

Our state and communities depend on economic growth, and electricity plays an important role.



# E-101: Section 4 The Power RFI

April 21, 2026



# Electricity 101

- Section 1 – Overview of the Electric Industry & Power System
- Section 2 – The Grid
  - Generation
  - Transmission
  - Distribution
- Section 3 – Electricity
  - Electric Service
  - Common Terms and Calculations
- Section 4 – The Power RFI
  - The Easy Questions and The Hard Answers
  - How to Spot an Intruder
  - Is This Big?

# The Power RFI - Easy Questions, Hard Answers

- **Customers want to know HOW MUCH CAN I GET?**
- **HOW MUCH will it cost?**
- **How QUICK can I get it?**
  
- **Generation Mix?**
- **What is the capacity?**
- **Ability to buy 100% Renewable Energy?**
- **Where is the closest line/substation?**
- **What is the voltage of the line?**

# Basic Understanding

- What is missing?
- Does this make sense?
- Is this big or small?

**The “Perfect” RFI would contain two out of three:**

**Demand (kW)**

**Consumption  
(kWh)**

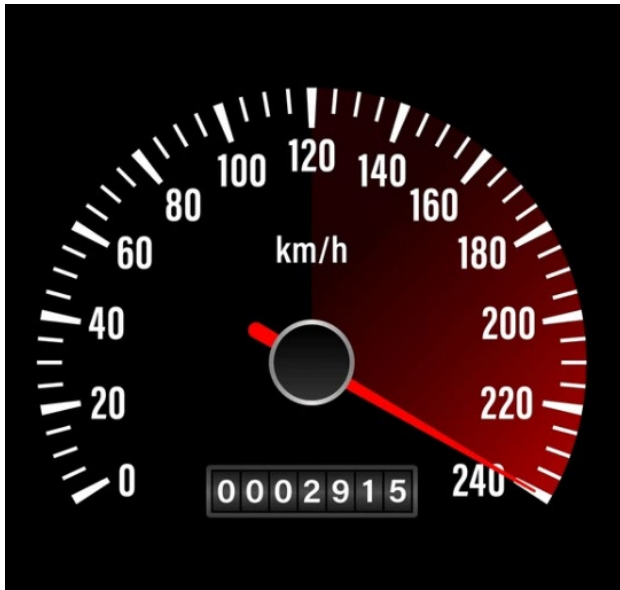
**Load Factor**

**Must have two out of three to calculate average electric cost.**

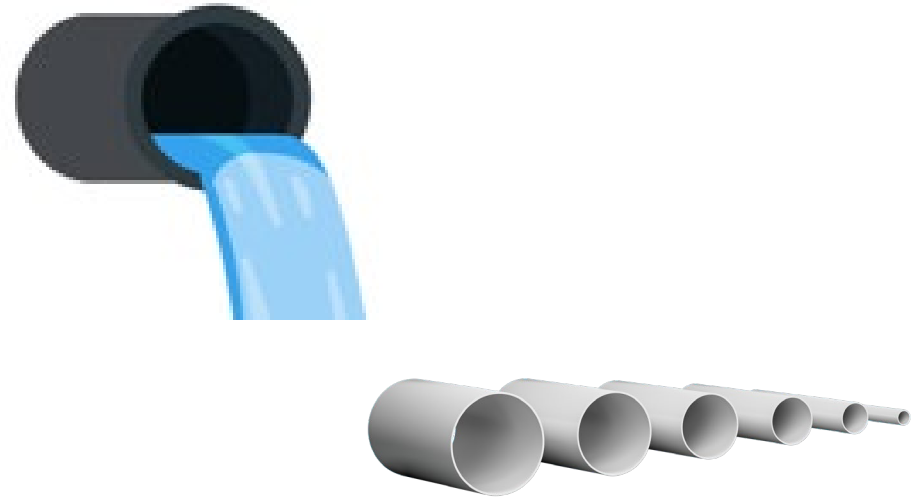
**Demand indicates how “BIG” of an electric user – method of service.**

# kW Demand

The maximum rate at which power is consumed



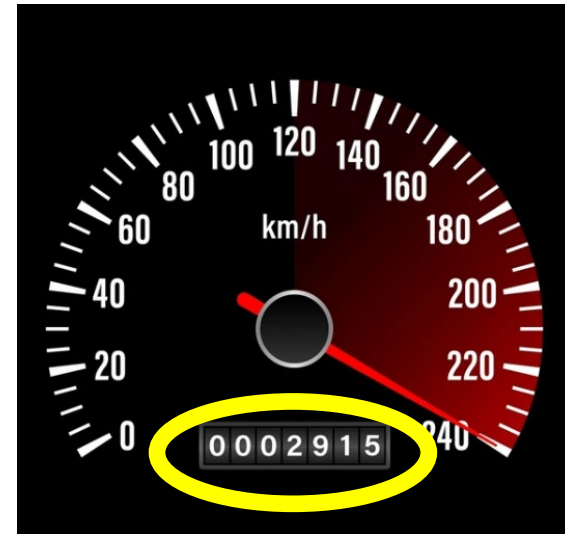
“speed”



“size of the pipe”

# kWh Consumption/“Usage”

Electric energy consumed over time,  
used to calculate actual monthly bills.

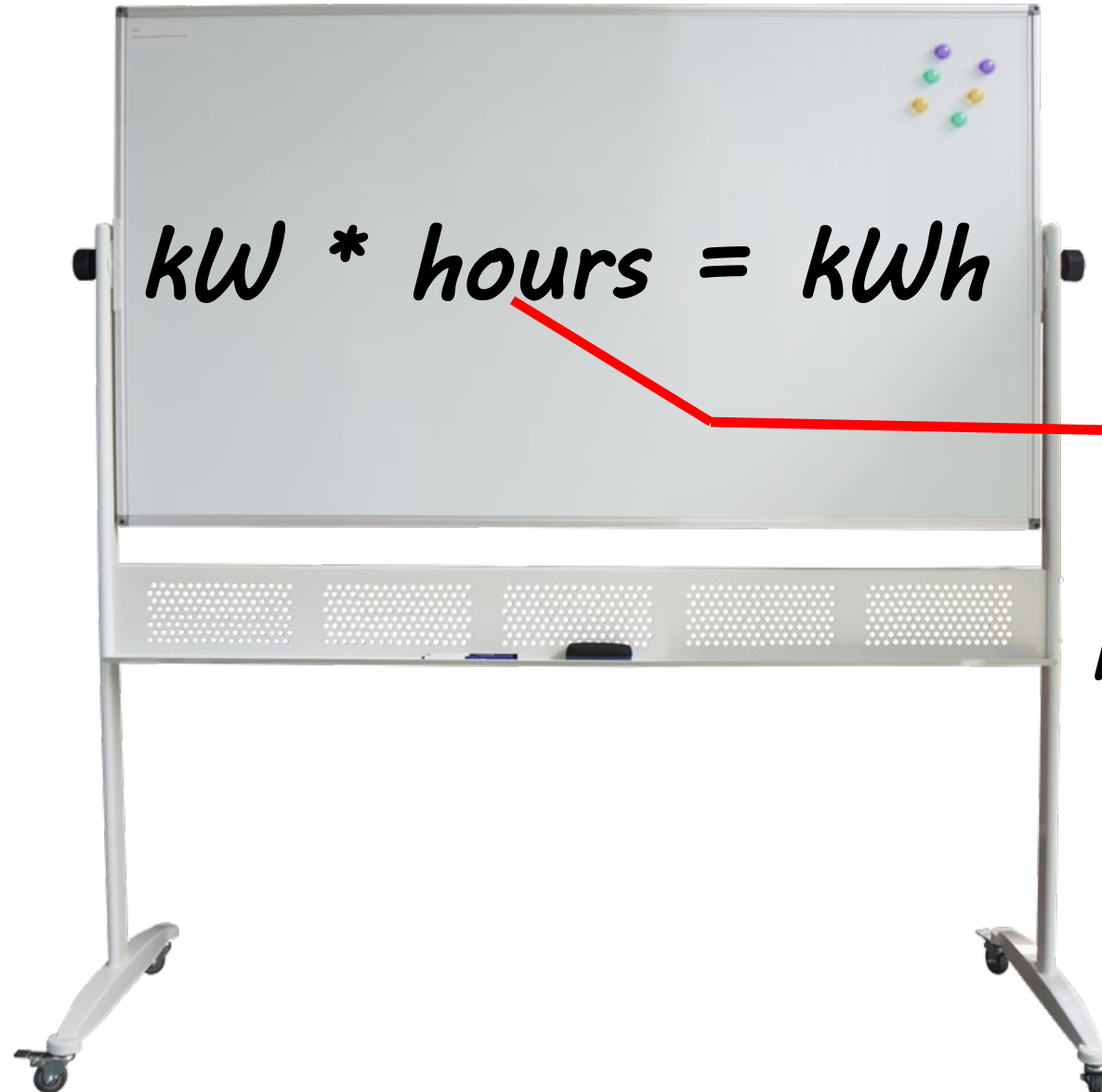


# LOAD FACTOR “HOURS USE”

Percentage of the total hours you are using your peak demand

Load Factor	Monthly Hours Use
100%	730
90%	657
80%	584
75%	547
70%	511

# The most basic calculation



**Load Factor**

**73% Load Factor**

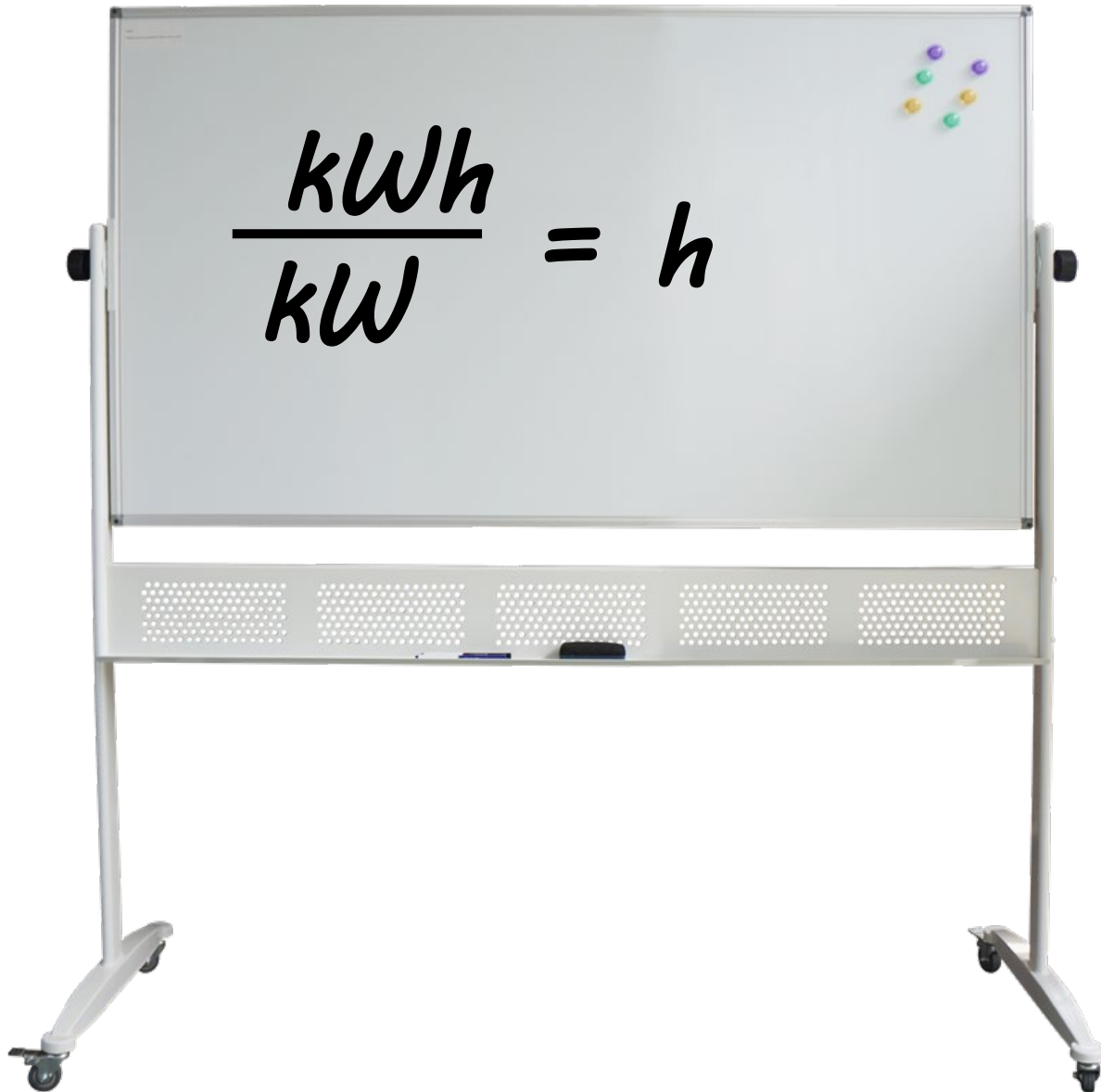
$$h = 730 * .73$$

$$h = 511$$

# The most basic calculation – division instead of multiplication



# The most basic calculation – division instead of multiplication



$$\text{Load Factor \%} = \frac{h}{730}$$

# Basic Understanding

- What is missing?
- Does this make sense?
- Is this big or small?

## Section 4 – The Power RFI

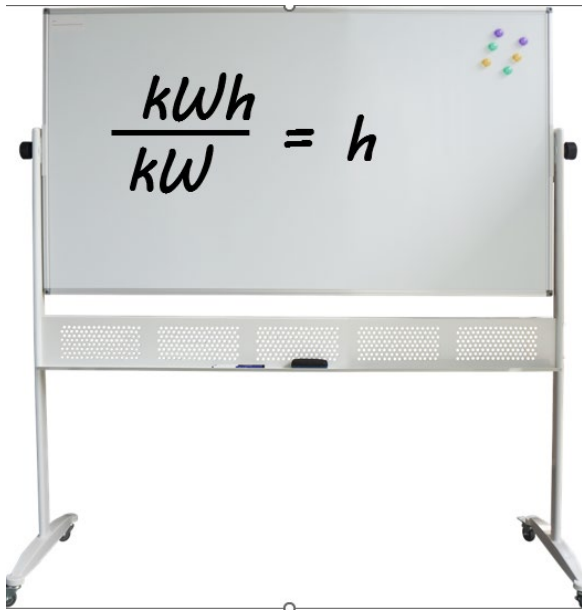
### Project Vitality

	Q1 2028	Q1 2031
Connected Load	6 MW	10 MW
Consumption	32,000,000 kWh/year	53,000,000 kWh/year
Peak Load	5000 kW	7500 kW

# What is missing?

32,000,000 kwh/year = 2,666,666.667 kwh/month

# Does this make sense?



$$\text{Load Factor \%} = \frac{h}{730}$$

	Q1 2028	Q1 2031
Connected Load	6 MW	10 MW
Consumption	32,000,000 kWh/year	53,000,000 kWh/year
Peak Load	5000 kW	7500 kW

$$h = \frac{2,666,666.667 \text{ kWh}}{5000 \text{ kW}} = 533.33333$$

$$\text{Load Factor \%} = \frac{533.33333}{730} = 0.73059 = 73\%$$

## Section 4 – The Power RFI

Is this ...

**BIG ?**

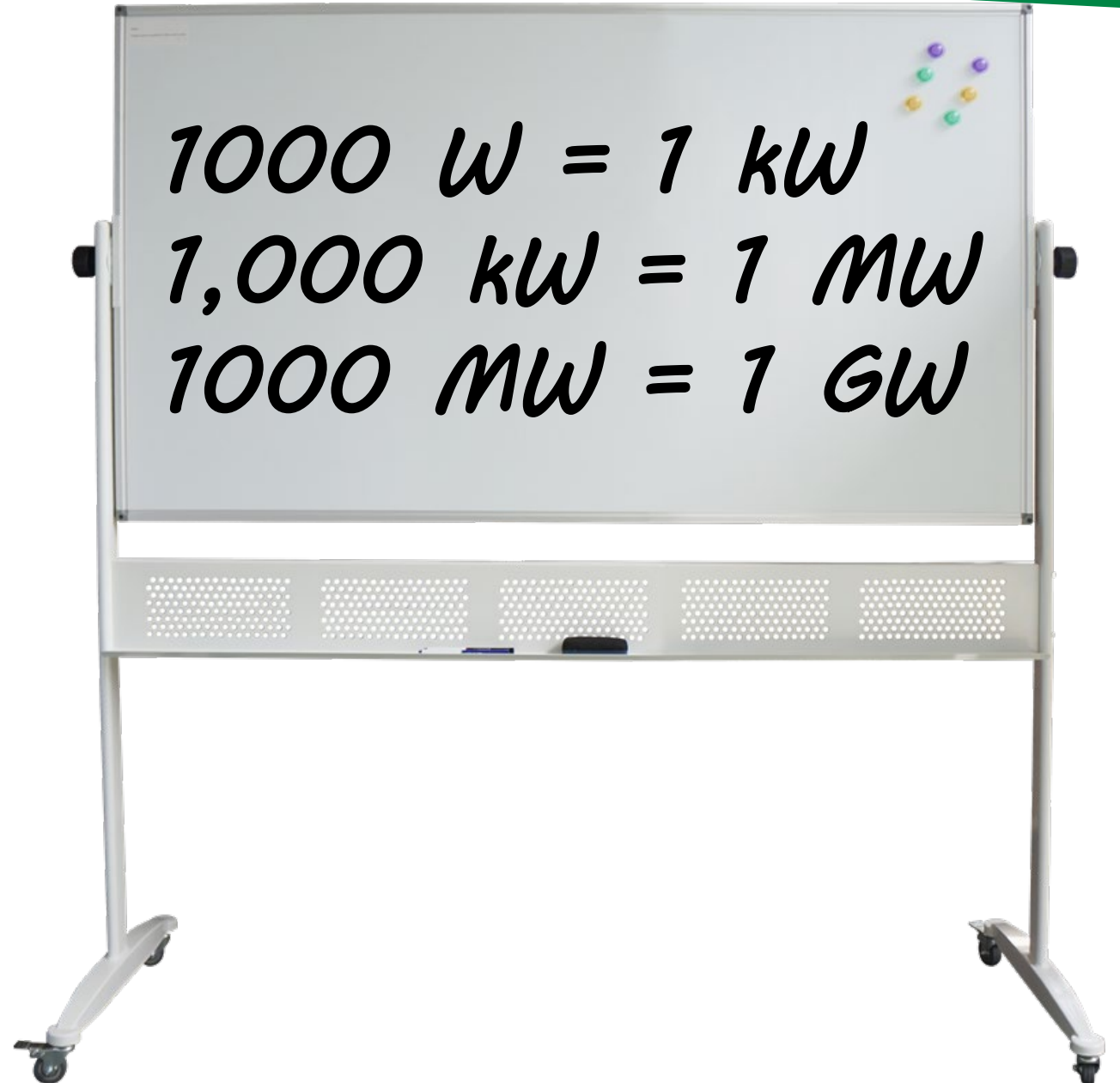
# UNITS of ELECTRICITY

Watts **W**

Kilowatts **KW**

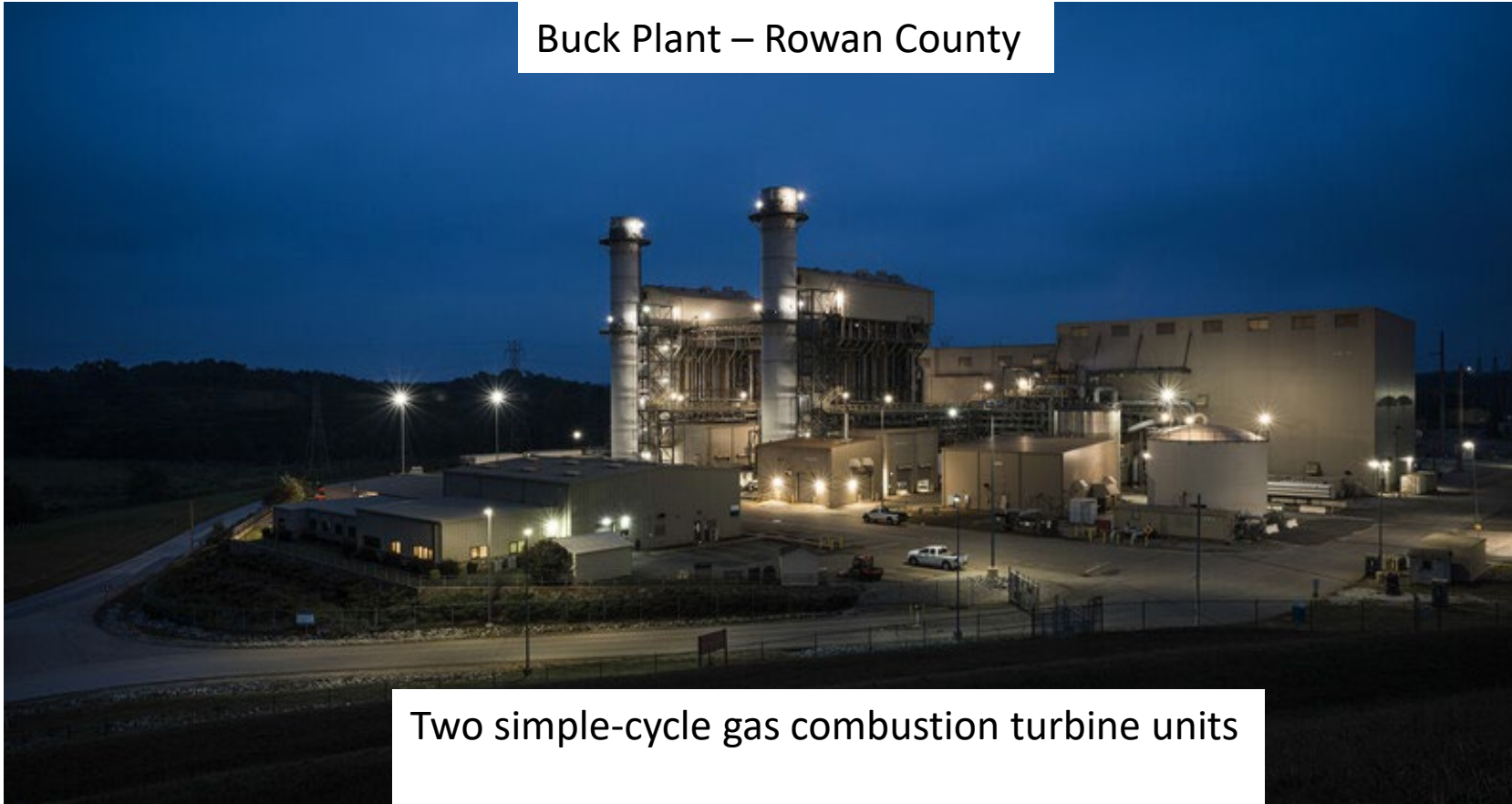
Megawatts **MW**

Gigawatts **GW**



This is BIG!

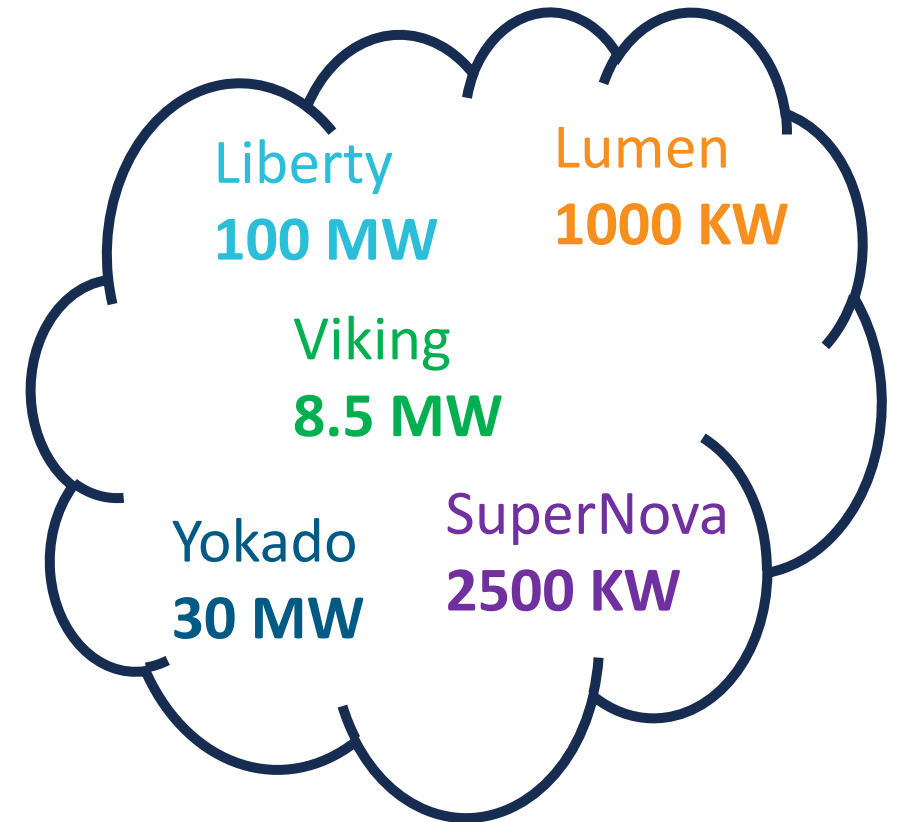
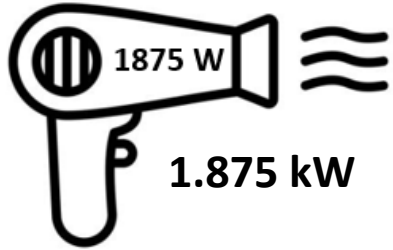
Buck Plant – Rowan County



Two simple-cycle gas combustion turbine units

**850 MW**

# Putting BIG into perspective ...



Blowing it out of perspective ...



**1000 MW**

**1 GW**

# Is this BIG?

Two simple-cycle gas combustion turbine units

# 850 MW



=

600,000 Homes

1063 Walmarts

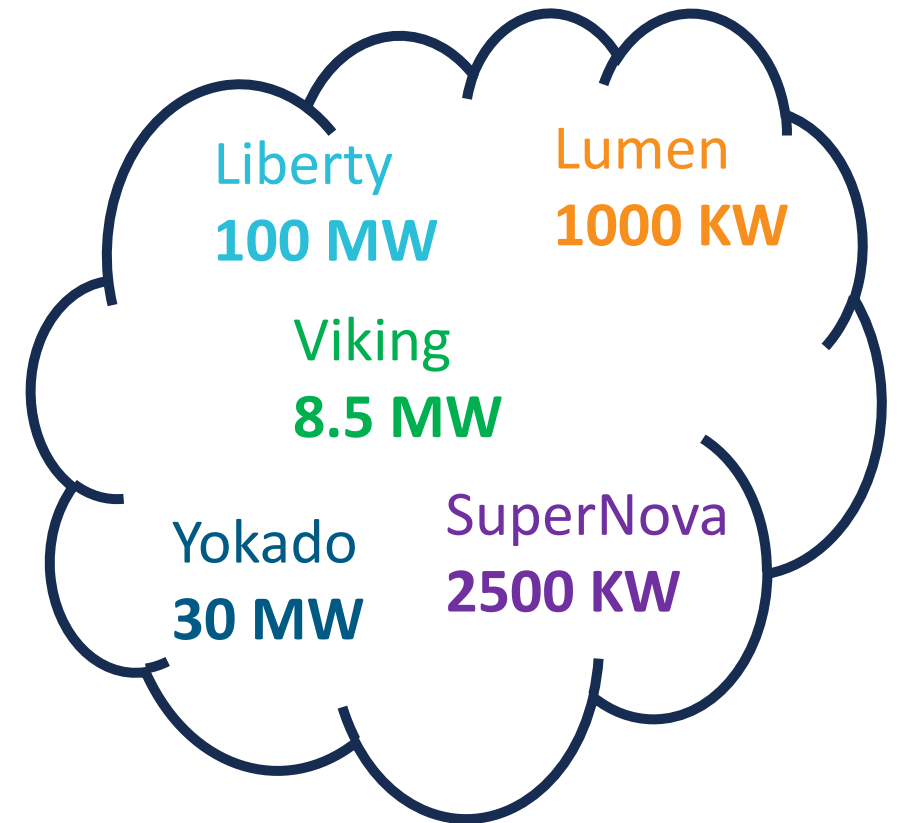
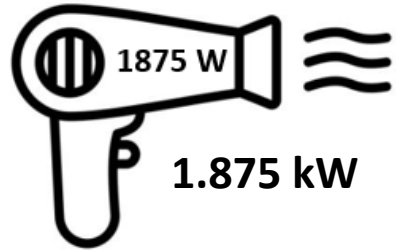
340 Supernovas

100 Vikings

28 Yokados

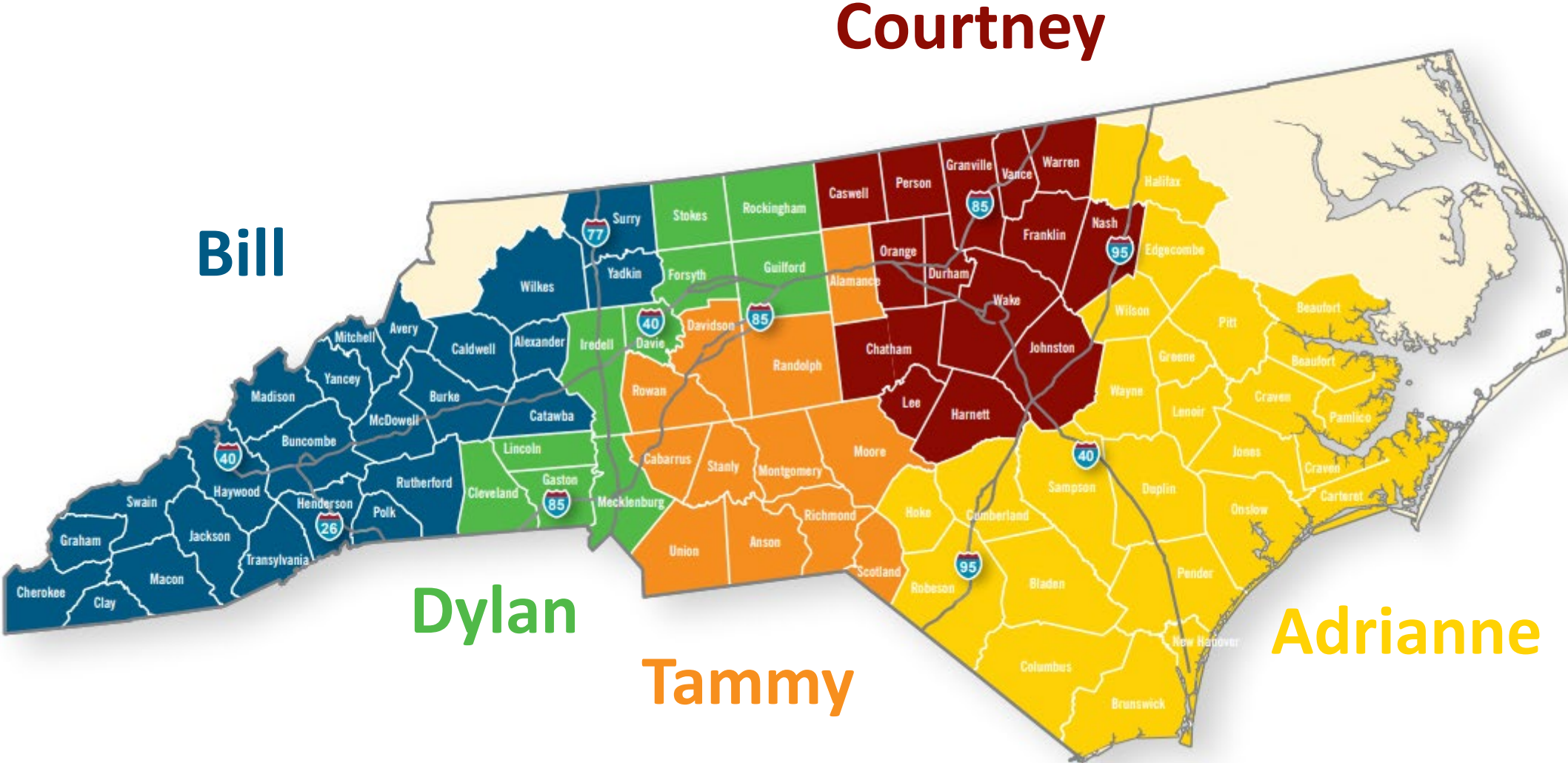
8.5 Libertys

# Is this Big?



# Power Intensive RFI - Why is EARLY ENGAGEMENT important?

- NOT every site will work for a large energy user!
- Early Engagement – Duke Team can help identify sites that are better positioned to serve POWER INTENSIVE projects.
- Prevents unnecessary work - Eliminates sites being submitted that will ultimately, and quickly, be cut due to inadequate electric infrastructure.



**Bill**

**Courtney**

**Dylan**

**Tammy**

**Adrienne**

## There are openings in the next Electricity 101 class!

- **What is the tipping point?**
  - **When do you need a TRANSMISSION LINE? 44 kV, 100 kV or 230 kV?**
- **Can a 12 kV line serve Project Lumen? Green Olive?**
- **What is a KVA?**
- **If the Service Panel is 2000 Amps – how big of a project can it serve?**
- **Is a High Load Factor better than a Low Load Factor?**