WBC Cogeneration Options: Option 1 Cash Flow

Scenario Details		
Scenario Name	[text]	Rouse Hill
Scenario Number	[integer]	3
Evaluation Results Against Base Case		
Present Value	[$ NPV]	-$137,151
Internal Rate of Return	[% p.a.]	-1.1%
Return on Investment (years)	[$ NPV/PVI]	-68.6%
Payback Period - years (Undiscounted Cash Flow)	[years]	#N/A
Payback Period - years (Discounted Cash Flow)	[years]	#N/A
Total Carbon Savings (tonnes) - 25 years	[t CO_2e]	961
Capital and Maintanence Costs		
Capital Costs	[$]	$207,223
Maintanence Costs	[$]	$9,408
Effective Tax Life	[years]	10
Present Value of Investment	[$]	$199,878
Construction Period		
Plant 1 Construction Commencement	[date]	1-Jul-07
Plant 1 Construction Complete	[date]	30-Jun-08
Plant 1 Operations Commencement	[date]	1-Jul-07
Plant 1 Decommissioning	[date]	30-Jun-33
Base Year Energy Demand		
Supplied Electricity	[kWh/year]	766,468
Supplied Gas	[GJ/year]	1,616
Base Year Operating Costs		
Supplied Electricity	[$/year]	$82,193
Supplied Gas	[$/year]	$25,314

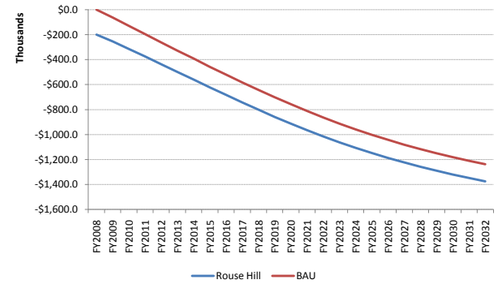
Rouse Hill
Present Value ($'000)

	FY08	FY09	FY10	FY11	FY12	FY13-33	Total FY09-FY33
Capital Expenditure	$200	$0	$0	$0	$0	$0	$200
Cogen Operating Costs	$0	$31	$29	$27	$25	$298	$410
Total Investment	$200	$31	$29	$27	$25	$298	$610
Net Operational Costs (Against BAU)	$0	$3	$1	$1	$0	-$36	-$32
Net Cash Flow (Against BAU)	-$200	$9	$7	$5	$4	$37	-$137
Net Present Value (NPV)	-$137						
Internal Rate of Return (IRR)	-1.1%						
Return on Investment (ROI)	-68.6%						
Payback Period Undiscounted (Years)	#N/A						

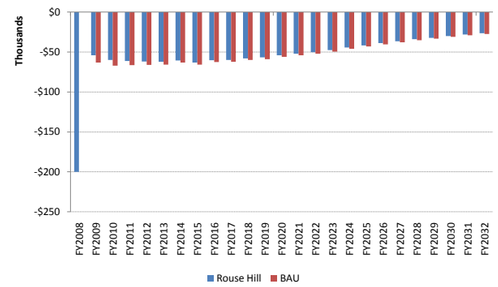
Carbon Emissions (t CO_2e Scope 1 & 2)

	FY08	FY09	FY10	FY11	FY12	FY13-33	Total FY09-FY33
Carbon Emissions	0	765	765	765	765	16,062	19,122
BAU Carbon Emissions	803	803	803	803	803	16,869	20,082
Net Carbon Emission Reduction	0	38	38	38	38	807	961
Equivalent Cars Removed from Carbon emission savings		9					
Equivalent Trees Planted from Carbon emission savings		231					

Cumulative Cash Flow (Present Value)



Annual Cash Flow (Present Value)



Time Period		FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037
Period Start	[date]	1-Jul-07	1-Jul-08	1-Jul-09	1-Jul-10	1-Jul-11	1-Jul-12	1-Jul-13	1-Jul-14	1-Jul-15	1-Jul-16	1-Jul-17	1-Jul-18	1-Jul-19	1-Jul-20	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31	1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	
Period End	[date]	30-Jun-08	30-Jun-09	30-Jun-10	30-Jun-11	30-Jun-12	30-Jun-13	30-Jun-14	30-Jun-15	30-Jun-16	30-Jun-17	30-Jun-18	30-Jun-19	30-Jun-20	30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-31	30-Jun-32	30-Jun-33	30-Jun-34	30-Jun-35	30-Jun-36	30-Jun-37	
Included in Evaluation	[binary]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Cost Escalation Indicies and Discount Factors																															
Present Value Factor	[index Jul-09=1]	1.00	0.91	0.83	0.76	0.69	0.63	0.57	0.52	0.48	0.44	0.40	0.36	0.33	0.30	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.08	0.07
Inflation Index	[index Jul-09=1]	0.96	0.98	1.00	1.03	1.05	1.07	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34	1.38	1.41	1.45	1.48	1.52	1.56	1.60	1.64	1.68	1.72	1.76	1.81	1.85	1.90	1.94
Supplied Electricity Price Index	[index Jul-09=1]	0.81	0.84	1.00	1.07	1.16	1.25	1.27	1.45	1.48	1.59	1.65	1.75	1.78	1.85	1.91	1.95	1.93	1.94	1.94	1.95	1.93	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Supplied Gas Price Index	[index Jul-09=1]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Capital Cost Index	[index Jul-09=1]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maintanence Cost Index	[index Jul-09=1]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Energy and Carbon Prices																															
Supplied Electricity	[$/kWh]	$0.08	$0.09	$0.11	$0.12	$0.13	$0.14	$0.15	$0.18	$0.18	$0.20	$0.22	$0.23	$0.24	$0.26	$0.28	$0.29	$0.29	$0.30	$0.31	$0.32	$0.32	$0.34	$0.34	$0.35	$0.36	$0.37	$0.38	$0.39	$0.40	$0.41
Supplied Gas	[$/GJ]	$15.11	$15.43	$15.67	$16.11	$16.43	$16.84	$17.26	$17.69	$18.14	$18.59	$19.05	$19.53	$20.02	$20.52	$21.03	$21.56	$22.10	$22.65	$23.22	$23.80	$24.39	$25.00	$25.63	$26.27	$26.92	$27.60	$28.29	$28.99	$29.72	$30.46
CPRS Emission Permit	[$/t CO_2e]	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$34.04	$36.47	$39.12	$41.76	$44.75	$47.74	$50.97	$54.34	$57.45	$61.36	$65.29	$69.67	$74.08	$78.97	$84.52	$90.31	$96.49	$103.09	$109.96	$117.47	$125.28	$133.59	$142.62	$152.02
Carbon Tax	[$/t CO_2e]	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NGAC	[$/t CO_2e]	*not considered*																													
Grid Electricity Consumption																															
Electricity	[kWh]	0	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468	766,468
Grid Electricity Emission Intensity (Scope 2)	[t CO_2e/MWh]	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Grid Electricity Emission Intensity (Scope 3)	[t CO_2e/MWh]	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Indirect Carbon Emissions (Scope 2)	[t CO_2e]	0	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682
Cogenerator Operation																															
Electricity Generation	[kWh]	0	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005
Gas Consumption	[GJ]	0	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616	1,616
Maintanence Costs	[$]	$0	$9,266	$9,408	$9,672	$9,865	$10,112	$10,365	$10,624	$10,890	$11,162	$11,441	$11,727	$12,020	$12,320	$12,628	$12,944	$13,268	$13,600	$13,939	$14,288	$14,645	$15,011	$15,387	$15,771	$16,166	$16,570	$16,984	$17,409	$17,844	$18,290
Direct Carbon Emissions (Scope 1)	[t CO_2e]	0	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Indirect Carbon Emissions (Scope 3)	[t CO_2e]	0	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Capital Expenditure																															
Total Capital Expenditure	[$]	$199,878	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Present Value Investment	[$ PV]	$199,878	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Asset Depreciation																															
Opening Asset Value	[$]	$0	$199,878	$159,902	$127,922	$102,338	$81,870	$65,496	$52,397	$41,917	$33,534	$26,827	$21,462	$17,169	$13,736	$10,988	$8,791	$7,033	$5,626	$4,501	$3,601	$2,881	$2,304	$1,844	$1,475	$1,180	$944	$755	$604	$483	$387
Capital Depreciation	[$]	$0	$39,976	$31,980	$25,584	$20,468	$16,374	$13,099	$10,479	$8,383	$6,707	$5,365	$4,292	$3,434	$2,747	$2,198	$1,758	$1,407	$1,125	$900	$720	$576	$461	$369	$295	$236	$189	$151	$121	$97	$77
Capital Expenditure	[$]	$199,878	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Closing Asset Value	[$]	$199,878	$159,902	$127,922	$102,338	$81,870	$65,496	$52,397	$41,917	$33,534	$26,827	$21,462	$17,169	$13,736	$10,988	$8,791	$7,033	$5,626	$4,501	$3,601	$2,881	$2,304	$1,844	$1,475	$1,180	$944	$755	$604	$483	$387	$309
Operating Expenses																															
Electricity Consumption	[$]	$0	$67,753	$82,193	$90,417	$100,233	$110,858	$115,275	$134,670	$140,613	$155,190	$165,062	$178,839	$187,122	$199,257	$210,897	$219,963	$223,310	$230,427	$235,988	$243,009	$247,449	$257,273	$263,705	$270,298	$277,055	$283,982	$291,081	$298,358	$305,817	$313,463
Gas Consumption	[$]	$0	$24,932	$25,314	$26,023	$26,544	$27,207	$27,887	$28,585	$29,299	$30,032	$30,782	$31,552	$32,341	$33,149	$33,978	$34,828	$35,698	$36,591	$37,505	$38,443	$39,404	$40,389	$41,399	$42,434	$43,495	$44,582	$45,697	$46,839	$48,010	$49,210
Maintenance	[$]	$0	$9,266	$9,408	$9,672	$9,865	$10,112	$10,365	$10,624	$10,890	$11,162	$11,441	$11,727	$12,020	$12,320	$12,628	$12,944	$13,268	$13,600	$13,939	$14,288	$14,645	$15,011	$15,387	$15,771	$16,166	$16,570	$16,984	$17,409	$17,844	$18,290
Carbon Permit Purchase	[$]	$0	$0	$0	$0	$0	$0	$2,816	$3,017	$3,236	$3,454	$3,701	$3,949	$4,216	$4,495	$4,752	$5,075	$5,401	$5,763	$6,127	$6,532	$6,991	$7,470	$7,981	$8,527	$9,096	$9,716	$10,362	$11,050	$11,797	$12,574
Total Operating Expenses	[$]	$0	$101,951	$116,916	$126,112	$136,642	$148,177	$156,343	$176,896	$184,037	$199,838	$210,986	$226,066	$235,699	$249,221	$262,255	$272,810	$277,676	$286,380	$293,560	$302,272	$308,490	$320,143	$328,472	$337,030	$345,811	$354,850	$364,124	$373,656	$383,468	$393,537
Present Value Cogen Opex	[$ PV]	$0	$31,181	$28,867	$27,057	$25,164	$23,518	$23,597	$22,122	$20,743	$19,446	$18,238	$17,101	$16,038	$15,041	$14,096	$13,225	$12,405	$11,641	$10,921	$10,250	$9,626	$9,040	$8,491	$7,977	$7,494	$7,043	$0	$0	$0	$0
Present Value Total Operating Expenses	[$ PV]	$0	$92,957	$97,198	$95,594	$94,439	$93,377	$89,832	$92,675	$87,911	$87,038	$83,787	$81,856	$77,815	$75,022	$71,981	$68,272	$63,360	$59,582	$55,688	$52,282	$48,651	$46,035	$43,066	$40,290	$37,693	$35,266	$0	$0	$0	$0
Taxation																															
Operating Expenses	[$]	$0	$101,951	$116,916	$126,112	$136,642	$148,177	$156,343	$176,896	$184,037	$199,838	$210,986	$226,066	$235,699	$249,221	$262,255	$272,810	$277,676	$286,380	$293,560	$302,272	$308,490	$320,143	$328,472	$337,030	$345,811	$354,850	$364,124	$373,656	$383,468	$393,537
Interest Expenses	[$]																														
Depreciation	[$]	$0	$39,976	$31,980	$25,584	$20,468	$16,374	$13,099	$10,479	$8,383	$6,707	$5,365	$4,292	$3,434	$2,747	$2,198	$1,758	$1,407	$1,125	$900	$720	$576	$461	$369	$295	$236	$189	$151	$121	$97	$77
Total Tax Deductions	[$]	$0	$141,927	$148,897	$151,696	$157,109	$164,551	$169,442	$187,375	$192,421	$206,545	$216,352	$230,359	$239,133	$251,969	$264,453	$274,568	$279,083	$287,506	$294,460	$302,992	$309,066	$320,604	$328,840	$337,325	$346,047	$355,039	$364,275	$373,777	$383,564	$393,614
Net Tax Shield	[$]	$0	$42,578	$44,669	$45,509	$47,133	$49,365	$50,833	$56,213	$57,726	$61,963	$64,906	$69,108	$71,740	$75,591	$79,336	$82,370	$83,725	$86,252	$88,338	$90,898	$92,720	$96,181	$98,652	$101,198	$103,814	$106,512	$109,283	$112,133	$115,069	$118,084
Carbon Tax Payable	[$]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow																															
Nominal Cash Flow	[$]	-$199,878	-$59,373	-$72,247	-$80,603	-$89,509	-$98,811	-$105,510	-$120,683	-$126,311	-$137,874	-$146,081	-$156,959	-$163,959	-$173,631	-$182,920	-$190,439	-$193,952	-$200,129	-$205,222	-$211,374	-$215,770	-$223,962	-$229,820	-$235,833	-$241,997	-$248,338	$0	$0	$0	$0
Discounted Cash Flow	[$ PV]	-$199,878	-$54,135	-$60,063	-$61,098	-$61,864	-$62,269	-$60,625	-$63,226	-$60,337	-$60,050	-$58,012	-$56,833	-$54,131	-$52,267	-$50,206	-$47,659	-$44,256	-$41,637	-$38,930	-$36,560	-$34,028	-$32,204	-$30,131	-$28,192	-$26,377	-$24,680	$0	$0	$0	$0
Cumulative Nominal Cash Flow	[$]	-$199,878	-$259,251	-$331,498	-$412,101	-$501,610	-$600,421	-$705,932	-$826,615	-$952,926	-$1,090,800	-$1,236,881	-$1,393,840	-$1,557,799	-$1,731,430	-$1,914,349	-$2,104,789	-$2,298,740	-$2,498,869	-$2,704,091	-$2,915,465	-$3,131,235	-$3,355,197	-$3,585,017	-$3,820,849	-$4,062,846	-$4,311,185	-$4,311,185	-$4,311,185	-$4,311,185	-$4,311,185
Cumulative Discounted Cash Flow	[$ PV]	-$199,878	-$254,013	-$314,076	-$375,174	-$437,038	-$499,307	-$559,931	-$623,157	-$683,493	-$743,544	-$801,555	-$858,389	-$912,519	-$964,786	-$1,014,992	-$1,062,651	-$1,106,907	-$1,148,544	-$1,187,474	-$1,224,034	-$1,258,062	-$1,290,266	-$1,320,398	-$1,348,590	-$1,374,967	-$1,399,647	-$1,399,647	-$1,399,647	-$1,399,647	-$1,399,647
Net Cash Flow Against Base Case																															
Nominal Cash Flow	[$]	-$199,878	$10,052	$8,624	$7,120	$6,172	$5,551	$4,649	$5,111	$4,721	$5,096	$5,215	$5,700	$5,834	$6,301	$6,768	$7,067	$6,961	$7,150	$7,233	$7,432	$7,441	$7,853	$8,012	$8,180	$8,357	$8,542	$0	$0	$0	$0
Discounted Cash Flow	[$ PV]	-$199,878	$9,165	$7,170	$5,397	$4,266	$3,498	$2,671	$2,678	$2,255	$2,220	$2,071	$2,064	$1,926	$1,897	$1,857	$1,769	$1,588	$1,487	$1,372	$1,285	$1,173	$1,129	$1,050	$978	$911	$849	$0	$0	$0	$0
Cumulative Nominal Cash Flow	[$]	-$199,878	-$189,826	-$181,202	-$174,082	-$167,910	-$162,360	-$157,710	-$152,599	-$147,878	-$142,782	-$137,567	-$131,867	-$126,033	-$119,732	-$112,964	-$105,897	-$98,936	-$91,787	-$84,554	-$77,122	-$69,682	-$61,829	-$53,817	-$45,637	-$37,280	-$28,738	-$28,738	-$28,738	-$28,738	-$28,738
Cumulative Discounted Cash Flow	[$ PV]	-$199,878	-$190,713	-$183,543	-$178,146	-$173,880	-$170,383	-$167,711	-$165,034	-$162,778	-$160,559	-$158,488	-$156,424	-$154,498	-$152,601	-$150,743	-$148,975	-$147,387	-$145,899	-$144,527	-$143,242	-$142,068	-$140,939	-$139,889	-$138,911	-$138,000	-$137,151	-$137,151	-$137,151	-$137,151	-$137,151
Carbon Emissions																															
Direct Carbon Emissions (Scope 1)	[t CO_2e]	0	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	0	0	0	0
Indirect Carbon Emissions (Scope 2)	[t CO_2e]	0	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	682	0	0	0	0
Total Carbon Emissions	[t CO_2e]	0	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	765	0	0	0	0
Carbon Savings Compared to Base Case																															
Direct Carbon Emissions (Scope 1)	[t CO_2e]	0	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	0	0	0
Indirect Carbon Emissions (Scope 2)	[t CO_2e]	0	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	0	0	0	0
Total Carbon Emissions	[t CO_2e]	0	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	0	0	0	0
Present Value Operating Expenses																															
Total Opex Against Base Case	[$ PV]	$0	$2,528	$1,152	$601	-$31	-$575	-$590	-$1,472	-$1,505	-$1,919	-$2,045	-$2,282	-$2,266	-$2,355	-$2,395	-$2,338	-$2,131	-$2,025	-$1,887	-$1,783	-$1,637	-$1,585	-$1,480	-$1,382	-$1,290	-$1,205	$0	$0	$0	$0