



# 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

UNIVERSITY  
OF  
CALIFORNIA

Office  
of the  
President



Jobs People

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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.

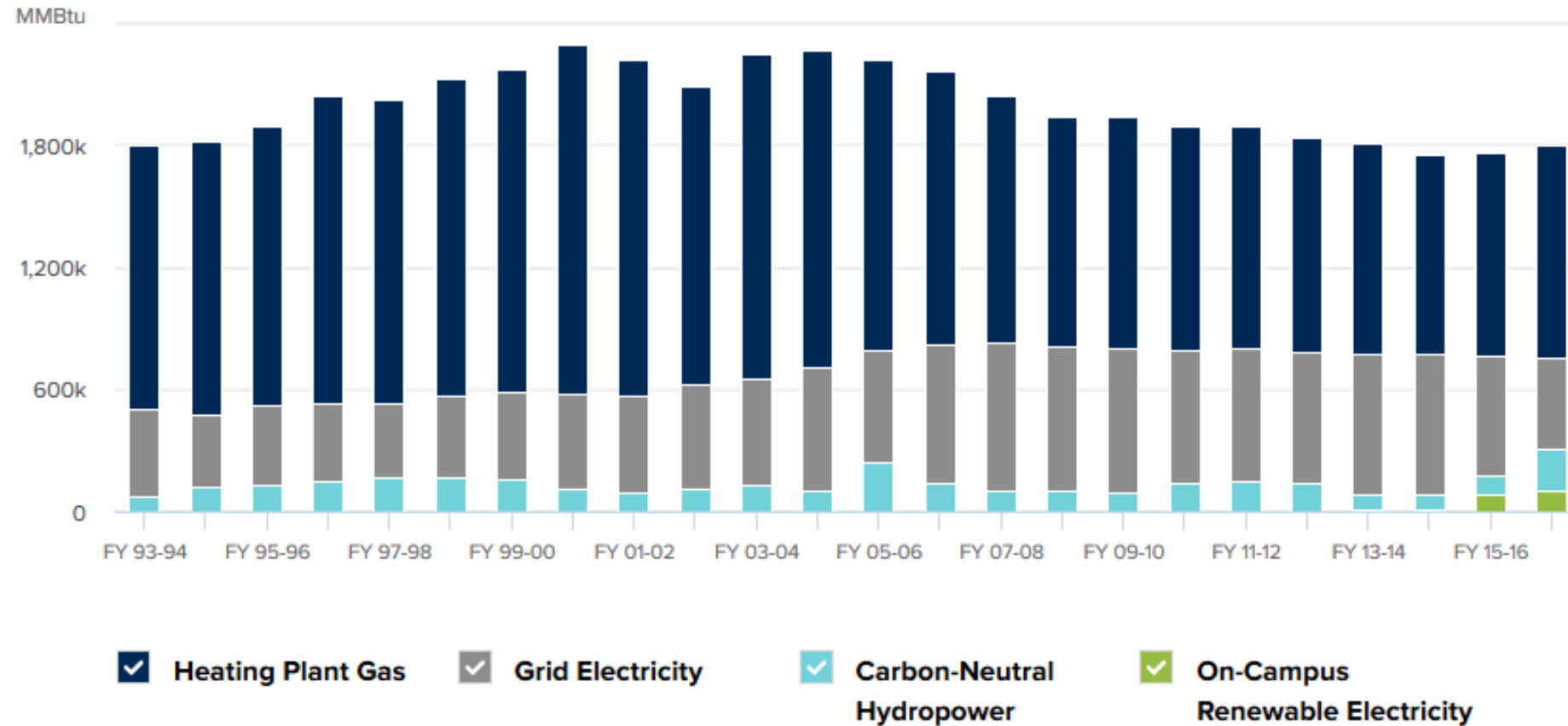


*"We are the University of California, and there is no reason that UC can't lead the world in this quest, as it has in so many others."*

— UC President Janet Napolitano

# Our Energy Story

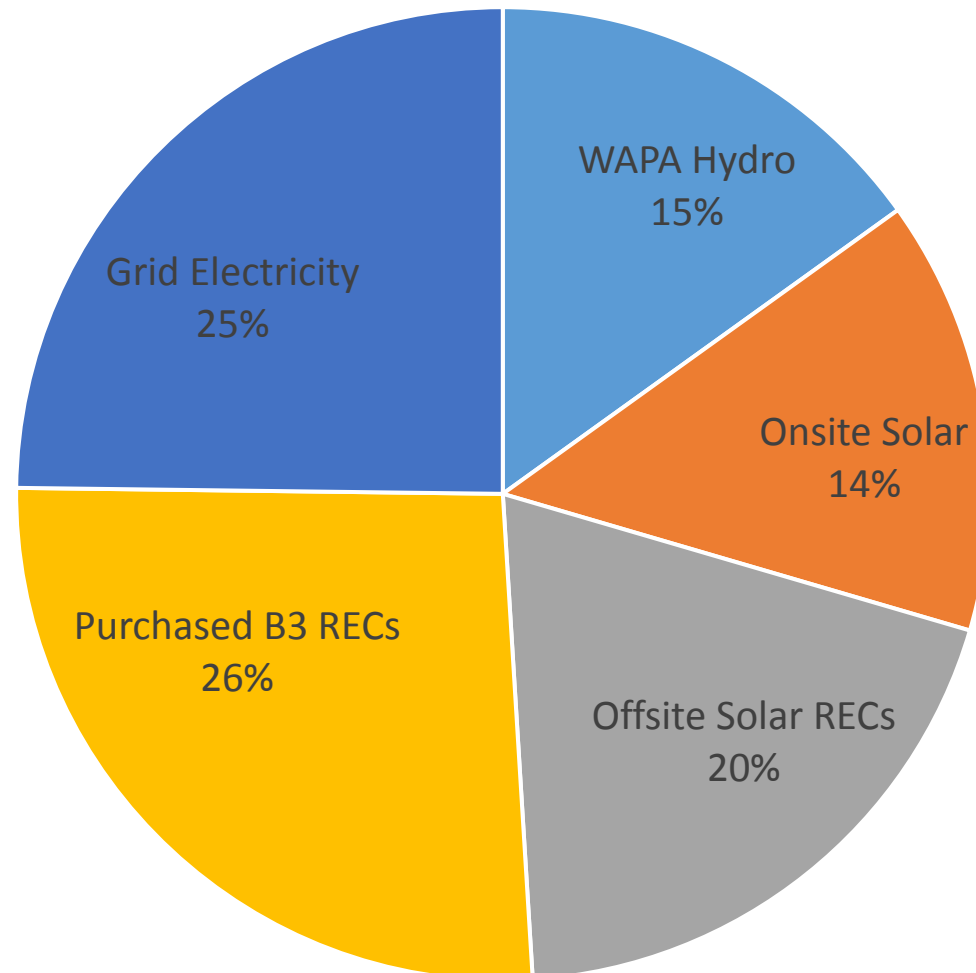
<https://ceed.ucdavis.edu/energystory>



# Davis Main Campus CY 2017 Energy Use

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

# Renewable Electricity (estimated CY 2018)



# Onsite Renewable Electricity



# Offsite Renewable Electricity



Partnership with UC System; UCD receives 24% of output

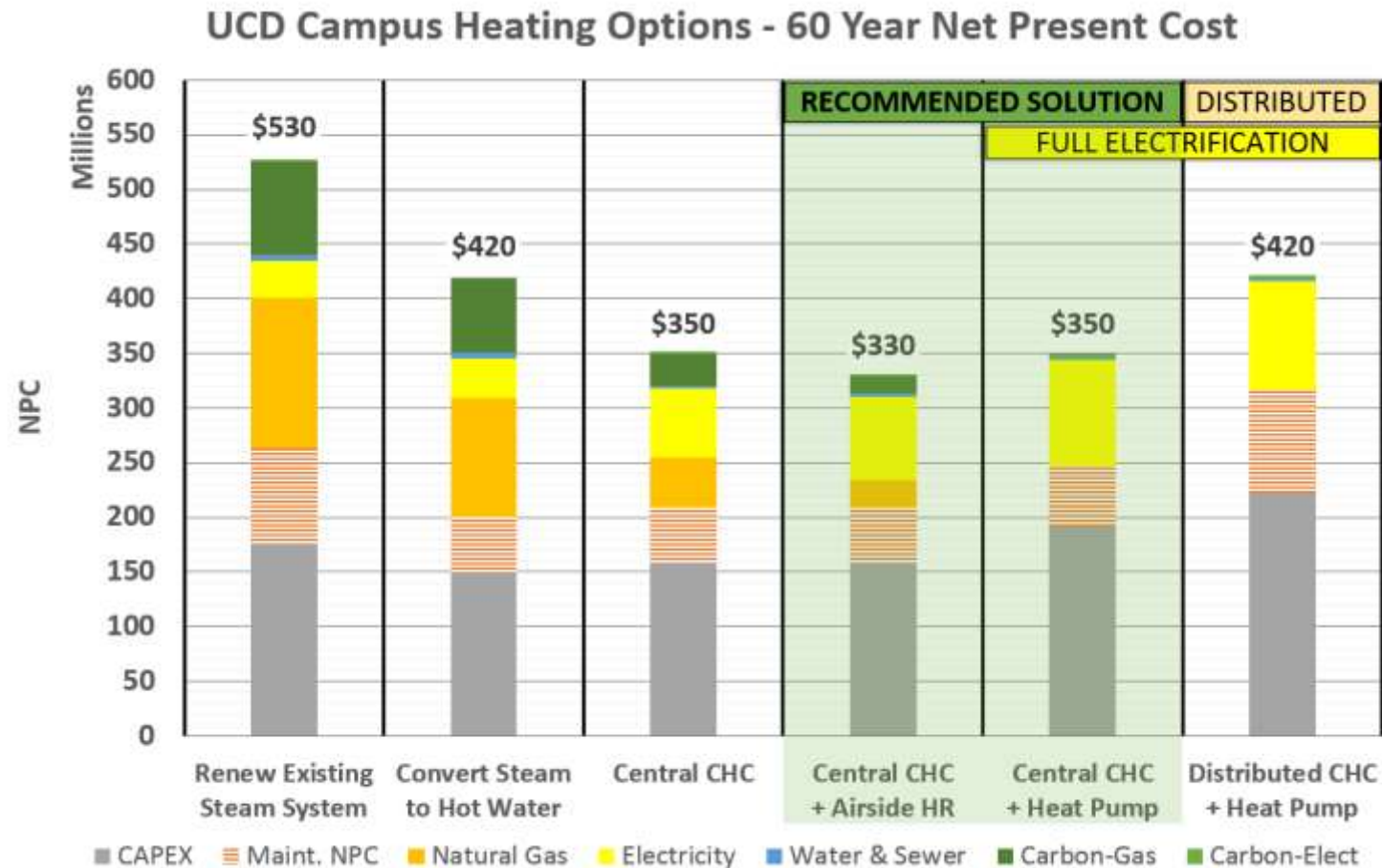
# Biogas Development

- 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

# Big Idea: Sustainable Campus, Sustainable Cities



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## Sustainable Energy for a Sustainable Future

Climate change is the defining challenge of our time. While tackling climate change requires many complex actions, there is no question that cutting greenhouse gas (GHG) emissions is the crucial first step — and taking that step in cities is our greatest hope for a more sustainable future. Many of the tools and technologies to operate carbon-neutral cities already exist. But how do different cities implement solutions at scale, and in ways that are equitable, fiscally sound, and sustainable for the long term? And how do we prepare the next generation to lead the way in ensuring these solutions take root?

## A Living Example for Green Energy

No university is better positioned than UC Davis to take this on this challenge. Our award-winning green campus is a model for decarbonizing campuses and cities, leading the world in sustainable transportation, energy efficiency and high-performance building design. We leverage broad interdisciplinary expertise, industry partnerships, enduring relationships with policymakers in the world's fifth-largest economy, and collaboration among administration, staff and faculty.

The Sustainable Campus, Sustainable Cities Initiative will engage students in transforming the UC Davis campus into a practical solution showcase demonstrating how communities can significantly reduce GHG emissions even while growing. Students will collaborate with renowned faculty and staff experts to discover, test and implement solutions, at scale and in real time.

Harvesting the unique breadth of our research strengths while using our city-sized campus as a living lab, this initiative will develop decarbonization solutions that we will spin out to other universities. UC Davis will demonstrate how universities can forge partnerships in their cities to improve quality of life while tackling climate change.

## Accelerate Climate Change Solutions for the World

UC Davis is looking to partner with donors, corporations, and foundations to accomplish the following:

- Create training programs to support the next generation of climate leaders
- Develop community engagement projects to inform social change
- Fund faculty and staff to produce cutting-edge decarbonization research
- Develop design summits and exchange programs to disseminate ideas and state-of-the-art technology

UC Davis will use its experience to work with cities in developing sustainable solutions. We invite the partnership of our alumni and friends in leading the way to a brighter future for all.

GIVE NOW

## Champion



Kurt Kambhuth  
Biological and Agricultural Engineering

## Team

Josiah Schatz  
Facilities Management

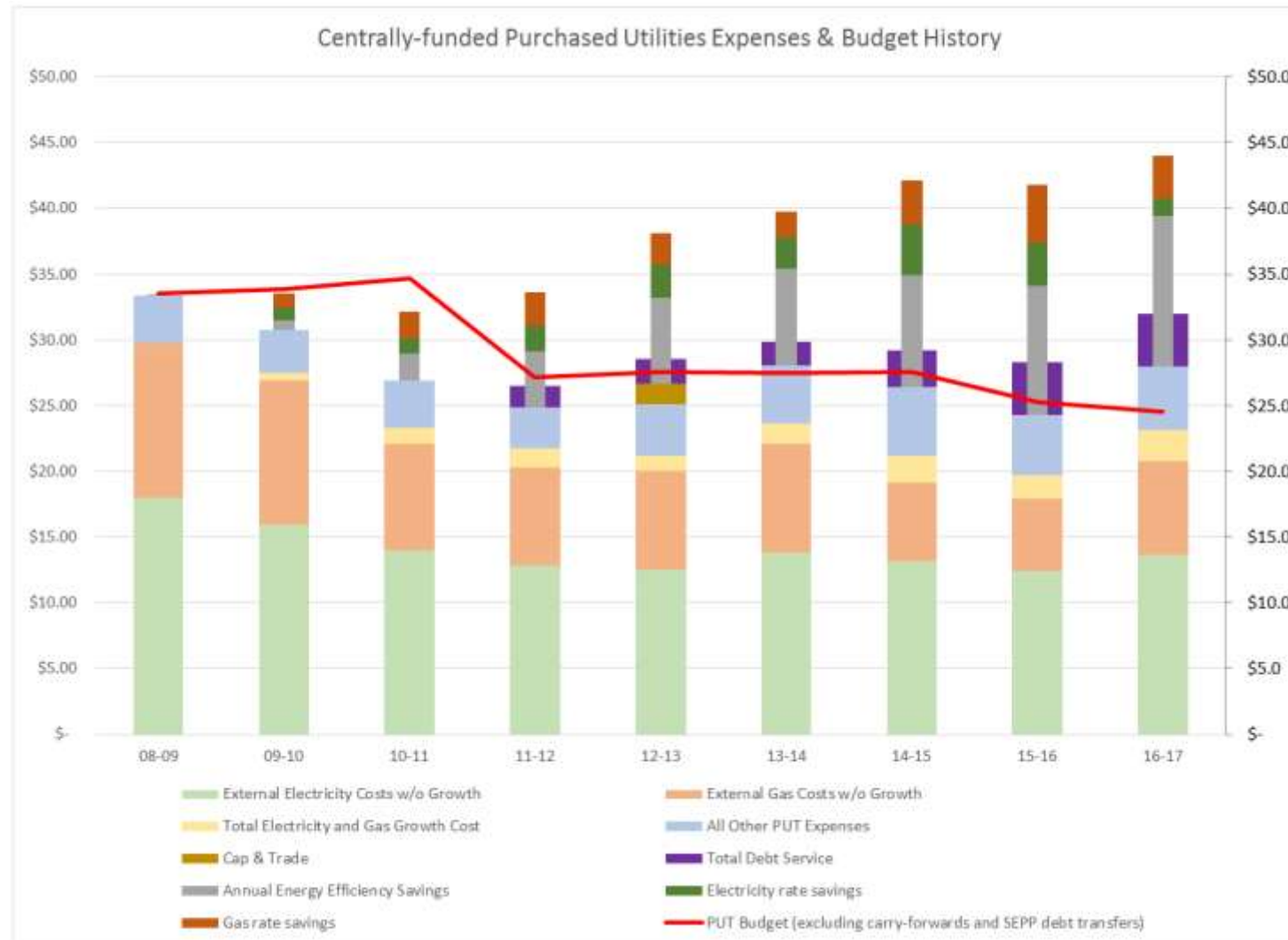
Candice Kim

Environmental Stewardship and Sustainability

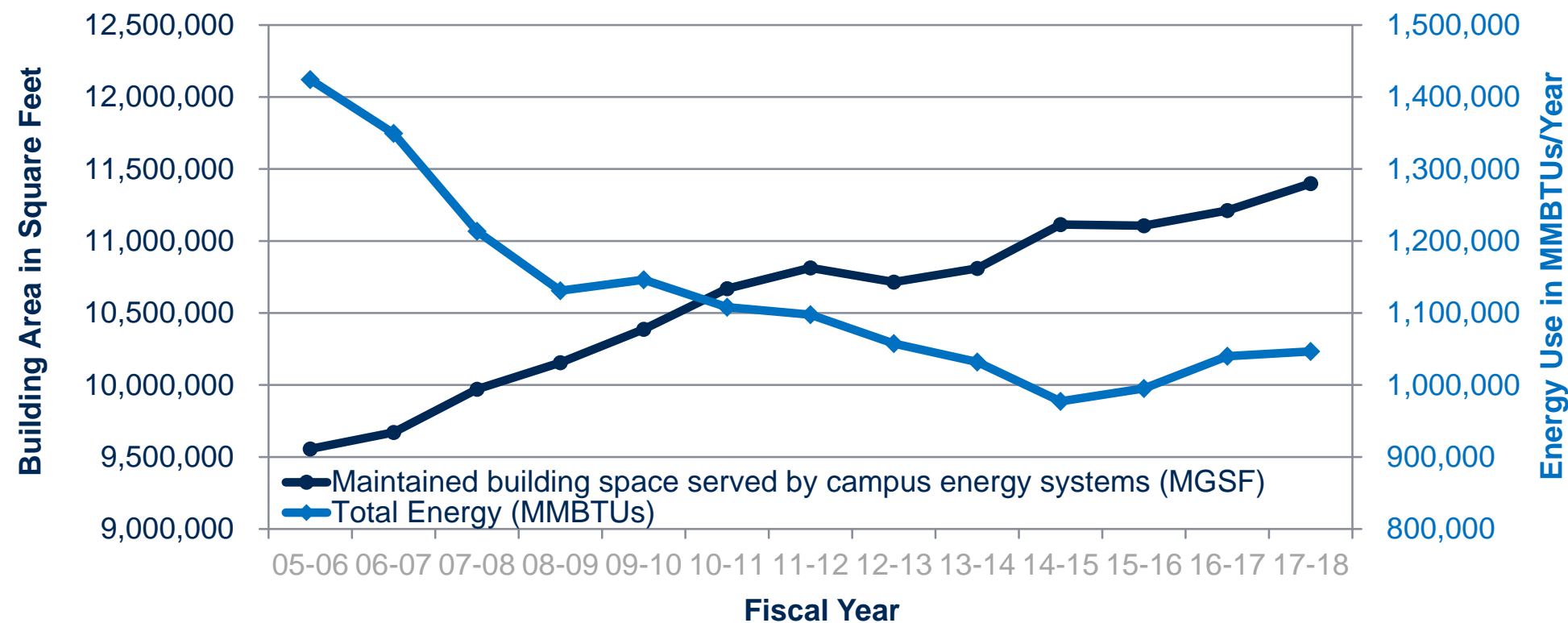
Brian Foster

Graduate School of Management

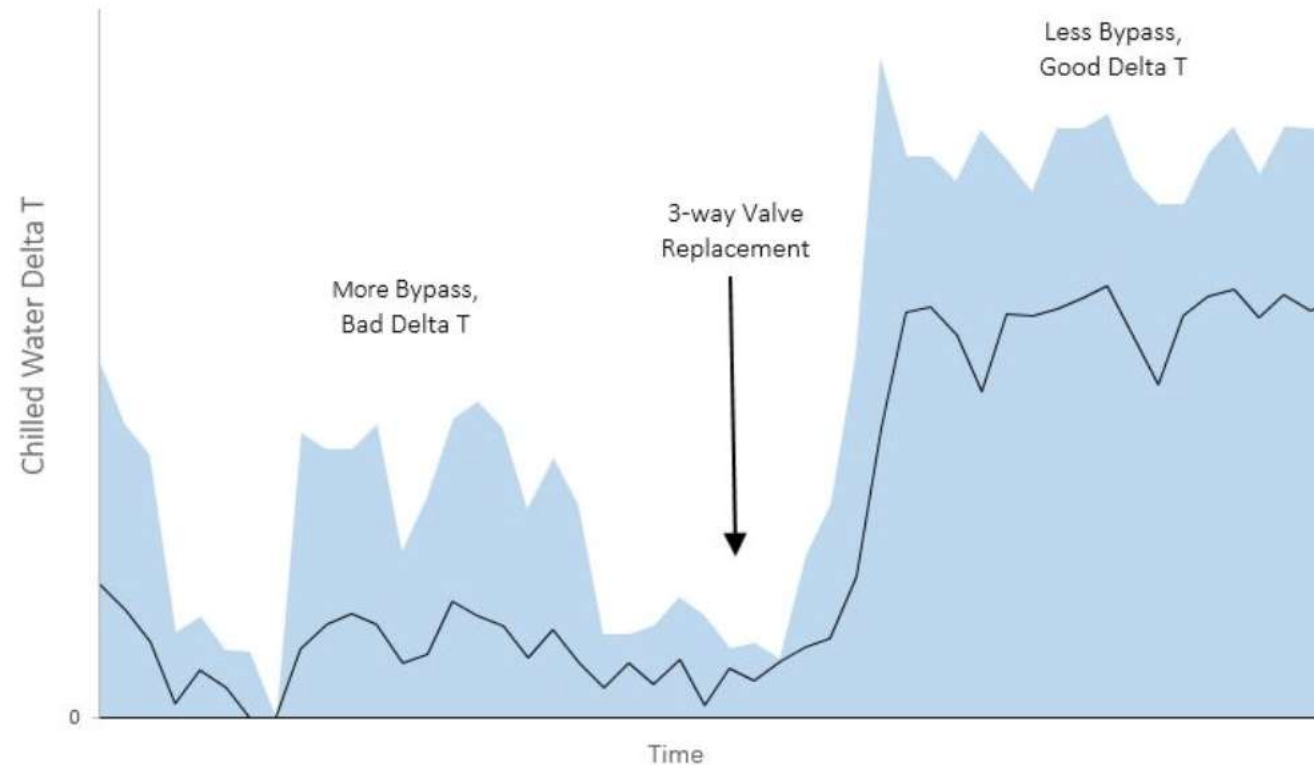
# Energy Efficiency



# Energy Efficiency



# Active Commissioning Enterprise

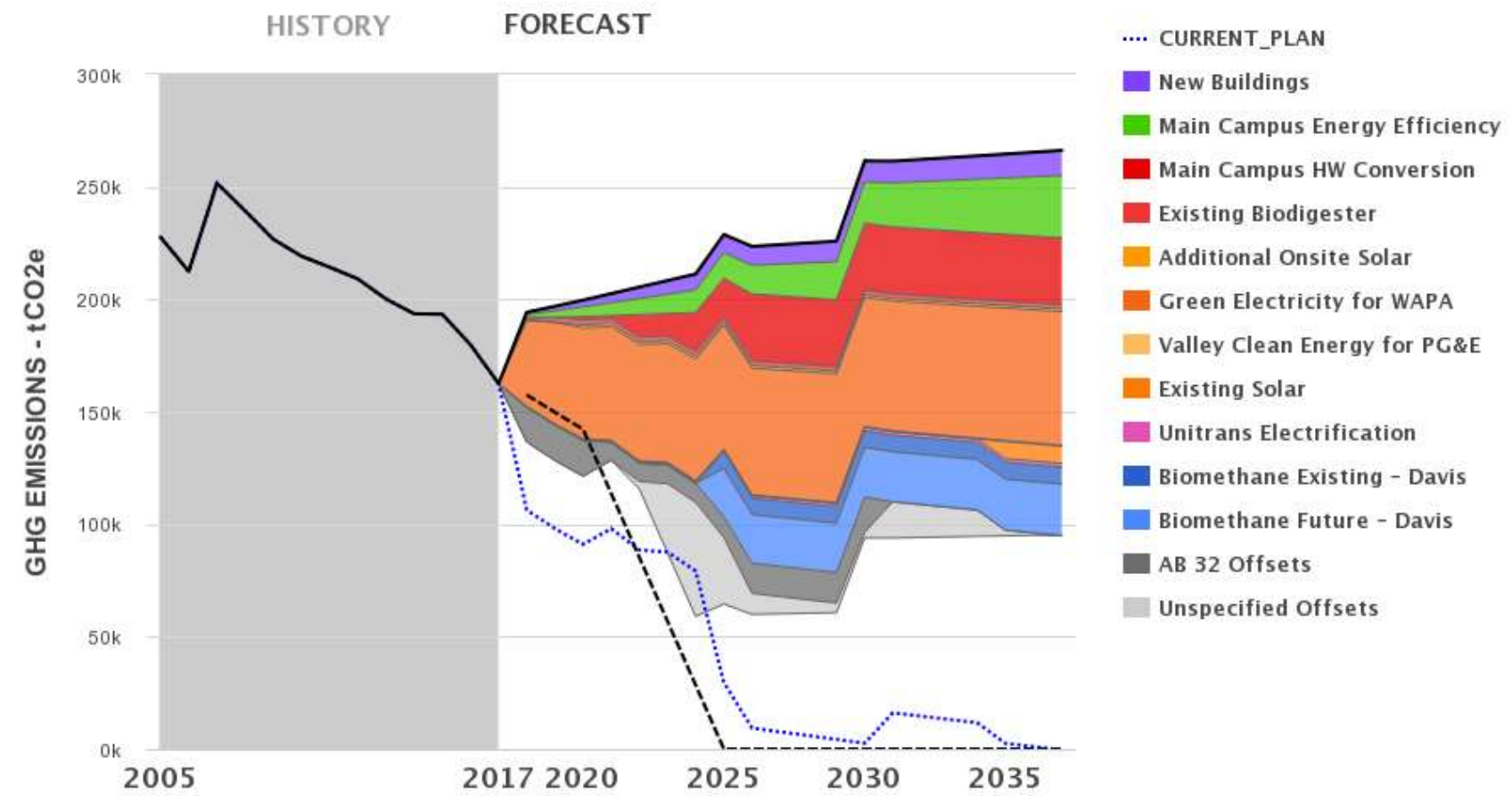


- Initial seed funding from campus
- Ultimately self-funding from savings: expected in FY19-20
- Green revolving fund – mechanism to reinvest savings

# 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



# Next Steps

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