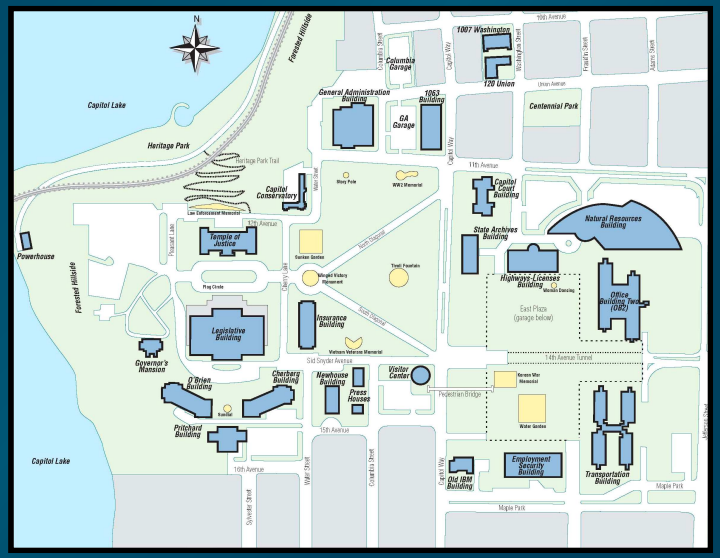
Energy Conservation on the Capitol Campus



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McKinstry Capitol Campus Team

Robert Hail – Program Manager

Main Contact Since 2007

Pat Paradise – Site Superintendent

30+ Years on Campus

Bill Macan – Commissioning

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McKinstry Capitol Campus Team - Continued

Mike Dean – Project Director. 25+ Years on Campus.

Mark Nieman – Energy Engineer. 14+ Years on Campus.

Dave McClain – Construction Manager.

Ben Woodhouse – Project Engineer.

Seth Davis – Lead Design Engineer.

Kristina Sing – Engineer of Record.

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Capitol Campus Energy Overview

- Puget Sound Energy supplies electricity and natural gas
- One campus electricity meter. Building submeters tracked by McKinstry AEM since Feb. ’09.
- Annual electricity use of about 54,000,000 kWh
- Natural gas mostly consumed at the Powerhouse central steam plant. Building steam meters.
- Annual gas use of about 1,000,000 therms
- Energy carbon footprint of 27,500 metric tons per year

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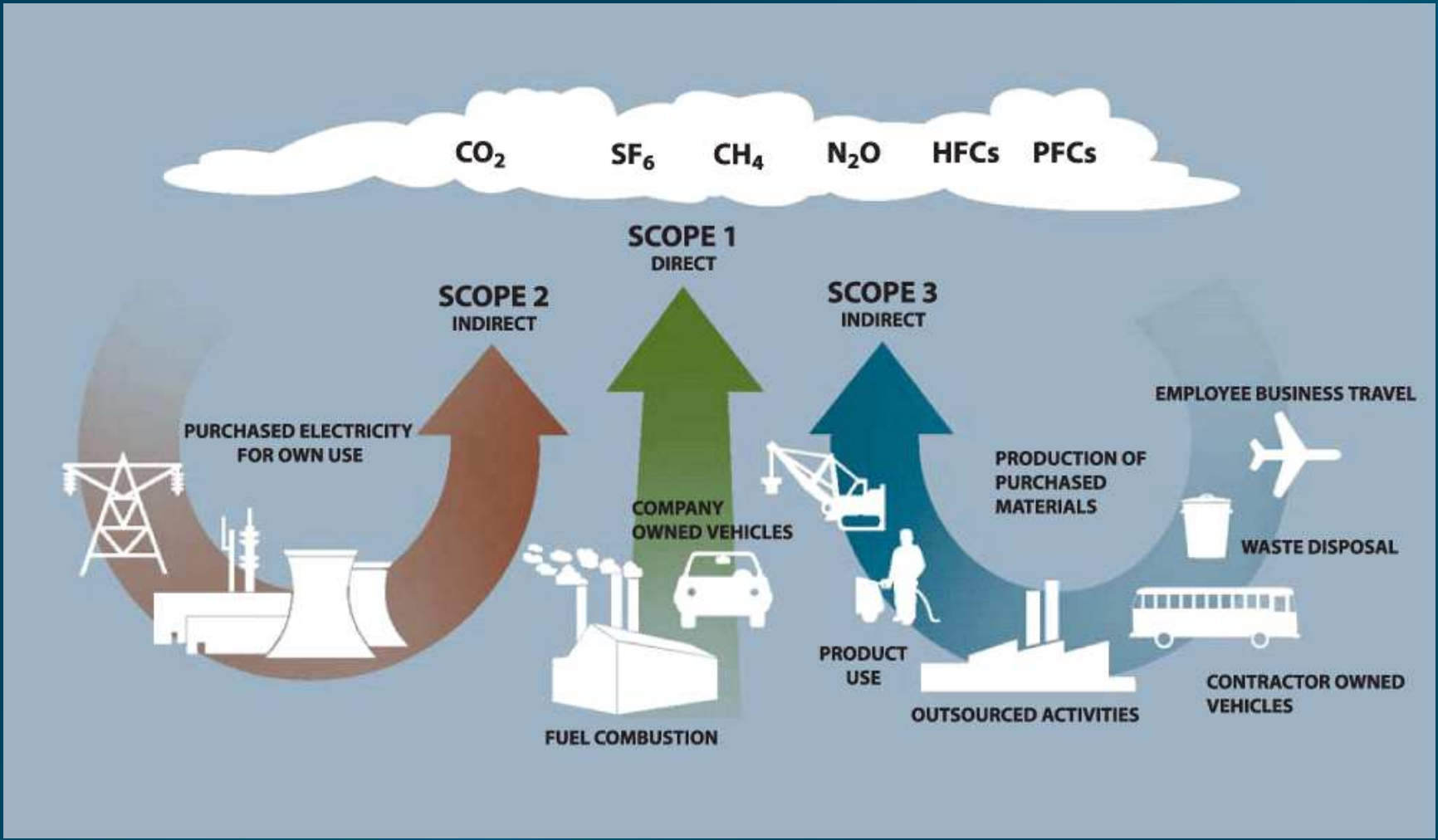
Emissions Inventory Diagram



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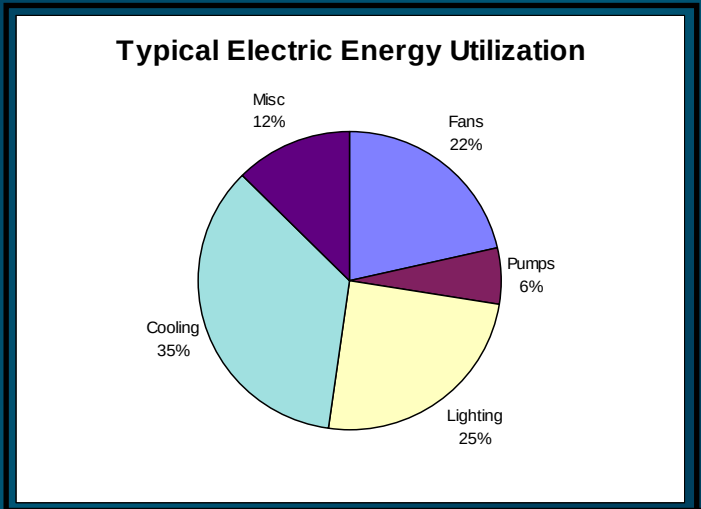
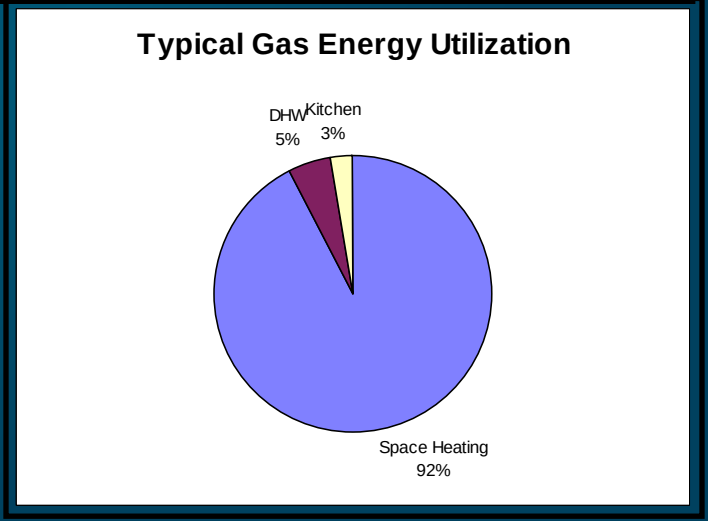
Campus Level Conservation Overview

- Targets
  - Heating
  - Cooling
  - Lighting
  - Air Distribution
  - Pumping





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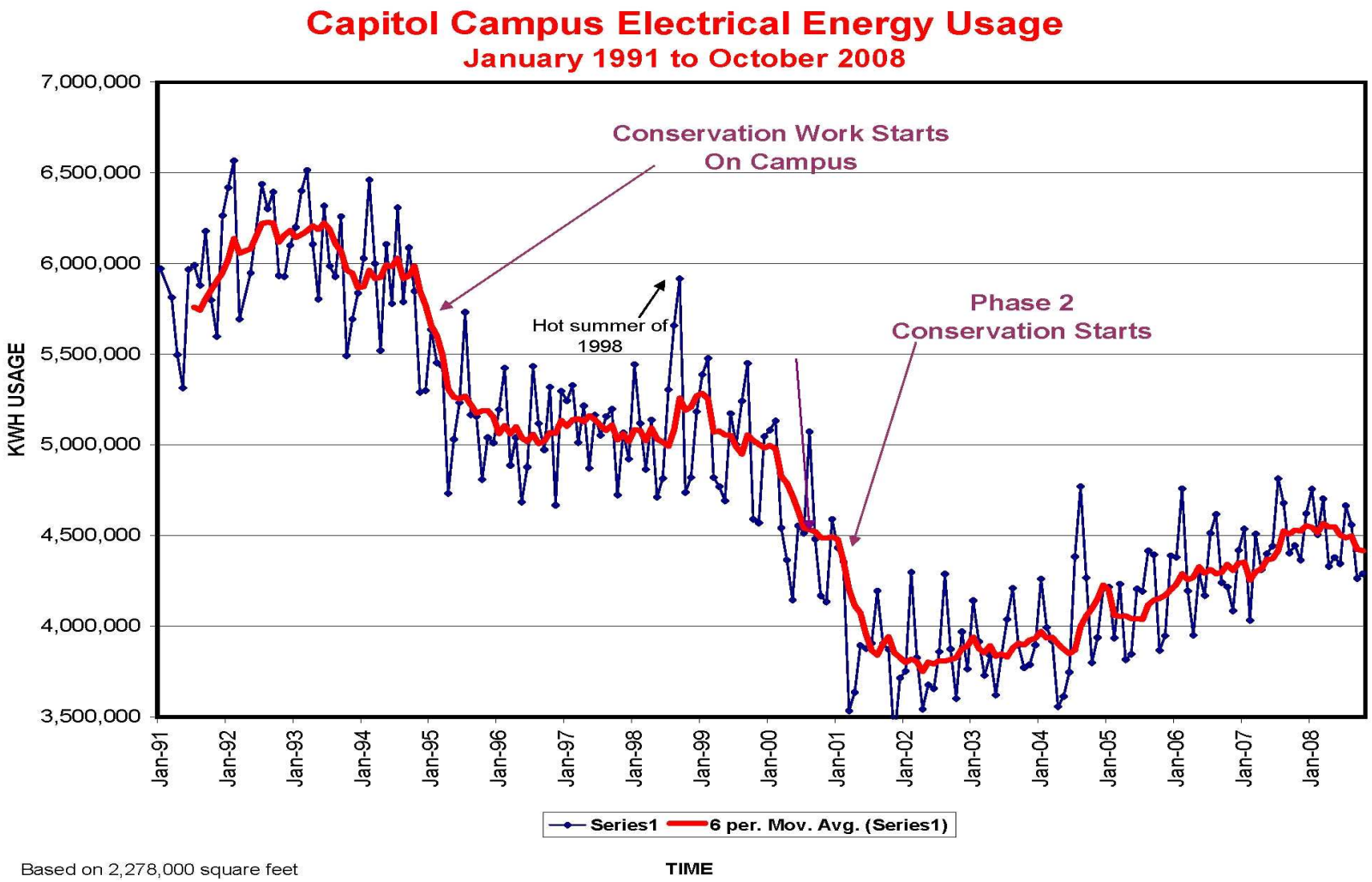

Based on 2,278,000 square feet

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Campus Lighting Upgrades

Project Highlights

- Inefficient T12 Magnetic Ballast lighting has been practically eliminated on Campus
- NRB upgrades resulted in savings of 480,000 kWh/year, $24,000/year, and a one-time rebate from PSE of $140k

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OB2 (Data Center) & NRB Heat Recovery

Project Highlights

- Waste heat previously released to the atmosphere has been used for over ten years to preheat NRB during the winter months
- New project re-purposes equipment after data center relocation

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OB2 Mechanical System Upgrades

Project Highlights

- Replaced old, failing, and inefficient equipment.
- New chilled water system
- Building exhaust re-routed through Plaza Garage to provide free heat to the parking garage.

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Legislative Building Solar Project

Project Highlights

- Photovoltaic panels
- 20 kilowatt solar system
- Two arrays with 72 photovoltaic panels
- In-Kind contribution to offset cost
- Long payback – demonstration project

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Highways-Licenses Building

Project Highlights

- Chilled water plant upgrades
- Fan replacement and major pressurization correction
- Terminal box recalibration
- Super T8 lighting retrofit

Overview

- Over $70 K of annual savings
- Over $300 K of grants

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Powerhouse Central Plant

Project Highlights

- New high-efficiency 680-ton chiller
- Replaced two 1970's era cooling towers
- Initiating project for boiler plant upgrades including new burner controls

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Employment Security

Project Highlights

- Replaced old chiller with new high-efficiency chiller
- Terminal box recalibration
- Building controls upgrade – Pneumatic to Direct Digital Control
- Retrocommissioning

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Natural Resources

Project Highlights

- Replace preheat source
- Terminal box recalibration
- Building controls upgrade – Pneumatic to Direct Digital Control
- Implement ongoing commissioning

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Future Project Opportunities

- Campus Steam to Hot Water Loop Conversion
- East Campus Chilled Water Loop
- DIS Heat Recovery
- Parking Garage Lighting
- Central Heating Plant Summer Shutdown
- Mansion Decentralization
- Additional Terminal Box Recalibration
- Additional Building Controls Upgrades
- Building Lighting Controls

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