



Minimizing Waste
Maximizing Value

Demand Response for Data Centers: *Challenges and Technologies*

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Challenges



Market Wide Challenges

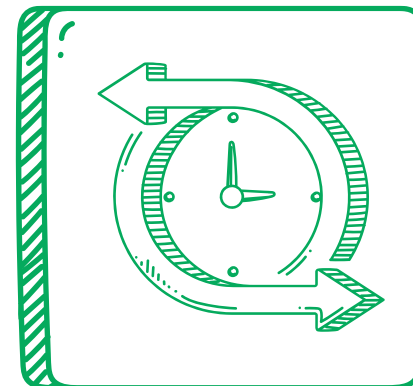
Downtime!!

Capacity



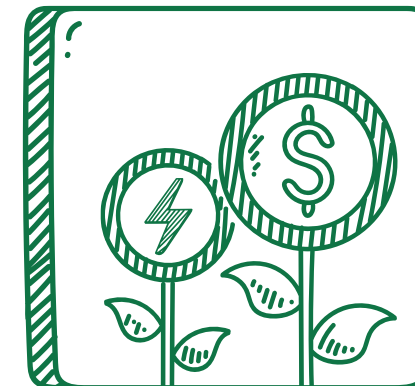
+

Ontime



=

Profitability



Challenges



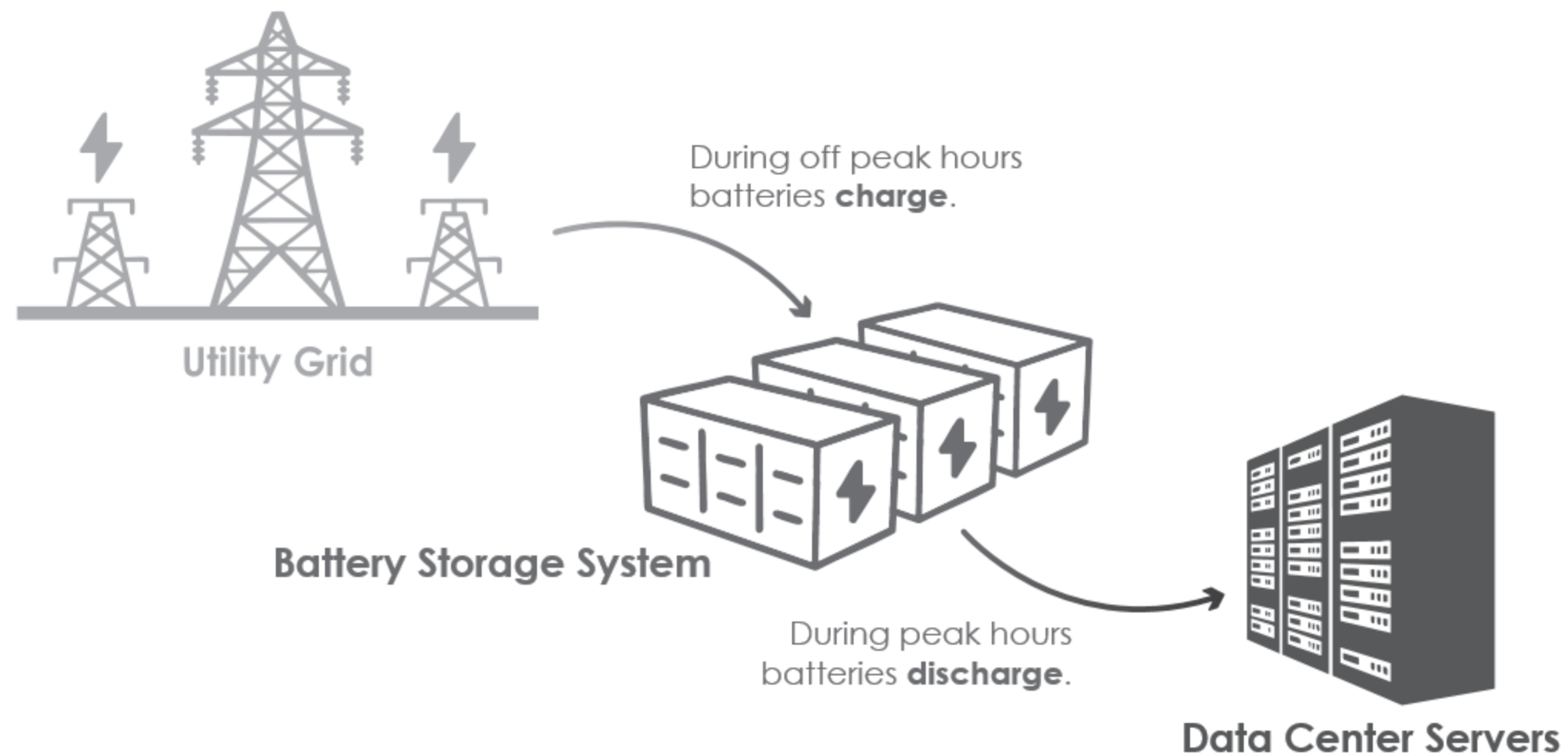
Other Challenges

- **Hyper Competitive Market**
- **Increased Complexity**
- **Ever-Shifting Regulatory Framework**
 - Utility
 - Municipal
 - State
 - Federal

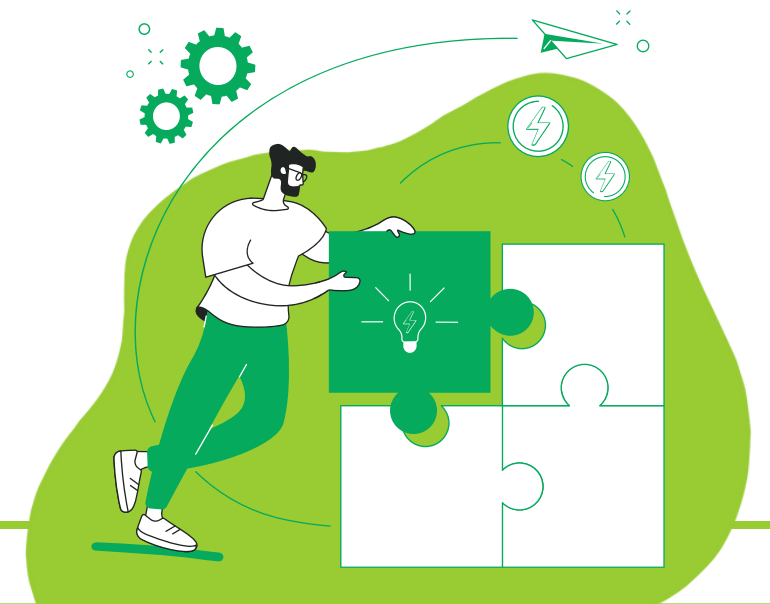


Demand Response - Onsite Storage

Battery Storage



- Keeps it simple
- Allows for uptime to be maintained
- Instantaneous load smoothing



Demand Response - Load Shifting

Geographic Shifting

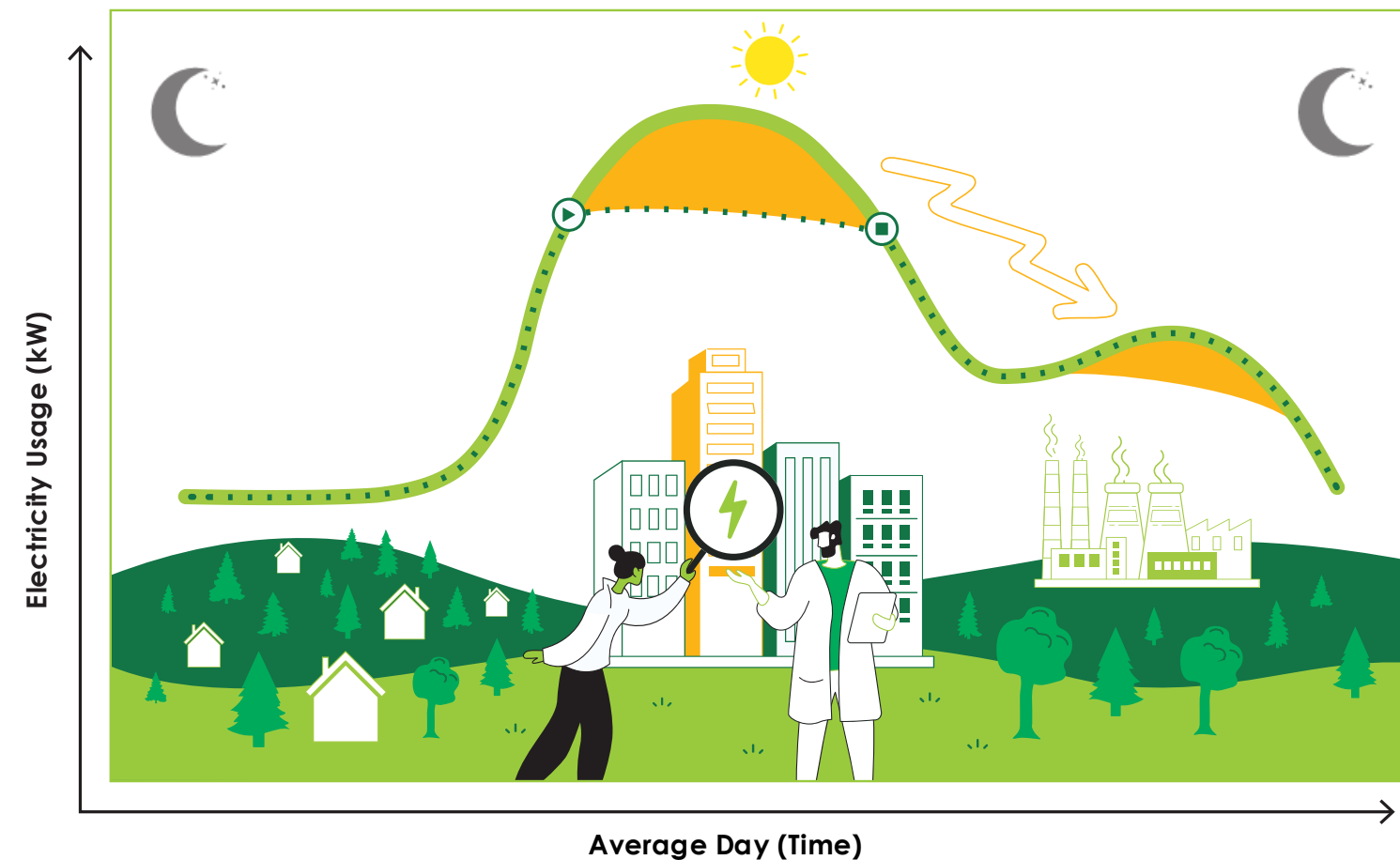


- For large enterprise data centers with national or international infrastructure, tasks can be shifted from high to low demand regions
- Tasks can also be shifted to regions with more available renewables in real time



Demand Response - Load Shifting

Time of Day Shifting



KEY			
	Normal Usage		Electric Usage with DR
	DR Demand Event (start & stop)		Load Shift (kW saved)

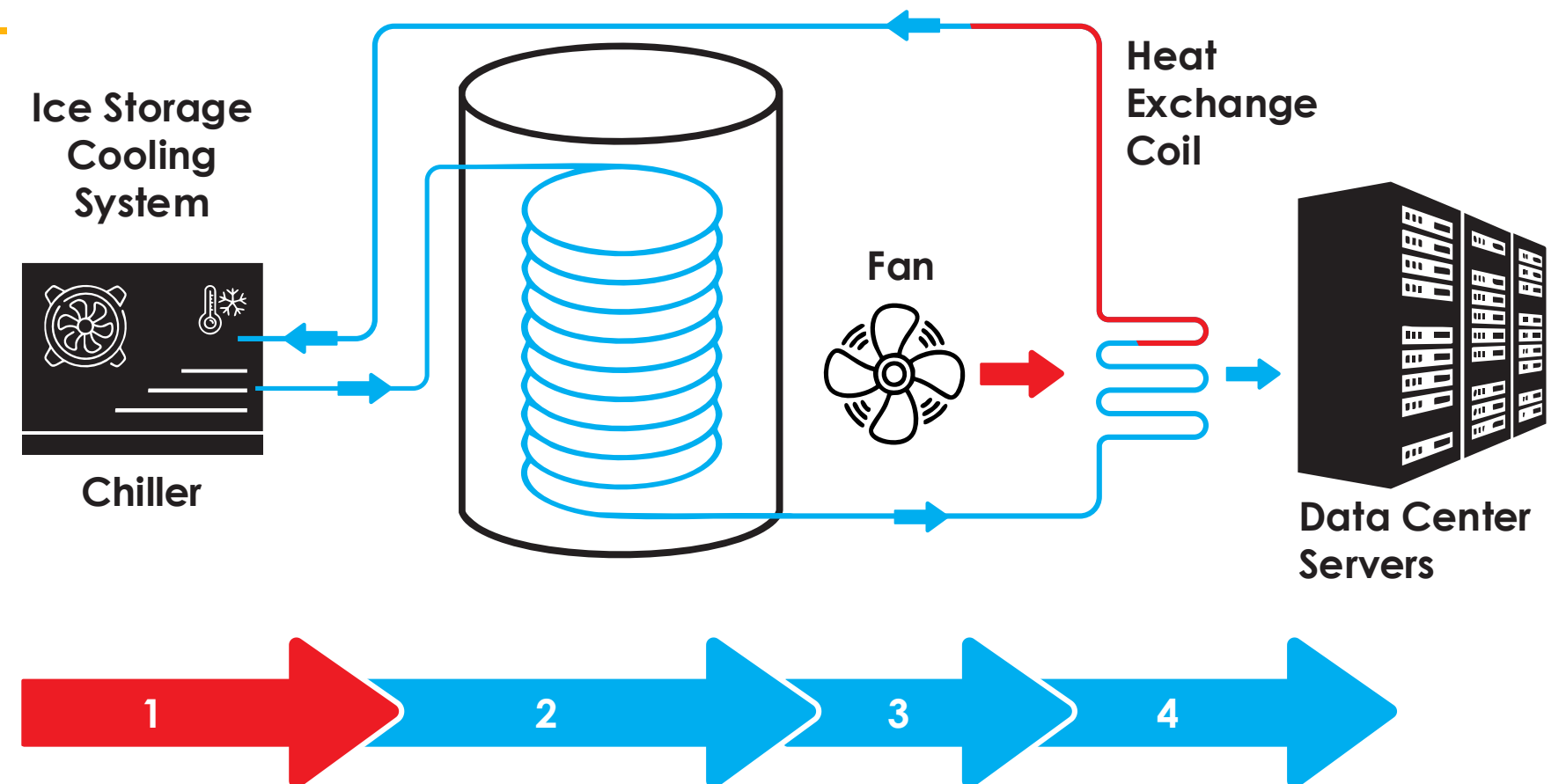
- High demand AI processes can be scheduled to run at night
- Can use AI to monitor and shift tasks and make an ideal schedule
- Batch jobs
- Model runs

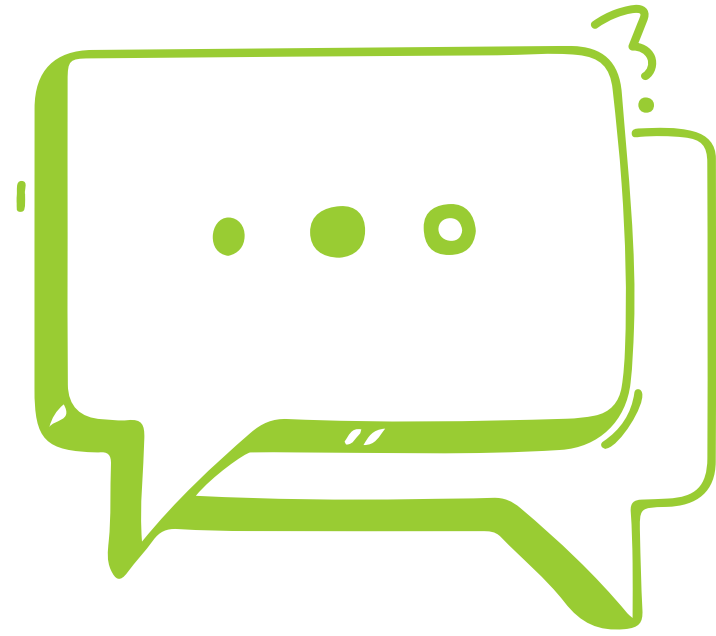


Demand Response - Onsite Storage

Thermal Energy Storage

- Allows for load shifting during peak without switching power supplies so no danger of dropping load
- Doesn't require a separate fuel source





Any Questions?

