

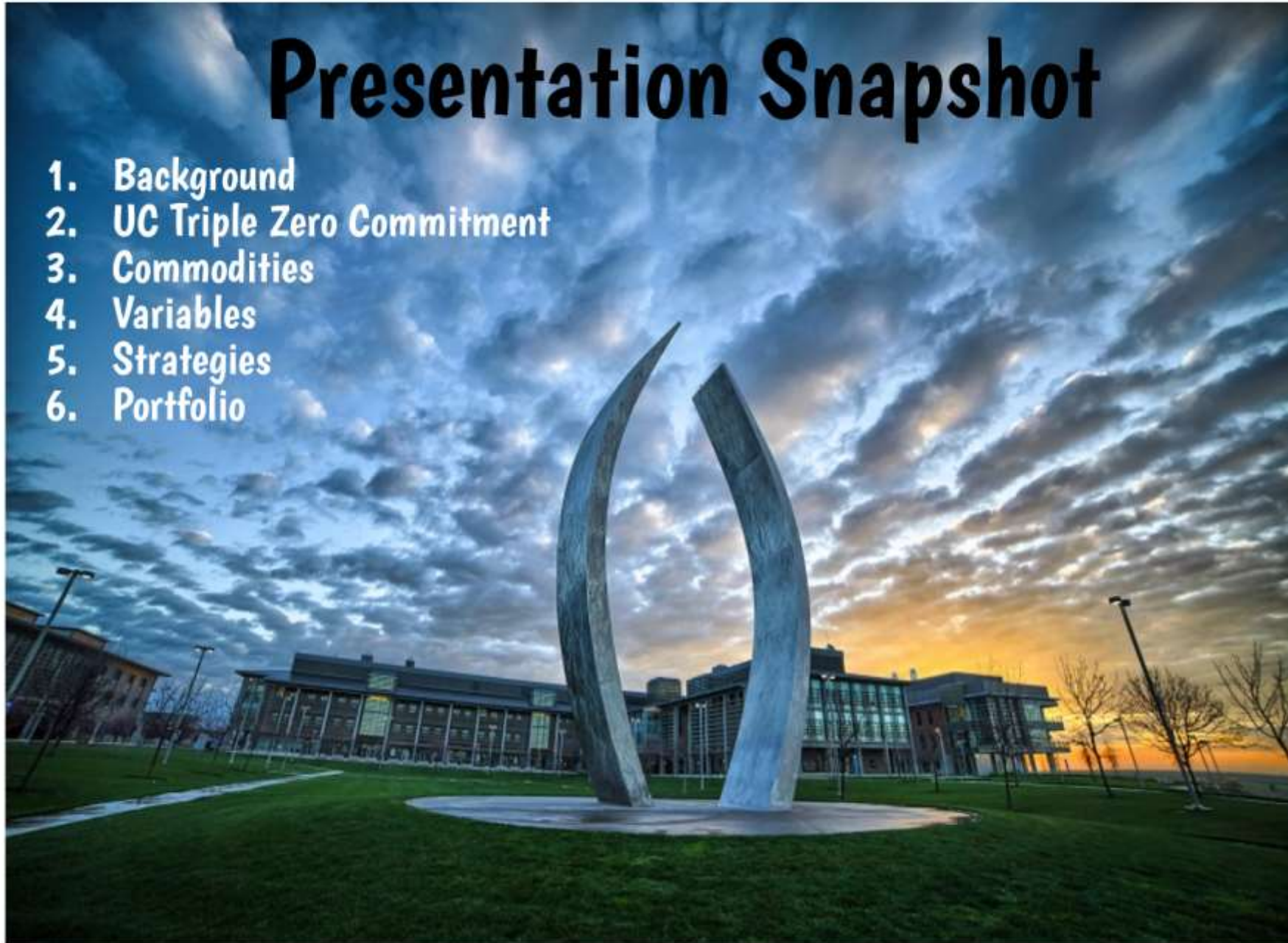
UC MERCED

Net Zero Energy

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Presentation Snapshot

1. Background
2. UC Triple Zero Commitment
3. Commodities
4. Variables
5. Strategies
6. Portfolio



Background



- **Campus opened in 2005 and sits on 104 acres of land.**
- **Three schools include:**
 - 1. School of Engineering**
 - 2. School of Natural Sciences**
 - 3. School of Humanities and Arts**
- **Population (2017-2018)**
 - 1. Students: 7,967**
 - 2. Faculty & Staff: 1,462**

Background



- **Campus expansion known as the "2020 Project".**
- **UC Merced is expanding its existing campus by 1.2 million gross square feet to accommodate an enrollment size of 10,000 students.**
- **The "2020 Project" will deliver 13 buildings to include teaching and research facilities, housing, athletics, and student life space.**

UC Triple Zero Commitment

- **Net Zero Energy**

Net Zero Energy as defined by UC Merced is sourcing and generating renewable energy to meet campus energy use consumption.

- **Zero Landfill Waste**

Divert from landfill all campus waste by reducing excess consumption and recycling to maximum extent feasible. Diverting 90% of waste generated on the campus from the landfill.

- **Net Zero Greenhouse Gas Emissions**

Prevent or neutralize carbon emissions the campus produces.

Two Main Energy Commodities



- **Electricity and Natural Gas which are used both for building energy usage, heating/cooling, plug loads etc.**
- **Both Commodities generate greenhouse gas emissions through either generation (outside of the use of renewables) or combustion.**

Additional Variables

- There are additional underlying variables that influence both the campus energy consumption and consequently carbon emission output. These include:
 1. Gross Square Footage
 2. Population Growth



How is the campus prioritizing achieving these goals?

- The campus has taken the following approaches to achieve the campus Zero Net Energy and Carbon Neutrality goals:
 1. **Reduce** Energy Usage: Through efficiency and conservation the campus will save as much energy as is economically feasible.
 2. **Replace**: Existing brown power needs through renewable energy generation or sourcing clean/renewable power.
 3. **Mitigate**: Offset remaining greenhouse gas emissions through prioritizing on-site and regional offsets.

Strategies (Reduce)

- **Building Energy-Efficiency Program:** New Buildings are designed to consume half of the energy of comparable university buildings in California by 30% less energy than mandated by Title 24. Total of seventeen (17) buildings on campus all certified under LEED NC.
 1. Platinum (8)
 2. Gold (8)
 3. Silver (1)



Strategies (Reduce)

- The campus has also implemented programmatic initiatives that influence behavioral changes on campus.
 1. **Green Labs Program:** Reduces environmental impacts of laboratory buildings. Laboratories are the largest consumers of energy/waste at Universities.
 2. **EcoRep Program:** Student peer to peer educator program designed to foster a culture of sustainability education and literacy that directly impacts social and environmental changes on campus.
 3. **Green Offices Program:** Informs departments of practices that can be integrated into work-spaces, creating a community that reflects environmental stewardship.

Strategies (Reduce)

- **LEED Lab Course:** Multidisciplinary course that spans over two semesters where students work on the certification of buildings under LEED Existing Buildings: Operations & Maintenance (LEED EBOM).

The course assists the campus with identifying and ensuring that equipment and technology in buildings are functional and maintain efficiency capabilities.



Strategies (Replace)

- **Solar Power:** The campus has a 1 megawatt solar array system that generates approximately 2 million kWh annually or 12% of the campus electrical load.

The campus will be installing a 4.2 megawatt PV system as solar covered parking structures. The panels are set to produce approximately 8 million kWh annually and will be installed late 2018.



Strategies (Replace)

- **Wholesale Power Program:** The Regents of the University of California are UC Merced's Energy Services Provider (ESP). The campus purchases clean power from the ESP. Currently, 44% of the portfolio of power the campus sources is renewable.



Strategies (Replace)

- **Biogas:** The campus is exploring sourcing bio-gas from the Merced Landfill in-lieu of natural gas usage for the campus.



Image Source:
Pepcoholdings

Strategies (Mitigate)

- **Offset:** Remaining greenhouse gas emissions, prioritizing on-site and regional offsets.

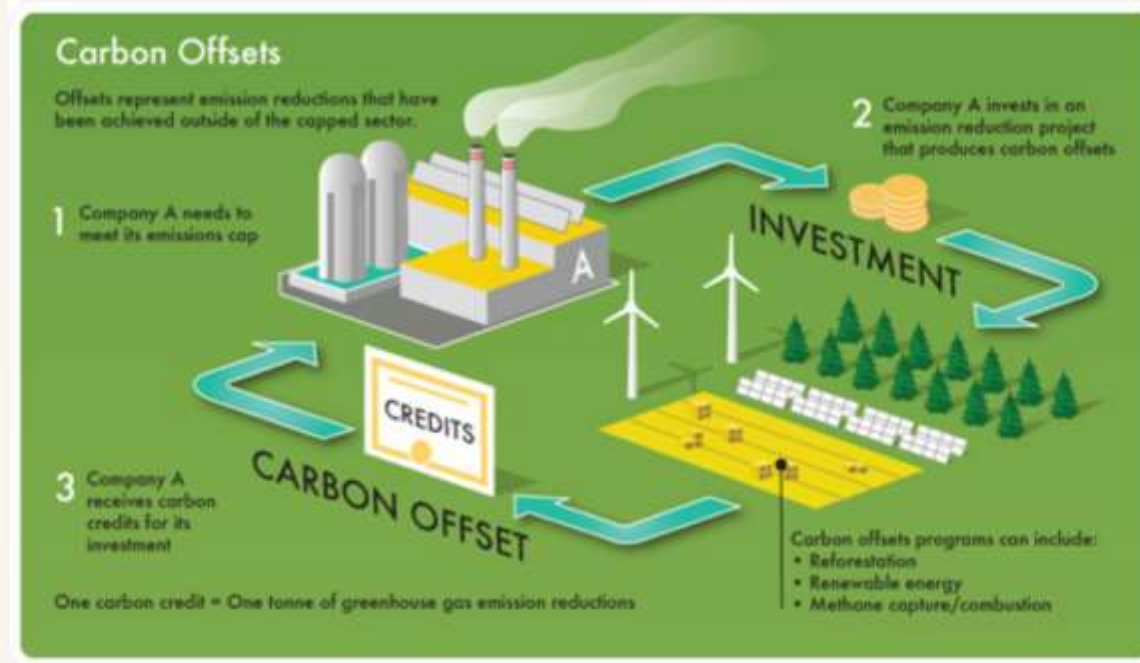
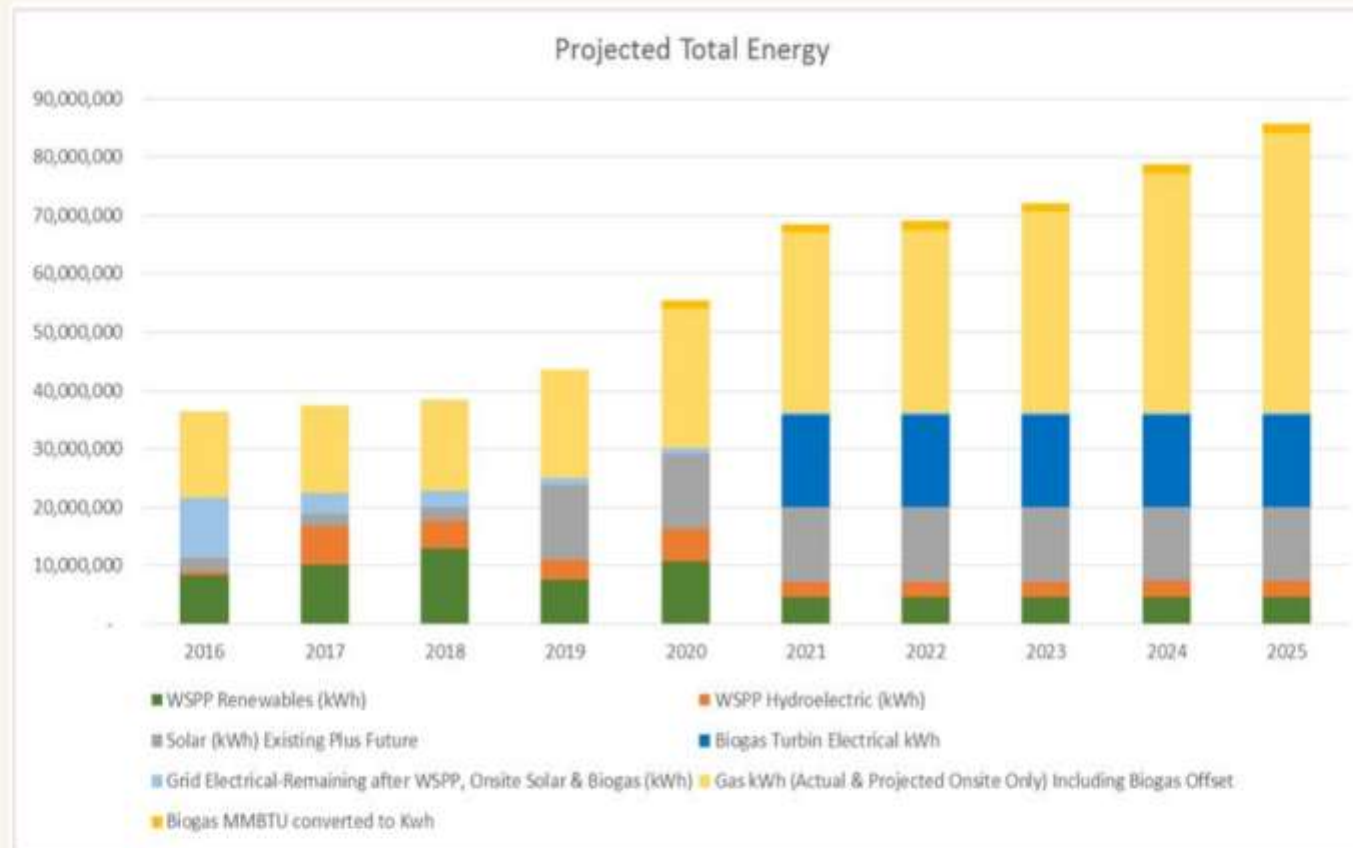


Image Source:
Emerson Consulting

Renewable Energy Portfolio

- Example of the campus existing renewable energy portfolio.



Questions?

Thank You!