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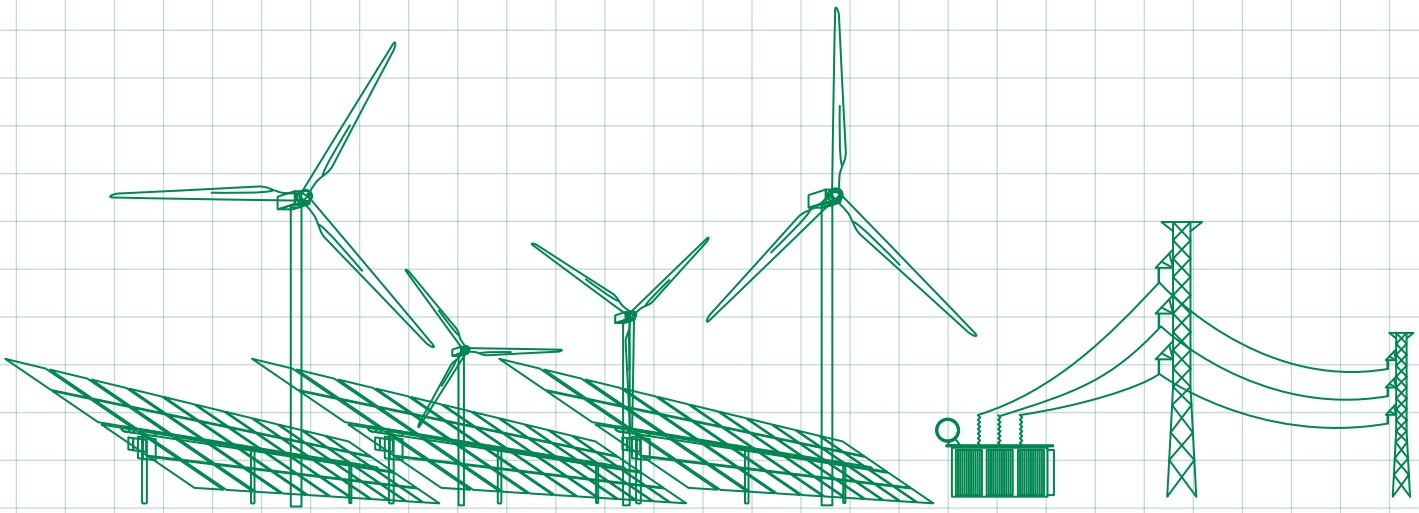
www.simplerenewables.com

Supply solutions for large power consumers

Northland Power Inc. (NPI) is a global independent power producer dedicated to the development, construction, and operation of power generation projects. The company has diversified its projects globally, pioneering in the use of renewable power generation technology.

Northland Power Energía (NPE) is a subsidiary of NPI in Mexico registered and credited as a Qualified Supplier, offering multiple products related to the Wholesale Electricity Market (WEM). Together with its subsidiary Northland Power Desarrollo (NPD) they offer tailor-made solutions that provide maximum value for end users, unlike other standard solutions.



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The Electricity Market

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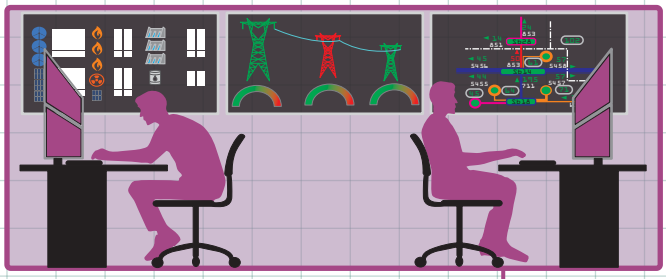
Energy Regulatory Commission (CRE)

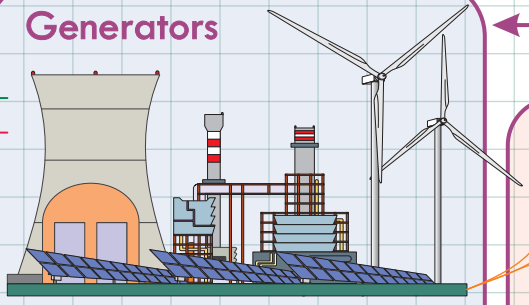
Grid Operator*

Electricity Market*

*In Mexico, both are operated by CENACE



Generators



Utility Scale Generation

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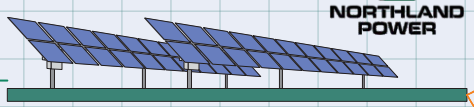
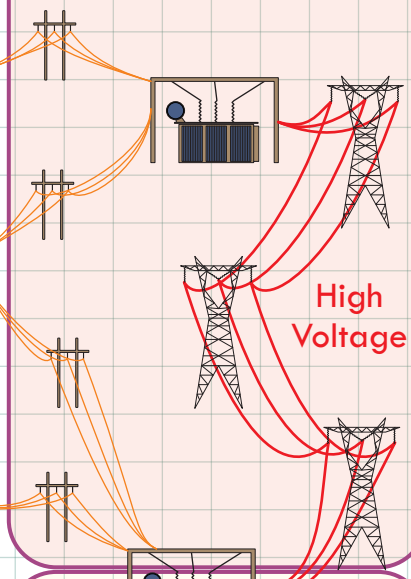
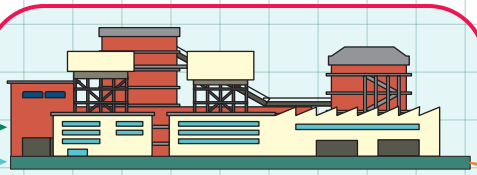


Local generation

National Transmission Grid



High Voltage



Large consumers (Qualified Users) >1MW

Consumers

Wholesale Electricity Market

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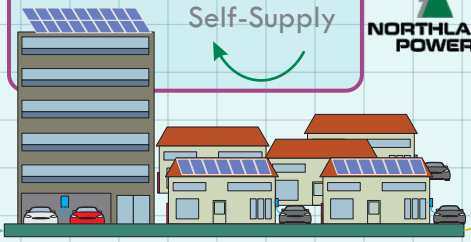
Qualified Supplier

Large consumers (Non-qualified)

Medium Voltage

Basic Supplier



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Small consumers

Low Voltage

General distribution network

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The complexity of power supply

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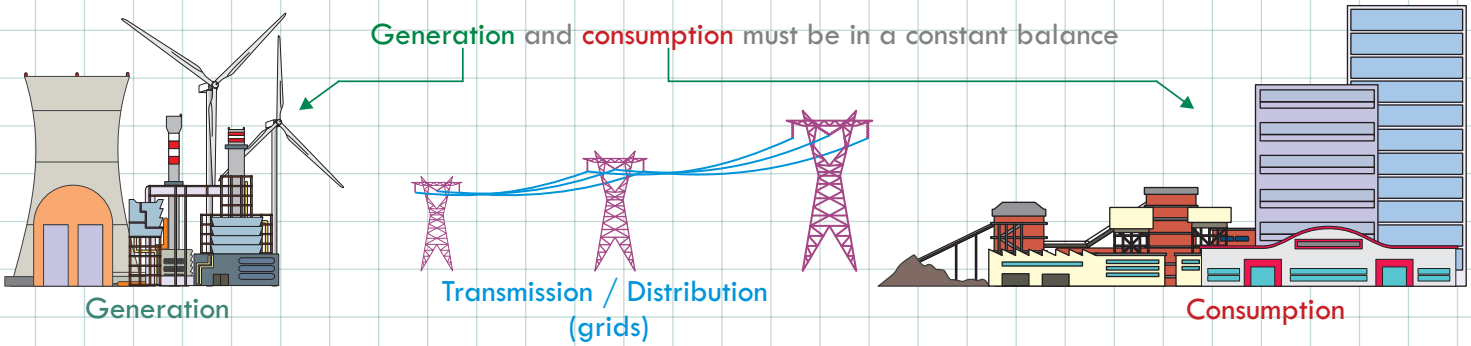
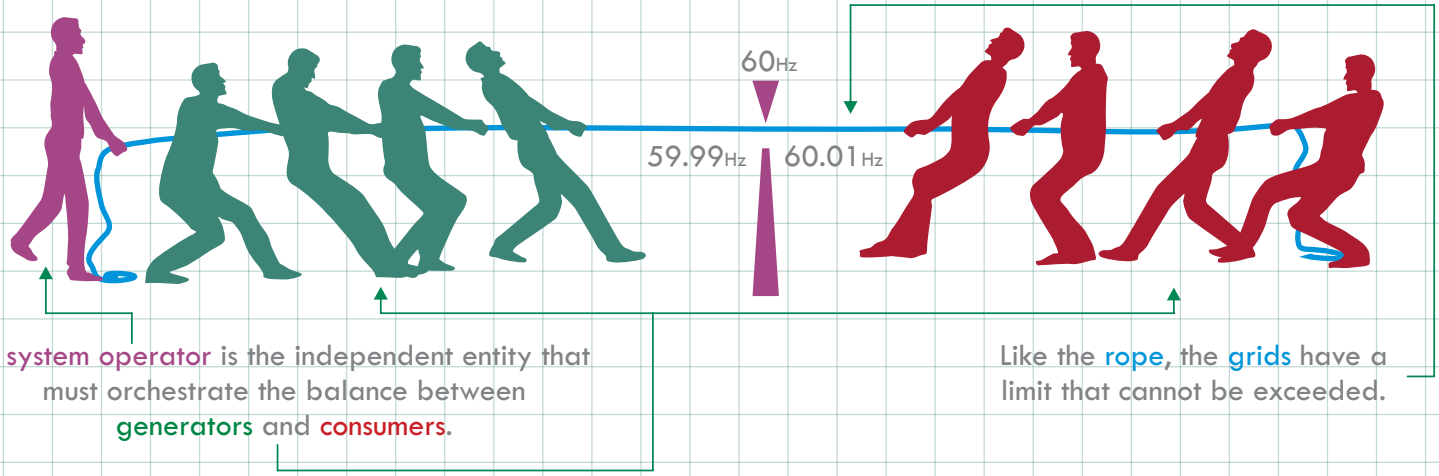
Power supply is a complex process that requires large and costly infrastructure projects to be continuously and meticulously coordinated to generate a service that must be produced, distributed and consumed simultaneously, without intermittency, with the best quality and at the lowest possible cost.

This is probably the reason why the most expensive input for many companies is electricity. However, there are multiple ways to significantly reduce these costs, but first it is necessary to understand the fundamentals of power supply.

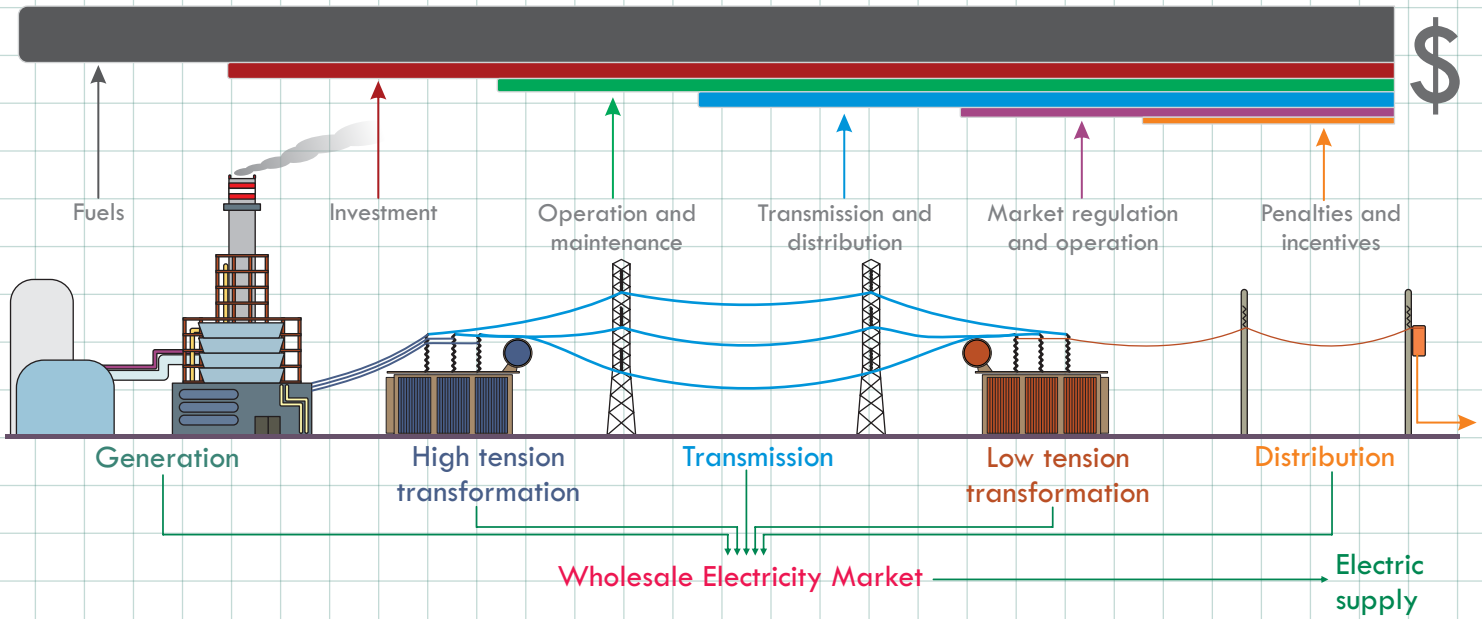


Electricity supply is similar to a game of tug-of-war that never ends, generators must produce the same amount of energy (force) that is demanded by the consumers, if the force of demand increases, other generators must join in to match the force. If any of the participants exceeds the force, the game ends up resulting in a partial or total blackout.



What generates large power costs?

Transmission and distribution tariffs are regulated tariffs.



The Wholesale Electricity Market (WEM) is the market where the different products and services associated with high power consumption and demand are traded. Only accredited entities are allowed to participate in this market where it is possible to buy or sell electricity at different stages of the supply chain.

Demand curve

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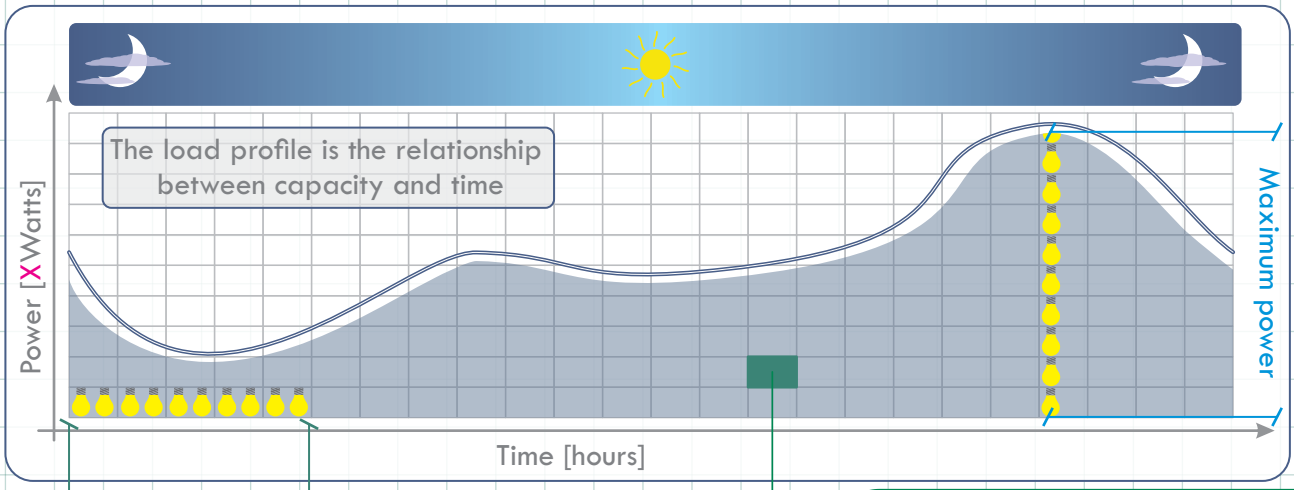
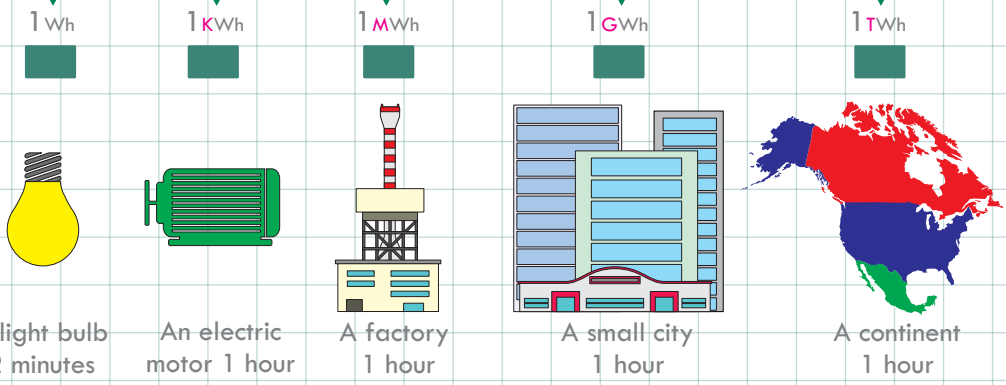
Understanding the demand curve of any consumer is essential to know the costs related to their power consumption and the possible solutions to improve them. The 4 most important factors are: energy consumed, maximum power demand, consumption schedules and profiles, and types of loads.

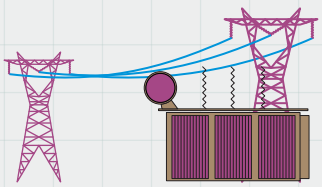


Energy Consumed = Power X Time [XWh]

What can you energize with different magnitudes of a watt hour?

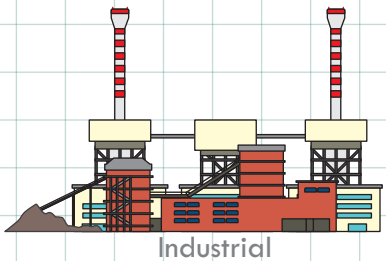


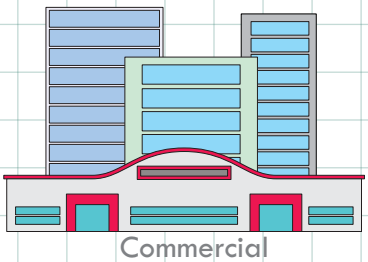
Type of Loads



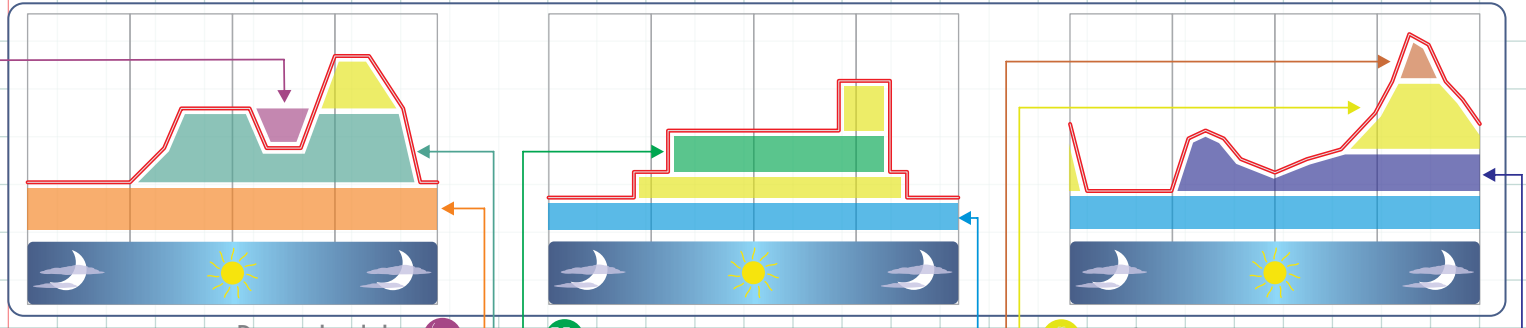
The electrical characteristics of the loads determines the necessary infrastructure

Each sector and industry have different load profiles depending on the nature of its activities. However, there are certain common elements that, when added together, create regional trends which is one of the main causes of the constant changes in power prices.


Industrial


Commercial


Residential



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Major power consumers

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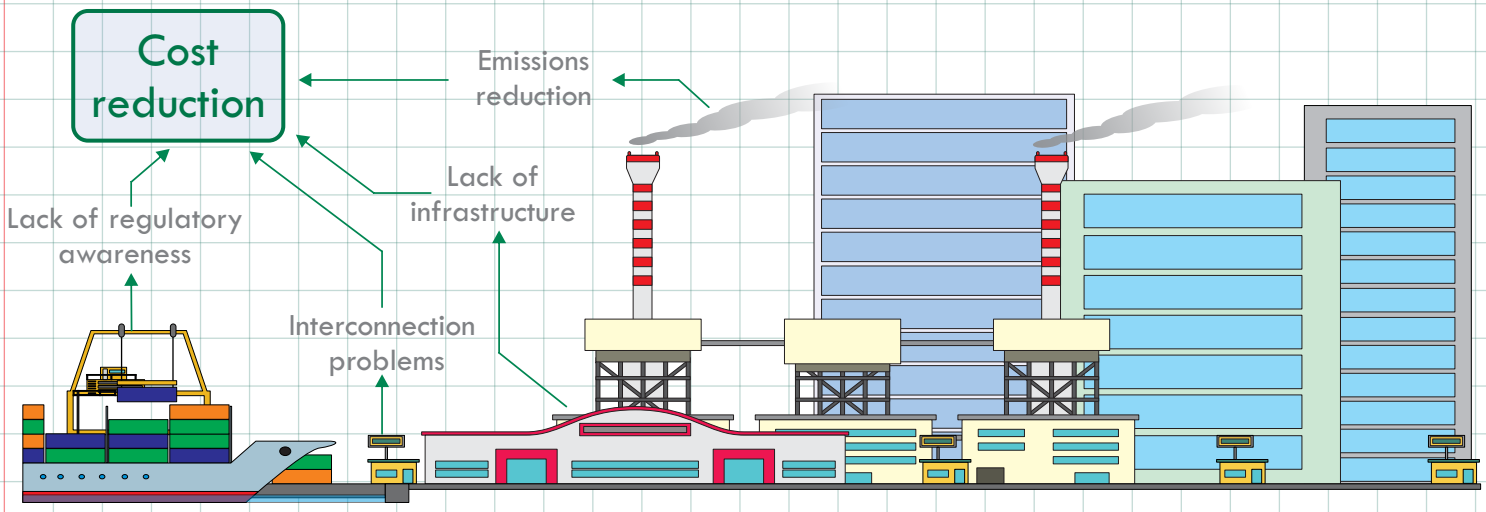
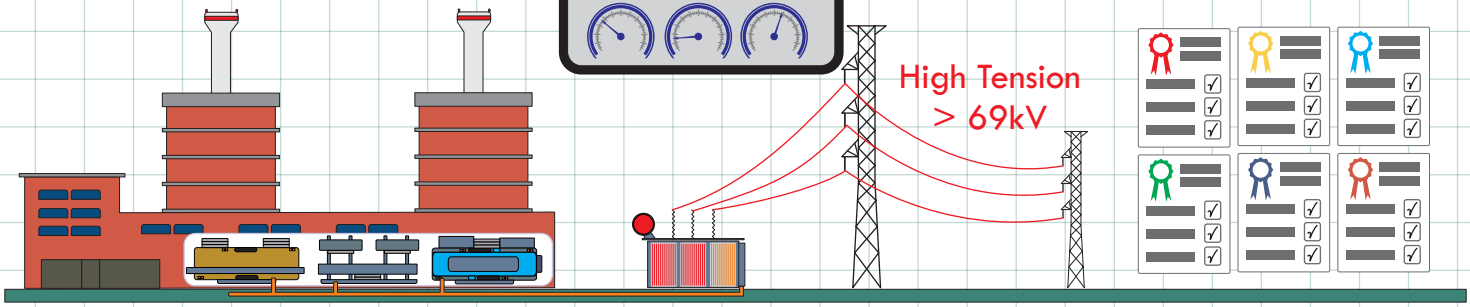
Large energy consumers can be considered as companies that by themselves or when adding up all their load points require capacity of 1 MW. Under this criterion, a wide range of commercial and industrial loads are considered large consumers. Most of these consumers face similar problems related to costs, regulation, interconnection and emissions.

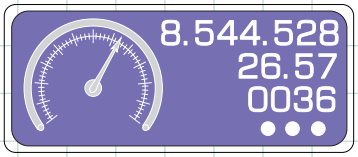


$$$ Connection studies
$$$ Installation
$$ Operation
$$ Monitoring
Cost vs. Voltage

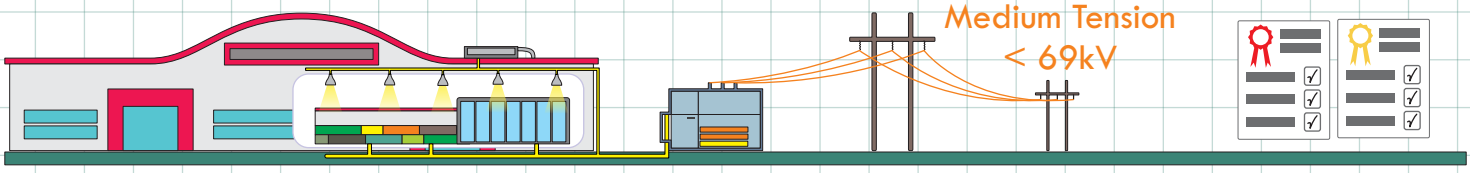
High costs associated with the necessary infrastructure to comply with the grid code, in addition to the various procedures required to connect to the high tension grid.



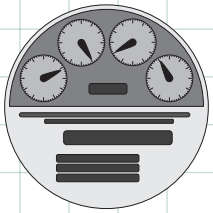
$$ Connection studies
$$ Installation
$ Operation
$ Monitoring
Cost vs. Voltage



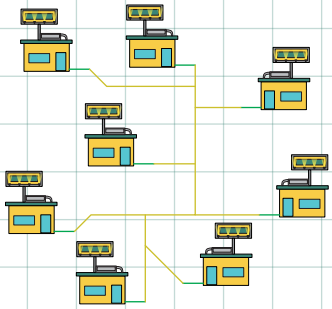
Equipment and procedures that must be continuously updated to comply with existing regulations for each load.

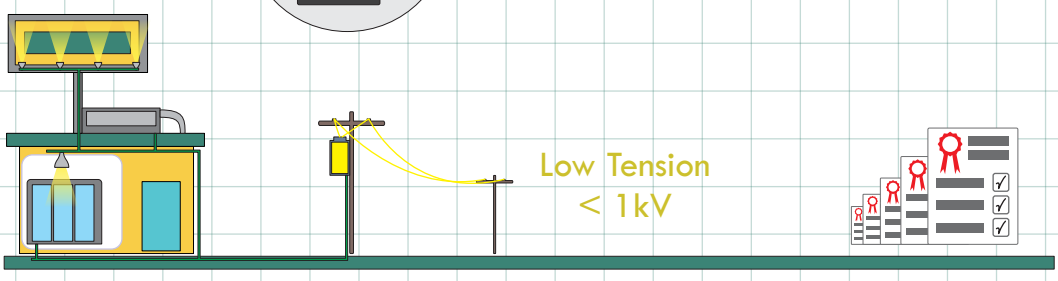


$ Connection studies
$ Installation
Costo vs. Voltaje
X



Multiple load points spread over large regions that must update their infrastructure in order to be efficiently controlled, each load center requiring its own procedures and updates.





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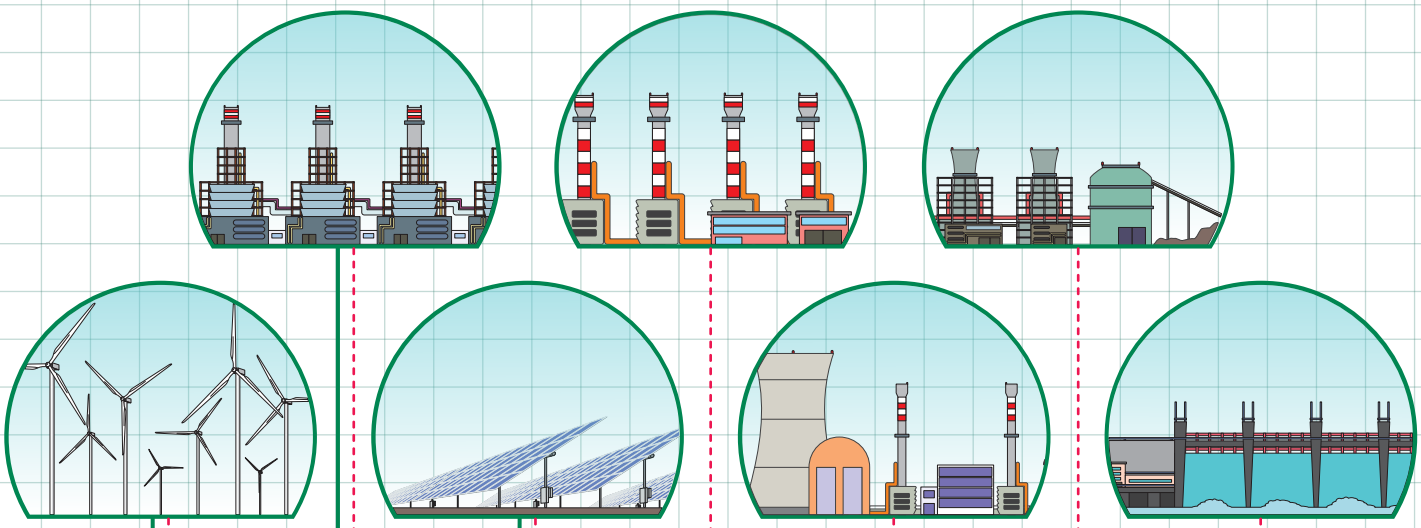
Independent power supply

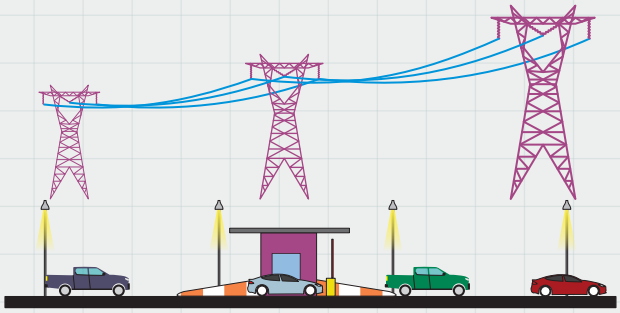
The qualified supply is that which is provided by autonomous entities whose tariffs are not regulated so they can market products using different economic models that best suit the needs of each customer. A qualified supplier can obtain energy from the WEM and/or procure it directly from utility scale and/or local generators and other market participants, always complying with the regulation issued by the CRE regarding power hedging requierements.



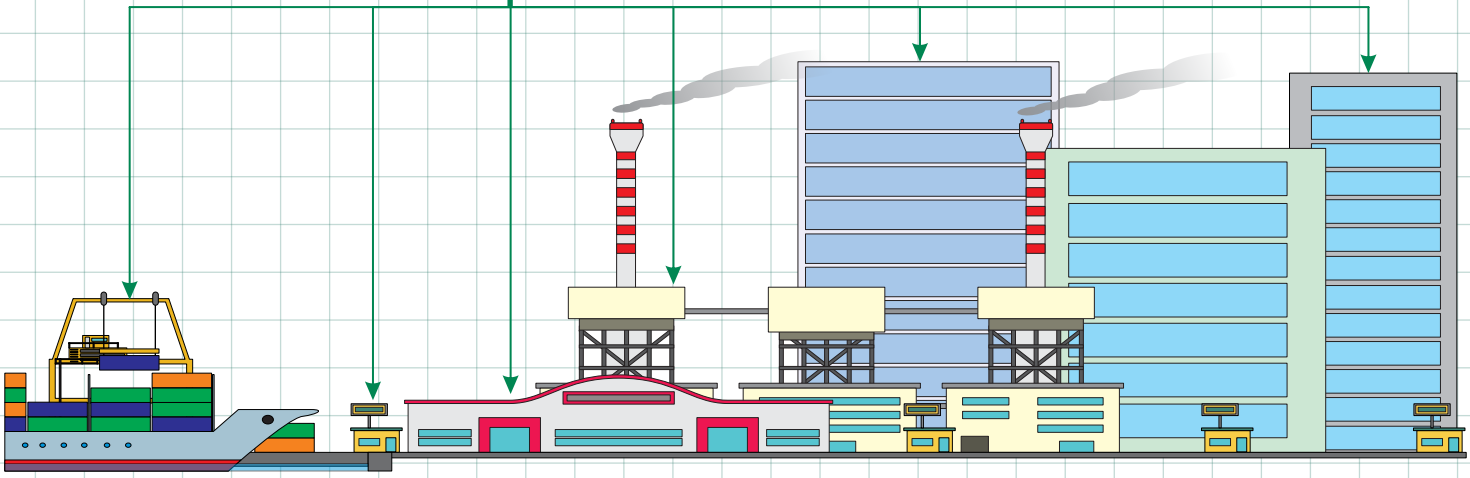
In the WEM all generators compete continuously, the lowest prices are always dispatched first

Currently, cheapest power in the WEM comes from solar and wind energy

Power grids function like a highway system, owned and operated by a federal entity and a "toll" or quota is paid to use them to travel



By having multiple procurement options, the supplier ensures it can always offer the most competitive prices and rate structures



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Behind-the-meter (generation) solutions

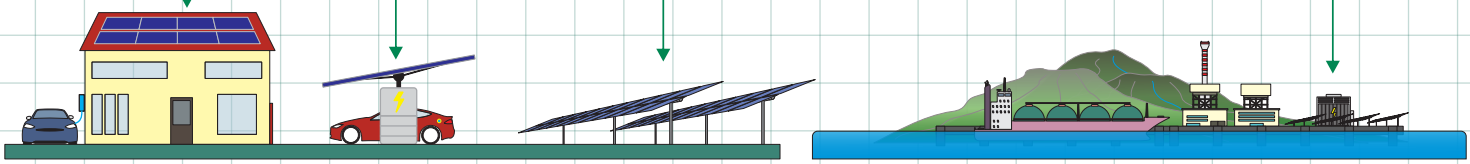
Within the WEM regulation 3 major types of generation are defined, divided by their installed capacity and operating model, each of these types of generation has certain advantages, which are adapted to the needs of each client. Northland Power Desarrollo has vast experience in the development, construction and operation of these types of projects.

Local generation

Self-supply refers to electricity generation that is consumed on site without having to be transmitted through the grid.

Solar generation is very flexible in its dimensions, making it ideal for off-grid supply as it can be located at multiple sites

In combination with batteries and other energy sources, it is possible to meet 100% of a load's demand

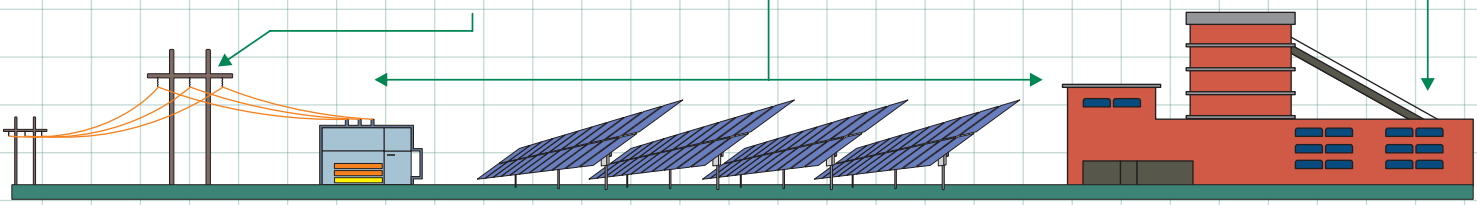


Exempt generator

An exempt generator is a power plant with an installed capacity of less than 500KW, due to its size it does not require a generation permit, however, it can only commercialize its energy through a supplier or by consuming it on site

By being able to deliver power both to the grid and locally, exempt generation is highly flexible and benefits both the consumer and the grid operator

Exempt generation can be sized to meet the needs of multiple medium-sized businesses and industries

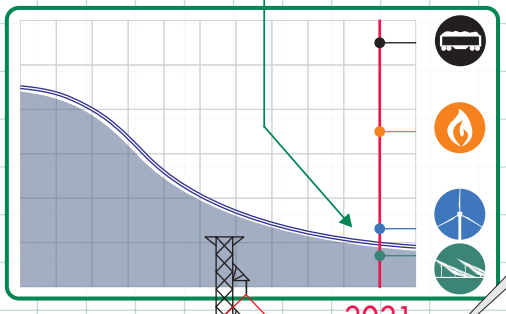


Utility scale generator

A utility scale generator is a power plant with an installed capacity greater than 500KW, in order to operate commercially it requires a generation permit and grid interconnection studies, due to their capacity they offer the most competitive power prices. Through the WEM and the transmission grids they can deliver energy to any point in the country

A large reduction in installation costs has allowed solar and wind generators to offer the lowest energy prices in history

In combination with firm generation such as natural gas, the needs of any type of customer can be met in a clean and economical manner



Large generators can offer multiple products on the WEM as Clean Energy Certificates (CEL)

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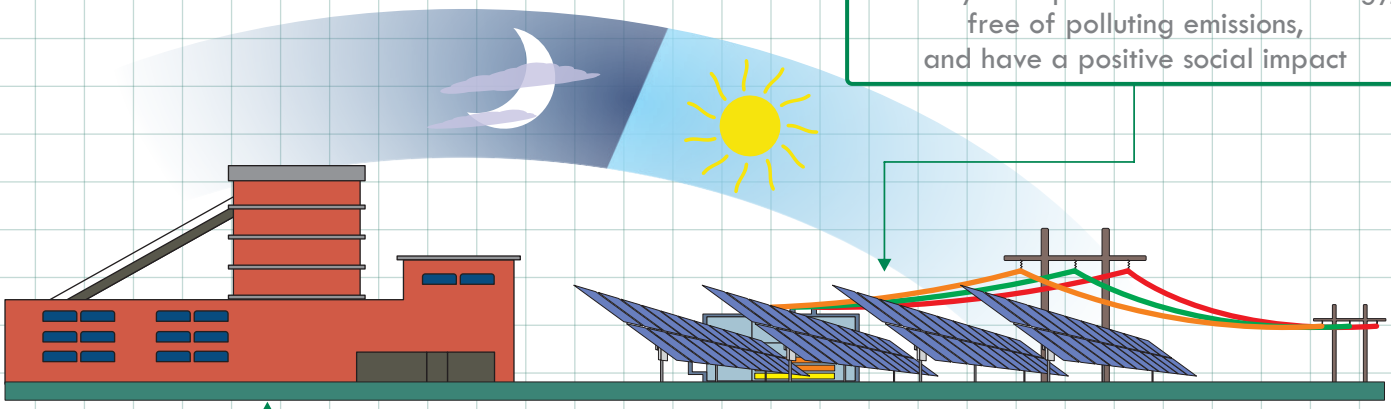
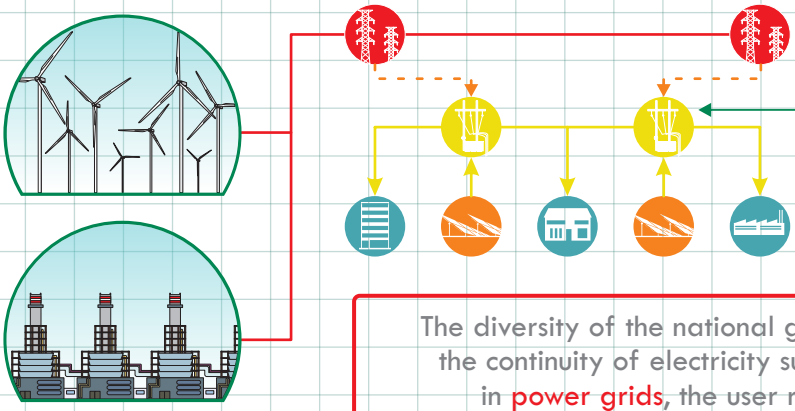
The benefits of a turnkey integrated solution

Distributed or on-site generation projects, whether exempt or local, have several technical, economic and environmental advantages. These advantages help both the grid operator and the consumer. Distributed generation in conjunction with qualified supply is the optimal solution analyzed from an economic, technical, and environmental perspective.

Solar systems provide renewable energy, free of polluting emissions, and have a positive social impact

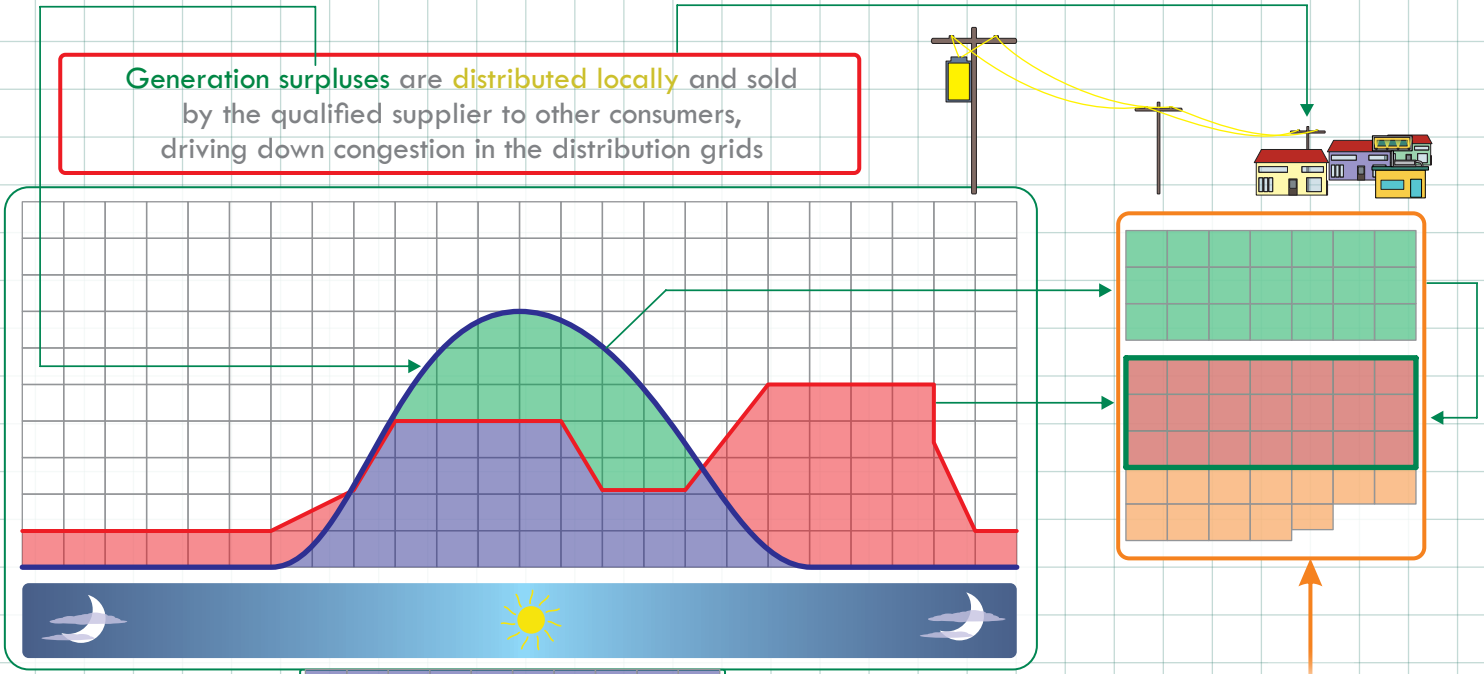




The modularity of solar systems is continuously adaptable to the demands of any consumer and their low costs considerably reduce the power price

The diversity of the national generation system is increased, this increases the continuity of electricity supply and reduces the need for investment in power grids, the user receives a constant and reliable supply.

Generation surpluses are distributed locally and sold by the qualified supplier to other consumers, driving down congestion in the distribution grids



The qualified supplier is in charge of balancing the surplus generation and the energy taken from the grid, the difference of this balance is monetized by the qualified supplier

Part of the energy is supplied locally, which reduces the use of the transmission and distribution grids

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