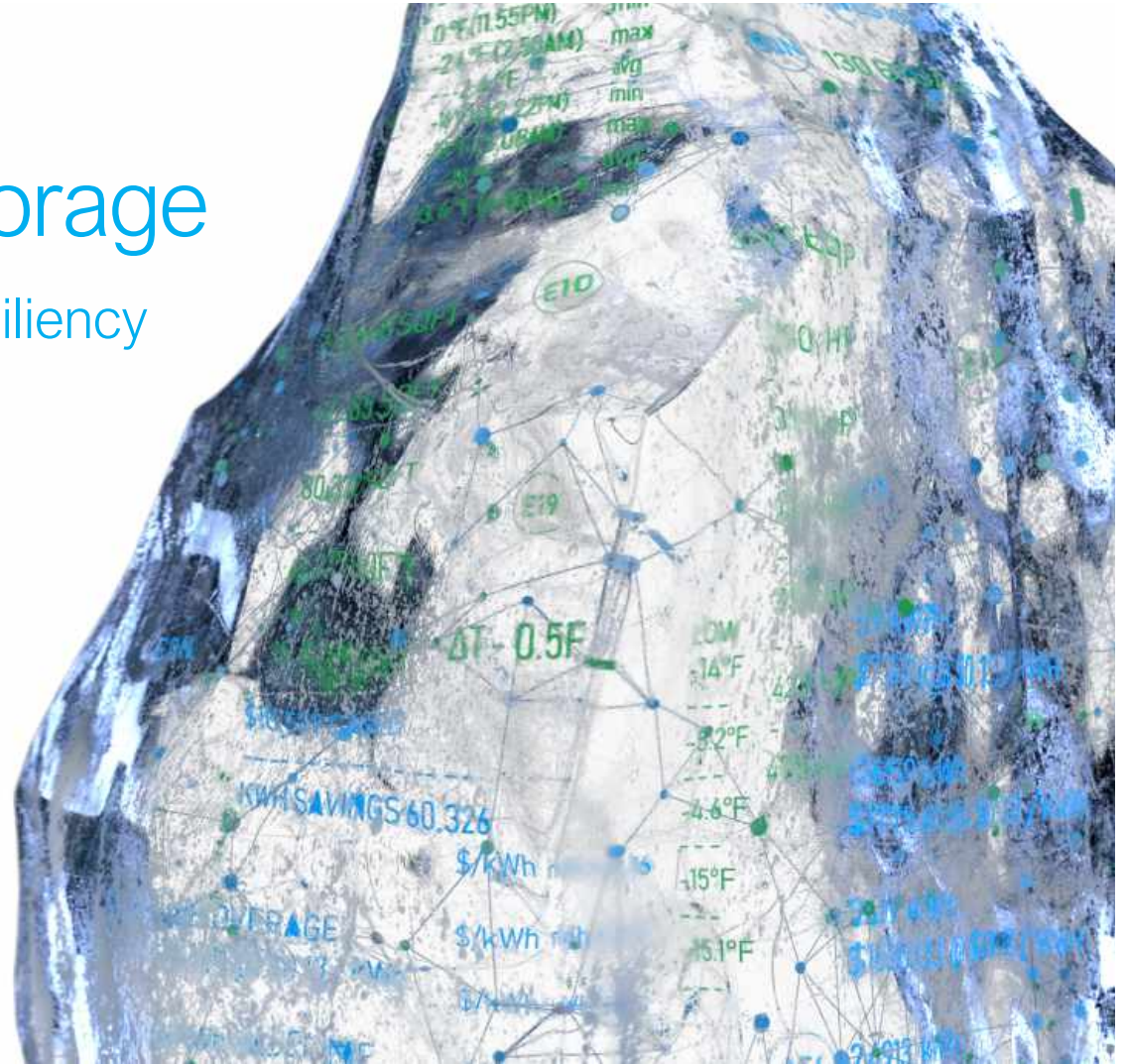


Intelligent Thermal Energy Storage

Long-Duration | Efficiency | Resiliency



Commercial & Industrial TES Applications

Energy Usage
OF THE GLOBAL COLD CHAIN

1ST HIGHEST DEMAND
of ANY industrial category per ft³

3RD HIGHEST CONSUMING
utility category

Temperature controlled
food costs over \$40B
in energy annually.



Temperature Controlled TES Facilities



- ▶ Compatible with any refrigerant
- ▶ 150 to 200,000+ ft²
- ▶ -20° to 32° Fahrenheit
- ▶ Continuous refrigeration 24 hours/day
- ▶ 5 kW to 2+ MW per installation



TES Absorbs & Consolidates Heat



Utility-Sponsored TES Cold Storage Program

- ▶ Four-hour targeted window
- ▶ 1.3 MW of curtailment
- ▶ 8 Customer installations
 - Largest foodservice distributor (Sysco)
 - Largest cold storage 3PL (Americold)
 - Food processors
 - Greater Boston Food Bank
- ▶ Average facility ~50,000 ft²
- ▶ Largest facility 157,000 ft²
- ▶ Average install period: 127 days from agreement to commissioning



Levelized Cost Of Energy < 2¢ per kWh

Operational & Maintenance: \$0

- ▶ No mechanical components
- ▶ Uses existing refrigeration system
- ▶ Software updated digitally

20-year+ system life, with no capacity degradation

Round trip efficiency: 100%

Discharge depth: 80%

Discharge length: 2 to 13 hours



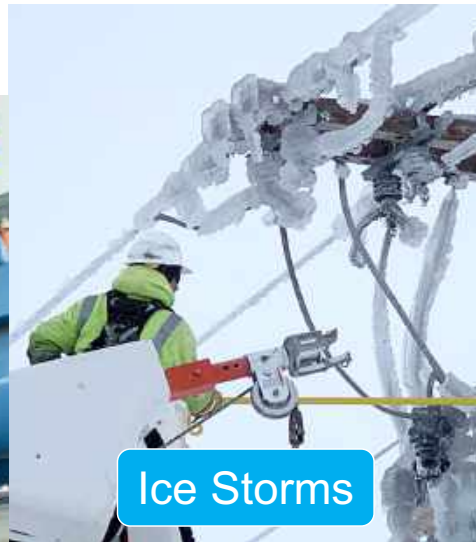
Requires no additional real estate

Improves average efficiency ~25%



TES Resiliency

- ▶ Can work with no grid energy
- ▶ Holds temperatures 3X longer
 - ▶ Power outages & other grid challenges
 - ▶ Natural disasters
 - ▶ Mechanical failures



TES Case Studies



Whole Foods Grocery Freezer - 320 Ft²

- ▶ Study 1: Energy Reduction
 - ▶ 18% Lower net consumption (kWh)
- ▶ Study 2: Peak Period Load Shed
 - ▶ 60% Less equipment run time (minutes)
 - ▶ 85% Targeted demand reduction (kW)
 - ▶ 38% More stable temperatures



Industrial Warehouse - 93,000 Ft²

- ▶ Flywheel on TES 13 hrs/day, 6 days/week
- ▶ 43% Lower net consumption (kWh)
- ▶ 29% Lower peak demand (kW)
- ▶ 50% More stable temperatures



Energy Industry Recognition of TES in 2019



Energy Institute
Technology Innovation Award



Platinum Project of the Year



Technology Pioneer



Top Green Provider



Behind-the-Meter
Technology Finalist



Top Software and
Technology Provider

vikingcold.com



Energy Storage + Efficiency

No additional real estate

No roundtrip energy loss

Long-Duration: 13-Hour Discharge

LCOE < 2¢ per kWh Zero maintenance

Improved temperature stability

20+ year system life No additional energy required

Easy retrofit installation Back-Up Resiliency

High CAPEX participation rate

Questions?

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