

LegacyGrid AI

Energy Stack - 13 System Diagrams

BESS · Waterless Cooling · Heat Recovery · AI Workload Scheduling · Community Resilience · Workforce Training

Working Concept - June 2025 | Subject to Revision as the Model Evolves

00 - Master Energy Stack Overview

02 - Grid Protection

04 - Energy Arbitrage

06 - AI Workload Scheduling

08 - Capture Data Center Heat

10 - Steam + Electricity Recovery

12 - Integrated Energy Ecosystem

01 - Peak Shaving

03 - Outage Ride-Through

05 - Community Resilience Reserve

07 - Student Training + Replication

09 - Reuse Heat First

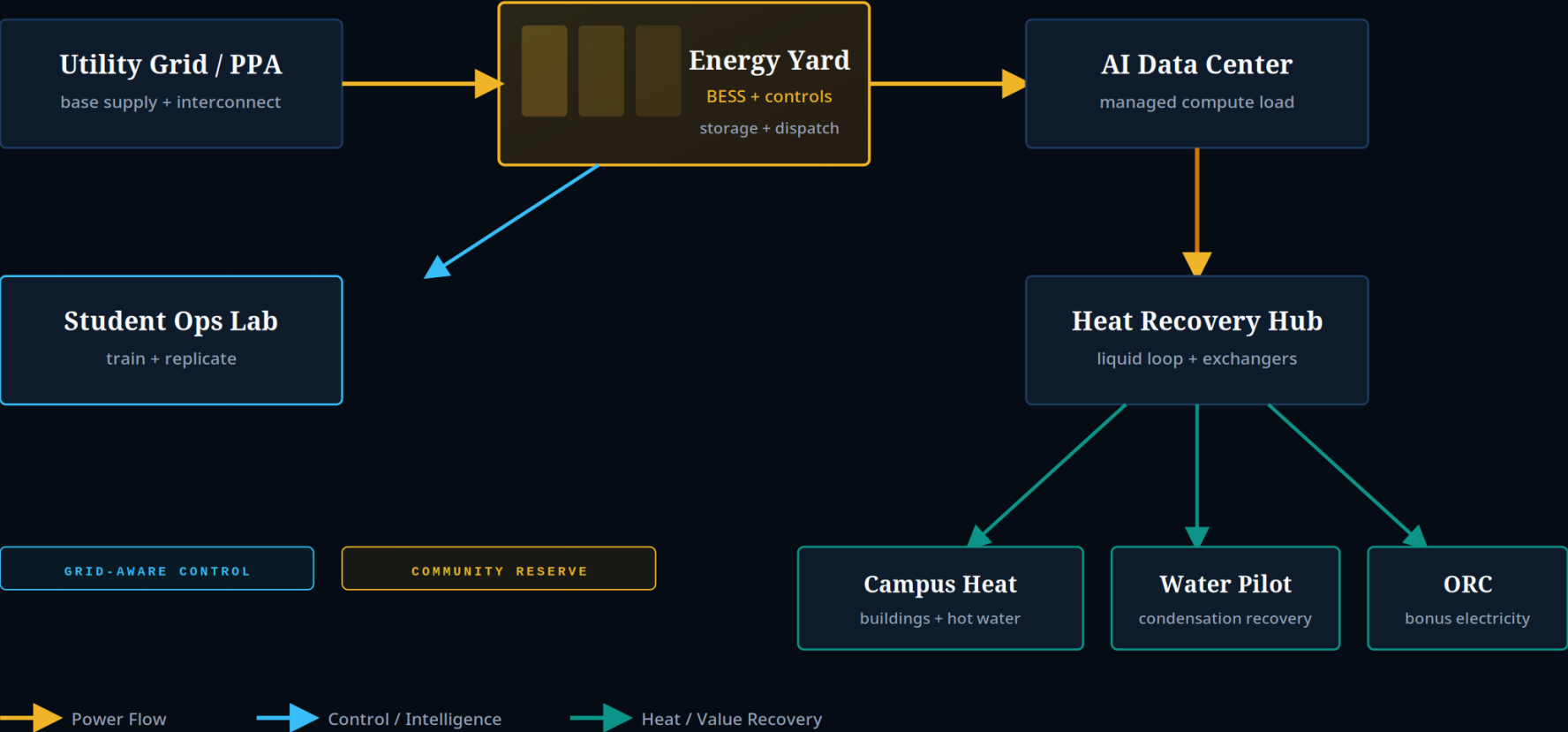
11 - Water Recovery + Condensation

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Master Energy Stack

Earth-based AI infrastructure that manages power in and captures value out.

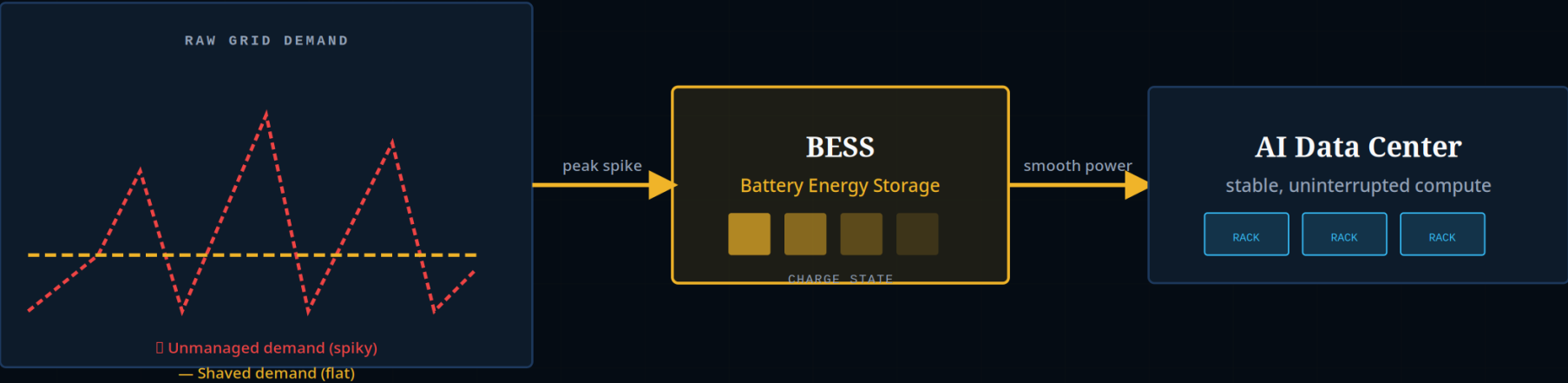
MASTER SYSTEM



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01 — Peak Shaving

Battery absorbs demand spikes — utility sees a flat, predictable load.



Key Outcome

BESS absorbs demand spikes in real time — the utility sees a flat, predictable load. Lower demand charges. Reduced grid stress.



Power / Dispatch



Unmanaged Demand

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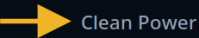
02 — Grid Protection

BESS isolates the data center from grid instability — voltage sags, frequency deviations, and surges.



Key Outcome

BESS acts as a power conditioner — the data center never sees what the grid is doing. Uptime is protected regardless of grid quality.



Clean Power

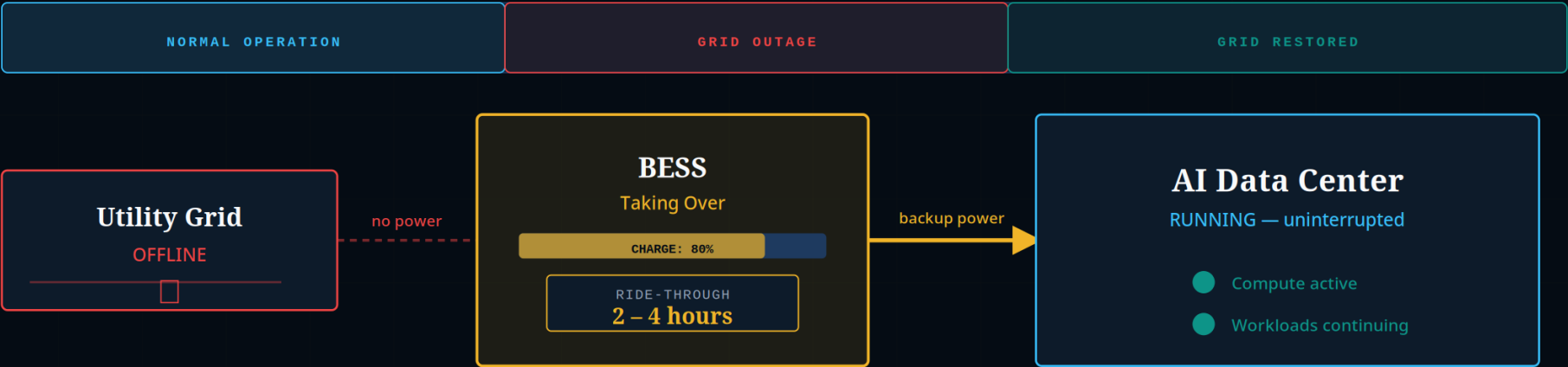


Grid Disturbance (blocked)

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03 — Outage Ride-Through

BESS keeps compute running during grid outages — no interruption to AI workloads.



Key Outcome

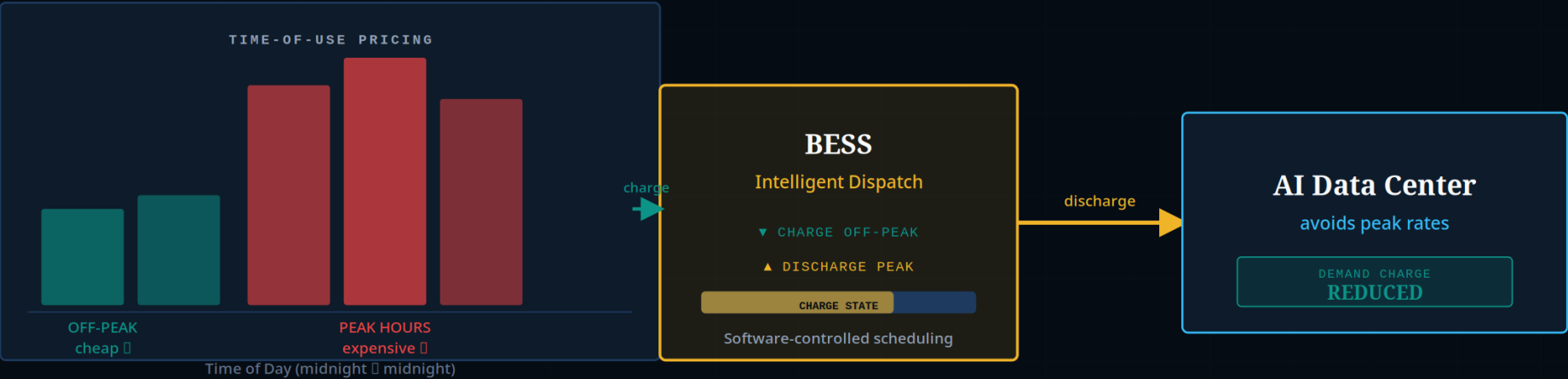
BESS provides 2–4 hours of ride-through at full load. AI workloads continue without interruption. No data loss. No downtime.

➡ BESS Backup Power - - - - Grid Offline

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04 — Energy Arbitrage

Charge BESS when energy is cheap. Discharge when energy is expensive. Buy low, avoid buying high.



Key Outcome

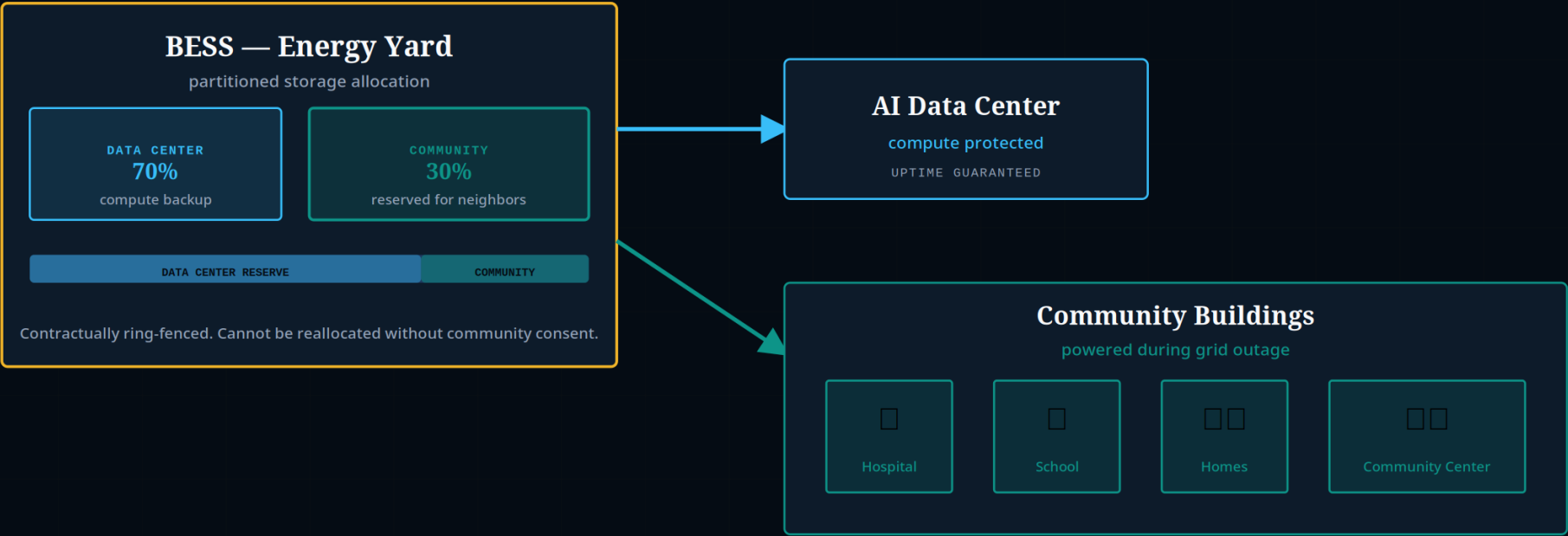
BESS charges during cheap off-peak hours and discharges during expensive peak hours — reducing energy costs and demand charges.

→ Discharge (peak) → Charge (off-peak)

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05 — Community Resilience Reserve

A dedicated partition of BESS storage is reserved for the surrounding community during grid outages.



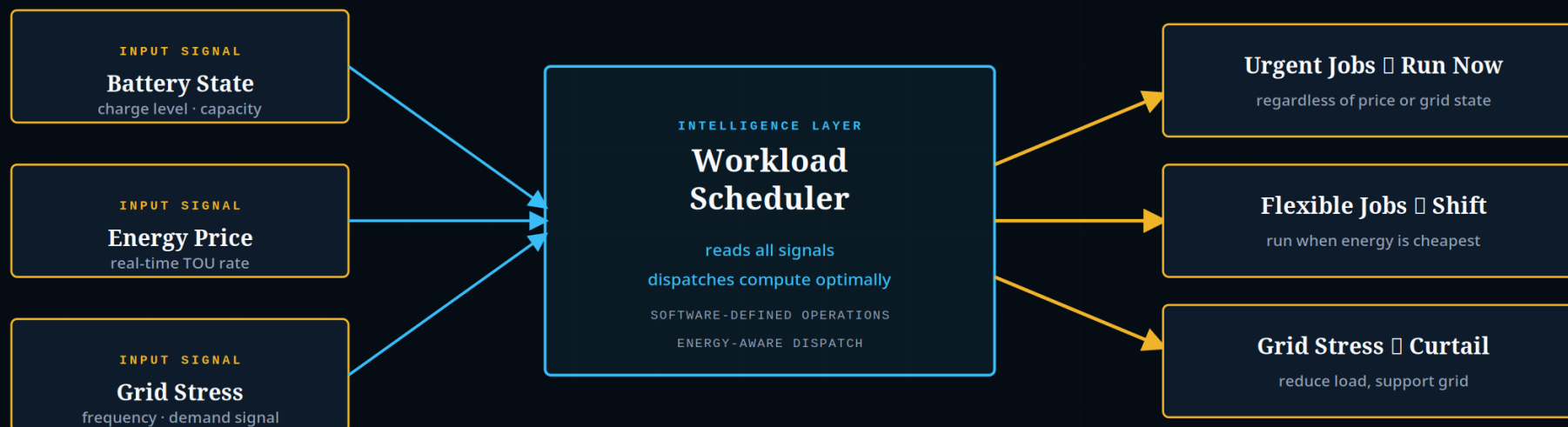
Key Outcome

30% of BESS capacity is contractually reserved for the community — hospitals, schools, and homes stay powered when the grid goes down.

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06 — AI Workload Scheduling

The software layer turns storage into an intelligent operating system — scheduling compute around energy and grid conditions.



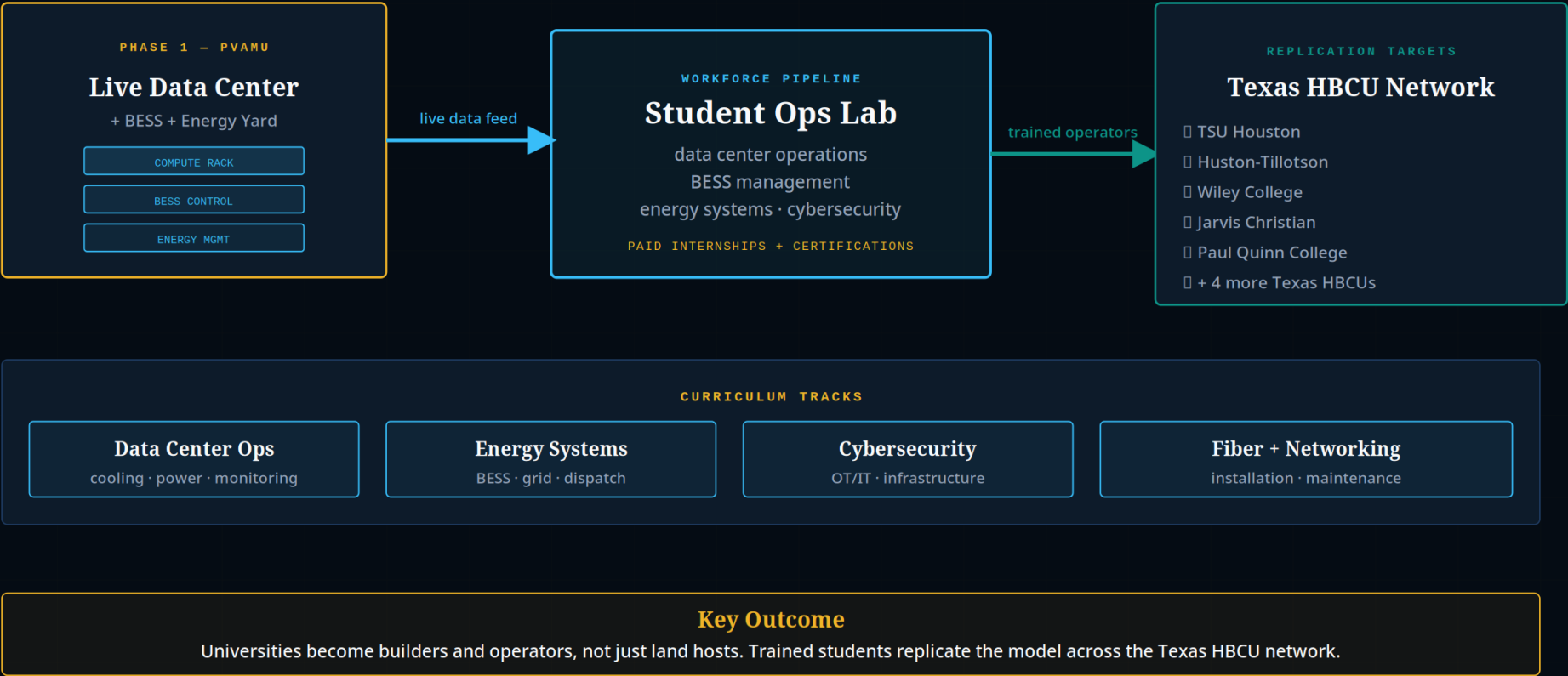
Key Outcome

The software layer is what turns storage into an intelligent operating system — not just a battery, but a grid-aware compute platform.

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07 — Student Training + Replication

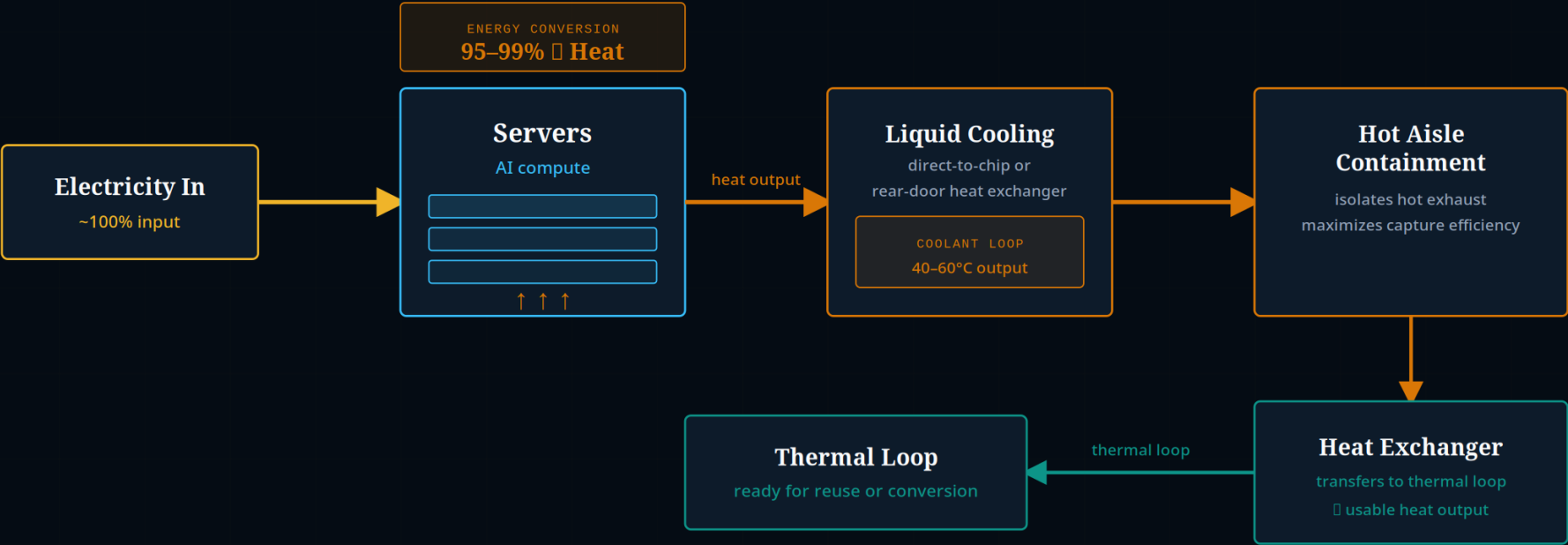
Universities become builders and operators — not just land hosts. Live infrastructure trains the next generation.



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08 — Capture Data Center Heat

Nearly all incoming electrical energy becomes heat. Capture it at the source — before it becomes waste.



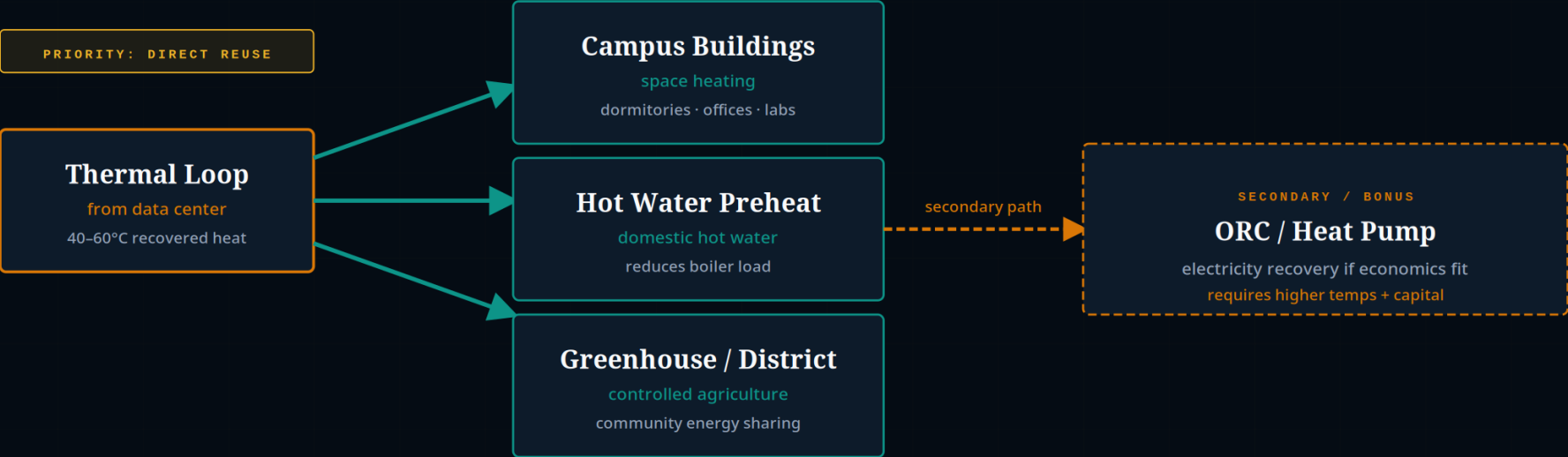
Key Outcome

95-99% of electrical input becomes heat. Liquid cooling + hot aisle containment captures it at the source — turning waste into a recoverable asset.

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09 — Reuse Heat First

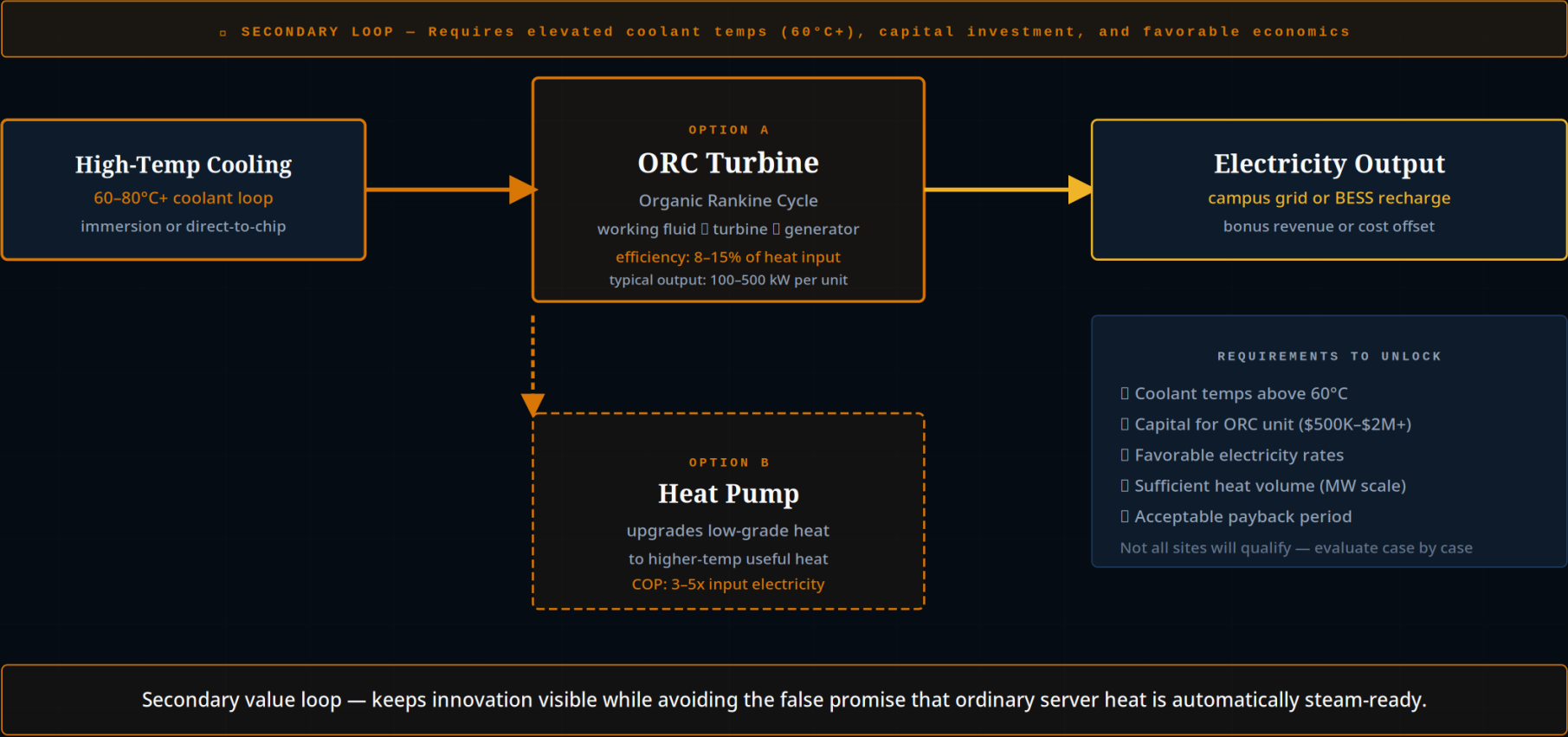
Direct heat reuse is the practical first win. Send recovered heat to useful loads before attempting electricity conversion.



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10 — Steam / Electricity Recovery

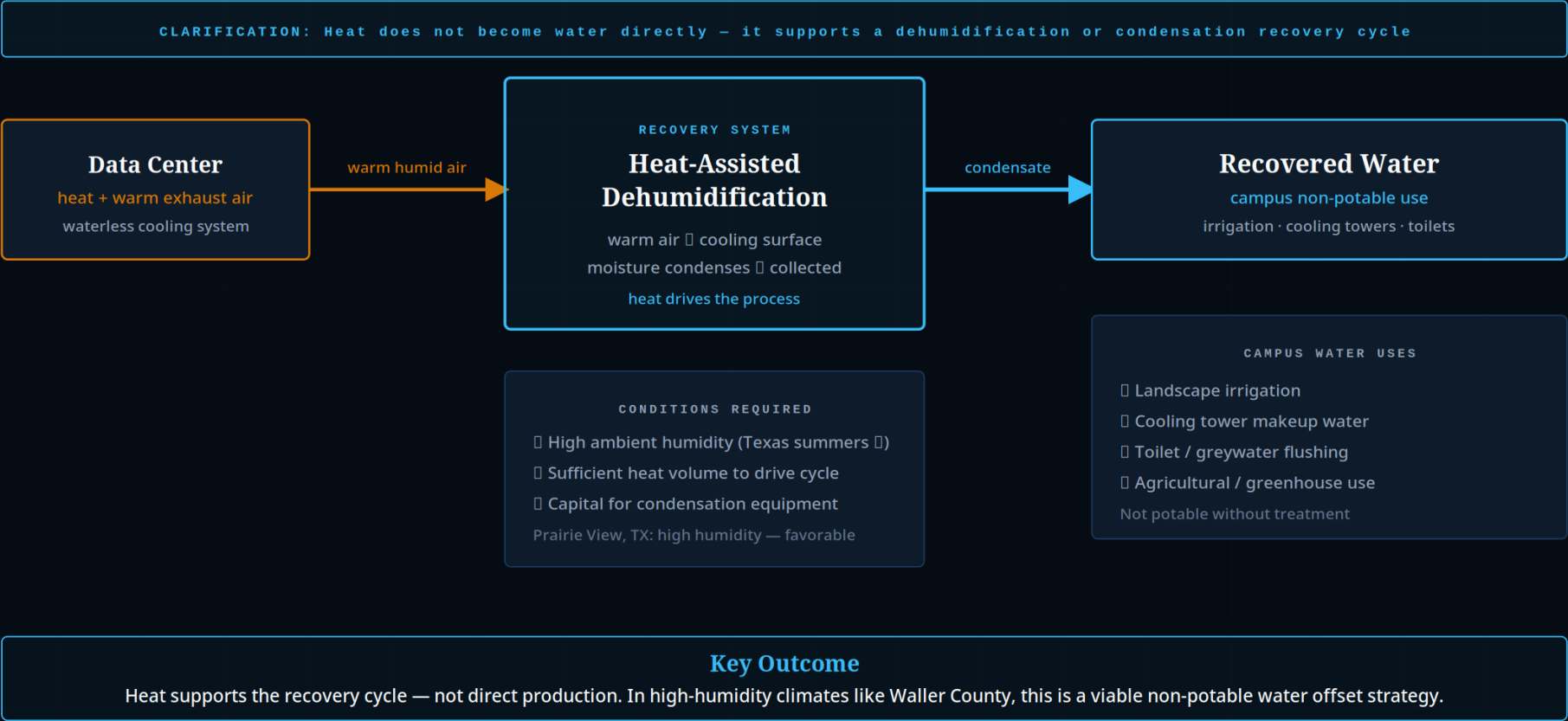
Secondary value loop — ORC and heat pumps convert recovered heat to electricity when conditions are right.



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11 — Water Recovery / Condensation

Heat supports a recovery cycle — not direct water production. Climate, humidity, and economics must align.



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12 — Integrated Energy Ecosystem

LegacyGrid as an integrated campus model — not a single battery idea, but a complete energy operating system.

