



CAMPUS LEADERSHIP in a WARMING WORLD



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Greening Virginia Universities and College

Presentation by: Julian Keniry,
Campus and Community Leadership

THE CAMPUS CLIMATE CHALLENGE

- Help campuses reduce greenhouse gas emissions 80% by 2050
- Engage students in solutions to global warming



OVERVIEW

- The goal and context
- The barrier
- Top four solutions
- How to get to 80%
- Opportunities to engage



The Greenhouse Effect



Some energy is reflected back out to space

Earth's surface is heated by the sun and radiates the heat back out towards space

CO₂
Water Vapor
Nitrous Oxide
Methane

Solar energy from the sun passes through the atmosphere

Greenhouse gases in the atmosphere trap some of the heat

60°F
Average

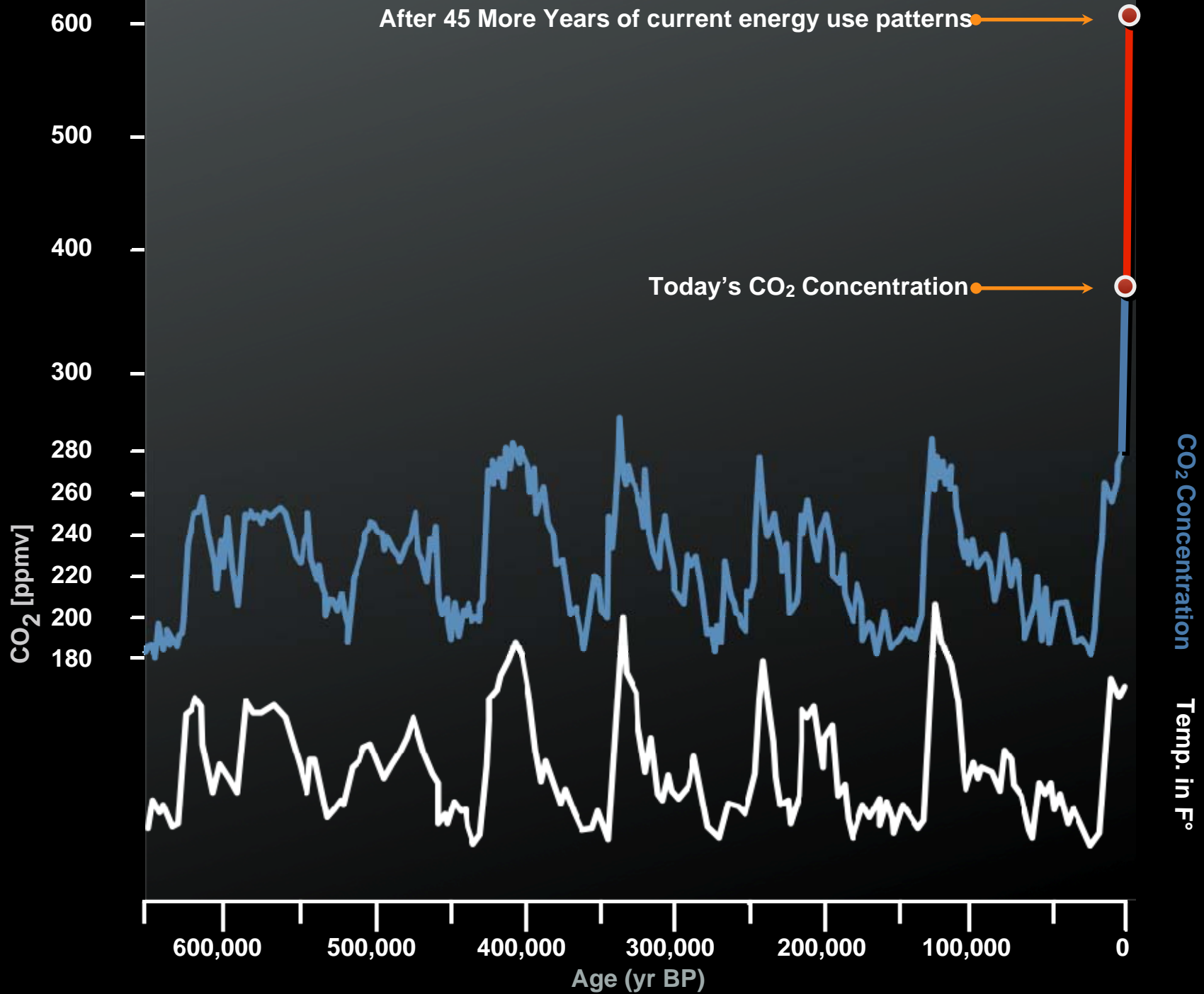


THE SCIENCE SAYS:

Shift now
towards safe,
renewable
forms of
energy

*Drilling an ice core in
Huascarán, Peru*





THE CHALLENGE:

Stabilize CO₂ at 450 parts per million (ppm)

- The 2% per Year Path
- NWF Challenge:
 - ↓ 30% by 2020
 - By Mid-Century:
 - ↓ 60-80%



REASONS WILDLIFE CARES

Birds of many species will be affected.

- Migratory disruptions.
- Nest failures.
- Population declines.



CAMPUS CLIMATE FOOTPRINT



- College buildings emit 19 million metric tons CO₂ (1.4% of US total)
- 5 Billion sq ft of built space
- Spend \$317 billion a year

MULTIPLE BENEFITS OF ACTION

- Enhance security
- Save money for education
- Improve economic and job prospects for graduates



LOOKING FORWARD

- \$33 trillion a year in ecosystem services.
- 240,000 new clean energy jobs by 2020
- Green companies returned between 5-14% annually in a 10-year period (including 2001)



COMMITMENT FROM THE TOP



- Develop a plan, take actions, share
- 368 pledged by Sep 6, 2007

<http://www.presidentsclimatecommitment.org>



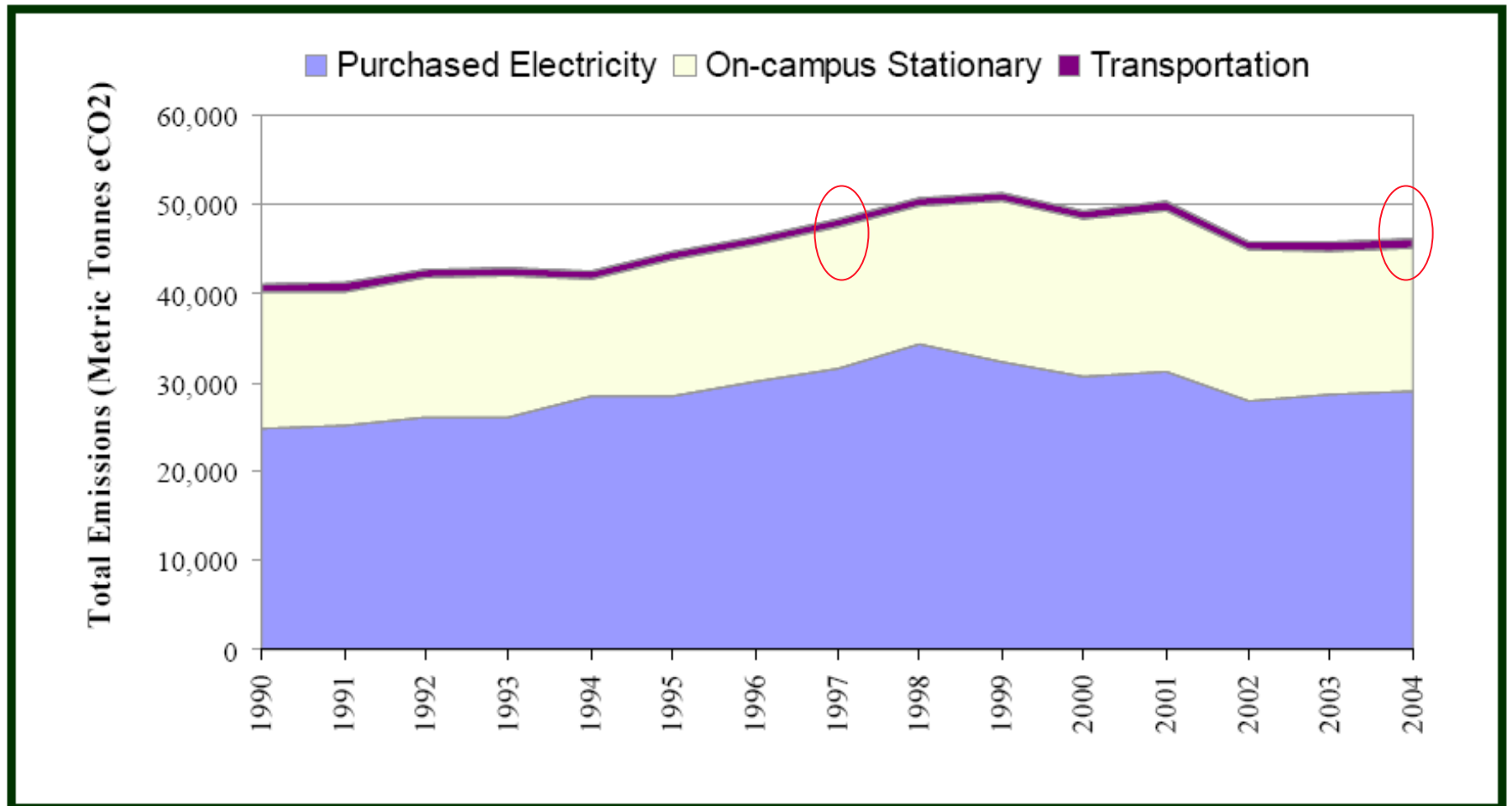
UCSB: BIG ENERGY SAVINGS

- Saved \$36.6 million in electrical costs since 1997
- A 35% return on investment



NET CO2 EFFECT AT UCSB:

Figure 1: UCSB GHG Emissions by Source

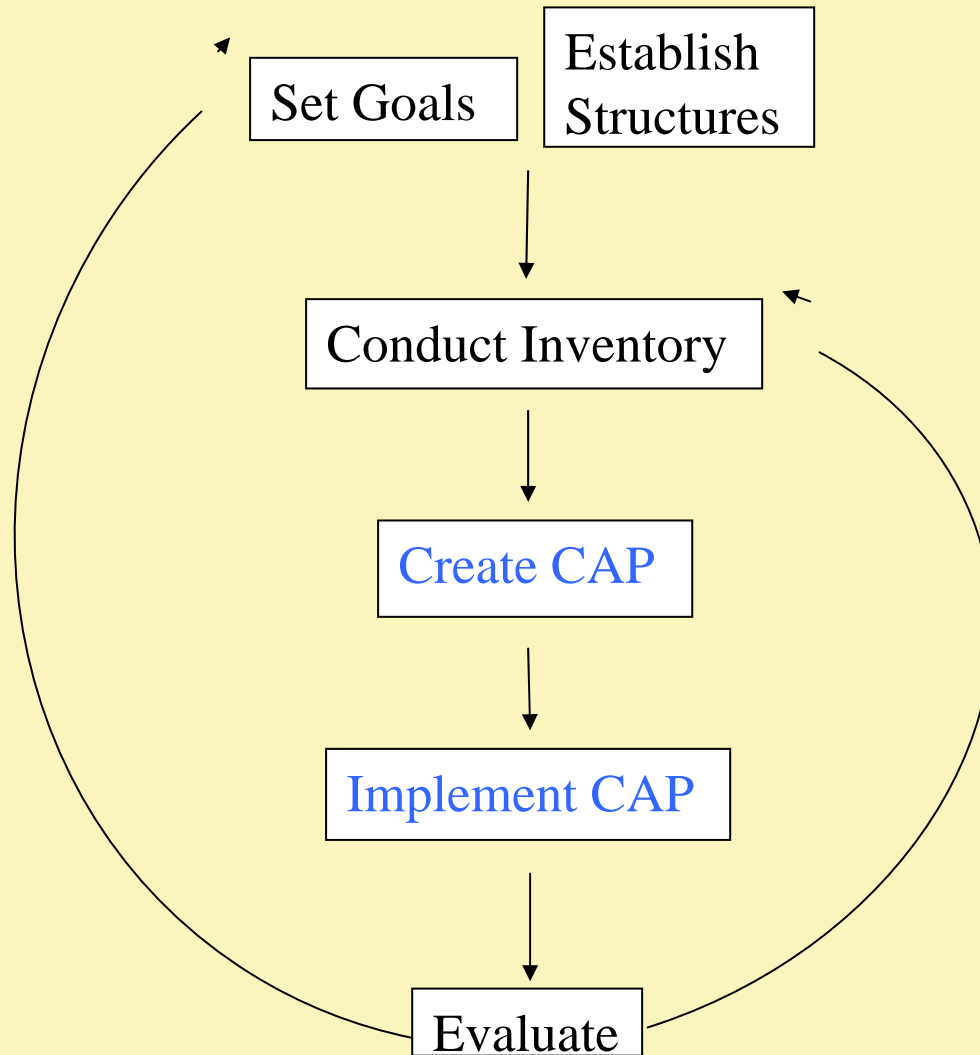


WHAT'S MISSING?

- Target for reducing CO₂ (or target doesn't match science)
- Reporting on energy savings but not net CO₂ reductions
- Inventories to establish the baseline and assess progress
- Plan to achieve the target



FIVE STEPS TO LAUNCH THE PROCESS



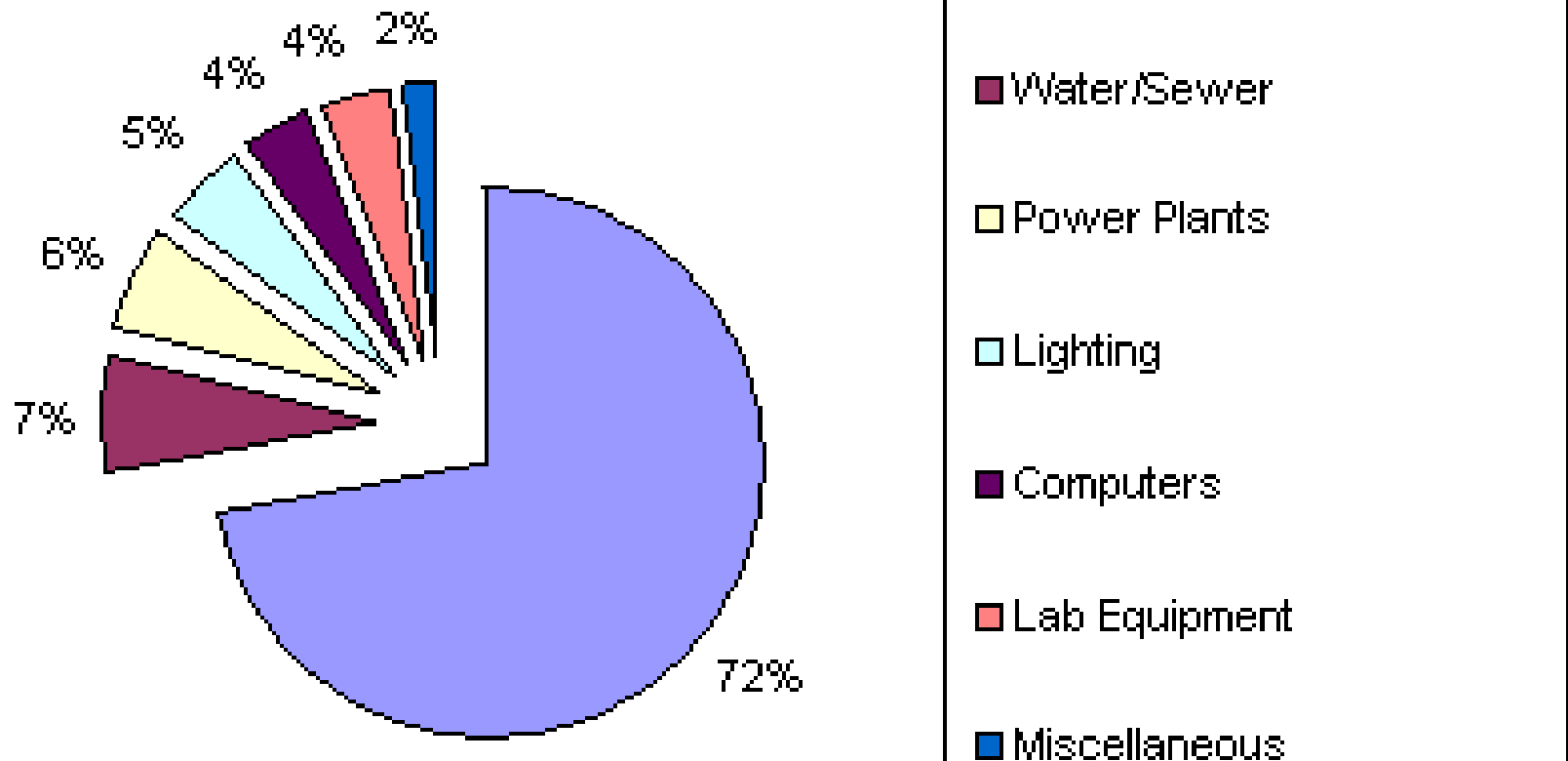
SAMPLE CLIMATE ACTION PLANS

- Tufts University: Tufts Climate Initiative
- Middlebury College: Carbon Reduction Initiative
- SUNY-Buffalo: UB Climate Action Initiative
- UC-Berkeley: Campus Climate Neutral Plan



WHAT IT TAKES TO RUN A CAMPUS

Energy Consumption Categories



Graphic and data from the University of Wisconsin-Madison



EVALUATING BUILDINGS

Students Scope Potential Savings at Penn State's Mueller Lab

Table 1. Potential Energy, Coal, and CO₂ Reductions and Money Savings for Mueller Building

System	Energy Savings (kW-hrs)	Coal Consumption Reduction (tons)	CO ₂ Emission Reduction (tons)	Money Savings (\$)
Lighting	143,292	58.5	151	4,421
HVAC	1,662,372	679	1,757	38,734
Computers	30,790	13	33	1,850
Printers	8,530	3.5	9	425
Elevators	3,627	1.5	3.8	85
Total	1,848,611	755.5	1,953	\$45,515

Improvements would cut energy use by 33%



TOP FOUR PROJECT APPROACHES



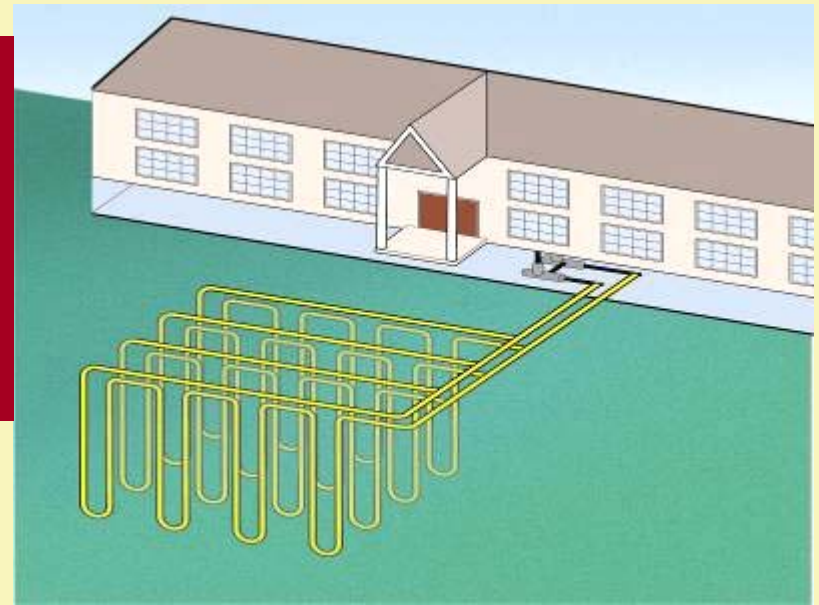
1. MINE EFFICIENCY

Hundreds of projects nationwide



- Energy Star Showcase dorm room, Tulane Univ., LA.
- Thermostat setbacks, SUNY-Buffalo.
- Vending misers, Tufts Univ., MA.

2. TACKLE HEATING & COOLING



West Chester University Pennsylvania, Geothermal Project Swope Music Building

- Retrofit cost \$248,500.
- Saves \$650,000 over 20 years.
- Eliminates 350 tons CO₂ annually.

3. BUILD RIGHT IN THE FIRST PLACE: University South Carolina



West Quad Residence Hall

- 45% less in energy costs.
- Saves \$40,000 a year in electricity \$40,000 in water.

West Quad is “170,000 square feet of evidence that proves green building is not more expensive.”

- Michael Koman
USC Envir. Programs Manager



4. INSTALL CLEANER SOURCES OF ELECTRICITY



- Oberlin College, OH 145 kW solar system, “Largest in state.”
- Chico State Univ., CA, 300 kW.
- Los Angeles Comm. College, CA, 1 MW.

How much is that?

9.6 kW will power an average home.

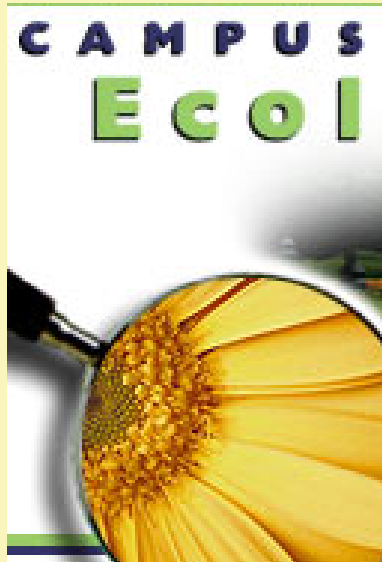


TOWARDS ZERO CARBON: Initial Plan to Reduce 70% at NWF

Description	Annual Electric Savings (kWh)	Ann. Cost Savings	Simple Payback (yrs)	CO2 offsets (tons)
Ground source heat pump retrofit	978,403	\$73,380	17.2	576
Solar parking lot fixtures	55,802	\$4,185	11.4	31.2
Virtual servers	29,673	\$2,225	10.0	17.3
Solar electric (PV)	12,350	\$926	60.0	7.3
Others	59,377	\$1,959	6.1	75.8+
Total kWh savings, plus 10% diversity factor	1,180,815	\$88,562	16.1	692.6



UPCOMING OPPORTUNITIES



- **November 2-5: Powershift:**
- **November 20: Chill-Out entries due**
- **January 30-31: Focus the Nation: Teach-In**
- **April 16: National Chill-Out Simulcast**

www.nwf/campusecology

NWF.ORG/CAMPUSECOLOGY

- Consultation
- Workshops
- Networking
- Fellowships
- Case study database & other publications
- National trends
- Awards and recognition

