



ECOTECH7

THERMAL ENERGY SYSTEMS

Hybrid Thermal Electric Energy Storage System

Bridging the Energy Gap by capturing/utilizing waste heat from any industry

"Efficiency | Independence | Innovation"

Meeting the Energy Challenge

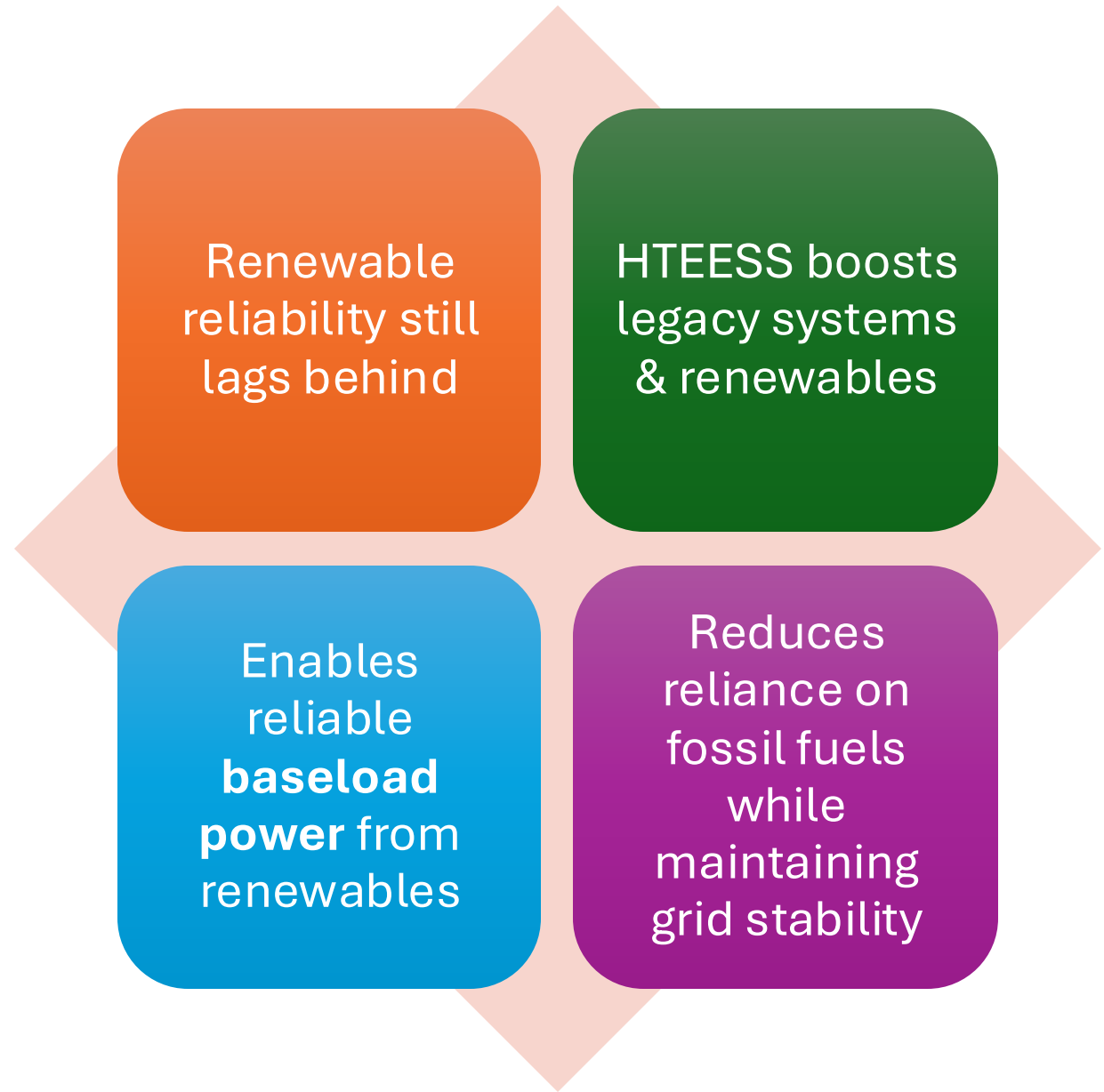
Global energy/electricity demand is rapidly growing

Industry can utilize only around 35% of the useful heat/energy available

Ecotech 7 is solving this with unique innovative hybrid energy systems

Improved efficiency, waste heat utilization, environment friendly and reduced grid reliance

Supporting the Renewable Transition



BRIDGING THE GAP: Core Technology

**HTEESS = Hybrid Thermal Electric Energy
Storage System**

Stores energy from heat or electricity

Delivers heat and/or electric output

Sits closer to end users, accelerating grid relief

Improved efficiency, waste heat utilization,
environment friendly and reduced grid reliance

Paradigm shift



A dynamic system with a wide range of operating parameters that can save fuel and increase system output at levels not previously seen.

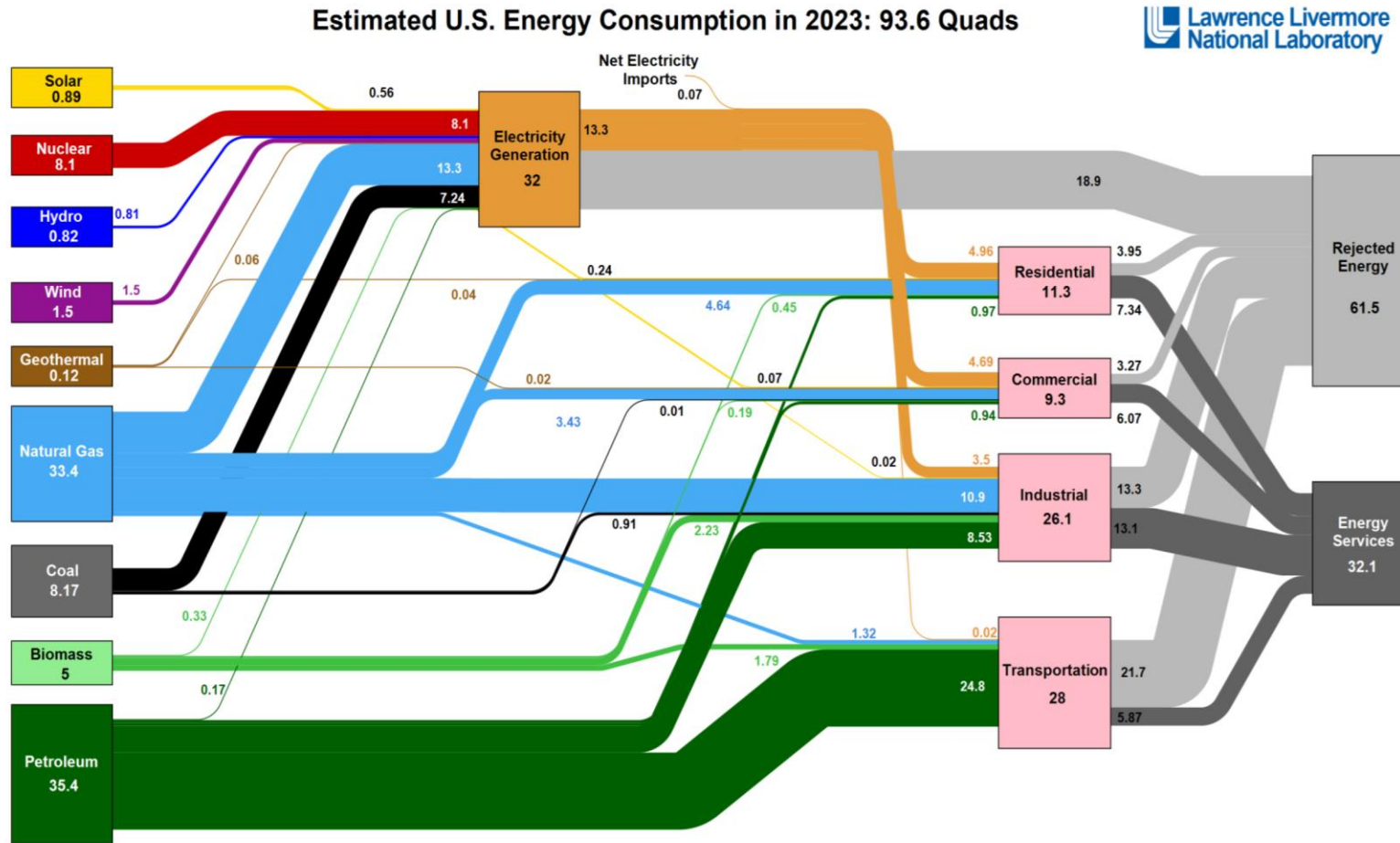


There is no other sector of business that can or does accept this level of loss and inefficiency. This loss represents as much as 4 to 5 trillion US dollars of capital loss annually.



As much as \$0.65 of every dollar spent on energy is wasted due to thermal energy losses.

Thermal Energy Utilization



- The light gray area represents our fuel source.
- As much as 65 % of all energy sold and consumed is rejected as wasted heat
- Losses of this magnitude are not accepted in any other area of business

Source: LLNL October, 2024. Data is based on DOE/EIA SEDS (2024). If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports consumption of renewable resources (i.e., hydro, wind, geothermal and solar) for electricity in BTU-equivalent values by assuming a typical fossil fuel plant heat rate. The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 65% for the residential sector, 65% for the commercial sector, 49% for the industrial sector, and, 21% for the transportation sector. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527

Thermal Energy Utilization



The HTEESS technology can absorb thermal energy from heat sources ranging from -40F to 450F and beyond, store it and re-deploy it in the form of low heat, high heat and/or grid synchronized electric energy.



Huge increases in demand for such things as electrification of transportation, AI, cyber coin production and cloud storage, is already putting a strain on power systems like never before. Our technology, HTEESS, reduces dependence on fossil fuel based power plants, and increases capacity to meet the higher demand for electrical power

Thermal Energy Utilization



Thermal energy can be received from almost any source including but not limited to geothermal resources, solar energy, and waste heat.



Geothermal energy is abundant around the world but due to mid and low levels of energy in many regions, it is not always feasible or economically practical using traditional methods.



Solar is abundant in most areas of the globe, but the timing of the solar day does not sync well with the peak demand of the grid.

Thermal Energy Utilization



Wind is a strong potential resource, but the unpredictable and intermittent nature requires a robust storage capability to make it a truly viable option.



Waste energy is often captured and used but requires high temperatures at high volume to be of any significant use at all.



The wide range of operating availability of the Hybrid system's storage capability allows for more versatility and when coupled with these resources, unlocks useful potential that can be deployed in a manner that is favorable to grid timing. As a result, HTEESS improves operational efficiency and consequently economic performance.

Thermal Energy Utilization

- Existing geothermal, solar, wind, and waste heat resources can be collected making the technology currently in place, operate at higher levels of efficiency. By collecting the heat produced by each of them, operating efficiencies are increased, and parasitic loads are reduced. Redirecting that stored energy to be used at a time when it can be deployed as an energy product, to reduce demand, and significantly improve OPEX with minimal impact on CAPEX.

THERMAL SOURCES & INTEGRATION: Compatibility



Benefits:

- Efficient use of *otherwise lost energy*
- Grid-aligned deployment
- Improved OPEX with minimal CAPEX

GEOHERMAL: Harvesting Subsurface Heat



CAPTURES BRINE HEAT
AFTER STEAM CYCLE



ADDS BASELOAD
CAPACITY



MINIMAL
ENVIRONMENTAL IMPACT



ENHANCES REINJECTION
PROCESS

PV SOLAR: Cooling + Power Output Boost

- Solar efficiency drops with heat
- Hybrid system cools panels
- Stores thermal energy
- Extends lifespan & increases generation



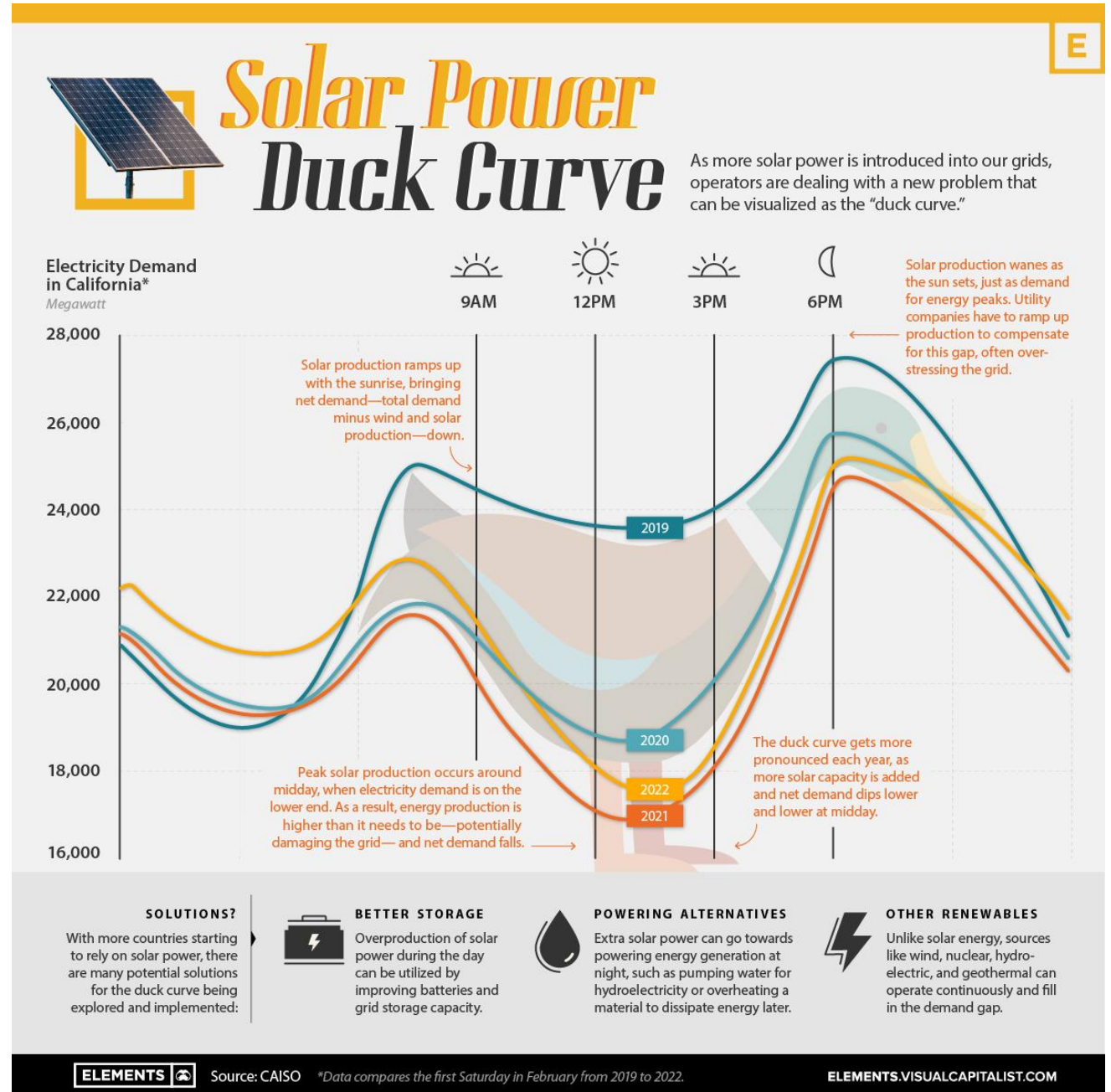
CSP ADVANTAGE: Concentrated Solar Power

- 90% efficiency vs 20% in PV
- Smaller footprint
- HTEESS stores and redistributes CSP heat
- Ideal for off-grid or remote zones



DUCK CURVE: The Solar Challenge

- Demand ramps up as solar tapers off
- Known as the "**Duck Curve**"
- HTEESS aligns solar with grid timing



HTEESS ADVANTAGE: Simultaneous Charge + Discharge

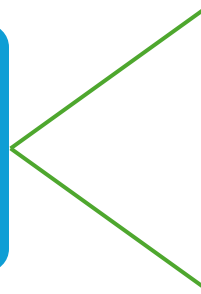
Batteries can only
charge or
discharge

HTEESS does
both:

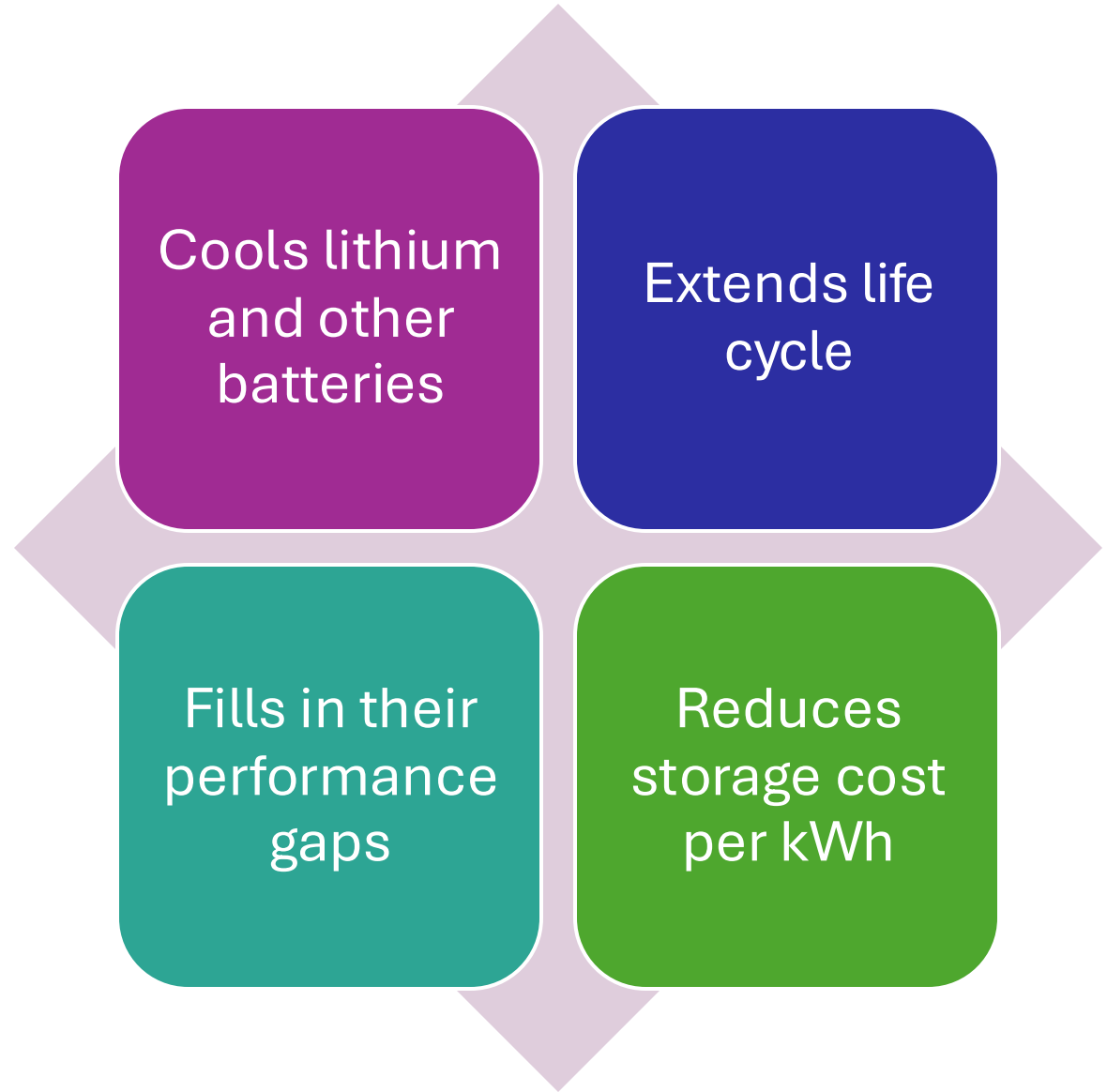
Smooths volatility
in generation and
demand

Charge (thermal
or electric)

Discharge
simultaneously



BATTERY ENHANCEMENT: Boosting Battery Life & Performance



HTEESS SYSTEM CONFIGURATION

100kW Units

**1MW Thermal to Thermal
Units: 1 unit**

**1MW Thermal to electric:
2 units**

* Modular * No toxic materials * Scalable to site needs
* Safe and low-pressure * Small footprint



WHY ECOTECH7: Your Strategic Energy Partner

- Solves today's energy gaps, not just tomorrow's
- Versatile applications across sectors
- Global scalability
- ROI via OPEX reduction + new revenue streams
- ROI : 3-5 yrs
- **Financing / Capex options available**
 - **Energy as a Service model**
 - **Leasing and lease purchase**
 - **Traditional Financing options**



LET'S BUILD THE FUTURE OF ENERGY TOGETHER

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