BROOKLYN UNITED METHODEST CHURCH HOME – DATABASE NOTES

Table 1 Database Notes

Data Collection	Data Logger: Data Collection Interval: Collection Method:	Site's BMS System 15 – Minute Daily Email
Project Information	DER Unit (make & model): Nameplate Capacity: Heat Recovery Medium: Heat Recovery Uses: Excess Heat:	Three (3) Tecogen INV-125 e+ Units 375 kW Hot Water Absorption Chiller hydronic load, DHW, Space Heating Rejected to atmosphere by fluid cooler
DER Electricity Generated	Engineering Units: Energy Measurement (net/gross): Measurement Type:	kWh/hour Gross Power Gross kW from Satec BFM136 meter
Electric Utility Import	Engineering Units: Measurement Type:	kWh kWh from ConEd electric meter
DER Fuel Consumed	Engineering Units: Measurement type:	cfh Calculated using measured power and manufacturer ratings
DER Heat Used	Engineering Units: Heat Measurement Type:	MBtu/hr (value calculated by site) MBtu from Onicon FM-1200 flowmeter and two PreCon ST-W temperature sensors, using 15-minute interval data, across all useful loads
DER Heat Rejected	Engineering Units: Heat Measurement Type:	MBtu/hr (value calculated by site) MBtu from Onicon FM-1200 flowmeter and two PreCon ST-W temperature sensors, using 15-minute interval data, across fluid cooler

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Table 2 Event Timeline

Date	Event
8/25/2021	Data collection begins. Gas use is low leading to elevated electrical and CHP efficiencies.
9/2/2021	Data posted to the DER website.
9/27/2021	Gas data set as invalid due to unrealistic electrical and CHP efficiencies. Gas consumption is low compared to power output. Data Quality Filter must be turned off to view data.
11/15/2021	Gas data stipulated for all time using measured power and manufacturer rating, see Appendix - Gas Calc for details.

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Range Checks

Table 3 Range Checks

| Data Point	Units	Database Lower Range	Database Upper Range	Notes
DER Electricity Generated	kWh/hour	0	450	
Electric Utility Import	kWh/hour	0	1000	
DER Fuel Consumed	cfh	0	5000	
DER Heat Used	MBtu/hour	0	4500	
DER Heat Rejected	MBtu/hour	0	4500	
Ambient Temperature	°F	-20	130	NOAA Airport Code - KJFK

Relational Checks

Table 4 Relational Checks

Evaluated Point(s)	Criteria	Result
Electricity Generated Fuel Consumed	Daily Electric Efficiency < 0% HHV and > 100% HHV	Electricity Generated = invalid Fuel Consumed = invalid Heat Used = invalid Heat Rejected = invalid

Gas data is calculated from power generation by using gas curve developed from the NYSERDA CHP Acceleration performance values for the InVerde Ultera (INV-125e+) unit.
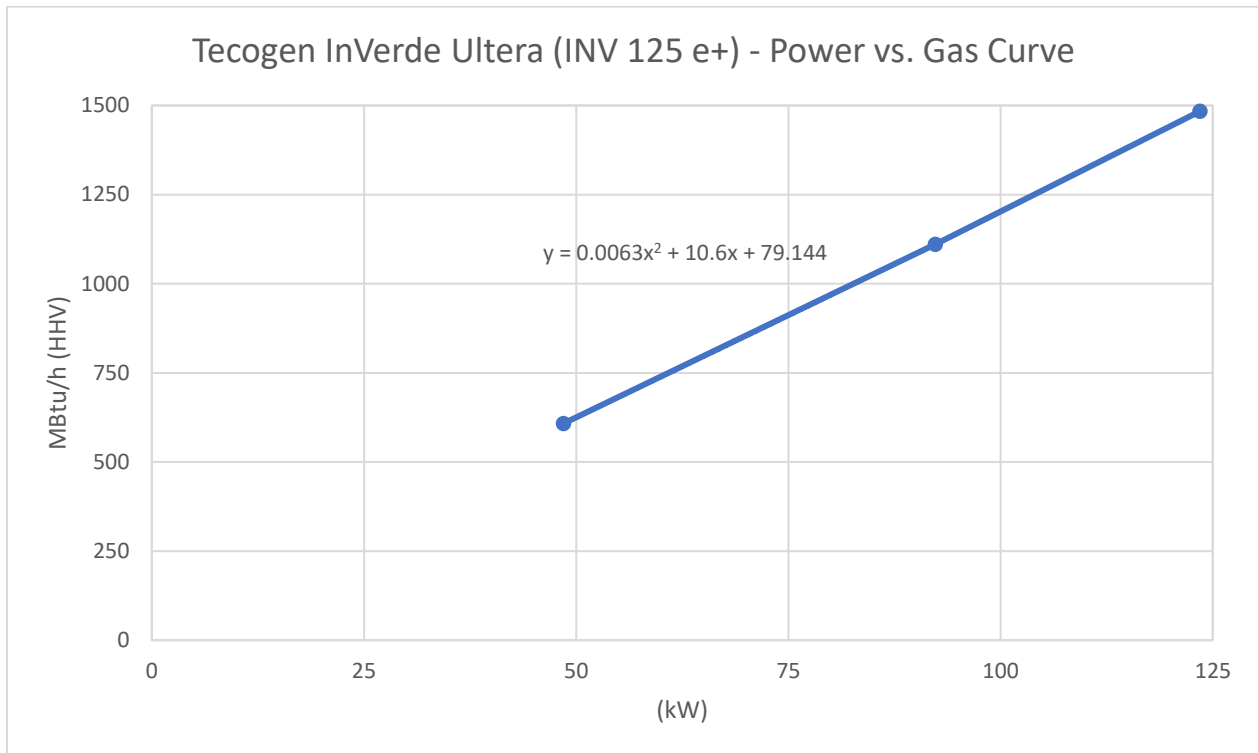
It is assumed that a unit gets fully loaded before the next unit comes online:

If power generation (**WT_KW**) is less than or equal to 125 kW, then gas consumption (**FG**) is:

$FG = 0.0063(WT\_KW)^2 + 10.6(WT\_KW) + 70.144$

If power generation is greater than 125 kW and less than or equal to 250 kW, then gas consumption is:

$FG = (0.0063(125)^2 + 10.6(125) + 70.144) + (0.0063(WT\_KW-125)^2 + 10.6(WT\_KW-125) + 70.144)$

If power generation is greater than 250 kW, then gas consumption is:

$FG = (0.0063(250)^2 + 10.6(250) + 70.144) + (0.0063(WT\_KW-250)^2 + 10.6(WT\_KW-250) + 70.144)$