

### VALUE ESTIMATING TOOL GAS TURBINE IN BREWERY APPLICATIONS

### **MAIN REFERENCE ASSUMPTIONS:**

Temperature: 15°C (59°F) Sea Level

Running hours = 7,800 hr/yr

Availability: 100%

Estimates Include Maintenance Costs

This tool provides a quick evaluation of potential annual operating savings. This is only an estimate and should be discussed with your Solar Sales Manager.



Visit the Solar Turbines CHP web page at www.solarturbines.com

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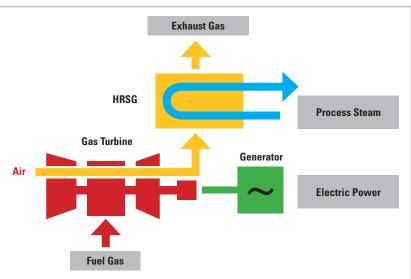


## REQUIRED DATA 1. Total Brewery Production [hectolitres/yr] 2. Total Steam Production [t/hr] 3. Total Electrical Load [kW] 4. Gas Cost [USD/MMBtu]



5. Electrical Cost [USD/kWh]

# ... and for DEEPER ANALYSIS 6. Steam Pressure and Temperature 7. Gas Pressure 8. Hot Water/Chilled Water Needs 9. Yearly Operating Hours



10. Yearly Operating Cost

### **STEP 1 – Select Your Gas Turbine**

Use the chart below to locate your plant's yearly production or electrical consumption [MW] and steam needs [t/hr]. This will identify which gas turbine best meets your requirements.

Brewery production 1 Million * hectoliters /yr		1.4-2.2	2.2-3	3-3.6	3.6-4.1	4.1-4.4	4.4-5.5	5.5-6.6	6.6-8.3	8.3-10	10-13	13-13.9	13.9-16.4	16.4-22.2	22.2-24.7	24.7-34.1
	Steam Production [t/hr] Electrical Consumption [MW]	5 -8	8 -11	11 - 13	13 - 15	15 - 16	16 - 20	20 - 24	24 - 30	30 - 36	36 - 47	47 - 50	50 - 59	59 - 80	80 -89	89 - 123
2.9 - 4.4	3 - 4		C40	C40	C40	C40	C40	C40	C40	C40						
3.9 - 5.5	4 - 5	M50	C40	C50												
4.9 - 6.6	5 - 6	M50	C40	T60/C50	T60											
5.8 - 7.7	6 - 7	M50	C40	T60/C50	T60/T65	T65	T65	T65	T65	T65	T65					
6.8 - 8.8	7 - 8	M50	C40	T60/C50	T65	T65/T70	T70	T70	T70	T70	T70	T70				
7.8 - 9.9	8 - 9	M50	C40	T60/C50	T65	T70										
8.8 - 10.9	9 - 10	M50	C40	T60/C50	T65	T70										
9.7 - 12	10 - 11	M50	C40	T60/C50	T65	T70	T70	M100	M100	M100	M100	M100	M100	M100		
10.7 - 13.1	11 - 12	M50	C40	T60/C50	T65	T70	T70	M100	M100	M100	M100	M100	M100	M100		
11.7 - 14.2	12 - 13	M50	C40	T60/C50	T65	T70	T70	M100	M100	M100	M100	M100	M100	M100		
12.6 - 15.3	13 - 14	M50	C40	T60/C50	T65	T70	T70	M100	M100	M100	M100	M100	M100	M100		
13.6 - 16.4	14 - 15	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
14.6 - 17.5	15 - 16	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
15.5 - 18.6	16 - 17	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
16.5 - 19.7	17 - 18	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
17.5 - 20.8	18 - 19	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
18.5 - 21.9	19 - 20	M50	C40	T60/C50	T65	T70	T70	M100	T130	T130	T130	T130	T130	T130	T130	
19.5 - 23	20 - 21	M50	C40	T60/C50	T65	T70	T70	M100	T130	T250	T250	T250	T250	T250	T250	T250
20.5 - 24	21 - 22	M50	C40	T60/C50	T65	T70	T70	M100	T130	T250	T250	T250	T250	T250	T250	T250
21.4 - 25.2	22 - 23	M50	C40	T60/C50	T65	T70	T70	M100	T130	T250	T250	T250	T250	T250	T250	T250

### **STEP 2 – Identify Your Potential Savings**

Locate the gas turbine from step 1 in the charts below. Identify the savings line according to your gas [USD/MMBtu] and power [USD/kWh] costs.

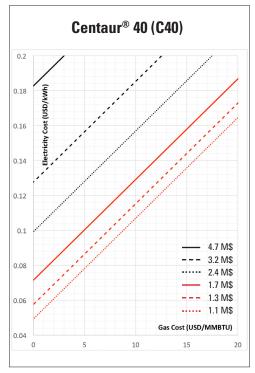
### **CALCULATION TIPS**

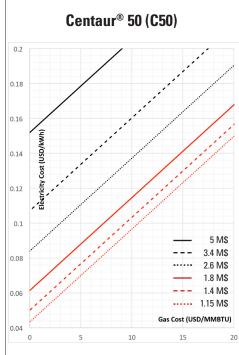
## 0,0034 $\frac{USD}{kWh} = 1 \frac{USD}{MMBtu} = \left(0,0324 \frac{USD}{Sm^3}\right)^*$ (\*) With Gas LHV = 9,5 $\frac{kWh}{Sm^3}$

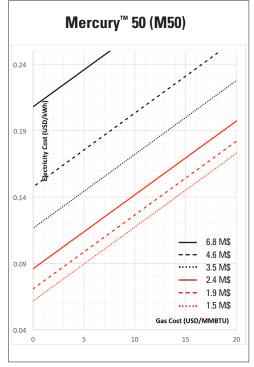
### Steam

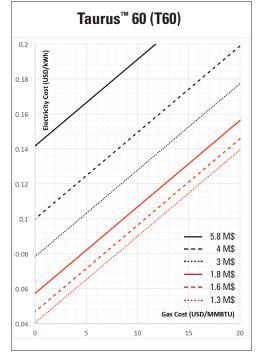
$$1 \frac{t}{h} = 2205 \frac{lb}{h}$$

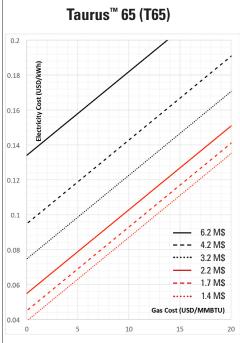


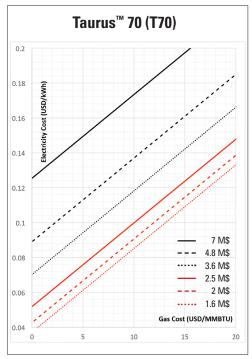




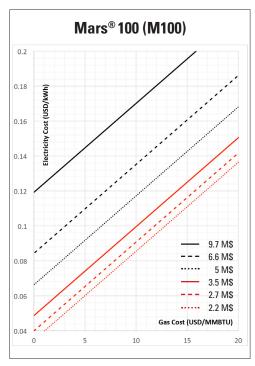


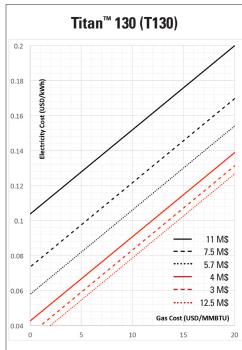


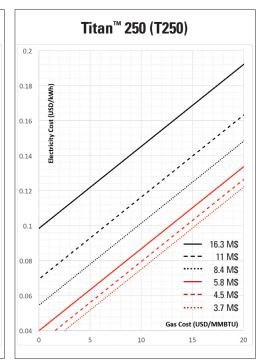




### **STEP 2 (continued) – Identify Your Potential Savings**







### **Solar Turbines - Sales and Service Locations**



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