REROC

RIVERINA EASTERN REGIONAL ORGANISATION OF COUNCILS

Assessing Feasibility of EV Charging Stations

Presented By

ChargeWorks

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About ChargeWorks

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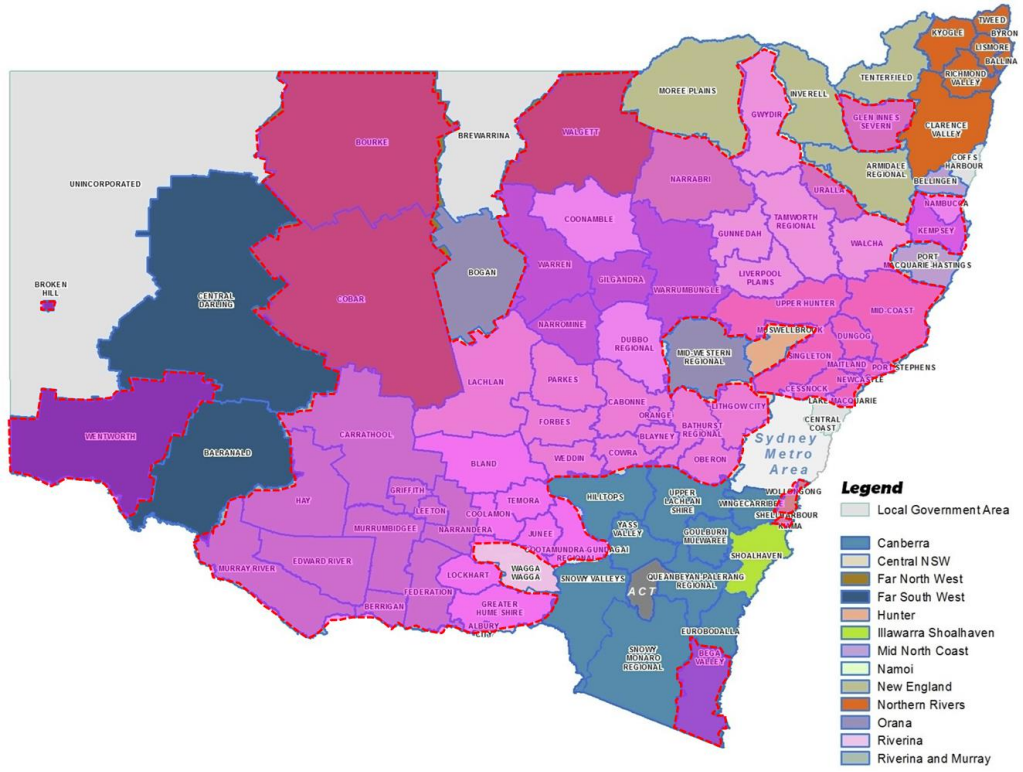
About ChargeWorks

- 20+ EV Ready Building Assessments
- 300+ Council Destination Charging Assessments
- Council Fleet Charging



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This Presentation Overview – Assessing EV Site Feasibility

1. Fundamentals of EV Charging
2. Fundamentals of Electrical Constraints
3. Assessing Site Feasibility

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1. **Fundamentals of EV Charging**
2. Fundamentals of Electrical Constraints
3. Assessing Site Feasibility

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Types of EV Charging

Level 1 - General Power Points (2kW)

- 10-15km of range per hour

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Level 2 – AC Charging (7-22kW)

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Level 3 – DC "Fast" Charging (25-350kW)

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Level 2 “Destination Charging”

Coolamon

Lockhart

Junee – Crossing Motel

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Level 2 “Destination Charging”

- $20 million co-funding for regional destination charging
- 7kW or 22kW Chargers

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- **Round 2 grants opening soon!**

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Council sites

- Museums, Landmarks, Parks, Sports facilities, Caravan Parks, Visitor Centres, Libraries

Privately owned sites

- Accommodation, Entertainment venues, Restaurants, Wineries

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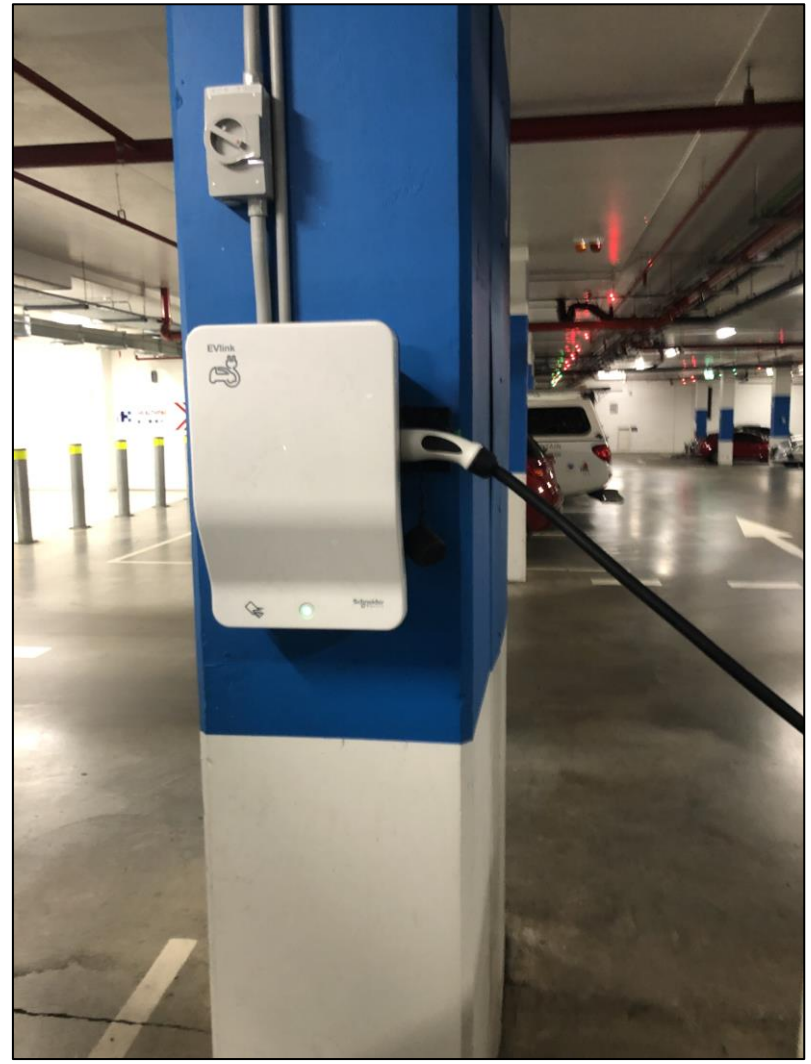
Level 2 “Fleet Charging”



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1. Fundamentals of EV Charging
2. **Fundamentals of Electrical Constraints**
3. Assessing Your Site

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Fundamentals of Electrical Constraints

- Maximum Demand

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Fundamentals of Electrical Constraints

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  - **Amps** – What cables / switches care about

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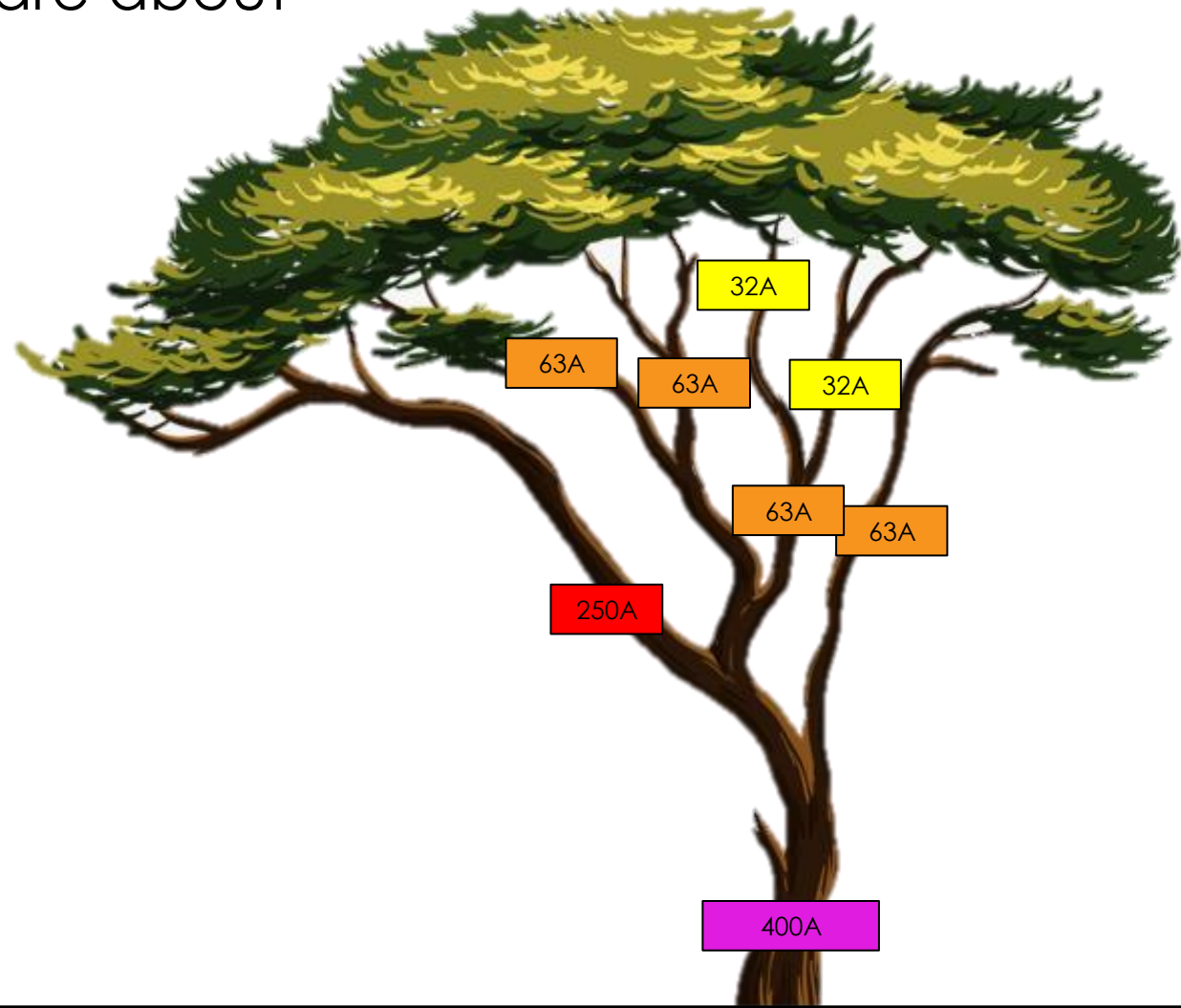

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Fundamentals of Electrical Constraints

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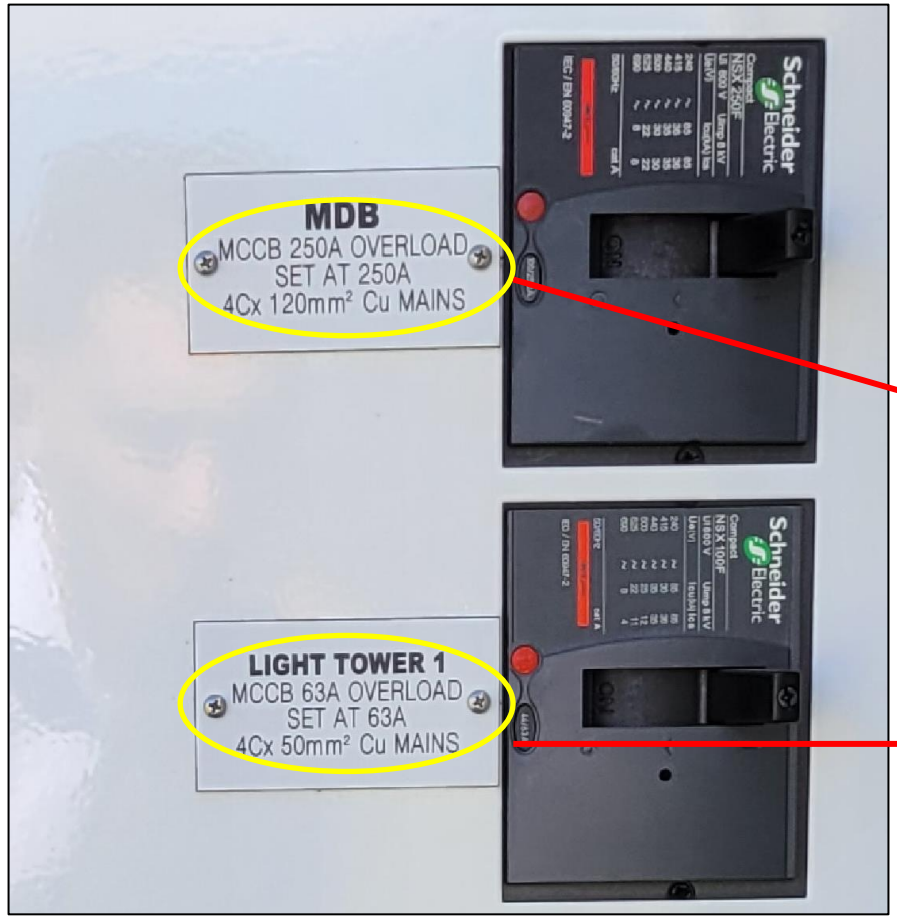

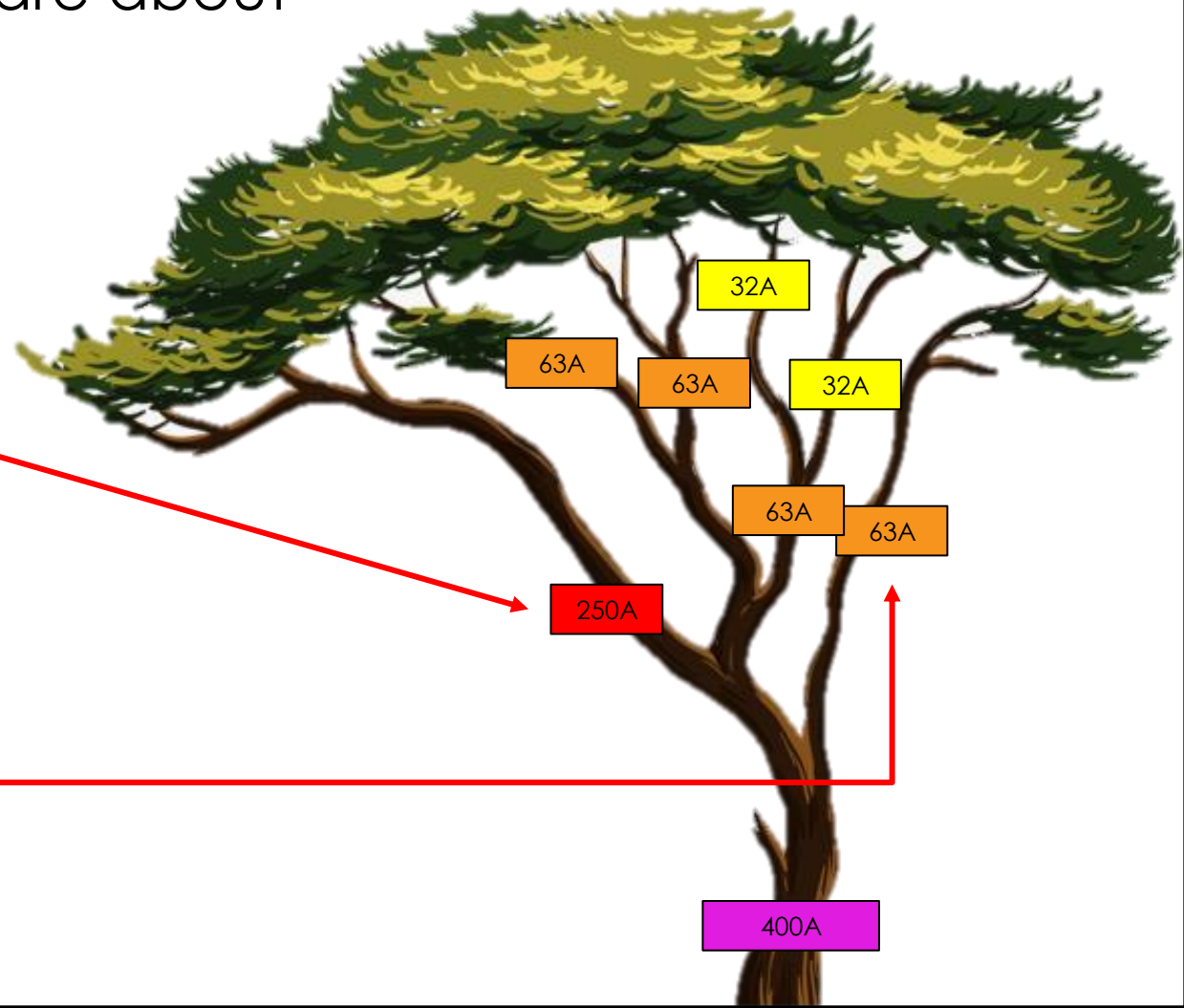

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Fundamentals of Electrical Constraints

- Maximum Demand
  - **Amps** – What cables / switches care about
    - **The physical limit of cables**

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Fundamentals of Electrical Constraints

- Maximum Demand
  - **kVA**

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Fundamentals of Electrical Constraints

- Maximum Demand
  - **kVA** - What transformers and the grid care about

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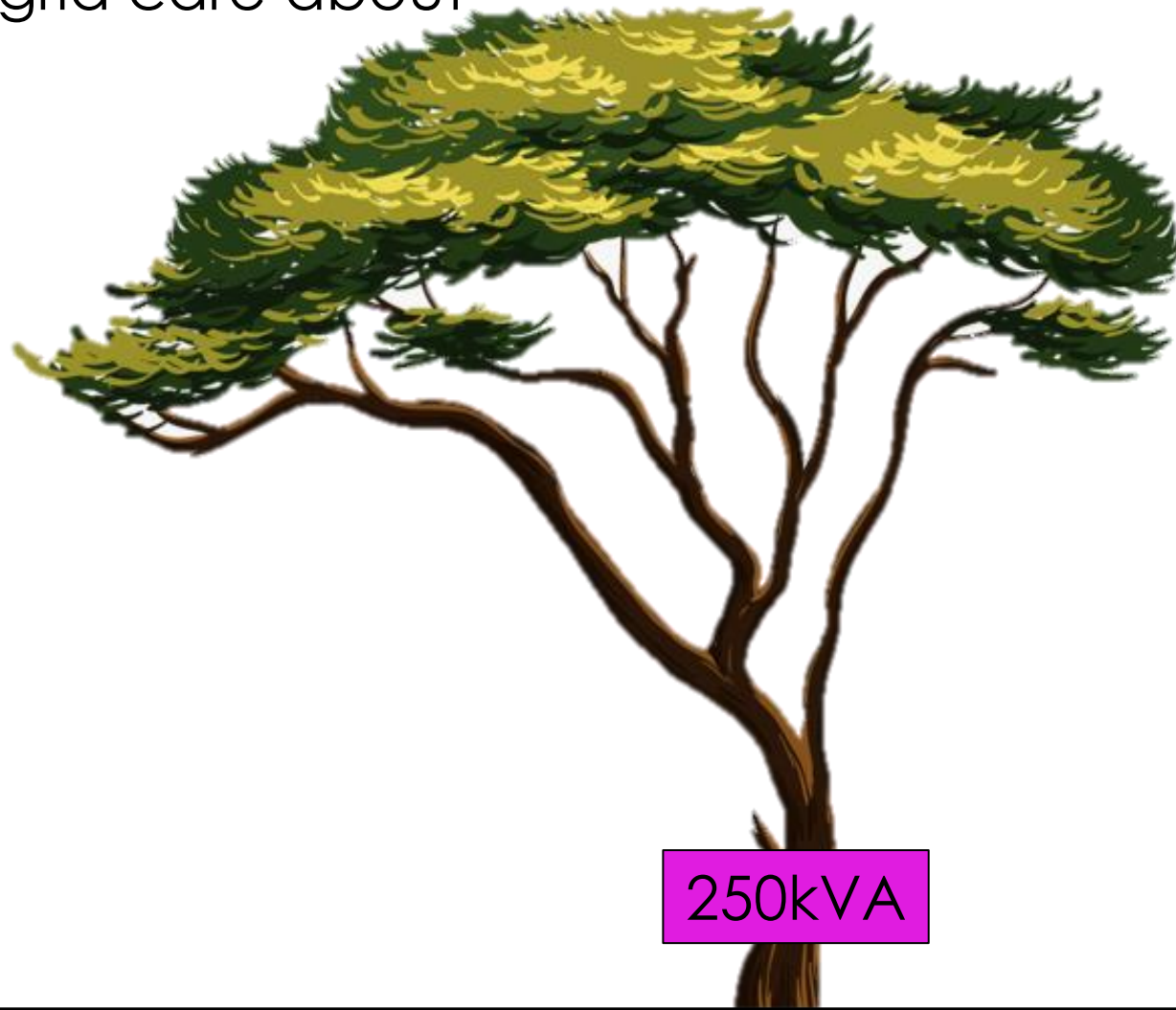

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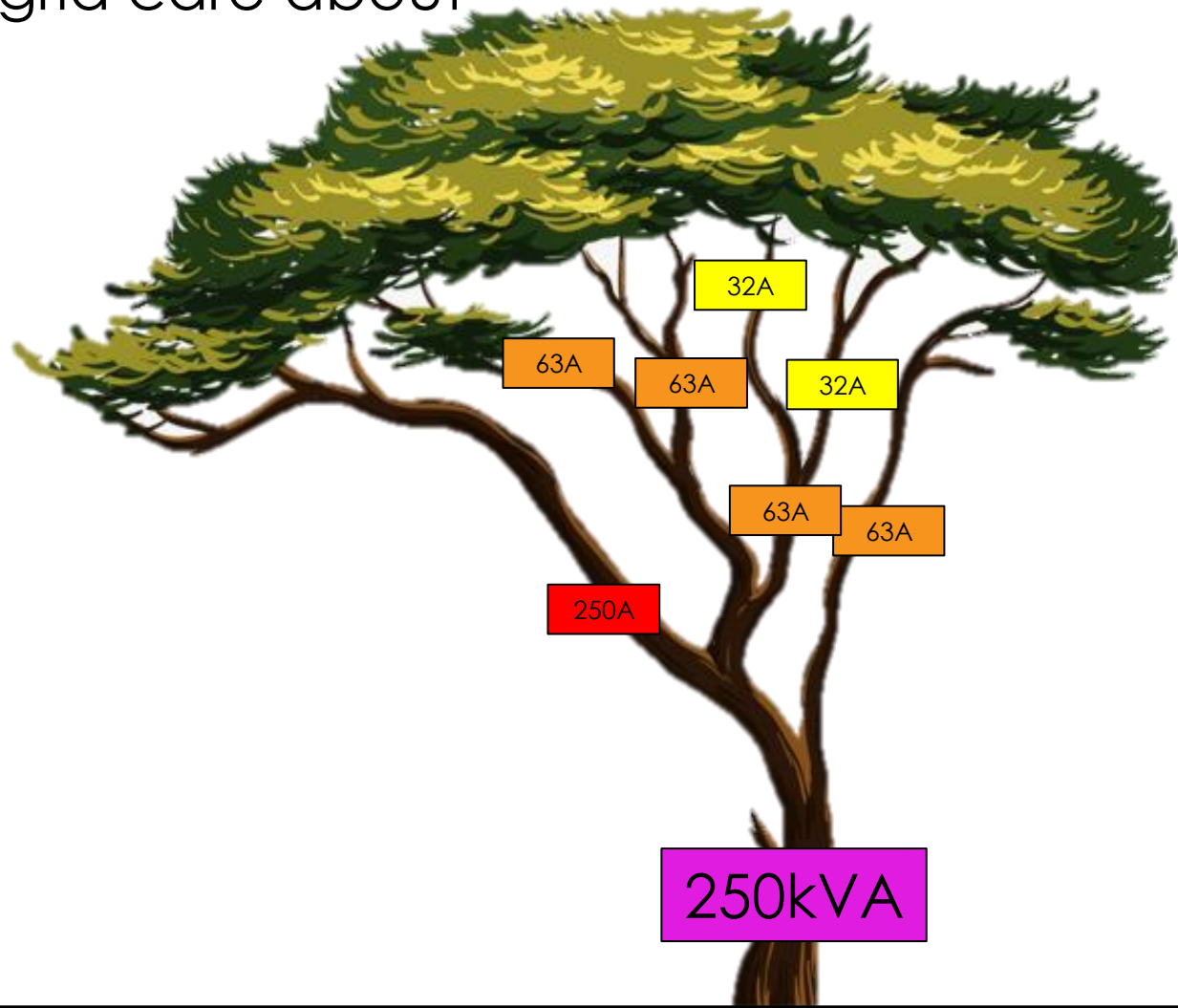

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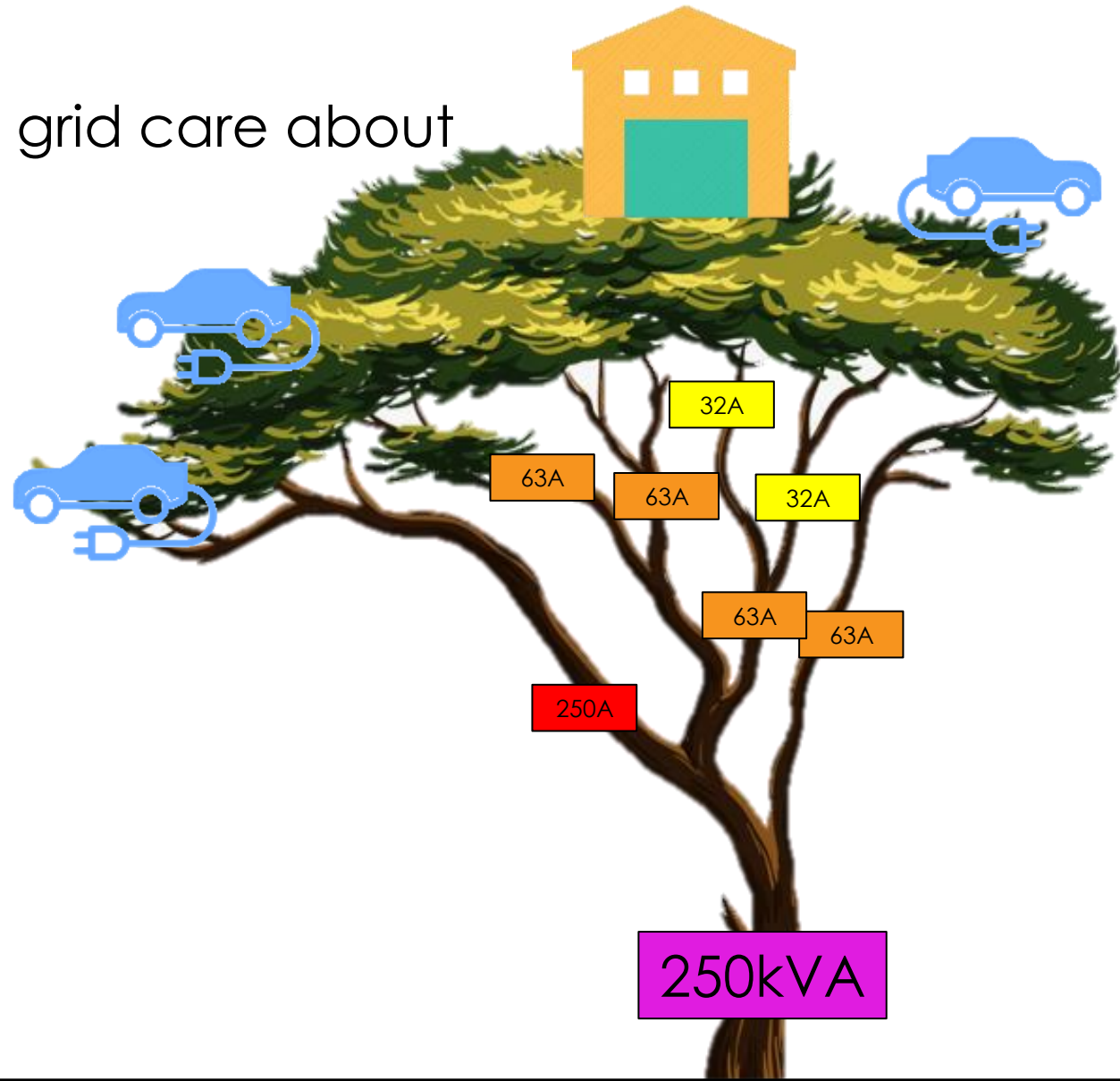

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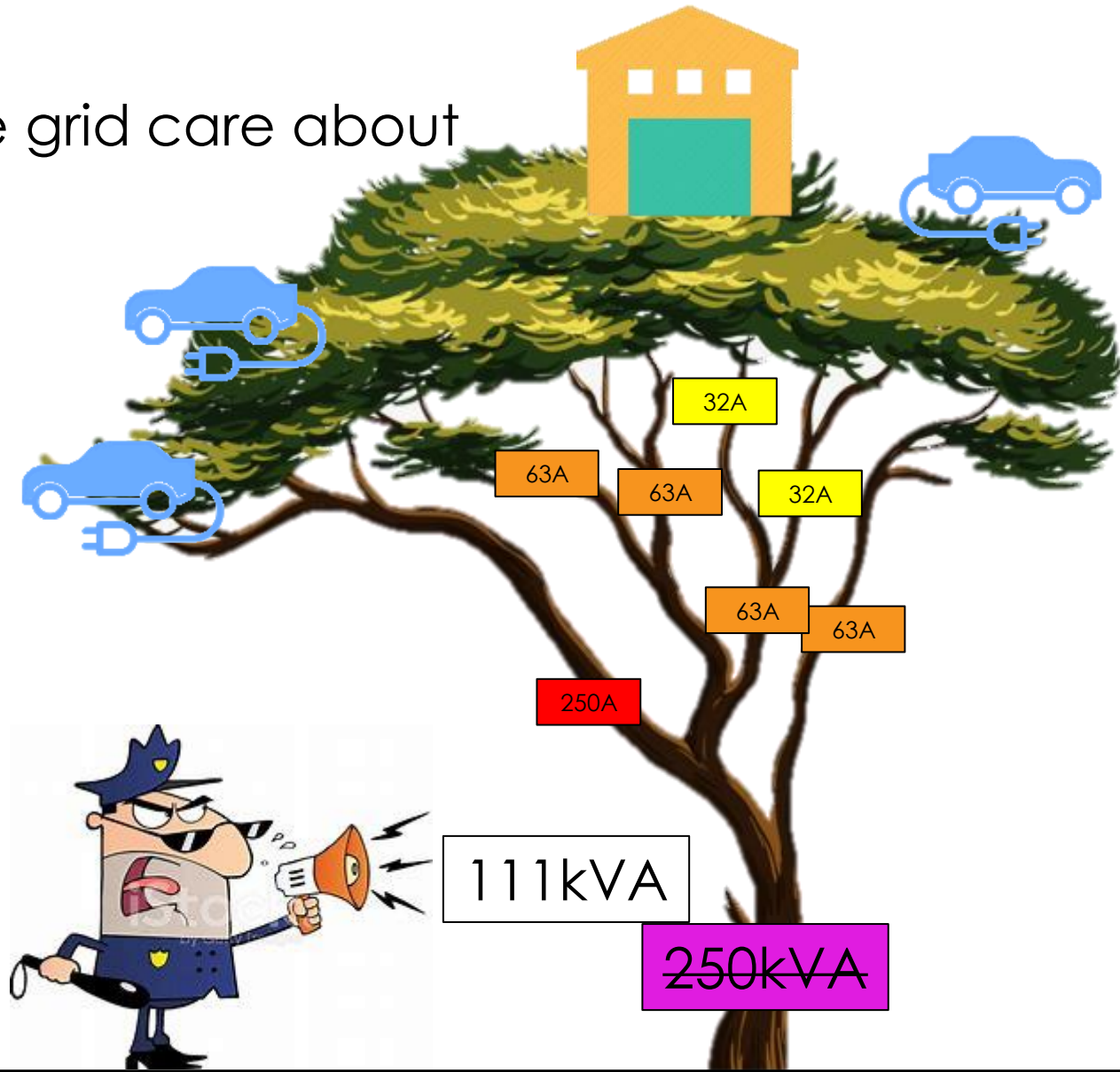

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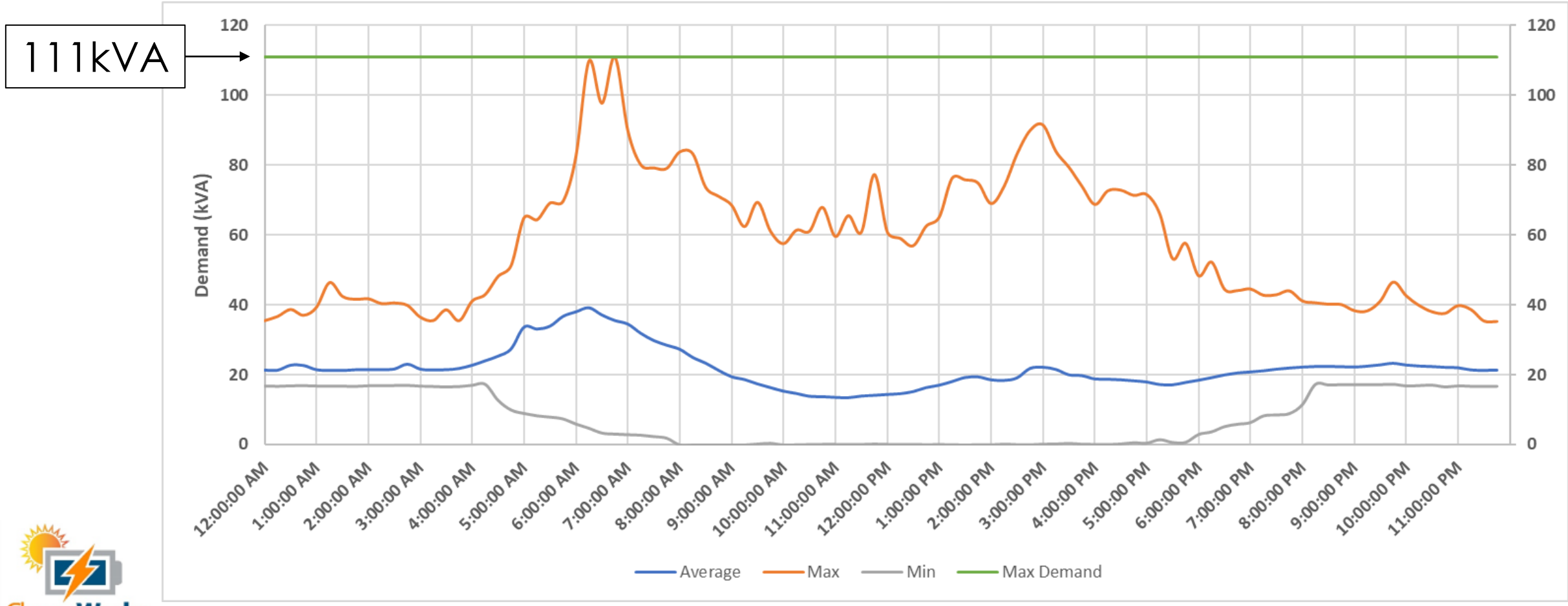

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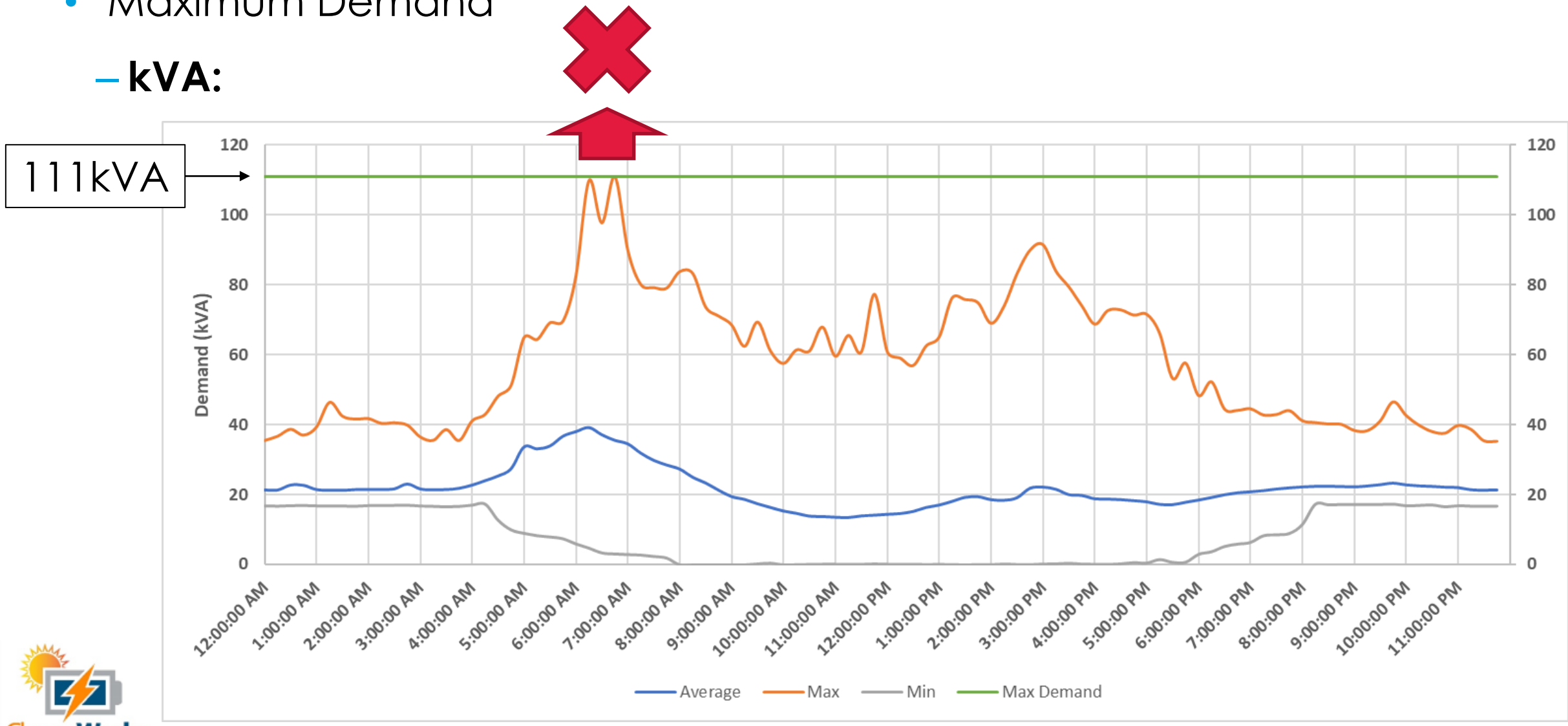

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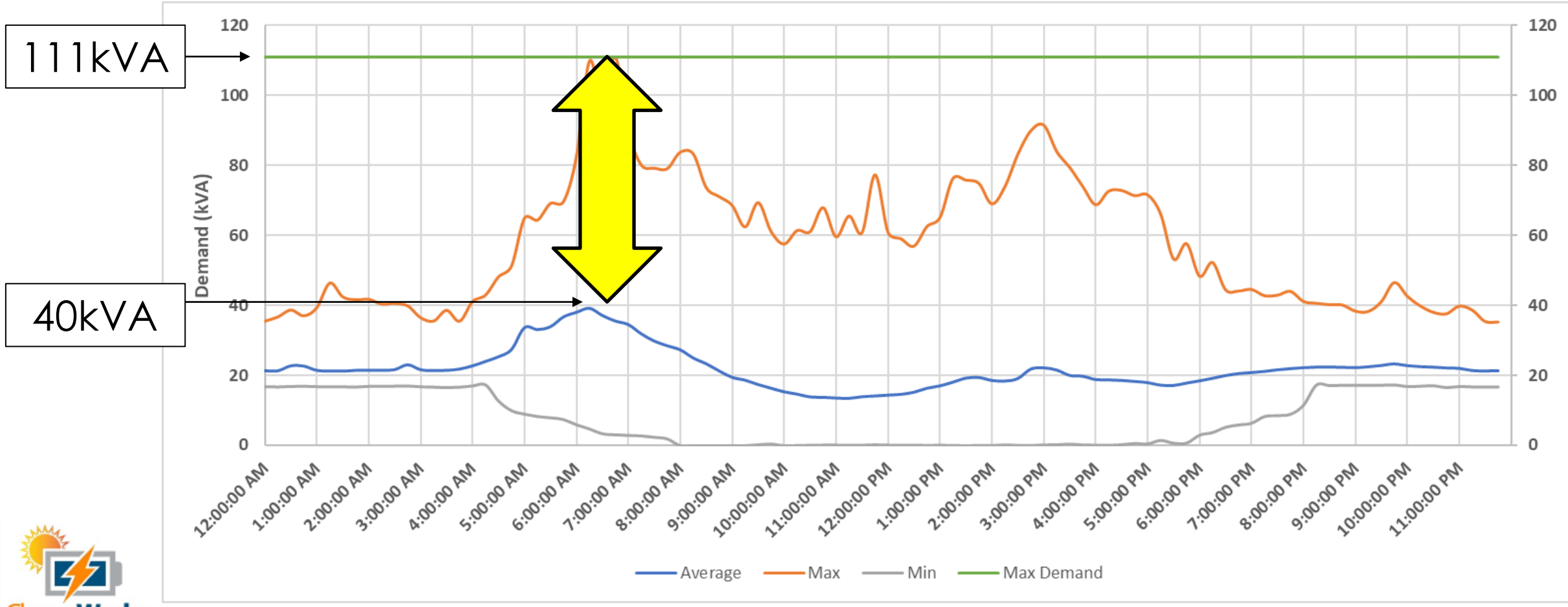

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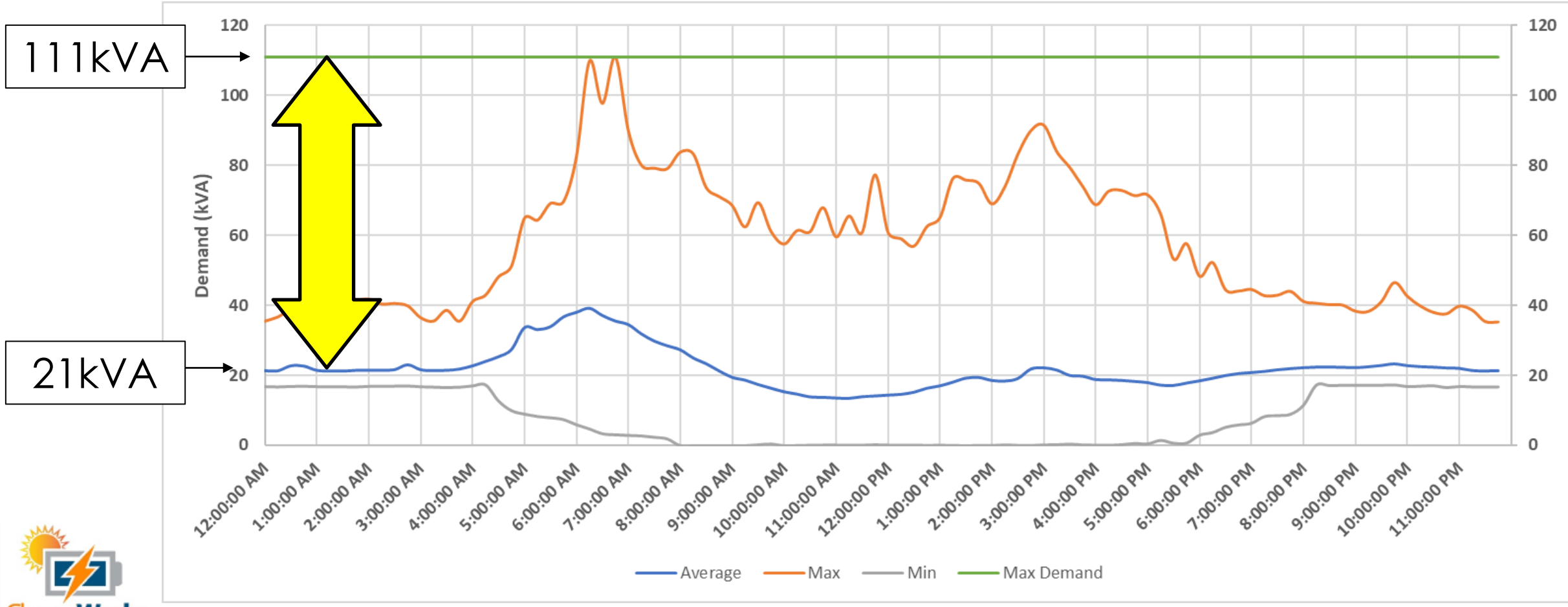

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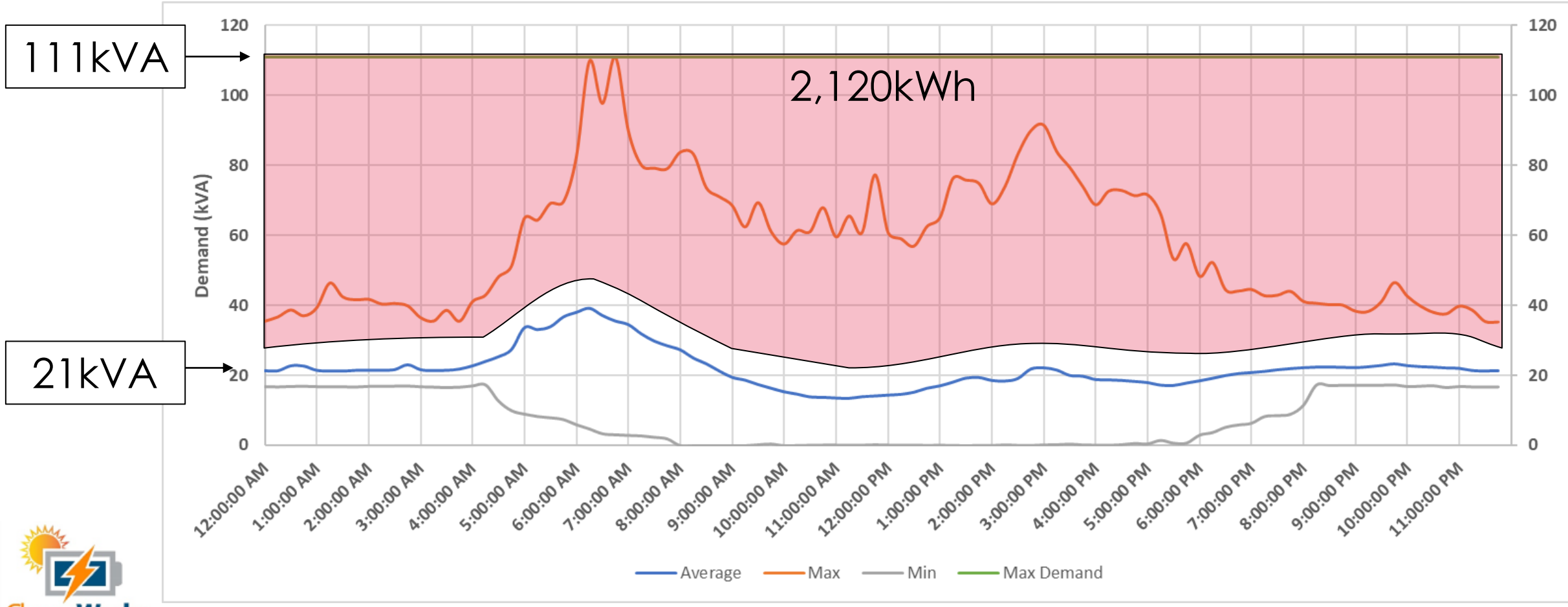

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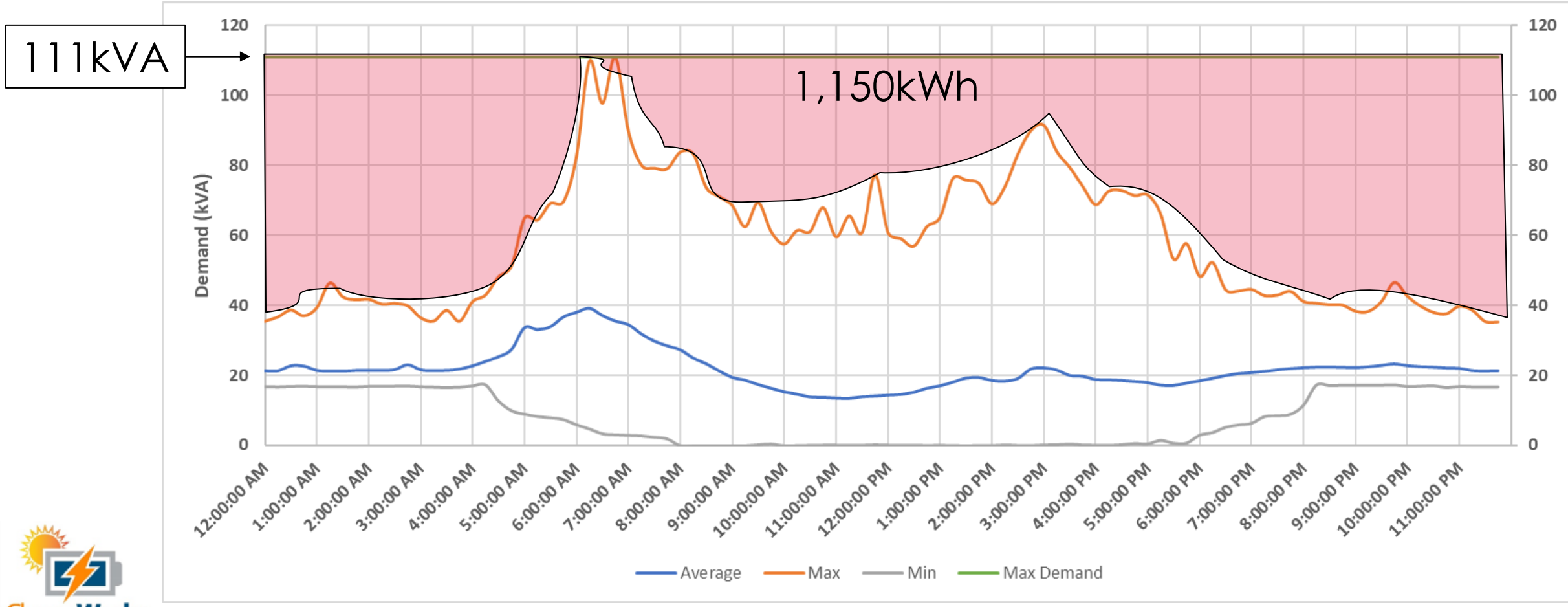

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Fundamentals of Electrical Constraints

- Maximum Demand
  - **AS/NZS 3000:2018 – Clause 2.2.2**

2.2.2 Maximum demand

The maximum demand in consumer mains, submains and final subcircuits, taking account of the physical distribution and intended usage of electrical equipment in the electrical installation and the manner in which the present requirements might vary, shall be determined using one of the methods set out in Items (a) to (d).

a) Calculation (Appendix C2)
b) Assessment
c) Measurement
d) Limitation

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TABLE C2

MAXIMUM DEMAND—NON-DOMESTIC ELECTRICAL INSTALLATIONS

1	2	3
Load group	**Residential institutions, hotels, boarding houses, hospitals, accommodation houses, motels[1]**	**Factories, shops, stores, offices, business premises, schools and churches[1]**
* (ii) Charging equipment associated with electric vehicles	Full connected load of highest rated appliance, plus 75% of full load of remainder	Full connected load of highest rated appliance, plus 75% of full load of remainder

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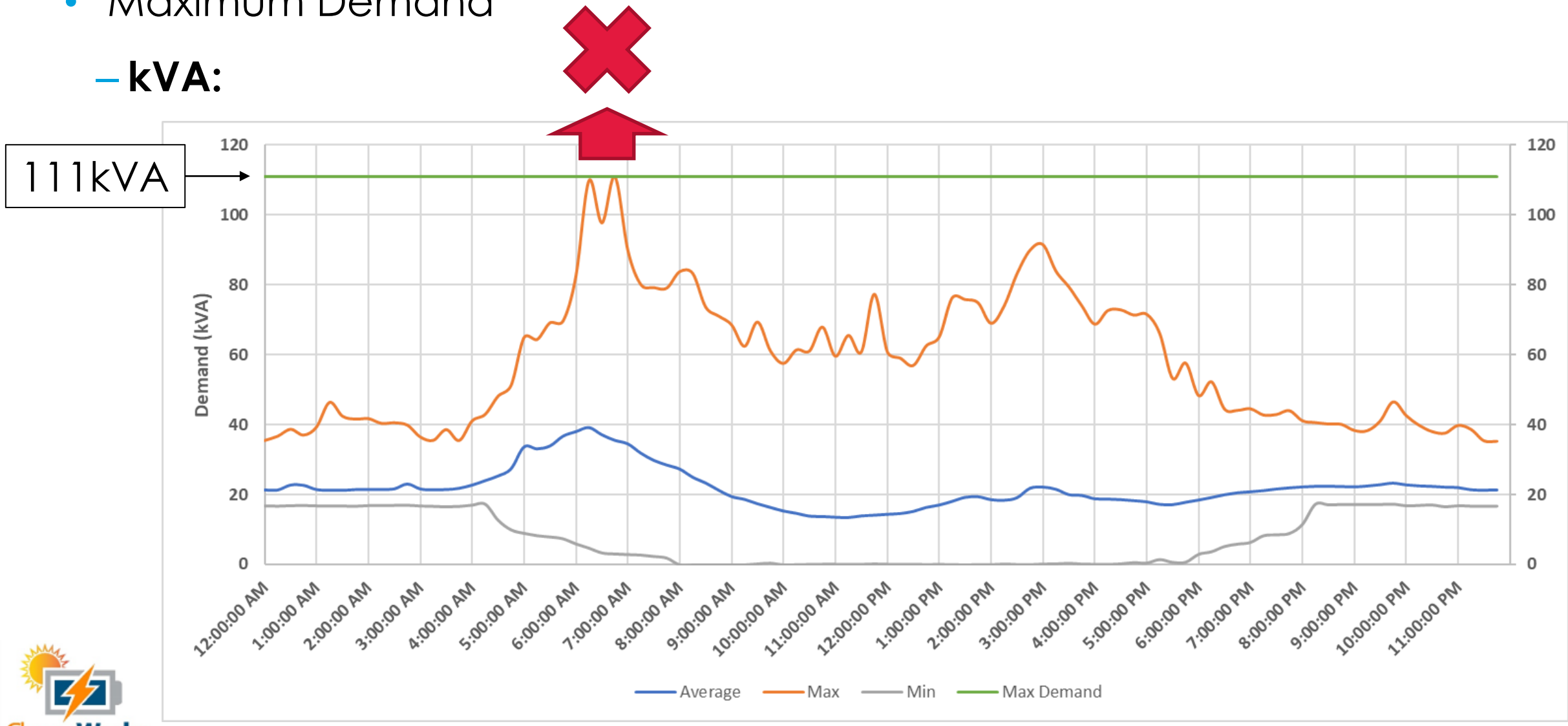
Fundamentals of Electrical Constraints

- Maximum Demand
  - **kVA:**



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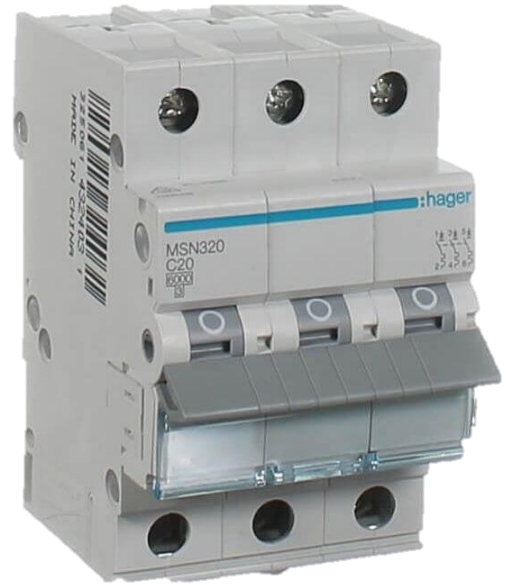

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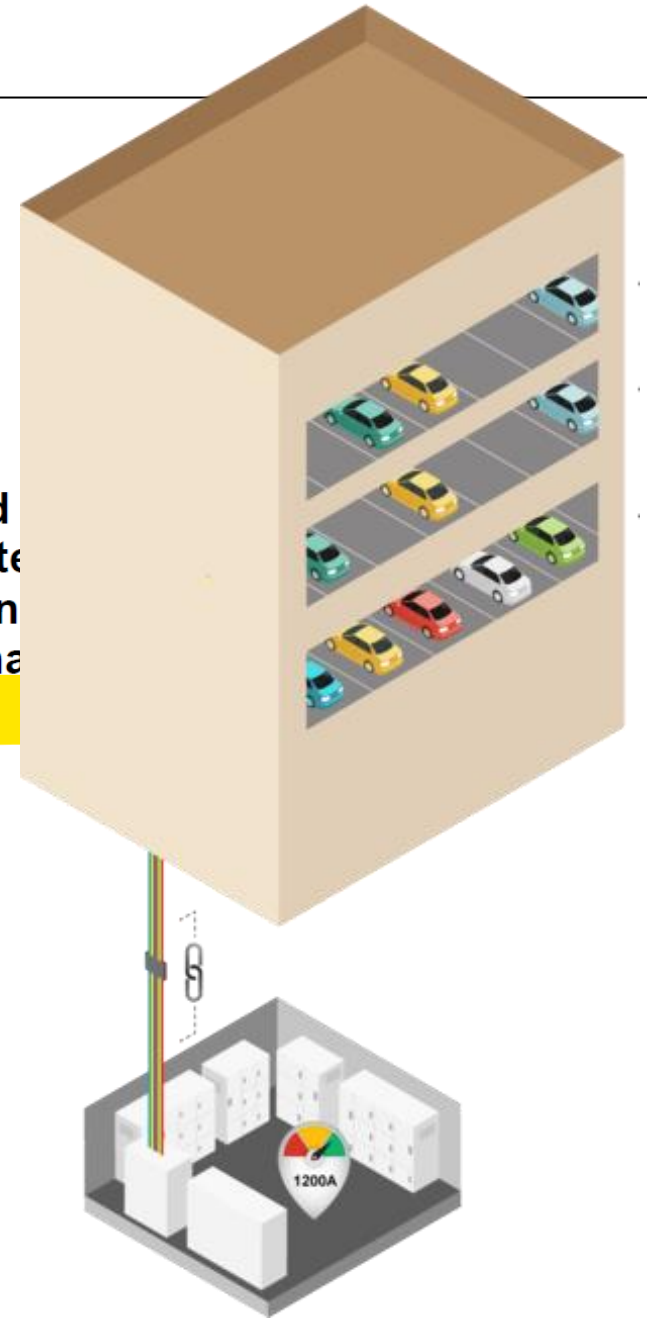
d) Limitation – Active load management
(usually with secondary protection)



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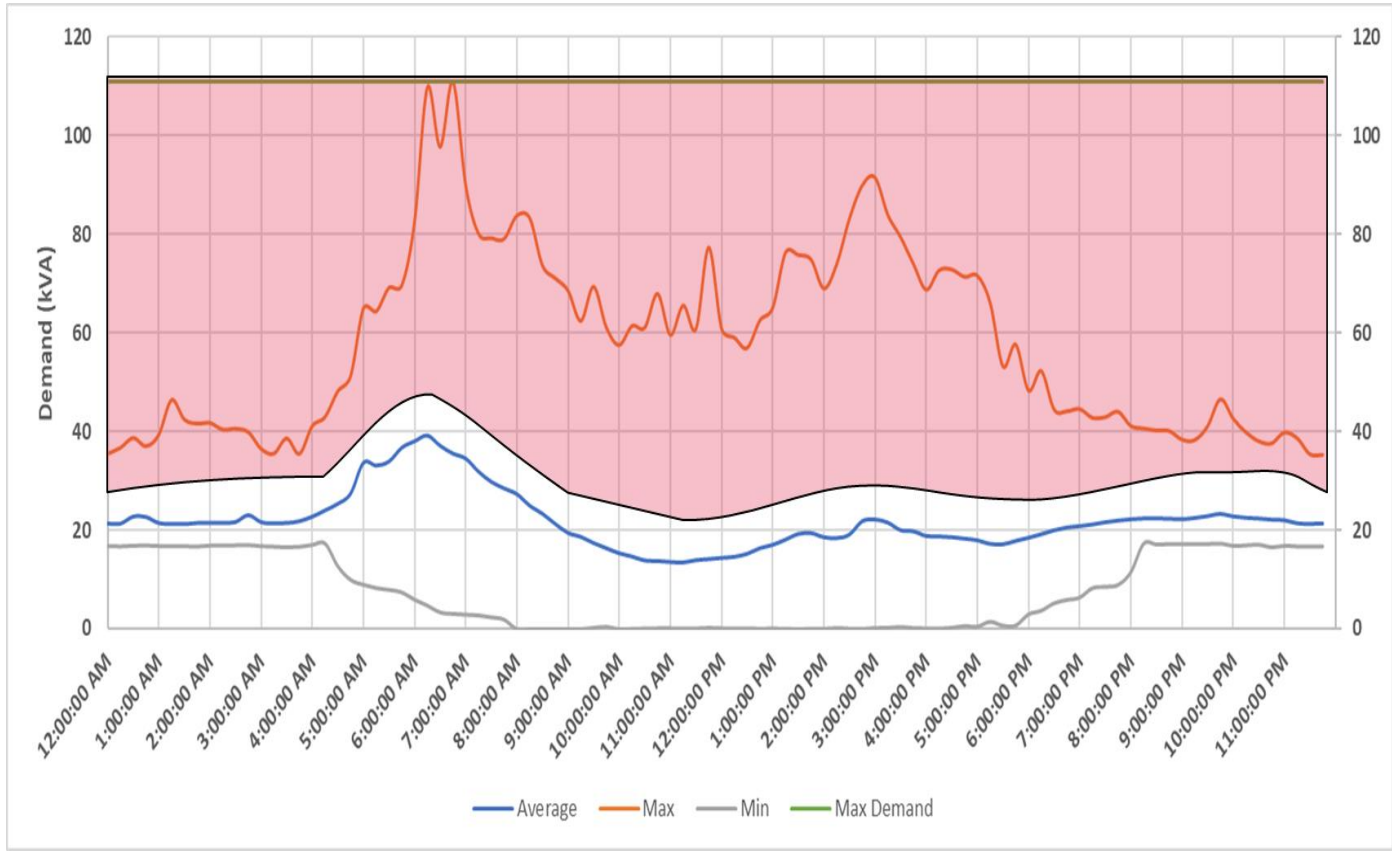
Fundamentals of Electrical Constraints

- Maximum Demand
  - **Load Management (Active / Dynamic)**



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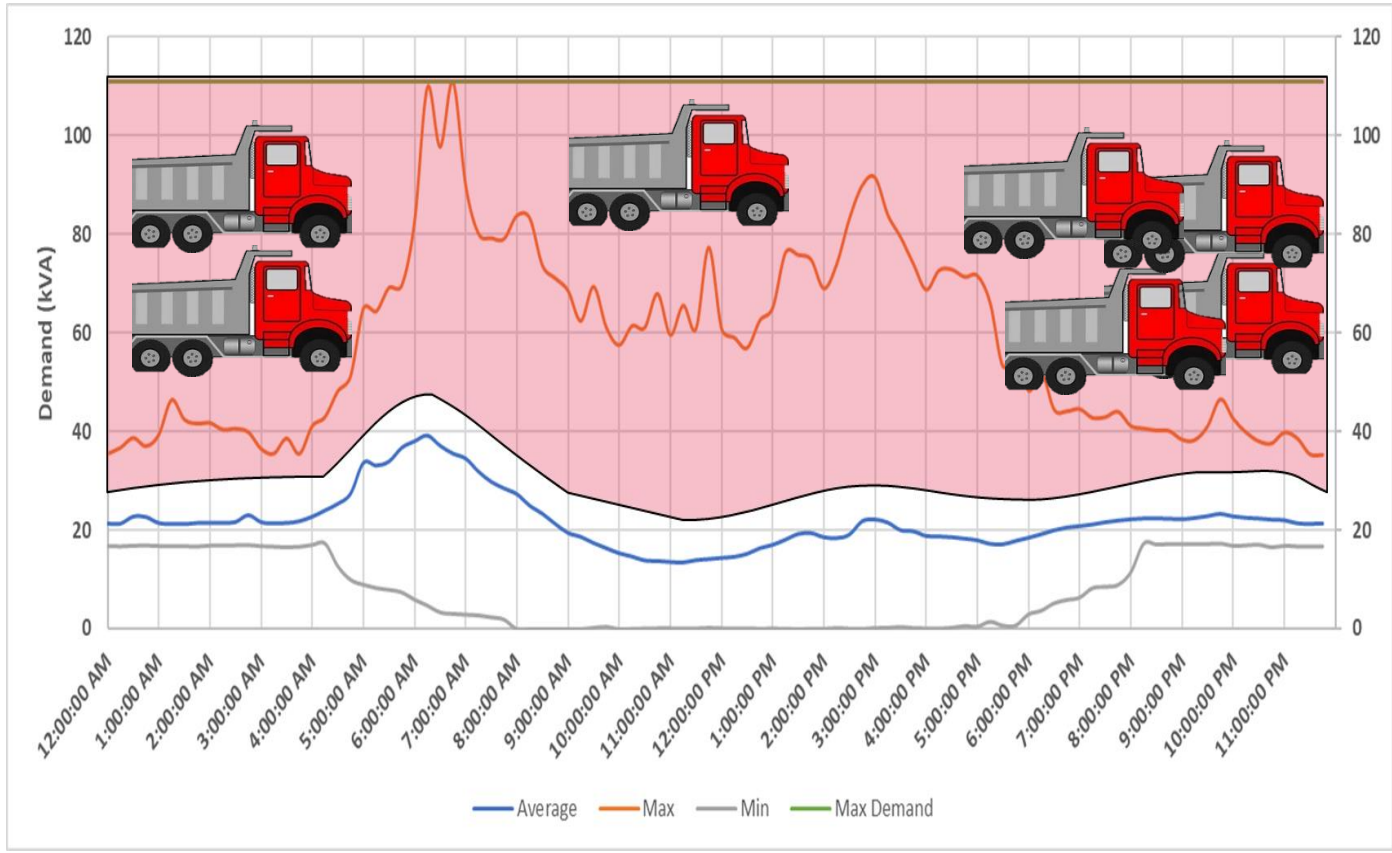

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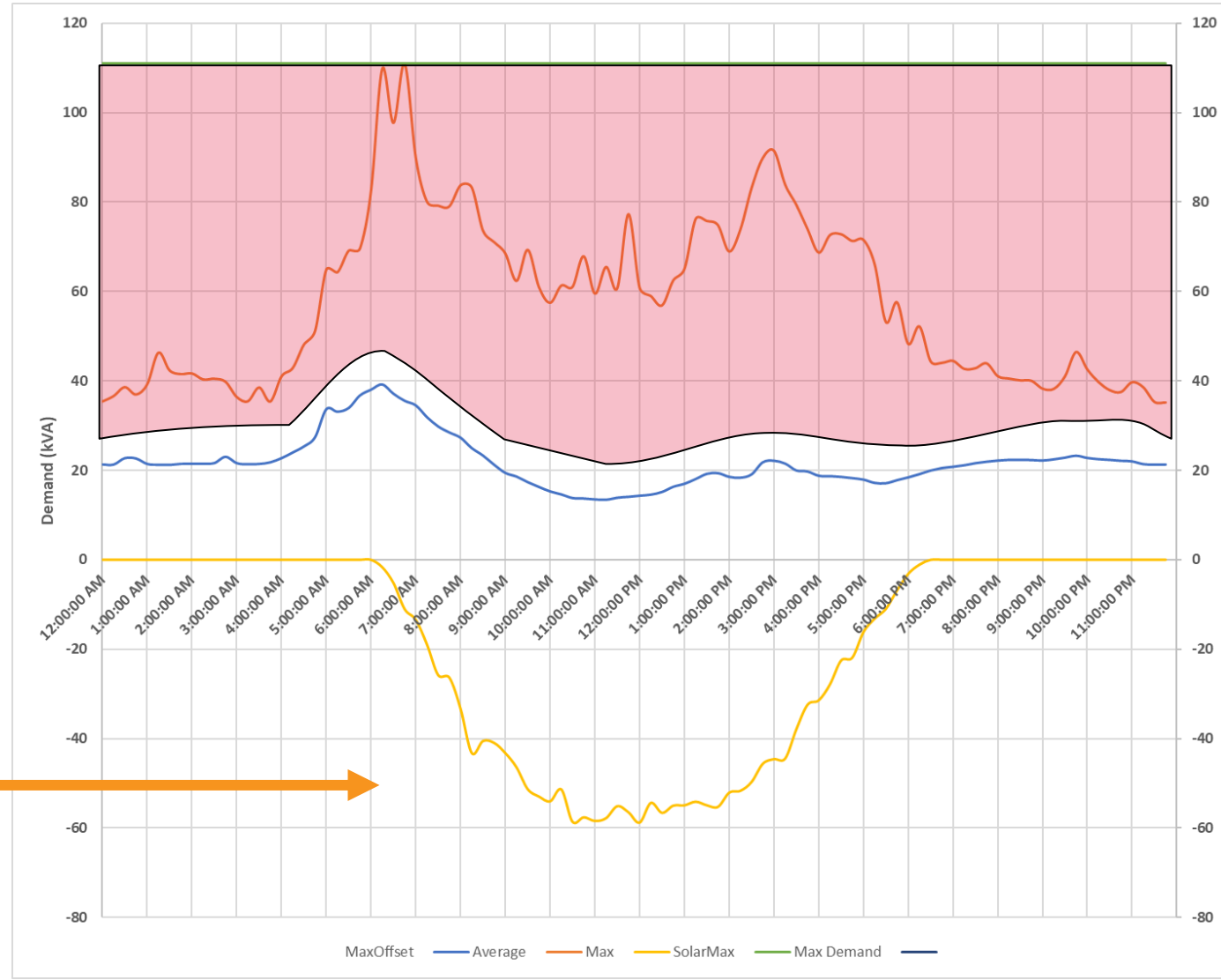
Fundamentals of Electrical Constraints

- Maximum Demand
  - **Load Management (Active / Dynamic)**
  - **Plus Solar!**



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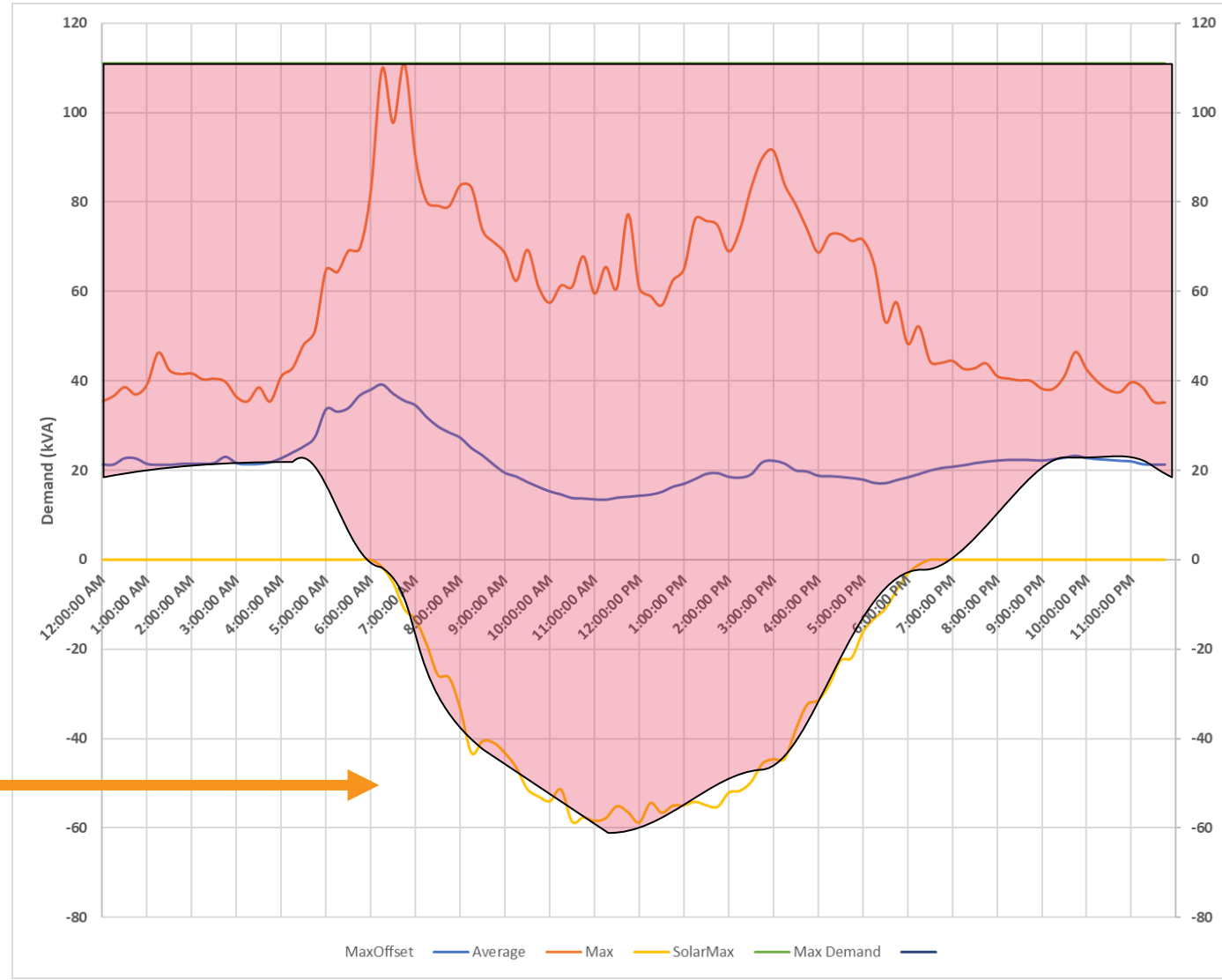

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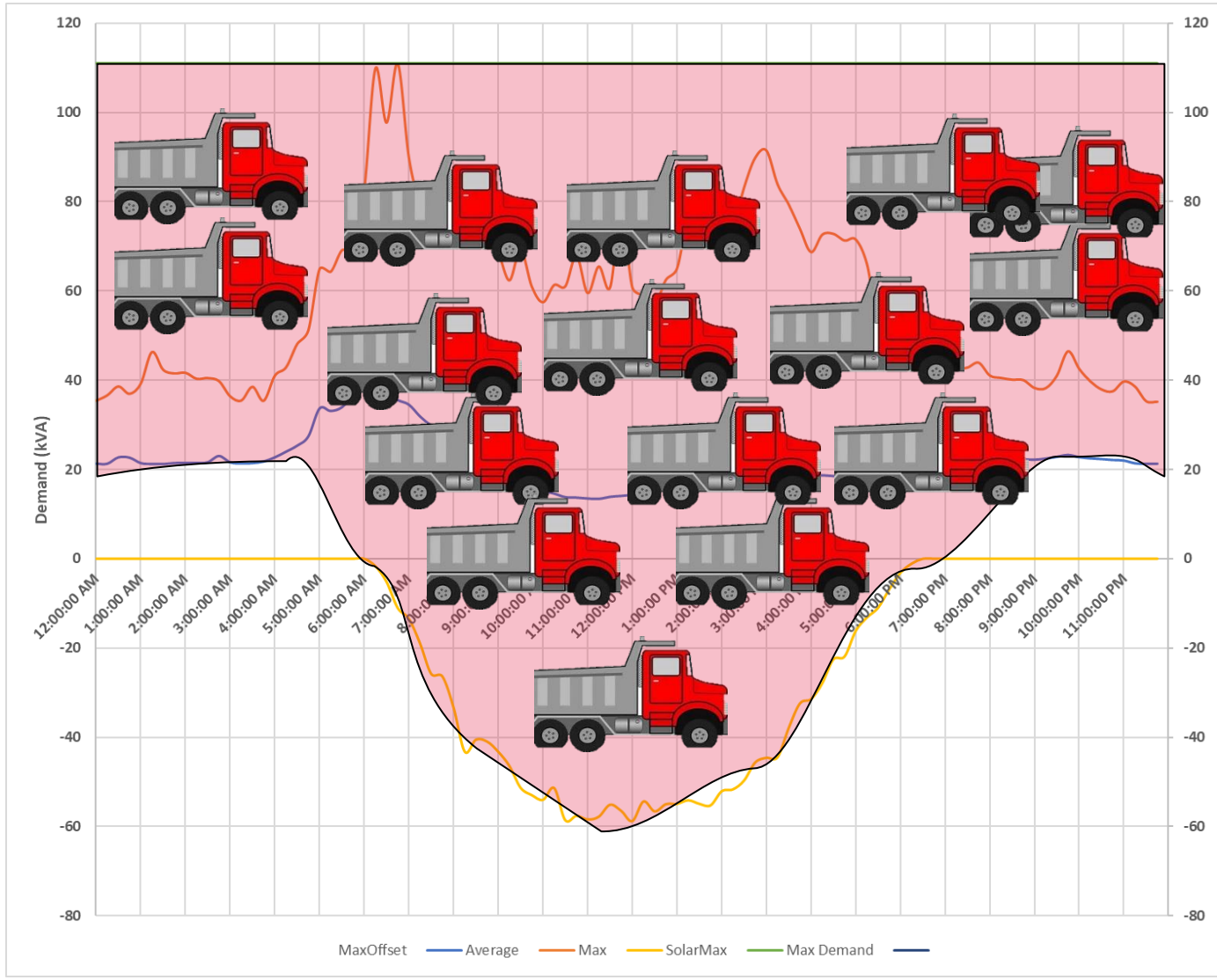
Fundamentals of Electrical Constraints

- Maximum Demand
  - Load Management (Active / Dynamic)
  - Plus Solar
    - **Potentially….**



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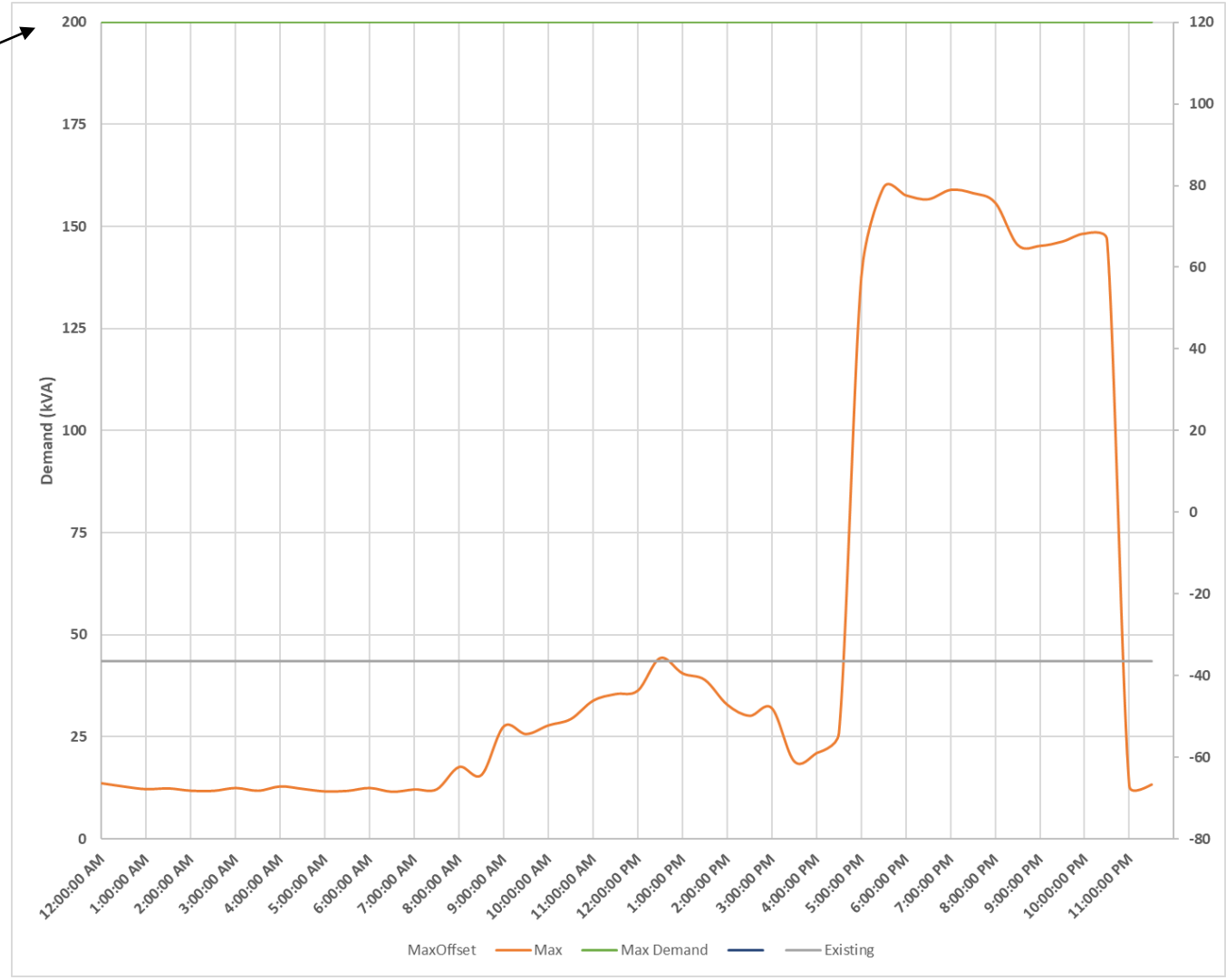
Fundamentals of Electrical Constraints – Battery Example

- Maximum Demand

200kVA SITE CAPACITY



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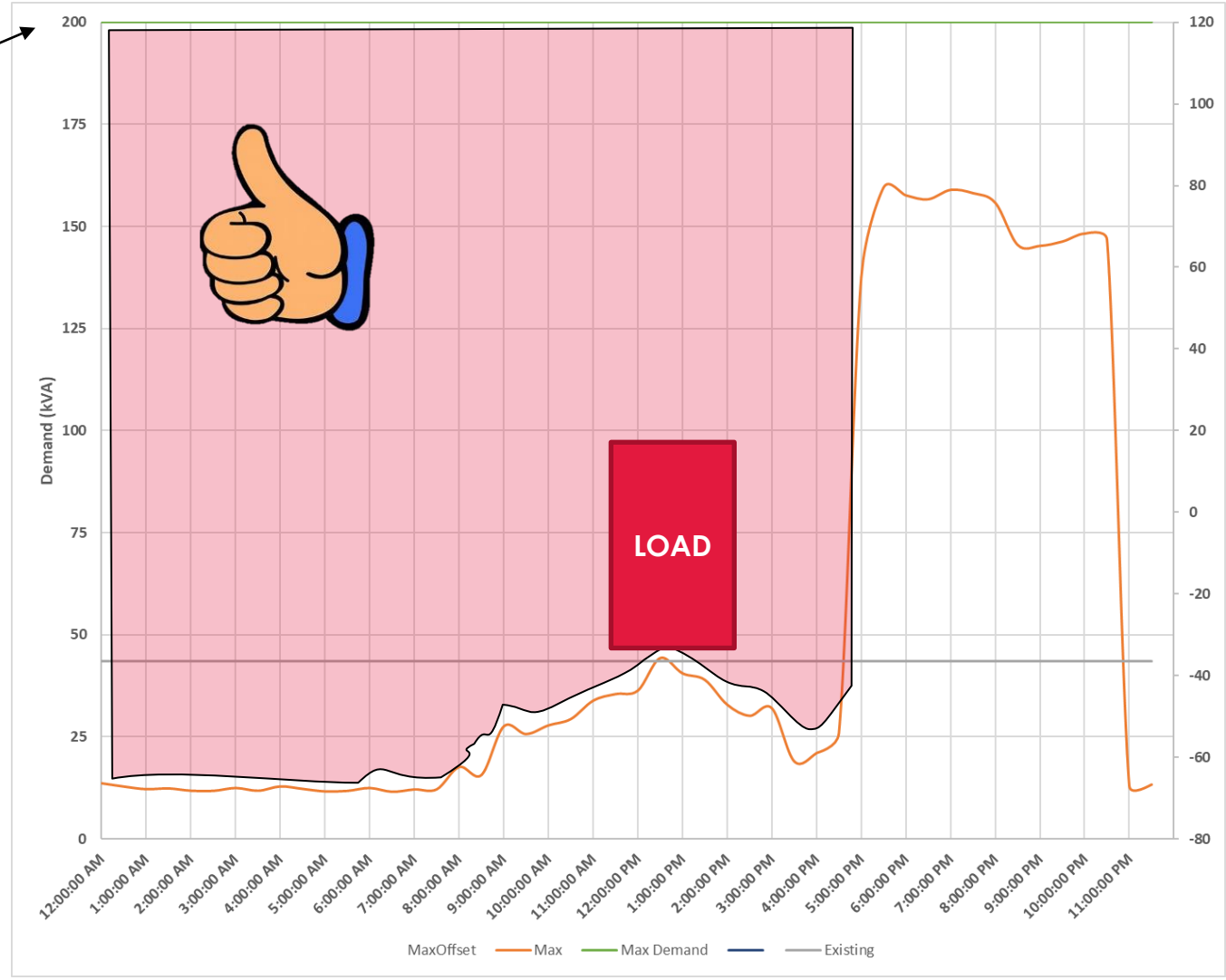

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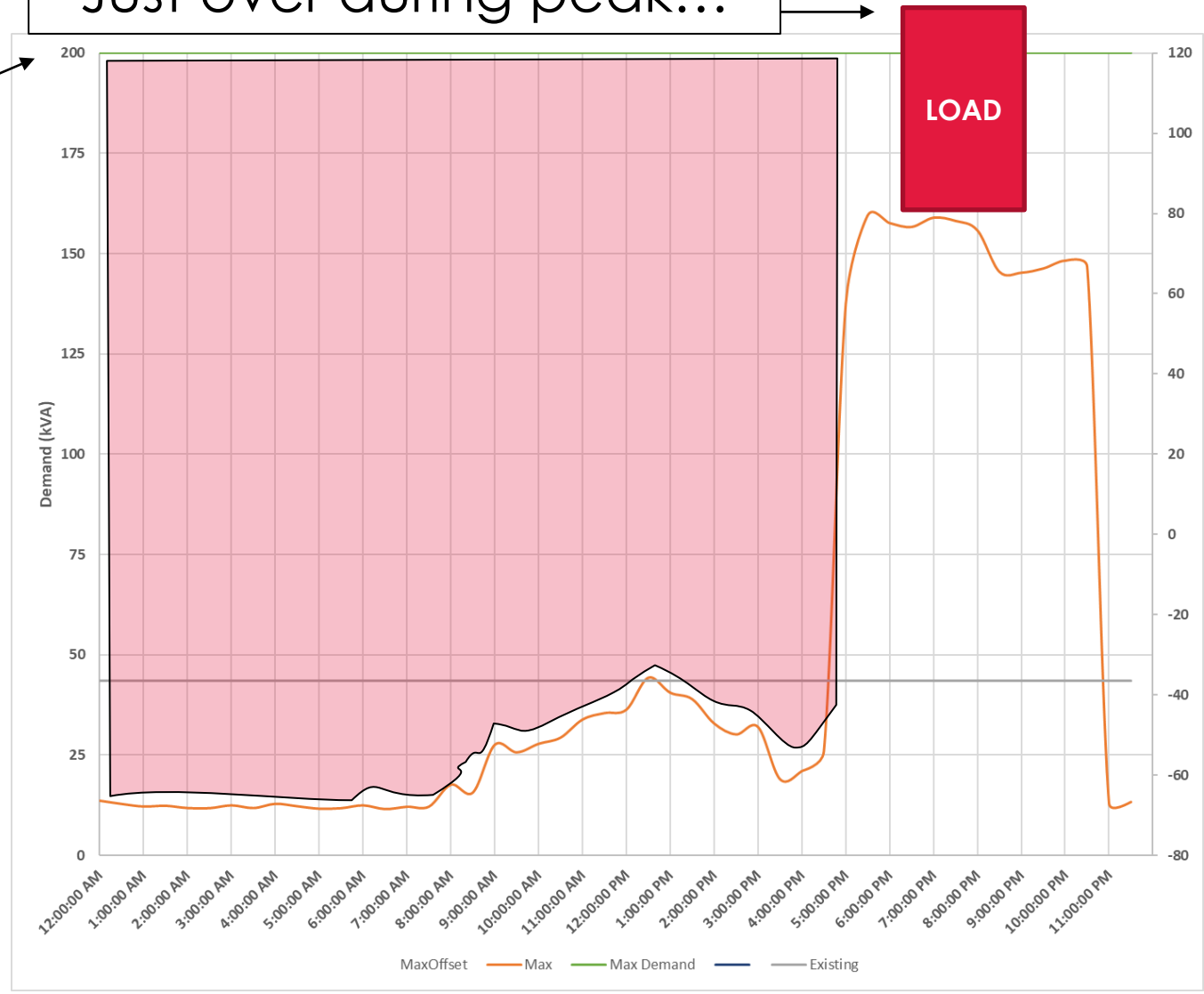
Fundamentals of Electrical Constraints – Battery Example

- Maximum Demand

200kVA SITE CAPACITY

Just over during peak…



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Fundamentals of Electrical Constraints – Battery Example

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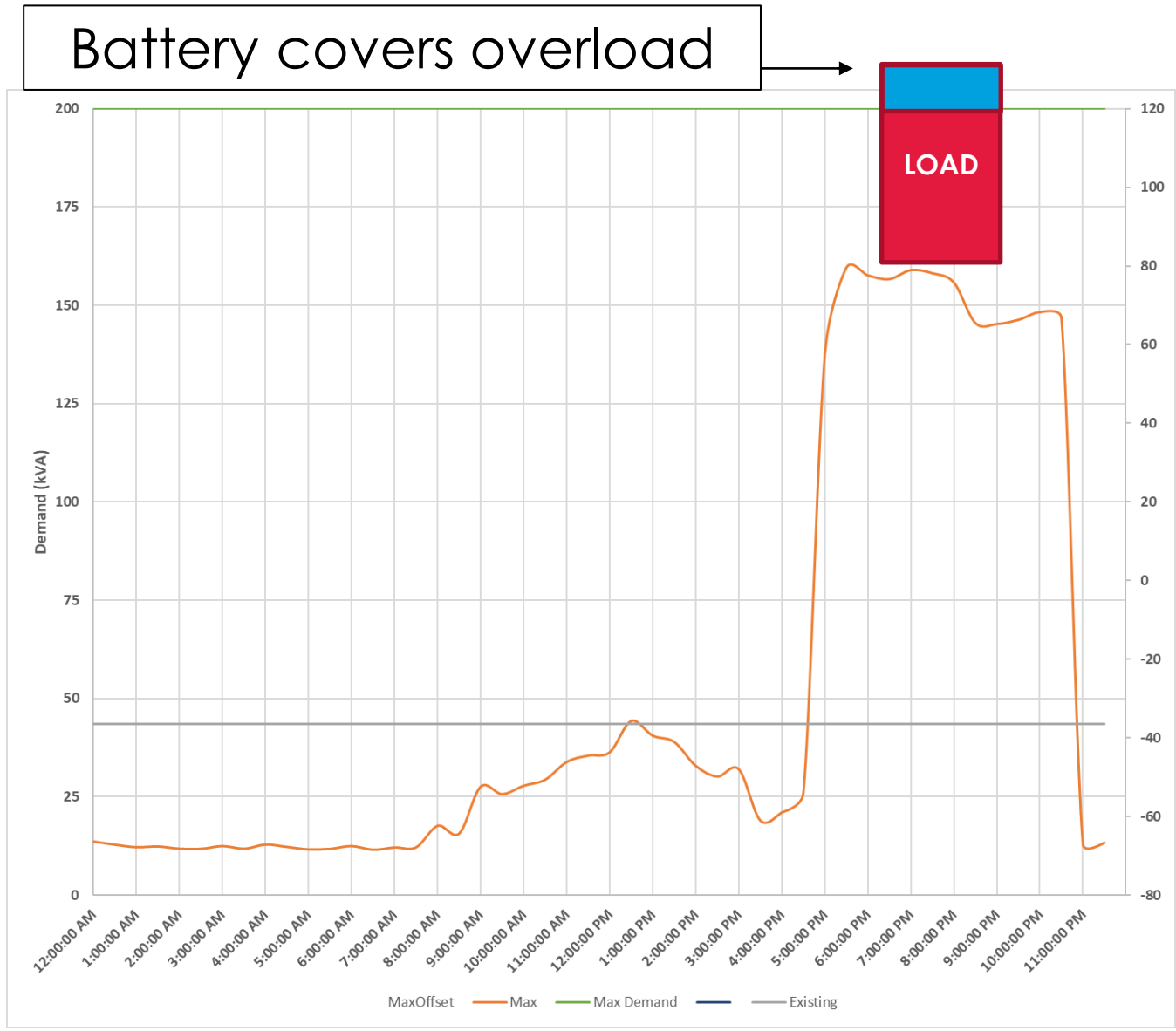

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Fundamentals of Electrical Constraints – Battery Example

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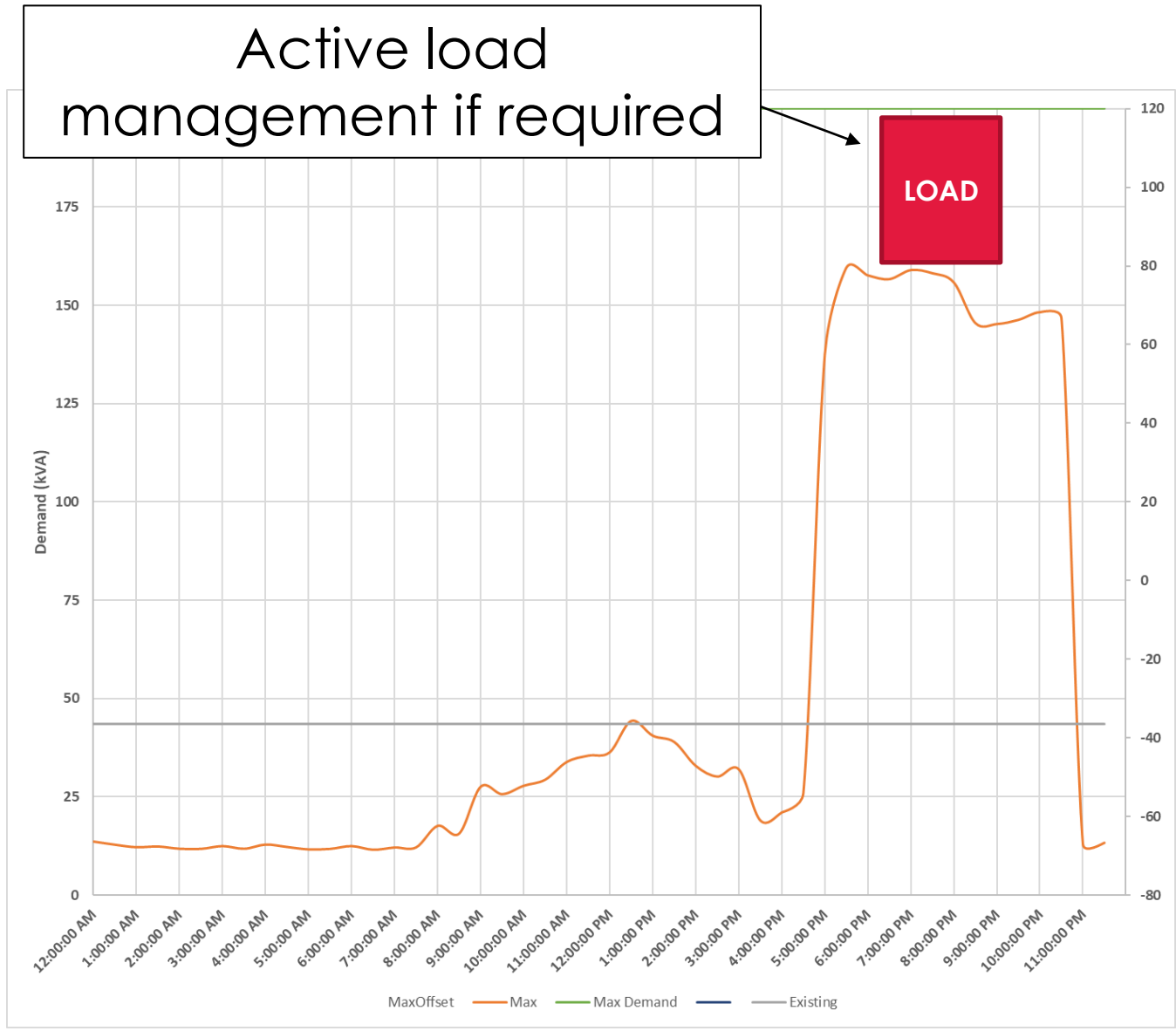

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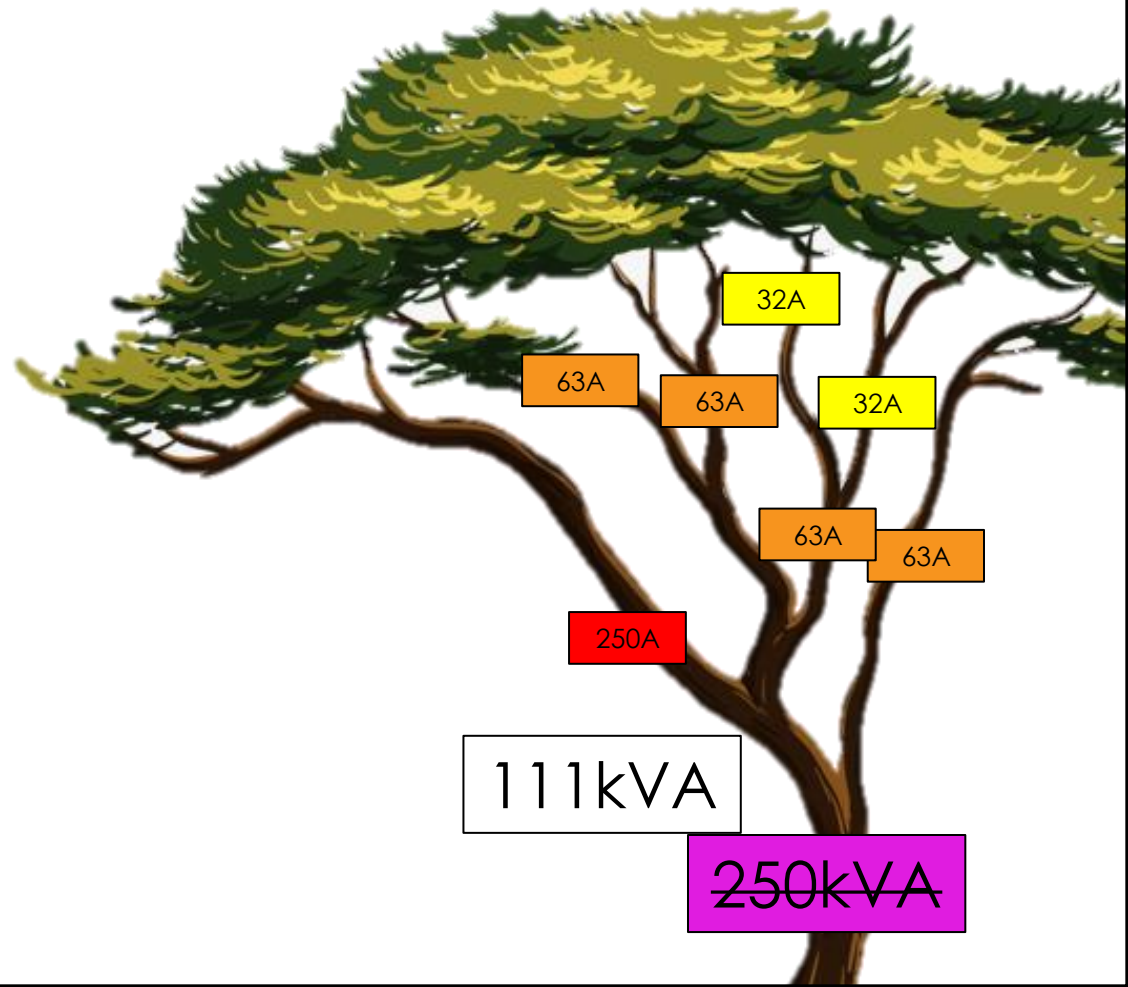
Fundamentals of Electrical Constraints

- Implications for EV Charging Feasibility



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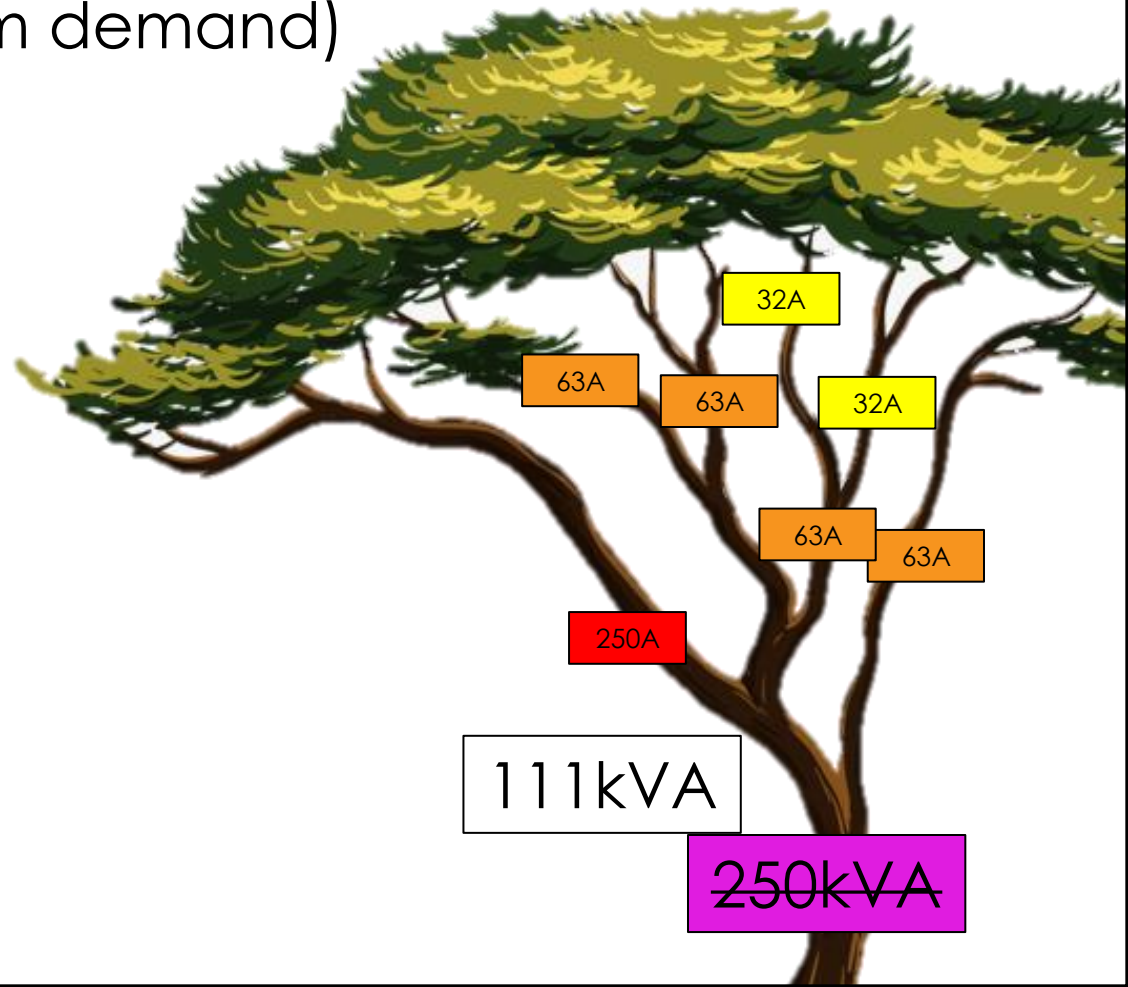
Fundamentals of Electrical Constraints

- Implications for EV Charging Feasibility
  1. Confirm “branch” capacity (submains / switchboards)
  2. Confirm “trunk” capacity (maximum demand)



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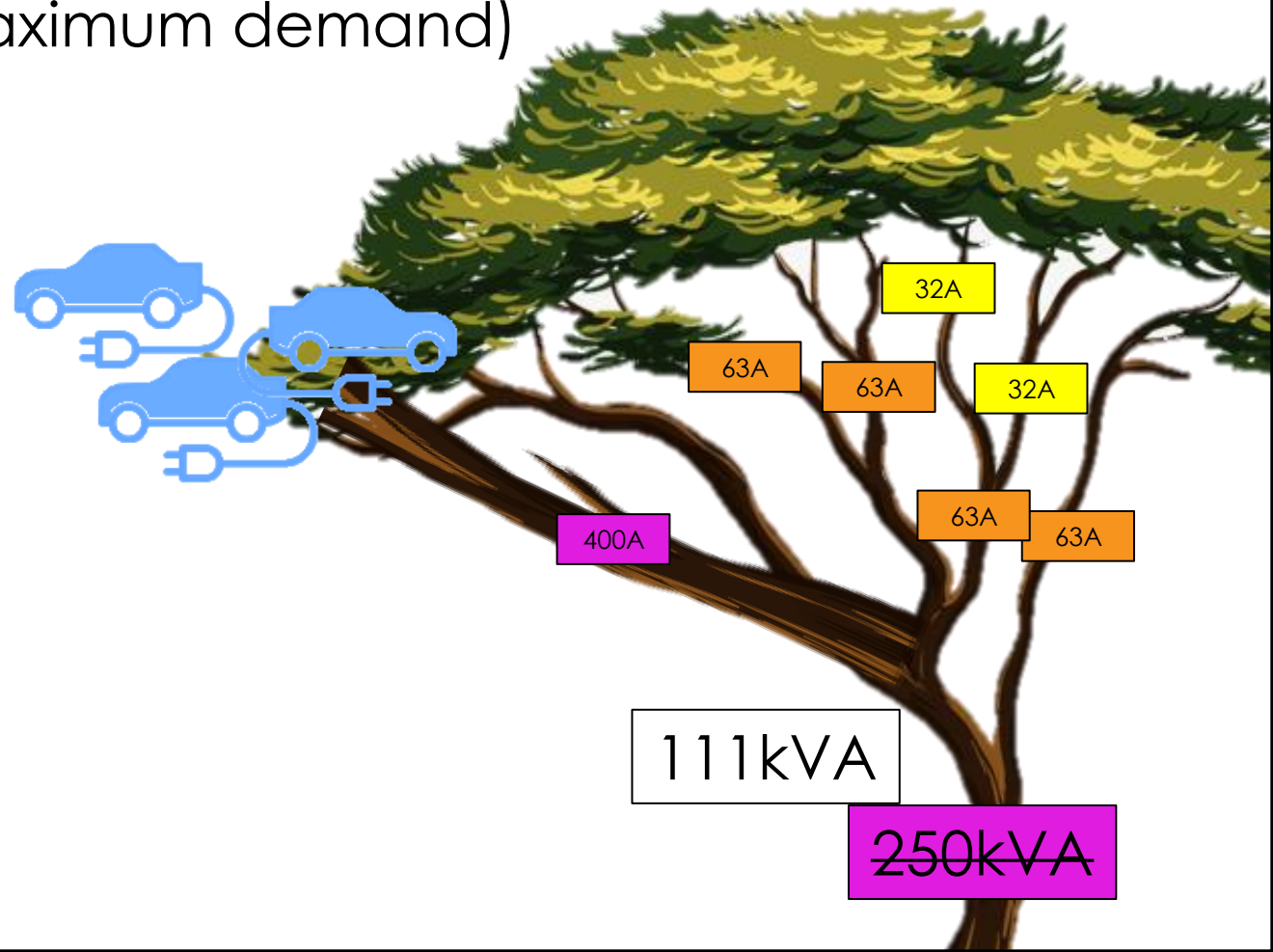
Fundamentals of Electrical Constraints

- Implications for EV Charging Feasibility
  1. **Upgrade** "branch" capacity (submains / switchboards)
  2. Confirm "trunk" capacity (maximum demand)



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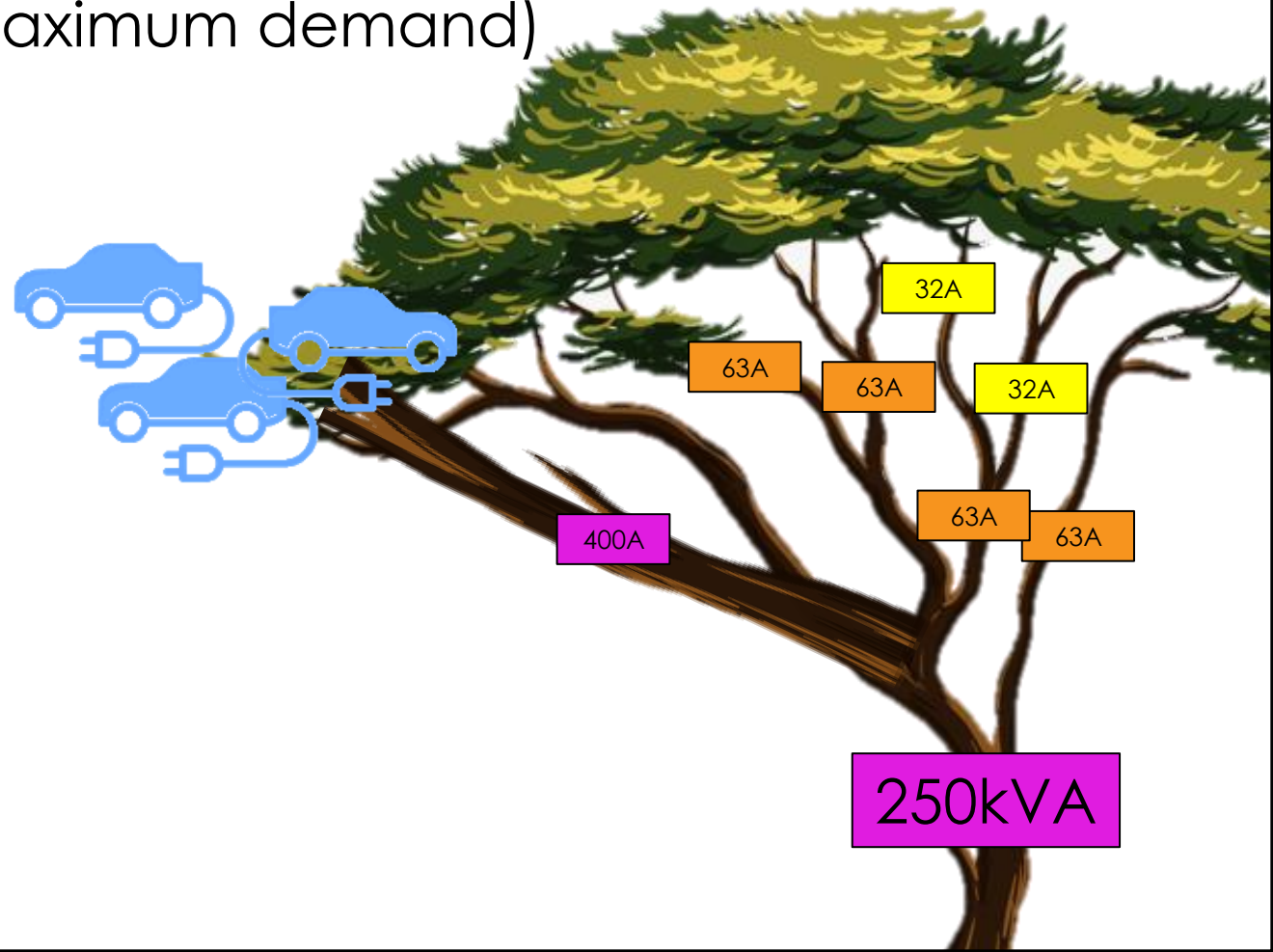

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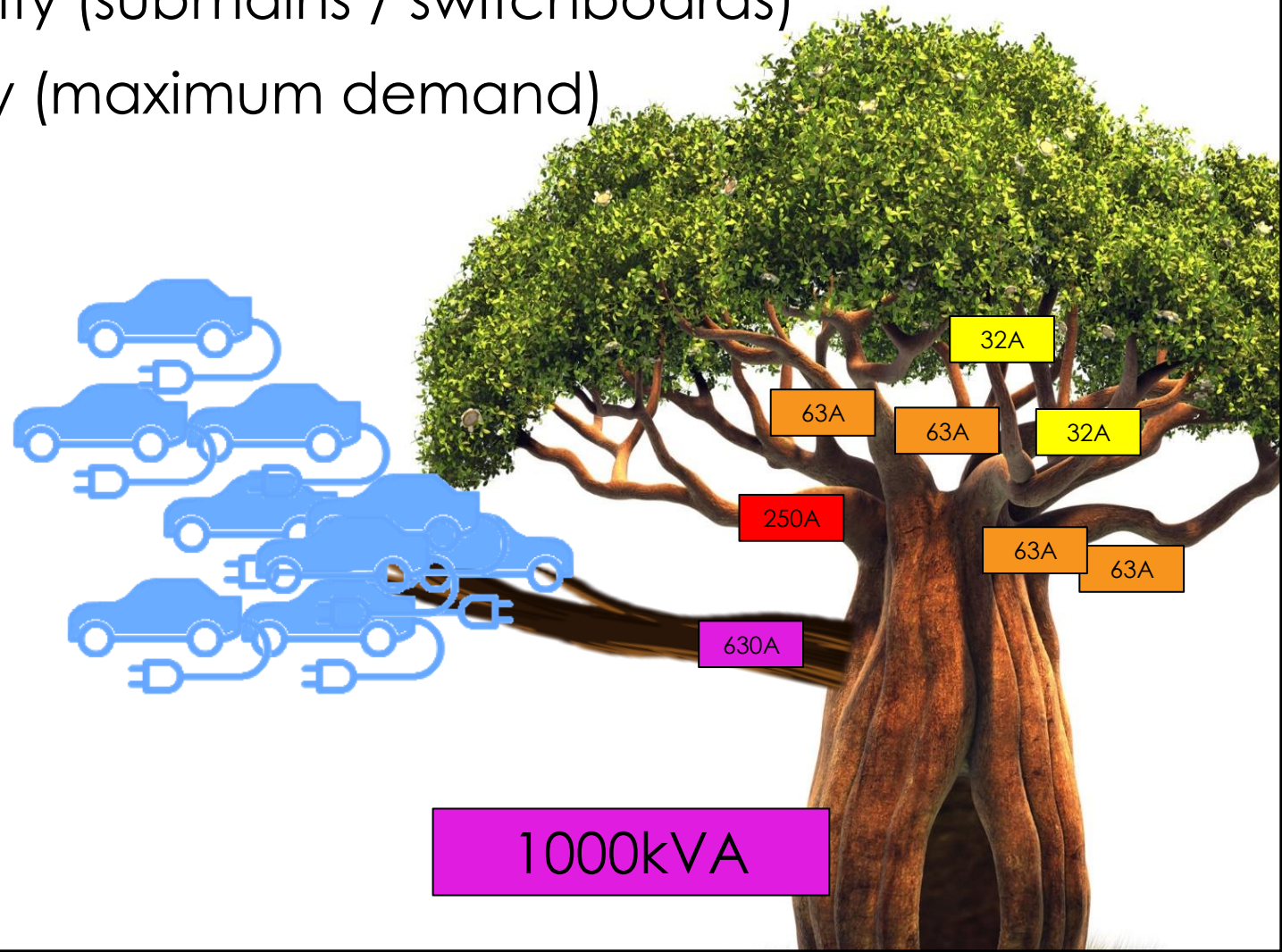

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This Presentation Overview – Assessing EV Site Feasibility

1. Fundamentals of EV Charging
2. Fundamentals of Electrical Constraints
3. **Assessing Your Site**

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Use Case

- Why is a vehicle charging here?
- What are the energy needs?
- How much time is available?
- What will drivers be doing whilst charging?

Assessing Your Site

Use Case

- Why is a vehicle charging here?
- What are the energy needs?
- How much time is available?
- What will drivers be doing whilst charging?

Site Constraints

- Physical
- Electrical

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Assessing Your Site

Use Case

- Why is a vehicle charging here?
- What are the energy needs?
- How much time is available?
- What will drivers be doing whilst charging?

Site Constraints

- Physical
- Electrical

Financial Constraints

- Is this site optimal?
- Are there alternatives?

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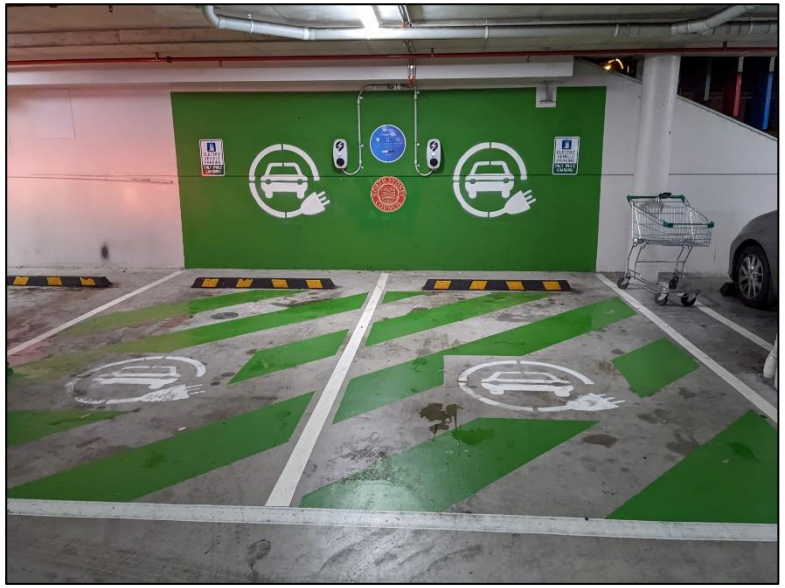
Assessing Your Site

- Physical and Electrical Considerations
- User experience
  - EV drivers and non-EV drivers
- Signage and Visibility



Woolworths

Bathurst

Taree

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Assessing Your Site

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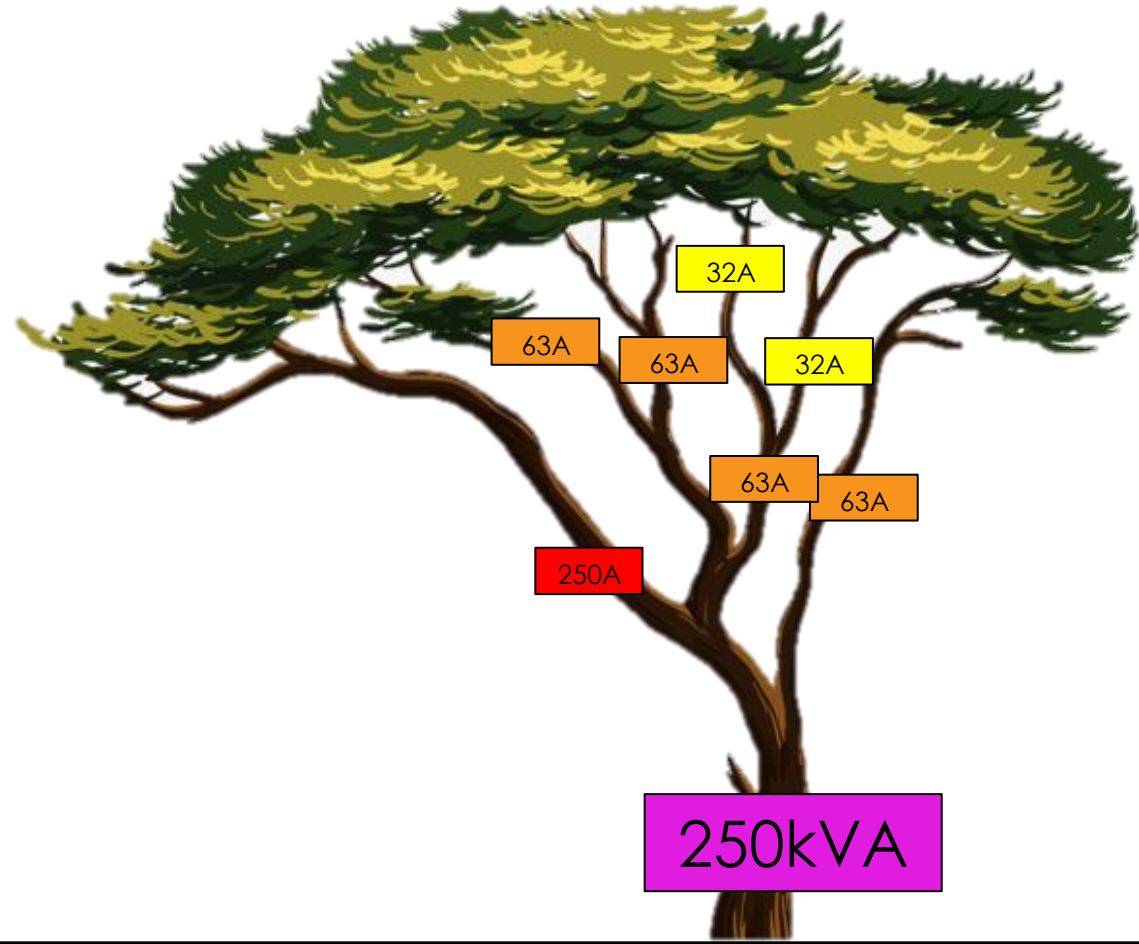

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Assessing Your Site

1. What are the constraints?
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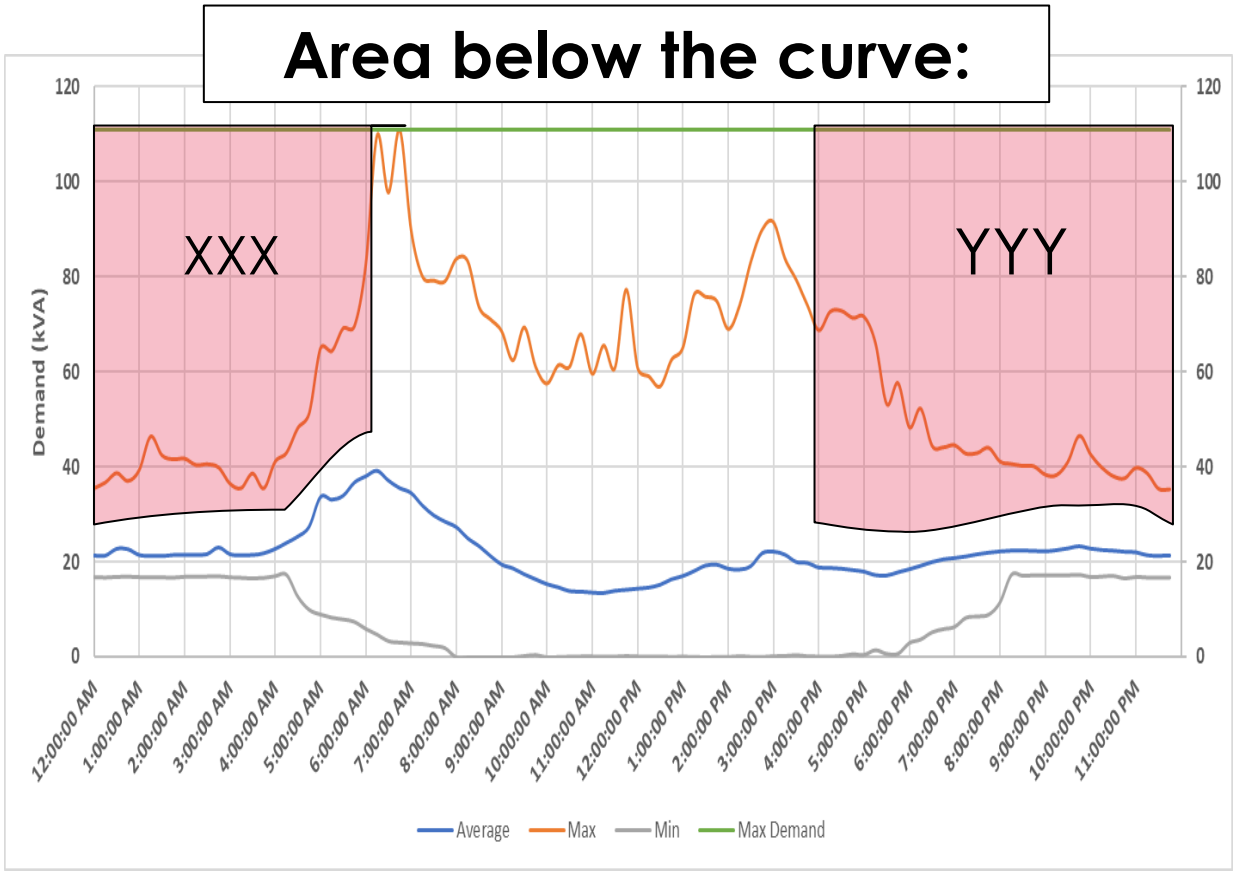
2. Solve for **Energy** (not Power!)



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Assessing Your Site

1. What are the constraints?
   - Confirm “branch” capacity (submains / switchboards)
   - Confirm “trunk” capacity (maximum demand)
2. Solve for Energy (not Power!)
3. Identify options:
   - Basic limitation
   - **Active load management** (solar and battery can help)
   - Or is an upgrade necessary?

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General Trends

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General Trends

1. **Admin building usually has sufficient capacity** (with basic or active load management)

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General Trends

1. Admin building usually has sufficient capacity (with basic or active load management)

2. **Operations centres usually have enough to get started…**

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   - **Not a binary outcome – it reduces periods of compromise**

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Questions?

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