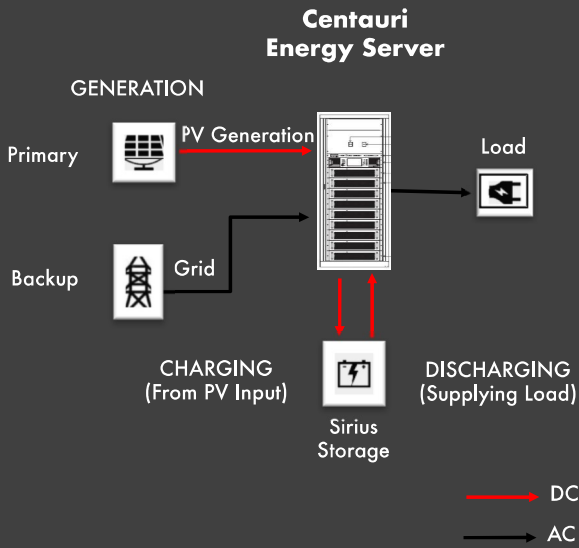


KILOWATT  LABS

Better Energy

**UTILITY OF THE FUTURE**  
**NON-WIRES ALTERNATIVE**

**UTILITY OF THE FUTURE  
"NON-WIRES ALTERNATIVE"**



**How does it work?**

- The utility installs the system (PV, Energy Server, Storage, accessories) at customer site. The system is connected to the grid but operates independently
- PV and storage, managed by the Energy Server, are the primary source of power, supplying 80-100% of daily consumption and handling 100% of peak load
- The grid connection remains in place as the backup source, and is connected to the Server. Allocation from the grid is reduced to 15% of customer load
- The Server uses grid power to charge energy storage on low PV generation days or high consumption days. At all times peak load is handled by the system (and no longer on the grid)
- In case of grid outage, the customer is not impacted. In the event of system failure, the grid is available to supply 15% power and operate critical functions of the customer, until the system is fixed
- The utility can offer the customer the ability to feed-in during periods of low consumption (weekends / vacation periods)

## UTILITY OF THE FUTURE "NON-WIRES ALTERNATIVE"



### How does the grid benefit?

Assume (per home): Load: 5kW; Consumption: 11,000kWh/year; PV: 8kW

For every 1000 homes migrated to the system, the grid:

- Permanently relieves congestion by reducing demand by 8-9GWh/year
- Allows the utility to better manage transmission and sub-station capacity
- Permanently eliminates expensive peaker plant / ancillary resources by reducing peak demand by 5MW
- Permanently eliminates GHG emissions by removing 1.5MW of fossil fuel generation
- Permanently adds 8MW of renewable generation (for RPS)

## UTILITY OF THE FUTURE "NON-WIRES ALTERNATIVE"



### What are the financial benefits to the grid?

Assume (per home): Load: 5kW; Consumption: 11,000kWh/year; PV: 8kW

By migrating customers to the system:

- Without changing tariffs, allows utility to earn unlevered IRR on capital in-line with, or better than, regulated returns (in most cases)
- Reduces costs by eliminating subsidy-based programs (NEM, DR)
- Reduces costs of maintenance associated with "poles + wires"
- Optimizes capital allocation from long-term forecast-based to near-term demand-based
- Defers investments in generation, transmission and distribution to relieve congestion
- Invests in a long term asset with predictable life and performance (25 yr)

In addition, it enables the utility to diversify its revenue sources by enabling it to offer a "non-wires alternative" to diesel-based systems in remote sites such as mining, agriculture, military bases.

It also enables the utility to catalyze revenue growth by enabling immediate response to customer demand in congested sub-station locations

**UTILITY OF THE FUTURE  
"NON-WIRES ALTERNATIVE"**



**How does the customer benefit?**

- Uses electricity from clean sources (contributing to climate change mitigation)
- Establishes a fixed price system over the long term (financially beneficial)
- Is not affected by grid disruptions (continuity, resilience)
- C&I customers have the ability to add load quickly in line with their business expansion (economic benefits, job creation)

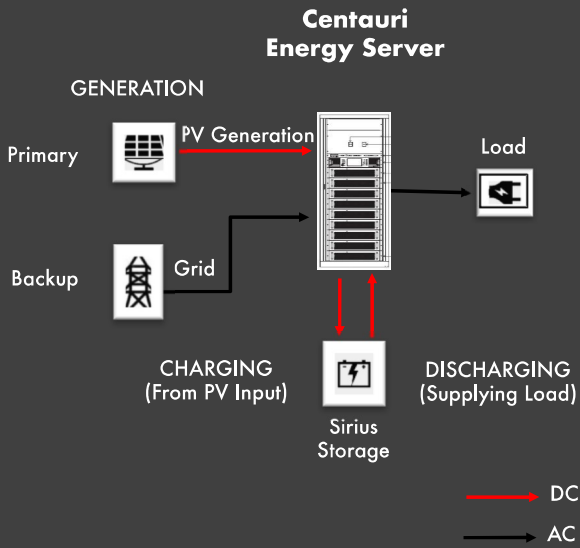
**UTILITY OF THE FUTURE  
"NON-WIRES ALTERNATIVE"**



**What stakeholders continue to benefit?**

- Equipment vendors
- PV panel manufacturers
- Storage manufacturers
- Installers / EPC's
- Distributors
- Regulators
- Government

**UTILITY OF THE FUTURE**  
**"NON-WIRES ALTERNATIVE"**



**The non-wires alternative only works if:**

- The power electronics have the functionality to manage the inputs, storage and output, independently, and without the need for grid support
- The utility is responsible for installing, owning and managing the system (PV, Energy Server, Storage, accessories)
- PV and storage, managed by the Energy Server, are the primary source of power
- The grid connection is in place as a backup source, connected to the Server and is used to charge energy storage on low PV generation days or high consumption days
- The peak load is handled by the system and never by the grid