014	1,144	88%	4,634	-53	-1%	-47	-1%
Balangan Coal Companies ³	PT Semesta Centramas (SCM)	OC	67.6	60.2	6	1	75%	50.7	104	71.2	25	8	75%	78.3	-37	-35%	-28	-35%
	PT Paramitha Cipta Sarana (PCS)	OC	51	36	14	1		38	51	36	14	1		38	0	0%	0	0%
	PT Laskar Semesta Alam (LSA)	OC	141.8	92.9	42	7		106.3	174	114	50	11		131	-33	-19%	-24	-19%
Total South Kalimantan Total Kalimantan Selatan			5,445	3,215	1,077	1,153	86%	4,782	5,567	3,300	1,103	1,164	86%	4,881	-123	-2%	-99	-2%
PT Bhakti Energi Persada ⁴	PT Bumi Kaliman Sejahtera	OC	1,402	526	683	193	90%	1,261	1,402	526	683	193	90%	1,261	0	0%	0	0%
	PT Bumi Murau Coal	OC	1,817	858	808	151		1,635	1,817	858	808	151		1,635	0	0%	0	0%
	PT Birawa Pandu Selaras	OC	186	75	62	48		167	186	75	62	48		167	0	0%	0	0%
	PT Khazana Bumi Kaliman	OC	745	374	238	133		671	745	374	238	133		671	0	0%	0	0%
	PT Persada Multi Bara	OC	2,696	1,307	1,186	202		2,426	2,696	1,307	1,186	202		2,426	0	0%	0	0%
	PT Telen Eco Coal	OC	1,093	712	223	157		984	1,093	712	223	157		984	0	0%	0	0%
	PT Tri Panuntun Persada	OC	19	14	4	1		17	19	14	4	1		17	0	0%	0	0%
Adaro MetCoal Companies	PT Pari Coal	OC	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018				100%	N/A	No resources estimated in 2017 Belum ada perkiraan sumber daya di 2017				100%	N/A	No Resources estimated in 2018/2017 Belum ada perkiraan Sumber Daya di 2018/2017			
Total East Kalimantan Total Kalimantan Timur			7,955	3,866	3,204	885	90%	7,161	7,955	3,866	3,204	885	90%	7,161	0	0%	0	0%
Adaro MetCoal Companies ⁵	PT Juloi Coal Bumbun (metallurgical/thermal)	OC	200	28	79	92	100%	200	200	28.2	79.4	92.1	100%	200	0	0%	0	0%
	PT Juloi Coal Juloi Northwest (metallurgical/thermal)	OC	639	-	62	577		639	639	-	62.5	576.5		639	0	0%	0	0%
	PT Kalteng Coal Luon (metallurgical/thermal)	OC	150	23	27	100		150	150	23.4	26.8	100.1		150	0	0%	0	0%
	PT Kalteng Coal Luon (metallurgical underground) ⁵	UG	109	14	27	68		109	109	14.2	26.8	67.8		109	0	0%	0	0%
	PT Lahai Coal Haju (metallurgical/thermal) ⁶	OC	12.4	11.39	0.81	0.17		12.4	13.7	13.3	0.2	0.2		13.7	-1	-10%	-1	-10%
	PT Maruwai Coal - Lampunut (metallurgical) ⁷	OC	100.1	94.3	5.8	0.1		100	101	95.5	5.5	0.2		101	-1	-1%	-1	-1%
	PT Maruwai Coal - Lampunut (thermal) ⁸	OC	9.5	-	-	9.5		9.5	8.4	-	-	8.4		8.4	1	13%	1	13%
	PT Ratah Coal	OC	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018					N/A	No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					N/A	No Resources estimated in 2018/2017 Belum ada perkiraan Sumber Daya di 2018/2017			
	PT Sumber Barito Coal (metallurgical/thermal)	OC	55.5	8.8	15.3	31.4		55.5	55.5	8.8	15.3	31.4	56	0	0	0	0	
	PT Sumber Barito Coal (metallurgical underground) ⁹	UG	75.1	4.9	19.2	51.0		75	75.1	4.9	19.2	51.0	75	0	0	0	0	
Total Central Kalimantan Total Kalimantan Tengah			1,351	185.2	236.6	928.8	100%	1,351	1,351.8	188.3	235.7	927.8	100%	1,352	-1	-0%	-1	-0%
PT Mustika Indah Permai ¹⁰	Lahat	OC	287.5	277.7	9.6	0.2	75%	216	287.5	277.7	9.6	0.2	75%	216	0	0%	0	0%
PT Bukit Enim Energi	Muara Enim	OC	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018				61%	N/A	No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017				61%	N/A	No Resources estimated in 2018/2017 Belum ada perkiraan Sumber Daya di 2018/2017			
Total South Sumatra Total Sumatera Selatan		OC	287.5	277.7	9.6	0.2	75%	216	287.5	277.7	9.6	0.2	75%	216	0	0%	0	0%
Kestrel Coal Mine, Australia ¹¹ Tambang Batubara Kestrel		UG	430.7	18.8	321.9	90	38.4%	165	Asset not partially owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro				Asset not partially owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro					
Total Central Queensland, Australia			430.7	18.8	321.9	90	38.4%	165	Asset not partially owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro				Asset not partially owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro					
Total Adaro Group's Coal Resources Total Sumber Daya Batubara		OC	15,468	7,562	4,849	3,057	88%	13,674	15,162	7,632	4,552	2,977	90%	13,609	307	2.0%	64.9	0.5%

1) Adaro Group's Coal Resources refer to Resources generally suited to host open-pit mineable coal Reserves unless noted otherwise. Resources are reported according to JORC 2012 Edition, with reference to the Australian Coal Guidelines 2014.
2) PT Adaro Indonesia's (AI) Coal Resources were estimated as at Dec. 31, 2017 by AI Geology Department and updated by depletion of 2018 mined in situ tonnes. CPI is Yansen Palobo, a full time employee of Adaro Indonesia. The CP was Joseph Crisostomo MAUSIMM, of PT Adaro Jasabara Indonesia. Decreases in AI's attributable total Measured, Indicated and Inferred Resources from a 1% decrease from depletion of 2018 production. Small differences are due to decimal place rounding.
3) The Coal Resources at PCS were estimated in March 2016 while Resources at SCM and LSA were estimated as at Dec. 31, 2018 in accordance with JORC 2012 Edition subject to the use of the Australian Coal Guidelines 2014. The CP was Joseph Crisostomo MAUSIMM, of PT Adaro Jasabara Indonesia. Decreases in SCM and LSA Coal Resources are due to updated geological model from new drilling, update of the Coal Resource pit shell applying revised coal price assumption and production cost parameters and depletion of 2018 production.
4) The CP was Peter Mucalo MAUSIMM, of PT Adaro Jasabara Indonesia, and the Coal Resources were estimated in April 2013 according to JORC 2012 Edition.
5) The Coal Resources at Adaro MetCoal's PT Juloi Coal, PT Kalteng Coal and PT Sumber Barito Coal were estimated as at 31 December 2017 while Resources at PT Lahai Coal and PT Maruwai Coal were estimated as at Dec. 31, 2018 in accordance with JORC 2012 Edition subject to the use of the Australian Coal Guidelines 2014. The CP was Joseph Crisostomo MAUSIMM, of PT Adaro Jasabara Indonesia.

6) A decrease in PT Lahai Coal Coal Resource is attributable to update of geological model resulting from mine seam roof and floor survey pickup and depletion of 2018 production.
7) Changes in PT Maruwai Coal metallurgical Coal Resource is attributable to update of geological model resulting from new drilling.
8) An increase in PT Maruwai Coal thermal Coal Resource is attributable to update of the geological model resulting from new Line of Oxidation (LOX) drilling which resulted to greater depths to mine fresh coking coal.
9) PT Kalteng Coal and PT Sumber Barito Coal metallurgical Coal Resources are designated as having potential to host underground mining.
10) The Resources were estimated in November 2013. The CP was John Devon of Marston Inc., a Golder company.
11) The Kestrel Coal Resources were estimated as at Dec. 1, 2018. Resources are reported according to the 2012 JORC Code. The Kestrel Coal Resources are inclusive of Coal Reserves. The CP was Christopher Speedy MAIG, a consultant working for Encompass Mining Services Pty Ltd. Kestrel is owned by Kestrel Coal Resources Pty Ltd (80%) and Mitsui Coal Australia (20%). Kestrel Coal Resources Pty Ltd is a joint venture company formed in March 2018 by Adaro Energy (48%) and EMR Capital Ltd (52%).

1) Sumber Daya Batubara Grup Adaro merujuk pada sumber daya yang sesuai sebagai sumber cadangan batubara yang dapat ditambah dengan metode penambangan terbuka. Sumber Daya dilaporkan sesuai dengan JORC 2012 Edition mengacu kepada Australian Coal Guidelines 2014.
2) Sumber Daya Batubara PT Adaro Indonesia (AI) diestimasi pada 31 Des 2017 oleh Departemen Geologi AI dan diperbarui dengan pengurangan tonase insitu yang ditambah tahun 2018. CPI adalah Yansen Palobo, karyawan tetap AI. Competent Person adalah Joseph Crisostomo MAUSIMM dari PT Adaro Jasabara Indonesia (AI). Pengurangan dari total sumber daya Terukur, Terkira dan Tereka berasal dari pengurangan 1% akibat produksi di tahun 2018. Perbedaan kecil dapat terjadi karena pembulatan.
3) Sumber Daya Batubara di PCS diestimasi pada bulan Maret 2016 sementara Sumber Daya di SCM dan LSA diestimasi pada 31 Des 2018 sesuai dengan JORC 2012 Edition yang mengacu pada Australian Coal Guidelines 2014. Competent Person adalah Joseph Crisostomo MAUSIMM dari AI. Pengurangan Sumber Daya batubara di SCM dan LSA disebabkan oleh pembaruan model geologi yang berasal dari pengeboran baru, pembaruan Sumber Daya PIT SHELL akibat penggunaan asumsi harga batubara yang baru, serta parameter biaya produksi dan pengurangan produksi tahun 2018.
4) Competent Person adalah Peter Mucalo MAUSIMM dari AI, dan Sumber Daya Batubara diestimasi pada bulan April 2013 sesuai dengan laporan JORC 2012 Edition.
5) Sumber Daya Batubara PT Juloi Coal, PT Kalteng Coal, PT Sumber Barito Coal milik Adaro MetCoal Companies diestimasi pada 31 Des 2017 sementara Sumber Daya PT Lahai Coal dan PT Maruwai Coal diestimasi pada 31 Des 2018 sesuai dengan JORC 2012 Edition yang mematuhi Australian Coal Guidelines 2014. Competent Person adalah Joseph Crisostomo MAUSIMM dari AI.

6) Penurunan Sumber Daya Batubara PT Lahai Coal disebabkan oleh pembaharuan/ pemutakhiran model geologi yang berasal dari penambahan survey aktual SEAM ROOF dan FLOOR serta dikurangi produksi tahun 2018.
7) Perubahan Sumber Daya Batubara metalurgi PT Maruwai Coal disebabkan oleh pemutakhiran/pembaruan model geologi dari program pengeboran terkini.
8) Penambahan Sumber Daya Batubara termal PT Maruwai Coal disebabkan oleh pengkinian model geologi dari pengeboran Line of Oxidation (LOX) (zona pelapukan) baru yang lebih dalam untuk menambang batubara kokas baru.
9) Sumber Daya Batubara metalurgi PT Kalteng Coal dan PT Sumber Barito Coal diperkirakan memiliki potensi penambangan bawah tanah.
10) Sumber daya dihitung pada bulan November 2013. Competent Person adalah John Devon dari Marston Inc., grup Golder Associates.
11) Sumber Daya Batubara Kestrel diestimasi pada 1 Des 2018. Sumber Daya dilaporkan berdasarkan JORC Code 2012 Edition. Sumber Daya Batubara sudah termasuk Cadangan Batubara. Competent Person adalah Christopher Speedy MAIG, konsultan yang bekerja untuk Encompass Mining Services Pty Ltd. Kestrel dimiliki oleh Kestrel Coal Resources Pty Ltd (80%) dan Mitsui Coal Australia (20%). Kestrel Coal Resources Pty Ltd adalah perusahaan patungan yang dibentuk pada bulan Maret 2018 oleh Adaro Group (48%) dan EMR Capital Ltd (52%).

Adaro Group Coal Reserves Quantity
Kuantitas Cadangan Batubara Grup Adaro

Operating Company/ Project	Locality Lokasi	Mining Method Metode penambangan	Coal Reserves as Estimated at 31 st Dec 2018 Perkiraan Cadangan Batubara per 31 Des 2018				Coal Reserves as Estimated at 31 st Dec 2017 Perkiraan Cadangan Batubara per 31 Des 2017				Calculated Changes to Adaro Group's Coal Reserves 2018 vs 2017 Perubahan Perhitungan 2018 vs 2017						
			Total Proved & Probable (Mt) Total Terbukti & Terkira (Mt)	Proved (Mt) Terbukti (Mt)	Probable (Mt) Terkira (Mt)	Adaro Group Ownership Equity (%) Kepemilikan Saham Adaro (%)	Adaro Group Attributable Total Proved & Probable (Mt) Porsi Terbukti & Terkira Adaro (Mt)	Total Proved & Probable (Mt) Total Terbukti & Terkira (Mt)	Proved (Mt) Terbukti (Mt)	Probable (Mt) Terkira (Mt)	Adaro Group Ownership Equity (%) Kepemilikan Saham Adaro (%)	Adaro Group Attributable Total Proved & Probable (Mt) Porsi Terbukti & Terkira Grup Adaro (Mt)	Changes to Operating Company Total Proved & Probable (Mt) Perubahan Porsi Terbukti & Terkira Perusahaan (Mt)	Changes to Operating Company Total Proved & Probable (%) Perubahan Porsi Perusahaan (%)	Changes to Adaro Group Attributable Total Proved & Probable (Mt) Perubahan Porsi Terbukti & Terkira Adaro (Mt)	Changes to Adaro Group Attributable Total Proved & Probable (%) Perubahan Porsi Terbukti & Terkira Adaro (%)	
PT Adaro Indonesia	Tutupan ^(1,2,4)	OC	602	511	91		533		733	651	82		649	-131	-18%	-116	-18%
	North Paringin ^(1,2,4)	OC	18	17	1		16		27	26	1		24	-9	-33%	-8	-33%
	South Paringin	OC	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018			88.5%	N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			88.5%	N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	Wara I ^(1,2,4)	OC	286	267	19		253		172	160	12		152	114	66%	101	66%
	Wara II	OC	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	Total Adaro Indonesia		906	796	111	88.5%	802		932	837	95	88.5%	825	-26	-3%	-23	-3%
Balangan Coal Companies	PT Semesta Centramas (SCM) ^(1,3,5)	OC	41	38	2		30		57	49	8		43	-16	-28%	-12	-28%
	PT Paramitha Cipta Sarana (PCS) ^(1,3)	OC	28	20	8	75%	21		28	20	8	75%	21	0	0%	0	0%
	PT Laskar Semesta Alam (LSA) ^(1,3,5)	OC	87	72	16		66		96	79	17		72	-9	-9%	-6	-9%
Total South Kalimantan			1,062	926	137	86%	918.9		1,113	985	128	86%	960	-51	-5%	-42	-4%
PT Bhakti Energi Persada	(at Muara Wahau)	OC	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018			N/A	N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			N/A	N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
Total East Kalimantan Total Kalimantan Timur			No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018			N/A	N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			N/A	N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
AdaroMet Coal Companies	PT Juloi Coal	N/A	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Kalteng Coal		No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Lahai Coal (Metallurgical) ^(1,6)	OC	2.6	2.6			2.6	2.87	2.77	0.10		2.9	-0	-9%	-0	-9%	
	PT Lahai Coal (Thermal) ^(1,6)	OC	0.25	0.25			0.25	0.13	0.13	0.0		0.1	0	96%	0	96%	
	PT Maruwai Coal Marketable (Metallurgical) ⁽⁸⁾	OC	51.5	38.2	13.3	100%	51.5	51.5	38	13	100%	51.5	0	0%	0	0%	
	PT Pari Coal	N/A	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Ratah Coal		No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Sumber Barito Coal		No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				N/A	No reserves estimated in 2018/2017 Belum ada perkiraan cadangan di 2017			
Total Central Kalimantan Total Kalimantan Tengah			54.4	41.1	13.3	100%	54.40	54.50	41.10	13	100%	54.50	-0	-0%	-0	-0%	
PT Mustika Indah Permai	Lahat ⁽⁸⁾	OC	254	246	8	75%	190.5	254	246	8	75%	190.5	0	0%	0	0%	
PT Bukit Enim Energi	Muara Enim	OC	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018			61%	N/A		No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			61%	N/A	No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
Total South Sumatra Total Sumatera Selatan			254	246	8	75%	190.5	254	246	8	75%	190.5	0	0%	0	0%	
Kestrel Coal Mine Australia ¹⁰	Kestrel Marketable (Metallurgical)	UG	150.7	15.1	135.6	38.4%	57.9	Asset not partially owned by Adaro Group at this time Aset belum dimiliki sebagian oleh Grup Adaro			Asset not partially owned by Adaro Group at this time Aset belum dimiliki sebagian oleh Grup Adaro						
Total Central Queensland, Australia			150.7	15.1	135.6	38.4%	57.9	Asset not partially owned by Adaro Group at this time Aset belum dimiliki sebagian oleh Grup Adaro			Asset not partially owned by Adaro Group at this time Aset belum dimiliki sebagian oleh Grup Adaro						
Total Adaro Group Coal Reserves Total Cadangan Batubara Grup Adaro			1,521	1,228	294	80%	1,222	1,422	1,272	149	85%	1,205	100	7%	16	1%	

1) Approximate drill hole spacings used to classify Reserves are as below:

Deposit	Proven Coal Reserves	Probable Coal Reserves
Tutupan	Maximum 500m spacing of geophysically logged, analysed, drillholes	500m to 1000m spacing of geophysically logged, analysed, drillholes
North Paringin	Maximum 500m spacing of geophysically logged, analysed, drillholes	500m to 1000m spacing of geophysically logged, analysed, drillholes
Wara I	Maximum 500m spacing of geophysically logged, analysed, drillholes	500m to 1000m spacing of geophysically logged, analysed, drillholes
SCM	Maximum 250m spacing of geophysically logged, analysed, drillholes	250m to 500m spacing of geophysically logged, analysed, drillholes
LSA	Maximum 250m spacing of geophysically logged, analysed, drillholes	250m to 500m spacing of geophysically logged, analysed, drillholes
PCS	Maximum 250m spacing of geophysically logged, analysed, drillholes	250m to 500m spacing of geophysically logged, analysed, drillholes
PT Lahai Coal (Metallurgical)	Maximum 250m spacing of geophysically logged, analysed, drillholes with =>85% recovery	250m to 500m spacing of geophysically logged, analysed, drillholes with =>85% recovery
PT Lahai Coal (Thermal)	Maximum 250m spacing of geophysically logged, analysed, coreholes with =>85% recovery	250m to 500m spacing of geophysically logged, analysed, coreholes with =>85% recovery
PT Maruwai Coal Marketable (Metallurgical)	Maximum 500m spacing of geophysically logged, analysed, coreholes with =>85% recovery	500m to 1000m spacing of geophysically logged, analysed, coreholes with =>85% recovery
Kestrel Coal Mine Marketable (Metallurgical)	Maximum 600m spacing of geophysically logged, analysed, drillholes	580m to 1160m spacing of geophysically logged, analysed, drillholes

- Competent Person Reserves - Ilman Rijaya Putra, MAusIMM / CPI who is a full time employee of PT Adaro Indonesia.
- Competent Person Reserves - Rifan Ahda, MAusIMM / CPI who is a full time employee of PT Adaro Jasabara Indonesia.
- Changes in Adaro Indonesia Coal Reserves are due to updated Life of Mine pit design applying revised coal price assumption and depletion of 2018 production.
- Decreases in SCM and LSA Coal Reserves are due to updated geological model from new drilling, update of the Life of Mine pit design applying revised coal price assumption and production cost parameters and depletion of 2018 production.
- Competent Person Reserves - Herwin Syahputra, MAusIMM / CPI who is a full time employee of PT Adaro Jasa Bara Indonesia.
- Changes in Haju Coal Reserves are from an update of the geological model including additional Reserves from minor seams, changes in pit design and an depletion from 2018 production.
- First Coal Reserves for PT Maruwai Coal were reported in 2008.
- Competent Person Reserves - Mark Dunnel AusIMM, who is an independent consultant.
- Competent Person Reserves - Len Dolby who was a full time Employee of Golders and Associates.
- The Kestrel Coal Reserves were estimated as at Dec. 1, 2018. Reserves are reported according to the 2012 JORC Code. The Mineral Reserve estimate was prepared by Bruce Robertson, B.Eng (Mining), FAusIMM, CP, RPEQ, an employee of MEC Mining Pty Ltd. and a Qualified Person under the JORC Code (2012).

1) Perkiraan jarak lubang bor yang digunakan untuk mengklasifikasikan Cadangan adalah sebagai berikut:

Deposit	Cadangan Batubara Terbukti	Cadangan Batubara Terkira
Tutupan	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
North Paringin	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
Wara I	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
SCM	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
LSA	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
PCS	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 500 m sampai 1000 m untuk lubang bor yang dicatat secara geofisika dan dianalisa
PT Lahai Coal (Metallurgical)	Jarak maksimum 250 m untuk lubang bor yang dicatat secara geofisika dan dianalisa dengan recovery >=85%	Jarak 250 m sampai 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa dengan recovery >=85%
PT Lahai Coal (Thermal)	Jarak maksimum 250 m untuk lubang bor yang dicatat secara geofisika dan dianalisa dengan recovery >=85%	Jarak 250 m sampai 500 m untuk lubang inti yang dicatat secara geofisika dan dianalisa dengan recovery >=85%
PT Maruwai Coal Marketable (Metallurgical)	Jarak maksimum 500 m untuk lubang bor yang dicatat secara geofisika dan dianalisa dengan recovery >=85%	Jarak 500 m sampai 1000 m untuk lubang inti yang dicatat secara geofisika dan dianalisa dengan recovery >=85%
Kestrel Coal Mine Marketable (Metallurgical)	Jarak maksimum 600 m untuk lubang bor yang dicatat secara geofisika dan dianalisa	Jarak 580 m sampai 1160 m untuk lubang bor yang dicatat secara geofisika dan dianalisa

- Competent Person Cadangan - Ilman Rijaya Putra, MAusIMM / CPI yang merupakan karyawan tetap PT Adaro Indonesia (AI).
- Competent Person Cadangan - Rifan Ahda, MAusIMM / CPI yang merupakan karyawan tetap PT Adaro Jasabara Indonesia (AJI).
- Perubahan Cadangan Batubara AI disebabkan oleh pembaruan desain tambang Life of Mine dengan menggunakan asumsi harga batubara dan parameter biaya produksi yang telah direvisi dikurangi oleh produksi tahun 2018.
- Penurunan Cadangan Batubara SCM dan LSA disebabkan oleh pembaruan model geologi dari pengeboran baru, pengkinian desain tambang Life of Mine dengan menggunakan asumsi harga batubara dan parameter biaya produksi yang telah direvisi dikurangi oleh produksi tahun 2018.
- Competent Person Cadangan - Herwin Syahputra, MAusIMM / CPI yang merupakan karyawan tetap AI.
- Perubahan Cadangan Batubara Haju disebabkan oleh pembaruan model geologis termasuk tambahan cadangan dari MINOR SEAM, perubahan desain tambang dan dikurangi oleh produksi tahun 2018.
- Cadangan Batubara PT Maruwai Coal pertama kali dilaporkan tahun 2008. Competent Person Cadangan adalah Mark Dunnel MAusIMM, konsultan independen.
- Competent Person Cadangan Batubara adalah Len Dolby, karyawan tetap Golders dan Associates.
- Cadangan Batubara Kestrel diestimasi pada 1 Dec 2018. Cadangan dilaporkan sesuai dengan JORC Code 2012 Edition. Estimasi Cadangan Mineral dikerjakan oleh Bruce Robertson, B.Eng (Mining), FAusIMM, CP, RPEQ, karyawan MEC Mining Pty Ltd., dan merupakan Qualified Person sesuai JORC Code (2012).

Quality of Adaro Group's Thermal Coal Resources (Gross As Received Basis)
Kualitas Sumber Daya Batubara Termal Grup Adaro (GAR)

Operating Company/Project Perusahaan	Locality Lokal	Estimated as at 31 st Dec 2018 Sesuai perkiraan per 31 Des 2018					Estimated as at 31 st Dec 2017 Sesuai perkiraan per 31 Des 2017					Calculated Changes to the Quality of Coal Resources 2018 vs. 2017 Perubahan Kualitas Sumber Daya 2018 vs 2017				
		Total Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/ kg Nilai Kalori Kkal/Kg	Total Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/ kg Nilai Kalori Kkal/Kg	Total Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/ kg Nilai Kalori Kkal/Kg
PT Adaro Indonesia ¹	Tutupan	27.7	2.4	36.0	0.11	4,848	27.7	2.4	36.0	0.11	4,848	0.00	0.00	0.00	0.00	0.0
	North Paringin	28.6	3.7	33.5	0.25	4,758	28.6	3.7	33.5	0.25	4,758	0.00	0.00	0.00	0.00	0.0
	South Paringin	30.2	3.3	32.8	0.26	4,668	30.2	3.3	32.8	0.26	4,668	0.00	0.00	0.00	0.00	0.0
	Wara I	38.8	3.5	30.4	0.28	3,953	38.8	3.5	30.4	0.28	3,953	0.00	0.00	0.00	0.00	0.0
	Wara II	43.3	3.0	29.1	0.22	3,666	43.3	3.0	29.1	0.22	3,666	0.00	0.00	0.00	0.00	0.0
	Total Adaro Indonesia (thermal)	31.9	2.9	33.7	0.2	4,510	31.9	2.9	33.7	0.18	4,510	0.00	0.00	0.00	0.00	0.0
Balangan Coal Companies ²	PT Semesta Centramas	32.7	2.0	34.3	0.08	4,452	32.2	2.2	33.9	0.07	4,408	0.45	-0.14	0.41	0.01	44.2
	PT Paramitha Cipta Sarana	31.0	3.5	33.9	0.08	4,359	31.0	3.5	33.9	0.08	4,359	0.00	0.00	0.00	0.00	0.0
	PT Laskar Semesta Alam	30.1	2.0	34.5	0.08	4,478	29.8	1.9	35.3	0.09	4,597	0.30	0.10	-0.80	-0.01	-120
Total South Kalimantan (thermal) Total Kalimantan Selatan (thermal)		31.9	2.9	33.7	0.2	4,507	31.9	2.8	33.7	0.17	4,510	0.01	0.00	-0.02	-0.00	-2.6
PT Bhakti Energi Persada	PT Bumi Kaliman Sejahtera	47.3	3.6	25.4	0.10	3,272	47.3	3.6	25.4	0.10	3,272	0.00	0.00	0.00	0.00	0.0
	PT Bumi Murau Coal	46.3	2.9	26.2	0.09	3,415	46.3	2.9	26.2	0.09	3,415	0.00	0.00	0.00	0.00	0.0
	PT Birawa Pandu Selaras	46.0	3.3	26.2	0.09	3,423	46.0	3.3	26.2	0.09	3,423	0.00	0.00	0.00	0.00	0.0
	PT Khazana Bumi Kaliman	47.0	3.5	25.7	0.10	3,329	47.0	3.5	25.7	0.10	3,329	0.00	0.00	0.00	0.00	0.0
	PT Persada Multi Baraw	47.8	2.8	25.5	0.10	3,297	47.8	2.8	25.5	0.10	3,297	0.00	0.00	0.00	0.00	0.0
	PT Telen Eco Coal	45.2	2.9	27.2	0.11	3,497	45.2	2.9	27.2	0.11	3,497	0.00	0.00	0.00	0.00	0.0
	PT Tri Panuntun Persada	42.7	2.8	29.4	0.10	3,606	42.7	2.8	29.4	0.10	3,606	0.00	0.00	0.00	0.00	0.0
	Total PT Bhakti Energi Persada (thermal)	46.9	3.1	25.9	0.10	3,354	46.9	3.1	25.9	0.10	3,354	0.00	0.00	0.00	0.00	0.0
PT Pari Coal	Melak	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017				
Total East Kalimantan Total Kalimantan Timur		46.9	3.1	25.9	0.10	3,354	46.9	3.1	25.9	0.10	3,354	0.0	0.0	0.0	0.0	0.0
Adaro MetCoal Companies	PT Maruwai Coal - Lampunut (thermal)	10.0	9.7	24.9	0.45	6,909	No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No declared Resource qualities in 2017 Belum ada perkiraan Sumber Daya di 2017				
Total Central Kalimantan Total Kalimantan Tengah		10.0	9.7	24.9	0.45	6,909	No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No declared resource qualities in 2017 Belum ada perkiraan sumber daya di 2017				
PT Mustika Indah Permai ³	Lahat	34.1	5.1	31.2	0.46	4,342	34.1	5.1	31.2	0.46	4,342	0.0	0.0	0.0	0.0	0.0
PT Bukit Enim Energi	Muara Enim	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017				
Total South Sumatra (thermal) Total Sumatera Selatan (thermal)		34.1	5.1	31.2	0.46	4,342	34.1	5.1	31.2	0.46	4,342	0.0	0.0	0.0	0.0	0.0
Adaro Group Total Sub-bituminous Coal Resources i.e. AI, SCM, LSA, PCS, MIP, MC Total Sumber Daya Batubara Subbituminus Grup Adaro		32.0	3.0	33.6	0.2	4,499	32.0	3.0	33.6	0.2	4,501	0.0	0.0	-0.0	-0.0	-2.4
Adaro Group total low-rank Coal Resources i.e. BEP Total Sumber Daya Batubara Kalori Rendah Group Adaro (BEP)		46.9	3.1	25.9	0.1	3,354	46.9	3.1	25.9	0.1	3,354	0.0	0.0	0.0	0.0	0.0

1) PT Adaro Indonesia's coal quality samples have been analysed to ASTM standards.

2) Coal quality samples from SCM, LSA and PCS have each been analysed to ASTM standards. Changes in SCM and LSA calorific values are from new drill core sampling and analysis.

3) PT Mustika Indah Permai's coal quality samples have been analysed to ISO standards. Elevated levels of sodium in ash averaging 3% were noted in the 2014 JORC Coal Reserves.

1) Kualitas sampel batubara PT Adaro Indonesia dianalisa sesuai standar ASTM.

2) Kualitas sampel batubara dari SCM, LSA, PCS masing-masing telah dianalisa sesuai Standar ASTM. Perubahan nilai kalori SCM dan LSA disebabkan oleh sampel pengeboran inti baru yang analisa.

3) Kualitas sampel batubara MIP telah dianalisa sesuai standar ISO. Kenaikan tingkat kandungan sodium di dalam abu rata-rata 3% telah dinyatakan dalam cadangan batubara sesuai JORC tahun 2014.

Quality of Adaro Goup's Thermal Coal Resources (Air Dried Basis)
Jumlah Sumber Daya Batubara Termal Grup Adaro (ADB)

Operating Company/Project Perusahaan	Locality Lokal	Estimated as at 31 st Dec 2018 Sesuai perkiraan per 31 Des 2018					Estimated as at 31 st Dec 2017 Sesuai perkiraan per 31 Des 2017					Calculated changes to the quality of coal Resources 2018 vs. 2017 Perubahan 2018 vs 2017				
		Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/kg Nilai Kalori Kkal/Kg	Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/ kg Nilai Kalori Kkal/Kg	Moisture % Total Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur%	Calorific Value Kcal/kg Nilai Kalori Kkal/Kg
PT Adaro Indonesia ¹	Tutupan	19.8	2.7	39.9	0.13	5,367	19.8	2.7	39.9	0.13	5,367	0.0	0.0	0.0	0.0	0.0
	North Paringin	20.4	3.6	37.7	0.26	5,343	20.4	3.6	37.7	0.26	5,343	0.0	0.0	0.0	0.0	0.0
	South Paringin	19.1	3.9	38.1	0.31	5,408	19.1	3.9	38.1	0.31	5,408	0.0	0.0	0.0	0.0	0.0
	Wara I	24.0	4.4	37.8	0.34	4,907	24.0	4.4	37.8	0.34	4,907	0.0	0.0	0.0	0.0	0.0
	Wara II	19.1	4.4	41.5	0.30	5,230	19.1	4.4	41.5	0.30	5,230	0.0	0.0	0.0	0.0	0.0
	Total Adaro Indonesia (thermal)	20.9	3.4	39.2	0.21	5,234	20.9	3.4	39.2	0.21	5,235	0.0	0.0	-0.0	0.0	-0.7
Balangan Coal Companies ²	PT Semesta Centramas	26.6	2.3	36.9	0.09	4,848	25.2	2.4	37.4	0.08	4,865	1.4	-0.1	-0.5	0.0	-17.2
	PT Paramitha Cipta Sarana	23.4	3.9	37.6	0.08	4,767	23.4	3.9	37.6	0.08	4,767	0.0	0.0	0.0	0.0	0.0
	PT Laskar Semesta Alam	23.6	2.1	38.4	0.09	4,887	22.3	2.1	39.1	0.09	5,087	1.3	0.0	-0.7	-0.0	-201
Total South Kalimantan (thermal) Total Kalimantan Selatan (thermal)	21.0	3.3	39.2	0.21	5,216	21.0	3.3	39.2	0.20	5,219	0.0	0.0	-0.0	0.0	-3.1	
PT Bhakti Energi Persada	PT Bumi Kaliman Sejahtera	14.3	5.9	41.4	0.17	5,328	14.3	5.9	41.4	0.17	5,328	0.0	0.0	0.0	0.0	0.0
	PT Bumi Murau Coal	14	4.6	41.9	0.15	5,474	14.0	4.6	41.9	0.15	5,474	0.0	0.0	0.0	0.0	0.0
	PT Birawa Pandu Selaras	13.5	5.3	41.9	0.15	5,488	13.5	5.3	41.9	0.15	5,488	0.0	0.0	0.0	0.0	0.0
	PT Khazana Bumi Kaliman	13.4	5.6	41.9	0.16	5,436	13.4	5.6	41.9	0.16	5,436	0.0	0.0	0.0	0.0	0.0
	PT Persada Multi Baraw	14.2	4.6	41.8	0.16	5,418	14.2	4.6	41.8	0.16	5,418	0.0	0.0	0.0	0.0	0.0
	PT Telen Eco Coal	13.5	4.6	42.9	0.17	5,517	13.5	4.6	42.9	0.17	5,517	0.0	0.0	0.0	0.0	0.0
	PT Tri Panuntun Persada	13.6	4.2	44.4	0.16	5,441	13.6	4.2	44.4	0.16	5,441	0.0	0.0	0.0	0.0	0.0
	Total PT Bhakti Energi Persada (thermal)	13.6	5.0	42.1	0.16	5,457	13.6	5.0	42.1	0.16	5,457	0.0	0.0	0.0	0.0	0.0
PT Pari Coal	Melak	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017				
Total East Kalimantan Total Kalimantan Timur	13.6	5.0	42.1	0.16	5,457	13.6	5.0	42.1	0.16	5,457	0.0	0.0	0.0	0.0	0.0	
Adaro MetCoal Companies	PT Maruwai Coal - Lampunut (thermal)	2.0	10.5	27.1	0.49	7,525	1.1	10.6	N/A	N/A	7,665	0.9	-0.1	N/A	N/A	-140
Total Central Kalimantan Total Kalimantan Tengah	2.0	10.5	27.1	0.49	7,525	1.1	10.6	N/A	N/A	7,666	0.9	-0.1	N/A	N/A	-141	
PT Mustika Indah Permai ³	Lahat	21.3	6.1	37.3	0.55	5,186	21.3	6.1	37.3	0.55	5,186	0.0	0.0	0.0	0.0	0.0
PT Bukit Enim Energi	Muara Enim	No Resources estimated in 2018 Belum ada perkiraan Sumber Daya di 2018					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017					No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017				
Total South Sumatra (thermal) Total Sumatera Selatan (thermal)	21.3	6.1	37.3	0.55	5,186	21.3	6.1	37.3	0.55	5,186	0.0	0.0	0.0	0.0	0.0	
Adaro Group total Sub-bituminous Coal Resources i.e. AI, SCM, LSA, PCS, MIP, MC Total Sumber Daya Batubara Subbituminus Grup Adaro	21.1	3.5	39.1	0.22	5,215	21.0	3.4	39.1	0.22	5,218	0.0	0.0	-0.0	0.0	-3.0	
Adaro Group total low-rank Coal Resources i.e. BEP Total Sumber Daya Batubara kalori rendah Grup Adaro (BEP)	13.6	5.0	42.1	0.16	5,457	13.6	5	42.1	0.16	5,457	0.0	0.0	0.0	0.0	0.0	

- 1) PT Adaro Indonesia's coal quality samples have been analysed to ASTM standards.
- 2) Coal quality samples from SCM, LSA and PCS have each been analysed to ASTM standards. Changes in SCM and LSA calorific values are from new drill core sampling and analysis.
- 3) PT Mustika Indah Permai's coal quality samples have been analysed to ISO standards. Elevated levels of sodium in ash averaging 3% were noted in the 2014 JORC Coal Reserves.

- 1) Kualitas sampel batubara PT Adaro Indonesia dianalisa sesuai standar ASTM.
- 2) Kualitas sampel batubara dari SCM, LSA, PCS masing-masing dianalisa sesuai Standar ASTM. Perubahan nilai kalori SCM dan LSA disebabkan oleh sampel pengeboran inti baru yang dianalisa.
- 3) Kualitas sampel batubara MIP dianalisa sesuai standar ISO. Kenaikan tingkat kandungan sodium di dalam abu rata-rata 3% telah dinyatakan dalam cadangan batubara sesuai JORC tahun 2014.

Quality of the Adaro Group's Metallurgical Coal Resources (Air Dried Basis)¹
 Kualitas Sumber Daya Batubara Metalurgi Grup Adaro (ADB)¹

Operating Company/ Project Perusahaan	Locality Lokal	Coal Quality Estimated as at 31 st Dec 2018 Kualitas Batubara Sesuai Perkiraan per 31 Des 2018				Coal Quality Estimated as at 31 st Dec 2017 Kualitas Batubara Sesuai Perkiraan per 30 Des 2017				Calculated Changes to the Quality of Coal Resources 2018 vs. 2017 Perubahan Kualitas Sumber Daya Batubara 2018 vs 2017			
		Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %	Yield % ² Hasil % ²	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %	Yield % Hasil %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %	Yield % Hasil %
Adaro MetCoal Companies	PT Juloi Coal Bumbun (metallurgical/thermal)	3.4	17.5	0.75	81.4	3.4	17.5	0.75	81.4	0.0	0.0	0.0	0.0
	PT Juloi Coal Juloi Northwest (metallurgical/thermal)	4.1	26.6	0.52	84.2	4.1	26.6	0.52	84.2	0.0	0.0	0.0	0.0
	PT Kalteng Coal Luon (metallurgical/thermal; opencut)	3.6	17.5	0.66	78.5	3.6	17.5	0.66	78.5	0.0	0.0	0.0	0.0
	PT Kalteng Coal Luon (metallurgical; underground)	3.9	18.5	0.76	73.5	3.9	18.5	0.76	73.5	0.0	0.0	0.0	0.0
	PT Lahai Coal Haju (metallurgical/thermal)	5.1	39.2	1.08	-	4.9	39.2	1.04	-	0.2	0.0	0.04	0.0
	PT Maruwai Coal - Lampunut (metallurgical)	4.1	28.3	0.52	84.9	4.3	28.4	0.52	84.8	-0.2	-0.1	-0.0	0.1
	PT Ratah Coal	No Resources estimated in 2018 Belum ada perkiraan sumber daya di 2018				No Resources estimated in 2017 Belum ada perkiraan sumber daya di 2017				No Resources estimated in 2017 Belum ada perkiraan Sumber Daya di 2017			
	PT Sumber Barito Coal (metallurgical/thermal; opencut)	3.9	17.8	0.80	75.5	3.9	17.8	0.80	75.5	0.0	0.0	0.0	0.0
	PT Sumber Barito Coal (metallurgical; underground)	3.9	18.1	0.88	73.8	3.9	18.1	0.88	73.8	0.0	0.0	0.0	0.0
Total Central Kalimantan Total Kalimantan Tengah		3.9	23.0	0.63	80.6	3.9	23.0	0.63	80.5	-0.01	-0.03	-0.00	0.08
Kestrel Coal Mine ³ Tambang Batubara Kestrel	Central Queensland, Australia	6.6	34.0	0.61	75.6	Asset not partialy owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro				Asset not partialy owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro			

- 1) Coal qualities are for a potential product on an air-dried basis. Adaro MetCoal Companies Resource tonnages reported in-situ and subject to % Yield except PT Lahai Coal Haju.
- 2) Theoretical Yield from bore core analyses.
- 3) Kestrel Coal Mine coal qualities are for Primary Coking Product with a target 6.5% Ash for the GC (German Creek) Seam. Kestrel Resource tonnage reported in-situ and subject to % Yield.

- 1) Kualitas batubara potensial produk berdasarkan air-dried basis (ADB). Tonase Sumber Daya Adaro MetCoal Companies dilaporkan in-situ dan mengacu pada % pengembalian (yield) kecuali PT Lahai Coal Haju.
- 2) Pengembalian (yield) teoretis berdasarkan analisis bor inti.
- 3) Kualitas batubara Kestrel Coal Mine untuk Produk Kokas Utama dengan target kadar abu 6,5% untuk SEAM GC (German Creek). Tonase sumber daya Kestrel dilaporkan in-situ dan mengacu pada % pengembalian (yield).

Adaro Group Thermal Coal Reserves Quality (Gross As Received Basis)¹ | Kualitas cadangan Batubara Termal Grup Adaro (Gross As Received Basis)¹

Operating Company/Project Perusahaan	Locality Lokal	Estimated as at 31 st Dec 2018 Sesuai perkiraan per 31 Des 2018					Estimated as at 31 st Dec 2017 Sesuai perkiraan per 31 Des 2017					Calculated Changes to Coal Reserves Quality 2018 vs 2017 Perubahan Kualitas Cadangan Batubara 2018 vs 2017				
		Total Moisture %	Ash %	Volatile Matter %	Total Sulphur %	Calorific Value Kcal/kg	Total Moisture %	Ash %	Volatile Matter %	Total Sulphur %	Calorific Value Kcal/ kg	Total Moisture %	Ash %	Volatile Matter %	Total Sulphur %	Calorific Value Kcal/ kg
		Total Kelembaban %	Abu %	Zat Terbang %	Total Sulfur %	Nilai Kalori Kkal/Kg	Total Kelembaban %	Abu %	Zat Terbang %	Total Sulfur %	Nilai Kalori Kkal/Kg	Total Kelembaban %	Abu %	Zat Terbang %	Total Sulfur %	Nilai Kalori Kkal/Kg
PT Adaro Indonesia	Tutupan	27.2	2.0	36.4	0.09	4,832	27.1	2.0	36.4	0.10	4,899	0.1	-0.0	-0.0	-0.01	-66
	North Paringin	26.3	2.9	35.2	0.19	5,040	26.7	2.8	35.2	0.20	5,010	-0.4	0.1	0.0	-0.01	30
	South Paringin	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2018/2017 Belum ada perkiraan Cadangan di 2018/2017				
	Wara I	39.3	2.8	30.5	0.21	3,983	39.0	2.8	30.6	0.21	3,988	0.3	0.0	-0.1	0.00	-6
	Wara II	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2017/2016 Belum ada perkiraan Cadangan di 2017/2016				
	Total Adaro Indonesia	31.0	2.3	34.5	0.13	4,568	29.27	2.20	35.3	0.12	4,738	1.8	0.1	-0.8	0.01	-170
Balangan Coal Companies	PT Semesta Centramas (SCM)	31.6	2.1	34.1	0.08	4,395	32.4	2.1	34.0	0.07	4,399	-0.8	0.0	0.1	0.01	-3
	PT Paramitha Cipta Sarana (PCS)	31.1	3.7	33.7	0.07	4,341	31.1	3.7	33.7	0.07	4,341	0.0	0.0	0.0	0.00	0
	PT Laskar Semesta Alam (LSA)	31.6	1.7	35.2	0.08	4,571	30.2	1.8	35.1	0.08	4,545	1.4	-0.1	0.1	-0.00	26
	Total Balangan Coal	31.5	2.1	34.7	0.08	4,484	31.0	2.2	34.5	0.08	4,468	0.5	-0.0	0.1	-0.00	16
	Total South Kalimantan Total Kalimantan Selatan	31.1	2.2	34.5	0.12	4,556	29.5	2.2	35.2	0.12	4,701	1.6	0.1	-0.7	0.01	-145
PT Pari Coal	Melak	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2018/2017 Belum ada perkiraan Cadangan di 2018/2017				
PT Bhakti Energi Persada	Muara Wahau	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2018/2017 Belum ada perkiraan Cadangan di 2018/2017				
	Total East Kalimantan Total Kalimantan Timur	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2018/2017 Belum ada perkiraan Cadangan di 2018/2017				
	PT Lahai Coal (Thermal)	6.2	6.0	36.4	0.85	6,550	7.0	7.0	36.8	0.97	6,639	-0.8	-0.9	-0.4	-0.1	-90
	Total Central Kalimantan Total Kalimantan Tengah	6.2	6.0	36.4	0.85	6,550	7.0	7.0	36.8	1.0	6,639	-0.8	-0.9	-0.4	-0.1	-90
	PT Mustika Indah Permai	34.1	5.7	31.1	0.40	4,292	34.1	5.7	31.1	0.40	4,292	0.0	0.0	0.0	0.00	0
	PT Bukit Enim Energi	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018					No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017					No Reserves estimated in 2018/2017 Belum ada perkiraan Cadangan di 2018/2017				
	Total South Sumatra Total Sumatera Selatan	34.1	5.7	31.1	0.40	4,292	34.1	5.7	31.1	0.40	4,292	0.0	0.0	0.0	0.00	0

1) Adaro Mineable Coal Qualities are Run of Mine basis

2) Changes in calorific values are from updated Life of Mine pit designs and new drill core sampling and analysis.

1) Kualitas batubara Adaro Group yang dapat ditambang berdasarkan kualitas ROM (Run of Mine)

2) Perubahan nilai kalori disebabkan oleh pembaruan desain tambang LOM (Life of Mine) dan sampel pengeboran inti baru dan analisis.

Adaro Group Metallurgical Coal Reserves Quality (Air Dried Basis)¹ | Kualitas Cadangan Batubara Metalurgi Grup Adaro (Air Dried Basis)¹

Operating Company/Project Perusahaan	Locality Lokal	Estimated as at 31 st Dec 2018 Sesuai perkiraan per 31 Des 2018				Estimated as at 31 st Dec 2017 Sesuai perkiraan per 31 Des 2017				Calculated Changes to Coal Reserves Quality 2018 vs 2017 Perubahan Kualitas Cadangan Batubara 2018 vs 2017			
		Moisture % Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %	Moisture % Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %	Moisture % Kelembaban %	Ash % Abu %	Volatile Matter % Zat Terbang %	Total Sulphur % Total Sulfur %
Adaro MetCoal Companies	PT Juloi Coal	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Kalteng Coal	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Lahai Coal Marketable (Metallurgical)	3.1	6.4	38.5	1.0	3.2	6.9	38.3	1.1	-0.1	-0.5	0.2	-0.10
	PT Maruwai Coal Marketable (Metallurgical)	N/A	4.3	29.3	0.5	NA	4.3	29.3	0.5	NA	0.0	0.0	0.00
	PT Ratah Coal (Metallurgical)	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
	PT Sumber Barito Coal (Metallurgical)	No Reserves estimated in 2018 Belum ada perkiraan Cadangan di 2018				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017				No Reserves estimated in 2017 Belum ada perkiraan Cadangan di 2017			
Total Central Kalimantan Total Kalimantan Tengah		3.2	4.4	29.8	0.5	3.2	4.5	29.9	0.5	0.0	-0.1	-0.1	-0.01
Kestrel Coal Mine	Central Queensland, Australia	N/A	N/A	N/A	N/A	Asset not partialy owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro				Asset not partialy owned by Adaro at this time Aset belum dimiliki sebagian oleh Grup Adaro			

1) Coal qualities are for a potential product on an air-dried basis.

1) Kualitas batubara produk potensial berdasarkan air-dried basis (ADB).