



## **Presenting:**

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# BMS & Sub-Metering

97% of sub-metering systems report incorrect information....



# Why do we meter?



SHAREHOLDERS



DEFINE

Define the problem.



MEASURE

Map out the current process.



ANALYZE

Identify the cause of the problem.



IMPROVE

Implement and verify the solution.



CONTROL

Maintain the solution.



# Common Sub-metering Methods

METHOD	UTILITY TYPE			
	Electricity	Water	Gas	Thermal (chilled&hot)
Pulse	✓	✓	✓	✓
Mbus	✓	✓		✓
Modbus	✓	✓		✓
BACnet	✓	✓		✓

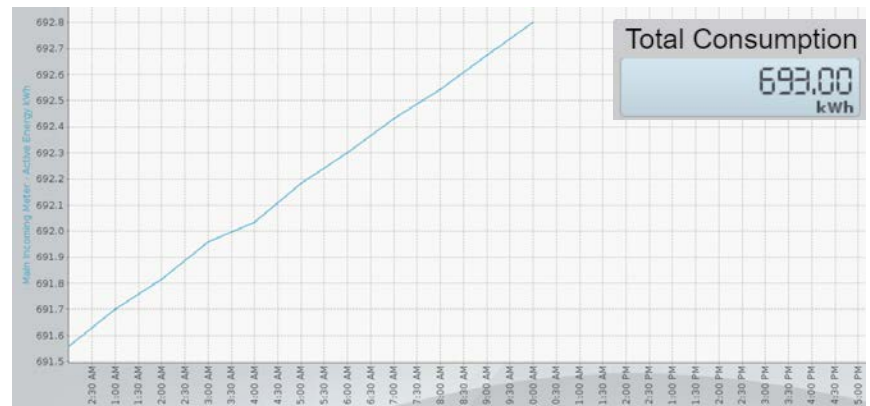
Not uncommon for all of these methods to exist in one building



# Common Issues

- Naming conventions
  - IE: MCC-A1-3T ?
- Incorrect
  - CT ratios
  - Correction factors
  - Units
  - Meter and BMS miss match
- Un-reliable networks
  - Gaps in data
  - Data spikes
- Analog values reaching a ceiling
- Pulse metering
  - Gas....
- Coverage/location of meters

Ownership of data...subscription models?

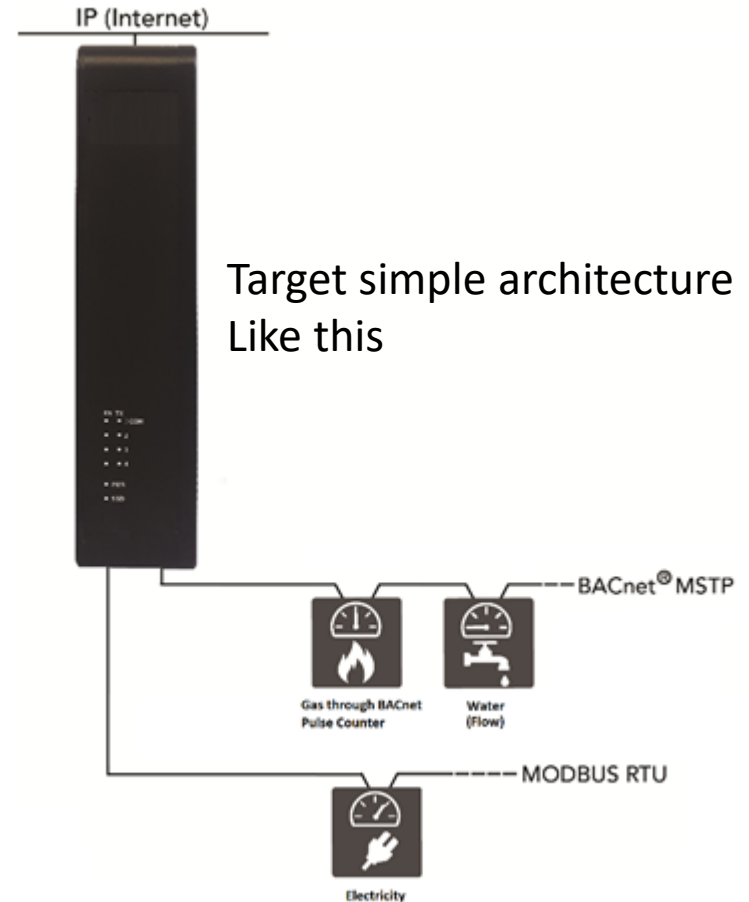


Is this good or bad performance?



# Avoiding Common Issues

- Avoid pulse meters (if you must, put accumulator at meter)
- Avoid Gateways and protocol conversions
- Select meters with memory and use...
- Common Open Protocols like:
  - BACnet
  - Modbus
- Use meaningful naming conventions across all documentation
- To avoid data ownership issues request systems that have:
  - NOT SUBSCRIPTION FEES
  - NO ANNUAL LICENCE FEES



Target simple architecture  
Like this



# Avoid common issues with good commissioning methodology

## 10.4.4 Example of a validation record for electrical non-utility meters

Building name: \_\_\_\_\_ Building address: \_\_\_\_\_  
 Name of person undertaking validation: \_\_\_\_\_ Qualification and/or certified licence number: \_\_\_\_\_  
 Date of validation: \_\_\_\_\_

Non-utility meter ID (meter no. or tenancy / unit no.)	Non-utility meter description (meter brand and type)	Meter wiring checked*	Remote meter reading Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				CT ratio (only applicable for CT type meters)	Meter multiplier; K factor; or meter factor (only applicable for CT type meters)	Power meter check (kWh) (only required where it is not possible to identify the CT ratio)
			Time A		Time B				
			Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face			
Example	Example	Yes	Time A: 12:25 12357.90    12357.90		Time B: 12:32 18256.31    18256.31		300:5	60	1600 kWh
			Time A:		Time B:				
			Time A:		Time B:				

\*The meter wiring check for CT type meters should check for: reverse CT connection errors; cross phase CT connection errors; phase sequence connection errors; and faulty or missing potential fuses.

Signed to record that the above non-utility meters are correctly configured and have been validated: .....

## 10.4.5 Example of a validation record for gas non-utility meters

Building name: \_\_\_\_\_ Building address: \_\_\_\_\_  
 Date of validation: \_\_\_\_\_ Name of person undertaking validation: \_\_\_\_\_

Non-utility meter ID (meter no. or tenancy / unit no.)	Non-utility meter description (meter brand and type)	Remote meter reading Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				Meter pressure (kPa)	Correction factor
		Time A		Time B			
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face		
Example	Example	Time A: 12:25 12357.90    12357.90		Time B: 12:32 18256.31    18256.31		116.372	1.1485
		Time A:		Time B:			
		Time A:		Time B:			
		Time A:		Time B:			

Signed to record that the above non-utility meters are correctly configured and have been validated: .....

## 10.4.6 Example of a validation record for water non-utility meters

Building name: \_\_\_\_\_ Building address: \_\_\_\_\_  
 Date of validation: \_\_\_\_\_ Name of person undertaking validation: \_\_\_\_\_

Non-utility meter ID (Meter no. or tenancy / unit no.)	Non-utility meter description (Meter brand and type)	Remote meter reading Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)			
		Time A		Time B	
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face
Example	Example	Time A: 12:25 12357.90    12357.90		Time B: 12:32 18256.31    18256.31	
		Time A:		Time B:	
		Time A:		Time B:	
		Time A:		Time B:	

Signed to record that the above non-utility meters are correctly configured and have been validated: .....



# Data Representation



Administrator



\*Indication of performance, not an official rating

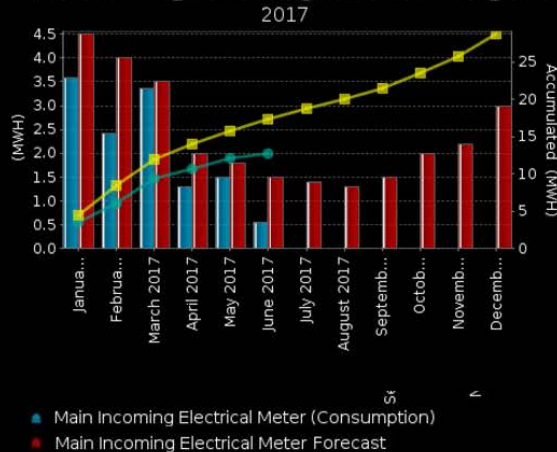


## NABERS Overview

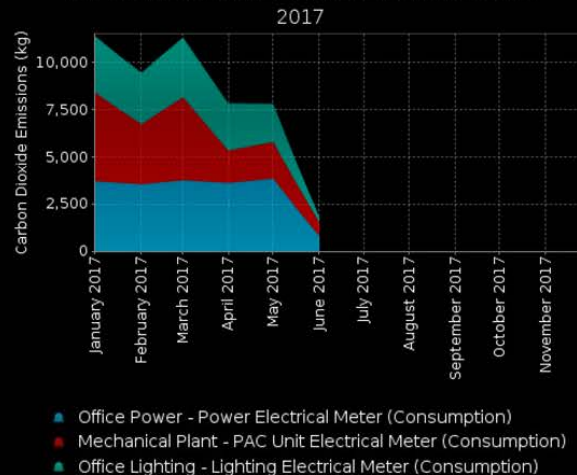
## 5 Star Target

Current Rating (Past 12 Month's Data)

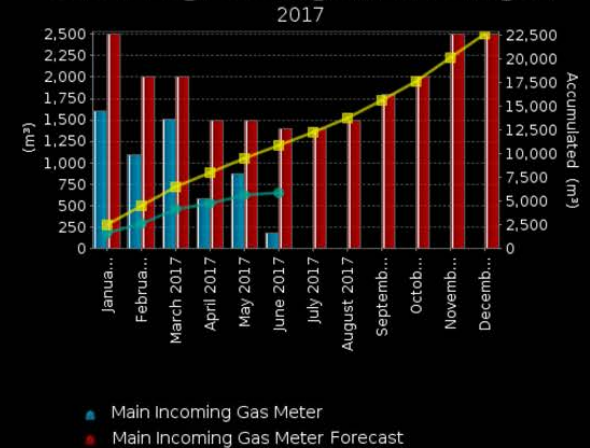
### Elec Progress Against Budget



### Greenhouse Gas Emissions



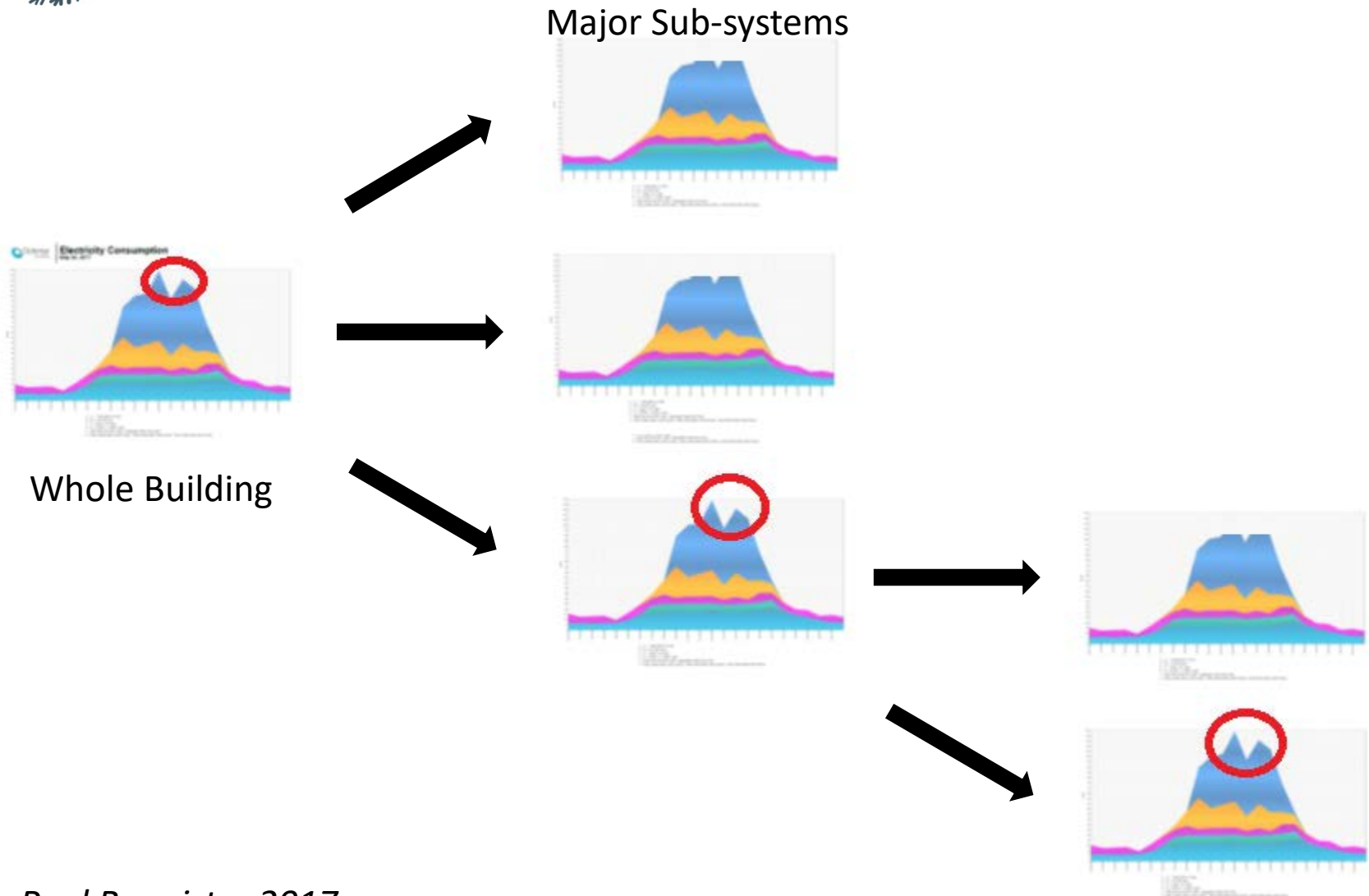
### Gas Progress Against Budget







# Logical Data Representation





# Questions



# Thank you for your attendance

Please join us for refreshments

Thanks to our event sponsor

