

# Carbon Emissions Trading and Combined Heat and Power



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## University of New Mexico

- Founded in 1889
- 600 acre campus in Albuquerque
- 25,800 students at the Albuquerque campus
- 6,900 additional students at four branch campuses
- Approximately 8 million square feet of facilities



The duck pond



## CHP at UNM

- Cogeneration – 2 gas turbine/boiler units totaling 8.3 MW and 45,000 lb/hr
- Approximately 6 miles of utility tunnels



- Cooling – 8 chillers totaling 13,300 tons
- Heating – 2 boilers totaling 160,000 lb/hr
- Two 115 kV substations and a 12.5kV distribution system



## CHP at UNM

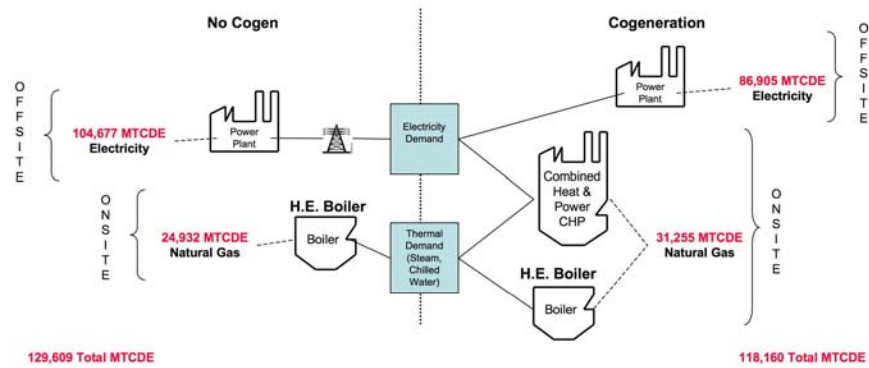
- First CHP plant was constructed in 1938
- Over the following 70 years UNM invested in a second heating plant, three chilled water plants, and two cogeneration plants
- In 1969 the heating plant was dedicated to A.D. "Pop" Ford



The Ford Utilities Center



# Cogeneration Scenario



The Cogeneration Scenario provides a 9% reduction in GHG Emissions



# Cogeneration at UNM

## Greenhouse Gas Emissions – Impact of UNM Cogeneration

UNM Operating Scenario	ONSITE CARBON EMISSIONS Purchased Natural Gas			OFFSITE CARBON EMISSIONS Purchased Electricity			Total GHG Emissions (MTCDE)
	MMBTU	MTCDE / MMBTU	GHG (MTCDE)	kWh	MTCDE / kWh	GHG (MTCDE)	
No Cogen	472,197	0.0528	24,932	120,317,822	0.00087	104,677	129,609
Cogeneration	591,944	0.0528	31,255	99,890,822	0.00087	86,905	118,160
Difference	119,747	0.0528	6,323	-20,427,000	0.00087	-17,771	-11,449
Percentage Change in Emissions	Onsite Emissions			Offsite Emissions			
	25.4%			-17.0%			-8.8%



## Forecast of Financial Impact

- The Western Climate Initiative (WCI), in its current form, and a few assumptions allowed us to analyze the potential financial impact of a carbon cap and trade system
- If the cost per MTCDE starts at \$10 in 2012 and rises to \$25 in 2020, then:
  - Compliance costs under the “No Cogen” scenario would be about \$1 million from 2012 to 2020
  - Adding cogeneration to the analysis doubles the compliance costs to more than \$2 million over the same time period



## Summary

- Combined heat and power projects increase energy efficiency and reduce greenhouse gas emissions
- Carbon cap and trade systems must be structured in a manner that insures regulations do not become a barrier to development of CHP and other energy efficient technologies





Thank You

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