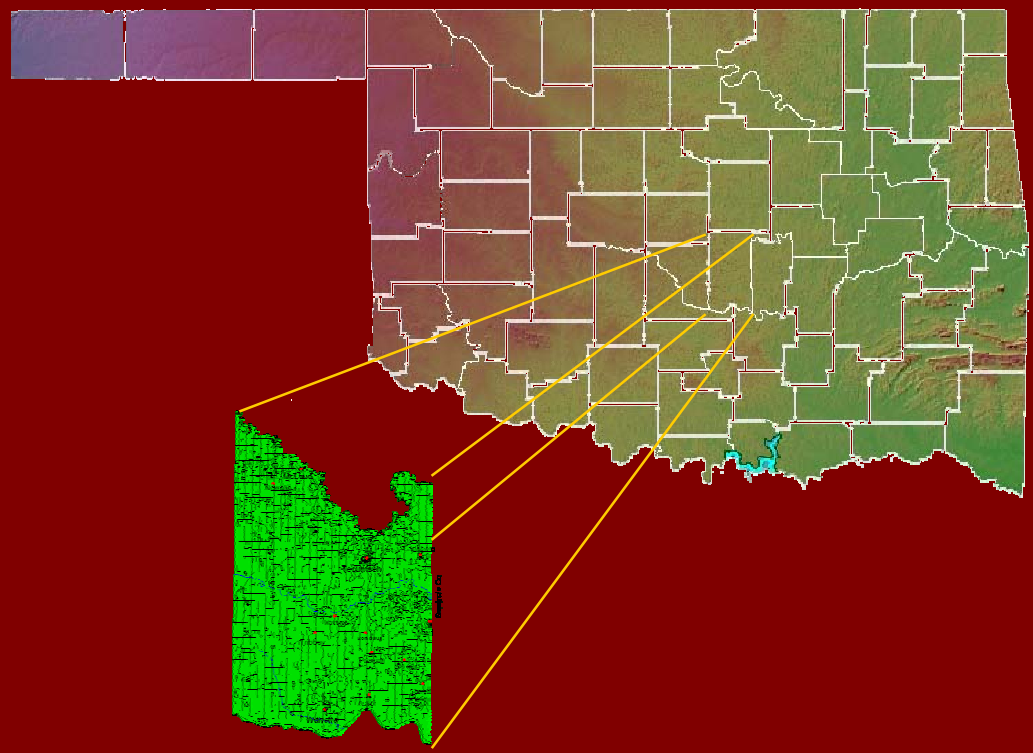
Citizen Potawatomi Nation

Department of Energy
Tribal Energy Program Review
October 18-21, 2004

Located in Shawnee, Oklahoma

- Citizen Potawatomi purchased allotment lands consisting of a small 900 square mile parcel
- The largest part of the Potawatomi made their way to the new reservation in the 1880s.



Citizen Potawatomi Nation Tribal Headquarters, ca. 1973

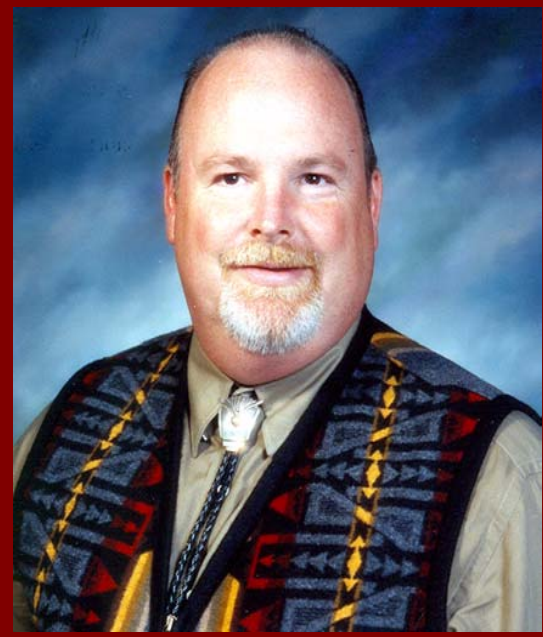
Tribal Leadership

John A. Barrett Jr.

Chairman

Linda Capps

Vice Chairman



D. Wayne Trousdale

Secretary/Treasurer

Economic Impact

2003 Community Impact = $84,979,660

Enterprise Employees (480)	$12,041,845
Enterprise Expenditures	$38,476,036
Non-Enterprise Employees (298)	$12,104,616
Annual Economic Impact	$84,979,660

2002 Community Impact = $73,087,828

2001 Community Impact = $56,642,420

2000 Community Impact = $48,006,270

CPN Headquarters

The Tribal Administration Building houses:

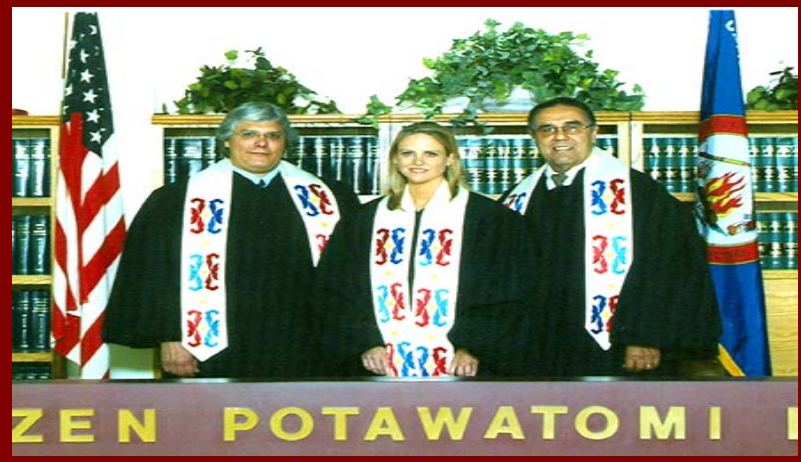
- Administrative Offices
- Enterprise/Tribal Accounting
- Tribal Rolls
- Employment and Training
- Cultural Resources
- Child Development Center
- Office of Self Governance
- Title VI Elderly Program
- Human Resources
- Purchasing
- Networking
- Occupied February 1998

Citizen Potawatomi Population

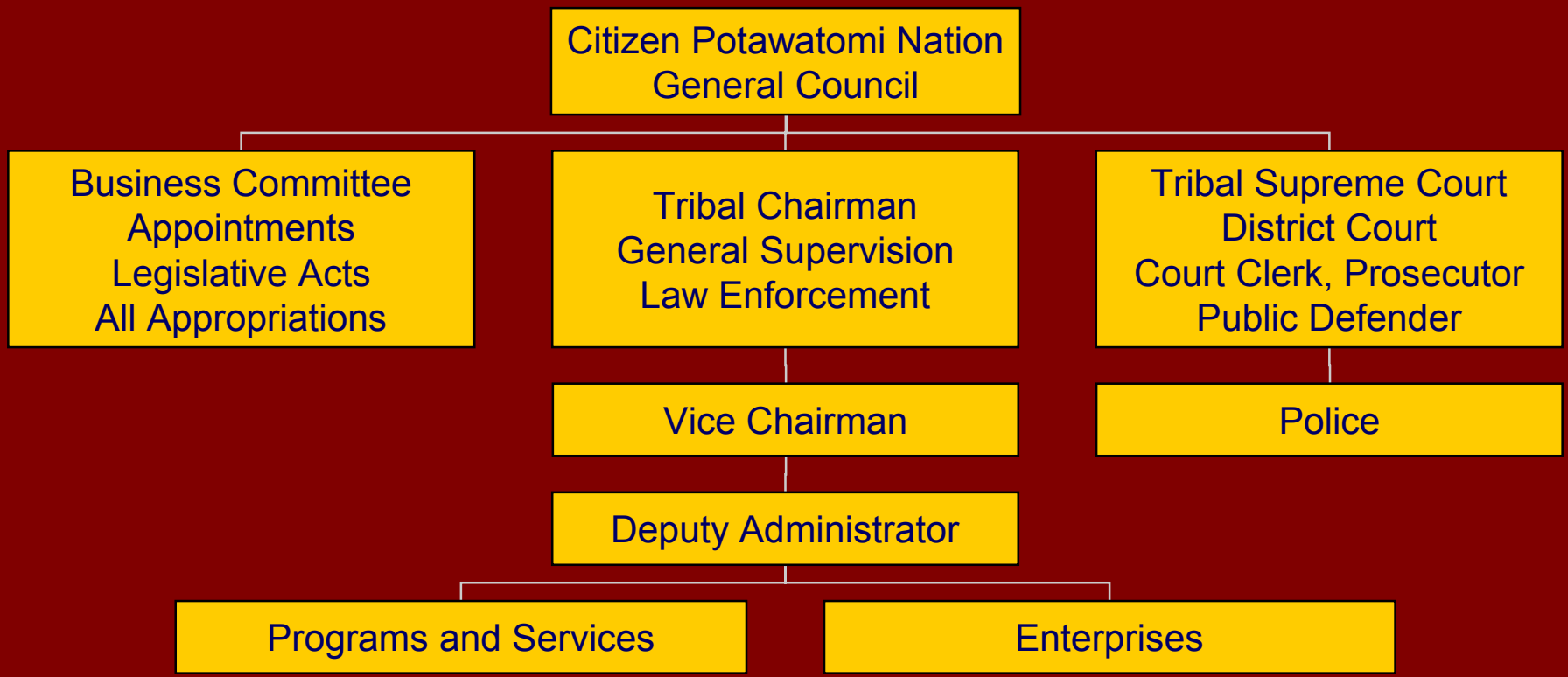
CPN Tribal Member Densities based on 5 Digit ZIP Codes

Tribal Court

- In operation since 1986
- 7 Supreme Court Justices
- 3 District Court Judges
- One prosecuting attorney
- One public defender
- One court clerk
- Jurisdiction over any Citizen Potawatomi - anywhere
- Civil jurisdiction over non-Indians



Citizen Potawatomi Nation Tribal Government Structure



Jurisdictional Programs and Activities

Health Complex

Clinic ~ Pharmacy ~ CHRs

Contract Health ~ Optometry

Dental ~ Audiology

Behavioral Health ~ Substance Abuse

FireLake Fitness Center

Child Development Services

Child Care Center

After School Program

Child Development Center Expansion

- One of Only Two Two-Star Child Development Centers in Pott. County
- Current Capacity - 400
- 200-Plus Slots Added in 2004

First National Bank & Trust Co. of Shawnee

Main Bank

FireLake Branch

With solid earnings performance for the past six years, First National Bank is the fastest growing bank in Shawnee and the community's ***only*** locally owned bank.

FNB/Holdenville

FireLake Golf Course

FireLake Casino

Potawatomi Gift Shop

FireLake Farms

1,200 Acres (Approx.)
1 Full-time employee
Best suited for agriculture production

- Hay
- Horticultural Produce
- Field Crops

San Remo's Cafe at FireLake

FireLake Discount Foods


Monterey


FIRELAKE


HE BUTCHER BLOCK
QUALITY & VALUE

FireLake Discount Foods

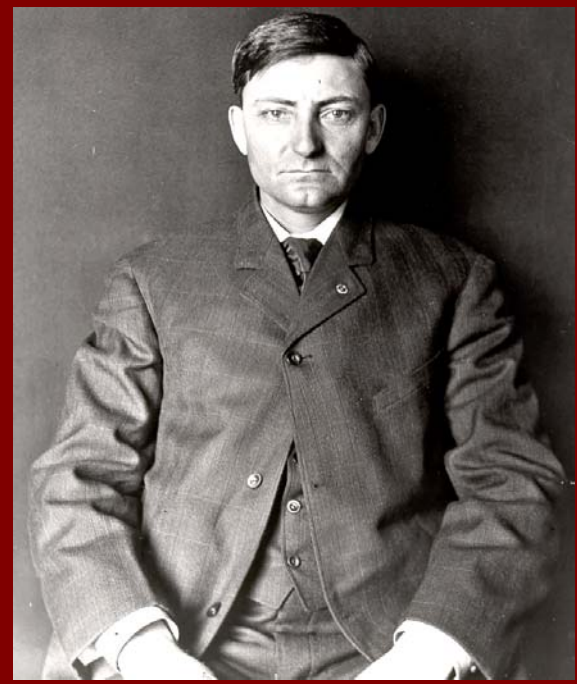
Regional Tribal Functions

- To provide tribal members an opportunity to interact with tribal officials
- To assimilate and distribute information to the regional members
- Only tribe in the United States that hosts regional meetings

The first regional council meeting was held in 1984.

Tribal Rolls

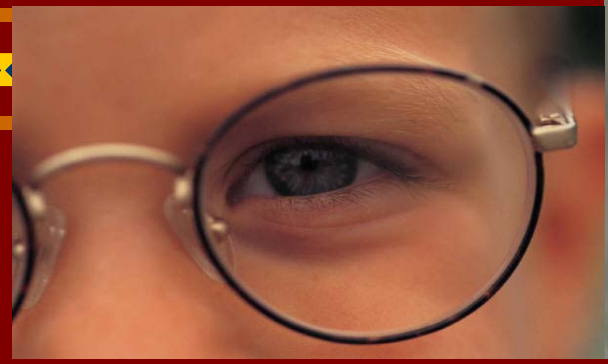
- Enrollment
- Genealogy Research
- Provide and maintain photo ID cards
- Tribal Scholarships
- Burial Insurance Program



Mail-Order Pharmacy

- Plan A – Tribal members 63 OR OLDER. CPN will pay 100% of the cost for drugs on the formulary
- Plan B – Tribal members YOUNGER THAN 63. 100% co-pay by tribal member.

Health Aid Foundation



- Eyeglasses - Contacts
- Hearing Aids - Crowns
- Dentures - Partials - Bridges
- Prosthetic Devices
- CPAP Machines
- Wheelchairs – Mobile Chairs
- Mobile Chair Ramps for Vehicles
- Prescription Sunglasses (w/Doctor's Statement)

Must have been born by December 31, 1971 or be at least 1/8 Citizen Potawatomi

Scholarships and Education Programs

- Nishwamen Scholarship at St. Gregory's University
- Tribal Scholarships
- Higher Education
- Housing Allowance
- All programs have strict deadlines

CPN Housing Authority

- Emergency rehabilitation loan program

- Down payment and closing cost assistance grant

Cultural Resources

- Preserve Potawatomi Culture
- Language Classes
- Historic Preservation
- Archaeology

New Cultural Heritage Center

Family Reunion Festival

Final Weekend in June Annually

Project Overview

- The Citizen Potawatomi Nation seeks to create long-term energy strategies, explore development of tribal utilities, and analyze renewable energy and energy efficiency options.

Project Participants

- CPN Chairman – Mr. John A. Barrett Jr.
- CPN Vice Chairman – Linda Capps
- CPN Secretary-Treasurer – Mr. D. Wayne Trousdale
- Director/Self-Governance – Ms. Rhonda Butcher
- Project Coordinator – Mr. Art Muller
- Public Works Director – Mr. Richard Kunze
- Housing Authority Director – Mr. Robert Carlile, Ph. D.

Project Participants- Energy Consulting Team

- Team Leader –Marvin Smith, Ph.D.
- Principal – James Bose , Ph.D.
- Principal –Richard Beier , Ph.D.
- Principal –Young Chang , Ph.D.
- Engineer – Randolf Perry
- Engineer – Fred Schroeder

All associated with Oklahoma State University and International Ground Source Heat Pump Assoc.

Objective One

- Conduct planning sessions with the Citizen Potawatomi Nation Strategic Energy Planning Team. The goal is to set a baseline assessment and create an energy vision.

Objective Two

- Conduct an analysis of energy efficiency opportunities to reduce overhead and increase the efficiency of energy consuming devices, improve design of the overall system, switch to a more efficient system, improve control of the system, improve maintenance, and reduce energy demand in Citizen Potawatomi Nation buildings.

Objective Three

- Conduct analysis and study feasibility of geo-thermal resources, wind-generation, propane and natural gas distribution systems, and the future of hydrogen and fuel cells for production, transportation, and storage of large quantities of energy.

Objective Four

- The Citizen Potawatomi Nation will address electricity restructuring by increasing our participation beyond continuing to purchase electricity from the local distribution utility. Determining the opportunities and pitfalls of electricity restructuring will prepare the CPN to protect and serve tribal interests.

New Projects

- None currently with DOE
- Plans are to implement recommendations resulting from the current project

On Going Projects- Project Status

- Made an assessment of the primary sources of energy consumption on CPN land
- Example Results:
  - Water well cost to be made an energy asset
  - Integrate current waste heat into new business
  - Utilize close proximity of primary sources of energy consumption to become an advantage

New CPN Heritage Center

Installing geothermal heat pump system to heat and cool the building. Original design used vertical bore-holes for energy source.

Result of assessment of energy consumption in CPN operations led to new potential. Use water that is already being pumped into ponds on golf course as the heat pump energy source.

FireLake Discount Foods

A large source of heat energy: supply a car wash, or greenhouse, or laundry or similar business

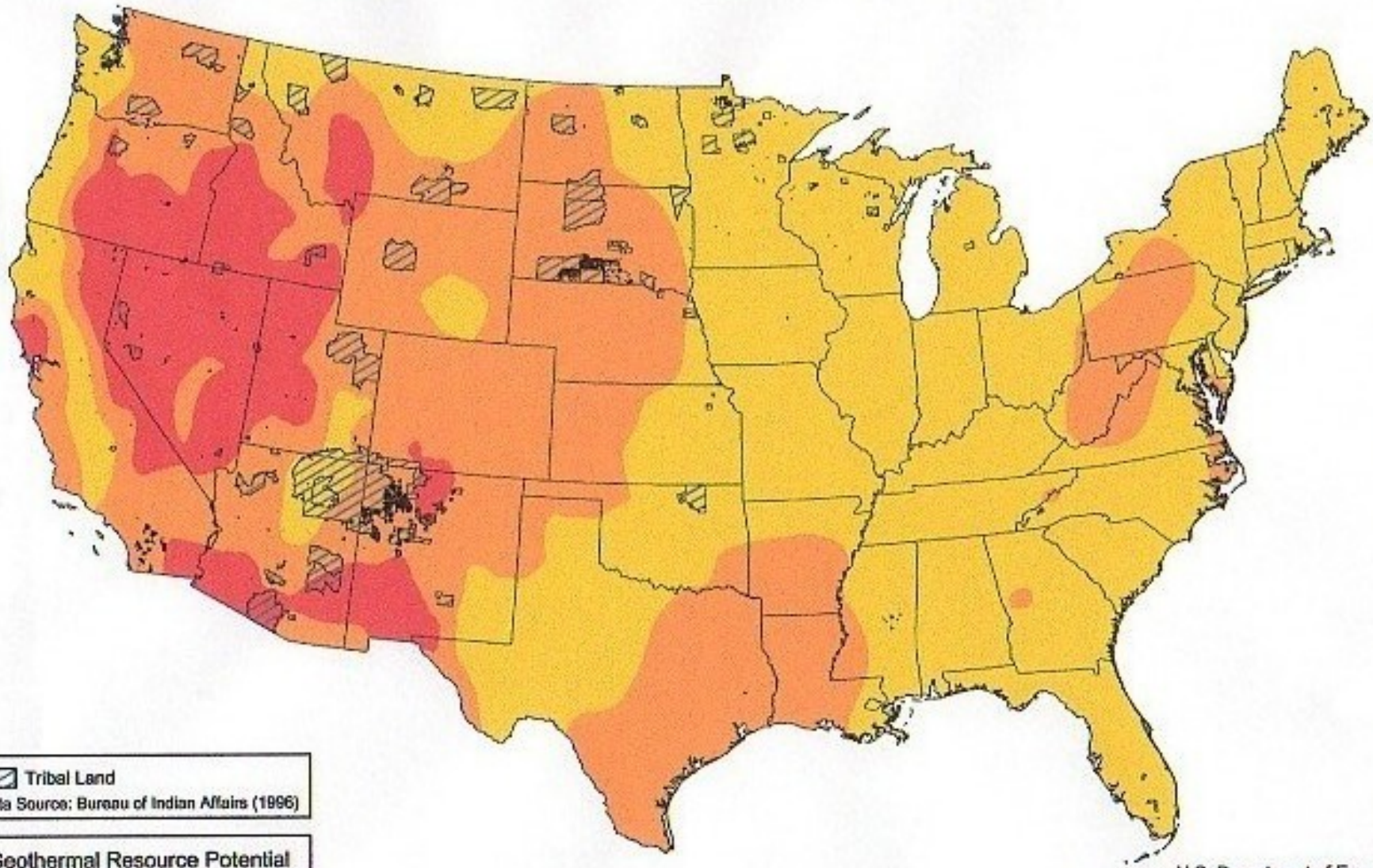
On Going Projects- Project Status-Example

- Most of the primary sources are in close proximity of each other
- Led to a guiding statement:
  - Maximize economic opportunities through energy efficiency, energy system integration and energy management
  - Thus evolving into: creating jobs, establishing businesses, reducing energy consumption, cost reduction, and obtaining competitive advantage

On Going Projects- Project Status

- Assessed the characteristics and potential of energy systems that could impact the generation/conservation of energy
- Example Systems and Results:
  - Geothermal Energy
  - Wind Energy
  - Biomass
  - Combined Heating and Power (CHP)

United States - Geothermal Resource and Tribal Lands



Tribal Land
Data Source: Bureau of Indian Affairs (1996)

Geothermal Resource Potential
- Electric Generation
- Direct Heat
- Geothermal Heat Pump

Data Source: Southern Methodist University Geothermal Laboratory (2002)

U.S. Department of Energy
National Renewable Energy Laboratory

NREL

08-SEP-2003 1.1.1

The CPN & Geo-Thermal Energy

- The CPN already uses geo-thermal energy in its health clinic.

The CPN & Geo-Thermal Energy

- The CPN's Cultural Heritage Center, now under construction, will feature use of geo-thermal energy.

GHP Commercial Installation

Low Cost Housing

- 3 Bedroom
- 960 square feet
- Heating, Cooling and Water Heating averages $17/month at $0.07/kWh

New CPN Housing Project

Previous design and construction used conventional heating and cooling

New housing project (25 duplexes) will use the environmental friendly GHP system for each unit. Energy and cost savings and comfort will be experienced.

High Potential for New GHP Business

CPN has the Requirements:

- Champions
- Business knowledge
- Drilling experience
  - Vertical boreholes and water wells
  - Horizontal boring
- Construction experience and talent
- Currently implementing them into CPN buildings

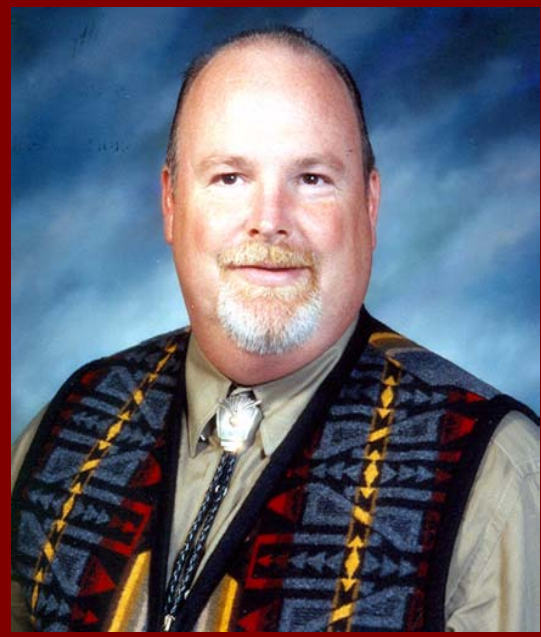
Champions to Lead the GHP Business

John A. Barrett Jr.

Chairman

Linda Capps

Vice Chairman



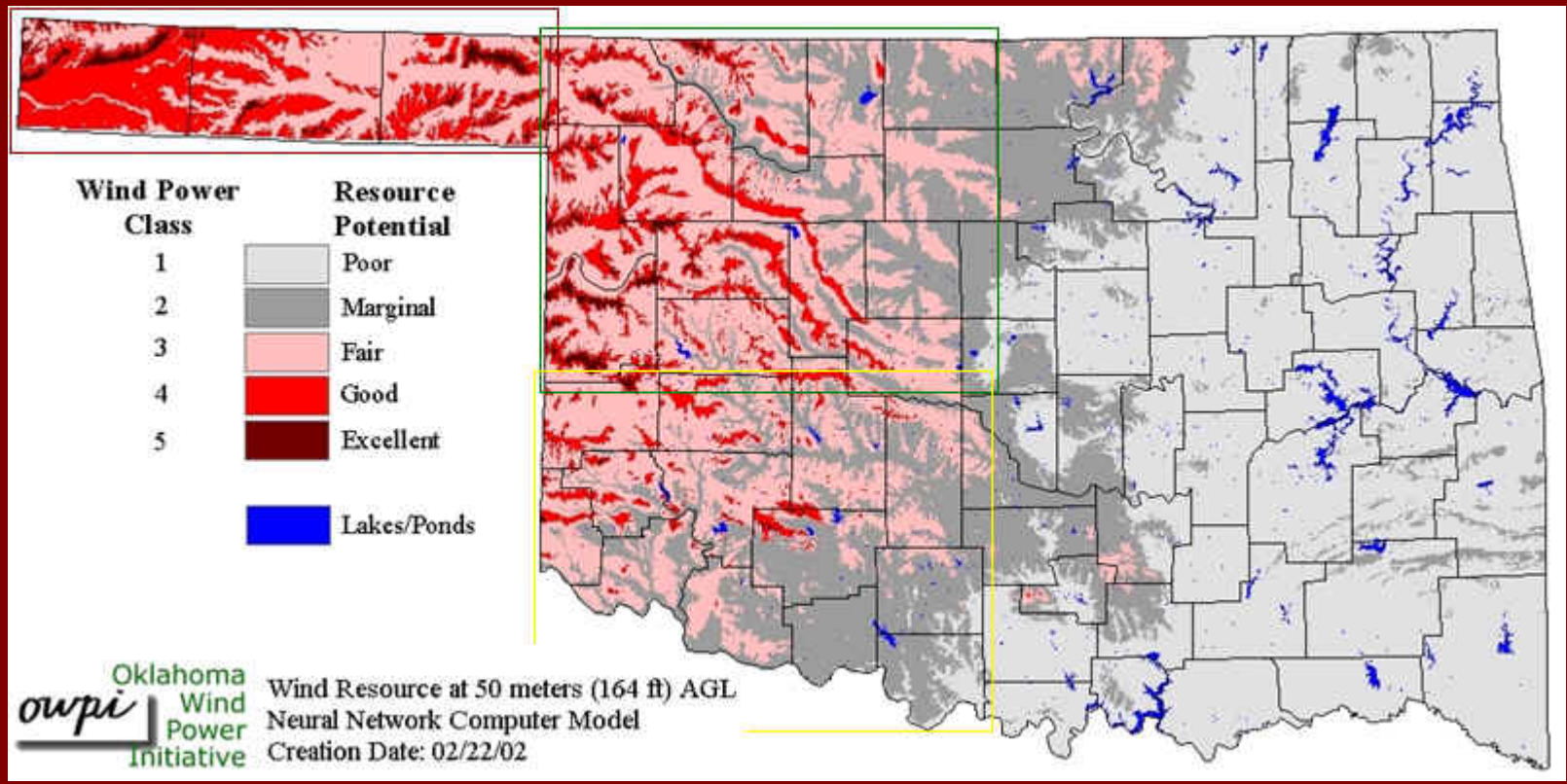
D. Wayne Trousdale

Secretary/Treasurer

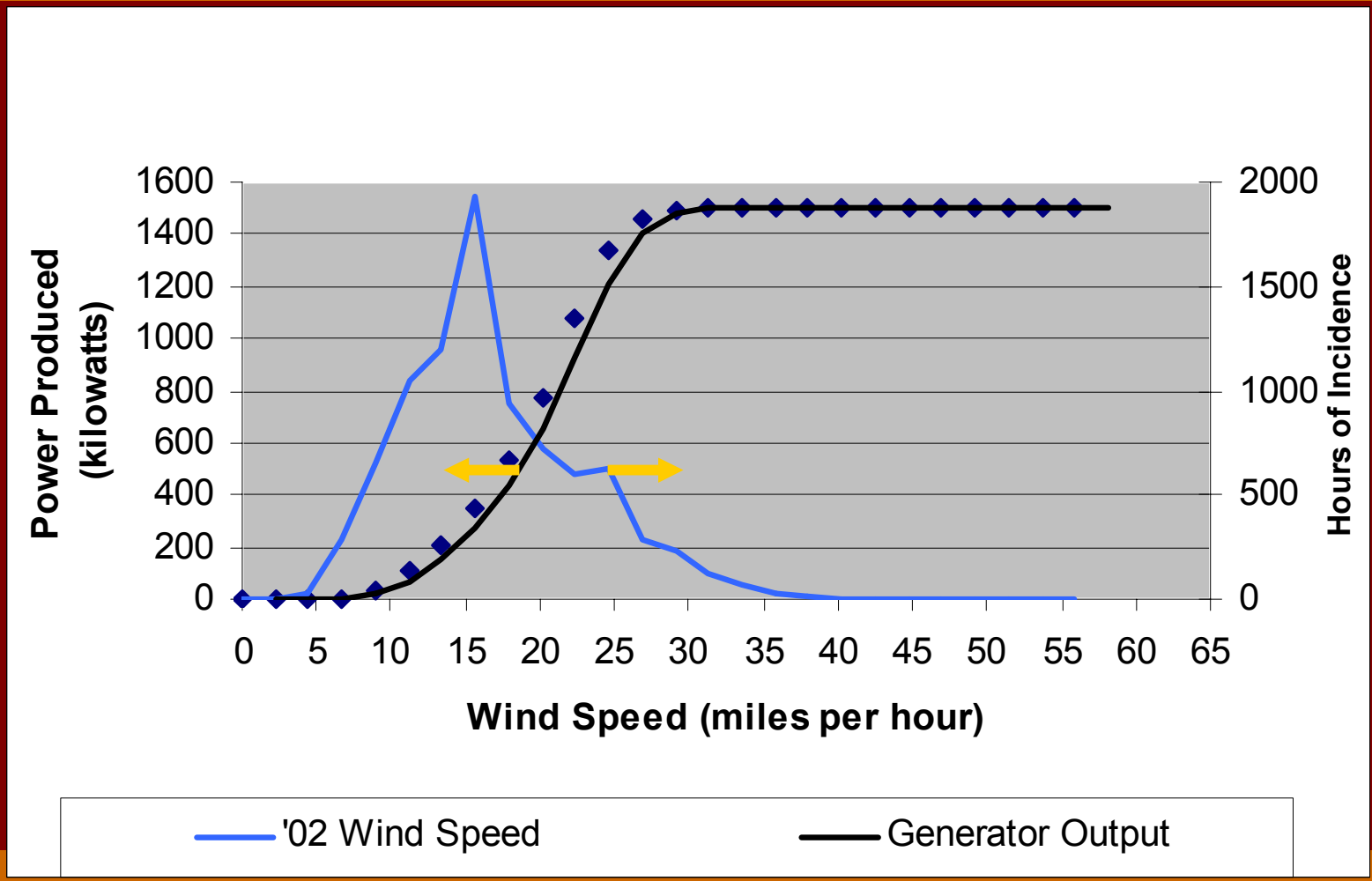
Wind Energy

- CPN entered agreement with OG&E to purchase electricity generated by wind turbines
- NREL has made available through Native American Loan Program an anemometer to measure wind characteristics on CPN land
- Currently wind energy requires Tax Credit for viability, this has been extended by congress
- This technology is modular and highly additive

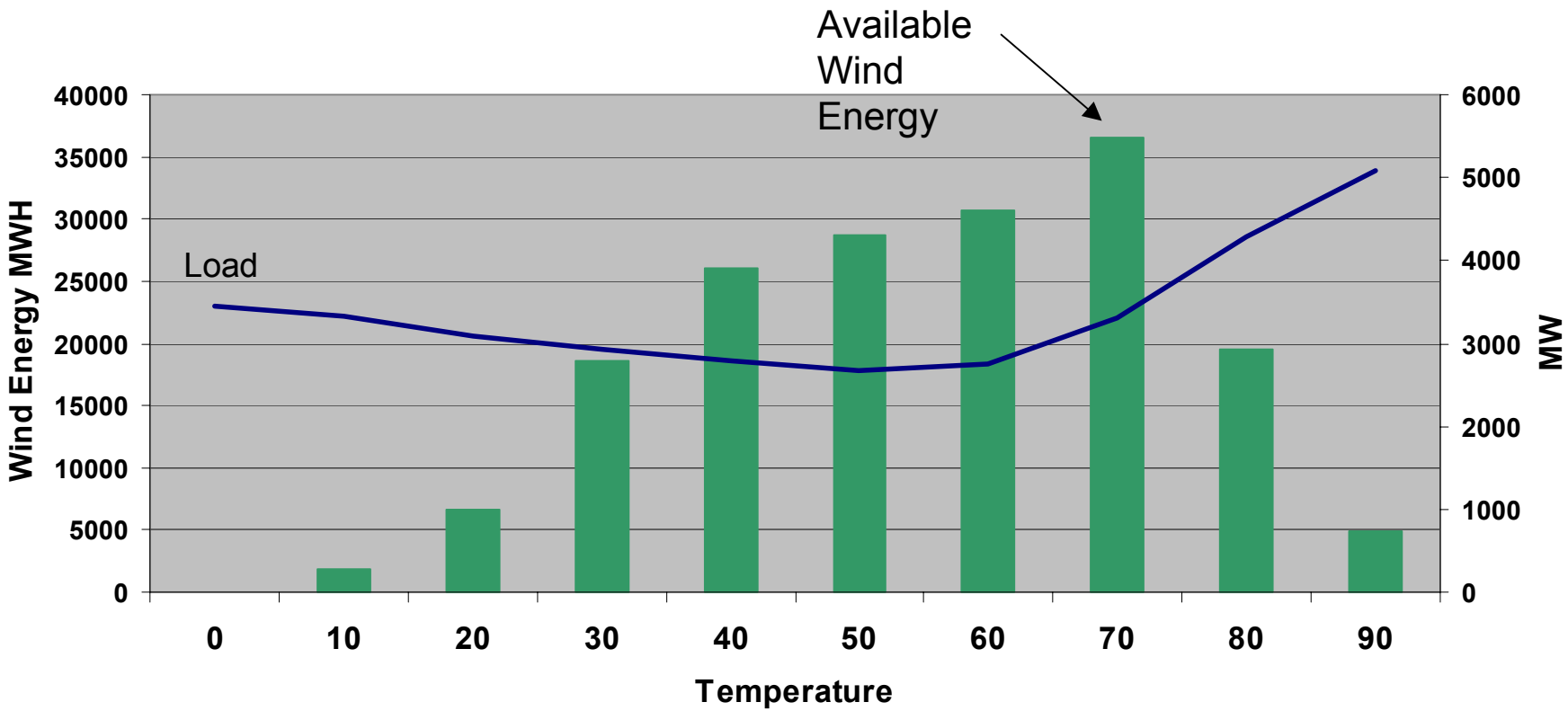
Oklahoma Wind Potential



Output of Typical GE 1.5MW Turbine



How Well Does Wind Generation Fit the OG&E System?



OSU Ethanol Strategy

Biomass—grow, harvest and transport → Gasifier—Convert biomass to producer gas → Bioreactor—Ferment producer gas to ethanol (and other useful products)

Potential Impact

100 MGY Ethanol Plant

Over $14 M/yr to farmers

Bioconversion Facility
(30 plant personnel = $1.2 M/yr)

Integrated harvesting system (260 laborers = $6.5 M/yr)

Transporting biomass from field to plant (90 truckers =$2.3M/yr)

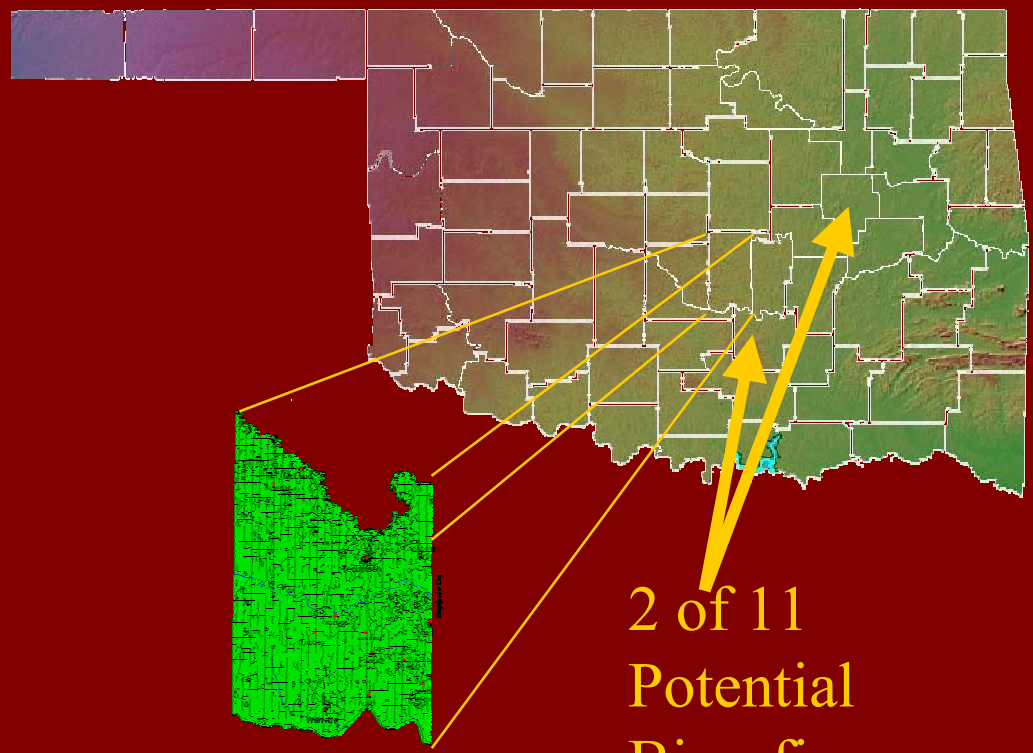
Switchgrass

Will grow anywhere in U.S.

High biomass yield with low input

Potential for CPN involvement in Biomass projects

- Citizen Potawatomi Nation located between two of eleven potential plant locations
- Pilot plants expected in 2 to 3 years.
- Current projections are that the OSU process can produce ethanol at a breakeven price of **$0.758/gallon.**



2 of 11 Potential Biorefinery Plant Locations

Combined Heating and Power (CHP)

Recent advances override earlier problem:

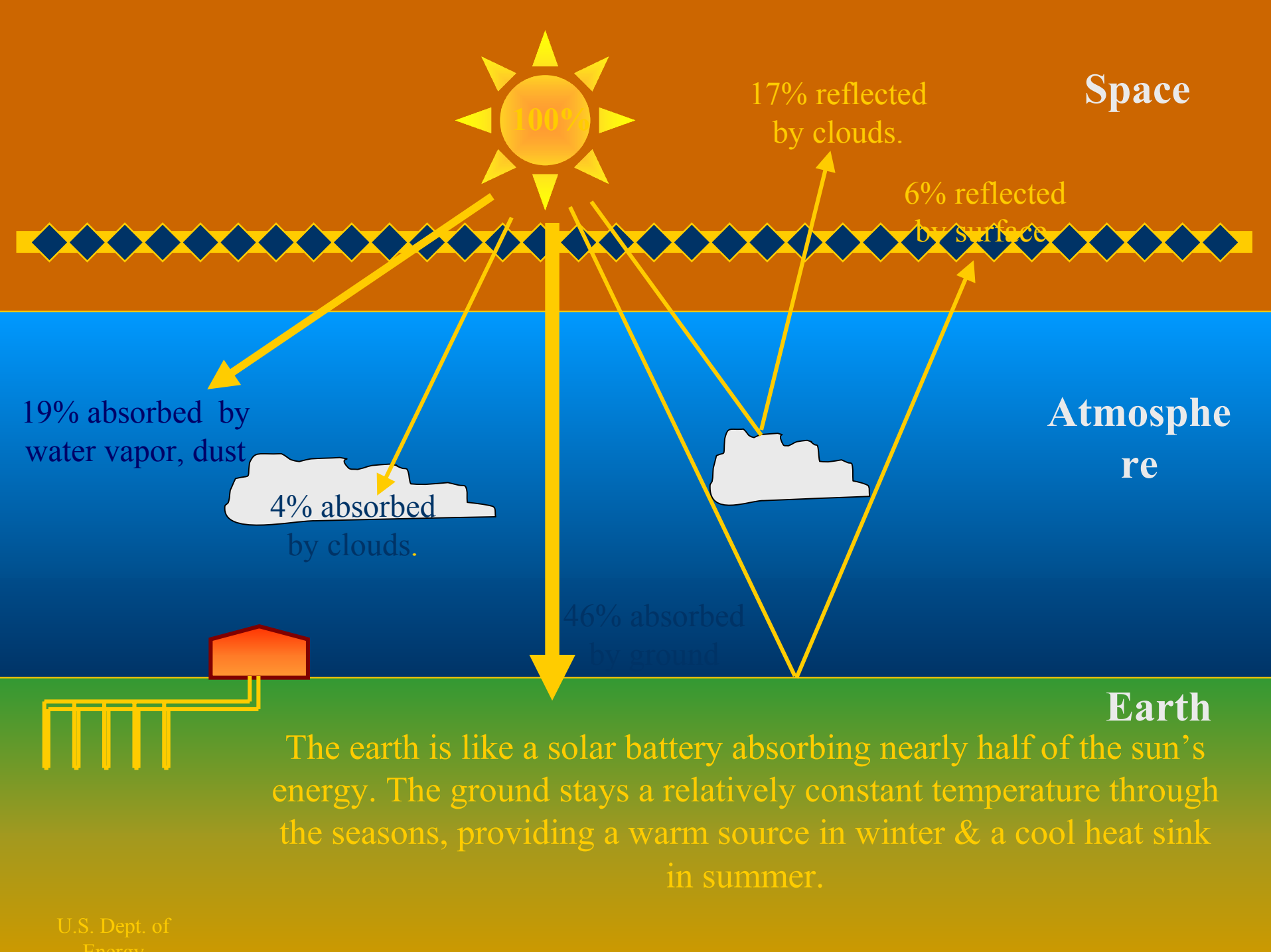
- **Effective heat recovery from generating equipment can improve the return on investment**
- **Also this displaces air emissions from boilers**
- **If CHP coupled with economic heat recovery then benefits can be obtained for only 2000 to 3000 per year (1 year = 8736 hours)**
- **Efficiencies now 75 - 85% for natural gas fueled**

On Going Projects- Activities To Be Completed

- Finalize the cost benefit analysis for GHP's in specific CPN facilities
- Finalize feasibility study of creating a GHP Tribal Enterprise
- Expand upon and document the potential energy savings of suggested methods for existing major energy consumers
- Extend the approach to create integrated businesses using heat from existing systems
- Analyze the potential of a Tribal Utility or a feasible option such as a CHP

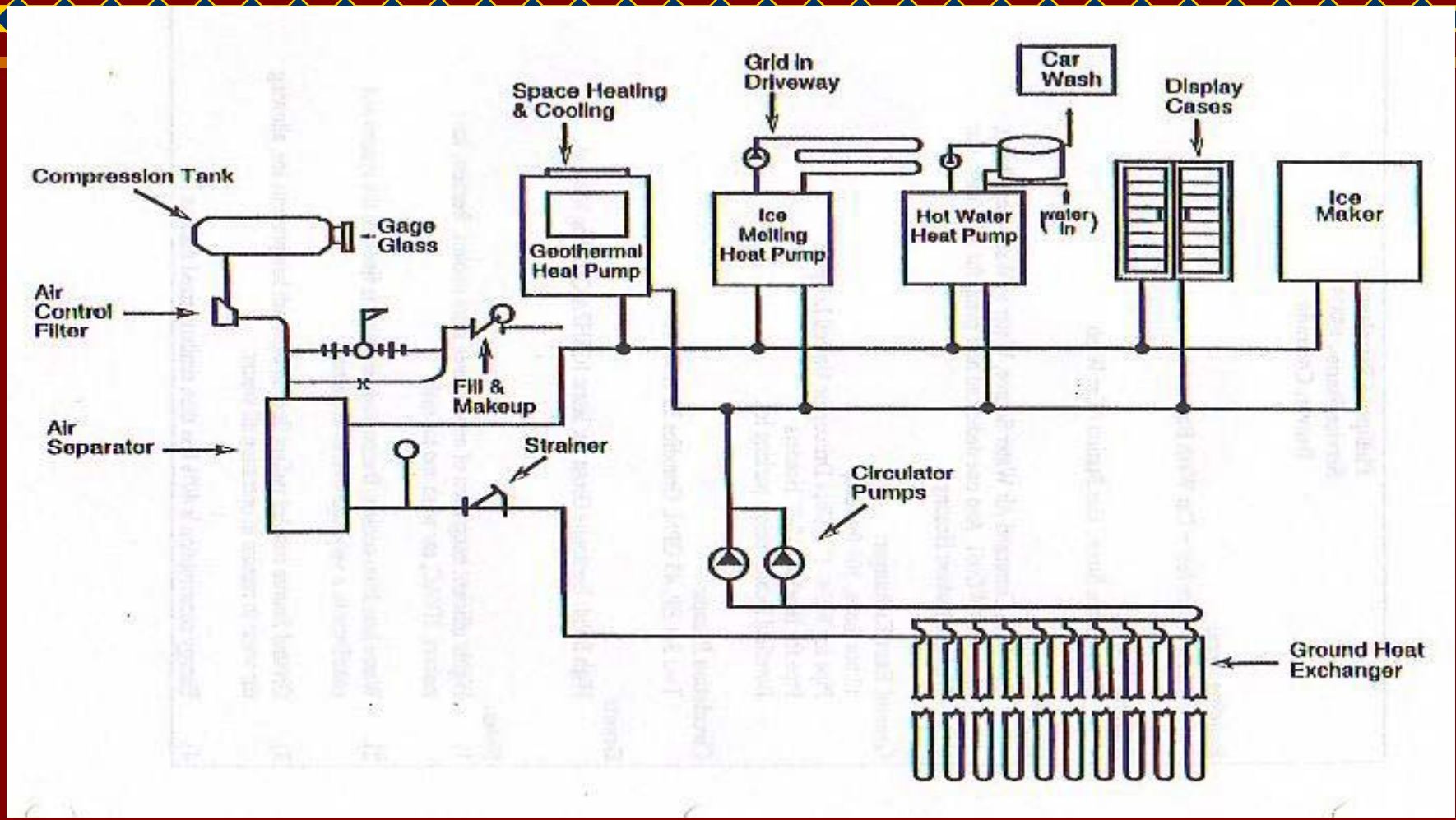
On Going Projects- Future Plans

- Prioritize and implement the potential methods of reducing energy costs that were determined from the study
- Prioritize and implement the options of business development revealed during this study



The earth is like a solar battery absorbing nearly half of the sun's energy. The ground stays a relatively constant temperature through the seasons, providing a warm source in winter & a cool heat sink in summer.

Integrated System



Service Centers Integrated System

Hybrid System

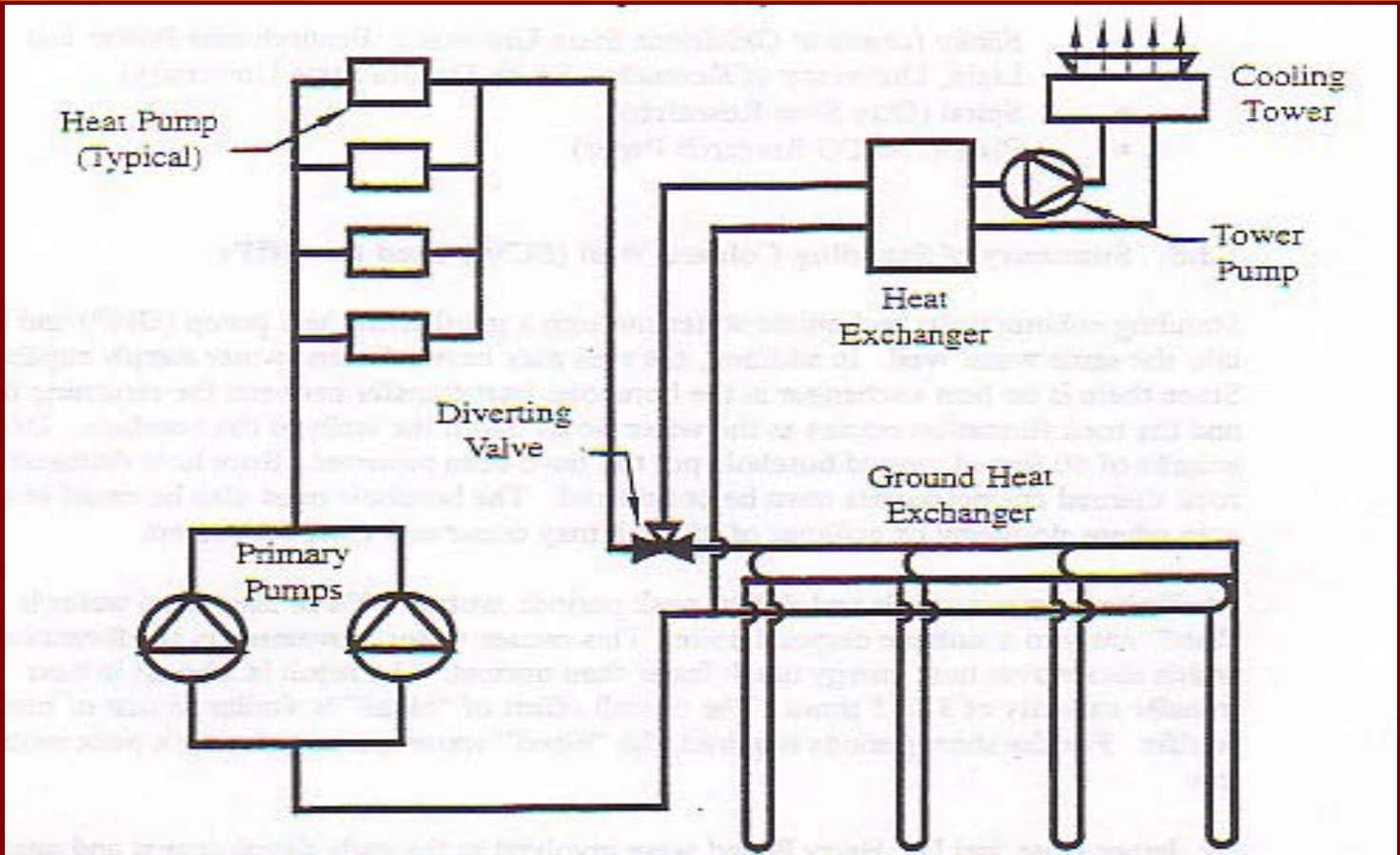


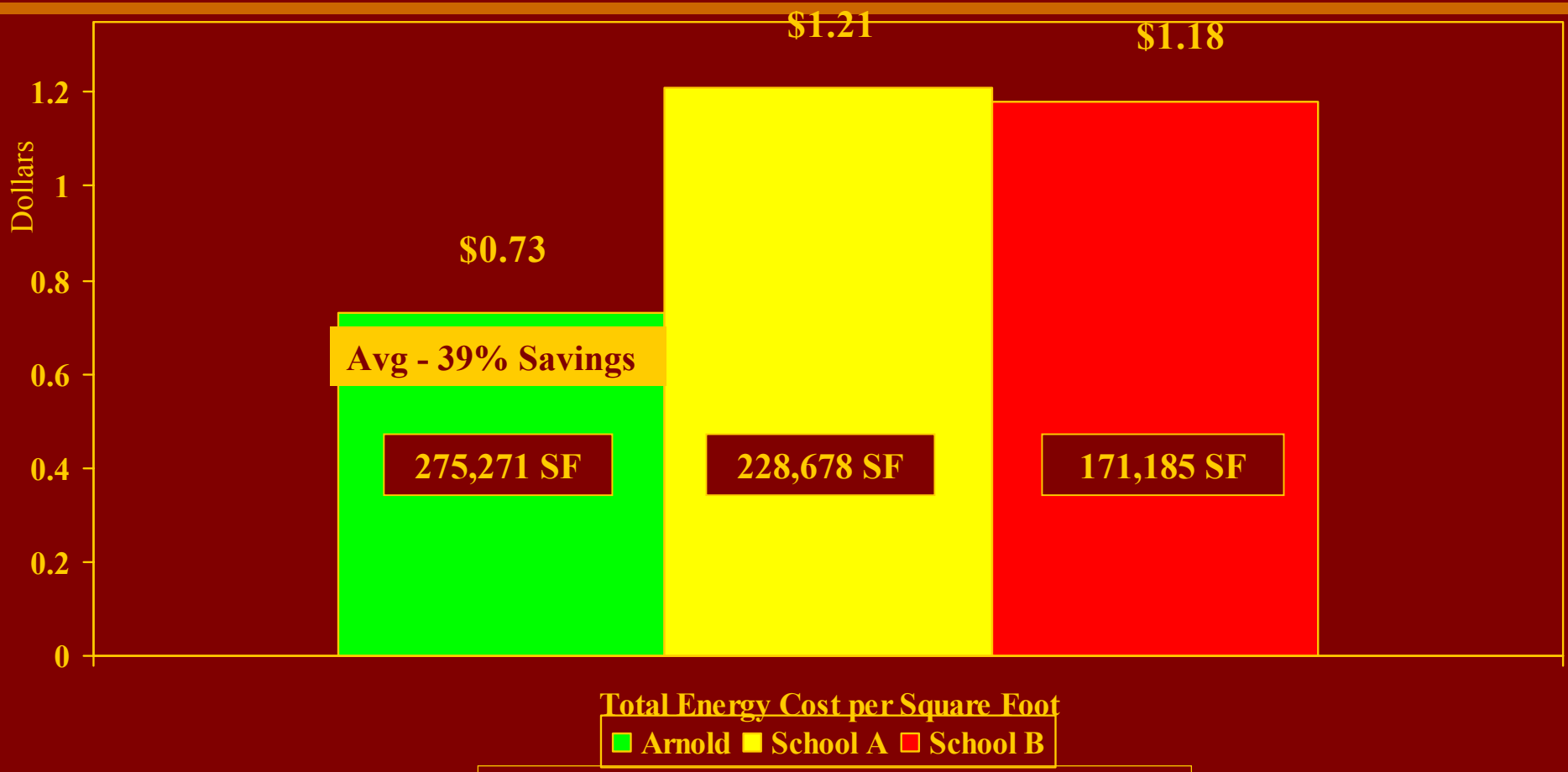
Figure 1.3 Hybrid System Using A Cooling Tower

Two Office Buildings and Eight Residences with Hybrid Ground HEX System

The Texas House

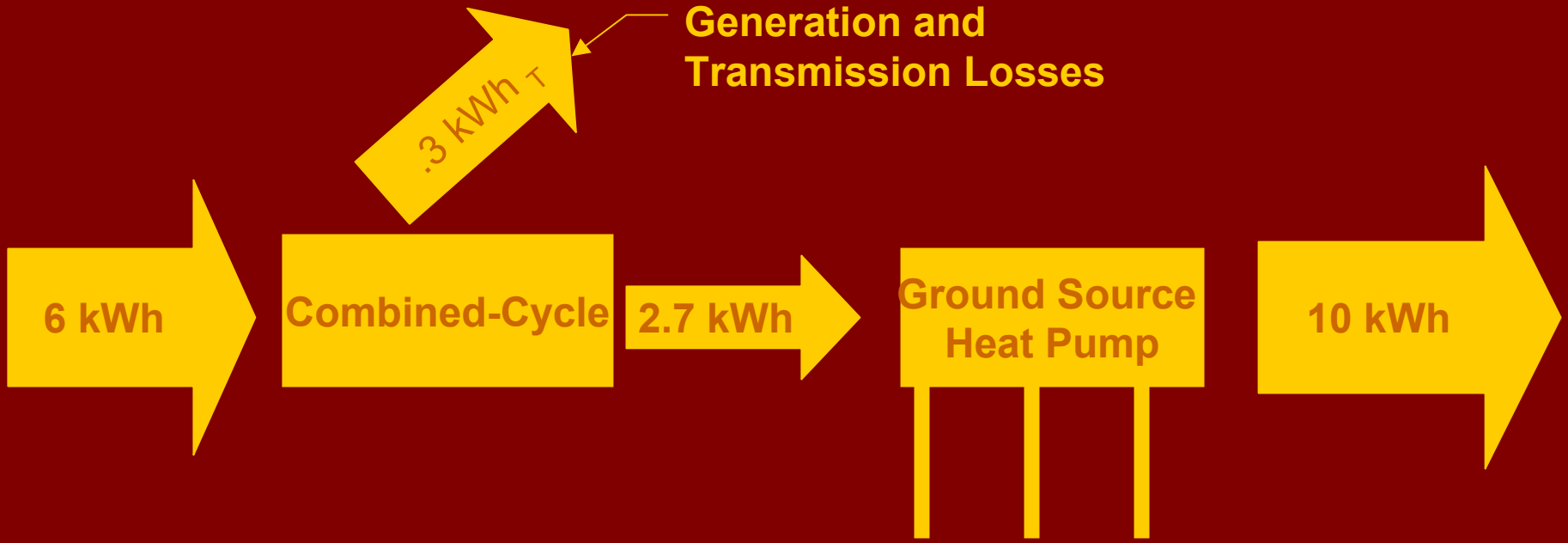
- Energy Conserving
- 4 Heat Pumps for Zone Control
- Vertical Heat Exchanger Field
- Very Proud Owner

Geothermal School Annual Energy Operating Costs Comparison



* Arnold High - **Closed-Loop Geothermal System** (completed Aug, 2000)
* School A - Gas Boiler/Chiller System (Updated w/ new equipment 1996)
* School B - Multiple Systems

Advanced Ground Source Heat Pump



Generation efficiency approaches 55% compared with 35% for a steam cycle alone. GSHP require only 6 kWh_T from the source to provide 10 kWh_T to the building due to the increase in power plant efficiency.

Summary
Load to Source Ratios

1.	**Gas/Electric HVAC**	**0.68**
2.	**Air-Source Heat Pump**	**0.58**
3.	**Ground Source Heat Pump**	**1.11**
4.	**Advanced Ground Source Heat Pump**	**1.67**