UC Davis Path to Carbon Neutrality by 2025

February 28, 2019

UC Davis Overview

- 35k Students
- 23k Faculty & Staff
- 1,000+ Buildings, 180 over 10,000 SF
- 11.3M SF total; 5,300 acres Land
- Founded 1905, Average Building Age: 41 years

Carbon Neutrality Initiative

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Carbon Neutrality Initiative

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UC, a national leader in sustainability, has pledged to become carbon neutral by 2025, becoming the first major university to accomplish this achievement.

Global climate disruption is impacting the planet in ways never experienced in human history. Warmer temperatures are contributing to changing weather patterns that cause more intense storms and heavier rainfall in some places, while elsewhere drought is parching the land. Glaciers are melting at an accelerated rate and oceans are rising.

The overwhelming scientific consensus is that climate change is being driven by the release of carbon dioxide into the atmosphere, primarily from the burning of fossil fuels.

The University of California has responded to this growing environmental crisis with direct action aimed at ending its reliance on fossil fuels.

In November 2013, President Janet Napolitano announced the Carbon Neutrality Initiative, which commits UC to emitting net zero greenhouse gases from its buildings and vehicle fleet by 2025, something no other major university system has done.

The initiative builds on UC's pioneering work on climate research and furthers its leadership on sustainable business practices. UC is improving its energy efficiency, developing new sources of renewable energy and enacting a range of related strategies to cut carbon emissions.

"We are the University of California, and there is no reason that UC can't lead the world in this quest, as it has in so many others."

— UC President Janet Napolitano

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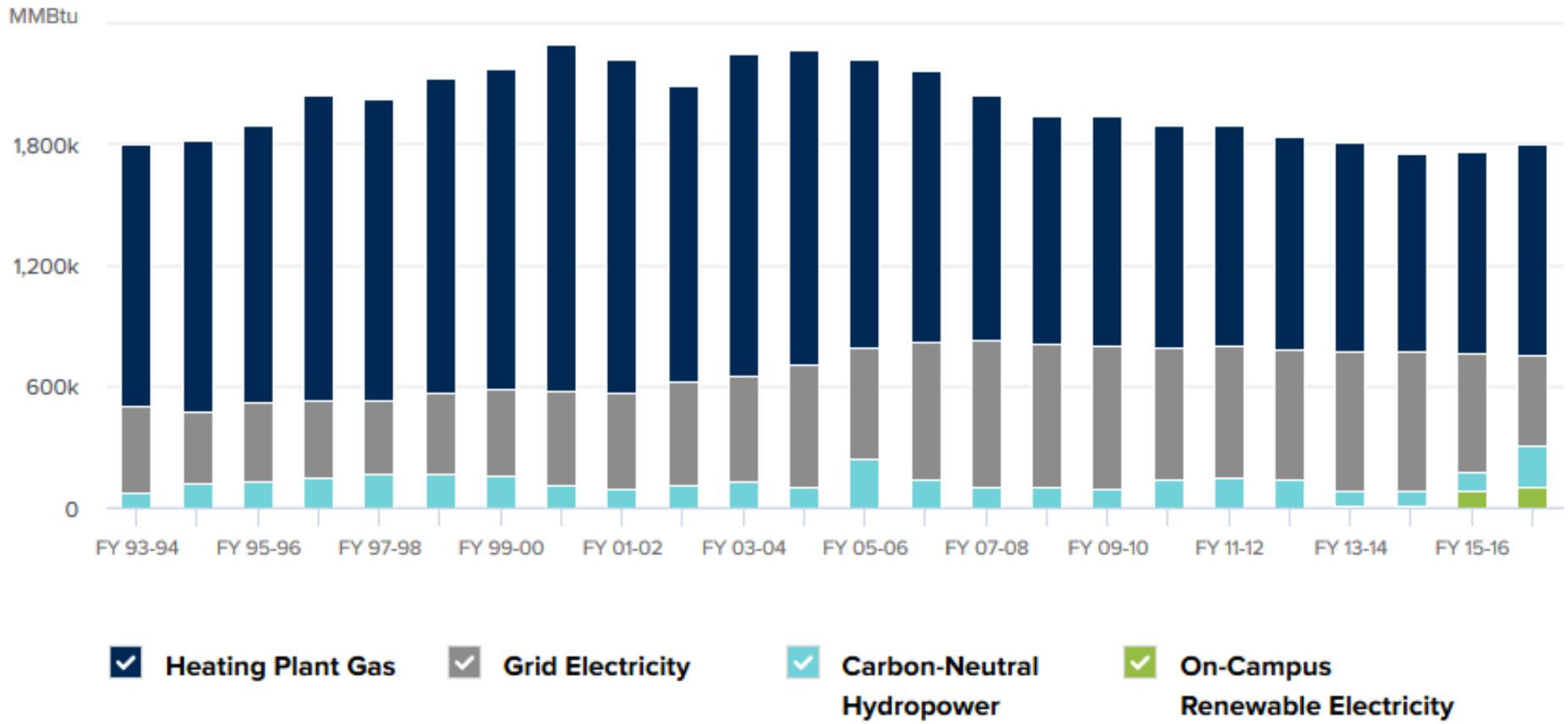
Our Energy Story

https://ceed.ucdavis.edu/energystory



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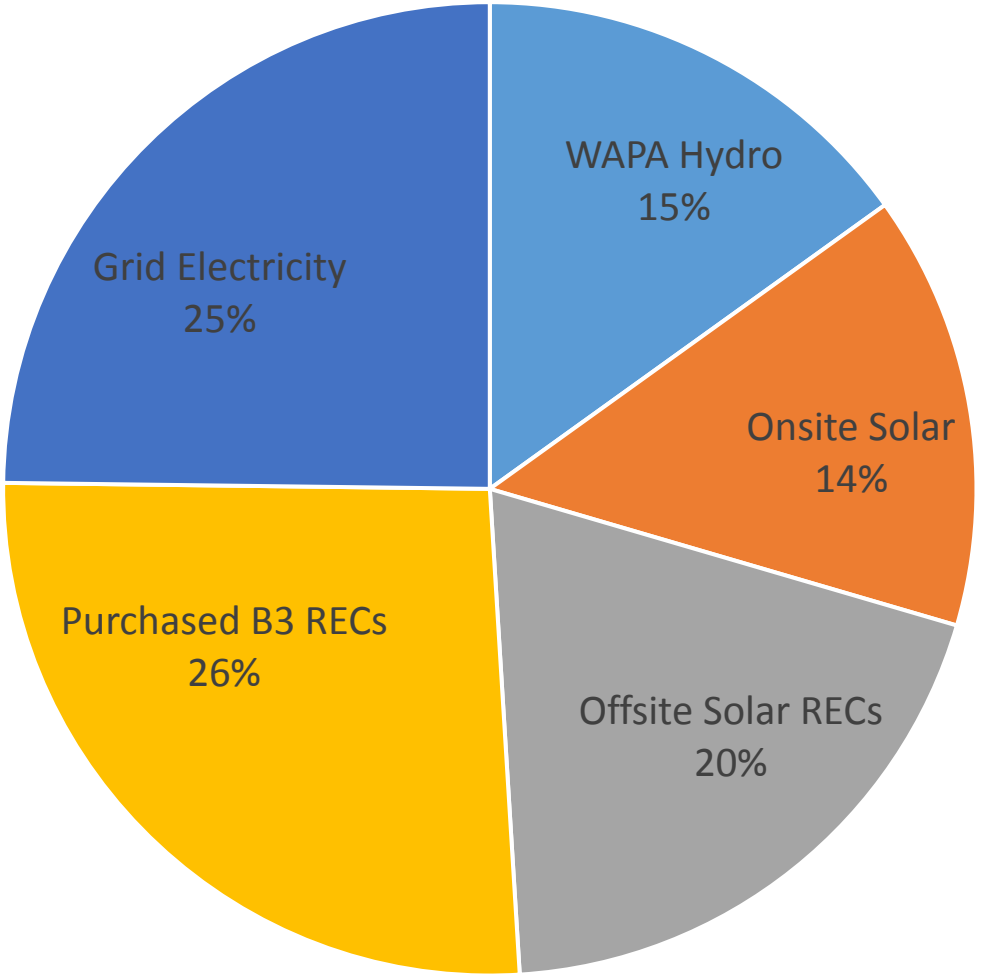
Davis Main Campus CY 2017 Energy Use

Commodity	Units	Annual Use
Total Electricity	**GWh**	**227.2**
Solar Farm	GWh	29.2
Other Renewable	GWh	1.3
Total Gas	**MM Therm**	**10.3**
CHCP	MM Therm	8.3
Chilled Water	**MM Ton-hr**	**39.1**
Steam	**MM lb**	**763.1**

Renewable Electricity (estimated CY 2018)



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Onsite Renewable Electricity

13.7 MWAC behind the meter solar farm; ~15% of total electricity

Offsite Renewable Electricity

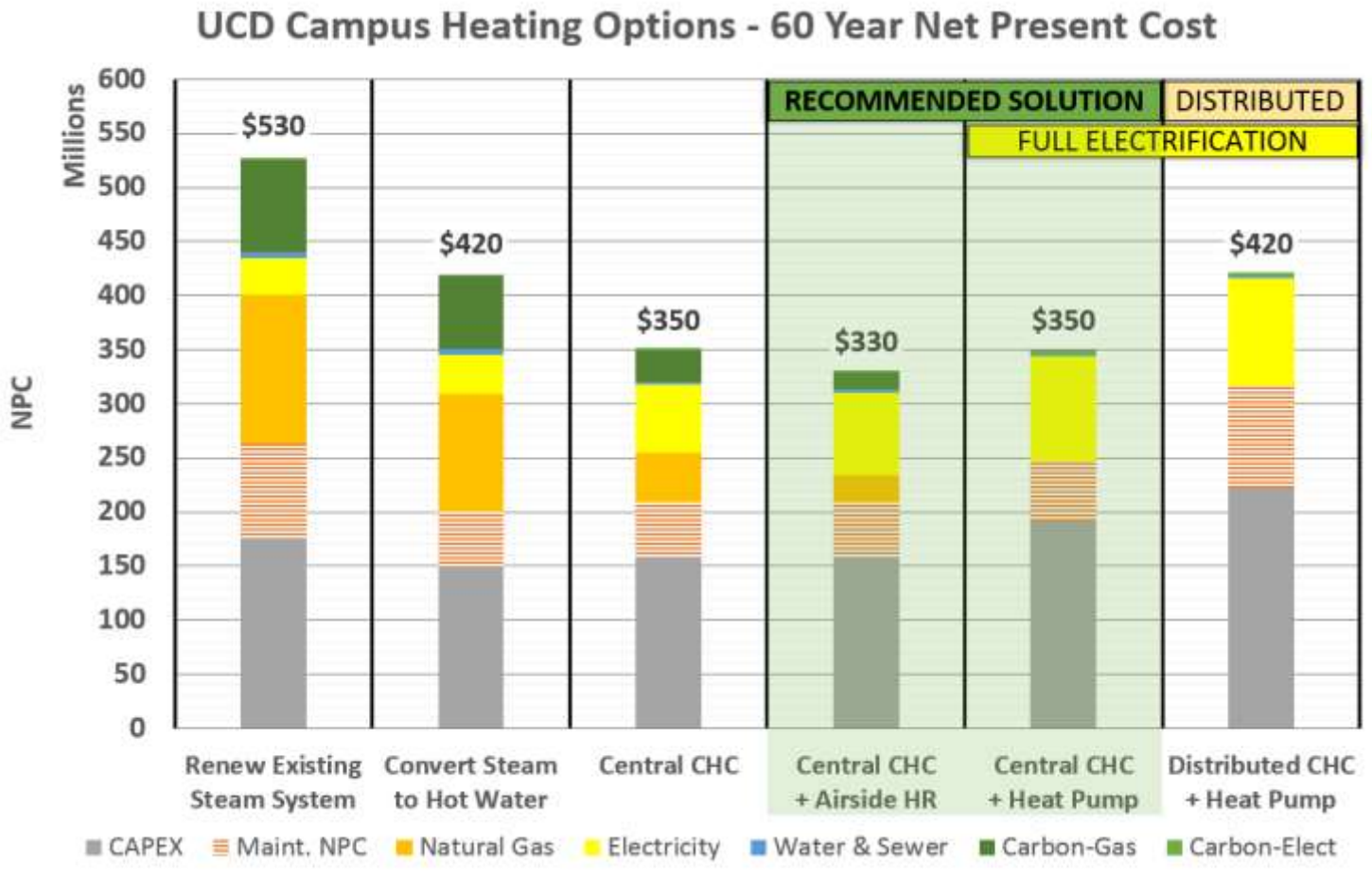
Partnership with UC System; UCD receives 24% of output

Biogas Development

- Projects will cover 10-15% of campus gas starting in 2025

Partnership with UC System

Steam to Hot Water Conversion



- 62% reduction in campus gas use, 10% increase in campus electricity use

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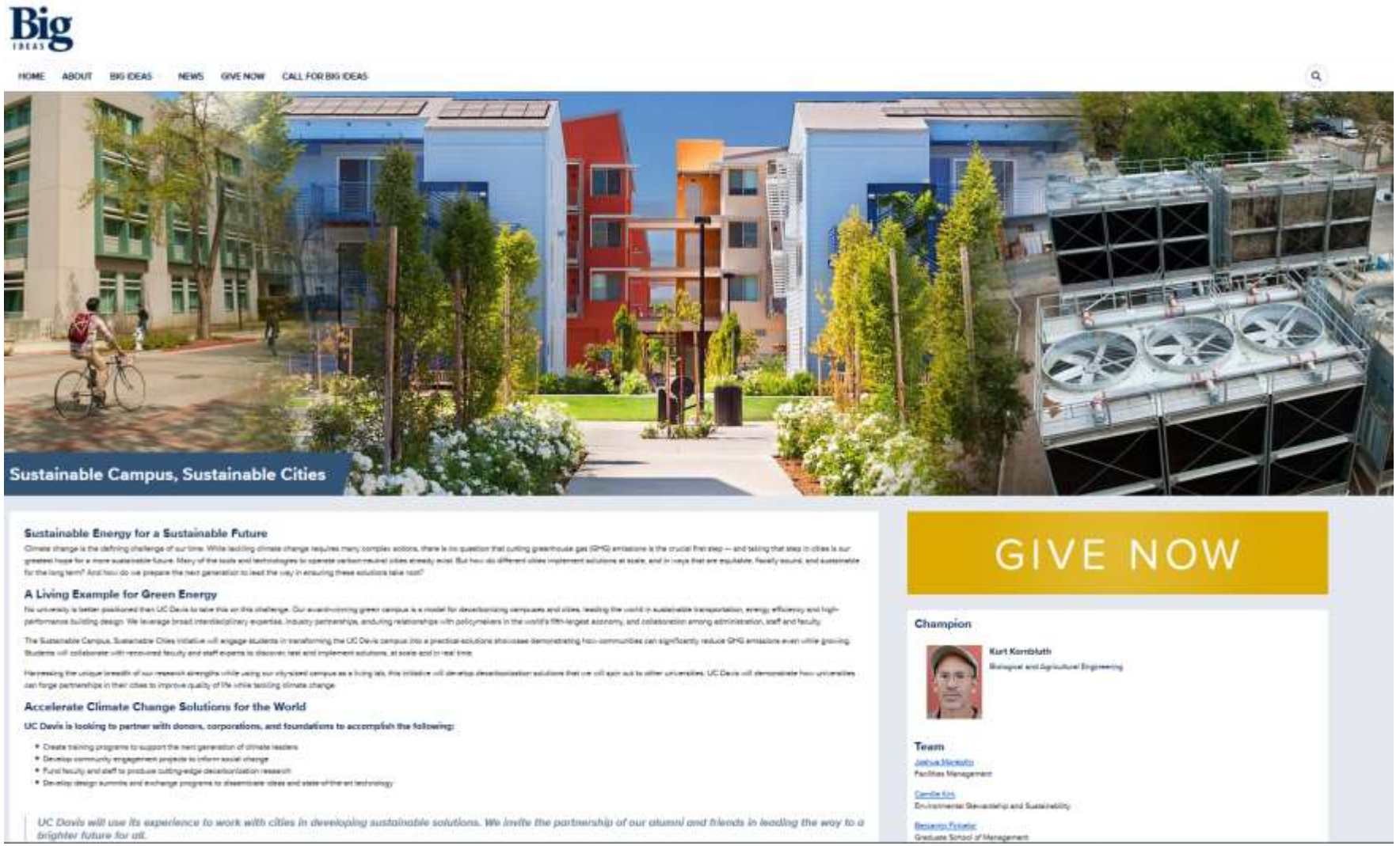
Big Idea: Sustainable Campus, Sustainable Cities



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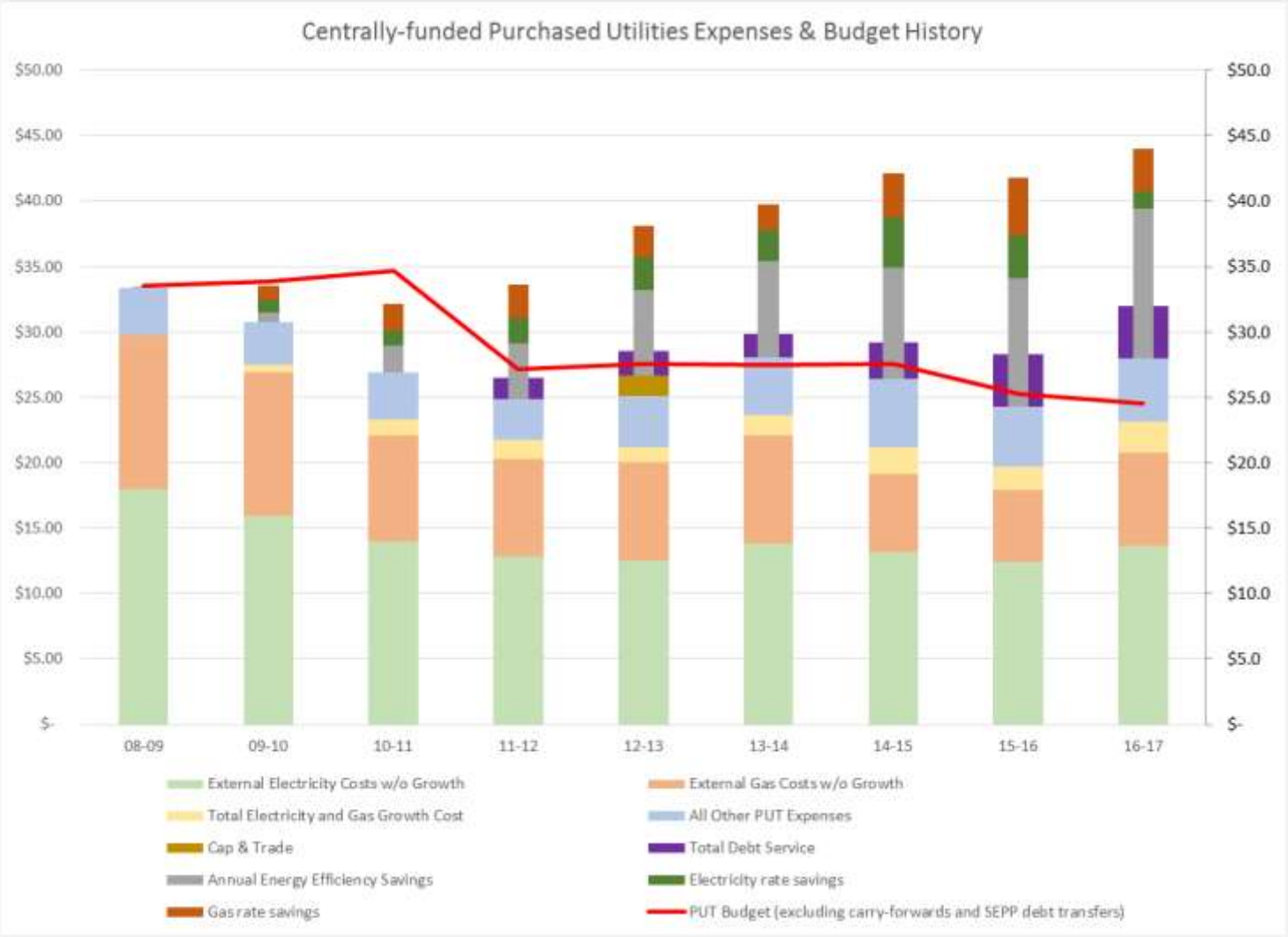
Energy Efficiency



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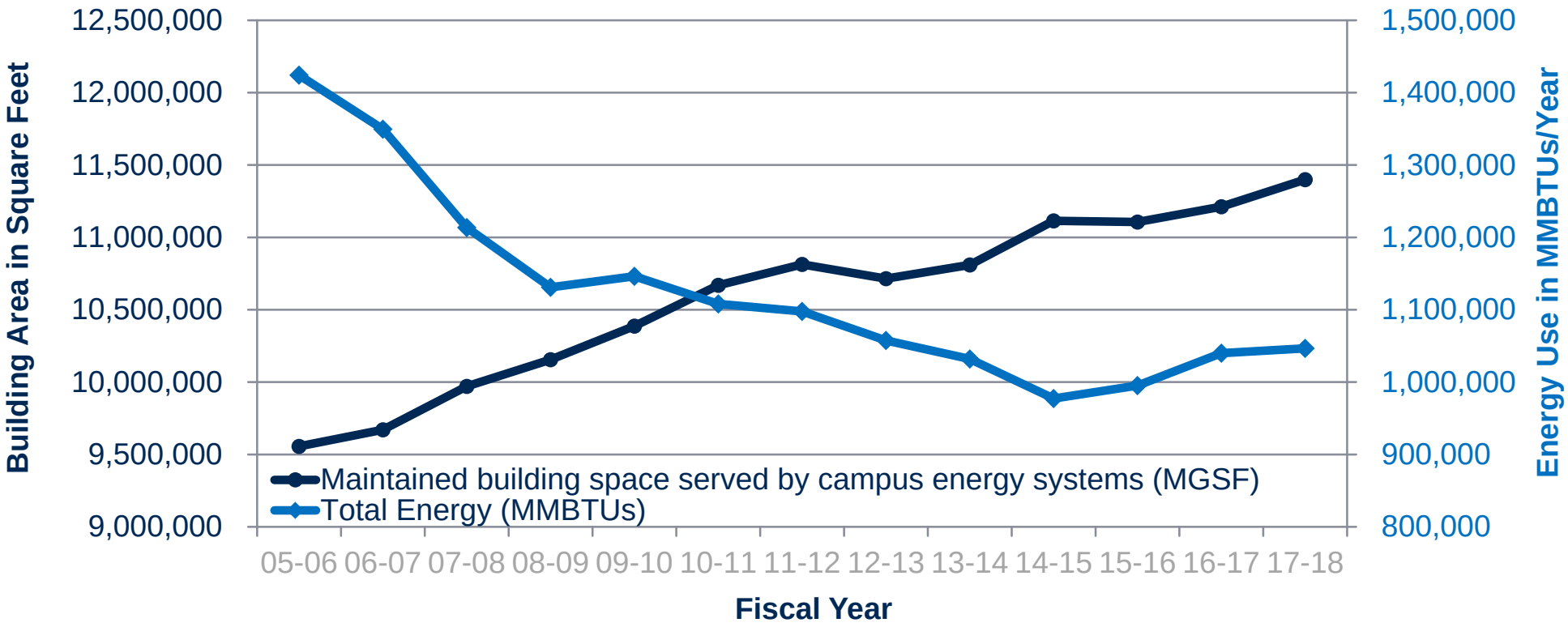
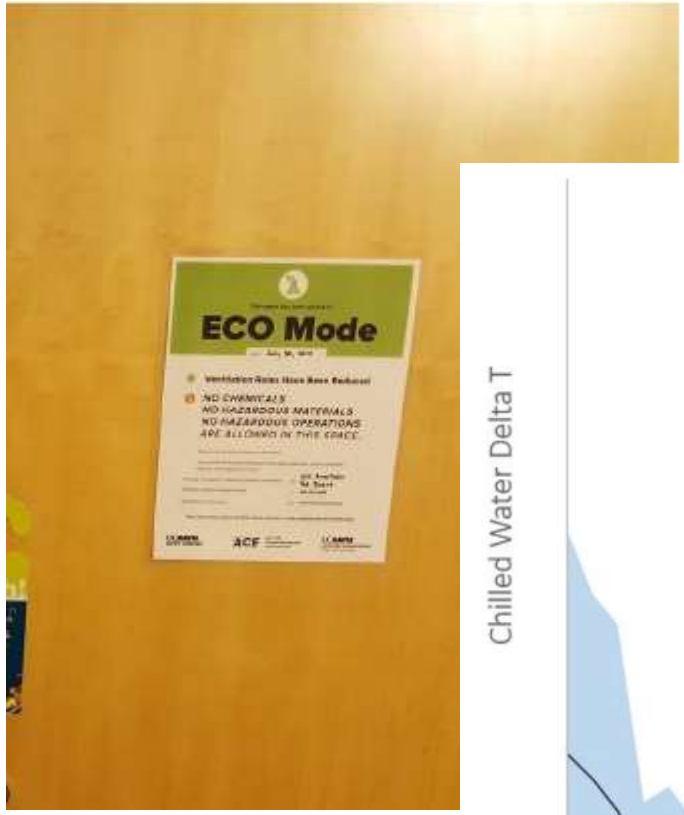
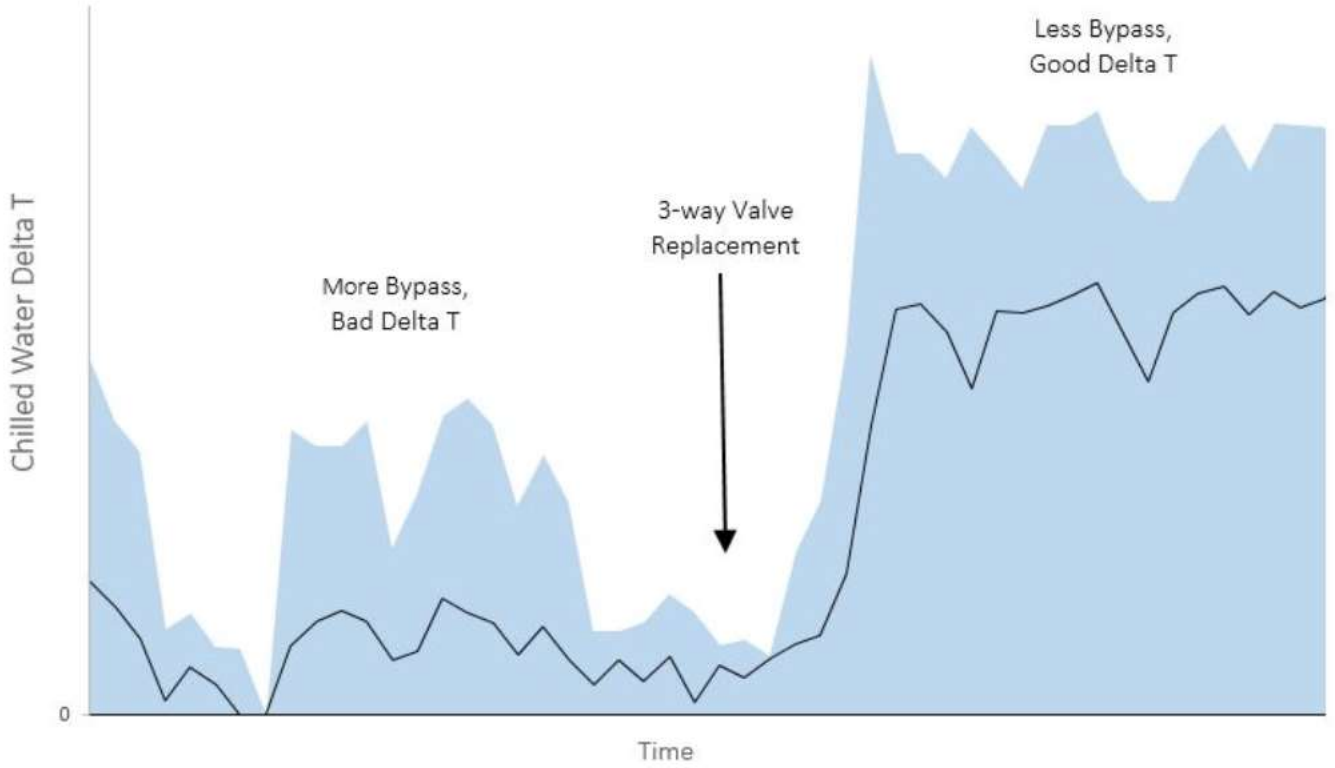
Energy Efficiency



Active Commissioning Enterprise





- Initial seed funding from campus
- Ultimately self-funding from savings: expected in FY19-20
- Green revolving fund – mechanism to reinvest savings

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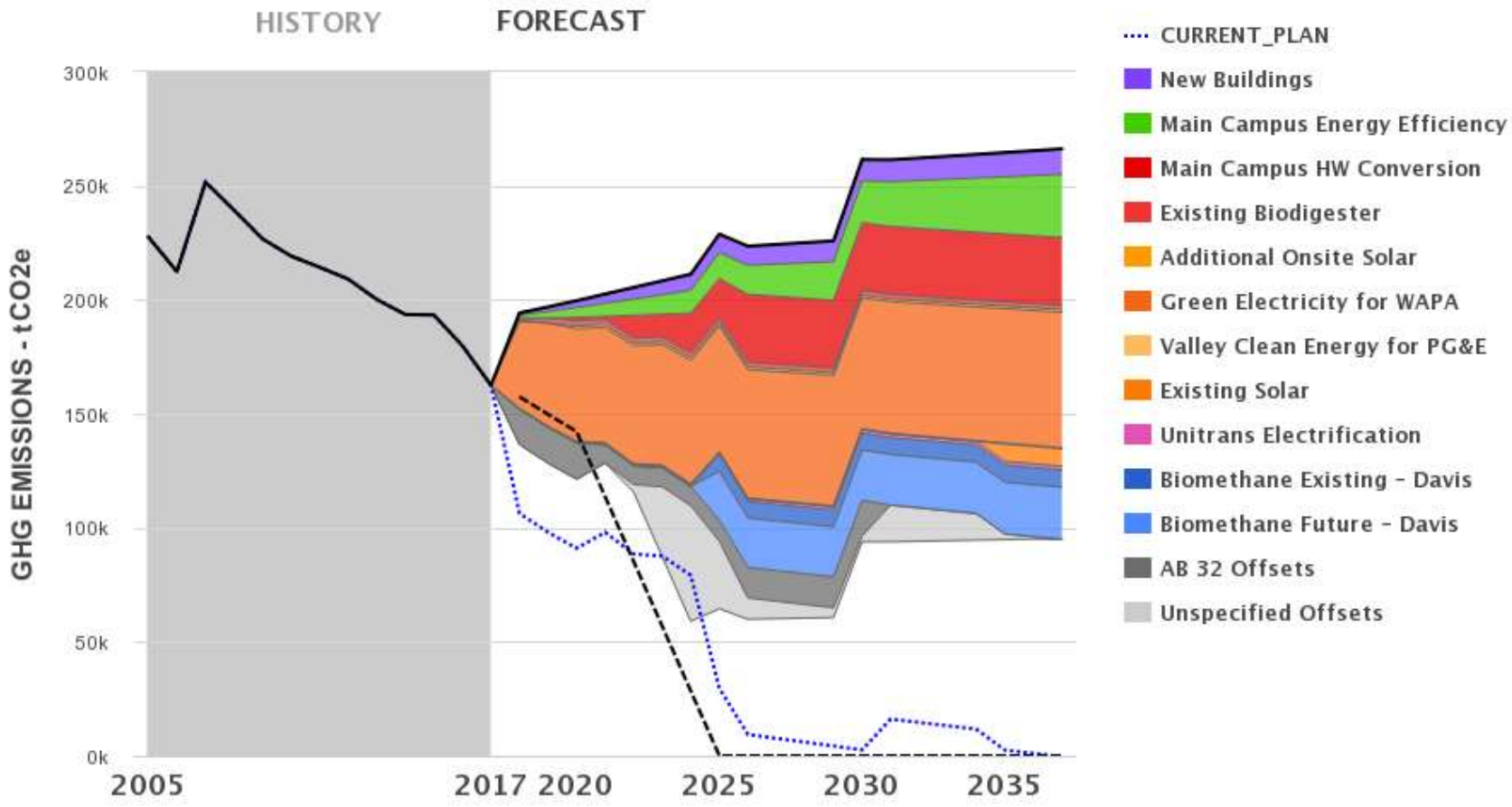
Electricity Supply Cost Optimization

- Analysis of complex electricity cost structure
  - “Quasi-flat” rate
  - Portfolio participation vs peak load shifting
  - Customization of market risk analysis
  - Favorable low carbon electricity supply
- Potential for DR market participation
- Currently in discussions with supplier to modify existing contract

Next Steps


HISTORY
FORECAST
300k
250k
200k
150k
100k
50k
0k
GHG EMISSIONS - tCO2e
2005
2017 2020
2025
2030
2035
CURRENT_PLAN
New Buildings
Main Campus Energy Efficiency
Main Campus HW Conversion
Existing Biodigester
Additional Onsite Solar
Green Electricity for WAPA
Valley Clean Energy for PG&E
Existing Solar
Unitrans Electrification
Biomethane Existing - Davis
Biomethane Future - Davis
AB 32 Offsets
Unspecified Offsets

Next Steps

- Additional renewables investment to cover electricity emissions
- CHW optimization
- Building retrocommissioning
- Deep energy efficiency