The Feasibility of Creating A Microgrid At A Manufacturing Facility

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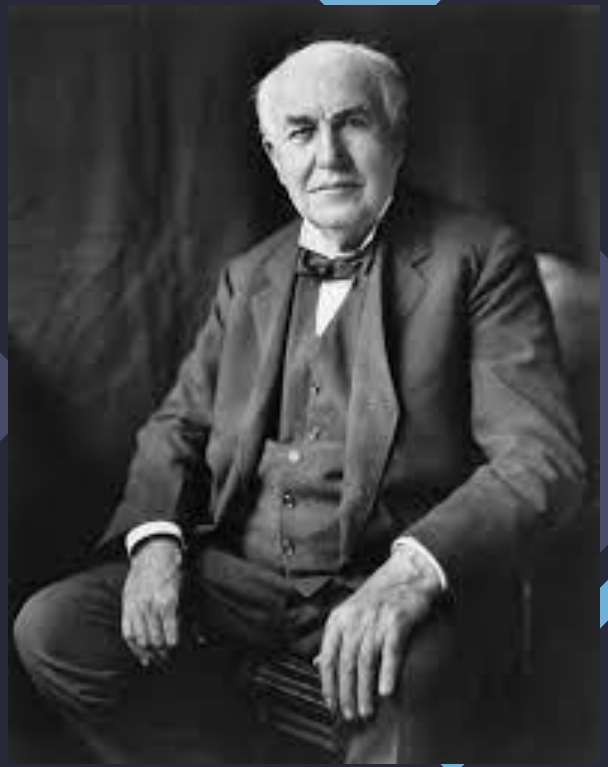
Background

Background

- Climate change has forced our economy to immediately present solutions to combat it.
- For both businesses and the land



The 1st Microgrid

- 1882 by Thomas Edison
- Was created for his Pearl Street Station because there was no distribution system for electricity
- Powered a few blocks in all directions

Definition

- Small-scale power system made up of generation units that can operate independently from a high-voltage transmission system
- Used to only use fossil fuels but is transitioning
- Serve as primary source of power

Advantages & Disadvantages

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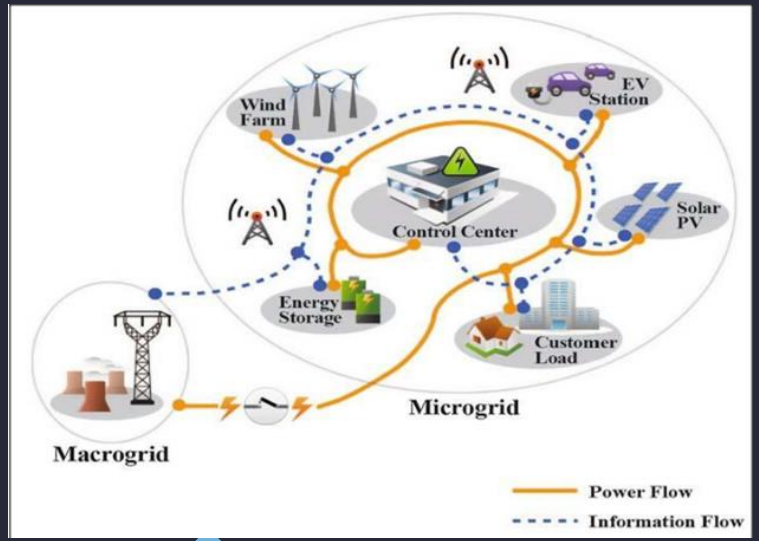
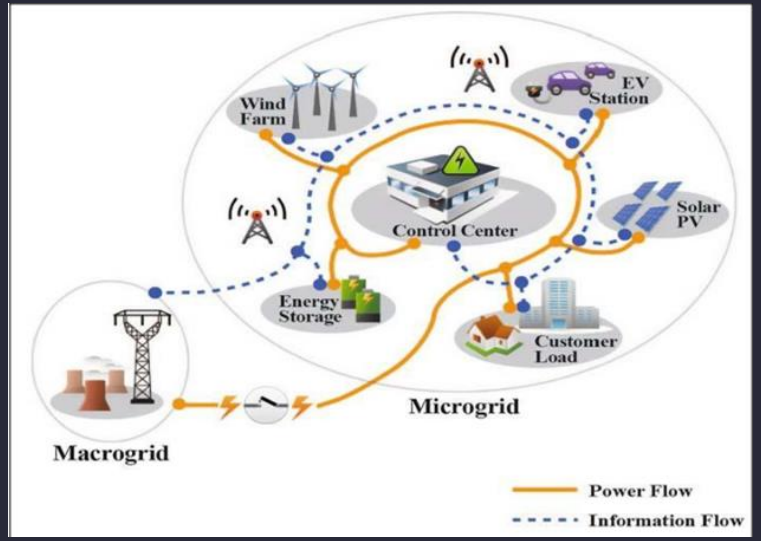
Benefits



- can manage and reduce electricity demand while relieving grid congestion; lowering electricity prices and reduces peak power consumption
- less power to meet the same demand
- microgrids redirect generated heat energy into its facilities while reducing greenhouse gas emissions
- its own independent system
- directly and indirectly benefits the macrogrid

Challenges

- Not one size fit all
- Factors include geography, current market, the facility's load, its annual weather, and state regulations
- a large number of regulations across all states and microgrids don't yet have a clear legal definition
- the risk of new laws being created that regulate or restrict microgrids or add additional costs during development
- regulations may increase cost



Costs & Currency Usage

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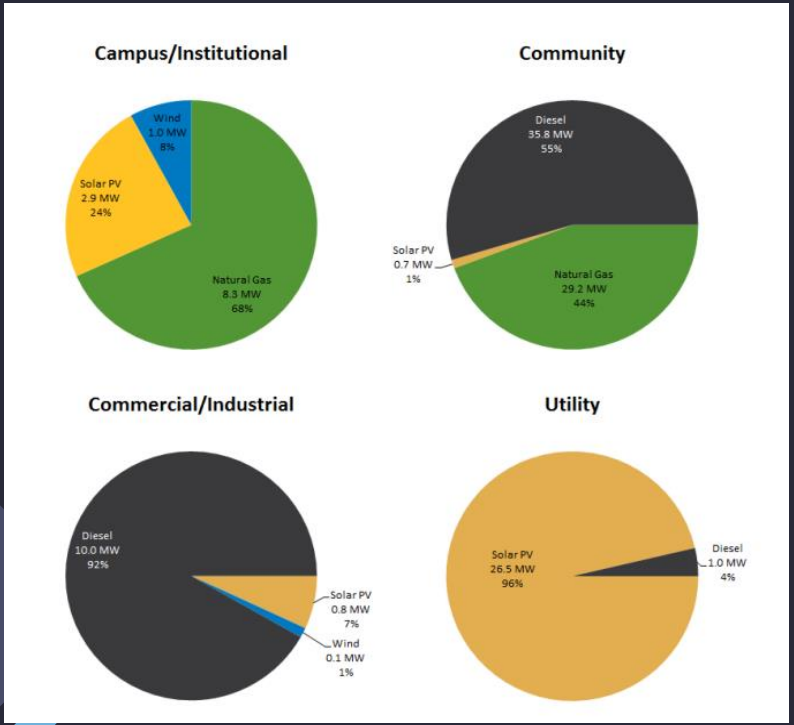
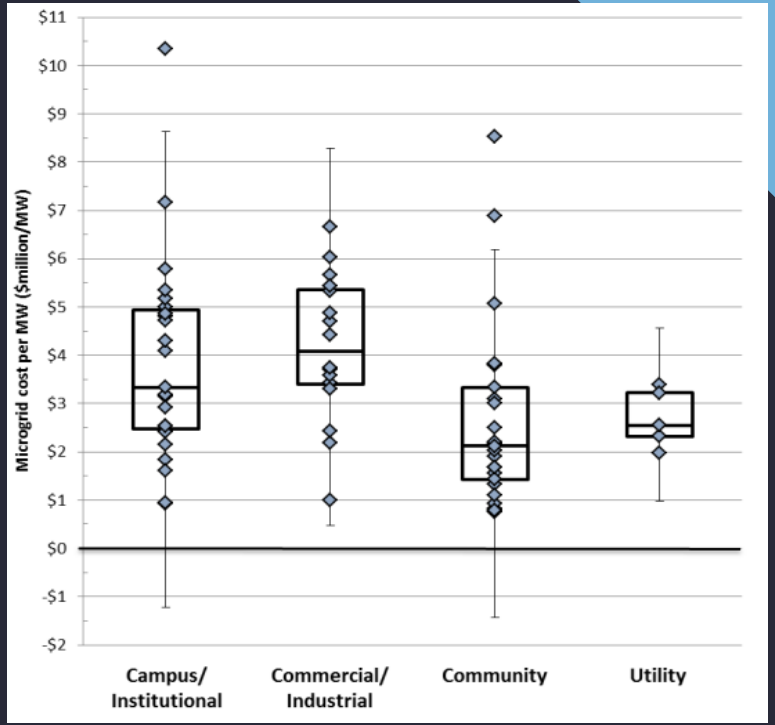
Usage

- research only accounts for a range of 40-50% of databases
- 3% were commercial/industrial while 53% were institutional, 36% were community and 8% were remote

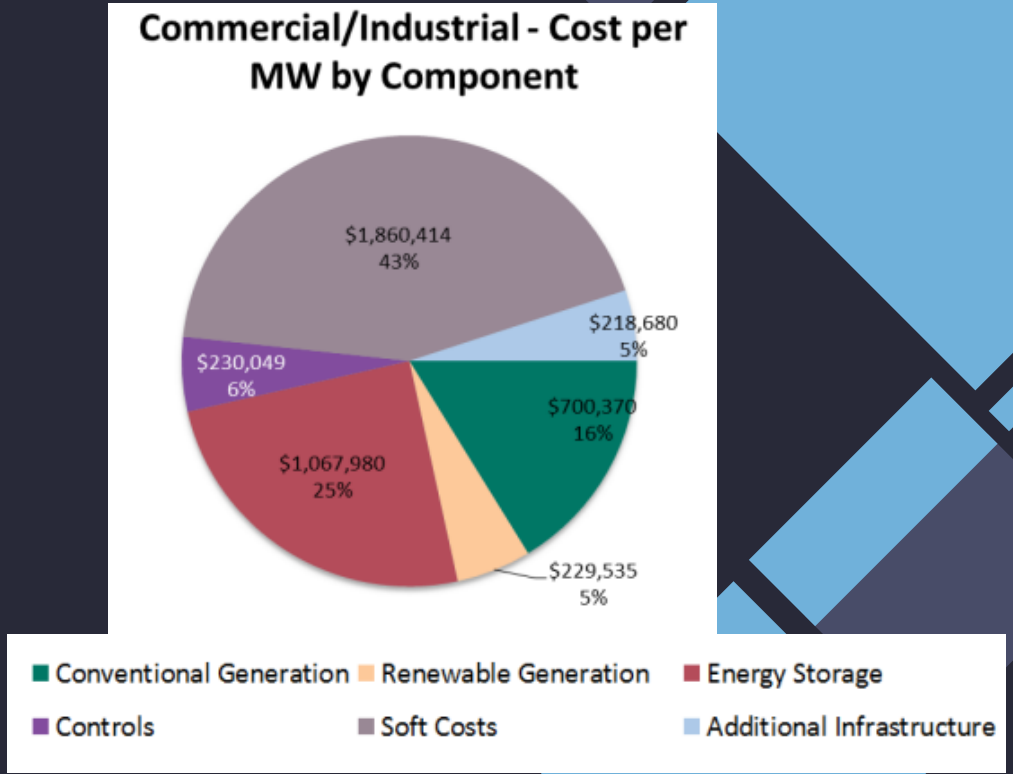
NREL Case Study





Costs

- Controller costs as a percentage would decrease as the capacity of projects increased with 2 MW or more
- Soft costs are made up of construction, commissioning, engineering, and regulation costs
- Construction range from 2-75% of the project
- Regulation costs were a lot lower with an average of 0.6%
- Infrastructure costs make up equipment and other tangible assets



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Goals

Steps Towards Solutions

Clear Legal Framework

- Building requirements
- Sell excess energy

Development Programs by States

- offer grant programs to create clean energy microgrid projects

Public-private partnerships

- reduce costs

Detailed Models

Demonste the cost savings, emission reductions, and independence

Financial needs and estimated cash flow

Strategies for managing the power supply and demand appropriately

Little to no numbers supporting microgrids makes them expensive risks

Cost Solution

- current technology is complex and requires onsite repair engineers -> pre-configured key hardware components
- equipment costs would be significantly cheaper driving down the price
- only use the components that each facility demands

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Conclusion

Definition

- Potential to be effective
- Large changes need to be made
- Assistance and cooperation from government and individual companies

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