J. Craig Venter Institute

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PROJECT OVERVIEW

SITE: 2.03 acres on land leased from UCSD

SIZE: 45,000 SF lab and office constructed atop parking garage

- 12,000 SF wet-lab
- 33,000 SF office/conference

OCCUPANCY: Occupied in November 2013. Supports 125 researchers and staff

DIFFERENTIATORS:

- World's first ZNE wet lab
- Thermal loads 100% managed w/ water
- 0.5MW photovoltaic
- Fully integrated building systems

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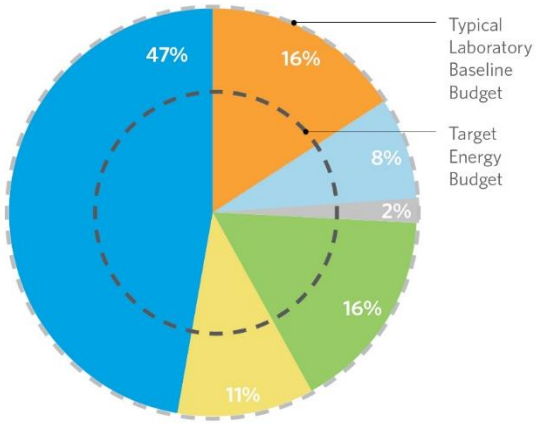
DESIGN CHALLENGE

TYPICAL LAB
BASELINE
ENERGY BUDGET
EUI = 270 kbtu/sf/yr

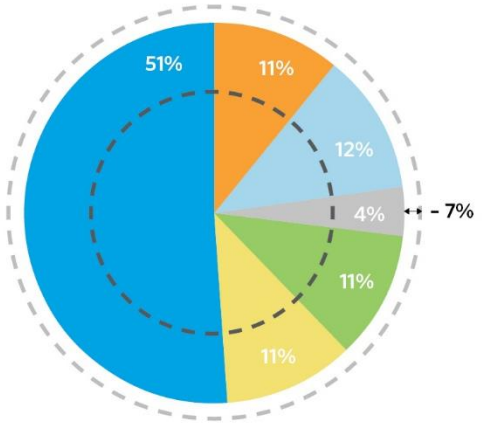
AVAILABLE
ENERGY BUDGET
EUI = 68 kbtu/sf/yr

REDUCE ENERGY
USE BY 75%

TYPICAL LABORATORY

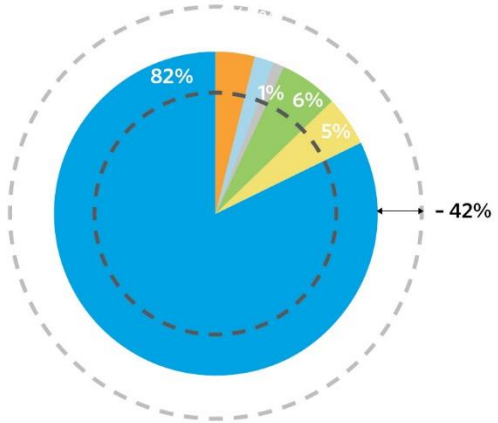


ARCHITECTURE

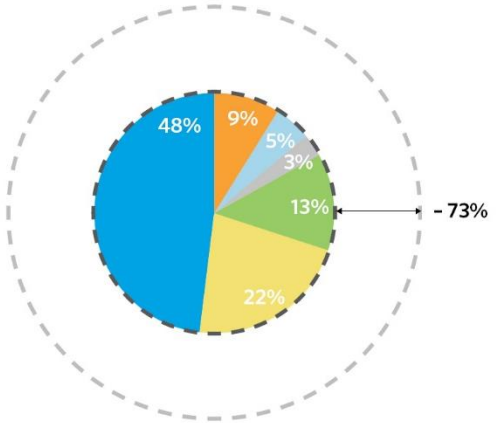


LEGEND

MEP SYSTEMS



PLUG LOADS



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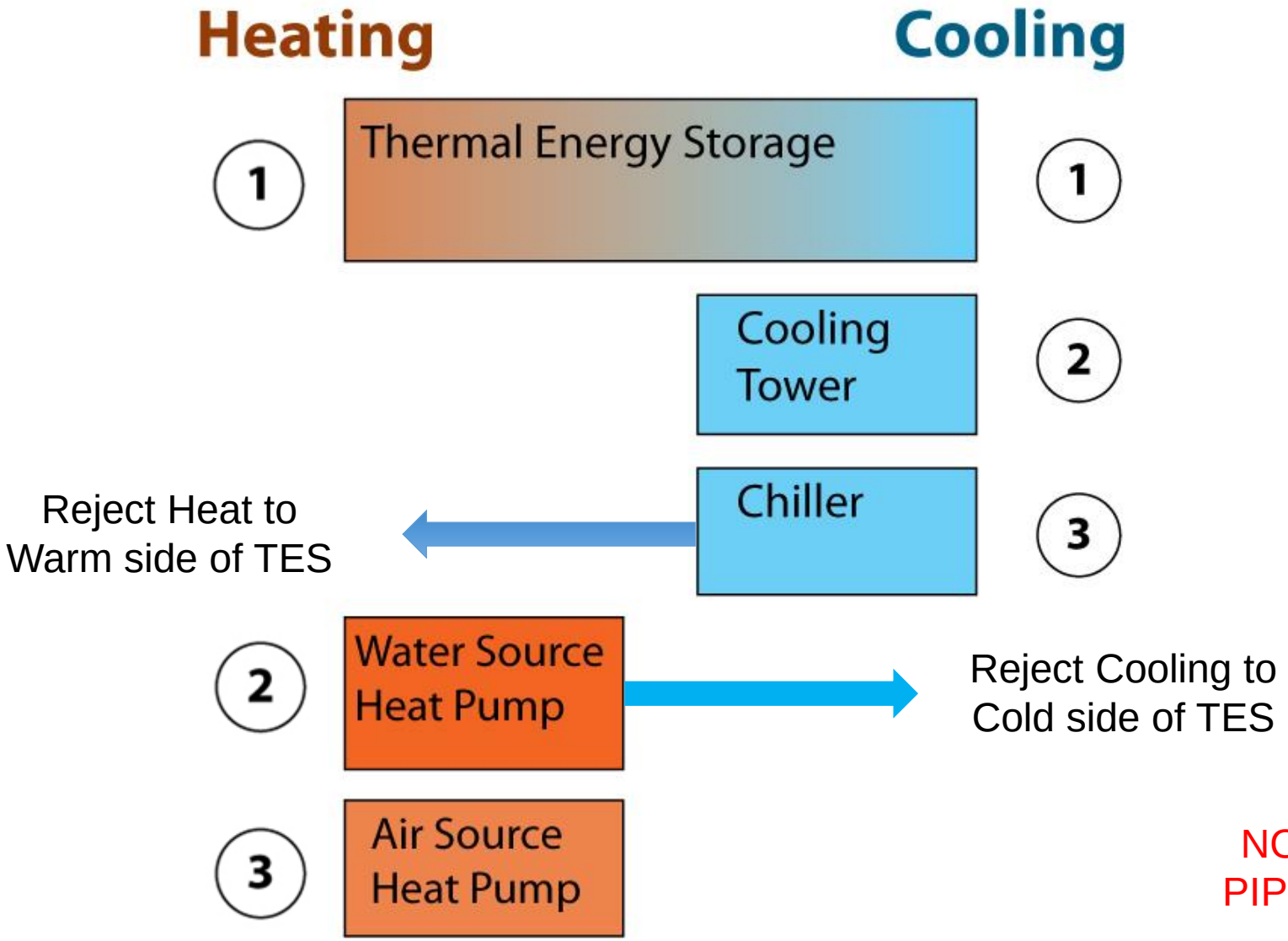
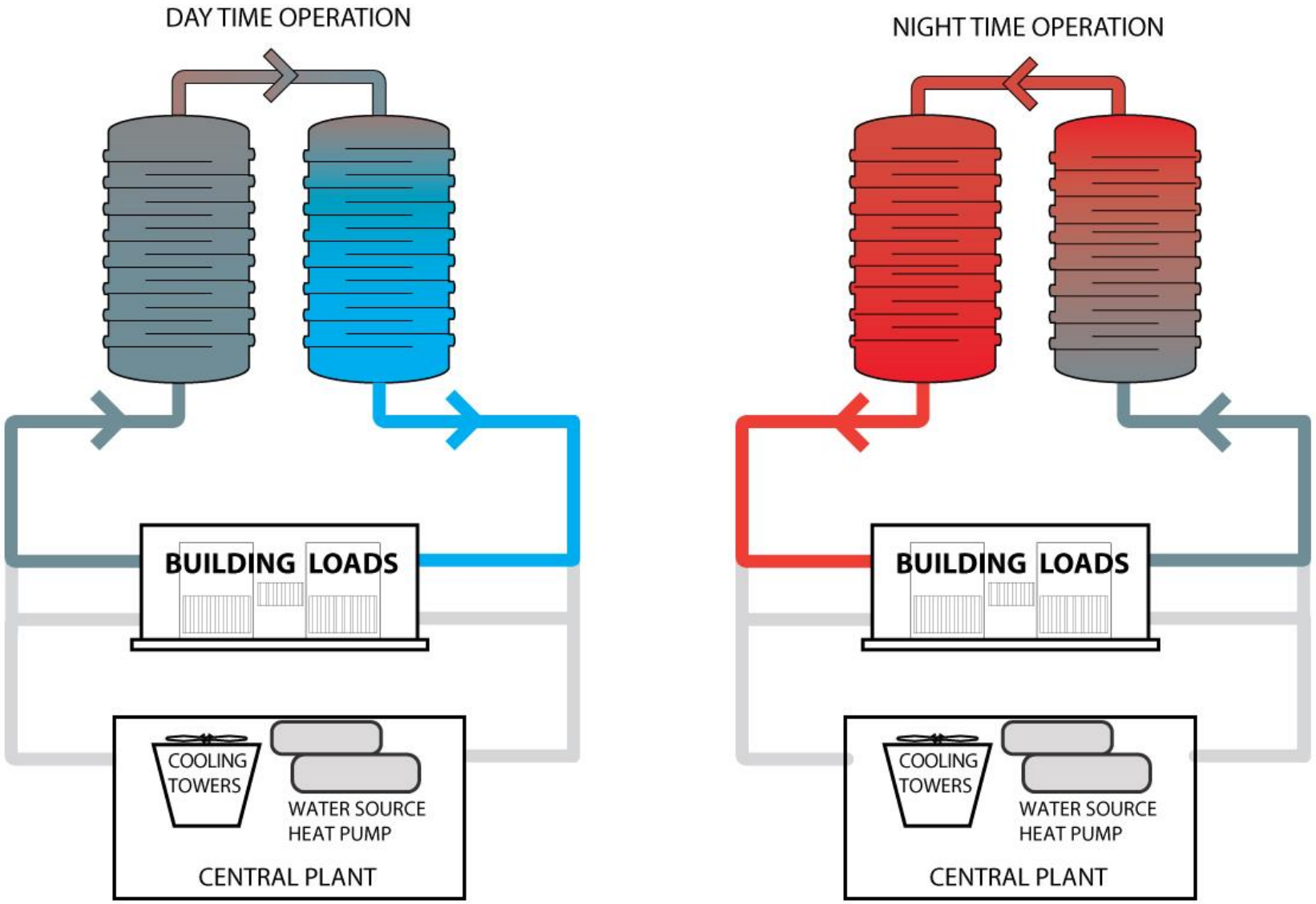
MECHANICAL SYSTEM DESIGN



NO NATURAL GAS
PIPED TO BUILDING

THERMAL ENERGY STORAGE TANKS



MECHANICAL SYSTEM DESIGN: COOLING

Primary Cooling Source

Cooling Tower

- Sized to allow for 4 degree approach temperature to maximize free cooling
- Designed to operate at night to maximize free cooling hours
- Can operate during day if supplemental cooling is needed

MECHANICAL SYSTEM DESIGN: COOLING

Secondary Cooling Source

Water Cooled Chillers

- Sized for heat wave use
- Heat rejected stored in warm side of TES tanks

MECHANICAL SYSTEM DESIGN: HEATING

Primary Heating Source

Water Source Heat Pumps

- Sized for building heating, domestic and industrial water heat loads
- “Cooling” rejected stored in TES tanks

MECHANICAL SYSTEM DESIGN: ENERGY RECOVERY

Energy Recovery Water Cooled -80 C Freezers

- Heat rejected stored in warm side of TES tank
- Fed from cold side of TES tank water, backed up by emergency power

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