

Desalination & CHP Modeling: Energy Converter Logic

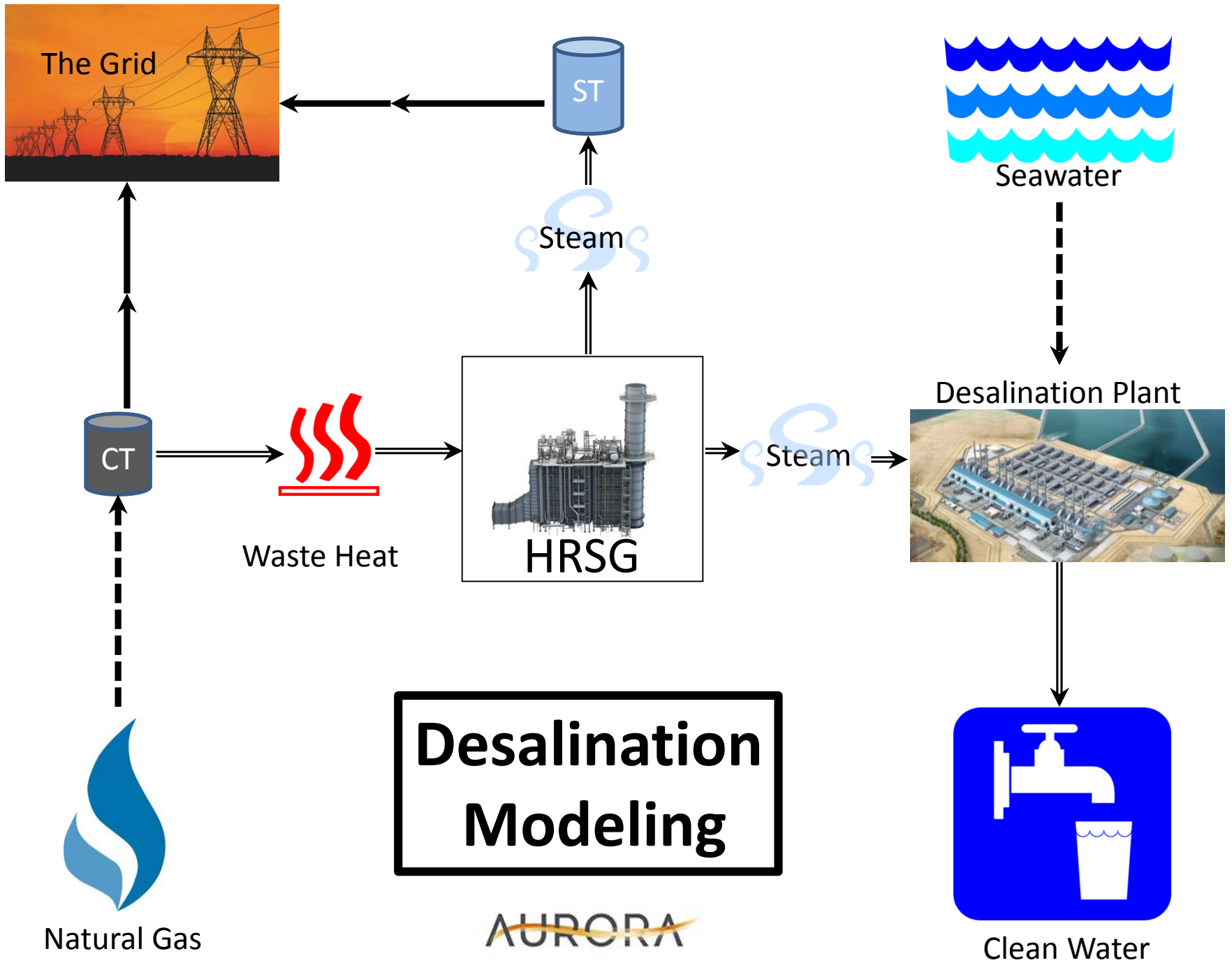
This is a short tutorial that shows the background for Energy Converter logic.

It includes

- a diagram,
- input data setup,
- and output results

Examples include:

- Desalination modeling
- CHP modeling



Desalination Inputs

Resources Table

	ID	Name	Heat Rate	Capacity	Fuel	Area
			Btu/kWh	kW		
1	CT1	CT1	13000	100000	NGHenry	1
2	ST1	ST1	0	100000	NGHenry	1

Energy Converters Table

	Converter ID	Units	Availability	Fixed Cost	Hourly Withdrawal	Storage Minimum	Storage Maximum	Storage Starting Contents
1	HRSG	tons	1	1050	0	0	0	0
2	Desal	m ³	1	3000	wk_WaterDemand	100	1000	200

Energy Conversions Table

	Conversion ID	Input Type	Input ID	Output Type	Output ID	Operating Hourly Min	Operating Hourly Max	Variable Cost	Conversion Coeff Quadratic	Conversion Coeff Linear
1	CT_to_HRSG	Resource	CT1	Energy Converter	HRSG	0	200	.05	.001	10
2	HRSG_Steam_Med_to_Water	Energy Converter	HRSG	Energy Converter	Desal	10	400	1.25	.0005	0.01
3	HRSG_Steam_High_to_Water	Energy Converter	HRSG	Energy Converter	Desal	10	200	1.35	.003	0.015
4	HRSG_Steam_Med_to_ST	Energy Converter	HRSG	Resource	ST1	0	150	.025	.002	0.04
5	HRSG_Steam_High_to_ST	Energy Converter	HRSG	Resource	ST1	0	150	.1	.003	0.08

Desalination Outputs

ResourceHour Output Table

	Time_Period	ID	Name	Capability	Output
				MWa	MWa
1	2016_01_01 Hr 05	CT1	CT1	100.00	37.85
2	2016_01_01 Hr 05	ST1	ST1	100.00	96.72

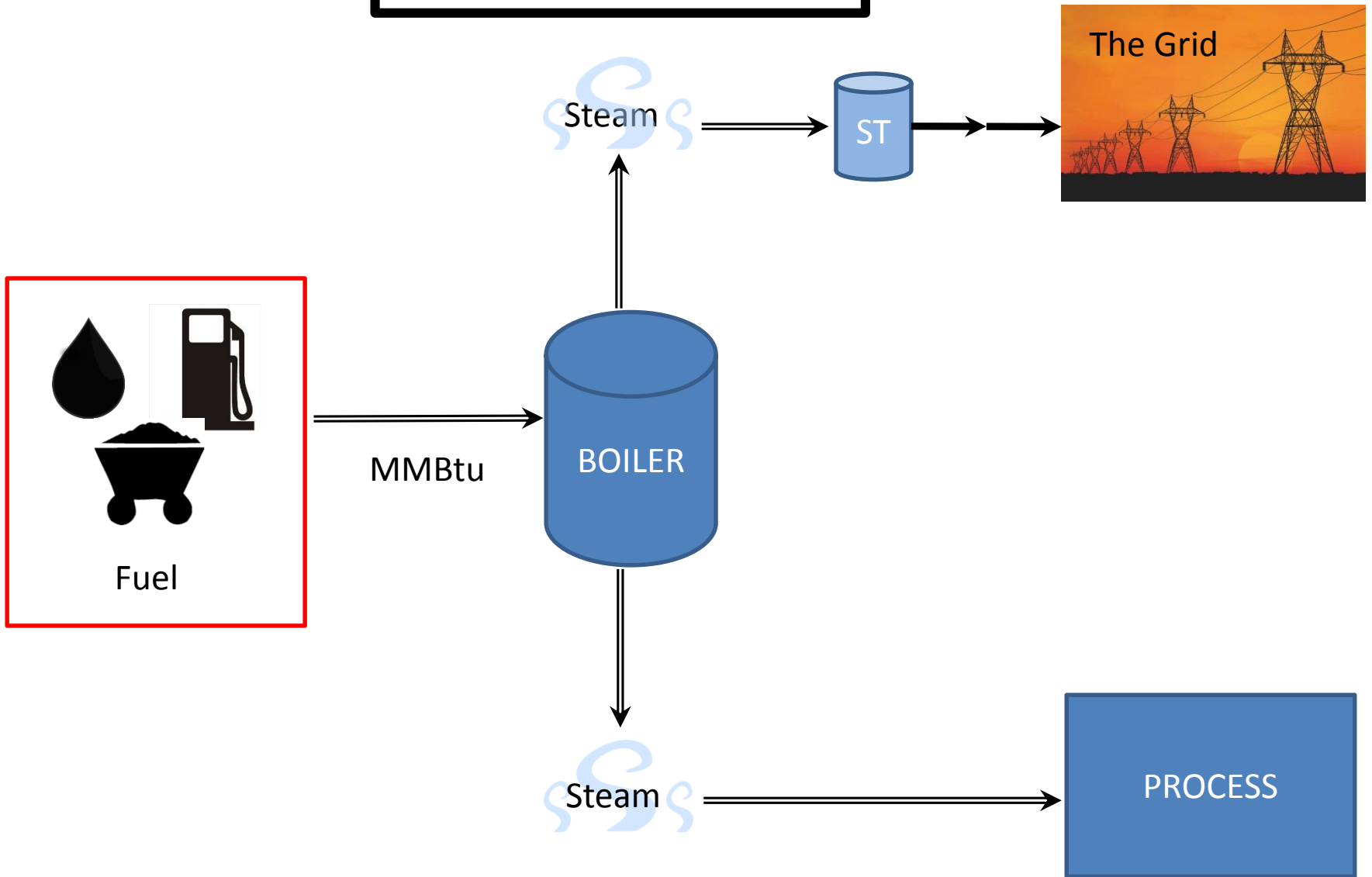
EnergyConverterHour Output Table

	Time_Period	Converter ID	Units	Amount_Produced	Amount_Converted	Amount_Withdrawn	Storage_Change	Ending_Contents	Shadow_Price
									\$/unit
1	2016_01_01 Hr 05	HRSG	tons	380.02	380.02	0.00	0.00	0	.00
2	2016_01_01 Hr 05	Desal	m^3	67.06	0.00	65.00	2.06	446	4.36

EnergyConversionHour Output Table

	Time_Period	Conversion_ID	Input_Type	Input_ID	Input_Units	Output_Type	Output_ID	Output_Units	Input_Amount	Output_Amount
1	2016_01_01 Hr 05	CT_to_HRSG	Resource	CT1	MWh	Energy Converter	HRSG	tons	37.85	380.02
2	2016_01_01 Hr 05	HRSG_Steam_Med_to_ST	Energy Converter	HRSG	tons	Resource	ST1	MWh	83.33	17.22
3	2016_01_01 Hr 05	HRSG_Steam_Med_to_Water	Energy Converter	HRSG	tons	Energy Converter	Desal	m^3	0.00	0.00
4	2016_01_01 Hr 05	HRSG_Steam_High_to_ST	Energy Converter	HRSG	tons	Resource	ST1	MWh	150.00	79.50
5	2016_01_01 Hr 05	HRSG_Steam_High_to_Water	Energy Converter	HRSG	tons	Energy Converter	Desal	m^3	146.68	67.06

CHP Modeling



CHP Inputs

Resources Table

	ID	Name	Heat Rate	Capacity	Fuel	Area
			Btu/kWh	kW		
1	Coal1	Coal Plant	0	300000	Coal	1

Energy Converters Table

	Converter ID	Units	Availability	Fixed Cost	Hourly Withdrawal	Storage Minimum	Storage Maximum	Storage Starting Contents
1	Coal_Pile	mmBtu	1	0	0	0	100000000000	100000000000
2	Boiler	tons	1	1000	0	0	0	0
3	HeatProcess	tons	1	500	wk_SteamDemand	0	0	0

Energy Conversions Table

	Conversion ID	Input Type	Input ID	Output Type	Output ID	Operating Hourly Min	Operating Hourly Max	Variable Cost	Conversion Coeff Quadratic	Conversion Coeff Linear
1	Coal_to_Boiler	Energy Converter	Coal_Pile	Energy Converter	Boiler	0	3300	1.25	.0001	0.09
2	Boiler_to_Power	Energy Converter	Boiler	Resource	Coal1	200	1000	0	.0002	0.04
3	Boiler_to_HeatProcess	Energy Converter	Boiler	Energy Converter	HeatProcess	0	500	0	0	1

CHP Outputs

ResourceHour Output Table

	Time_Period	ID	Name	Capability	Output
				MWa	MWa
1	2016_01_01 Hr 05	Coal1	Coal Plant	300.00	240.00

EnergyConverterHour Output Table

	Time_Period	Converter ID	Units	Amount_Produced	Amount_Converted	Amount_Withdrawn	Storage_Change	Ending_Contents	Shadow_Price
									\$/unit
1	2016_01_01 Hr 05	Coal_Pile	mmBtu	0.00	2795.14	0.00	-2795.14	99999989760	.00
2	2016_01_01 Hr 05	Boiler	tons	1036.00	1036.00	0.00	0.00	0	.00
3	2016_01_01 Hr 05	HeatProcess	tons	36.00	0.00	36.00	0.00	0	1.95

EnergyConversionHour Output Table

	Time_Period	Conversion_ID	Input_Type	Input_ID	Input_Units	Output_Type	Output_ID	Output_Units	Input_Amount	Output_Amount	Total_Variable_Cost
											\$000
1	2016_01_01 Hr 05	Coal_to_Boiler	Energy Converter	Coal_Pile	mmBtu	Energy Converter	Boiler	tons	2795.14	1036.00	3.49
2	2016_01_01 Hr 05	Boiler_to_Power	Energy Converter	Boiler	tons	Resource	Coal1	MWh	1000.00	240.00	.00
3	2016_01_01 Hr 05	Boiler_to_HeatProcess	Energy Converter	Boiler	tons	Energy Converter	HeatProcess	tons	36.00	36.00	.00