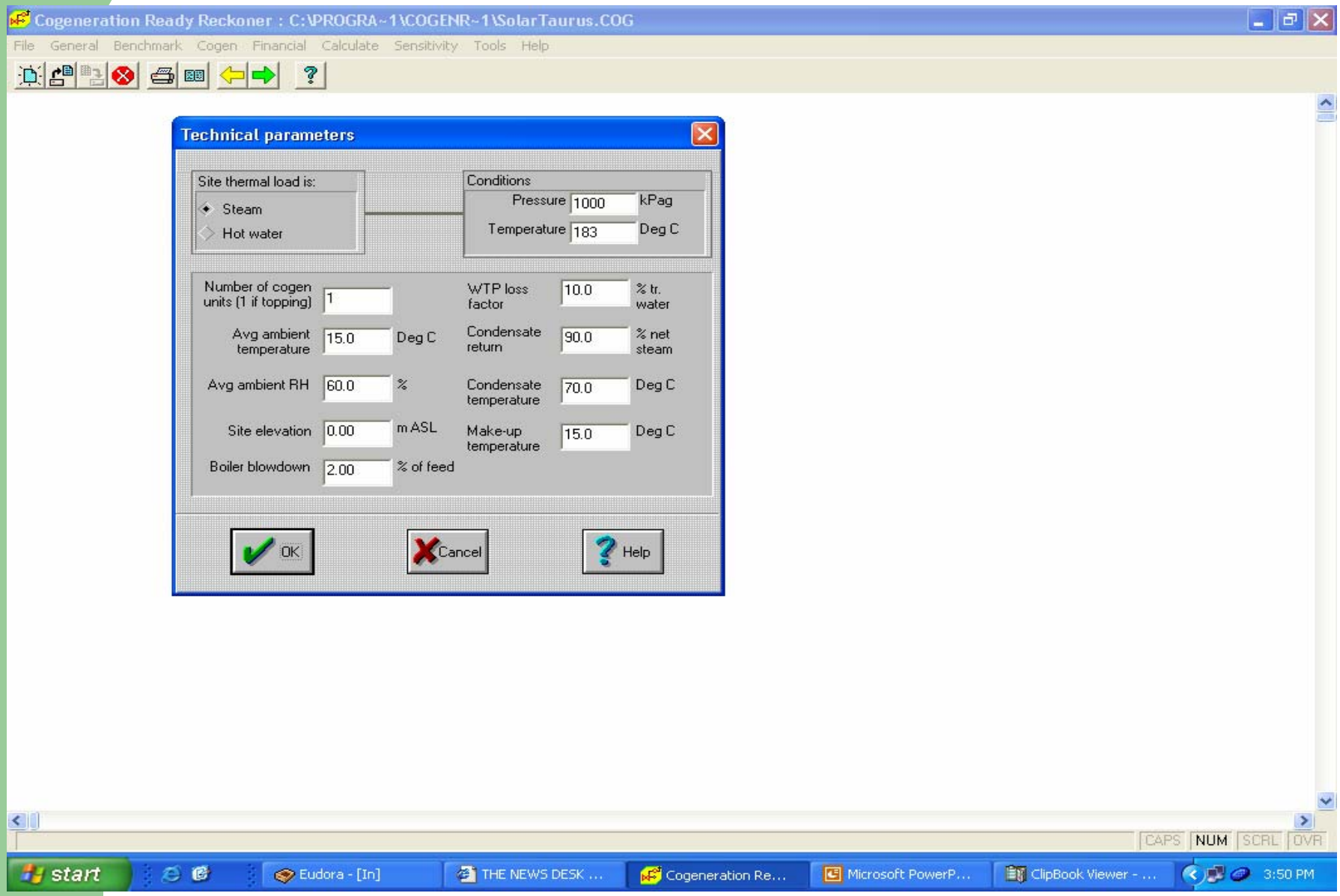
Cogeneration Ready Reckoner

- Developed initially for Australian Department of Industry, Science, and Resources by Sinclair Knight Merz
- Primary use: Screening of industrial cogeneration applications
- Provides baseline comparison (grid electricity and separate steam boiler)
- Equipment data library: GT and recip engine gen sets
- CHP applications: Process steam, hot water, chilled water
- Analysis duration/time step: 20 years; up to monthly
- Economic analyses: cash flow, payback, NPV, IRR
- Cost: Free (download from http://www.eere.energy.gov/der/chp/chp-eval2.html

Input to Ready Reckoner Is Through Pop-Up Windows



Ready Reckoner Output Is Tabular – On Screen, Printer, or File

Cogeneration Ready Reckoner : C:\PROGRA~1\COGENR~1\SolarTaurus.COG

File General Benchmark Cogen Financial Calculate Sensitivity Tools Help

Approx date:		Jun-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16
Year:		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
									Cogen case annual flows							
WHB steam	kT/a		64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6
Aux boiler steam	kT/a		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gross steam	kT/a		64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6
Deaeration steam	kT/a		4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58	4.58
Net steam	kT/a		60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Gross Gen. Electricity	GWh		29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Process electricity usage	GWh		29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Parasitic electricity	GWh		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Export Electricity	GWh		0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036
Import Electricity	GWh		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Import Elec. Demand	MW		4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83
Cogen Fuel usage	TJ/a HHV		397	397	397	397	397	397	397	397	397	397	397	397	397	397
Aux Boiler Fuel usage	TJ/a HHV		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Fuel usage	TJ/a HHV		397	397	397	397	397	397	397	397	397	397	397	397	397	397
Fuel demand	GJ/h HHV		66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2
Ash	kT/a		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CO2 emissions	kT/a		20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
Net electrical efficiency	% HHV		26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3
Net elec effic (f-to-p)	% HHV		47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6
Net thermal efficiency	% HHV		64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3
Condensate returned	kT/a		54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Treated water	kT/a		7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32
Raw water	kT/a		8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05
WTP loss	kT/a		0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732
Blowdown	kT/a		1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32
Sewer	kT/a		2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05

CAPS NUM SCRL OVR

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Ready Reckoner Output

Separately for baseline (benchmark) and DER case:

- Hourly and annual mass flows (e.g., steam, water, CO_2)
- Hourly and annual fuel flows
- Hourly and annual electricity usage
- Annual operating, capital, and tax-related cash flows

In comparison of baseline to DER case:

- Differential operating, capital, and tax-related cash flows
- Net present value (NPV)
- Internal rate of return (IRR)
- Simple payback
- NPV sensitivity charts for fuel and electricity prices, capital cost, discount rate