

The Mohegan Tribe's Integrated Energy Management Approach

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Based on the work of Dr. Norman Richards

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Mohegan Vision Statement

“We are the Wolf People, Children of Mundo, a part of the Tree of Life. Our Ancestors form our roots; our living Tribe is the trunk; our grandchildren are the buds of our future...we survive as a nation guided by the wisdom of our past. Our circular trail returns us to wholeness as a people.”

MEPD Core Values

- ❖ Develop, maintain and evolve state of the art, cost saving tribal environmental management programs.
- ❖ Program includes:
 - Regulatory compliance
 - Litigation avoidance
 - Education of the Public and Community Leaders
 - Technical credibility
 - Leadership in Native American sovereignty
 - Expeditious permit processing
 - Minimal engineering retrofits/rework
 - Reliable, low emitting power
 - Economic competitiveness
 - Acceptable risk

Fuel Cell Program Support and Appreciation

- ❖ UTC Power
- ❖ Johnson Controls
- ❖ US Department of Energy
- ❖ US Army Corps of Engineers
- ❖ Connecticut Department of Environmental Protection
- ❖ US Environmental Protection Agency
- ❖ Mohegan Tribal Members
- ❖ Mohegan Sun Engineering and Transportation Departments
- ❖ Dr. Norman Richards, former MEPD Administrator

Mohegan Tribe Cooperative Agreement with the State of CT

- ❖ Through an MOU with CTDEP the Tribe adopted the SIP in 1995
 - ❖ Ensured that Tribal activities didn't negatively affect the attainment of National Ambient Air Quality Standards (NAAQS)
 - ❖ Tribe agreed to offset vehicle (car and bus) emissions from patron visits in the form of Emission Reduction Credits (ERCs)
 - ❖ Tribe agreed to an emission reduction trading order to offset NOx and VOCs from patron vehicles
 - ❖ In 1996, Tribe began purchasing ERCs at market value (\$1000/T for NOx and \$2500/T for VOCs) from CAAR
 - ❖ In 2000, Tribe proposed to substitute energy conservation project capital costs in lieu of purchasing ERCs from the open market

2006 OZONE SEASON

EMISSION REDUCTION OFFSETS (tons)

(EPA MODEL MOBIL 6.2 WAS USED TO
CALCULATE EMISSION FACTORS)

| | <u>MAY</u> | <u>JUN</u> | <u>JUL</u> | <u>AUG</u> | <u>SEP</u> | <u>TOTALS</u> |
|-------------|------------|------------|------------|------------|------------|---------------|
| <u>VOCs</u> | 26.6 | 26.94 | 29.92 | 28.86 | 26.39 | 140 |
| <u>NOx</u> | 50.51 | 50.51 | 54.83 | 53.43 | 49.97 | <u>259</u> |
| | | | | | | 399 |

Note: Tonnages are based on 2005 patron counts. Annual equivalent value for expenses to offset these vehicle emissions is \$609,000 for the 2006 ozone season

Energy Conservation Projects

- ❖ In 2000, CTDEP preliminarily approves \$2.4 million fuel cell purchase for demonstration and public outreach program which provided necessary ERCs through summer ozone season 2003
- ❖ In 2005, CTDEP preliminarily approves \$7.1 million in energy conservation projects providing necessary ERCs through year 2011
- ❖ Fuel cell performance summary results are published by joint effort with UTC Power in February of 2007 to promote awareness of the need for clean energy alternatives
- ❖ Fuel cell report is posted on the Tribal website in March of 2007 at:

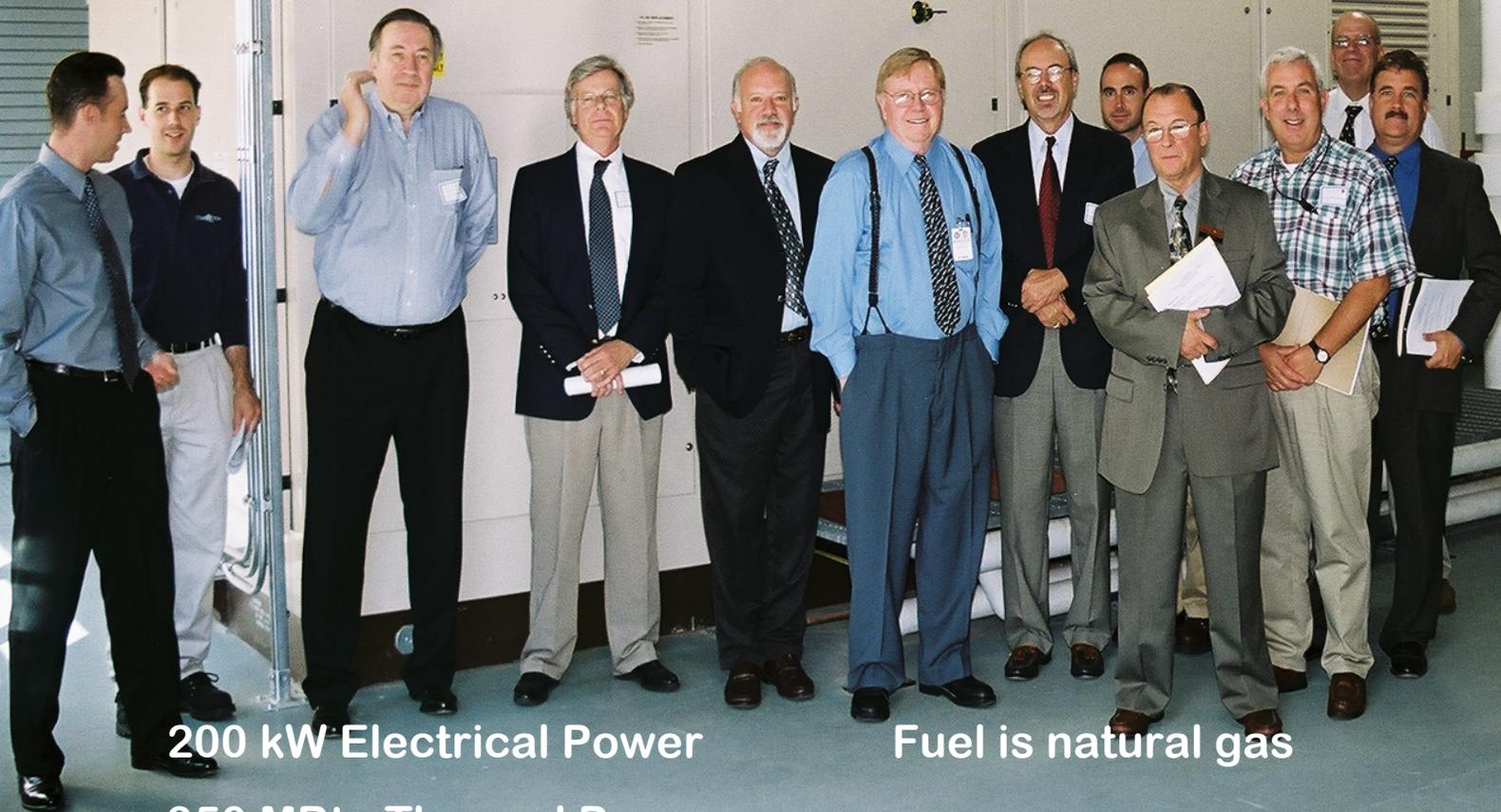
www.mohegan.nsn.us



UTC Fuel Cells

A United Technologies Company

Original Fuel Cell Team



200 kW Electrical Power

Fuel is natural gas

950 MBtu Thermal Power

Advantages of Fuel Cell Use

- ❖ Reservation is in a serious ozone non-attainment area capped at < 50 T for NO_x
- ❖ MTGA TIP allows future installation of more fuel cells for Phase III expansion – Project Horizon
- ❖ Fuel cell emissions are much less than conventional combustion technologies (NO_x, SO_x, CO, VOCs, PM)
- ❖ Renewable Energy Credits are traded for revenue \$276,810
- ❖ (2004-2006)
- ❖ Operational Savings for the Tribe \$188,674 (2002-2006) (defined as: electrical & thermal savings - maintenance & fuel costs)
- ❖ Operational Savings for Commercial Customers are estimated by UTC Power to be much higher (\$2,157,215)

Other Energy Conservation Projects

- ❖ Photovoltaic Fort Shantok restroom
- ❖ Hotel room occupancy detectors (HVAC)
- ❖ Install VFDs on hot water pumps, chillers, air handlers
- ❖ Ground source heat pumps/chiller unit – Daycare Center
- ❖ Energy efficient lighting conversion – parking garages
- ❖ Cimetrics equipment tracking for BMS
- ❖ Vending miser installation w/passive infrared sensor
- ❖ Install Longlite QL3 energy saving devices on 2600 light fixtures
- ❖ Installation of JCI's CO2 sensors for air handlers
- ❖ Hybrid electric cars for police surveillance
- ❖ Ultra low sulfur fuel replacement for employee buses
- ❖ Exhaust emission control retrofits for buses

Eagleview Child Development Center



Ground source heat pump system



Fort Shantok Restroom







Mohegan Security Department Toyota Prius vs Ford Escape





Mohegan Carbon Dioxide Sequestration Forest in Costa Rica

Thank You!

Fuel Cell Tours available

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Introduce David Paul

UTC Power