Energy and Utilities Plans

Energy & Utilities Master Plan

- Utilities Overview
- Energy Initiatives
- Energy Results

UTILITIES OVERVIEW – 2018 Energy Master Plan Scope

Future Planning
  - Assessed all utilities against current, 10-year, and 30-year needs for:
    - Condition
    - Capacity
    - Configuration

Conservation Opportunities
  - Focused assessment on 16 of the highest energy-intensity buildings
  - Energy savings opportunities identified for each building

UTILITIES OVERVIEW – Current Utility Overview

Oakland campus (138 bldgs. at 14.7 MSF):
- **Heating**: Pitt/UPMC generate steam and augment it with steam generated from Bellefield Boiler Plant.
- **Cooling**: Chilled Water need has reached capacity for our three plants (Posvar, Petersen, and BST) which is distributed via Pitt chilled water lines.
- **Electricity**: Electricity is received at Oakland Substation and distributed across campus via Pitt’s six substations and feeder cables.
- **Gas, Water, and Sewer**: Provided by local suppliers.

UTILITIES OVERVIEW – Current Utility Usage

Utilities to meet Master Plan implementation
- The current full capacity of our steam plants is "just enough" to meet future needs.
- Electrical capacity is close and we’ll need to add a 7th substation.
- Gas, Water, and Sewer: Provided by local suppliers and are adequate.
- Chilled Water generation has reached capacity and additional capacity is needed.
  - Unlike our Steam System our Chilled Water Plants are not interconnected.
  - We added new Chilled Water Lines while we had Bigelow Blvd open
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**ENERGY INITIATIVES – University Energy Focus Areas**

A huge driver is the University’s commitment to Carbon Neutrality by 2037
- We’ve accomplished a lot, but our goal posts were extended & raised here.
- Facilities will lead ~ 60% of the remaining GHG emissions reduction

**Two Strategies**
- **Reducing Demand**
  - Reduce consumption in all buildings, with focus on highest energy intensity bldgs.
  - Six buildings account for 40% of our energy use
- **Cleaning Supply**
  - Purchase Renewable Energy
  - 2 small short-term contracts for energy that’s 100% renewables today
  - 2 long-term agreements for local hydro & solar (~40% total need) operational soon

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**ENERGY INITIATIVES – University Energy Focus Areas**

**Pitt Climate Action Plan**

**Carbon Neutral Pitt**

- ADVANCE SUSTAINABLE ACTIONS
- FUND OUR ACADEMIC MISSION
- ENHANCE OUR COMMUNITY & ENVIRONMENT

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**ENERGY INITIATIVES – University Energy Focus Areas**

**PittCAP: Building Energy Use & Reduction Potential**

(Electricity, Heated Space, Other Energy)

**PROCESS**

1. Estimate total energy reduction potential by building (0-25%)
2. Apply cost factors for investment and savings.
3. Apply carbon factors to estimate avoided GHGs

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**ENERGY INITIATIVES – Oakland Campus Data**

**ENERGY INITIATIVES – Buildings Selected for Energy Improvements**

- Renovation & Construction have strict energy guidelines
  - Our Energy and Water Usage Intensity standards exceed industry guidelines
  - We are completing documentation to LEED certify 5 new buildings recently completed
- **Campus Energy Center**
  - Extensive (800k+ sensors) and 24/7/365 monitoring
  - Retro-Commissioning and Continuous Fault Detection
- **Power Purchase Agreements for hydroelectric and solar power**
  - In 2020, 18% of our energy originated from renewable energy sources
  - Hydropower ~25% of all our electrical needs (in 2024)
  - Solar Agreement will amount to 13% of all our electrical needs (in 2023)
- **Stormwater Master Plan**
  - New stormwater management infrastructure on new Bigelow Boulevard and WPU plaza
  - Plan has identified many opportunities to capture and reuse stormwater

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**ENERGY INITIATIVES – Oakland Campus**

- **Bldg & University**
  - Business College & University
  - College & University Residential
  - College & University Other

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**ENERGY INITIATIVES – Buildings Selected for Energy Improvements**

- Included: Scaife Hall, Bigelow, Memorial, and Stephen Foster Memorial

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2/5/2021
ENERGY INITIATIVES – Energy Savings Strategies

Most favorable energy saving strategies for the 16 buildings are:

- Converting existing lighting to LED lighting
- Air change and temperature setbacks per occupancy or schedule
- Commissioning fume hood zone presence sensors (rapid payback)
- Demand control ventilation using air quality or particulate-sensing (lab spaces)

Created Energy Dashboard for these projects.

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ENERGY RESULTS – Energy Consumption

• Achieved the lowest building energy use since tracking began in 2008
• Beating our “glide slope” targets to meet 2030 Challenge energy reduction goal of 50%
• LED lighting upgrade program saving more than $237,000 annually across 12 buildings
• Fault detection and diagnostics system yielding savings of more than $149,000 annually
• Water use on campus has decreased 13.9% since 2015
• “Team Water” monitors data for indications of leaks – results saving $187,000/month
• 14 buildings have been LEED certified, with another 5 pending (Gold and Platinum)
• Post Litchfield Towers restroom renovations, annual water saving equated to over $170K.

ENERGY RESULTS – 2020 Specific Achievements

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14
15
16