MPTS for Energy Efficiency and Resiliency

Welcome to this presentation

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MPTS

What is MPTS?

MPTS stands for Maximum Power Transfer Solution

The technology is based on Maximum Power Transfer Theorem (1840)

Popularly known as Jacobi's Law

MPTS

MAXIMUM POWER TRANSFER SOLUTION

IS THE NEXT GENERATION

POWER QUALITY SOLUTION

21st Century Solution

Why MPTS Technology?

Maximum Power Transfer Solution (MPTS) is the 21st century electrical power management technology to revolutionize energy efficiency, enhance our environment, promote energy conservation and decrease operating costs.

You may already be familiar with harmonic filters, surge arrestors, voltage stabilizers, power conditioning, renewable energy, power management, and power monitoring systems.

MPTS technology based on Jacobi's Law is a dynamic-real time solution that does all of the above in one device to improve power quality.

MPTS is a passive system that sits on an electrical network. MPTS is **fail-safe**, **not-intrusive**, and does **not interfere** with the operation of existing equipment.







Why use MPTS Technology?

Based on the Maximum Power Transfer Theorem 1840 – now known as Jacobi's Law

What is unique about the MPTS. - Benefits to the end user

- Increased efficiency, safety and reliability of the electrical network
- Reducing Service, Repair, and Maintenance costs – reduces operating costs
- Extending the life of connected equipment – delay aging or replacement of equipment
- Protecting your equipment from failures – reduces down time
- Not have to replace perfectly good working equipment with new equipment
- Releases electrical capacity - connect more load on the same electrical panels & transformer
- Decreases total electrical power demand and consumption- energy savings

What you can expect to see with one MPTS in your electrical network.

- Decrease the Max current in your network
- Decrease in KVA electrical Demand
- Decrease in KVAR- reactive power
- Decrease in harmonics
  - THD that is damaging your electrical, electronic, computer, lighting and mechanical equipment.
- Provide stable power to the connected loads
- Increase safety and reliability of the network
  - Avoids overload conditions and hot spots in panels and equipment a function of decrease in I^2R losses, KVAr, and harmonics

Significant Reduction in CO_2 Emissions

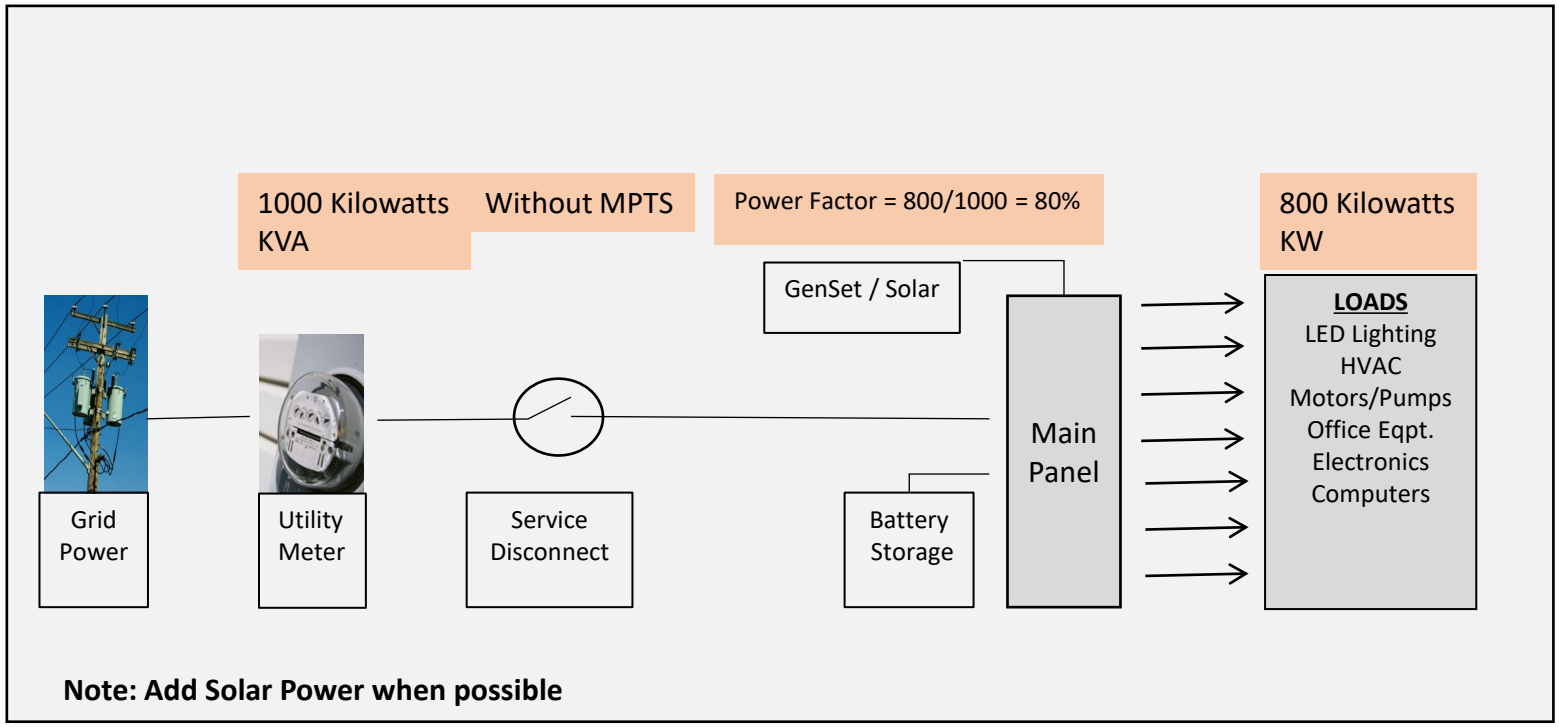
What are the outcomes when you use MPTS Technology?

MPTS for Energy Efficiency and Resiliency

Net Outcome = buildings are resilient and can be close to net Zero. *Reduce the load on Utility Meter and thus the Grid*

Typical layout of an existing facility without MPTS

The average Building load in KW is 800 Kilowatts
The average Building load in KVA is 1000 Kilowatts
The resulting average power factor of the load is 0.80 or 80%



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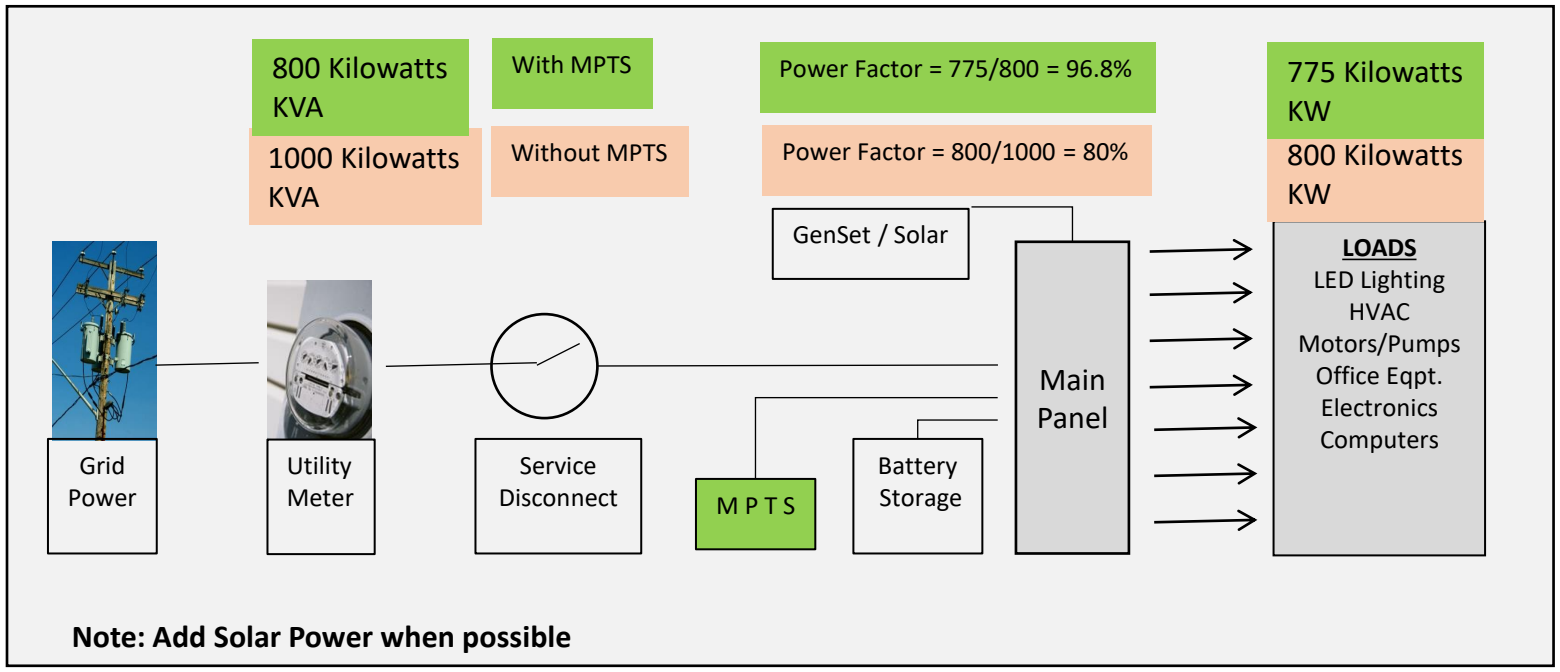
Typical layout of an existing facility

Without MPTS

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With MPTS

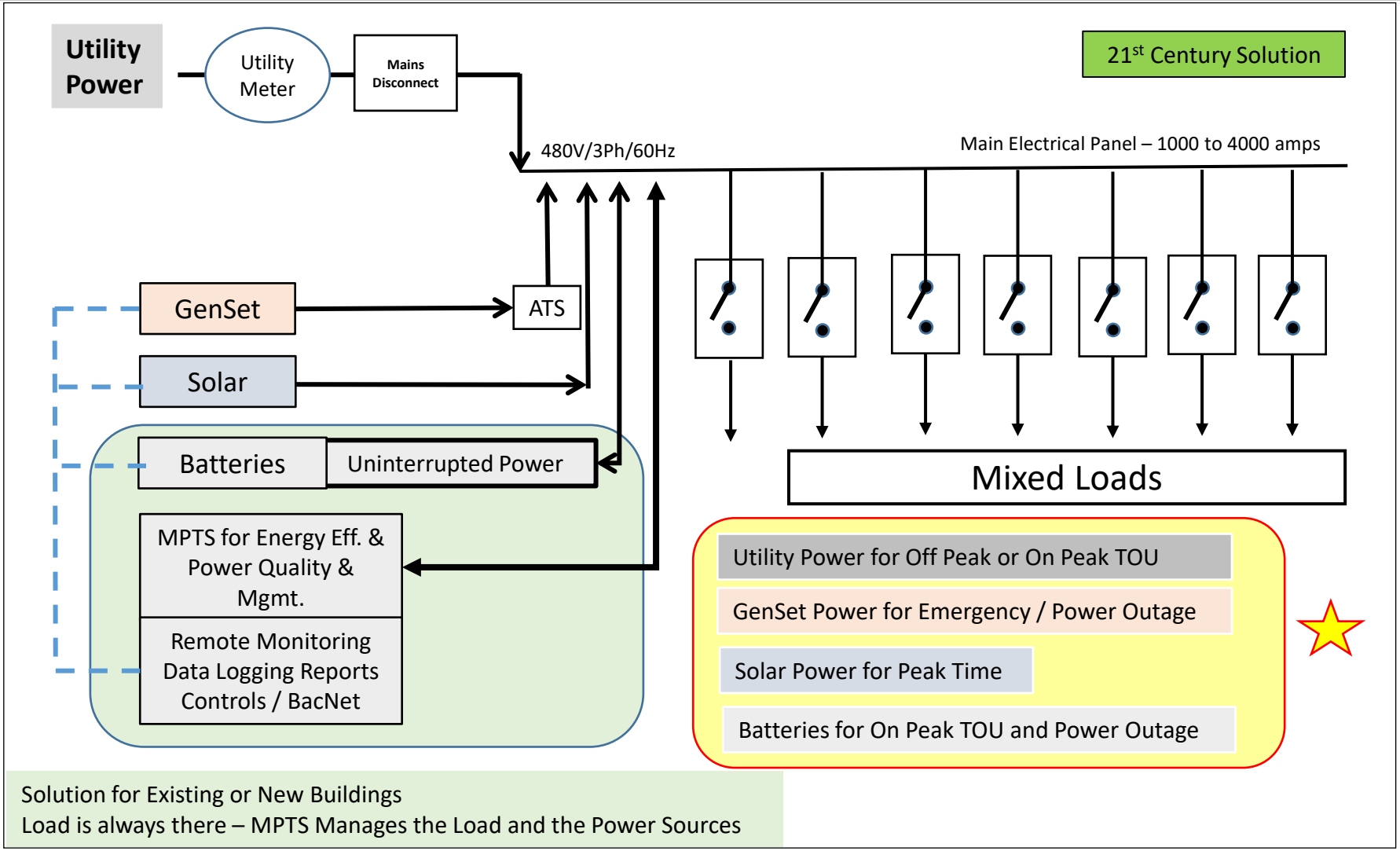
The average Building load in KW is 775 Kilowatts
The average Building load in KVA is 800 Kilowatts
The resulting average power factor of the load is greater than 95 percent



Note: Add Solar Power when possible

Energy Efficiency and Resiliency – Typical Schematic

Accentz, Inc Solutions will provide consistent performance 24 hours a day. Power Factor greater than 95%, THD less than 30%, and bring building close to Net Zero



Solution for Existing or New Buildings
Load is always there – MPTS Manages the Load and the Power Sources

MUST BE INSTALLED IN COMPLIANCE WITH NEC AND LOCAL ELECTRICAL CODE

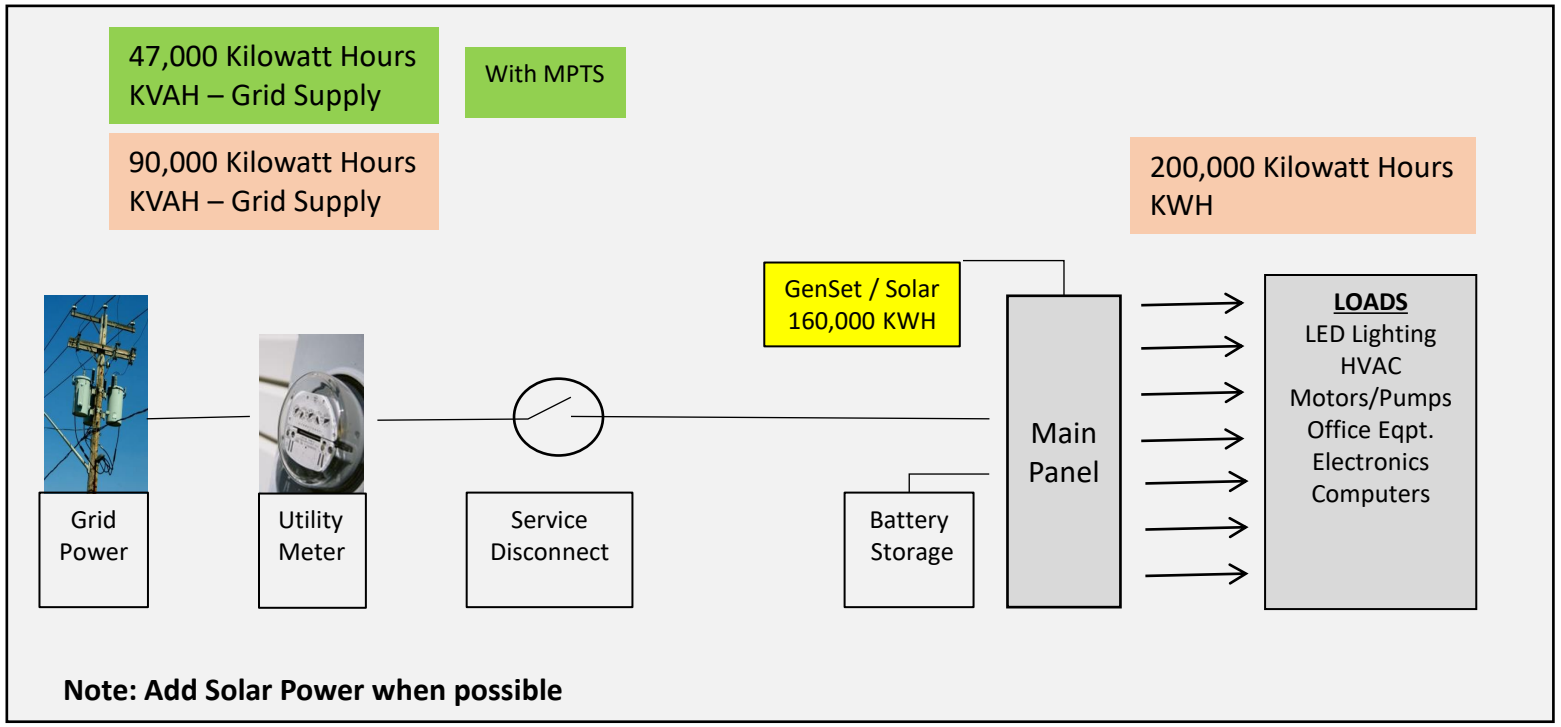
What are the outcomes when you use MPTS Technology with Solar?

MPTS for Energy Efficiency and Resiliency

Net Outcome = buildings are resilient and can be close to net Zero. *Reduce the load on Utility Meter and thus the Grid*
MPTS, when deployed with Solar systems increases the KWHs offset from the grid power.

Typical layout of an existing facility without MPTS

The average Building consumption Grid Supply = 250,000 KWH
The average Building consumption Grid Supply = 90,000 KWH with a Solar System offsetting 160,000 KWHs
The average Building consumption Grid Supply = 47,000 KWH with a Solar System and MPTS offsetting 203,000 KWHs



Energy Efficiency and Resiliency – Typical Schematic with alternate power sources

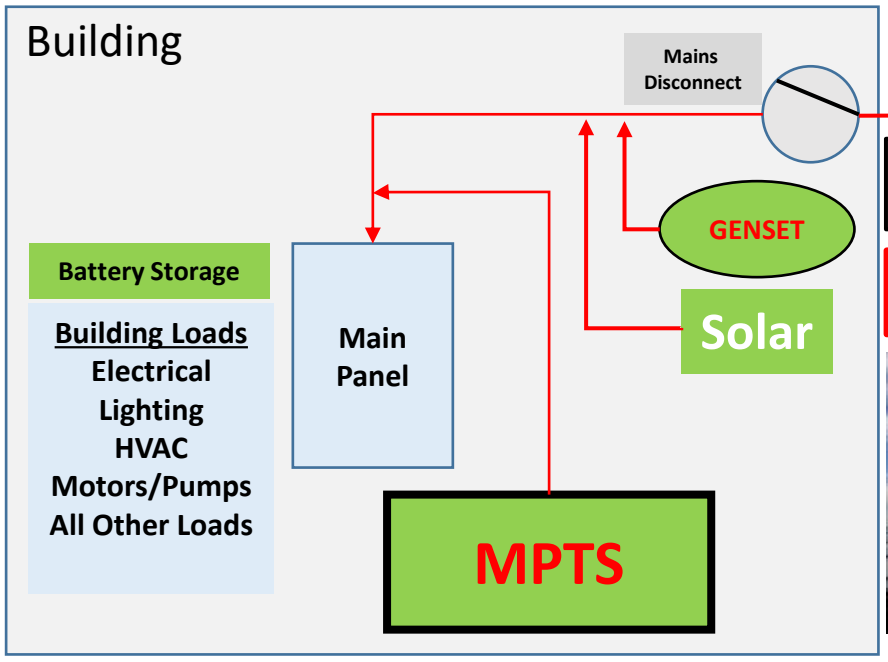
With MPTS the Solar System get significantly smaller with MPTS.

An existing Solar System will provide additional 20% in surplus energy (kWh) that is sent back to the grid when you install MPTS, see below.

During power outages, the MPTS along with the Solar Power and Batteries will act as the power management platform to provide power to the whole building or for mission critical loads inside the building.







Power Surplus is 20,000 KWH
Without MPTS

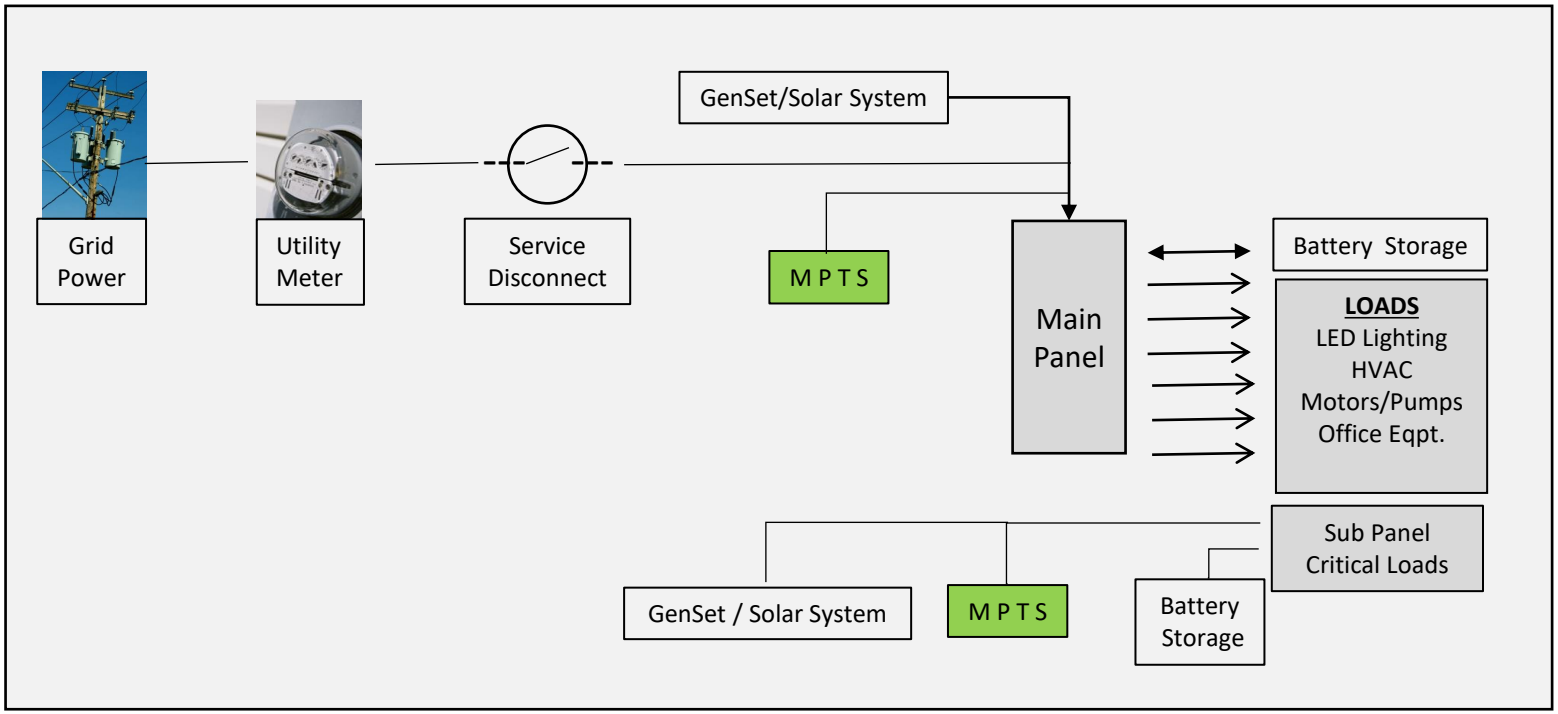
Power Surplus is 24,000 KWH
With MPTS



MPTS for Energy Efficiency and Resiliency

Net Outcome = buildings are resilient and close to net Zero. Reduce the load on Utility Meter and thus the Grid

- MPTS saves total electrical power 24 hours a day
- Savings in electrical power required for the building help reduce the size of the GenSet or Solar Systems. Or have a greater surplus because less power is required for the building.
- Saved energy also is used to Charge the Batteries
- Batteries are used to reduce peak time KWH every day.
- Batteries also provide power during power outages



MAXIMUM POWER TRANSFER SOLUTION - MPTS

Benefits from MPTS

- **Decrease** Amps significantly
  - Avoids Overload conditions and hot spots in panels and equipment
  - Decreases kWh usage by decreasing I^2R losses
  - Creates capacity for more breakers in your panels

- **Maintains** stability of voltage and current in building
  - Eliminates flickering lights, popping breaker or failing power supplies
  - Increases life of connected equipment

- **Protects** investment in electrical and mechanical equipment.

- **Reduce** service, repair, replacement, and maintenance costs

- **Reduce** total electrical power demand and consumption

- **Reduce** C02 Emissions

Significant Reduction in CO2 Emissions

Customers – Short List

Norad – Cheyenne Mtn. Air Force Station	Morgan County Government
Underwriters laboratory (UL)	Aurora Public Schools District
Metal Works, Dubai	Citywide Banks
Aurora Mental Health Center-1	Green House for Roses
GSA – Federal Center	St Marie Nursing Home
Aurora Mental Health Center-2	Aluminum Extrusion Factory
Rabine Group HQ Building	Chemical Plant
Aurora Mental Health Center-3	City and County of Denver
Aurora Mental Health Center-4	Ecotech Institute
WH Office building	Museum
Hillcrest Hospital	Printing Press
Kaiser Permanente-1	University
Fitzsimons Campus	Water Filtration Plan
Kaiser Permanente-2	GSA – Federal Courthouse building

Significant dollars savings from the benefits of MPTS – Payback Period / Return on investment (ROI) is 1-2 years

Carbon Emissions Equivalency from MPTS



Average reduction from per MPTS per year in generation capacity:
438,000 Kilowatt Hours = 310 Metric Tons of CO2

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Energy Savings and Carbon reduction

Average CO2 emissions reduction per MPTS per year = 310 Metric Tons

Equivalency Results How are they calculated?

The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:

310 Metric Tons

CO_2 emissions from

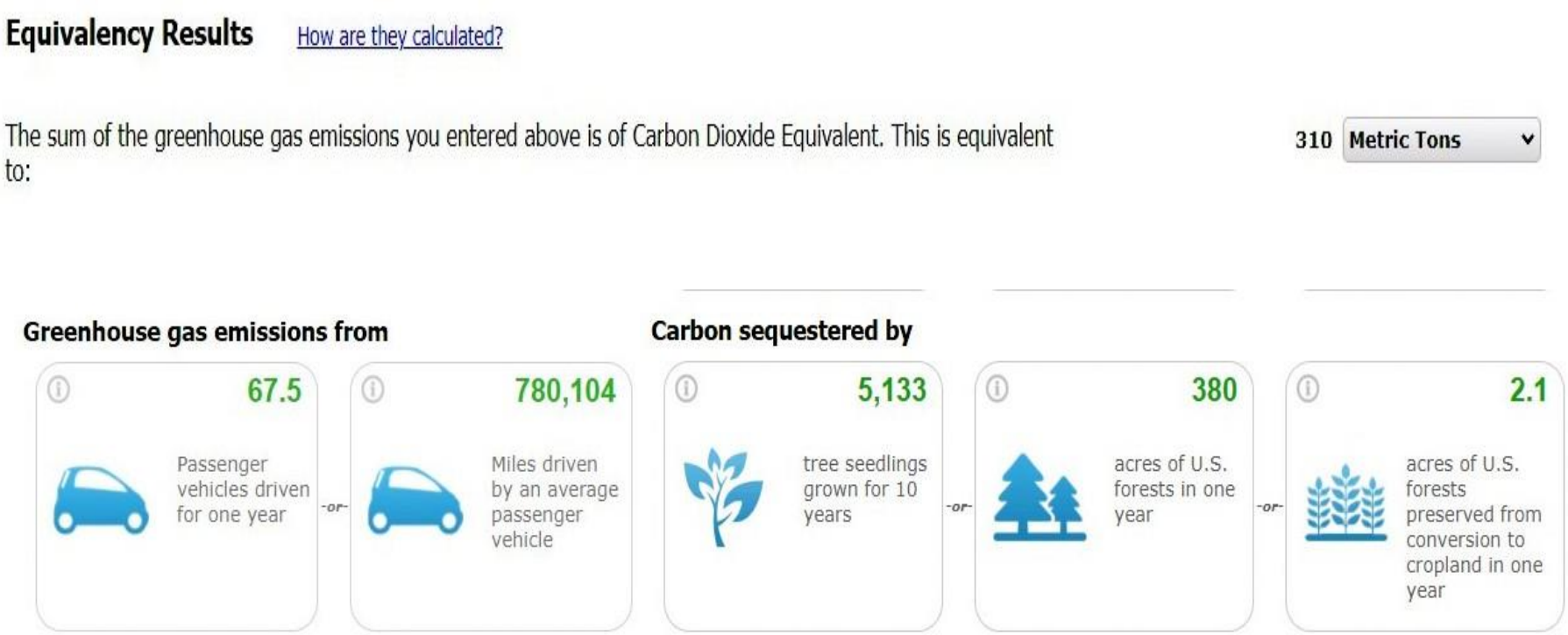


Significant dollars savings from the benefits of MPTS – Payback period / Return on investment (ROI) is 1-2 years

Energy Savings and Carbon reduction

Average CO_2 emissions reduction per MPTS per year = 310 Metric Tons

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator



Significant dollars savings from the benefits of MPTS – Payback period / Return on investment (ROI) is 1-2 years

Savings examples – ten year savings

Example: short list of customers

Customer	Energy Saved (KVAH) Savings	CO2 emissions -Savings Lbs. of Coal Burned
NORAD Cheyenne Mtn. Air Force Station	3,285,000 Kilowatt Hours	2,463,516
GSA Federal Center	3,679,200 Kilowatt Hours	2,759,138
Manufacturing plant	26,925,000 Kilowatt Hours	20,191,834
Factory	7,500,000 Kilowatt Hours	5,624,466
School	200,000 Kilowatt Hours	149,986
Hospital	400,000 Kilowatt Hours	299,972

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Field Data for MPTS Performance: There are three graphs below.

Red line is without MPTS, Green Line is with MPTS

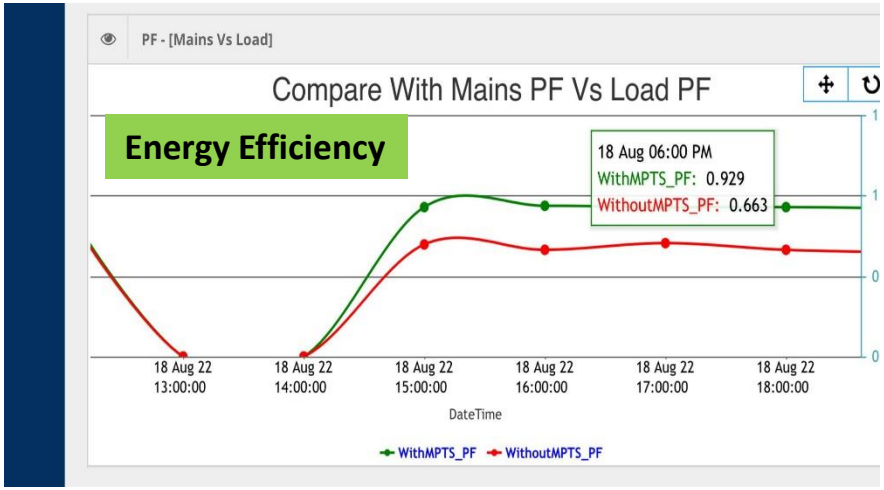
- Graph 1 – Electrical Efficiency with and without the MPTS technology
- Graph 2 – Electrical Demand with and without the MPTS technology.
- Graph 3 - Wasted Electrical Power that is recycled as active energy is between the two lines.

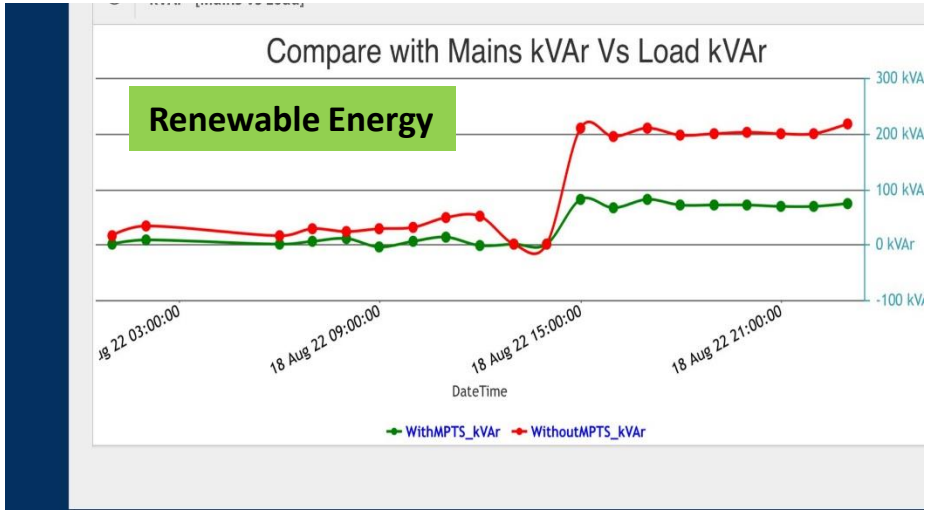


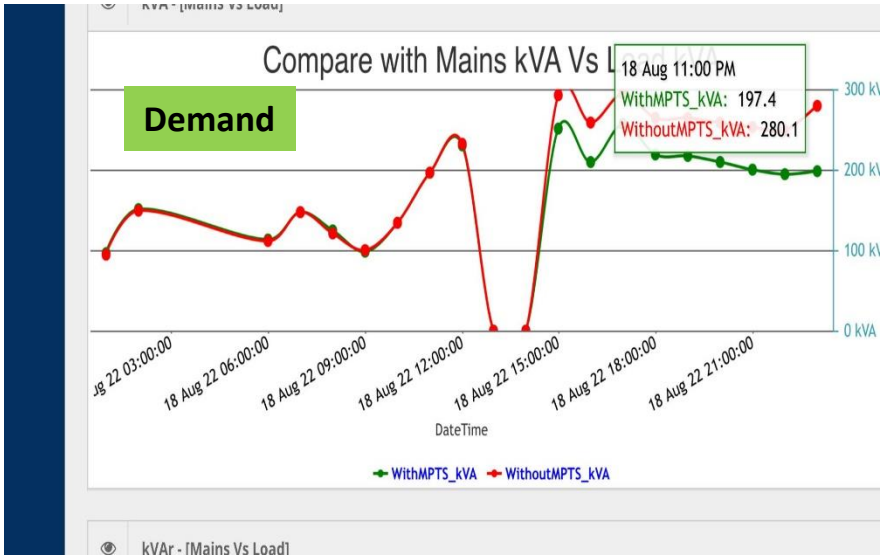
Case Study data below for Prison – 24 Hours application.

- Load Amps and Mains Amps refers to the load of the Prison without MPTS
- Load PF and Mains PF refers to the load of the prison with MPTS

With MPTS - Green Line
Without MPTS - Red Line







MPTS Installed on August 18th, 2022

Case Studies and Actual Performance Data for MPTS are available on request

Thank you !