

## Appendix B. Tabular Emissions Results

Table B1. Summary of GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh).

Process	Japan				Korea				Taiwan				Japan with Carbon Capture			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	6.78	27.00	17.38	21.99	6.78	27.00	17.38	21.99	6.78	27.00	17.38	21.99	9.45	36.84	24.22	31.18
Coal Cleaning	N/A	0.17	N/A	N/A	N/A	0.17	N/A	N/A	N/A	0.17	N/A	N/A	N/A	0.23	N/A	N/A
Truck Transport	N/A	N/A	2.02	2.56	N/A	N/A	2.02	2.56	N/A	N/A	2.02	2.56	N/A	N/A	2.82	3.63
Rail Transport	16.90	1.51	N/A	N/A	16.90	1.51	N/A	N/A	16.90	1.51	N/A	N/A	23.55	2.06	N/A	N/A
Barge Transport	N/A	N/A	1.87	2.36	N/A	N/A	1.87	2.36	N/A	N/A	1.87	2.36	N/A	N/A	2.60	3.35
Export Terminal	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.53	0.41	0.54	0.70
Ocean Transport	32.59	26.50	19.65	24.87	34.90	28.09	18.38	23.26	40.90	25.89	12.58	15.91	45.41	36.17	27.39	35.26
Import Terminal	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.53	0.41	0.54	0.70
Power Plant	807.34	778.57	812.64	842.39	807.34	778.57	812.64	842.39	807.34	778.57	812.64	842.39	125.24	118.96	125.52	132.11
Saline Aquifer Sequestration	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.36	16.65	14.49	15.24
Total	864.38	834.36	854.33	895.15	866.68	835.94	853.06	893.54	872.68	833.74	847.26	886.20	219.06	211.74	198.12	222.16

**Table B2.** PRB Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	1.11E-04	1.07E-04	0.00E+00	9.12E-02
		Fuel Upstream	1.95E-02	4.56E-03	1.17E-04	3.97E-08	2.41E-02
	Power Plant	Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
		Plant Auxiliary Inputs	4.99E+00	6.18E-01	2.10E-02	2.76E-05	5.62E+00
		Plant Construction	1.11E+00	8.83E-02	1.86E-03	8.49E-04	1.20E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	2.56E+01	1.52E-02	3.77E-01	0.00E+00	2.60E+01
		Fuel Upstream	5.32E+00	1.25E+00	3.20E-02	1.08E-05	6.60E+00
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	1.94E-02	3.14E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	6.48E-01	1.66E-02	5.64E-06	3.43E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	1.71E-01	1.27E-02	7.86E-04	1.05E-03	1.86E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
	Overburden Removal	Mine Methane	0.00E+00	2.19E+00	0.00E+00	0.00E+00	2.19E+00
		Fuel Combustion	7.39E-01	1.07E-03	1.73E-03	0.00E+00	7.42E-01
		Ammonium Nitrate Upstream	3.89E-01	2.11E-02	5.49E-01	2.19E-09	9.59E-01
		Electricity Upstream	1.48E+00	1.09E-01	6.79E-03	9.08E-03	1.61E+00
	Construction	Fuel Upstream	1.49E-01	3.59E-02	9.07E-04	2.83E-07	1.86E-01
		Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
		Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
Total			8.58E+02	5.04E+00	1.27E+00	1.10E-02	8.64E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B3.** PRB Coal to South Korea Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	1.11E-04	1.07E-04	0.00E+00	9.12E-02
		Fuel Upstream	1.95E-02	4.56E-03	1.17E-04	3.97E-08	2.41E-02
	Power Plant	Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
		Plant Auxiliary Inputs	4.99E+00	6.18E-01	2.10E-02	2.76E-05	5.62E+00
		Plant Construction	1.11E+00	8.83E-02	1.86E-03	8.49E-04	1.20E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	2.74E+01	1.62E-02	4.03E-01	0.00E+00	2.78E+01
		Fuel Upstream	5.70E+00	1.33E+00	3.42E-02	1.16E-05	7.06E+00
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	1.94E-02	3.14E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	6.48E-01	1.66E-02	5.64E-06	3.43E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	1.71E-01	1.27E-02	7.86E-04	1.05E-03	1.86E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
	Overburden Removal	Mine Methane	0.00E+00	2.19E+00	0.00E+00	0.00E+00	2.19E+00
		Fuel Combustion	7.39E-01	1.07E-03	1.73E-03	0.00E+00	7.42E-01
		Ammonium Nitrate Upstream	3.89E-01	2.11E-02	5.49E-01	2.19E-09	9.59E-01
		Electricity Upstream	1.48E+00	1.09E-01	6.79E-03	9.08E-03	1.61E+00
	Construction	Fuel Upstream	1.49E-01	3.59E-02	9.07E-04	2.83E-07	1.86E-01
		Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
		Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
Total			8.60E+02	5.13E+00	1.30E+00	1.10E-02	8.67E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B4.** PRB Coal to Taiwan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	1.11E-04	1.07E-04	0.00E+00	9.12E-02
		Fuel Upstream	1.95E-02	4.56E-03	1.17E-04	3.97E-08	2.41E-02
	Power Plant	Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
		Plant Auxiliary Inputs	4.99E+00	6.18E-01	2.10E-02	2.76E-05	5.62E+00
		Plant Construction	1.11E+00	8.83E-02	1.86E-03	8.49E-04	1.20E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	3.21E+01	1.90E-02	4.73E-01	0.00E+00	3.26E+01
		Fuel Upstream	6.67E+00	1.56E+00	4.01E-02	1.36E-05	8.28E+00
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	1.94E-02	3.14E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	6.48E-01	1.66E-02	5.64E-06	3.43E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	1.71E-01	1.27E-02	7.86E-04	1.05E-03	1.86E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
	Overburden Removal	Mine Methane	0.00E+00	2.19E+00	0.00E+00	0.00E+00	2.19E+00
		Fuel Combustion	7.39E-01	1.07E-03	1.73E-03	0.00E+00	7.42E-01
		Ammonium Nitrate Upstream	3.89E-01	2.11E-02	5.49E-01	2.19E-09	9.59E-01
		Electricity Upstream	1.48E+00	1.09E-01	6.79E-03	9.08E-03	1.61E+00
	Construction	Fuel Upstream	1.49E-01	3.59E-02	9.07E-04	2.83E-07	1.86E-01
		Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
		Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
Total			8.66E+02	5.36E+00	1.37E+00	1.10E-02	8.73E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B5.** Australian Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	1.98E-04	1.90E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	8.09E-03	2.08E-04	7.04E-08	4.28E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	5.99E-01	2.07E-02	2.65E-05	5.48E+00
		Plant Construction	1.08E+00	8.54E-02	1.80E-03	8.21E-04	1.16E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.08E+01	1.23E-02	3.06E-01	0.00E+00	2.11E+01
		Fuel Upstream	4.32E+00	1.01E+00	2.60E-02	8.82E-06	5.36E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	1.20E+00	1.74E-03	2.81E-03	0.00E+00	1.20E+00
		Fuel Upstream	2.47E-01	5.79E-02	1.49E-03	5.04E-07	3.07E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.58E-01	1.01E-02	8.02E-04	6.88E-04	1.70E-01
	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	2.43E-01	1.54E-02	1.23E-03	1.05E-03	2.60E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
		Mine Methane	0.00E+00	1.34E+01	0.00E+00	0.00E+00	1.34E+01
	Overburden Removal	Fuel Combustion	2.02E+00	2.93E-03	4.73E-03	0.00E+00	2.03E+00
		Ammonium Nitrate Upstream	1.17E+00	6.32E-02	1.65E+00	6.56E-09	2.88E+00
		Electricity Upstream	6.29E+00	4.00E-01	3.18E-02	2.73E-02	6.75E+00
		Fuel Upstream	4.47E-01	1.08E-01	2.72E-03	8.49E-07	5.57E-01
	Construction	Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
		Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
	Total		8.15E+02	1.58E+01	2.28E+00	2.99E-02	8.34E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B6.** Australian Coal to South Korea Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	1.98E-04	1.90E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	8.09E-03	2.08E-04	7.04E-08	4.28E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	5.99E-01	2.07E-02	2.65E-05	5.48E+00
		Plant Construction	1.08E+00	8.54E-02	1.80E-03	8.21E-04	1.16E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.21E+01	1.31E-02	3.25E-01	0.00E+00	2.24E+01
		Fuel Upstream	4.58E+00	1.07E+00	2.76E-02	9.35E-06	5.69E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	1.20E+00	1.74E-03	2.81E-03	0.00E+00	1.20E+00
		Fuel Upstream	2.47E-01	5.79E-02	1.49E-03	5.04E-07	3.07E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.58E-01	1.01E-02	8.02E-04	6.88E-04	1.70E-01
	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	2.43E-01	1.54E-02	1.23E-03	1.05E-03	2.60E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
		Mine Methane	0.00E+00	1.34E+01	0.00E+00	0.00E+00	1.34E+01
	Overburden Removal	Fuel Combustion	2.02E+00	2.93E-03	4.73E-03	0.00E+00	2.03E+00
		Ammonium Nitrate Upstream	1.17E+00	6.32E-02	1.65E+00	6.56E-09	2.88E+00
		Electricity Upstream	6.29E+00	4.00E-01	3.18E-02	2.73E-02	6.75E+00
		Fuel Upstream	4.47E-01	1.08E-01	2.72E-03	8.49E-07	5.57E-01
		Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
	Construction	Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
	Total		8.18E+02	1.59E+01	2.30E+00	2.99E-02	8.36E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B7.** Australian Coal to Taiwan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	1.98E-04	1.90E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	8.09E-03	2.08E-04	7.04E-08	4.28E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	5.99E-01	2.07E-02	2.65E-05	5.48E+00
		Plant Construction	1.08E+00	8.54E-02	1.80E-03	8.21E-04	1.16E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.03E+01	1.21E-02	2.99E-01	0.00E+00	2.06E+01
		Fuel Upstream	4.22E+00	9.90E-01	2.54E-02	8.61E-06	5.24E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	1.20E+00	1.74E-03	2.81E-03	0.00E+00	1.20E+00
		Fuel Upstream	2.47E-01	5.79E-02	1.49E-03	5.04E-07	3.07E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.58E-01	1.01E-02	8.02E-04	6.88E-04	1.70E-01
	Mine Reclamation	Fuel Combustion	1.39E-01	2.01E-04	3.25E-04	0.00E+00	1.39E-01
		Fuel Upstream	2.86E-02	6.70E-03	1.72E-04	5.83E-08	3.55E-02
	Coal Extraction	Fuel Combustion	2.37E-01	3.43E-04	5.53E-04	0.00E+00	2.37E-01
		Ammonium Nitrate Upstream	1.62E-01	8.80E-03	2.29E-01	9.14E-10	4.01E-01
		Electricity Upstream	2.43E-01	1.54E-02	1.23E-03	1.05E-03	2.60E-01
		Fuel Upstream	4.75E-02	1.15E-02	2.90E-04	8.81E-08	5.93E-02
		Mine Methane	0.00E+00	1.34E+01	0.00E+00	0.00E+00	1.34E+01
	Overburden Removal	Fuel Combustion	2.02E+00	2.93E-03	4.73E-03	0.00E+00	2.03E+00
		Ammonium Nitrate Upstream	1.17E+00	6.32E-02	1.65E+00	6.56E-09	2.88E+00
		Electricity Upstream	6.29E+00	4.00E-01	3.18E-02	2.73E-02	6.75E+00
		Fuel Upstream	4.47E-01	1.08E-01	2.72E-03	8.49E-07	5.57E-01
	Construction	Access Road Construction	8.92E-03	2.01E-03	5.29E-05	7.93E-11	1.10E-02
		Equipment Manufacturing	2.92E-02	1.07E-03	2.51E-04	6.65E-06	3.05E-02
	Total		8.15E+02	1.58E+01	2.27E+00	2.99E-02	8.34E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B8.** Indonesian (Mulia) Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	9.08E-05	8.72E-05	0.00E+00	7.41E-02
		Fuel Upstream	1.59E-02	3.72E-03	9.53E-05	3.23E-08	1.59E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	6.38E-01	2.07E-02	2.87E-05	5.12E+00
		Plant Construction	1.16E+00	9.17E-02	1.93E-03	8.82E-04	1.16E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.95E+01	1.16E-02	2.87E-01	0.00E+00	1.95E+01
		Fuel Upstream	4.06E+00	9.51E-01	2.44E-02	8.27E-06	4.06E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	4.43E-04	2.56E-02	0.00E+00	1.89E+00
		Fuel Upstream	3.61E-01	8.46E-02	2.17E-03	7.36E-07	3.61E-01
	Truck	Fuel Combustion	2.02E+00	2.47E-03	2.38E-03	0.00E+00	2.02E+00
		Fuel Upstream	4.32E-01	1.01E-01	2.60E-03	8.81E-07	4.32E-01
Coal Mining	Mine Reclamation	Fuel Combustion	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
		Fuel Upstream	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Coal Extraction	Fuel Combustion	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
		Ammonium Nitrate Upstream	5.35E-01	7.75E-04	1.25E-03	0.00E+00	5.35E-01
		Fuel Upstream	1.10E-01	2.59E-02	6.63E-04	2.25E-07	1.10E-01
	Overburden Removal	Mine Methane	8.44E-01	1.22E-03	1.97E-03	0.00E+00	8.44E-01
		Fuel Combustion	2.09E-01	1.13E-02	2.95E-01	1.17E-09	2.09E-01
		Ammonium Nitrate Upstream	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
		Fuel Upstream	1.72E-01	4.09E-02	1.04E-03	3.40E-07	1.72E-01
	Construction	Access Road Construction	0.00E+00	1.12E+01	0.00E+00	0.00E+00	0.00E+00
		Equipment Manufacturing	4.77E+00	6.90E-03	1.11E-02	0.00E+00	4.77E+00
Total			8.80E+02	1.35E+01	1.98E+00	9.32E-04	8.80E+02

Note: <sup>1</sup> Zero values include cases of no data.



**Table B9.** Indonesian (Adaro) Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	4.10E-05	3.94E-05	0.00E+00	3.36E-02
		Fuel Upstream	7.17E-03	1.68E-03	4.31E-05	1.46E-08	8.89E-03
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	6.22E-01	2.04E-02	2.79E-05	5.65E+00
		Plant Construction	1.12E+00	8.89E-02	1.87E-03	8.55E-04	1.21E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	1.54E+01	9.15E-03	2.27E-01	0.00E+00	1.57E+01
		Fuel Upstream	3.21E+00	7.52E-01	1.93E-02	6.54E-06	3.98E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	3.50E-04	2.02E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	6.68E-02	1.71E-03	5.81E-07	3.54E-01
	Truck	Fuel Combustion	1.60E+00	1.95E-03	1.88E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	8.00E-02	2.05E-03	6.96E-07	4.23E-01
Coal Mining	Mine Reclamation	Fuel Combustion	4.23E-01	6.13E-04	9.90E-04	0.00E+00	4.25E-01
		Fuel Upstream	8.72E-02	2.04E-02	5.24E-04	1.78E-07	1.08E-01
	Coal Extraction	Fuel Combustion	6.67E-01	9.66E-04	1.56E-03	0.00E+00	6.69E-01
		Ammonium Nitrate Upstream	1.65E-01	8.95E-03	2.33E-01	9.28E-10	4.07E-01
		Fuel Upstream	1.36E-01	3.23E-02	8.23E-04	2.69E-07	1.69E-01
	Overburden Removal	Mine Methane	0.00E+00	8.88E+00	0.00E+00	0.00E+00	8.88E+00
		Fuel Combustion	3.77E+00	5.45E-03	8.80E-03	0.00E+00	3.78E+00
		Ammonium Nitrate Upstream	7.24E-01	3.92E-02	1.02E+00	4.07E-09	1.79E+00
		Fuel Upstream	7.94E-01	1.88E-01	4.80E-03	1.58E-06	9.87E-01
	Construction	Access Road Construction	9.07E-03	2.05E-03	5.37E-05	8.06E-11	1.12E-02
		Equipment Manufacturing	2.96E-02	1.08E-03	2.55E-04	6.76E-06	3.10E-02
Total			8.42E+02	1.08E+01	1.57E+00	9.00E-04	8.54E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B10.** Indonesian (Mulia) Coal to South Korea Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	9.08E-05	8.72E-05	0.00E+00	7.43E-02
		Fuel Upstream	1.59E-02	3.72E-03	9.53E-05	3.23E-08	1.97E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	6.38E-01	2.07E-02	2.87E-05	5.78E+00
		Plant Construction	1.16E+00	9.17E-02	1.93E-03	8.82E-04	1.25E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.83E+01	1.08E-02	2.69E-01	0.00E+00	1.85E+01
		Fuel Upstream	3.80E+00	8.90E-01	2.28E-02	7.74E-06	4.71E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	4.43E-04	2.56E-02	0.00E+00	1.92E+00
		Fuel Upstream	3.61E-01	8.46E-02	2.17E-03	7.36E-07	4.48E-01
	Truck	Fuel Combustion	2.02E+00	2.47E-03	2.38E-03	0.00E+00	2.02E+00
		Fuel Upstream	4.32E-01	1.01E-01	2.60E-03	8.81E-07	5.36E-01
Coal Mining	Mine Reclamation	Fuel Combustion	5.35E-01	7.75E-04	1.25E-03	0.00E+00	5.37E-01
		Fuel Upstream	1.10E-01	2.59E-02	6.63E-04	2.25E-07	1.37E-01
	Coal Extraction	Fuel Combustion	8.44E-01	1.22E-03	1.97E-03	0.00E+00	8.47E-01
		Ammonium Nitrate Upstream	2.09E-01	1.13E-02	2.95E-01	1.17E-09	5.15E-01
		Fuel Upstream	1.72E-01	4.09E-02	1.04E-03	3.40E-07	2.14E-01
	Overburden Removal	Mine Methane	0.00E+00	1.12E+01	0.00E+00	0.00E+00	1.12E+01
		Fuel Combustion	4.77E+00	6.90E-03	1.11E-02	0.00E+00	4.79E+00
		Ammonium Nitrate Upstream	9.16E-01	4.97E-02	1.29E+00	5.15E-09	2.26E+00
		Fuel Upstream	1.01E+00	2.38E-01	6.07E-03	2.00E-06	1.25E+00
	Construction	Access Road Construction	1.15E-02	2.59E-03	6.80E-05	1.02E-10	1.41E-02
		Equipment Manufacturing	3.75E-02	1.37E-03	3.23E-04	8.56E-06	3.92E-02
Total			8.78E+02	1.34E+01	1.96E+00	9.31E-04	8.93E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B11.** Indonesian (Adaro) Coal to South Korea Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	4.10E-05	3.94E-05	0.00E+00	3.36E-02
		Fuel Upstream	7.17E-03	1.68E-03	4.31E-05	1.46E-08	8.89E-03
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	6.22E-01	2.04E-02	2.79E-05	5.65E+00
		Plant Construction	1.12E+00	8.89E-02	1.87E-03	8.55E-04	1.21E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	1.44E+01	8.56E-03	2.12E-01	0.00E+00	1.47E+01
		Fuel Upstream	3.00E+00	7.03E-01	1.80E-02	6.12E-06	3.72E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	3.50E-04	2.02E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	6.68E-02	1.71E-03	5.81E-07	3.54E-01
	Truck	Fuel Combustion	1.60E+00	1.95E-03	1.88E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	8.00E-02	2.05E-03	6.96E-07	4.23E-01
Coal Mining	Mine Reclamation	Fuel Combustion	3.35E-02	4.10E-05	3.94E-05	0.00E+00	3.36E-02
		Fuel Upstream	7.17E-03	1.68E-03	4.31E-05	1.46E-08	8.89E-03
	Coal Extraction	Fuel Combustion	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Ammonium Nitrate Upstream	5.01E+00	6.22E-01	2.04E-02	2.79E-05	5.65E+00
		Fuel Upstream	1.36E-01	3.23E-02	8.23E-04	2.69E-07	1.69E-01
	Overburden Removal	Mine Methane	0.00E+00	8.88E+00	0.00E+00	0.00E+00	8.88E+00
		Fuel Combustion	3.77E+00	5.45E-03	8.80E-03	0.00E+00	3.78E+00
		Ammonium Nitrate Upstream	7.24E-01	3.92E-02	1.02E+00	4.07E-09	1.79E+00
		Fuel Upstream	7.94E-01	1.88E-01	4.80E-03	1.58E-06	9.87E-01
	Construction	Access Road Construction	9.07E-03	2.05E-03	5.37E-05	8.06E-11	1.12E-02
		Equipment Manufacturing	2.96E-02	1.08E-03	2.55E-04	6.76E-06	3.10E-02
Total			8.41E+02	1.08E+01	1.55E+00	8.99E-04	8.53E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B12.** Indonesian (Mulia) Coal to Taiwan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	9.08E-05	8.72E-05	0.00E+00	7.43E-02
		Fuel Upstream	1.59E-02	3.72E-03	9.53E-05	3.23E-08	1.97E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	6.38E-01	2.07E-02	2.87E-05	5.78E+00
		Plant Construction	1.16E+00	9.17E-02	1.93E-03	8.82E-04	1.25E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.25E+01	7.41E-03	1.84E-01	0.00E+00	1.27E+01
		Fuel Upstream	2.60E+00	6.09E-01	1.56E-02	5.30E-06	3.22E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	4.43E-04	2.56E-02	0.00E+00	1.92E+00
		Fuel Upstream	3.61E-01	8.46E-02	2.17E-03	7.36E-07	4.48E-01
	Truck	Fuel Combustion	2.02E+00	2.47E-03	2.38E-03	0.00E+00	2.02E+00
		Fuel Upstream	4.32E-01	1.01E-01	2.60E-03	8.81E-07	5.36E-01
Coal Mining	Mine Reclamation	Fuel Combustion	5.35E-01	7.75E-04	1.25E-03	0.00E+00	5.37E-01
		Fuel Upstream	1.10E-01	2.59E-02	6.63E-04	2.25E-07	1.37E-01
	Coal Extraction	Fuel Combustion	8.44E-01	1.22E-03	1.97E-03	0.00E+00	8.47E-01
		Ammonium Nitrate Upstream	2.09E-01	1.13E-02	2.95E-01	1.17E-09	5.15E-01
		Fuel Upstream	1.72E-01	4.09E-02	1.04E-03	3.40E-07	2.14E-01
	Overburden Removal	Mine Methane	0.00E+00	1.12E+01	0.00E+00	0.00E+00	1.12E+01
		Fuel Combustion	4.77E+00	6.90E-03	1.11E-02	0.00E+00	4.79E+00
		Ammonium Nitrate Upstream	9.16E-01	4.97E-02	1.29E+00	5.15E-09	2.26E+00
		Fuel Upstream	1.01E+00	2.38E-01	6.07E-03	2.00E-06	1.25E+00
	Construction	Access Road Construction	1.15E-02	2.59E-03	6.80E-05	1.02E-10	1.41E-02
		Equipment Manufacturing	3.75E-02	1.37E-03	3.23E-04	8.56E-06	3.92E-02
Total			8.71E+02	1.32E+01	1.87E+00	9.29E-04	8.86E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B13.** Indonesian (Adaro) Coal to Taiwan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	4.10E-05	3.94E-05	0.00E+00	3.36E-02
		Fuel Upstream	7.17E-03	1.68E-03	4.31E-05	1.46E-08	8.89E-03
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	6.22E-01	2.04E-02	2.79E-05	5.65E+00
		Plant Construction	1.12E+00	8.89E-02	1.87E-03	8.55E-04	1.21E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	9.88E+00	5.85E-03	1.45E-01	0.00E+00	1.00E+01
		Fuel Upstream	2.05E+00	4.81E-01	1.23E-02	4.18E-06	2.55E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	3.50E-04	2.02E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	6.68E-02	1.71E-03	5.81E-07	3.54E-01
	Truck	Fuel Combustion	1.60E+00	1.95E-03	1.88E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	8.00E-02	2.05E-03	6.96E-07	4.23E-01
Coal Mining	Mine Reclamation	Fuel Combustion	4.23E-01	6.13E-04	9.90E-04	0.00E+00	4.25E-01
		Fuel Upstream	8.72E-02	2.04E-02	5.24E-04	1.78E-07	1.08E-01
	Coal Extraction	Fuel Combustion	6.67E-01	9.66E-04	1.56E-03	0.00E+00	6.69E-01
		Ammonium Nitrate Upstream	1.65E-01	8.95E-03	2.33E-01	9.28E-10	4.07E-01
		Fuel Upstream	1.36E-01	3.23E-02	8.23E-04	2.69E-07	1.69E-01
	Overburden Removal	Mine Methane	0.00E+00	8.88E+00	0.00E+00	0.00E+00	8.88E+00
		Fuel Combustion	3.77E+00	5.45E-03	8.80E-03	0.00E+00	3.78E+00
		Ammonium Nitrate Upstream	7.24E-01	3.92E-02	1.02E+00	4.07E-09	1.79E+00
		Fuel Upstream	7.94E-01	1.88E-01	4.80E-03	1.58E-06	9.87E-01
	Construction	Access Road Construction	9.07E-03	2.05E-03	5.37E-05	8.06E-11	1.12E-02
		Equipment Manufacturing	2.96E-02	1.08E-03	2.55E-04	6.76E-06	3.10E-02
Total			8.35E+02	1.05E+01	1.48E+00	8.97E-04	8.47E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B14.** CCS Case for PRB Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
CO <sub>2</sub> Transport and Storage	Saline Aquifer Sequestration	Site Monitoring	3.31E-03	5.91E-05	3.11E-05	1.17E-11	3.40E-03
		Brine Management	3.34E-01	2.45E-02	1.53E-03	2.03E-03	3.62E-01
		Injection and Site Operations	1.21E+01	5.22E-01	3.25E-02	4.32E-02	1.27E+01
		Site Prep and Construction	3.85E-02	2.09E-04	2.21E-05	9.34E-06	3.88E-02
	CO <sub>2</sub> Pipeline	Pipeline Maintenance	8.28E-01	0.00E+00	0.00E+00	0.00E+00	8.28E-01
		Pipeline Operation	7.98E-02	0.00E+00	0.00E+00	0.00E+00	7.98E-02
		Pipeline Construction	3.12E-01	1.19E-02	5.18E-03	0.00E+00	3.29E-01
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.28E-01	1.56E-04	1.50E-04	0.00E+00	1.28E-01
		Fuel Upstream	2.73E-02	6.40E-03	1.64E-04	5.57E-08	3.39E-02
	Power Plant	Stack Emissions	1.12E+02	0.00E+00	0.00E+00	0.00E+00	1.12E+02
		Plant Auxiliary Inputs	1.03E+01	1.06E+00	5.53E-02	3.62E-05	1.15E+01
		Plant Construction	1.11E+00	8.84E-02	1.86E-03	8.50E-04	1.20E+00
Transport	Processing	Import Terminal	5.32E-01	0.00E+00	0.00E+00	0.00E+00	5.32E-01
	Ocean	Fuel Combustion	3.57E+01	2.11E-02	5.25E-01	0.00E+00	3.62E+01
		Fuel Upstream	7.41E+00	1.74E+00	4.46E-02	1.51E-05	9.19E+00
	Processing	Export Terminal	5.32E-01	0.00E+00	0.00E+00	0.00E+00	5.32E-01
	Rail	Fuel Combustion	1.87E+01	2.71E-02	4.37E-02	0.00E+00	1.88E+01
		Fuel Upstream	3.85E+00	9.03E-01	2.32E-02	7.85E-06	4.78E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.93E-01	2.80E-04	4.52E-04	0.00E+00	1.94E-01
		Fuel Upstream	3.98E-02	9.34E-03	2.40E-04	8.12E-08	4.94E-02
	Coal Extraction	Fuel Combustion	3.30E-01	4.77E-04	7.71E-04	0.00E+00	3.31E-01
		Ammonium Nitrate Upstream	2.26E-01	1.23E-02	3.20E-01	1.27E-09	5.58E-01
		Electricity Upstream	2.39E-01	1.77E-02	1.09E-03	1.47E-03	2.59E-01
		Fuel Upstream	6.62E-02	1.61E-02	4.04E-04	1.23E-07	8.26E-02
		Mine Methane	0.00E+00	3.05E+00	0.00E+00	0.00E+00	3.05E+00
	Overburden Removal	Fuel Combustion	1.03E+00	1.49E-03	2.40E-03	0.00E+00	1.03E+00
		Ammonium Nitrate Upstream	5.41E-01	2.93E-02	7.65E-01	3.05E-09	1.34E+00
		Electricity Upstream	2.06E+00	1.53E-01	9.46E-03	1.27E-02	2.24E+00
		Fuel Upstream	2.08E-01	5.00E-02	1.26E-03	3.94E-07	2.59E-01
	Construction	Access Road Construction	1.24E-02	2.81E-03	7.36E-05	1.11E-10	1.53E-02
		Equipment Manufacturing	4.06E-02	1.48E-03	3.50E-04	9.27E-06	4.25E-02
Total			2.09E+02	7.75E+00	1.83E+00	6.03E-02	2.18E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B15.** CCS Case for Australian Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
CO <sub>2</sub> Transport and Storage	Saline Aquifer Sequestration	Site Monitoring	3.16E-03	5.64E-05	2.97E-05	1.12E-11	3.25E-03
		Brine Management	4.46E-01	2.84E-02	2.26E-03	1.94E-03	4.78E-01
		Injection and Site Operations	1.43E+01	6.04E-01	4.80E-02	4.12E-02	1.50E+01
		Site Prep and Construction	3.73E-02	2.23E-04	2.48E-05	8.92E-06	3.76E-02
	CO <sub>2</sub> Pipeline	Pipeline Maintenance	7.88E-01	0.00E+00	0.00E+00	0.00E+00	7.88E-01
		Pipeline Operation	7.61E-02	0.00E+00	0.00E+00	0.00E+00	7.61E-02
Pipeline Construction		2.97E-01	1.13E-02	4.94E-03	0.00E+00	3.13E-01	
Energy Conversion	Fly Ash Disposal	Fuel Combustion	2.23E-01	2.73E-04	2.62E-04	0.00E+00	2.23E-01
		Fuel Upstream	4.76E-02	1.12E-02	2.86E-04	9.70E-08	5.90E-02
	Power Plant	Stack Emissions	1.05E+02	0.00E+00	0.00E+00	0.00E+00	1.05E+02
		Plant Auxiliary Inputs	1.01E+01	1.03E+00	5.52E-02	3.41E-05	1.12E+01
		Plant Construction	1.05E+00	8.37E-02	1.76E-03	8.06E-04	1.14E+00
Transport	Processing	Import Terminal	4.14E-01	0.00E+00	0.00E+00	0.00E+00	4.14E-01
	Ocean	Fuel Combustion	2.84E+01	1.68E-02	4.18E-01	0.00E+00	2.88E+01
		Fuel Upstream	5.90E+00	1.38E+00	3.55E-02	1.20E-05	7.32E+00
	Processing	Export Terminal	4.14E-01	0.00E+00	0.00E+00	0.00E+00	4.14E-01
	Rail	Fuel Combustion	1.64E+00	2.37E-03	3.83E-03	0.00E+00	1.64E+00
		Fuel Upstream	3.37E-01	7.91E-02	2.03E-03	6.88E-07	4.18E-01
Coal Mining	Coal Cleaning	Electricity Upstream	2.16E-01	1.37E-02	1.09E-03	9.38E-04	2.32E-01
	Mine Reclamation	Fuel Combustion	1.89E-01	2.74E-04	4.43E-04	0.00E+00	1.90E-01
		Fuel Upstream	3.90E-02	9.15E-03	2.35E-04	7.96E-08	4.84E-02
	Coal Extraction	Fuel Combustion	3.23E-01	4.67E-04	7.55E-04	0.00E+00	3.24E-01
		Ammonium Nitrate Upstream	2.22E-01	1.20E-02	3.13E-01	1.25E-09	5.47E-01
		Electricity Upstream	3.31E-01	2.11E-02	1.68E-03	1.44E-03	3.55E-01
		Fuel Upstream	6.48E-02	1.57E-02	3.96E-04	1.20E-07	8.09E-02
		Mine Methane	0.00E+00	1.83E+01	0.00E+00	0.00E+00	1.83E+01
	Overburden Removal	Fuel Combustion	2.76E+00	3.99E-03	6.45E-03	0.00E+00	2.77E+00
		Ammonium Nitrate Upstream	1.59E+00	8.62E-02	2.25E+00	8.95E-09	3.92E+00
		Electricity Upstream	8.58E+00	5.46E-01	4.35E-02	3.73E-02	9.21E+00
		Fuel Upstream	6.10E-01	1.47E-01	3.71E-03	1.16E-06	7.60E-01
	Construction	Access Road Construction	1.22E-02	2.75E-03	7.21E-05	1.08E-10	1.50E-02
		Equipment Manufacturing	3.98E-02	1.45E-03	3.42E-04	9.08E-06	4.16E-02
Total			1.85E+02	2.24E+01	3.19E+00	8.36E-02	2.10E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B16.** CCS Case for Indonesian (Mulia) Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
CO <sub>2</sub> Transport and Storage	Saline Aquifer Sequestration	Site Monitoring	3.52E-03	6.28E-05	3.30E-05	1.24E-11	3.61E-03
		Brine Management	3.54E-01	2.60E-02	1.62E-03	2.16E-03	3.84E-01
		Injection and Site Operations	1.29E+01	5.55E-01	3.45E-02	4.59E-02	1.35E+01
		Site Prep and Construction	4.09E-02	2.22E-04	2.35E-05	9.91E-06	4.12E-02
	CO <sub>2</sub> Pipeline	Pipeline Maintenance	8.80E-01	0.00E+00	0.00E+00	0.00E+00	8.80E-01
		Pipeline Operation	8.47E-02	0.00E+00	0.00E+00	0.00E+00	8.47E-02
Pipeline Construction		3.31E-01	1.26E-02	5.50E-03	0.00E+00	3.49E-01	
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.06E-01	1.30E-04	1.25E-04	0.00E+00	1.07E-01
		Fuel Upstream	2.28E-02	5.33E-03	1.37E-04	4.64E-08	2.82E-02
	Power Plant	Stack Emissions	1.18E+02	0.00E+00	0.00E+00	0.00E+00	1.18E+02
		Plant Auxiliary Inputs	1.05E+01	1.10E+00	5.43E-02	3.86E-05	1.17E+01
		Plant Construction	1.18E+00	9.34E-02	1.97E-03	8.99E-04	1.27E+00
Transport	Processing	Import Terminal	6.96E-01	0.00E+00	0.00E+00	0.00E+00	6.96E-01
	Ocean	Fuel Combustion	2.77E+01	1.64E-02	4.08E-01	0.00E+00	2.81E+01
		Fuel Upstream	5.75E+00	1.35E+00	3.46E-02	1.17E-05	7.14E+00
	Processing	Export Terminal	6.96E-01	0.00E+00	0.00E+00	0.00E+00	6.96E-01
	Barge	Fuel Combustion	2.68E+00	6.28E-04	3.63E-02	0.00E+00	2.72E+00
		Fuel Upstream	5.12E-01	1.20E-01	3.08E-03	1.04E-06	6.35E-01
	Truck	Fuel Combustion	2.86E+00	3.51E-03	3.37E-03	0.00E+00	2.87E+00
		Fuel Upstream	6.12E-01	1.44E-01	3.68E-03	1.25E-06	7.60E-01
Coal Mining	Mine Reclamation	Fuel Combustion	7.59E-01	1.10E-03	1.78E-03	0.00E+00	7.62E-01
		Fuel Upstream	1.56E-01	3.67E-02	9.40E-04	3.19E-07	1.94E-01
	Coal Extraction	Fuel Combustion	1.20E+00	1.73E-03	2.80E-03	0.00E+00	1.20E+00
		Ammonium Nitrate Upstream	2.96E-01	1.61E-02	4.18E-01	1.67E-09	7.30E-01
		Fuel Upstream	2.44E-01	5.80E-02	1.48E-03	4.82E-07	3.04E-01
		Mine Methane	0.00E+00	1.59E+01	0.00E+00	0.00E+00	1.59E+01
	Overburden Removal	Fuel Combustion	6.76E+00	9.78E-03	1.58E-02	0.00E+00	6.79E+00
		Ammonium Nitrate Upstream	1.30E+00	7.04E-02	1.83E+00	7.31E-09	3.20E+00
		Fuel Upstream	1.43E+00	3.37E-01	8.61E-03	2.84E-06	1.77E+00
	Construction	Access Road Construction	1.63E-02	3.67E-03	9.64E-05	1.45E-10	2.00E-02
Equipment Manufacturing		5.31E-02	1.94E-03	4.58E-04	1.21E-05	5.56E-02	
Total			1.99E+02	1.99E+01	2.87E+00	4.90E-02	2.21E+02

Note: <sup>1</sup> Zero values include cases of no data.



**Table B17.** CCS Case for Indonesian (Adaro) Coal to Japan Drilldown GHG Results—AR5 100-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
CO <sub>2</sub> Transport and Storage	Saline Aquifer Sequestration	Site Monitoring	3.34E-03	5.96E-05	3.14E-05	1.18E-11	1.97E+02
		Brine Management	3.37E-01	2.48E-02	1.54E-03	2.05E-03	3.43E-03
		Injection and Site Operations	1.22E+01	5.27E-01	3.28E-02	4.36E-02	3.65E-01
		Site Prep and Construction	3.89E-02	2.11E-04	2.23E-05	9.42E-06	1.28E+01
	CO <sub>2</sub> Pipeline	Pipeline Maintenance	8.36E-01	0.00E+00	0.00E+00	0.00E+00	3.91E-02
		Pipeline Operation	8.05E-02	0.00E+00	0.00E+00	0.00E+00	8.36E-01
Pipeline Construction		3.14E-01	1.20E-02	5.23E-03	0.00E+00	8.05E-02	
Energy Conversion	Fly Ash Disposal	Fuel Combustion	4.82E-02	5.90E-05	5.67E-05	0.00E+00	3.32E-01
		Fuel Upstream	1.03E-02	2.41E-03	6.19E-05	2.10E-08	4.83E-02
	Power Plant	Stack Emissions	1.12E+02	0.00E+00	0.00E+00	0.00E+00	1.28E-02
		Plant Auxiliary Inputs	1.03E+01	1.06E+00	5.40E-02	3.65E-05	1.12E+02
		Plant Construction	1.12E+00	8.90E-02	1.87E-03	8.56E-04	1.14E+01
Transport	Processing	Import Terminal	5.41E-01	0.00E+00	0.00E+00	0.00E+00	1.21E+00
	Ocean	Fuel Combustion	2.15E+01	1.27E-02	3.17E-01	0.00E+00	5.41E-01
		Fuel Upstream	4.47E+00	1.05E+00	2.69E-02	9.11E-06	2.18E+01
	Processing	Export Terminal	5.41E-01	0.00E+00	0.00E+00	0.00E+00	5.54E+00
	Barge	Fuel Combustion	2.08E+00	4.88E-04	2.82E-02	0.00E+00	5.41E-01
		Fuel Upstream	3.97E-01	9.31E-02	2.39E-03	8.10E-07	2.11E+00
	Truck	Fuel Combustion	2.22E+00	2.72E-03	2.62E-03	0.00E+00	4.93E-01
		Fuel Upstream	4.76E-01	1.12E-01	2.86E-03	9.70E-07	2.23E+00
Coal Mining	Mine Reclamation	Fuel Combustion	5.90E-01	8.54E-04	1.38E-03	0.00E+00	5.92E-01
		Fuel Upstream	1.21E-01	2.85E-02	7.30E-04	2.48E-07	1.51E-01
	Coal Extraction	Fuel Combustion	9.29E-01	1.35E-03	2.17E-03	0.00E+00	9.33E-01
		Ammonium Nitrate Upstream	2.30E-01	1.25E-02	3.25E-01	1.29E-09	5.67E-01
		Fuel Upstream	1.90E-01	4.50E-02	1.15E-03	3.74E-07	2.36E-01
	Overburden Removal	Mine Methane	0.00E+00	1.24E+01	0.00E+00	0.00E+00	1.24E+01
		Fuel Combustion	5.25E+00	7.60E-03	1.23E-02	0.00E+00	5.27E+00
		Ammonium Nitrate Upstream	1.01E+00	5.47E-02	1.43E+00	5.68E-09	2.49E+00
		Fuel Upstream	1.11E+00	2.62E-01	6.69E-03	2.20E-06	1.38E+00
	Construction	Access Road Construction	1.26E-02	2.85E-03	7.49E-05	1.12E-10	1.56E-02
		Equipment Manufacturing	4.13E-02	1.51E-03	3.55E-04	9.42E-06	4.32E-02
Total			1.79E+02	1.58E+01	2.25E+00	4.66E-02	1.97E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B18.** Summary of GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh).

Process	Japan				Korea				Taiwan				Japan-Carbon Capture			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	10.10	46.68	30.25	38.28	10.10	46.68	30.25	38.28	10.10	46.68	30.25	38.28	14.08	63.71	42.16	54.28
Coal Cleaning	N/A	0.18	N/A	N/A	N/A	0.18	N/A	N/A	N/A	0.18	N/A	N/A	N/A	0.25	N/A	N/A
Truck Transport	N/A	N/A	2.14	2.71	N/A	N/A	2.14	2.71	N/A	N/A	2.14	2.71	N/A	N/A	2.98	3.84
Rail Transport	17.84	1.60	N/A	N/A	17.84	1.60	N/A	N/A	17.84	1.60	N/A	N/A	24.86	2.18	N/A	N/A
Barge Transport	N/A	N/A	1.96	2.48	N/A	N/A	1.96	2.48	N/A	N/A	1.96	2.48	N/A	N/A	2.73	3.52
Export Terminal	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.53	0.41	0.54	0.70
Ocean Transport	34.33	27.92	20.70	26.20	36.77	29.59	19.36	24.50	43.09	27.27	13.25	16.77	47.84	38.10	28.86	37.15
Import Terminal	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.38	0.30	0.39	0.49	0.53	0.41	0.54	0.70
Power Plant	808.34	779.55	813.64	843.43	808.34	779.55	813.64	843.43	808.34	779.55	813.64	843.43	126.96	120.64	127.21	133.87
Saline Aquifer Sequestration	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15.13	17.55	15.27	16.07
Total	871.39	856.54	869.48	914.08	873.82	858.21	868.14	912.38	880.14	855.89	862.02	904.65	229.93	243.25	220.29	250.10

**Table B19.** PRB Coal to Japan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	2.69E-04	9.62E-05	0.00E+00	9.13E-02
		Fuel Upstream	1.95E-02	1.10E-02	1.05E-04	2.95E-08	3.06E-02
		Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
	Power Plant	Plant Auxiliary Inputs	4.99E+00	1.49E+00	1.89E-02	2.05E-05	6.50E+00
		Plant Construction	1.11E+00	2.13E-01	1.67E-03	6.32E-04	1.33E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	2.56E+01	3.67E-02	3.39E-01	0.00E+00	2.60E+01
		Fuel Upstream	5.32E+00	3.01E+00	2.88E-02	8.08E-06	8.36E+00
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	4.70E-02	2.82E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	1.57E+00	1.49E-02	4.20E-06	4.35E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
		Fuel Upstream	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
	Coal Extraction	Fuel Combustion	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
		Ammonium Nitrate Upstream	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Electricity Upstream	1.71E-01	3.06E-02	7.07E-04	7.83E-04	2.03E-01
		Fuel Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Mine Methane	0.00E+00	5.30E+00	0.00E+00	0.00E+00	5.30E+00
	Overburden Removal	Fuel Combustion	7.39E-01	2.58E-03	1.55E-03	0.00E+00	7.43E-01
		Ammonium Nitrate Upstream	3.89E-01	5.09E-02	4.94E-01	1.63E-09	9.33E-01
		Electricity Upstream	1.48E+00	2.65E-01	6.10E-03	6.77E-03	1.76E+00
		Fuel Upstream	1.49E-01	8.67E-02	8.16E-04	2.11E-07	2.36E-01
	Construction	Access Road Construction	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
		Equipment Manufacturing	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
	Total		8.58E+02	1.22E+01	1.14E+00	8.22E-03	8.71E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B20.** PRB Coal to South Korea Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	2.69E-04	9.62E-05	0.00E+00	9.13E-02
		Fuel Upstream	1.95E-02	1.10E-02	1.05E-04	2.95E-08	3.06E-02
	Power Plant	Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
		Plant Auxiliary Inputs	4.99E+00	1.49E+00	1.89E-02	2.05E-05	6.50E+00
		Plant Construction	1.11E+00	2.13E-01	1.67E-03	6.32E-04	1.33E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	2.74E+01	3.93E-02	3.63E-01	0.00E+00	2.78E+01
		Fuel Upstream	5.70E+00	3.23E+00	3.08E-02	8.65E-06	8.95E+00
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	4.70E-02	2.82E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	1.57E+00	1.49E-02	4.20E-06	4.35E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
		Fuel Upstream	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
	Coal Extraction	Fuel Combustion	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
		Ammonium Nitrate Upstream	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Electricity Upstream	1.71E-01	3.06E-02	7.07E-04	7.83E-04	2.03E-01
		Fuel Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Mine Methane	0.00E+00	5.30E+00	0.00E+00	0.00E+00	5.30E+00
	Overburden Removal	Fuel Combustion	7.39E-01	2.58E-03	1.55E-03	0.00E+00	7.43E-01
		Ammonium Nitrate Upstream	3.89E-01	5.09E-02	4.94E-01	1.63E-09	9.33E-01
		Electricity Upstream	1.48E+00	2.65E-01	6.10E-03	6.77E-03	1.76E+00
		Fuel Upstream	1.49E-01	8.67E-02	8.16E-04	2.11E-07	2.36E-01
	Construction	Access Road Construction	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
		Equipment Manufacturing	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
Total			8.60E+02	1.24E+01	1.17E+00	8.22E-03	8.74E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B21.** PRB Coal to Taiwan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	9.10E-02	2.69E-04	9.62E-05	0.00E+00	9.13E-02
		Fuel Upstream	1.95E-02	1.10E-02	1.05E-04	2.95E-08	3.06E-02
	Power Plant	Stack Emissions	8.00E+02	0.00E+00	0.00E+00	0.00E+00	8.00E+02
		Plant Auxiliary Inputs	4.99E+00	1.49E+00	1.89E-02	2.05E-05	6.50E+00
		Plant Construction	1.11E+00	2.13E-01	1.67E-03	6.32E-04	1.33E+00
Transport	Processing	Import Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Ocean	Fuel Combustion	3.21E+01	4.60E-02	4.25E-01	0.00E+00	3.26E+01
		Fuel Upstream	6.67E+00	3.78E+00	3.61E-02	1.01E-05	1.05E+01
	Processing	Export Terminal	3.82E-01	0.00E+00	0.00E+00	0.00E+00	3.82E-01
	Rail	Fuel Combustion	1.34E+01	4.70E-02	2.82E-02	0.00E+00	1.35E+01
		Fuel Upstream	2.76E+00	1.57E+00	1.49E-02	4.20E-06	4.35E+00
Coal Mining	Mine Reclamation	Fuel Combustion	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
		Fuel Upstream	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
	Coal Extraction	Fuel Combustion	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
		Ammonium Nitrate Upstream	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Electricity Upstream	1.71E-01	3.06E-02	7.07E-04	7.83E-04	2.03E-01
		Fuel Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Mine Methane	0.00E+00	5.30E+00	0.00E+00	0.00E+00	5.30E+00
	Overburden Removal	Fuel Combustion	7.39E-01	2.58E-03	1.55E-03	0.00E+00	7.43E-01
		Ammonium Nitrate Upstream	3.89E-01	5.09E-02	4.94E-01	1.63E-09	9.33E-01
		Electricity Upstream	1.48E+00	2.65E-01	6.10E-03	6.77E-03	1.76E+00
		Fuel Upstream	1.49E-01	8.67E-02	8.16E-04	2.11E-07	2.36E-01
	Construction	Access Road Construction	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
		Equipment Manufacturing	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
Total			8.66E+02	1.30E+01	1.24E+00	8.22E-03	8.80E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B22.** Australian Coal to Japan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	4.78E-04	1.71E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	1.96E-02	1.87E-04	5.24E-08	5.43E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	1.45E+00	1.86E-02	1.98E-05	6.33E+00
		Plant Construction	1.08E+00	2.06E-01	1.62E-03	6.12E-04	1.28E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.08E+01	2.98E-02	2.75E-01	0.00E+00	2.11E+01
		Fuel Upstream	4.32E+00	2.45E+00	2.34E-02	6.57E-06	6.80E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	1.20E+00	4.20E-03	2.52E-03	0.00E+00	1.21E+00
		Fuel Upstream	2.47E-01	1.40E-01	1.34E-03	3.75E-07	3.89E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.58E-01	2.43E-02	7.21E-04	5.12E-04	1.84E-01
	Mine Reclamation	Fuel Combustion	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
		Fuel Upstream	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
	Coal Extraction	Fuel Combustion	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
		Ammonium Nitrate Upstream	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Electricity Upstream	2.43E-01	3.73E-02	1.11E-03	7.85E-04	2.82E-01
		Fuel Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Mine Methane	0.00E+00	3.24E+01	0.00E+00	0.00E+00	3.24E+01
	Overburden Removal	Fuel Combustion	2.02E+00	7.07E-03	4.25E-03	0.00E+00	2.04E+00
		Ammonium Nitrate Upstream	1.17E+00	1.53E-01	1.48E+00	4.88E-09	2.80E+00
		Electricity Upstream	6.29E+00	9.67E-01	2.86E-02	2.03E-02	7.30E+00
		Fuel Upstream	4.47E-01	2.60E-01	2.45E-03	6.32E-07	7.09E-01
	Construction	Access Road Construction	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
		Equipment Manufacturing	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
	Total		8.16E+02	3.82E+01	2.05E+00	2.23E-02	8.56E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B23.** Australian Coal to South Korea Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	4.78E-04	1.71E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	1.96E-02	1.87E-04	5.24E-08	5.43E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	1.45E+00	1.86E-02	1.98E-05	6.33E+00
		Plant Construction	1.08E+00	2.06E-01	1.62E-03	6.12E-04	1.28E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.21E+01	3.16E-02	2.92E-01	0.00E+00	2.24E+01
		Fuel Upstream	4.58E+00	2.60E+00	2.48E-02	6.96E-06	7.20E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	2.47E-01	1.40E-01	1.34E-03	3.75E-07	3.89E-01
		Fuel Upstream	1.58E-01	2.43E-02	7.21E-04	5.12E-04	1.84E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
	Mine Reclamation	Fuel Combustion	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
		Fuel Upstream	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
	Coal Extraction	Fuel Combustion	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Ammonium Nitrate Upstream	2.43E-01	3.73E-02	1.11E-03	7.85E-04	2.82E-01
		Electricity Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Fuel Upstream	0.00E+00	3.24E+01	0.00E+00	0.00E+00	3.24E+01
		Mine Methane	2.02E+00	7.07E-03	4.25E-03	0.00E+00	2.04E+00
	Overburden Removal	Fuel Combustion	1.17E+00	1.53E-01	1.48E+00	4.88E-09	2.80E+00
		Ammonium Nitrate Upstream	6.29E+00	9.67E-01	2.86E-02	2.03E-02	7.30E+00
		Electricity Upstream	4.47E-01	2.60E-01	2.45E-03	6.32E-07	7.09E-01
		Fuel Upstream	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
	Construction	Access Road Construction	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
		Equipment Manufacturing	2.47E-01	1.40E-01	1.34E-03	3.75E-07	3.89E-01
	Total		8.18E+02	3.84E+01	2.07E+00	2.23E-02	8.58E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B24.** Australian Coal to Taiwan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	1.62E-01	4.78E-04	1.71E-04	0.00E+00	1.62E-01
		Fuel Upstream	3.45E-02	1.96E-02	1.87E-04	5.24E-08	5.43E-02
	Power Plant	Stack Emissions	7.72E+02	0.00E+00	0.00E+00	0.00E+00	7.72E+02
		Plant Auxiliary Inputs	4.86E+00	1.45E+00	1.86E-02	1.98E-05	6.33E+00
		Plant Construction	1.08E+00	2.06E-01	1.62E-03	6.12E-04	1.28E+00
Transport	Processing	Import Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Ocean	Fuel Combustion	2.03E+01	2.91E-02	2.69E-01	0.00E+00	2.06E+01
		Fuel Upstream	4.22E+00	2.39E+00	2.28E-02	6.41E-06	6.64E+00
	Processing	Export Terminal	3.03E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-01
	Rail	Fuel Combustion	1.20E+00	4.20E-03	2.52E-03	0.00E+00	1.21E+00
		Fuel Upstream	2.47E-01	1.40E-01	1.34E-03	3.75E-07	3.89E-01
Coal Mining	Coal Cleaning	Electricity Upstream	1.58E-01	2.43E-02	7.21E-04	5.12E-04	1.84E-01
	Mine Reclamation	Fuel Combustion	1.39E-01	4.86E-04	2.92E-04	0.00E+00	1.40E-01
		Fuel Upstream	2.86E-02	1.62E-02	1.55E-04	4.34E-08	4.49E-02
	Coal Extraction	Fuel Combustion	2.37E-01	8.28E-04	4.98E-04	0.00E+00	2.38E-01
		Ammonium Nitrate Upstream	1.62E-01	2.13E-02	2.06E-01	6.80E-10	3.90E-01
		Electricity Upstream	2.43E-01	3.73E-02	1.11E-03	7.85E-04	2.82E-01
		Fuel Upstream	4.75E-02	2.79E-02	2.61E-04	6.56E-08	7.56E-02
		Mine Methane	0.00E+00	3.24E+01	0.00E+00	0.00E+00	3.24E+01
	Overburden Removal	Fuel Combustion	2.02E+00	7.07E-03	4.25E-03	0.00E+00	2.04E+00
		Ammonium Nitrate Upstream	1.17E+00	1.53E-01	1.48E+00	4.88E-09	2.80E+00
		Electricity Upstream	6.29E+00	9.67E-01	2.86E-02	2.03E-02	7.30E+00
		Fuel Upstream	4.47E-01	2.60E-01	2.45E-03	6.32E-07	7.09E-01
	Construction	Access Road Construction	8.92E-03	4.87E-03	4.75E-05	5.91E-11	1.38E-02
		Equipment Manufacturing	2.92E-02	2.58E-03	2.26E-04	4.95E-06	3.20E-02
	Total		8.15E+02	3.82E+01	2.04E+00	2.23E-02	8.56E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B25.** Indonesian (Mulia) Coal to Japan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	2.19E-04	7.84E-05	0.00E+00	7.44E-02
		Fuel Upstream	1.59E-02	8.98E-03	8.57E-05	2.41E-08	2.49E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	1.54E+00	1.86E-02	2.14E-05	6.68E+00
		Plant Construction	1.16E+00	2.22E-01	1.74E-03	6.57E-04	1.38E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.95E+01	2.80E-02	2.59E-01	0.00E+00	1.98E+01
		Fuel Upstream	4.06E+00	2.30E+00	2.19E-02	6.16E-06	6.38E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	1.07E-03	2.30E-02	0.00E+00	1.91E+00
		Fuel Upstream	3.61E-01	2.04E-01	1.95E-03	5.48E-07	5.67E-01
	Truck	Fuel Combustion	2.02E+00	5.98E-03	2.14E-03	0.00E+00	2.03E+00
		Fuel Upstream	4.32E-01	2.45E-01	2.34E-03	6.56E-07	6.79E-01
Coal Mining	Mine Reclamation	Fuel Combustion	5.35E-01	1.87E-03	1.13E-03	0.00E+00	5.38E-01
		Fuel Upstream	1.10E-01	6.25E-02	5.96E-04	1.67E-07	1.73E-01
	Coal Extraction	Fuel Combustion	8.44E-01	2.95E-03	1.77E-03	0.00E+00	8.48E-01
		Ammonium Nitrate Upstream	2.09E-01	2.74E-02	2.65E-01	8.75E-10	5.02E-01
		Fuel Upstream	1.72E-01	9.88E-02	9.37E-04	2.53E-07	2.72E-01
	Overburden Removal	Mine Methane	0.00E+00	2.72E+01	0.00E+00	0.00E+00	2.72E+01
		Fuel Combustion	4.77E+00	1.67E-02	1.00E-02	0.00E+00	4.80E+00
		Ammonium Nitrate Upstream	9.16E-01	1.20E-01	1.16E+00	3.84E-09	2.20E+00
		Fuel Upstream	1.01E+00	5.75E-01	5.46E-03	1.49E-06	1.59E+00
	Construction	Access Road Construction	1.15E-02	6.26E-03	6.11E-05	7.60E-11	1.78E-02
		Equipment Manufacturing	3.75E-02	3.31E-03	2.90E-04	6.37E-06	4.11E-02
Total			8.80E+02	3.26E+01	1.78E+00	6.94E-04	9.14E+02

Note: <sup>1</sup> Zero values include cases of no data.



**Table B26.** Indonesian (Adaro) Coal to Japan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	9.92E-05	3.55E-05	0.00E+00	3.37E-02
		Fuel Upstream	7.17E-03	4.06E-03	3.88E-05	1.09E-08	1.13E-02
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	1.50E+00	1.83E-02	2.07E-05	6.53E+00
		Plant Construction	1.12E+00	2.15E-01	1.68E-03	6.37E-04	1.34E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	1.54E+01	2.21E-02	2.04E-01	0.00E+00	1.57E+01
		Fuel Upstream	3.21E+00	1.82E+00	1.73E-02	4.87E-06	5.04E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	8.46E-04	1.82E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	1.62E-01	1.54E-03	4.33E-07	4.48E-01
	Truck	Fuel Combustion	1.60E+00	4.72E-03	1.69E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	1.93E-01	1.85E-03	5.18E-07	5.37E-01
Coal Mining	Mine Reclamation	Fuel Combustion	4.23E-01	1.48E-03	8.90E-04	0.00E+00	4.26E-01
		Fuel Upstream	8.72E-02	4.94E-02	4.71E-04	1.32E-07	1.37E-01
	Coal Extraction	Fuel Combustion	6.67E-01	2.33E-03	1.40E-03	0.00E+00	6.70E-01
		Ammonium Nitrate Upstream	1.65E-01	2.16E-02	2.10E-01	6.91E-10	3.96E-01
		Fuel Upstream	1.36E-01	7.81E-02	7.40E-04	2.00E-07	2.15E-01
	Overburden Removal	Mine Methane	0.00E+00	2.15E+01	0.00E+00	0.00E+00	2.15E+01
		Fuel Combustion	3.77E+00	1.32E-02	7.92E-03	0.00E+00	3.79E+00
		Ammonium Nitrate Upstream	7.24E-01	9.48E-02	9.20E-01	3.03E-09	1.74E+00
		Fuel Upstream	7.94E-01	4.54E-01	4.31E-03	1.18E-06	1.25E+00
	Construction	Access Road Construction	9.07E-03	4.95E-03	4.83E-05	6.00E-11	1.41E-02
		Equipment Manufacturing	2.96E-02	2.62E-03	2.29E-04	5.03E-06	3.25E-02
Total			8.42E+02	2.61E+01	1.41E+00	6.70E-04	8.69E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B27.** Indonesian (Mulia) Coal to South Korea Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	2.19E-04	7.84E-05	0.00E+00	7.44E-02
		Fuel Upstream	1.59E-02	8.98E-03	8.57E-05	2.41E-08	2.49E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	1.54E+00	1.86E-02	2.14E-05	6.68E+00
		Plant Construction	1.16E+00	2.22E-01	1.74E-03	6.57E-04	1.38E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.83E+01	2.62E-02	2.42E-01	0.00E+00	1.85E+01
		Fuel Upstream	3.80E+00	2.15E+00	2.05E-02	5.76E-06	5.97E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	1.07E-03	2.30E-02	0.00E+00	1.91E+00
		Fuel Upstream	3.61E-01	2.04E-01	1.95E-03	5.48E-07	5.67E-01
	Truck	Fuel Combustion	2.02E+00	5.98E-03	2.14E-03	0.00E+00	2.03E+00
		Fuel Upstream	4.32E-01	2.45E-01	2.34E-03	6.56E-07	6.79E-01
Coal Mining	Mine Reclamation	Fuel Combustion	5.35E-01	1.87E-03	1.13E-03	0.00E+00	5.38E-01
		Fuel Upstream	1.10E-01	6.25E-02	5.96E-04	1.67E-07	1.73E-01
	Coal Extraction	Fuel Combustion	8.44E-01	2.95E-03	1.77E-03	0.00E+00	8.48E-01
		Ammonium Nitrate Upstream	2.09E-01	2.74E-02	2.65E-01	8.75E-10	5.02E-01
		Fuel Upstream	1.72E-01	9.88E-02	9.37E-04	2.53E-07	2.72E-01
	Overburden Removal	Mine Methane	0.00E+00	2.72E+01	0.00E+00	0.00E+00	2.72E+01
		Fuel Combustion	4.77E+00	1.67E-02	1.00E-02	0.00E+00	4.80E+00
		Ammonium Nitrate Upstream	9.16E-01	1.20E-01	1.16E+00	3.84E-09	2.20E+00
		Fuel Upstream	1.01E+00	5.75E-01	5.46E-03	1.49E-06	1.59E+00
	Construction	Access Road Construction	1.15E-02	6.26E-03	6.11E-05	7.60E-11	1.78E-02
		Equipment Manufacturing	3.75E-02	3.31E-03	2.90E-04	6.37E-06	4.11E-02
Total			8.78E+02	3.25E+01	1.76E+00	6.94E-04	9.12E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B28.** Indonesian (Adaro) Coal to South Korea Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	9.92E-05	3.55E-05	0.00E+00	3.37E-02
		Fuel Upstream	7.17E-03	4.06E-03	3.88E-05	1.09E-08	1.13E-02
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	1.50E+00	1.83E-02	2.07E-05	6.53E+00
		Plant Construction	1.12E+00	2.15E-01	1.68E-03	6.37E-04	1.34E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	1.44E+01	2.07E-02	1.91E-01	0.00E+00	1.46E+01
		Fuel Upstream	3.00E+00	1.70E+00	1.62E-02	4.55E-06	4.72E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	8.46E-04	1.82E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	1.62E-01	1.54E-03	4.33E-07	4.48E-01
	Truck	Fuel Combustion	1.60E+00	4.72E-03	1.69E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	1.93E-01	1.85E-03	5.18E-07	5.37E-01
Coal Mining	Mine Reclamation	Fuel Combustion	4.23E-01	1.48E-03	8.90E-04	0.00E+00	4.26E-01
		Fuel Upstream	8.72E-02	4.94E-02	4.71E-04	1.32E-07	1.37E-01
	Coal Extraction	Fuel Combustion	6.67E-01	2.33E-03	1.40E-03	0.00E+00	6.70E-01
		Ammonium Nitrate Upstream	1.65E-01	2.16E-02	2.10E-01	6.91E-10	3.96E-01
		Fuel Upstream	1.36E-01	7.81E-02	7.40E-04	2.00E-07	2.15E-01
	Overburden Removal	Mine Methane	0.00E+00	2.15E+01	0.00E+00	0.00E+00	2.15E+01
		Fuel Combustion	3.77E+00	1.32E-02	7.92E-03	0.00E+00	3.79E+00
		Ammonium Nitrate Upstream	7.24E-01	9.48E-02	9.20E-01	3.03E-09	1.74E+00
		Fuel Upstream	7.94E-01	4.54E-01	4.31E-03	1.18E-06	1.25E+00
	Construction	Access Road Construction	9.07E-03	4.95E-03	4.83E-05	6.00E-11	1.41E-02
		Equipment Manufacturing	2.96E-02	2.62E-03	2.29E-04	5.03E-06	3.25E-02
Total			8.41E+02	2.60E+01	1.40E+00	6.70E-04	8.68E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B29.** Indonesian (Mulia) Coal to Taiwan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	7.41E-02	2.19E-04	7.84E-05	0.00E+00	7.44E-02
		Fuel Upstream	1.59E-02	8.98E-03	8.57E-05	2.41E-08	2.49E-02
	Power Plant	Stack Emissions	8.35E+02	0.00E+00	0.00E+00	0.00E+00	8.35E+02
		Plant Auxiliary Inputs	5.12E+00	1.54E+00	1.86E-02	2.14E-05	6.68E+00
		Plant Construction	1.16E+00	2.22E-01	1.74E-03	6.57E-04	1.38E+00
Transport	Processing	Import Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Ocean	Fuel Combustion	1.25E+01	1.79E-02	1.65E-01	0.00E+00	1.27E+01
		Fuel Upstream	2.60E+00	1.47E+00	1.40E-02	3.94E-06	4.08E+00
	Processing	Export Terminal	4.91E-01	0.00E+00	0.00E+00	0.00E+00	4.91E-01
	Barge	Fuel Combustion	1.89E+00	1.07E-03	2.30E-02	0.00E+00	1.91E+00
		Fuel Upstream	3.61E-01	2.04E-01	1.95E-03	5.48E-07	5.67E-01
	Truck	Fuel Combustion	2.02E+00	5.98E-03	2.14E-03	0.00E+00	2.03E+00
		Fuel Upstream	4.32E-01	2.45E-01	2.34E-03	6.56E-07	6.79E-01
Coal Mining	Mine Reclamation	Fuel Combustion	5.35E-01	1.87E-03	1.13E-03	0.00E+00	5.38E-01
		Fuel Upstream	1.10E-01	6.25E-02	5.96E-04	1.67E-07	1.73E-01
	Coal Extraction	Fuel Combustion	8.44E-01	2.95E-03	1.77E-03	0.00E+00	8.48E-01
		Ammonium Nitrate Upstream	2.09E-01	2.74E-02	2.65E-01	8.75E-10	5.02E-01
		Fuel Upstream	1.72E-01	9.88E-02	9.37E-04	2.53E-07	2.72E-01
	Overburden Removal	Mine Methane	0.00E+00	2.72E+01	0.00E+00	0.00E+00	2.72E+01
		Fuel Combustion	4.77E+00	1.67E-02	1.00E-02	0.00E+00	4.80E+00
		Ammonium Nitrate Upstream	9.16E-01	1.20E-01	1.16E+00	3.84E-09	2.20E+00
		Fuel Upstream	1.01E+00	5.75E-01	5.46E-03	1.49E-06	1.59E+00
	Construction	Access Road Construction	1.15E-02	6.26E-03	6.11E-05	7.60E-11	1.78E-02
		Equipment Manufacturing	3.75E-02	3.31E-03	2.90E-04	6.37E-06	4.11E-02
Total			8.71E+02	3.18E+01	1.68E+00	6.92E-04	9.04E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B30.** Indonesian (Adaro) Coal to Taiwan Drilldown GHG Results—AR5 20-year GWP (kg CO<sub>2</sub>e/MWh) <sup>1</sup>.

Stage	Process 1	Process 2	Pollutant				
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	Total
Energy Conversion	Fly Ash Disposal	Fuel Combustion	3.35E-02	9.92E-05	3.55E-05	0.00E+00	3.37E-02
		Fuel Upstream	7.17E-03	4.06E-03	3.88E-05	1.09E-08	1.13E-02
	Power Plant	Stack Emissions	8.06E+02	0.00E+00	0.00E+00	0.00E+00	8.06E+02
		Plant Auxiliary Inputs	5.01E+00	1.50E+00	1.83E-02	2.07E-05	6.53E+00
		Plant Construction	1.12E+00	2.15E-01	1.68E-03	6.37E-04	1.34E+00
Transport	Processing	Import Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Ocean	Fuel Combustion	9.88E+00	1.41E-02	1.31E-01	0.00E+00	1.00E+01
		Fuel Upstream	2.05E+00	1.16E+00	1.11E-02	3.12E-06	3.23E+00
	Processing	Export Terminal	3.88E-01	0.00E+00	0.00E+00	0.00E+00	3.88E-01
	Barge	Fuel Combustion	1.49E+00	8.46E-04	1.82E-02	0.00E+00	1.51E+00
		Fuel Upstream	2.85E-01	1.62E-01	1.54E-03	4.33E-07	4.48E-01
	Truck	Fuel Combustion	1.60E+00	4.72E-03	1.69E-03	0.00E+00	1.60E+00
		Fuel Upstream	3.41E-01	1.93E-01	1.85E-03	5.18E-07	5.37E-01
Coal Mining	Mine Reclamation	Fuel Combustion	4.23E-01	1.48E-03	8.90E-04	0.00E+00	4.26E-01
		Fuel Upstream	8.72E-02	4.94E-02	4.71E-04	1.32E-07	1.37E-01
	Coal Extraction	Fuel Combustion	6.67E-01	2.33E-03	1.40E-03	0.00E+00	6.70E-01
		Ammonium Nitrate Upstream	1.65E-01	2.16E-02	2.10E-01	6.91E-10	3.96E-01
		Fuel Upstream	1.36E-01	7.81E-02	7.40E-04	2.00E-07	2.15E-01
	Overburden Removal	Mine Methane	0.00E+00	2.15E+01	0.00E+00	0.00E+00	2.15E+01
		Fuel Combustion	3.77E+00	1.32E-02	7.92E-03	0.00E+00	3.79E+00
		Ammonium Nitrate Upstream	7.24E-01	9.48E-02	9.20E-01	3.03E-09	1.74E+00
		Fuel Upstream	7.94E-01	4.54E-01	4.31E-03	1.18E-06	1.25E+00
	Construction	Access Road Construction	9.07E-03	4.95E-03	4.83E-05	6.00E-11	1.41E-02
		Equipment Manufacturing	2.96E-02	2.62E-03	2.29E-04	5.03E-06	3.25E-02
Total			8.35E+02	2.54E+01	1.33E+00	6.68E-04	8.62E+02

Note: <sup>1</sup> Zero values include cases of no data.

**Table B31.** TRACI 2.1 Acidification Results (kg SO<sub>2</sub>-e/MWh).

Process	Japan				Korea				Taiwan			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	4.11E-02	1.09E-01	1.68E-01	2.12E-01	4.11E-02	1.09E-01	1.68E-01	2.12E-01	4.11E-02	1.09E-01	1.68E-01	2.12E-01
Coal Cleaning	N/A	3.92E-04	N/A	N/A	N/A	3.92E-04	N/A	N/A	N/A	3.92E-04	N/A	N/A
Truck Transport	N/A	N/A	1.30E-02	1.65E-02	N/A	N/A	1.30E-02	1.65E-02	N/A	N/A	1.30E-02	1.65E-02
Rail Transport	6.21E-02	1.41E-02	N/A	N/A	6.21E-02	1.41E-02	N/A	N/A	6.21E-02	1.41E-02	N/A	N/A
Barge Transport	N/A	N/A	1.11E-02	1.40E-02	N/A	N/A	1.11E-02	1.40E-02	N/A	N/A	1.11E-02	1.40E-02
Export Terminal	3.05E-03	2.42E-03	3.10E-03	3.92E-03	3.05E-03	2.42E-03	3.10E-03	3.92E-03	3.05E-03	2.42E-03	3.10E-03	3.92E-03
Ocean Transport	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Import Terminal	3.05E-03	2.42E-03	3.10E-03	3.92E-03	3.05E-03	2.42E-03	3.10E-03	3.92E-03	3.05E-03	2.42E-03	3.10E-03	3.92E-03
Power Plant	6.72E-01	6.72E-01	6.71E-01	6.72E-01	6.72E-01	6.72E-01	6.71E-01	6.72E-01	6.72E-01	6.72E-01	6.71E-01	6.72E-01
Total	7.81E-01	8.00E-01	8.69E-01	9.23E-01	7.81E-01	8.00E-01	8.69E-01	9.23E-01	7.81E-01	8.00E-01	8.69E-01	9.23E-01

**Table B32.** TRACI 2.1 Eutrophication Results (kg Nitrogen-e/MWh).

Process	Japan				Korea				Taiwan			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	3.17E-03	6.81E-03	1.06E-02	1.34E-02	3.17E-03	6.81E-03	1.06E-02	1.34E-02	3.17E-03	6.81E-03	1.06E-02	1.34E-02
Coal Cleaning	N/A	1.11E-03	N/A	N/A	N/A	1.11E-03	N/A	N/A	N/A	1.11E-03	N/A	N/A
Truck Transport	N/A	N/A	6.35E-04	8.04E-04	N/A	N/A	6.35E-04	8.04E-04	N/A	N/A	6.35E-04	8.04E-04
Rail Transport	3.65E-03	8.73E-04	N/A	N/A	3.65E-03	8.73E-04	N/A	N/A	3.65E-03	8.73E-04	N/A	N/A
Barge Transport	N/A	N/A	N/A	N/A	N/A	N/A	5.38E-04	6.81E-04	N/A	N/A	5.38E-04	6.81E-04
Export Terminal	1.87E-04	1.48E-04	1.90E-04	2.40E-04	1.87E-04	1.48E-04	1.90E-04	2.40E-04	1.87E-04	1.48E-04	1.90E-04	2.40E-04
Ocean Transport	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Import Terminal	1.87E-04	1.48E-04	1.90E-04	2.40E-04	1.87E-04	1.48E-04	1.90E-04	2.40E-04	1.87E-04	1.48E-04	1.90E-04	2.40E-04
Power Plant	1.38E-02	1.38E-02	1.37E-02	1.38E-02	1.38E-02	1.38E-02	1.37E-02	1.38E-02	1.38E-02	1.38E-02	1.37E-02	1.38E-02
Total	2.10E-02	2.29E-02	2.59E-02	2.91E-02	2.10E-02	2.29E-02	2.59E-02	2.91E-02	2.10E-02	2.29E-02	2.59E-02	2.91E-02

**Table B33.** TRACI 2.1 Human Health Particulate Results (kg PM<sub>2.5</sub>-e/MWh).

Process	Japan				Korea				Taiwan			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	3.14E-03	8.98E-03	1.12E-02	1.42E-02	3.14E-03	8.98E-03	1.12E-02	1.42E-02	3.14E-03	8.98E-03	1.12E-02	1.42E-02
Coal Cleaning	N/A	6.96E-05	N/A	N/A	N/A	6.96E-05	N/A	N/A	N/A	6.96E-05	N/A	N/A
Truck Transport	N/A	N/A	7.45E-04	9.43E-04	N/A	N/A	7.45E-04	9.43E-04	N/A	N/A	7.45E-04	9.43E-04
Rail Transport	3.52E-03	8.99E-04	N/A	N/A	3.52E-03	8.99E-04	N/A	N/A	3.52E-03	8.99E-04	N/A	N/A
Barge Transport	N/A	N/A	3.11E-03	3.94E-03	N/A	N/A	3.11E-03	3.94E-03	N/A	N/A	3.11E-03	3.94E-03
Export Terminal	1.29E-04	1.02E-04	1.31E-04	1.65E-04	1.29E-04	1.02E-04	1.31E-04	1.65E-04	1.29E-04	1.02E-04	1.31E-04	1.65E-04
Ocean Transport	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Import Terminal	1.29E-04	1.02E-04	1.31E-04	1.65E-04	1.29E-04	1.02E-04	1.31E-04	1.65E-04	1.29E-04	1.02E-04	1.31E-04	1.65E-04
Power Plant	4.24E-02	4.71E-02	3.83E-02	4.11E-02	4.24E-02	4.71E-02	3.83E-02	4.11E-02	4.24E-02	4.71E-02	3.83E-02	4.11E-02
Total	4.93E-02	5.73E-02	5.36E-02	6.05E-02	4.93E-02	5.73E-02	5.36E-02	6.05E-02	4.93E-02	5.73E-02	5.36E-02	6.05E-02

**Table B34.** TRACI 2.1 Smog (kg O<sub>3</sub>-e/MWh).

Process	Japan				Korea				Taiwan			
	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia	PRB	AU	ID-Adaro	ID-Mulia
Mining	9.73E-01	2.45E+00	3.82E+00	4.83E+00	9.73E-01	2.45E+00	3.82E+00	4.83E+00	9.73E-01	2.45E+00	3.82E+00	4.83E+00
Coal Cleaning	N/A	3.75E-03	N/A	N/A	N/A	3.75E-03	N/A	N/A	N/A	3.75E-03	N/A	N/A
Truck Transport	N/A	N/A	2.34E-01	2.96E-01	N/A	N/A	2.34E-01	2.96E-01	N/A	N/A	2.34E-01	2.96E-01
Rail Transport	1.63E+00	3.36E-01	N/A	N/A	1.63E+00	3.36E-01	N/A	N/A	1.63E+00	3.36E-01	N/A	N/A
Barge Transport	N/A	N/A	2.07E-01	2.62E-01	N/A	N/A	2.07E-01	2.62E-01	N/A	N/A	2.07E-01	2.62E-01
Export Terminal	1.05E-01	8.32E-02	1.06E-01	1.35E-01	1.05E-01	8.32E-02	1.06E-01	1.35E-01	1.05E-01	8.32E-02	1.06E-01	1.35E-01
Ocean Transport	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Import Terminal	1.05E-01	8.32E-02	1.06E-01	1.35E-01	1.05E-01	8.32E-02	1.06E-01	1.35E-01	1.05E-01	8.32E-02	1.06E-01	1.35E-01
Power Plant	7.01E+00	7.02E+00	7.00E+00	7.01E+00	7.01E+00	7.02E+00	7.00E+00	7.01E+00	7.01E+00	7.02E+00	7.00E+00	7.01E+00
Total	9.82E+00	9.98E+00	1.15E+01	1.27E+01	9.82E+00	9.98E+00	1.15E+01	1.27E+01	9.82E+00	9.98E+00	1.15E+01	1.27E+01