Tribal Renewable Energy-Final Technical Report

Project Title:	Development of a Tribal Energy Plan
Covering Period:	09/30/2003 through 06/30/2006
Recipient Organization:	Fort Sill Apache Tribe of Oklahoma
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Partners:	Caddo Electric Cooperative, State of Oklahoma, Department of Energy, CERT, DEMRM, Dr. Shaine Tyson
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1. Executive Summary: The Fort Sill Apache Tribe of Oklahoma has concluded an energy project funded through the "First Steps Toward Developing Renewable Energy & Energy Efficiency" program provided by the Department of Energy. The intent of the project was to include the establishment of a tribal Energy Office, an energy audit of tribal facilities, and a Strategic Energy Plan.

2. Project Overview: The Fort Sill Apache Tribe envisioned a need for energy conservation, self-sufficiency and energy as an economic development venture. After receiving funding for the project, the Fort Sill Apache Tribe established an Energy Office in conjunction with the Environmental Office in 2004. The Fort Sill Apache Tribe felt that the combination of these two programs would provide an effective means of combining resources, particularly for outreach efforts.

3. Project Objectives: The objective of the project is to develop a comprehensive Strategic Energy Plan. The plan will guide the Fort Sill Apache Tribe in making informed decision regarding effective energy management, set precedence with

established goals, and utilized when considering energy development as an economic resource.

4. Description of Activities Performed: Three key elements were targeted for this project and included:

a. Establishment of an Energy Office
b. Conduct an Energy Audit of tribal facilities
c. Develop a Strategic Energy Plan

As part of the planning process energy resources were identified. Among these are Oklahoma Wind Power, the State of Oklahoma Department of Energy, Council of Energy Resource Tribes, Western Farmer's Electric Cooperative, Caddo Electric, Oklahoma Natural Gas, and the Bureau of Indian Affairs.

Other activities included staff participation in the Wind Energy Application and Training Symposium in 2004. This training highlighted the latest technology concerning wind power and included a tour of the National Wind Technology Center near Golden, Colorado. This tour included wind technology for both large and small applications, wind systems testing, and other alternative energy systems. Sponsored by the National Renewable Energy Laboratory, this weeklong training provided an opportunity for tribal programs to share information and approaches for energy development.

Staff also participated in events sponsored by Oklahoma Wind Power. These meetings included a tour of Blue Canyon Wind Farm facility located within the Fort Sill Apache's jurisdiction in Southwestern Oklahoma. Located at the foot of the Wichita Mountains, this 45 turbine facility produces energy for Western Farmer's Electric Cooperative headquartered in Anadarko, Oklahoma. Green electricity generated by Blue Canyon's second phase is produced by 84 Vestas V80 1.8 MW turbines. This system is projected to harness and produce 151.2 MW of Oklahoma wind energy.

The Fort Sill Apache Energy Program also purchased a map through the Council of Energy Resource Tribes that identifies all the energy generating resources (water, gas, electrical, geothermal) and very clearly demonstrates that Indian Tribes have the fewest available resources and therefore lack sufficient infrastructure to support economic development projects that consume large amounts of energy. It also highlighted the need to plan for the energy needs as they relate to economic development initiatives.

The Council of Energy Resource Tribes assisted the Fort Sill Apache Tribe in the development of its Strategic Energy Plan. This plan was developed during a two-day meeting held in Lawton, Oklahoma and included participation by Tribal Business Committee members, Tribal staff, and tribal community members. This plan included data compiled by tribal staff and an overview of potential energy resources. One of the important components of the energy planning meeting was the presentation of information concerning the need for energy conservation and the current demand on energy resources.

The Fort Sill Apache Energy Staff also participated in the Annual Department of Energy meeting for Tribal energy programs in 2004 and 2005. As part of this participation, the Fort Sill Apache Tribe developed power-point presentations to highlight program activities and accomplishments.

As part of its outreach effort, articles concerning the program were included in the Tribal newsletter and provided energy conservation information.

In the fall of 2005, and energy audit was conducted by Caddo Electric Cooperative. A report was given to the tribe in the spring of 2006. Recommendations were presented to the tribe with implementation still in progress. The final Strategic Plan as presented in this technical report is the culmination of the energy audit with recommendations, the Strategic Planning Session conducted by CERT, and the accumulation of information and resources in the Tribal Energy/Environmental Office.

5. Patents: No patents were produced as a result of this funding nor are they expected in the future as a direct result of this funding.

6. Conclusions and Recommendations: The energy audit of the tribal buildings produced specific recommendations to increase the energy efficiency of each building at the tribal complex. These recommendations are being addressed but not yet completed. Training of staff members to conduct energy audits in the future will prove invaluable. Long term sustainability through the reduction in dependence from outside energy sources remains to be developed. Energy development as an economic venture for the tribe is constantly being reviewed as Energy comes to the forefront of Tribal, State, and National News.

7. Lessons Learned: Staff turn over caused unexpected delays, with tribal champions for the cause lost and the vision hampered. The CERT two day workshop increased the "Energy" knowledge base of tribal staff, tribal members, and Business Committee members. The vision was re-ignited with the need for a Strategic Energy Plan becoming visible. The Strategic Energy Plan will be used as a guide for policy making, new construction endeavors, building rehabilitation, and economic development. The Energy Audit will be instrumental in making the necessary repairs to increase efficiency of each building and therefore reduce energy consumption. The Energy Audit established a baseline a baseline that will be used in evaluation of energy use and subsequent reduction in energy consumption.

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Fort Sill Apache Tribe

STRATEGIC PLANNING SESSION REPORT

Fort Sill, Oklahoma

12-13 January 2005

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Executive Summary

Fort Sill Apache Tribe requested technical assistance from CERT to conduct a two day Strategic Planning Session, January 12-13, 2005. There were twelve attendees, including Tribal Chairman Houser, Tribal and board members. In addition, the Business Committee, Housing Authority, Transportation Department, and the Energy Development Office were represented at the session. Each attendee indicated interest in learning more about energy-related opportunities. People also indicated concerns about pursuing energy development with adequate knowledge so as to avoid pitfalls and maximize efficiency.

Roger Fragua, deputy Director, CERT, introduced the Strategic Planning Session with a map displaying energy development and production in the U.S. The map clearly indicated that much of energy production locations are off Indian lands. Possible reasons why control and production of these entities are located off Trust land relate to ownership of resources and tax obligations. Tim Harjo, from Housing Authority, suggested that double taxation may dampen developer interests in energy production on Indian land.

At Fort Sill Apache, there is a long and rich history of migration. Ms. Vanessa Vance agreed that there is much oil in Oklahoma and yet little production occurs on Indian land. There may be royalty going to Tribes but there is little operation on Tribal lands. There is a need for Tribes to maximize production of their resources.

Mr. Fragua provided a brief CERT history. It began as a group of Tribes working with each other on an energy future that would include Tribes. As in 1975, during the initial impetus for forming CERT, there is once again a call for increased domestic production of energy. The CERT mission statement, program activities, policy agenda and education programs are equally as important, viable and necessary today as they were in 1975, when CERT was created.

The over the next two days, CERT facilitation methods were employed and utilized, to develop a long-term vision and strategy with a significant amount of attention to trends, recent achievements, barriers and contradictions and finally how each Tribal representative could participate in the implementation of the plan(s).

CERT discussed a formal un-solicited proposal that would engage further work in developing a comprehensive resource assessment, focusing on the feasibility of bio-diesel development, the development of a comprehensive strategy to implementing self-governance contracting of various federal programs, and finally, a proposal to the Fort Sill Tribe to support the CERT education program.

Introduction to CERT

The Council of Energy Resource Tribes, formed in 1975, responded to the Energy Crisis and a national need to increase domestic resources. CERT is an organization formed by Tribes to work for Tribes; a "true" Inter-Tribal organization. CERT is dynamically changing and challenging the Federal-Indian relationship.

Member Tribes include: Acoma, Blackfeet, Cherokee, Cheyenne Arapaho, Cheyenne River Sioux Tribe, Chippewa CreeTribe, Colville, Crow, Eastern Shoshone, Fort Belknap, Fort Hall, Fort Mojave, Fort Peck, Hopi, Hualapai, Iowa, Jemez, Jicarilla, Kashia Pomo, Kaibab, Lummi, Muckleshoot, Morongo, Navajo, Nez Perce, Northern Cheyenne, Northern Ute, Fort Sill Apache, Oglala, Osage, Pauma, Pawnee, Penobscot, Picuris, Ponca, Laguna, Rosebud, Round Valley, Saginaw, St. Regis, Salish and Kootenai, San Juan, Santa Ana, Southern Ute, Standing Rock, Three Affiliated, Tule River, Turtle Mountain, Umatilla, Ute Mountain, Walker River, Yakama, Zia, Ermineskin, Louis Bull, Montana, and Samson Cree.

CERT mission is to support member Tribes as they develop their management capabilities and use their energy resources as the foundation for building stable, diversified self-governing economies (according to each Tribe's own values and priorities). CERT programs include: policy advocacy, technical assistance, education and capacity building, partnerships. The National Energy Vision is that by the year 2010 each Sovereign Indian Tribe will have a sufficient and reliable supply of electricity at reasonable costs to support its social and economic well-being.

The four components of the CERT vision include 1) Accessing federally discounted and Tribally preference allocations from federal Power Marketing Administrations; 2) Increased power generation for local use including renewable energy generation and distributed generation; 3) Energy efficiency and conservation programs on Tribal lands; 4) Full access to existing and new transmission systems.

Strategic planning session is a tool to realize unique Tribal goals. First of all it creates a Comprehensive Tribal Energy Vision, and the strategic and implementation of the plan. It also casts a broad net of inclusion from the Tribal community and administration. It looks creatively at potential partnerships with, between, and amongst Tribes, government and industry. Strategic planning session also encourages resource assessments, feasibility studies and business planning.

CERT services cater to Tribal needs. Business development and partnership structuring services include Tribe to Tribe, Regional Multi-Tribal Aggregation, Tribe-Industry, and Tribe-Existing or Incumbent Utility. Case Studies help Tribes assess opportunities and barriers through interviews, surveys, and regional meeting feedback. Training is a CERT component that builds capacity through training, communication, shared experiences and networking. Technical assistance responds to specific Tribal inquiries. As part of capacity building and information sharing, CERT disseminates knowledge through www.CERTRedearch.com and other media.

Electricity Sufficiency on Tribal Lands

Opportunities, Barriers, and Policy Recommendations

Prepared for The Council of Energy Resource Tribes
by E SOURCE, A division of Financial Times Energy, Boulder, Colorado, March 2, 2001

Introduction

In1999 the Council of Energy Resource Tribes (CERT), in cooperation with the Intertribal Energy Network,[1] convened a workshop to craft a ten-year vision of Tribes' participation in, and response to, electric industry restructuring. This workshop was the culmination of an 18-month effort, carried out through regional conferences organized by CERT and the Intertribal Energy Network, to help Tribes begin to address the opportunities and challenges arising in electricity markets.

The National Tribal Energy Vision that resulted from this effort is embodied in the following summary statement:

> *By the year 2010 each sovereign Indian Tribe will have sufficient and reliable supply of electricity at reasonable costs to support its social and economic well-being.*[2]

Achievement of this vision would represent a dramatic change from the status quo. Relative to the U.S. population as a whole, Tribal citizens –

- Spend more of their income on electricity,
- Have the highest percentage of homes without electricity,
- Have the least control over the quality of electric service,
- Are experiencing dramatic population growth rates (between two and three times the national average).

The challenge confronting Indian Tribes and government policy-makers is to devise concrete policies and programs to rectify this situation. This paper is a small step in that direction. It identifies and briefly describes:

- Electricity and energy-efficiency projects consistent with the vision that would deliver significant socioeconomic benefits to Tribal members.
- Regulatory and legislative barriers to successful and timely pursuit of such projects.
- Recommended policy changes and incentives that would help turn the vision of electricity sufficiency into reality.

[1] Members of the Intertribal Energy Network are: Affiliated Tribes of Northwest Indians, All Indian Pueblo Council, Inter Tribal Council of Arizona, Inter-Tribal Council of Nevada, Intertribal Council on Utility Policy, Midwest Alliance of Sovereign Tribes, Mni Sose Intertribal Water Rights Coalition, Southern California Tribal Chairmen's Association, and United South and Eastern Tribes.
[2] Council of Energy Resource Tribes, *National Tribal Energy Vision Workshop Report,* 1999.

The Context for Tribal Energy Development

Ten percent of the energy resources in the United States are located on Indian lands, which together occupy land areas the size of Texas. Historically, these resources have been exploited for non-Indian use, with Indians receiving only a portion of their potential benefit. By and large, Tribes have not benefited from electricity development on their lands. For example, Tribes in the Four Corners region provide the mineral and water resources to meet one-fourth of Southern California's electricity needs, but the Tribes have received little in return.

The United States, dependent on imports for roughly twenty-five percent of its total energy needs and sixty percent of petroleum needs, has vital and increasing interests in developing domestic energy resources. Tribes, shackled by poverty and shocking unemployment rates, need substantially increased economic opportunities in their communities, as well as relief from the burdens of high electricity prices and inefficient buildings and appliances. The confluence of national and Tribal needs, coupled with new energy markets and technical advances, creates a potential for economic development on Indian lands that can benefit multiple parties.

Tribes can enhance the value of their energy resources by using sovereign nation status to control development. There is a resonant relationship between Tribal control and Tribal economic growth, with progress on one front enabling progress on the other. By controlling development, Tribes can set goals and direct efforts that support local needs.

Moreover, the development of indigenous resources can help meet the demand for additional energy supply in major load centers, such as California, the Northeast, and the Pacific Northwest, where supplies are constrained, reliability is compromised, and prices are highly escalated from the norm of previous years.

Tribes can reverse these historic patterns of remote decision-making, outside appropriation of mineral wealth, and loss of cultural integrity by using their federally mandated and sovereign authority to build, plan and market energy development. When Tribes take charge, a new class of projects can be undertaken on Indian lands that will benefit Tribal members directly.

Projects to Further the National Tribal Energy Vision

Several types of energy projects have the potential to deliver important benefits to Indian Tribes while simultaneously advancing the National Tribal Energy Vision. Especially promising opportunities include:

- Creating Tribal electric utilities
- Developing Tribal generation resources.
- Establishing energy efficiency programs to upgrade the building stock
- Adopting building energy codes that push new construction toward higher efficiency levels.

Tribal Electric Utilities

To date, only a handful of Indian Tribes have created their own electric utilities.[3] While the organizational, financial, and legal hurdles to such an undertaking are significant, the potential benefits to Tribes are large:

- Tribal utilities could receive allocations of low-cost power from federal power marketing agencies, including Bonneville Power Administration (BPA) and Western Area Power Administration (WAPA). Allocations could be applied to lower the price paid for electricity by Tribal members. With appropriate policy modifications (discussed later in this paper), the allocations could be monetized – that is, the energy could be sold in the open market, at a price above that which the power marketing agency would charge. Revenue in excess of the cost of producing the allocated power could then be used to fund energy planning, energy efficiency improvements, and other energy-related Indian needs.
- Tribal utilities could integrate supply-side (power-purchasing) decisions with demand-side (energy efficiency) decisions in a "least-cost" framework, finding the mix that minimizes long-run costs while enhancing the comfort and livability of homes and workplaces.
- Tribal utilities could direct resources toward overcoming problems of poor reliability and incomplete electrification, both commonplace in Indian Country. The Navajo Nation, for example, has some 50,000 people without regular electric service.[4]
- Tribal utilities would create jobs in the Tribal economy – in management, engineering, customer services, to name a few areas – and opportunities to help develop a skilled work force.
- Tribal utilities could ensure that electricity-related decisions in all spheres – management, operations, resource development, pricing, and customer service – are made in harmony with Indian values and priorities. For example, by using their rate-setting authority, Tribal utilities could offer low-cost power for select member groups such as the elderly. Utilities could also offer preferential rates to persuade businesses to locate on Indian lands, in support of economic development and diversification.

Many of these benefits could be obtained even without Tribes constructing or purchasing traditional utility assets such as transmission networks, distribution lines, meters, etc. Instead, Tribes could create "virtual utilities" that would take responsibility for the business relationship with their member-customers – including rate-setting, meter-reading, billing, and collection – while delivering electricity over the infrastructure already constructed by the incumbent utilities. These virtual utilities would use a portion of their revenue to pay the incumbent utilities for the use of their facilities, much as competitive electricity suppliers pay utilities in deregulated states for the use of their wires.

[3] Dean B. Suagee, "Renewable Energy in Indian Country," Issue Brief 10, Renewable Energy Policy Project, May 19, 1998.
[4] Council of Energy Resource Tribes, *National Tribal Energy Vision Workshop Report*, 1999.

Tribal Generation

By developing their own generation resources, Tribes could move toward their goal of achieving autonomy in electricity. Generation-owning Tribes could provide a price-stable source of electricity supply to Indian communities, substantially insulating them from volatile and increasingly high market prices. Located near Indian customers' point-of-use, such generation would help alleviate the power reliability problems that plague Tribal communities and inhibit economic and social development.

The output from Tribal generation need not be consumed locally; it could be transmitted ("wheeled") to non-contiguous Indian communities over interconnected utility transmission networks. And when price conditions are favorable, Tribes with their own generation would have the option of selling excess power in the open market, generating additional revenues for local economic development.

Tribes that develop their own utilities could include ownership of generation within the scope of their utility operations. Alternatively, Tribes could become generation-owning entities even without forming utilities; federal power market restructuring initiatives over the past decade have made it feasible for non-utilities to construct generation and participate in wholesale power markets (e.g., exempt wholesale generators). Opportunities also exist for business partnerships between Tribes and non-Indian independent power producers.

Wind generation is a natural choice for many Tribes. As one of the most environmentally benign forms of generation, wind is in harmony with Indian values. Wind can be a cost-effective source of generation: one study of wind-generating potential on Tribal land pegged production cost at five cents per kilowatt-hour.[5]

Substantial wind resources have been identified on Tribal lands, particularly in the Northern Plains and Four Corners regions. Nevertheless, while the world's largest wind power plants are currently being developed in the Western United States[6], to date no commercial utility-scale wind power projects have been constructed on Tribal lands, and only one project is planned for development in 2001.[7]

Strong and growing demand for wind generation presents business opportunities for Tribes. The Department of Energy is directed to purchase seven and one-half percent of its total electricity needs from non-hydro renewables by 2010[8]. The State of Texas has mandated that 2,880 MW of new renewable energy capacity be constructed within the State by 2009[9]. Other states are considering similar mandates.

Because of its "greenness," wind power can command a premium price. In deregulated markets, where customers can choose their retail electric supplier, wind generators have captured significant market share – despite charging more for their product. Even in states that have not adopted retail competition, such as Colorado, programs through which customers voluntarily pay higher prices to support wind generation development are runaway successes. Finally, wind generators can be sited and brought on-line rapidly.

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[5] Xenergy Inc., *Electric Energy Supply Integrated Resource Plan*, prepared for the Standing Rock Sioux Tribe, August 18, 1997.
[6] The 300 megawatt Stateline Power Project on the Oregon-Washington border and the 260 megawatt Nevada Test Site Project.
[7] The 22 megawatt Blackfeet I Wind Power Project.
[8] Federal Energy Management Program, *FEMP Focus*, May/June 2000.
[9] Senate Bill 7, Texas Legislature, May 1999.

Other types of generating projects may also be attractive to Tribes in certain circumstances. Photovoltaic generation may be cost-effective for electrifying homes that are remote from power transmission lines. Certain high-density loads such as casinos may be good candidates for on-site cogeneration systems, especially where natural gas is readily available and the cost of retail power is high.

On many Tribal lands, conventional fossil fuels and low-cost alternative resources (e.g., coal-bed methane, geothermal, etc.) are available to power electric generation. At the present time these resources are not being developed, partially because of the uncertain regulatory environment that prevails in Indian Country. Policy changes recommended in this paper (see below) could clarify the regulatory environment and attract the investment capital from strategic partners needed to develop these resources.

Additionally, distributed generation and cogeneration development across the U.S. have been stifled through outdated and inappropriate interconnection requirements imposed by utilities and state utility commissions. These factors have severely limited the beneficial and economical development of these local generation options. Tribes have the opportunity to develop less burdensome interconnection requirements that will precipitate more timely development of distributed generation and cogeneration on Indian lands. Distributed generation could meet Tribal needs for remote electrification and improved reliability. Furthermore, electricity from distributed generation could be marketed to non-Tribal customers – for example, nearby governmental or industrial facilities.

Energy Efficiency Programs

Tribal utilities and tribal-owned generation address Indian's electricity problems from the supply side. Electricity sufficiency can also be addressed, in part, from the demand side through measures and programs that foster efficiency in energy utilization.

Inefficient use of electricity (and other fuels used for space heating) imposes hardships on Indian communities. Because much of their housing stock is energy-inefficient, Indians spend a disproportionate share of their income on heating bills. Operation of older, inefficient refrigerators, other major appliances, and household lighting is also economically burdensome. Some Indian households spend 20 percent or more of their income on electricity.10

Nonresidential buildings in Indian communities are also frequently wasteful of energy. Federally-built schools and health care facilities have been constructed without careful attention to energy operating costs. As a consequence, federal funds that could be channeled to meet pressing social needs are being allocated to utility bills. As well, commercial facilities, including high-demand casinos, have been constructed with little regard for energy efficiency.

The antidote to these problems is substantial and sustained investment in energy efficiency. The opportunities in this area are indeed investments: chosen wisely, energy efficiency projects can yield saving far in excess of their initial costs. Many common energy efficiency measures provide simple payback periods measured in months.

[10] Energy Information Administration, *Energy Consumption and Renewable Energy Development Potential on Indian Lands,* April 2000.

The economic potential of energy-efficiency investments on Indian lands could be tapped in several ways:

- Home energy retrofit programs. Some programs of this type are in operation, supported by federal weatherization and low-income energy assistance grants, but the available funding is modest in relation to the need.
- Conversion of homes that use electric space- and water-heating to solar energy with propane backup, in conjunction with comprehensive and rigorous weatherization.
- Replacement of inefficient refrigerators and lighting with high-efficiency alternatives that provide quick paybacks.
- Construction of new housing stock that uses recently-developed advances in building science to dramatically cut energy costs while keeping life-cycle costs low.
- Development of commercial retrofit programs targeted to casinos, truck stops, and other businesses on Tribal lands. These programs might incorporate performance-contracting features that allow costs to be repaid through savings in heating, cooling, and lighting,
- Programs that could be offered by Tribal utilities (as discussed above) to incentivize equipment and appliance choices that minimize Tribal members' total cost of energy services.

All of the above concepts could be incorporated into a series of demonstration projects. Sound management, ongoing evaluation, strong educational/vocational components, and provisions for sharing knowledge and experience widely across Indian communities would be key elements of each demonstration project.

Building Energy Codes

Building energy codes are another area of opportunity on the demand side of the energy equation. Since the mid-1980s, governmental and building-industry stakeholders have worked to develop recommended or "model" energy codes for buildings. By requiring compliance with these codes, governments can ensure that new and renovated homes and commercial buildings are reasonably energy-efficient, as well as safe and long-lasting. Model codes do not necessarily increase the cost of construction; in many cases they educate designers and builders about energy-efficient alternatives that are no more costly than what would have been done absent the code.

As domestic sovereigns, Indian Tribes can adopt model codes and require compliance in areas of Tribal jurisdiction. Like other governmental entities, Tribes can alter and extend model codes to better reflect local conditions, priorities, and values.

Federal law has recognized the importance of model codes since passage in 1992 of the Energy Policy Act. Both the Department of Energy (DOE) and the Department of Housing and Urban Development (HUD) have programs that promote adoption of the Model Energy Code and its successor, the International Energy Conservation Code, through technical

assistance to state and local governments. Unfortunately, these efforts have largely bypassed Indian Tribes.[11] This oversight should be rectified.

Barriers and Incentives

Implementation of the projects recommended in this paper, as well as realization of the broader National Tribal Energy Vision, will not be easy. As is true for the energy challenges facing America as a whole, a multifaceted, multiyear effort bridging the public and private sectors is required. Involvement of leading energy-industry companies – Caterpillar, Enron, Honeywell, Sempra, Southern California Gas, Stirling Energy Systems, and others – as partners and supporters is key.

Two more elements are important. First, there are certain regulatory and policy barriers that impede timely and successful Indian electricity sufficiency. These barriers, identified below, can be removed through appropriate federal actions. Second, there are opportunities to create incentives that will boost the types of projects contemplated in this paper, enhancing their attractiveness and accelerating the time frame in which they will begin to benefit Indian communities.

Barriers and Their Solutions

- **State Challenges to Tribal Sovereignty in Regulatory Matters.** As a matter of constitutional law, Indian Tribes and their lands are not subject to regulation by the states. Nonetheless, some state public utility commissions have asserted regulatory authority over non-Indian lands within areas of Tribal jurisdiction, and over wholesale power transactions involving Tribes. The possibility of disputes over such matters clouds the business prospects for Tribally-owned utilities and generation resources

This situation could be remedied at the federal level, possibly by order of the Federal Energy Regulatory Commission, or alternatively by an act of Congress. The principle of tribal sovereignty in energy regulatory matters could be made unambiguous by one or both of these bodies.

It is important to note that Indian Tribes do not seek to be free from regulation. They do seek regulation that is clearly understandable and reasonable. Constitutionally, the regulation of Tribes should come from the federal level. Tribes' interactions with businesses subject to state regulation should occur via intergovernmental compacts.

- **Inability of Tribes to Benefit from Low-Cost Power Allocations.** While Indians are entitled to a portion of the low-cost power produced by federal power marketing administrations, it is difficult for Tribes to receive those benefits except by forming a utility. Western Area Power Administration has a established a procedure by which power credits can be funneled to individual Indian customers of non-Indian utilities, but this process is cumbersome and denies a decision-making role for the Tribe in the use of the benefits.

[11] Dean B. Suagee, "Renewable Energy in Indian Country," Issue Brief 10, Renewable Energy Policy Project, May 19, 1998.

Tribes should be eligible to receive the benefits of their power allocations even if they have not formed a utility. This could be accomplished through a two-step process. First, the power administration would monetize the allocation by selling the Tribe's low-cost power on the open market. Then, the gain from this transaction (the difference between the sales revenue and the price at which the Tribe was entitled to purchase the power) would be transferred to the Tribe for use in any suitable energy-related program, such as distributed generation, energy efficiency, etc.

- **Inability of Tribes to Receive Tax Credits on Renewable Generation.** Development of renewable generation, such as wind power, is aided by federal tax credits. These credits are important to the businesses that invest in partnership with Tribes to site renewable generation on Indian lands and should be maintained. If a Tribe wanted to invest in renewable generation on its own, however, its inability to receive the credit could impair the project's economics.

Federal policy should recognize that the societal benefits of renewable generation accrue whether or not the project is owned by a taxable entity. Accordingly, Tribes and other tax-exempt entities that develop renewable generation should receive federal project subsidies or grants comparable to, and in lieu of, the tax credits.

- **Inadequate Allocation of Federal Weatherization Dollars.** Federal funds for weatherization of low-income households are distributed to states and Tribes via complex allocation formulas. (Most Tribes receive their funding at the state level; a few receive direct federal allocations.) A shortcoming of this process is that it does not adjust for the extreme circumstances of most Indian Tribes. The proportion of houses with poverty-level incomes is far greater in Tribal economies than it is in the general population; similarly, the energy-inefficiency problems of housing on Indian lands are more severe.

Federal policies for allocation of weatherization dollars should account for the greater severity of Indian's energy problems. At the same time, funding for weatherization programs should be expanded across the board, because the pool of money available nationally for all recipients falls vastly short of the need.

Incentives

- **Retention of Energy Efficiency Savings.** The energy bills for some buildings on Tribal lands, such as schools and health care facilities, are paid by federal agencies. Tribes have no incentives to operate these buildings efficiently or to make permanent energy efficiency improvements to them, because money saved in the energy budget reverts to Washington. Allowing Tribes to retain a portion of the savings from energy efficiency projects in these buildings would be financially beneficial to Tribes and to the federal treasury. These projects could also help Tribes establish energy performance contracting businesses that would train and employ Tribal members in energy and building trades.
- **Tax Credits for Electricity Purchased from Tribes.** An incentive in the form of a tax credit to utilities and power markets for electricity purchased from Tribes would provide a major boost to the development of Tribal economies. It would also increase the likelihood of adequate transmission capacity between Indian lands and major population centers.

- **Title XXVI Amendments.** Title XXVI of the Energy Policy Act of 1992 authorizes funding for Tribal energy development. The programs envisioned under this title, however, have not been funded, except for a few projects secured by favored groups through special legislation.

The National Tribal Energy Network has proposed amending Title XXVI to overcome the shortcomings in funding and to provide broad and substantial support for distributed generation projects, renewable energy, and other energy needs. Components of the proposed legislation include:

- Tribal Energy Block Grants, analogous to the Department of Housing and Urban Development's Community Development Block Grants. Tribes could use these grants to support their energy policy, planning and management activities, as well as investments in energy infrastructure improvements.
- Tax credits for renewable energy and distributed generation projects that serve Tribal communities.
- Expansion of the federal government's Buy Indian policies (currently limited to goods and services purchased by the Bureau of Indian Affairs and the Department of Defense) to give preference in federal agencies' purchasing to energy commodities produced on Indian lands.
- Annual funding for the above programs equivalent to two percent of the Department of Energy's spending on renewable energy, energy efficiency, and fossil energy, or approximately $40 million.

ToP® Methods

ToP® Parcipatory Strategic Planning Process Overview

The following is a brief description of ToP® (Technology of Participation) Strategic Planning process which was used to create this document. The document itself is made up of charts, which were the products of each session, and the back-up data for various charts.

Introducing Participatory Methods:

Over the past twenty years a series of methods generally referred to as the "Technology of Participation" (ToP® Methods) have been developed by the Institute of Cultural Affairs. The Council of Energy Resource Tribes has been using ToP® Methods to facilitate Participatory Strategic Planning with tribes. The foundational values built into these ToP® Methods are quite straightforward:

- **Participation** - bringing together the insights of each participant in order to formulate the group consensus
- **Teamwork** - creating opportunities to work together in small teams to build the foundation for consensus
- **Creativity** - giving permission for the dialogue between rational and intuitive insights
- **Action** - moving from consensus to action through accountability based planning

How the ToP® workshop process works...

First, individually and then in small groups everyone participates in intuitive brainstorming. Second, the facilitator works with the group to weave their ideas together into clusters with an eye to new relationships. Third, the group names the clusters in an attempt to articulate their profound insights on each. Finally, the facilitator leads the group in reflection on what has been accomplished, the new resolve and decisions that have been made.

Strategic Planning with the ToP® Process

ToP® Strategic Planning process is a four-step workshop series. Each workshop session can be done in the time frame of two hours to a full day depending on the amount of time the group has to lend to the process. The sessions are done in a basic workshop format. This strategic planning with the Sample Tribe was done in two days. Below is a brief description of four steps in this strategic planning process:

- **Practical Vision Workshop** in which the participants focus on articulating the shared vision
- **Underlying Contradictions** Workshop in which the participants analyze the fundamental obstacles to their desired common future
- **Strategic Directions Workshop** in which the participants decide the key strategic actions to target in the next two years
- **Implementation Planning Workshop** in which the participants take responsibility for particular areas of the strategy and build one year set out one-year accomplishments and 90-day launch plans

Narrative Session Report

Fort Sill Apache Tribe Energy Planning Project aims to create an Energy Office within the Tribal structure, to complete an energy analysis of current and proposed Tribal building space, and to develop a Tribal Strategic Energy Plan. The project location will be in southwestern Oklahoma, eastern New Mexico and in Arizona. Tribal jurisdiction area in Oklahoma includes over 65 surface and 41 mineral tracts over three counties in southwestern Oklahoma. The Fort Sill Apache Tribe owns over 400 acres in rural Caddo County and within the Lawton, Oklahoma SMSA. The Tribe anticipates other land purchases within the next 12 months. In Arizona, the Fort Apache owns 4 acres. Portions of New Mexico and Arizona are considered aboriginal lands. In addition, the Fort Sill Apache Tribe owns 40 acres near Deming, New Mexico, and area east of El Paso, Texas.

Energy potential in New Mexico is located near El Paso. There is high potential for wind energy development. The land is held in Trust status, located on Interstate 10. The primary disadvantage, to this location, is the lack of existing development.

Project participants include Tribal members, area Native Americans, local community, area utilities and State Energy Resources (Wind Power Oklahoma, State Department of Commerce). Currently, over half of the Tribe's members live outside Oklahoma. Nearly 50% of the Tribe's membership is under 18. Absentee voting was held for the first time this year allowing out of state residents to have an active part in Tribal government and to actively participate in the project throughout the Energy website.

Utilities in the primary service area include: Oklahoma Natural Gas, Western Farmer's Electric Cooperative, Caddo Electric Cooperative, Cotton Electric Cooperative, and Public Service Company Oklahoma. Over 20% of all oil and gas payments made through the Bureau of Indian Affairs are processed by the Anadarko Agency. The Fort Sill Apache is the smallest of the seven Tribes under the Anadarko Agency. In addition, potential for solar and wind technologies are high.

The For Sill Apache Energy Planning Project

The first objective is to create an Energy Office within the Tribal structure. Staff will include an Energy Coordinator and a part-time Energy Technician. This staff will utilize GIS/GPS technology in development of project deliverables. Seminars will be held concerning energy efficiency and renewable energy options to assist Tribal homeowners in increasing their energy efficiency. Project funds will support specialized staff training. The Energy Office will serve as a resource for Tribal members, other Native Americans and the community for energy efficiency, renewable and sustainable energy information.

The second objective is to complete an Energy Analysis of Tribal Building Space. The Tribe will partner with area utility companies, DOE resources, private entities to conduct energy studies on existing and planned facilities. Renovation to casino will include energy saving components (by resolution), whereby historic usage data has been collected to document energy savings.

The third objective is the development of a Tribal Strategic Energy Plan. The plan development will be centered on training seminars for Energy Planning Team under contract

with CERT. The seminars will be open to other Indian Tribes and the community. Actual plan development will be conducted outside the seminar setting. The project intends to use a Planning Team Concept for the development of the Strategic Plan.

The Planning Team will include the Tribal Administrator, Energy Coordinator, Energy Technician, and Energy Consultants (CERT, Navigant), Tribal leadership representation, and Tribal hosing representation.

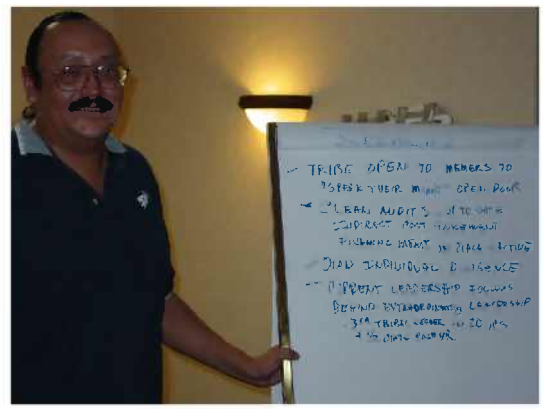
The project recently received a six months extension. The project activities include networking with other Tribal energy programs, energy resources and other energy related organizations. Participants in energy related conferences and training (CERT sponsored Oklahoma Energy Meeting). There will also be a development of a website to share information with Tribal members and other Native Americans. There will also be a close working relationship with Sandia Laboratories, and the National Renewable energy Laboratory (NREL).

Fort Sill Apache asked CERT to conduct a two day Strategic Planning Session January 12-13, 2005. There were twelve attendees, including Tribal Chairman Houser and Tribal members. In addition, the Business Committee, Housing Authority, Transportation Department, and the Energy Development Office were represented at the session. Each attendee indicated interest in learning more about energy-related opportunities. People also indicated concerns about pursuing energy development with adequate knowledge so as to avoid pitfalls and maximize efficiency.

Roger Fragua introduced the Strategic Planning Session with a map displaying energy development and production in the U.S. The map clearly indicated that much of energy production locations are off Indian lands. Possible reasons why control and production of these entities are located off Trust land, relate to ownership of resources and tax obligations. Tim Harjo, from Housing Authority, suggested that double taxation may dampen developer interests in energy production on Indian land.

At Fort Sill Apache, there is a long and rich history of migration. Vanessa Vance from the office for energy development, agreed that there is much oil in Oklahoma and yet little production occurs on Indian land. There may be royalty going to Tribes but there is little operation on Tribal lands. There is a need for Tribes to maximize production of their resources.

Mr. Fragua provided a brief CERT history. It began as a group of Tribes working with each other on an energy future that would include Tribes. As in 1975, during the initial impetus for forming CERT, there is once again a call for increased domestic production of energy. The introduction included a comprehensive view to Indian Energy and a few recent developments in terms of Tribal projects, Indian energy legislation, and partnership agreements. Many of the opportunities and challenges faced by other Tribes also relate to the Fort Sill Apache Tribe.



Clint LeBeau, CERT Facilitator, gave a brief introduction to the CERT Strategic Planning Methods and an outline of the remaining agenda for the planning session. The session began with a review of current trends within the Tribal government, enterprises, programs and a synopsis of the participants' general interest in energy development and management. The current trends are a number of activities surrounding the Tribe in the area of renewable energy opportunities. Specifically the general interest of the Tribe is in wind, hydro, bio-diesel, and ground source heat pumps. The Tribe is a "retail" customer of a local cooperative and receives no special, governmental or preferential treatment.

The next session was a retrospect of accomplishments that the Tribe can recall. There were a number of very significant accomplishments that the Tribe has to be proud of. The Tribe has had only three elected leaders in over twenty years, demonstrating a history of a stable government. The Tribe has experienced a significant increase in voter participation in recent elections, demonstrating a strong interest in the Tribal political process. The Tribe has successfully managed enterprises and programs to the benefit of the Tribal community. The Tribe is exercising Tribal sovereignty by pursuing a compact with the BIA and HIS programs. The Tribe is very proud of the commitment it has made to assure that the youth has higher education opportunities.

A session identified the strengths that the Tribe processes rendering confidence and the "can-do" spirit necessary for moving forward in Tribal energy. A number of the strengths the Tribe identified are in relation to the Tribes rich cultural history and legacy, demonstrating the tenacity and perseverance to maintain the "Tribal-ness", sense of community and political identity. Many of the strengths are related to the Tribal business operations, location(s), revenues and management capabilities.

The following session, the participants worked individually, then in small groups, and then finally as a Council to develop a long-range strategic vision. This session began working toward an answer to the question, "What do we want to see in place in the year 2015?". The participants spent a significant part of the days work in this session largely due to importance of the need to create a consensus based Tribal vision. The vision statement is "Moving Towards Tribal Resource Conservation, New Resource Development, Self-Sufficiency, Enhanced Collaborations, Acting Now to Achieve Goals and Enlightenment of Tribal Members Through Information Processing and Sharing.". This vision statement is supported by the "pillars" of interdependency, energy efficiency, new resources, and enlightenment of Tribal membership and projects for the Tribe.

In carrying out this exercise, Mr. LeBeau asked people to think of about their vision for the Tribe and to write down ideas toward achieving this vision. The entire group was divided into four smaller individual groups to share and discuss their visions and ideas. Mr. LeBeau asked each group to write down each of their ideas, in three to six words (to avoid multiple ideas), onto 5x7 cards, to be pasted in front of the room so as to share with the entire group.

After small group discussion, each group was asked to pick out the most futurist and the boldest ideas spread out in front of them. Some of the most futuristic ideas people wanted to realize in 10 years included: Projects for FSA; Aggressive state and federal energy legislation; Act now to achieve goal. The entire group was given a chance to ask the person or group who provided the idea to clarify their thoughts and provide a more in depth explanation.

After this, the groups were asked to select another card that represented other ideas that were not already represented in front. Some of the second set of goals included: Improved communication; Renegotiate ROW leases; Education for 40 students/College funding (in ten years there will be possibly more than 20 students as a whole); Work together to achieve goals; Get Tribe educated (on issues), and Biomass.

These individual ideas were then grouped together under unique headings. Unique categories that encompassed the group's vision fell under Improved Energy Efficiency, Introduction to Education Processing and Independency. With these categories established, the four groups were asked to examine their remaining cards and to consider if these ideas fit into the three formed categories. A new category with additional cards fit into New Resources, which included a goal to have housing powered by wind energy.

Before all the ideas were placed under their broad vision, the group wanted to more clearly define Information in Education and Processing. What is the vision behind the category name? Do all the cards under this heading really represent this vision? Two ideas were taken from the list. Similarity, Independency was discussed and better defined. The entire group considered cards speaking to Tribal construction and TERO and saw these as being overlapping. Cards speaking to government were taken out to form a new category—Inter Government. The Independency was more defined as Tribal Self-Sufficiency.

Additional visions included Resource Conservation, which included implementing recycling, while New Resources was modified to be New Resource Development. Enhanced Collaborative Partnerships included ideas that spoke to COOP and partnering. Thoughtful considerations and in depth discussions reassigned ideas and fine-tuned thoughts behind each vision. Two categories were reviewed in conjunction to see if the two efforts shared a common vision. People wanted to balance resources and development and they need an informed decision process so the Tribe will not destroy the environment. The Tribe must take ecology into consideration. Resource Management was an umbrella the group decided would encompass Resource Conservation and New Resource Development.

The group was asked to think about the visions and goals they had just formulated, and to keep in mind the underlying contradictions that may keep the Tribe from realizing what they envision. People were asked to not use "lack of" in describing the inherent contradictions, but to use words such as *outdated, fragmented, conflicting, disorganized, devalued or biased*. The session adjourned at 3:30 to start again the next morning at 9am.

Before the first day ended, people initiated comments that this gathering had been the single event that has had full participation of the group, and everyone stayed for entire day. People commented that it was rewarding to see good use of Tribal money and time. There was a strong sense of ownership of the resulting outcome. CERT received positive feedback on the level and quality of the presentations.

DAY TWO

The second day started with Clint LeBeau asking the group to once again consider the barriers to their vision. "What is stopping Tribe from achieving stated goals? Thinking about past accomplishments, what were the obstacles the Tribe had to overcome, and could these also be barriers to future accomplishments?" People spent time individually to think about known and perceived obstacles then they broke up into four smaller groups to share and discuss Tribal obstacles. Note that individuals rotated into different small groups each time these were formed to allow everyone an opportunity to work with each other.

After small group discussions, identified barriers included improper process for accomplishing goals, Tribe not set up top do EC partnership, conflicting personal agendas, and restriction of information to Tribal membership. Some of the issues brought up, as explained by James Buckner, have been brought up before in front of Tribal Counsel with no results. The group agreed that there needs to be a clear vision, and people need to be encouraged to work together toward shared goals. Communication is a major barrier that needs to be resolved.

The list of barriers increased with unmotivated/obsolete/uncoordinated project development, unmotivated to use recycled building materials, lines of authority, member priorities devalue culture, and previous financial limitations. One similarity centered on the general trend of unwillingness to change or lack of motivation. There needed to be a prioritization of spending, as expressed by Michael Darrow, in a discussion on funding deficit. James Buckner suggested that funding deficit was related to uncoordinated functions and unclear goals. Uncoordinated and Conflicting Priorities was a category that described funding deficit and conflicting interests. Chairman Houser added that there is a gap between project discussion and implementation.

Previous financial limitations, Pam Eagle Shield explained, had to do with Tribal income prior to the casino. There was a time when the Tribe did not have capital and worried about paying the electricity bill. Now, the Tribe has come into money, and yet the ability to think big has not arrived. Large-scale investments are within the capacity of the Tribe's new found wealth but not yet an accepted reality. The Tribe has been at a stand still because they remain in an old mindset, Mr. Buckner commented. This was a part of what the group labeled as Outdate Perspectives.

The next set of barriers related to Tribal culture. Mr. Darrow suggested there is cultural disconnectedness. There is perhaps a focus on business rather than preserving culture. Business takes place of dance and there are few people who speak the native language, as some members described. Vanessa Vance reminded the group that their existing Tribal library contains valuable information.

Ms. Vance also wanted a group discussion on business development process. Who initiates project and when does collaboration take place? Do they need absolute consensus on an issue? With the recent formation of a self-governed body, is there traditional impact on the body, given that the constitution is a cookie-cutter BIA form? In addition, who is responsible for disseminating information? Things shut down because there is no clear chain of command. Poor leadership practices can lead to a break down. When General Counsel speaks, Jeanette Mann indicated, there is nothing else that can be done. There was

indication that the Business Committee has failed to clearly communicate with General Counsel, including using unfamiliar words.

Mr. Buckner used the analogy that the *Tribal bus* has left and there are a bunch of Indians still trying to catch up to it. It was noted that the Tribe participated in an earlier strategic planning forum but nothing from that vision had been acted upon. What happened to those earlier goals? Ms. Eagle Shield believes a unified vision would help leaders work in unison.

Jeanette Mann warned the group that the Tribe was once again putting culture at the end on their list…pushing it lower on their priority as usual. There is a constant struggle between the dollar and their culture, which was not a problem until the Tribe started making money.

Strategic Directions

After a lunch break, the group gathered once again to formulate their strategic actions. These are steps the Tribe needs to take in the next two years to address the underlying contradictions and launch its vision. After individuals and small groups worked on strategic directions, they once again, shared and sorted out their ideas. Many steps fell under descriptive categories of Interactive, and Resource Acquisition/Utilization.

Next, Clint LeBeau asked the group to consider a timeframe for the actions they described in the strategies, in order to put movement to the actions. Individually, people were asked to select one strategy and provide a timeframe for the tasks. Then people came together in small groups to discuss their ideas and discussed a time for their collective goals. Specifically, the group needed to develop action plans for the next 90 days and for the next year that would work toward each of the four strategies: Resource Acquisition and Utilization, Cultural Preservation, Interacting Within the Tribe and with Outside Entities, and Infrastructure Accountability.

The entire group sat in one large circle at the end of the event to share the lessons each person learned. Words people used to describe the process included togetherness, spirituality, unison, and creativity. James Buckner expressed a strong desire to retain the feelings of unison they have gained from working together constructively in the past two days, and to carry it forward into their work for the Tribe. There was much anxiety at various parts of the two-day session. The group had experienced recent internal turmoil and some felt anxious as to the outcome of discussions, especially those discussions asking individuals to discuss barriers and obstacles in reaching their vision. Pamela Eagle Shield offered her feelings of anxiety regarding discussions around Tribal barriers, yet her experience proved to her that the members were capable of setting aside differences to work together as a team. Michael Darrow closed the meeting with an emotional Apache benediction.

Taking a break with the Harlem Globe Trotters

Vanessa getting ready to try out for the team

Recommendations

The Council of Energy Resource Tribes recommends that the Fort Silll Apache Tribe consider utilizing the Fort Sill Strategic Planning process, vision statement(s), goals and data to assist the Fort Sill Tribe in the activities associated with energy development, both the political and physical infrastructure. CERT recommends that the Fort Sill Tribe consider the recent development relative to Indian gaming and carry that same business spirit and business ownership and management and cross over into the energy development.

CERT proposes that the Fort Sill Tribe consider the CERT proposal (attached) to facilitate further strategic planning sessions in two additional areas in the spirit of continuing the highly participatory and broad-based consensus decision making in planning for 1) a comprehensive resource assessment and bio-diesel project feasibility study and 2) a strategic plan for implementing the self-governance contracting of various federal programs and 3) supporting Indian education with a $15,000 donation to the CERT education fundraiser in the American Spirit Awards Dinner.

Additionally, CERT recommends that the Fort Sill Apache Tribe consider the development of a Tribal energy office or program to keep the momentum that was started as a result of the success of the "First Steps Grant" funded by the DOE and the Tribal strategic planning process. CERT convenes several workshops, symposium and conference during the year and recommends that Fort Sill Tribal leadership, program managers and staff could benefit from the Tribe to Tribe, Tribe to Industry and the federal entities networking opportunities by participating in the events. CERT can assist, through various forms of technical assistance, the efforts of creating the energy office or program.

Finally, CERT recommends that the Fort Sill Apache Tribe consider recommending the CERT summer education program to qualifying Tribal members that are high school seniors that are college bound. The summer program, TRIBES, would be a great opportunity for the development of building Tribal capacity for developing the Fort Sill energy office or program with a long-term investment perspective.

Next Steps

Un-Solicited Proposal to the Fort Sill Apache Tribe
January 13, 2005

The Council of Energy Resource Tribes (CERT) proposes to facilitate a Comprehensive Resource Assessment Planning Session and Energy Project Feasibility Studies, A Strategy Session for Implementing Self-Governance and Fort Sill Participation in the 2005 American Spirit Awards Dinner for the Fort Sill Apache Tribe.

The purpose of the Resource Assessment Planning is to address several natural and energy resources and energy related issues, initiatives and discern the opportunities and challenges that the Tribes face in organizing, preparing and implementing the multitude of programmatic coordination. CERT proposes to work and coordinate with the Tribal administration to convene the Fort Sill Business Council and the following Tribal Programs, Offices and Departments; Land Use Planning, Natural Resource, Water, Legal, Housing, Environmental, Education, Economic Development and all others the Tribes believes necessary to ensure a comprehensive plan will be created. CERT proposes to conduct a working session that is designed to be highly interact and participatory in assessing the opportunities and challenges on developing a Strategic and Comprehensive Energy Plan, including a Rights of way assessment, and any other initiatives that are important to the Fort Sill Apache Tribe. The tangible results and deliverables from the session are proposed to be a funding proposal outline and an Implementation Plan outline for the prioritized initiatives and activities from the planning sessions. CERT proposes to invite Navigant Consulting to assist CERT in the technical portion of the resource assessment as a sub-contractor. Navigant Consulting is capable of delivering a comprehensive technical report that will delineate and identify resources within the area of influence of the Fort Sill Tribe. In addition to the Resource Assessment Strategy Session and the technical assessment, CERT also proposes to facilitate two separate funding proposals to both the DOE and USDA to determine the feasibility of potential project development in bio-diesel. This will require a close to immediate decision from the Tribal Business Council as RFP deadlines are in February 2005.

The purpose of the Implementing Self-Governance Session is to attempt to identify, comprehensively, as many of the opportunities and challenges as possible as the Fort Sill implements the Self-Governance process with the federal programs from BIA and HIS. There may be "other" federal programs that have a "trust responsibility" to the Fort Sill Tribe that may also have benefits to the Tribal community. CERT proposes to convene a meeting from executives from the Fort Sill Tribe to meet with other Self-Governance Tribes to hold a "Tribe-to-Tribe" discussion on lessons learned and what other opportunities and challenges Fort Sill might prepare for from an experienced perspective. Additionally, CERT proposes to facilitate a similarly situated and structured session to the previous strategy session utilizing the highly participatory consensus based decision making methods.

CERT proposes to convene the group for two, two day sessions, with a pre-session questionnaire of the various programs, departments and initiatives spelling out in detail, their respective mission statements, planning, and program and budget initiatives. The first event is an "ice breaker" that is designed to share information related to each program, by each program describing its highlights. Over the two day sessions, CERT proposes to conduct a

Vision, Strategy and Implementation planning session for each of the two sessions.

Finally, CERT proposes that the Fort Sill Apache Tribal Business Council seriously consider a sponsorship and participation in the 2005 Indian Energy Solutions and the American Spirit Awards Dinner. This significant series of events is considered the "premiere" Indian Energy and Education event in Indian Country. CERT is requesting $15,000 sponsorship of the American Spirit Awards Dinner that supports CERT and its' education programs.

Energy Services Fees and Expenses
2 Two Day Facilitated Strategic Planning each at: $10,000+
+ Travel for 1 CERT Facilitator
+ Travel for 1 CERT Staff Member

Sponsorship for the American Spirit Awards Dinner
Sponsorship of CERT Education at $15,000+
Registration for Tribal Business Council for the Indian Energy Conference

A. David Lester
Executive Director

Sign In Sheet

Sign in Sheet Fort Sill Apache Tribal Strategic Planning Session

NAME	TITLE	PHONE	EMAIL
Jeff Houser	Chairman	580-588-	
Pamela Eagle Shield	Energy Assistant	580-588-	patchywmn@yahoo.com
Jeanette Mann	Program Director	580-588-	Je_nee@yahoo.com
Loretta Buckner	Business Committee	580-588-	
Tim Harjo	Housing Authority	580-588-	Harjo98@yahoo.com
David Weryackwe	Transportation	580-588-3552	
Ben Kawaykla	Business Committee	580-588-9355	
Bobby Claborn Jr	EPA	580-588-3552	clabornfsaepa@yahoo.com
Michael Darrow	Business Committee	405-643-5315	shinii@aol.com
Martin Robertson	Tribal Member	580-917-8793	Martymar101@hotmail.com
James Buckner	Council Member	580-284-4855	Warmsprings45@aol.com
Vanessa Vance	Energy Coordinator	580-588-2298	

Facilitation Report

COUNCIL OF ENERGY RESOURCE TRIBES FACILITATION SERVICES

Introduction

> *Learning the Technology of Participation and internalizing its intrinsic values of honor, respect, and compassion is the effective means of leadership development for a multicultural America. In a single process individuals and groups can find their own self-defined center and see a new paradigm of their intra and inter group relationships. The process humbles and empowers. The process liberates the individuals of the group and strengthens the group. Apparent contradictions are resolved not by conflict but through the revelation of higher principles. Inefficiency of consensus gives way to effectiveness of unity. The group moves not to its lowest common denominator as is often expected, but rises to its higher common values. The group is not pulled by a single dominating leader but is pushed by its members who take individual responsibility for leadership and followership. Each contributing and each benefiting in one another's process of being and becoming.*
>
> *A. David Lester*
> *Executive Director*
> *Council of Energy Resource Tribes*

Since 1990 the CERT Facilitation Program has provided facilitation to over 150 events with more that 60 Tribes, Indian Organizations and agencies that serve Tribes.

Facilitation and training services currently available through the CERT Facilitation Services Program are:

Participatory Strategic Planning Sessions provide a participatory process for articulating the action priorities of an organization. These workshops have been held with boards, Tribal Councils, Management Teams, Communities and Inter-Tribal Organizations throughout the country.

Facilitation Methods Training are two-day intensive workshops to train participants in effective group communication skills, workshop methods, action planning techniques for launching group projects, and strategic planning methods, using the Technology of Participation (ToP®) Methods that have been developed by the *Institute for Cultural Affairs*.

Conference Facilitation Services help association, networks, and regional communities plan and carry-out lively conferences which use ToP® Methods to incorporate the wisdom and learning's of participants into the event itself.

Organizational and Management Development Services which offer opportunities for in-depth reflection on current organizational and management practices, and the development of skills and processes to enhance organizational effectiveness and productivity.

ToP® Parcipatory Strategic Planning Process Overview

The following is a brief description of ToP® (Technology of Participation) Strategic Planning process which was used to create this document. The document itself is made up of charts, which were the products of each session, and the back-up data for various charts.

Introducing Participatory Methods:
Over the past twenty years a series of methods generally referred to as the "Technology of Participation" (ToP® Methods) have been developed by the *Institute of Cultural Affairs*. The Council of Energy Resource Tribes has been using ToP® Methods to facilitate Participatory Strategic Planning with tribes. The foundational values built into these ToP® Methods are quite straightforward:

♦ **Participation** - bringing together the insights of each participant in order to formulate the group consensus

♦ **Teamwork** - creating opportunities to work together in small teams to build the foundation for consensus

♦ **Creativity** - giving permission for the dialogue between rational and intuitive insights

♦ **Action** - moving from consensus to action through accountability based planning

How the ToP® workshop process works...
First, individually and then in small groups everyone participates in intuitive brainstorming. Second, the facilitator works with the group to weave their ideas together into clusters with an eye to new relationships. Third, the group names the clusters in an attempt to articulate their profound insights on each. Finally, the facilitator leads the group in reflection on what has been accomplished, the new resolve and decisions that have been made.

Strategic Planning with the ToP® Process
ToP® Strategic Planning process is a four-step workshop series. Each workshop session can be done in the time frame of two hours to a full day depending on the amount of time the group has to lend to the process. The sessions are done in a basic workshop format. This strategic planning with the Sample Tribe was done in two days. Below is a brief description of four steps in this strategic planning process:

- **Practical Vision Workshop** in which the participants focus on articulating the shared vision
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- **Implementation Planning Workshop** in which the participants take responsibility for particular areas of the strategy and build one year set out one-year accomplishments and 90-day launch plans

CURRENT REALITY WORKSHOP

As a preliminary exercise to developing the shared practical vision the participants discussed the current reality they face. Three brief conversations on Trends, Accomplishments and Strengths resulted in the following brainstorming data.

Trends

- Wind Resources & What Scale
- Land Tracks in NM, AZ Potential Solar?
- Federal Policy
- No Oklahoma RPS or Renewable Incentives
- Hydro Resources in OK
- Army Corp of Engineers Hydro
- City 80" Water Pipes
- Ground Source Heat Pumps
- Bio Diesel
- Tribe is a "retail" gas and electric consumer

Accomplishments

- Acquired HUD Program
- DOE first steps grant
- Self-Governance (BIA & HIS)
- Tripled Tribal voters from 30 to more than 100
- 8(a) Corporation
- Casino doing well regionally
- Per Capita payments
- Purchased Day Care Operation
- Operates a Youth Center
- Still a Tribe!
- Gathered and organized energy data
- Fund College for more than 20 students at $18K per year

Strengths

- Financial resources from Casino
- Investment in youth
- Land holdings in states
- Tribal size, about 500 members, able to get member input more easily and quickly. There are about 100 members within area.
- Current Tribal participation, diverse input, unique
- Rich cultural history
- Business reputation
- Reputation as a stable government, willingness to cooperate and work with other Tribes
- Prisoner of war-Homeland of Fort Sill Apache
- Strong support from business committee and members across country, diversity
- Similarities in members—everyone knows everyone—recognize needs of members—react to people in need
- Openness of Tribe to members—Open door policy—Easy access to Tribal council
- Clean audit. Clean audit trail. Demonstrates financial management is in place and active.
- Own individual diligence. Individual passion on Tribal issues and work for Tribe
- History of extraordinary Tribal leadership. Chairman Houser is 3rd leader in past 20 years. Consistency in leadership. Half committee elected each year.

PRACTICAL VISION WORKSHOP

The practical vision workshop asks the question:

"What do we want to see in place ten years from now?"

The following was also offered to the group as alternative ways to look at the focus question:

1. *What are your hopes and dreams?*
2. *Tangible / visible / Achievable outcomes*
3. *Think Comprehensively*
4. *Describe the 'New Reality'*
5. *What would be the future 'Accomplishment'?*

The vision of an organization is held in part by all of its members, this workshop seeks to bring these together to create the shared picture of the future. The practical vision is the responsive statement of hope within the given environment.

The participant articulated their vision in regard to energy with six key elements. Those were:

Moving Toward Resource Conservation

- Implement Recycling Programs
- Implement Energy Savings – Techniques and practices
- Use Recycled Materials
- Energy Efficient Tribal Member Homes
- Energy Efficient Transportation
- Lessen Reliance on Fossil Fuels

Moving Toward New Resource Development

- Housing with Wind Energy
- Wind mill at Apache Wye
- Biomass (Corn, Soybeans, etc.)
- Utilize and take advantage of land in New Mexico and Arizona

Moving Toward Enlightenment of Tribal Membership through Information Processing and Sharing

- Be Open to Challenges
- Tribal Education System
- Be Honest and Reliable
- Heritage for Younger Generation (Learn)
- Improved Communications
- Get Tribe Educated on Issues
- Work Together to Reach Goals!
- Education for 40 Students (College Funding)

Moving Towards Enhanced Collaborative Partnerships

- State Level Partnering
- Aggressive State and Federal Legislation
- Oklahoma Tribal Energy Cooperative

Moving Towards Tribal Self Sufficiency

- Universal Tribal Health Care
- TERO so Can do work within
- Construction Equipment for Projects
- Have Laws/Rule implanted
- Full Functional Utility Authority
- Power Casino ourselves
- Renegotiate Right of Way Leases
- Own Tribe Utility
- Do construction for FAS ourselves
- Self sustaining economy
- Be self sufficient Tribe
- Tribal Hunan Resource Development

Moving Towards Acting Now to Achieve Goals

- Projects for FSA Started and Completed

UNDERLYING CONTRADICTIONS WORKSHOP

The Underlying Contradictions workshop asks the question:

"What are the barriers or obstacles that have prevented us from reaching our vision?"

The real issues facing an organization manifest when placed under the light of a practical vision. Without a vision, problems and anxieties are relegated to "lists of things to do" or are explained away as personal conflicts. As a group considers the entire range of its issues together, root causes can be uncovered and objectified for sober consideration.

Tribal members who participated in the planning found there were six underlying contradictions. These are shown below moving from the most challenging (in the center of the swirl) to the least challenging:

- - - A SWIRL DIAGRAM WILL BE INCERTED - - -

UNDERLYING CONTRADICTIONS WORKSHOP — BACK-UP DATA

People Unmotivated And Reluctant To Change
- Membership reluctance to change
- Unmotivated to use recycled building materials
- Reluctance to accept change (all levels)

Unclear Chain of Command
- State level partnership prevented by state reluctance
- Uncoordinated adminstration
- Biased or debiltating attitude
- Inadequate planning for long range development
- Conflicting and inadequate staffing
- Uncoordinated hiring practices
- Inconsistency in staffing
- Inadequate processes for accomplishing goals
- Tribe not set up to do EC partnership
- Disorganized infrastructure (lines fo authority)
- Fragmented Tribal programs
- Uncoordinated project development
- Uncoordinated effort (between Tribal programs)
- Overlapping jurisdiction impedes development
- Unclear comprehension of Tribal authorities
- Restriction of info to Tribal membership

Uncoordinated Priorities
- Funding deficit
- Conflicting interests prevent us from working together
- Unmotivated (no Tribal initiative)
- Uncoordinated goals and prioritiess (to accomplish projects)
- Tribal management reluctant to use staff or contractor
- Conflicting issues/Projects and goals for FSA
- Unclear understanding of Tribal members regarding issues

Focus on Short Term Priorities
- Reactiive instead of responsive (squeaking wheels at all levels)

Culture Disconnectedness
- Inaccessible cultural resources
- Member priorities devalue culture

Outdated Perspective
- Previous prevents Tribal property maintenance
- Restricted vision has prevented us from achieving Tribal self sufficiency
- Restricted office space
- Insecure self image

STRATEGIC DIRECTIONS WORKSHOP

The Strategic Directions workshop asks the question:

"What are specific actions the Fort Sill Apache Tribe needs to take in the next two years to address the underlying contradictions and launch its vision?"

In the Strategic Directions workshop people are asked to focus on action strategies. If an organization plans only in relation to its vision, it runs the risk of being overly idealistic and unrealistic. By planning strategically, that is in relation to its real situation and the underlying contradictions, then it has a chance to realize its vision.

STRATEGIC DIRECTIONS WORKSHOP — BACK-UP DATA

Interacting within the Tribe and with outside entities

- Tribal Unification (thru meetings and General Council)
- Have Leadership Initiate Government to Government Interaction
- Network with 'like' organization to pool information
- Understand and communicate benefits to tribe
- Acquire council approval to develop federal / state partnerships
- Implement energy efficiency projects/programs
- Create new ways to get information out to tribal members
- Initiate more local training workshops
- Universal tribal helat care / meeting with food to assess priorities
- Identify the issues that block our progress to the membership
- Identify organize implement common goals/ddreams/visions of membership
- Coordinated administration (tribal programs)
- Communication ! (improve) scheduled newsletter
- Organize open trainings / forums

Cultural preservation

- Coordinate language / culture programs
- More involvement with culture activities

Infrastructure accountability

- Create an organization for 'checks & banances" to oversee infrastructure – report to membership
- Financial management plan
- Update tribal codes
- Own tribal utility – clear up organizationa ambiguities
- People's advocacy committee
- Utilize 'like sized" organization as a 'template'
- Creae new intertribal cooperatives

Resouce acquisiion utilitzation

- Develop construction workplan
- Expand land development (local)
- Expand office space3 (tribal complex)
- Pland for new resource development
- Create a solid waste plan
- Naturla reouce analysis, development pland (address logistics)
- Intiate resource conservation practices
- Energy efficienty transport
- Expand in quipment / transportation (back hoes – tranctors – vehnicles)

IMPLEMENTATION PLAN

The effective implementation of any plan depends upon clarifying directions, aligning resources, designating leadership roles and responsibilities and building team trust and support. The final step in the strategic planning process is the implementation plan. At this point in the process participants build working teams, assign tasks, create calendars, and set meeting times all a part of constructing a motivating action plan.

This workshop consists of two steps, First is the creation of a 1-Year Calendar of Accomplishments, and Second is the creation of 90-Day Implementation Plans.

Working within each of the Strategies, the group was able to being the process of identifying one year milestone accomplishments. The following is only the beginning of the work and will need to be reviewed, shared and expanded to initiate first steps for each of the strategies.

Resource Acquisition and Utilization

1st Quarter Milestones

- Contact outside resoruce for help
- Develop scope of work
- Meeting with all cards on table to discuss issues
- Survey

Cultural Preservation

1st Quarter Milestones

- Get more Tribal members involved
- Make a schedule
- Announcements to Tribal members
- Update on culture activities (to Tribal Members)

Interacting within the tribe and with outside entities

Note: The group was unable with the time allotted to map out one year accomplisments for this strategy.

Infrastructure Accountability

1st Quarter Milestones

- Compile existing codes / approval / implementation authorities
- Review complied codes for relevence, continuity, conflict, enforceability
- Recommend repeal, revision to conflicting applicable codes
- Develop formal recommendations to business council
- With business council approval, submit changed to council for adoption / recinded
- Create an organization for checks & balances to oversee infrastructure, report to membership

2nd Quarter Milestones

- Develop Code implementation ordinances (public notice, public comments), notice to affected proposal, enforcement authorities, enforcement entities, penalties / fines)
- Organize open forums for strategic plan from members
- Update financil plan
- Create organiztional documents and organizational chart

3rd Quarter Milestones

- Update constitution to create checks and balances and accountability
- Revise Tribal Codes

4th Quarter Milestones

- Replace tribal codes

Agenda

The Fort Sill Apache Tribe
Strategic Planning Session
Energy Development, Utilization and Management

January 12-13, 2005
Best Western, Lawton, Oklahoma

Welcome Chairman Houser

Invocation Tribal Elder

Introduction to CERT and Indian Energy

Environmental Scan
Vision Workshop
Underlying Contradictions
Strategic Directions
Implementation Planning

Next Steps

CERT Survey Questionnaire

Fort Sill Apache Strategic Planning Session
January 12-13, 2005

Select all of the following that describes you?

1. Tribal Counsel 2. Business Committee 3. Tribal Member 4. Other

Please evaluate based upon a five-point scale:
(1=poor, 2=fair, 3=average, 4=good, 5=excellent):

1. Overall quality of the two-day Strategic Planning Session	1	2	3	4	5
2. Introduction to Indian energy presentation	1	2	3	4	5
3. Facilitated planning session	1	2	3	4	5
4. Quality of dialogue	1	2	3	4	5
5. Networking opportunities	1	2	3	4	5
6. Conference logistics (registration, meals, lodging)	1	2	3	4	5
7. Conference meeting venue (Best Western, Lawton)	1	2	3	4	5

8 Did this Strategic Planning Session meet your expectations? Please explain.

_____
_____
_____

9. What are the most important lessons you learned from this event? Why?

_____
_____
_____

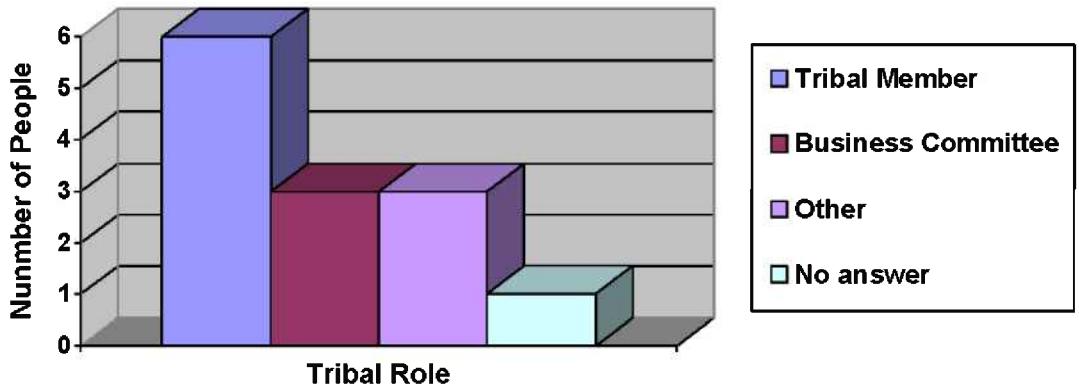
10. \How did this session differ from others you have attended in the past?_____
_____
_____

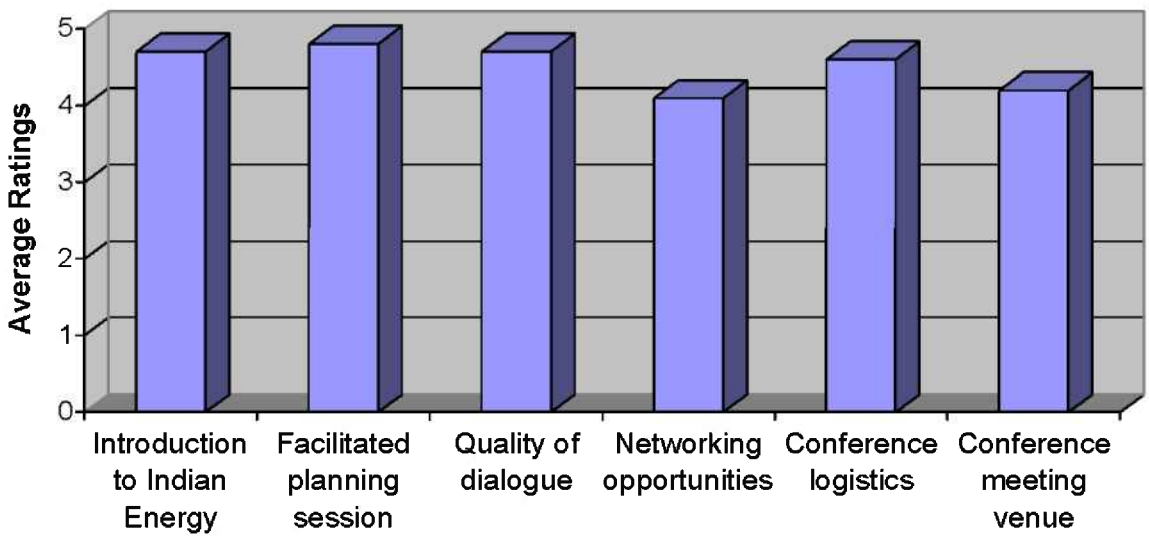
11. Likelihood you will attend Indian Energy 2005? Yes No Undecided

12. Suggested agenda items or topics for future conferences?

_____

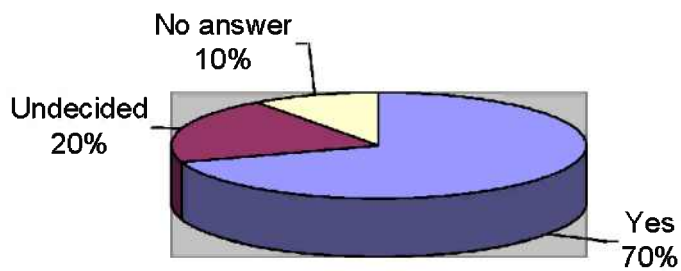
CERT Survey Results





Rating: 1= poor 2= fair 3=average 4=good 5=excellent

Likelihood of attending Indian Energy 2005



Did this Strategic Planning Session meet your expectations?

Exceeded my greatest expectations
Very much so
Yes. I had no expectations
Yes
Yes, very helpful
Yes, because I didn't know what to expect
Yes. It surpassed my expectations. It brought a feuding Tribe together. We came as enemies and left as family
Yes, learning together
Yes. Identify strengths and weaknesses. Set goals with economic development

What are the most important lessons you learned from this event?

Unity and spirituality
Group dynamics
That we can still work together
Resource conservation
A lot of venues that the Tribe can take
Tribe can work together
We are in turmoil and we were able to work through it
To move around positive and negative
Yes, same ideas from Tribal members

How did this session differ from others you have attended in the past?

The dedication and compassion of CERT representation
Much more group interaction
Smaller group
No one read to me
Participation levels were high
Attendance was consistent
All here paid attention and everybody gave feedback
Participation

Suggested agenda items or topics for future conferences

Advances in energy-related activities in Indian Country as a whole
Tribal utility development
You people do great work. Please keep it up
How to strength a feuding Tribe
More Tribal participation

Interviews

Jeff Houser, Chairman

Chairman Houser was born in 1957 in Norman, Oklahoma. In 2001, Chairman Houser moved from San Francisco back to Apache land in order to reach back to better understand and learn from his heritage. At this same time, the Tribe's casino was developing and the Chairman wanted to participate in its development. He took strong interest in Tribal government because his aunt had been the previous Chairwoman and because he wanted to participate in Tribal affairs.

When Chairman Houser was asked to define Tribal sovereignty, he defines it as the ability of the people to act with autonomy, within the confines of the US political system. He explains that sovereignty is a European concept that does not have roots in traditional Indian customs, and thus it lacks a clear definition in Indian country. The Indians lived among other Indian Tribes without considering ideas related to modern sovereignty. Can Indians achieve sovereignty? The Chairman thinks this is possible through running their own casino and sharing the profits but only if these actions fall within the parameters of US law.

The ideal definition of sovereignty would provide more independence and self governance to the Indian people but this is not the current reality. To achieve full sovereignty, Fort Sill Apache would be able to return to their homeland in New Mexico with the US government relinquishing control over this area. As it is, the Indians fight to maintain what they have. Chairman Houser sees himself as pragmatist and works toward the attainable. Economic development is a part of working toward independence and realistic sovereignty.

With 580 Tribal members spread across the US, with 51% of them living outside Oklahoma, Chairman Houser sees unity as the biggest challenge facing his Tribe. People are spread out. They don't know each other and they have not come to understand their common goals. The challenge is to maintain cohesiveness when they don't see one another. Other challenges facing the Tribe are providing education for their young people, and the preservation of their culture. First it is necessary to develop Tribal economy which will finance other Tribal developments. Fort Sill Apache is currently working to expand their casino operations.

Chairman Houser believes the ideal economy would be a diverse one. The form of economy depends on its returns to the Tribe. For now their goal is to expand the casino then diversify into other opportunities.

When the Chairman was asked what one single policy he would change, he said he would choose to do away with the BIA. He believes it is a patriarchal and outdated organization. This would be replaced by a limited government to government organization that would better serve all Indian communities.

Michael Darrow, Business Committee, Secretary Treasurer, Tribal Historian

Michael Darrow was born in Oklahoma City in 1957. His earliest Indian memory was of his grandmother making boiled meat and doing bead work while he played under the kitchen table. Boiled meat is still a part of his current life, among other Tribal activities. He speaks about 100 words of his native language while lamenting that few people can speak the language. As most Tribal members live off the reservation, they attend public schools in their area, where their culture and language are not taught. The Fort Sill Apache does not have a Tribal public education system.

Mr. Darrow explained the complex and tragic migration pattern and allotment system as experienced by his Tribe. In 1886, the Chiricahua people were forcibly removed from their homes in parts of New Mexico and Arizona. They were held as Prisoners of War (POW) and sent first to Florida then Alabama and eventually to Fort Sill. A period Mr. Darrow refers to as "ethnic cleansing" because their number was reduced 50% from about 500 to 261 (1914 when released from POW status). Many of children, forced into boarding schools in Pennsylvania as POWs, to better assimilate into the non-native culture, died from TB. On average, one person was dying every two weeks while they were in Florida. In 1914 the US government offered the Tribe three options: to stay on at Fort Sill (a military post) as POWs, to move to a non-homeland location in New Mexico or to move onto allotments in the immediate surrounding areas. While 2/3 of the people chose to move to New Mexico, the remaining chose the closer allotment option. While the original allotment offer was for 160 acres to each household, in reality, allotments were closer to 20 to 60 acres.

People of Fort Sill Apache can trace their heritage back to family members who were the first Prisoners of War or born as Prisoners of War. For Mr. Darrow, his grandfather was forced to New Mexico and his grandmother was born in Alabama when the Tribe was moved here. Federal government's fear of the Apache people, based on acts taken by Cochise and Geronimo, spur policy to scatter and separate the Tribe. Currently, many Tribal members live outside of Oklahoma. A Tribal challenge for Mr. Darrow is maintaining cohesiveness. In addition, there is a lack of cultural continuity with decreasing exposure to their culture.

When asked about the legacy of Geronimo on his Tribe, Mr. Darrow explained that popular culture has made this man a great legend, contrary to Tribal perspective. If placed on a scale where esteem for Apache heroes and figures were ranked, Mangas Colorados, Cochise, Victorio, Loco, Taza, Naiche and Chihuahua would all come above Geronimo.

The traditional governing structure of the Tribe called for heads of household to come together to select a leader. Recently, just in the past two weeks, the Tribe has adopted a full self-governing model. The Tribe has assumed all BIA programs except for the court and law enforcement. The General Council is the main governing body with staggered elections,

while the Chairman is elected for a two year term. When asked why Mr. Darrow chose to work in Tribal government, he feels the lack of human resources encouraged his participation. He also has vested interest in maintaining Tribal culture and language.

Asked to define Tribal sovereignty, Mr. Darrow deems equality and respect on a mutual scale as a basic. There must be equal rights for each sovereign entity, which cannot be achieved under the current structure. The recent DOE grant received by the Tribe is a major reason why they joined CERT. Mr. Darrow would like CERT to help them find focal point on energy to yield actual results. This would be followed with connecting them to the right people and organizations toward achieving their goals. Tribal goals and vision still need to be defined and agreed upon by Tribal members.

FORT SILL APACHE TRIBE ENERGY AUDIT

The following energy audits were conducted by Caddo Electric Cooperative on five buildings on the Fort Sill Apache Tribe's Reservation in Oklahoma. For each of the following buildings, various energy efficiency measures were proposed and the potential savings calculated.

The recommendations for each building, along with the potential savings are summarized in the attached report.

Building #1: Administrative Building
Building #2: Nutrition Center
Building #3: Youth Center
Building #4: Gymnasium
Building #5: Transportation Building

Fort Sill Apache Tribe Energy Audit

ADMINISTRATION BUILDING

Office Space: 2797 sq. ft.

Existing heating and cooling costs for ceiling, doors & floors, infiltration, ducts, walls, and windows.

EXISTING COSTS: $1093.95
PROPOSED COSTS: $851.90
SAVINGS: $242.05

Need to increase insulation in ceiling from 18.5 R to 45 R factor. Infiltration adds a lot of waste. Seal and weathercaulk windows and doors. Repair windows that are broken. Keep windows shut and seal them. Several windows are not sealed, and have lots of leakage around windows. Weather-strip doors. Most of the doors are not weather-stripped good and need to be replaced to get a good seal.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 5.88560983787479
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$161.32	$0.00	$29.25	$31.68	$222.25
FEBRUARY	$120.99	$0.00	$28.91	$31.32	$181.22
MARCH	$94.10	$0.00	$28.25	$30.60	$152.95
APRIL	$36.97	$0.00	$27.58	$29.88	$94.43
MAY	$0.00	$43.87	$26.92	$29.16	$99.95
JUNE	$0.00	$79.30	$25.92	$28.08	$133.30
JULY	$0.00	$116.83	$25.26	$27.36	$169.45
AUGUST	$0.00	$110.09	$26.92	$29.16	$166.17
SEPTEMBER	$0.00	$58.63	$27.58	$29.88	$116.09
OCTOBER	$30.25	$13.08	$28.25	$30.60	$102.17
NOVEMBER	$87.38	$0.00	$28.58	$30.96	$146.92
DECEMBER	$141.16	$0.00	$28.91	$31.32	$201.39
Total	$672.17	$421.79	$332.35	$360.00	$1786.30

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 5.88560983787479
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$128.42	$0.00	$29.25	$31.68	$189.35
FEBRUARY	$96.31	$0.00	$28.91	$31.32	$156.55
MARCH	$74.91	$0.00	$28.25	$30.60	$133.76
APRIL	$29.43	$0.00	$27.58	$29.88	$86.89
MAY	$0.00	$32.95	$26.92	$29.16	$89.03
JUNE	$0.00	$59.56	$25.92	$28.08	$113.57
JULY	$0.00	$87.76	$25.26	$27.36	$140.38
AUGUST	$0.00	$82.69	$26.92	$29.16	$138.77
SEPTEMBER	$0.00	$44.04	$27.58	$29.88	$101.50
OCTOBER	$24.08	$9.82	$28.25	$30.60	$92.75
NOVEMBER	$69.56	$0.00	$28.58	$30.96	$129.10
DECEMBER	$112.37	$0.00	$28.91	$31.32	$172.60
Total	$535.08	$316.82	$332.35	$360.00	$1544.25

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

TOTAL HEATING AND COOLING COSTS BY COMPONENT

Page 1 Minus Page 2

	EXISTING	PROPOSED	SAVINGS
CEILING	$262.59	$138.28	$124.31
DOORS	$18.84	$14.19	$4.65
FLOOR	$114.81	$114.81	$0.00
INFILTRATION	$190.60	$168.26	$22.34
MISCELLANEOUS	$50.45	$50.45	$0.00
DUCTS	$142.69	$111.12	$31.57
WALLS	$159.50	$159.50	$0.00
WINDOWS	$154.47	$95.29	$59.18
TOTAL	$1093.95	$851.90	$242.05

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

DOLLARS THAT CAN BE INVESTED

TO INCREASE THE THERMAL EFFICIENCY OF YOUR HOME

Page 1 Minus Page 2

	5 YEARS	7 YEARS	10 YEARS
CEILING	$489.74	$630.30	$794.83
DOORS	$18.33	$23.59	$29.75
FLOOR	$0.00	$0.00	$0.00
INFILTRATION	$88.01	$113.27	$142.84
MISCELLANEOUS	$0.00	$0.00	$0.00
DUCTS	$124.38	$160.08	$201.87
WALLS	$0.00	$0.00	$0.00
WINDOWS	$233.14	$300.06	$378.38
TOTAL	$953.61	$1227.31	$1547.67

BASED ON FUEL PRICE ESCALATION RATE OF 5.0 % PER YEAR
AND AN INTEREST RATE OF 7.0 % PER YEAR

All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	10,096	9,991
DOORS	923	548
FLOOR	11,391	0
INFILTRATION	28,859	7,210
MISCELLANEOUS	0	3,575
DUCTS	7,280	3,898
WALLS	8,647	3,922
WINDOWS	7,278	4,734
TOTAL	74,475	33,879

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

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Account: Building # 1

THE FOLLOWING ANALYSIS IS BASED ON:

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COOLING FUEL PRICE	$0.1/KWH	SEER = 12
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

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OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
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Account: Building # 1

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	2,304.58	0.00	365.58	352.00	3,022.16	1.00	7.15
FEBRUARY	1,728.43	0.00	361.43	348.00	2,437.86	0.81	5.91
MARCH	1,344.34	0.00	353.12	340.00	2,037.46	0.67	5.04
APRIL	528.13	0.00	344.81	332.00	1,204.95	0.40	3.16
MAY	0.00	438.66	336.50	324.00	1,099.16	0.36	2.91
JUNE	0.00	792.96	324.04	312.00	1,429.00	0.47	3.68
JULY	0.00	1,168.34	315.73	304.00	1,788.08	0.59	4.49
AUGUST	0.00	1,100.86	336.50	324.00	1,761.36	0.58	4.43
SEPTEMBER	0.00	586.28	344.81	332.00	1,263.09	0.42	3.30
OCTOBER	432.11	130.75	353.12	340.00	1,255.98	0.42	3.28
NOVEMBER	1,248.31	0.00	357.28	344.00	1,949.59	0.65	4.84
DECEMBER	2,016.51	0.00	361.43	348.00	2,725.94	0.90	6.52
Total	9,602.41	4,217.85	4,154.37	4,000.00	21,974.63	0.61	

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Adm. Off.
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OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	5,317	5,261
DOORS	695	413
FLOOR	11,391	0
INFILTRATION	20,614	5,824
MISCELLANEOUS	0	3,575
DUCTS	5,795	2,928
WALLS	8,647	3,922
WINDOWS	3,837	3,477
TOTAL	56,296	25,401

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

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AUGUST	$0.00	$82.69	$26.92	$29.16	$138.77
SEPTEMBER	$0.00	$44.04	$27.58	$29.88	$101.50
OCTOBER	$24.08	$9.82	$28.25	$30.60	$92.75
NOVEMBER	$69.56	$0.00	$28.58	$30.96	$129.10
DECEMBER	$112.37	$0.00	$28.91	$31.32	$172.60
Total	$535.08	$316.82	$332.35	$360.00	$1544.25

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Adm. Off.
Account: Building # 1

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	1,834.57	0.00	365.58	352.00	2,552.15	1.00	6.15
FEBRUARY	1,375.92	0.00	361.43	348.00	2,085.35	0.82	5.14
MARCH	1,070.16	0.00	353.12	340.00	1,763.28	0.69	4.43
APRIL	420.42	0.00	344.81	332.00	1,097.23	0.43	2.91
MAY	0.00	329.49	336.50	324.00	990.00	0.39	2.66
JUNE	0.00	595.62	324.04	312.00	1,231.66	0.48	3.22
JULY	0.00	877.60	315.73	304.00	1,497.33	0.59	3.83
AUGUST	0.00	826.90	336.50	324.00	1,487.41	0.58	3.81
SEPTEMBER	0.00	440.38	344.81	332.00	1,117.19	0.44	2.96
OCTOBER	343.98	98.21	353.12	340.00	1,135.32	0.44	3.00
NOVEMBER	993.72	0.00	357.28	344.00	1,695.00	0.66	4.28
DECEMBER	1,605.24	0.00	361.43	348.00	2,314.67	0.91	5.64
Total	7,644.02	3,168.21	4,154.37	4,000.00	18,966.60	0.62	

This program was developed by OKLAHOMA COOPERATIVE EXTENSION SERVICE AGRICULTURAL ENGINEERS at OKLAHOMA STATE UNIVERSITY
All loads calculated using procedures in Cooling and Heating Load Calculation Manual....ASHRAE GRP 158.
No capacity factors or multipliers have been applied to any heating or cooling loads.
* Diversified demand based on REA Bulletin 45-2 (N > 1500)
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

Fort Sill Apache Tribe Energy Audit

NUTRITION CENTER

Office Space: 4030 sq. ft.

Existing costs of heating and cooling components consist of ceiling, doors, floor, infiltration, misc., ducts, walls, and windows.

EXISTING COST:	$4349.58
PROPOSED COST:	$3207.39
SAVINGS:	$1142.19

Need to repair and replace broken windows. All of the windows in this building have a lot of wastes from the windows. Several windows were open and not sealed good. Some were broken and need to be repaired. The biggest waste of energy was the windows. Ceiling needs more insulation from 18.5 to 45. Building needs good seal around doors and weather-stripping and caulk around windows.

Energy cost included power cost adjustment.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 1.72446816228385
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$875.99	$0.00	$68.49	$51.01	$995.50
FEBRUARY	$657.00	$0.00	$67.71	$50.43	$775.14
MARCH	$511.00	$0.00	$66.16	$49.28	$626.43
APRIL	$200.75	$0.00	$64.60	$48.12	$313.46
MAY	$0.00	$72.76	$63.04	$46.96	$182.76
JUNE	$0.00	$131.52	$60.71	$45.22	$237.45
JULY	$0.00	$193.79	$59.15	$44.06	$297.00
AUGUST	$0.00	$182.59	$63.04	$46.96	$292.59
SEPTEMBER	$0.00	$97.24	$64.60	$48.12	$209.96
OCTOBER	$164.25	$21.69	$66.16	$49.28	$301.37
NOVEMBER	$474.50	$0.00	$66.93	$49.86	$591.29
DECEMBER	$766.50	$0.00	$67.71	$50.43	$884.64
Total	$3649.98	$699.60	$778.31	$579.71	$5707.59

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 1.72446816228385
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$645.94	$0.00	$68.49	$51.01	$765.45
FEBRUARY	$484.46	$0.00	$67.71	$50.43	$602.61
MARCH	$376.80	$0.00	$66.16	$49.28	$492.23
APRIL	$148.03	$0.00	$64.60	$48.12	$260.74
MAY	$0.00	$53.66	$63.04	$46.96	$163.66
JUNE	$0.00	$97.00	$60.71	$45.22	$202.93
JULY	$0.00	$142.92	$59.15	$44.06	$246.13
AUGUST	$0.00	$134.66	$63.04	$46.96	$244.66
SEPTEMBER	$0.00	$71.72	$64.60	$48.12	$184.43
OCTOBER	$121.11	$15.99	$66.16	$49.28	$252.54
NOVEMBER	$349.89	$0.00	$66.93	$49.86	$466.68
DECEMBER	$565.20	$0.00	$67.71	$50.43	$683.35
Total	$2691.44	$515.96	$778.31	$579.71	$4565.41

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

TOTAL HEATING AND COOLING COSTS BY COMPONENT

Page 1 Minus Page 2

	EXISTING	PROPOSED	SAVINGS
CEILING	$801.12	$421.88	$379.25
DOORS	$91.31	$77.27	$14.05
FLOOR	$545.01	$545.01	$0.00
INFILTRATION	$816.27	$644.23	$172.04
MISCELLANEOUS	$50.45	$50.45	$0.00
DUCTS	$567.34	$418.36	$148.98
WALLS	$468.71	$468.71	$0.00
WINDOWS	$1009.37	$581.50	$427.87
TOTAL	$4349.58	$3207.39	$1142.18

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

DOLLARS THAT CAN BE INVESTED

TO INCREASE THE THERMAL EFFICIENCY OF YOUR HOME

Page 1 Minus Page 2

	5 YEARS	7 YEARS	10 YEARS
CEILING	$1494.11	$1922.94	$2424.88
DOORS	$55.34	$71.22	$89.81
FLOOR	$0.00	$0.00	$0.00
INFILTRATION	$677.79	$872.32	$1100.02
MISCELLANEOUS	$0.00	$0.00	$0.00
DUCTS	$586.94	$755.39	$952.57
WALLS	$0.00	$0.00	$0.00
WINDOWS	$1685.68	$2169.48	$2735.78
TOTAL	$4499.85	$5791.36	$7303.07

BASED ON FUEL PRICE ESCALATION RATE OF 5.0 % PER YEAR
AND AN INTEREST RATE OF 7.0 % PER YEAR

All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	14,547	14,395
DOORS	1,845	1,096
FLOOR	15,514	0
INFILTRATION	41,582	10,389
MISCELLANEOUS	0	3,575
DUCTS	11,582	6,466
WALLS	9,912	4,341
WINDOWS	19,420	14,959
TOTAL	114,402	55,220

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

THE FOLLOWING ANALYSIS IS BASED ON:

HEATING FUEL PRICE	$0.07/KWH	HSPF = 1.72446816228385
COOLING FUEL PRICE	$0.1/KWH	SEER = 12
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$875.99	$0.00	$68.49	$51.01	$995.50
FEBRUARY	$657.00	$0.00	$67.71	$50.43	$775.14
MARCH	$511.00	$0.00	$66.16	$49.28	$626.43
APRIL	$200.75	$0.00	$64.60	$48.12	$313.46
MAY	$0.00	$72.76	$63.04	$46.96	$182.76
JUNE	$0.00	$131.52	$60.71	$45.22	$237.45
JULY	$0.00	$193.79	$59.15	$44.06	$297.00
AUGUST	$0.00	$182.59	$63.04	$46.96	$292.59
SEPTEMBER	$0.00	$97.24	$64.60	$48.12	$209.96
OCTOBER	$164.25	$21.69	$66.16	$49.28	$301.37
NOVEMBER	$474.50	$0.00	$66.93	$49.86	$591.29
DECEMBER	$766.50	$0.00	$67.71	$50.43	$884.64
Total	$3649.98	$699.60	$778.31	$579.71	$5707.59

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	12,514.21	0.00	154.50	566.72	13,235.43	1.00	26.47
FEBRUARY	9,385.66	0.00	152.74	560.28	10,098.68	0.76	20.83
MARCH	7,299.96	0.00	149.23	547.40	7,996.59	0.60	16.93
APRIL	2,867.84	0.00	145.72	534.52	3,548.08	0.27	8.24
MAY	0.00	727.58	142.21	521.64	1,391.43	0.11	3.59
JUNE	0.00	1,315.24	136.94	502.32	1,954.50	0.15	4.86
JULY	0.00	1,937.88	133.43	489.44	2,560.75	0.19	6.17
AUGUST	0.00	1,825.95	142.21	521.64	2,489.80	0.19	6.02
SEPTEMBER	0.00	972.44	145.72	534.52	1,652.68	0.12	4.18
OCTOBER	2,346.42	216.87	149.23	547.40	3,259.92	0.25	7.64
NOVEMBER	6,778.53	0.00	150.99	553.84	7,483.36	0.57	15.97
DECEMBER	10,949.94	0.00	152.74	560.28	11,662.96	0.88	23.66
Total	52,142.56	6,995.97	1,755.68	6,440.00	67,334.20	0.42	

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	7,661	7,581
DOORS	1,504	1,096
FLOOR	15,514	0
INFILTRATION	29,701	8,391
MISCELLANEOUS	0	3,575
DUCTS	8,540	4,769
WALLS	9,912	4,341
WINDOWS	10,240	11,380
TOTAL	83,071	41,133

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

HEATING FUEL PRICE	$0.07/KWH	HSPF = 1.72446816228385
COOLING FUEL PRICE	$0.1/KWH	SEER = 12
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$645.94	$0.00	$68.49	$51.01	$765.45
FEBRUARY	$484.46	$0.00	$67.71	$50.43	$602.61
MARCH	$376.80	$0.00	$66.16	$49.28	$492.23
APRIL	$148.03	$0.00	$64.60	$48.12	$260.74
MAY	$0.00	$53.66	$63.04	$46.96	$163.66
JUNE	$0.00	$97.00	$60.71	$45.22	$202.93
JULY	$0.00	$142.92	$59.15	$44.06	$246.13
AUGUST	$0.00	$134.66	$63.04	$46.96	$244.66
SEPTEMBER	$0.00	$71.72	$64.60	$48.12	$184.43
OCTOBER	$121.11	$15.99	$66.16	$49.28	$252.54
NOVEMBER	$349.89	$0.00	$66.93	$49.86	$466.68
DECEMBER	$565.20	$0.00	$67.71	$50.43	$683.35
Total	$2691.44	$515.96	$778.31	$579.71	$4565.41

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Nutr. Cen
Account: Building # 2

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW *
JANUARY	9,227.78	0.00	154.50	566.72	9,949.00	1.00	20.55
FEBRUARY	6,920.84	0.00	152.74	560.28	7,633.86	0.77	16.25
MARCH	5,382.87	0.00	149.23	547.40	6,079.51	0.61	13.28
APRIL	2,114.70	0.00	145.72	534.52	2,794.94	0.28	6.67
MAY	0.00	536.60	142.21	521.64	1,200.45	0.12	3.15
JUNE	0.00	970.00	136.94	502.32	1,609.26	0.16	4.09
JULY	0.00	1,429.20	133.43	489.44	2,052.07	0.21	5.07
AUGUST	0.00	1,346.65	142.21	521.64	2,010.50	0.20	4.98
SEPTEMBER	0.00	717.18	145.72	534.52	1,397.42	0.14	3.61
OCTOBER	1,730.21	159.95	149.23	547.40	2,586.79	0.26	6.23
NOVEMBER	4,998.38	0.00	150.99	553.84	5,703.21	0.57	12.55
DECEMBER	8,074.31	0.00	152.74	560.28	8,787.33	0.88	18.41
Total	38,449.10	5,159.57	1,755.68	6,440.00	51,804.35	0.43	

This program was developed by OKLAHOMA COOPERATIVE EXTENSION SERVICE AGRICULTURAL ENGINEERS at OKLAHOMA STATE UNIVERSITY
All loads calculated using procedures in Cooling and Heating Load Calculation Manual....ASHRAE GRP 158.
No capacity factors or multipliers have been applied to any heating or cooling loads.
* Diversified demand based on REA Bulletin 45-2 (N > 1500)
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

Fort Sill Apache Tribe Energy Audit

YOUTH SHELTER

Office Space: 3990 sq. ft.

Existing heating and cooling cost by the following components: ceiling, doors, floors, infiltration, misc., ducts, walls, and windows.

EXISTING COST: $1511.29
PROPOSED COST: $1271.69
SAVINGS: $239.60-1st year

Savings from the ceiling from 18.5 R to 45 R value also infiltration, weather-stripping, caulking, and good seal around doors and windows also more insulation around ducts.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 6.21339879707356
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$202.82	$0.00	$96.34	$91.24	$390.40
FEBRUARY	$152.12	$0.00	$95.25	$90.20	$337.57
MARCH	$118.31	$0.00	$93.06	$88.13	$299.50
APRIL	$46.48	$0.00	$90.87	$86.05	$223.40
MAY	$0.00	$69.29	$88.68	$83.98	$241.95
JUNE	$0.00	$125.25	$85.40	$80.87	$291.51
JULY	$0.00	$184.54	$83.21	$78.80	$346.54
AUGUST	$0.00	$173.88	$88.68	$83.98	$346.54
SEPTEMBER	$0.00	$92.60	$90.87	$86.05	$269.53
OCTOBER	$38.03	$20.65	$93.06	$88.13	$239.87
NOVEMBER	$109.86	$0.00	$94.15	$89.16	$293.18
DECEMBER	$177.47	$0.00	$95.25	$90.20	$362.92
Total	$845.08	$666.21	$1094.82	$1036.80	$3642.91

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 6.21339879707356
COOLING FUEL PRICE $0.1/KWH SEER = 12
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$173.73	$0.00	$96.34	$91.24	$361.32
FEBRUARY	$130.30	$0.00	$95.25	$90.20	$315.75
MARCH	$101.35	$0.00	$93.06	$88.13	$282.53
APRIL	$39.81	$0.00	$90.87	$86.05	$216.74
MAY	$0.00	$56.97	$88.68	$83.98	$229.63
JUNE	$0.00	$102.99	$85.40	$80.87	$269.25
JULY	$0.00	$151.74	$83.21	$78.80	$313.74
AUGUST	$0.00	$142.98	$88.68	$83.98	$315.64
SEPTEMBER	$0.00	$76.14	$90.87	$86.05	$253.07
OCTOBER	$32.58	$16.98	$93.06	$88.13	$230.74
NOVEMBER	$94.11	$0.00	$94.15	$89.16	$277.43
DECEMBER	$152.02	$0.00	$95.25	$90.20	$337.47
Total	$723.89	$547.80	$1094.82	$1036.80	$3403.31

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

TOTAL HEATING AND COOLING COSTS BY COMPONENT

Page 1 Minus Page 2

	EXISTING	PROPOSED	SAVINGS
CEILING	$365.45	$192.45	$173.00
DOORS	$27.38	$26.08	$1.30
FLOOR	$154.63	$154.63	$0.00
INFILTRATION	$259.84	$225.79	$34.05
MISCELLANEOUS	$75.77	$75.77	$0.00
DUCTS	$197.13	$165.87	$31.25
WALLS	$217.85	$217.85	$0.00
WINDOWS	$213.25	$213.25	$0.00
TOTAL	$1511.29	$1271.69	$239.60

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

DOLLARS THAT CAN BE INVESTED

TO INCREASE THE THERMAL EFFICIENCY OF YOUR HOME

Page 1 Minus Page 2

	5 YEARS	7 YEARS	10 YEARS
CEILING	$681.56	$877.18	$1106.15
DOORS	$5.12	$6.59	$8.31
FLOOR	$0.00	$0.00	$0.00
INFILTRATION	$134.16	$172.66	$217.73
MISCELLANEOUS	$0.00	$0.00	$0.00
DUCTS	$123.13	$158.46	$199.83
WALLS	$0.00	$0.00	$0.00
WINDOWS	$0.00	$0.00	$0.00
TOTAL	$943.97	$1214.90	$1532.02

BASED ON FUEL PRICE ESCALATION RATE OF 5.0 % PER YEAR
AND AN INTEREST RATE OF 7.0 % PER YEAR

All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	14,403	14,252
DOORS	1,384	822
FLOOR	16,165	0
INFILTRATION	41,169	10,285
MISCELLANEOUS	0	5,369
DUCTS	9,662	6,158
WALLS	11,834	5,870
WINDOWS	6,101	10,179
TOTAL	100,717	52,935

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

THE FOLLOWING ANALYSIS IS BASED ON:

HEATING FUEL PRICE	$0.07/KWH	HSPF = 6.21339879707356
COOLING FUEL PRICE	$0.1/KWH	SEER = 12
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$202.82	$0.00	$96.34	$91.24	$390.40
FEBRUARY	$152.12	$0.00	$95.25	$90.20	$337.57
MARCH	$118.31	$0.00	$93.06	$88.13	$299.50
APRIL	$46.48	$0.00	$90.87	$86.05	$223.40
MAY	$0.00	$69.29	$88.68	$83.98	$241.95
JUNE	$0.00	$125.25	$85.40	$80.87	$291.51
JULY	$0.00	$184.54	$83.21	$78.80	$346.54
AUGUST	$0.00	$173.68	$88.68	$83.98	$346.54
SEPTEMBER	$0.00	$92.60	$90.87	$86.05	$269.53
OCTOBER	$38.03	$20.65	$93.06	$88.13	$239.87
NOVEMBER	$109.86	$0.00	$94.15	$89.16	$293.18
DECEMBER	$177.47	$0.00	$95.25	$90.20	$362.92
Total	$845.08	$666.21	$1094.82	$1036.80	$3642.91

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	2,897.43	0.00	546.51	1,013.76	4,457.70	1.00	10.09
FEBRUARY	2,173.07	0.00	540.30	1,002.24	3,715.62	0.83	8.58
MARCH	1,690.17	0.00	527.88	979.20	3,197.25	0.72	7.51
APRIL	663.99	0.00	515.46	956.16	2,135.62	0.48	5.25
MAY	0.00	692.86	503.04	933.12	2,129.02	0.48	5.24
JUNE	0.00	1,252.48	484.41	898.56	2,635.45	0.59	6.33
JULY	0.00	1,845.41	471.99	875.52	3,192.92	0.72	7.50
AUGUST	0.00	1,738.81	503.04	933.12	3,174.97	0.71	7.47
SEPTEMBER	0.00	926.03	515.46	956.16	2,397.66	0.54	5.82
OCTOBER	543.27	206.53	527.88	979.20	2,256.88	0.51	5.52
NOVEMBER	1,569.44	0.00	534.09	990.72	3,094.25	0.69	7.30
DECEMBER	2,535.25	0.00	540.30	1,002.24	4,077.79	0.91	9.32
Total	12,072.62	6,662.12	6,210.38	11,520.00	36,465.12	0.68	

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING LOAD,BTU/HR	COOLING LOAD,BTU/HR
CEILING	7,585	7,505
DOORS	1,270	822
FLOOR	16,165	0
INFILTRATION	29,406	8,307
MISCELLANEOUS	0	5,369
DUCTS	8,276	5,063
WALLS	11,834	5,870
WINDOWS	6,101	10,179
TOTAL	80,637	43,117

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

HEATING FUEL PRICE	$0.07/KWH	HSPF = 6.21339879707356
COOLING FUEL PRICE	$0.1/KWH	SEER = 12
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$173.73	$0.00	$96.34	$91.24	$361.32
FEBRUARY	$130.30	$0.00	$95.25	$90.20	$315.75
MARCH	$101.35	$0.00	$93.06	$88.13	$282.53
APRIL	$39.81	$0.00	$90.87	$86.05	$216.74
MAY	$0.00	$56.97	$88.68	$83.98	$229.63
JUNE	$0.00	$102.99	$85.40	$80.87	$269.25
JULY	$0.00	$151.74	$83.21	$78.80	$313.74
AUGUST	$0.00	$142.98	$88.68	$83.98	$315.64
SEPTEMBER	$0.00	$76.14	$90.87	$86.05	$253.07
OCTOBER	$32.58	$16.98	$93.06	$88.13	$230.74
NOVEMBER	$94.11	$0.00	$94.15	$89.16	$277.43
DECEMBER	$152.02	$0.00	$95.25	$90.20	$337.47
Total	$723.89	$547.80	$1094.82	$1036.80	$3403.31

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Youth She
Account: Youth Shelter # 3

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW *
JANUARY	2,481.92	0.00	546.51	1,013.76	4,042.20	1.00	9.25
FEBRUARY	1,861.44	0.00	540.30	1,002.24	3,403.99	0.84	7.94
MARCH	1,447.79	0.00	527.88	979.20	2,954.87	0.73	7.00
APRIL	568.77	0.00	515.46	956.16	2,040.40	0.50	5.04
MAY	0.00	569.71	503.04	933.12	2,005.87	0.50	4.97
JUNE	0.00	1,029.86	484.41	898.56	2,412.83	0.60	5.85
JULY	0.00	1,517.40	471.99	875.52	2,864.91	0.71	6.81
AUGUST	0.00	1,429.75	503.04	933.12	2,865.91	0.71	6.82
SEPTEMBER	0.00	761.44	515.46	956.16	2,233.06	0.55	5.46
OCTOBER	465.36	169.82	527.88	979.20	2,142.26	0.53	5.27
NOVEMBER	1,344.37	0.00	534.09	990.72	2,869.19	0.71	6.82
DECEMBER	2,171.68	0.00	540.30	1,002.24	3,714.23	0.92	8.58
Total	10,341.34	5,477.97	6,210.38	11,520.00	33,549.70	0.69	

This program was developed by OKLAHOMA COOPERATIVE EXTENSION SERVICE AGRICULTURAL ENGINEERS at OKLAHOMA STATE UNIVERSITY
All loads calculated using procedures in Cooling and Heating Load Calculation Manual....ASHRAE GRP 158.
No capacity factors or multipliers have been applied to any heating or cooling loads.
* Diversified demand based on REA Bulletin 45-2 (N > 1500)
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

Fort Sill Apache Tribe Energy Audit

GYM BUILDING

Office Space: 2835 sq. ft

The gym itself is not figured in this audit and not many changes in the gym need to be made. The only proposal is to keep the thermostat at a reasonable level. When we were looking at the building the thermostat was set at 72° with no one in the gym. Air conditioning running for no purpose needs to be monitored.

Office space: Heating and cooling costs by component. A large cost was insulation for ceiling.

EXISTING COST:	$5848.43
PROPOSED COST:	$4941.65
SAVINGS:	$906.78

The largest cost cutting proposal was adding more insulation in the ceiling from 18.5 to 45. Also infiltration weather stripping and caulking around windows and door. Also more insulation needs to be wrapped around ducts.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

HEATING FUEL PRICE	$1.35/GAL	AFUE = 0.182050946295739
COOLING FUEL PRICE	$0.1/KWH	SEER = 10
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$1255.71	$0.00	$72.97	$33.66	$1362.34
FEBRUARY	$941.78	$0.00	$72.14	$33.28	$1047.20
MARCH	$732.50	$0.00	$70.48	$32.51	$835.49
APRIL	$287.77	$0.00	$68.82	$31.75	$388.34
MAY	$0.00	$64.10	$67.16	$30.98	$162.24
JUNE	$0.00	$115.87	$64.68	$29.84	$210.38
JULY	$0.00	$170.72	$63.02	$29.07	$262.80
AUGUST	$0.00	$160.86	$67.16	$30.98	$259.00
SEPTEMBER	$0.00	$85.67	$68.82	$31.75	$186.24
OCTOBER	$235.45	$19.11	$70.48	$32.51	$357.54
NOVEMBER	$680.18	$0.00	$71.31	$32.90	$784.38
DECEMBER	$1098.75	$0.00	$72.14	$33.28	$1204.16
Total	$5232.13	$616.31	$829.18	$382.50	$7060.11

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

HEATING FUEL PRICE	$1.35/GAL	AFUE = 0.182050946295739
COOLING FUEL PRICE	$0.1/KWH	SEER = 10
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$1064.55	$0.00	$72.97	$33.66	$1171.18
FEBRUARY	$798.41	$0.00	$72.14	$33.28	$903.83
MARCH	$620.99	$0.00	$70.48	$32.51	$723.98
APRIL	$243.96	$0.00	$68.82	$31.75	$344.53
MAY	$0.00	$52.63	$67.16	$30.98	$150.77
JUNE	$0.00	$95.14	$64.68	$29.84	$189.65
JULY	$0.00	$140.17	$63.02	$29.07	$232.26
AUGUST	$0.00	$132.08	$67.16	$30.98	$230.22
SEPTEMBER	$0.00	$70.34	$68.82	$31.75	$170.91
OCTOBER	$199.60	$15.69	$70.48	$32.51	$318.28
NOVEMBER	$576.63	$0.00	$71.31	$32.90	$680.83
DECEMBER	$931.48	$0.00	$72.14	$33.28	$1036.89
Total	$4435.61	$506.04	$829.18	$382.50	$6153.33

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

TOTAL HEATING AND COOLING COSTS BY COMPONENT

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	EXISTING	PROPOSED	SAVINGS
CEILING	$1006.79	$530.18	$476.61
DOORS	$42.29	$42.29	$0.00
FLOOR	$833.59	$833.59	$0.00
INFILTRATION	$1406.13	$1094.23	$311.90
MISCELLANEOUS	$77.04	$77.04	$0.00
DUCTS	$759.37	$641.09	$118.28
WALLS	$771.30	$771.30	$0.00
WINDOWS	$951.92	$951.92	$0.00
TOTAL	$5848.43	$4941.65	$906.78

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

DOLLARS THAT CAN BE INVESTED

TO INCREASE THE THERMAL EFFICIENCY OF YOUR HOME

Page 1 Minus Page 2

	5 YEARS	7 YEARS	10 YEARS
CEILING	$1877.68	$2416.60	$3047.40
DOORS	$0.00	$0.00	$0.00
FLOOR	$0.00	$0.00	$0.00
INFILTRATION	$1228.78	$1581.46	$1994.26
MISCELLANEOUS	$0.00	$0.00	$0.00
DUCTS	$465.97	$599.71	$756.25
WALLS	$0.00	$0.00	$0.00
WINDOWS	$0.00	$0.00	$0.00
TOTAL	$3572.44	$4597.77	$5797.92

BASED ON FUEL PRICE ESCALATION RATE OF 5.0 % PER YEAR
AND AN INTEREST RATE OF 7.0 % PER YEAR
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	10,234	10,127
DOORS	461	274
FLOOR	12,585	0
INFILTRATION	29,252	7,308
MISCELLANEOUS	0	2,977
DUCTS	8,318	4,747
WALLS	8,564	4,268
WINDOWS	9,637	9,761
TOTAL	79,051	39,462

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

THE FOLLOWING ANALYSIS IS BASED ON:

HEATING FUEL PRICE	$1.35/GAL	AFUE = 0.182050946295739
COOLING FUEL PRICE	$0.1/KWH	SEER = 10
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$1255.71	$0.00	$72.97	$33.66	$1362.34
FEBRUARY	$941.78	$0.00	$72.14	$33.28	$1047.20
MARCH	$732.50	$0.00	$70.48	$32.51	$835.49
APRIL	$287.77	$0.00	$68.82	$31.75	$388.34
MAY	$0.00	$64.10	$67.16	$30.98	$162.24
JUNE	$0.00	$115.87	$64.68	$29.84	$210.38
JULY	$0.00	$170.72	$63.02	$29.07	$262.80
AUGUST	$0.00	$160.86	$67.16	$30.98	$259.00
SEPTEMBER	$0.00	$85.67	$68.82	$31.75	$186.24
OCTOBER	$235.45	$19.11	$70.48	$32.51	$357.54
NOVEMBER	$680.18	$0.00	$71.31	$32.90	$784.38
DECEMBER	$1098.75	$0.00	$72.14	$33.28	$1204.16
Total	$5232.13	$616.31	$829.18	$382.50	$7060.11

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	71.00	0.00	912.10	374.00	1,357.09	0.48	3.51
FEBRUARY	53.25	0.00	901.73	369.75	1,324.73	0.47	3.44
MARCH	41.41	0.00	881.00	361.25	1,283.67	0.46	3.34
APRIL	16.27	0.00	860.27	352.75	1,229.29	0.44	3.22
MAY	0.00	640.96	839.54	344.25	1,824.75	0.65	4.57
JUNE	0.00	1,158.65	808.45	331.50	2,298.60	0.82	5.61
JULY	0.00	1,707.17	787.72	323.00	2,817.89	1.00	6.72
AUGUST	0.00	1,608.56	839.54	344.25	2,792.35	0.99	6.66
SEPTEMBER	0.00	856.66	860.27	352.75	2,069.69	0.73	5.11
OCTOBER	13.31	191.05	881.00	361.25	1,446.62	0.51	3.72
NOVEMBER	38.46	0.00	891.37	365.50	1,295.32	0.46	3.37
DECEMBER	62.12	0.00	901.73	369.75	1,333.60	0.47	3.46
Total	295.82	6,163.05	10,364.75	4,250.00	21,073.62	0.62	

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	5,389	5,333
DOORS	461	274
FLOOR	12,585	0
INFILTRATION	20,894	5,903
MISCELLANEOUS	0	2,977
DUCTS	7,046	3,898
WALLS	8,564	4,268
WINDOWS	9,637	9,761
TOTAL	64,576	32,414

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

HEATING FUEL PRICE	$1.35/GAL	AFUE = 0.182050946295739
COOLING FUEL PRICE	$0.1/KWH	SEER = 10
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$1064.55	$0.00	$72.97	$33.66	$1171.18
FEBRUARY	$798.41	$0.00	$72.14	$33.28	$903.83
MARCH	$620.99	$0.00	$70.48	$32.51	$723.98
APRIL	$243.96	$0.00	$68.82	$31.75	$344.53
MAY	$0.00	$52.63	$67.16	$30.98	$150.77
JUNE	$0.00	$95.14	$64.68	$29.84	$189.65
JULY	$0.00	$140.17	$63.02	$29.07	$232.26
AUGUST	$0.00	$132.08	$67.16	$30.98	$230.22
SEPTEMBER	$0.00	$70.34	$68.82	$31.75	$170.91
OCTOBER	$199.60	$15.69	$70.48	$32.51	$318.28
NOVEMBER	$576.63	$0.00	$71.31	$32.90	$680.83
DECEMBER	$931.48	$0.00	$72.14	$33.28	$1036.89
Total	$4435.61	$506.04	$829.18	$382.50	$6153.33

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache Gym # 4
Account: Gym # 4

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW *
JANUARY	71.00	0.00	912.10	374.00	1,357.09	0.54	3.51
FEBRUARY	53.25	0.00	901.73	369.75	1,324.73	0.53	3.44
MARCH	41.41	0.00	881.00	361.25	1,283.67	0.51	3.34
APRIL	16.27	0.00	860.27	352.75	1,229.29	0.49	3.22
MAY	0.00	526.28	839.54	344.25	1,710.08	0.68	4.31
JUNE	0.00	951.36	808.45	331.50	2,091.31	0.83	5.16
JULY	0.00	1,401.73	787.72	323.00	2,512.45	1.00	6.07
AUGUST	0.00	1,320.76	839.54	344.25	2,504.56	1.00	6.05
SEPTEMBER	0.00	703.40	860.27	352.75	1,916.42	0.76	4.77
OCTOBER	13.31	156.87	881.00	361.25	1,412.44	0.56	3.64
NOVEMBER	38.46	0.00	891.37	365.50	1,295.32	0.52	3.37
DECEMBER	62.12	0.00	901.73	369.75	1,333.60	0.53	3.46
Total	295.82	5,060.40	10,364.75	4,250.00	19,970.97	0.66	

This program was developed by OKLAHOMA COOPERATIVE EXTENSION SERVICE AGRICULTURAL ENGINEERS at OKLAHOMA STATE UNIVERSITY
All loads calculated using procedures in Cooling and Heating Load Calculation Manual....ASHRAE GRP 158.
No capacity factors or multipliers have been applied to any heating or cooling loads.
* Diversified demand based on REA Bulletin 45-2 (N > 1500)
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

Fort Sill Apache Tribe Energy Audit

TRANSPORTATION BUILDING

Office Space: 504 sq. ft.

EXISTING COST:	$532.15
PROPOSED COST:	$476.81
SAVINGS:	$55.34

Savings would be from more insulation in the ceiling also a little savings from weather-stripping doors and caulking around windows.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 3.413
COOLING FUEL PRICE $0.1/KWH SEER = 6
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$71.16	$0.00	$0.00	$10.30	$81.45
FEBRUARY	$53.37	$0.00	$0.00	$10.18	$63.55
MARCH	$41.51	$0.00	$0.00	$9.95	$51.45
APRIL	$16.31	$0.00	$0.00	$9.71	$26.02
MAY	$0.00	$24.51	$0.00	$9.48	$33.99
JUNE	$0.00	$44.30	$0.00	$9.13	$53.43
JULY	$0.00	$65.28	$0.00	$8.89	$74.17
AUGUST	$0.00	$61.51	$0.00	$9.48	$70.99
SEPTEMBER	$0.00	$32.76	$0.00	$9.71	$42.47
OCTOBER	$13.34	$7.31	$0.00	$9.95	$30.59
NOVEMBER	$38.54	$0.00	$0.00	$10.06	$48.61
DECEMBER	$62.26	$0.00	$0.00	$10.18	$72.44
Total	$296.49	$235.66	$0.00	$117.00	$649.15

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

HEATING FUEL PRICE $0.07/KWH HSPF = 3.413
COOLING FUEL PRICE $0.1/KWH SEER = 6
AVERAGE HEATING DEGREE DAYS 3321
AVERAGE COOLING HOURS 1247

	HEATING	COOLING	WATER HEATING	BASE	TOTAL
JANUARY	$64.85	$0.00	$0.00	$10.30	$75.15
FEBRUARY	$48.64	$0.00	$0.00	$10.18	$58.82
MARCH	$37.83	$0.00	$0.00	$9.95	$47.77
APRIL	$14.86	$0.00	$0.00	$9.71	$24.57
MAY	$0.00	$21.49	$0.00	$9.48	$30.96
JUNE	$0.00	$38.84	$0.00	$9.13	$47.97
JULY	$0.00	$57.23	$0.00	$8.89	$66.12
AUGUST	$0.00	$53.92	$0.00	$9.48	$63.40
SEPTEMBER	$0.00	$28.72	$0.00	$9.71	$38.43
OCTOBER	$12.16	$6.40	$0.00	$9.95	$28.51
NOVEMBER	$35.13	$0.00	$0.00	$10.06	$45.19
DECEMBER	$56.74	$0.00	$0.00	$10.18	$66.92
Total	$270.21	$206.61	$0.00	$117.00	$593.81

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
Prepared For: Ft. Sill Apache
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TOTAL HEATING AND COOLING COSTS BY COMPONENT

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	EXISTING	PROPOSED	SAVINGS
CEILING	$88.60	$46.66	$41.94
DOORS	$34.62	$26.07	$8.55
FLOOR	$66.82	$66.82	$0.00
INFILTRATION	$119.81	$114.97	$4.84
MISCELLANEOUS	$75.58	$75.58	$0.00
DUCTS	$0.00	$0.00	$0.00
WALLS	$121.67	$121.67	$0.00
WINDOWS	$25.04	$25.04	$0.00
TOTAL	$532.15	$476.81	$55.34

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES
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DOLLARS THAT CAN BE INVESTED

TO INCREASE THE THERMAL EFFICIENCY OF YOUR HOME

Page 1 Minus Page 2

	5 YEARS	7 YEARS	10 YEARS
CEILING	$165.24	$212.66	$268.17
DOORS	$33.68	$43.35	$54.66
FLOOR	$0.00	$0.00	$0.00
INFILTRATION	$19.09	$24.56	$30.98
MISCELLANEOUS	$0.00	$0.00	$0.00
DUCTS	$0.00	$0.00	$0.00
WALLS	$0.00	$0.00	$0.00
WINDOWS	$0.00	$0.00	$0.00
TOTAL	$218.00	$280.57	$353.81

BASED ON FUEL PRICE ESCALATION RATE OF 5.0 % PER YEAR
AND AN INTEREST RATE OF 7.0 % PER YEAR
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING LOAD BTU/HR	COOLING LOAD BTU/HR
CEILING	1,819	1,800
DOORS	923	548
FLOOR	4,882	0
INFILTRATION	5,200	1,299
MISCELLANEOUS	0	2,678
DUCTS	0	0
WALLS	3,642	1,631
WINDOWS	466	544
TOTAL	16,933	8,500

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

THE FOLLOWING ANALYSIS IS BASED ON:

HEATING FUEL PRICE	$0.07/KWH	HSPF = 3.413
COOLING FUEL PRICE	$0.1/KWH	SEER = 6
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$71.16	$0.00	$0.00	$10.30	$81.45
FEBRUARY	$53.37	$0.00	$0.00	$10.18	$63.55
MARCH	$41.51	$0.00	$0.00	$9.95	$51.45
APRIL	$16.31	$0.00	$0.00	$9.71	$26.02
MAY	$0.00	$24.51	$0.00	$9.48	$33.99
JUNE	$0.00	$44.30	$0.00	$9.13	$53.43
JULY	$0.00	$65.28	$0.00	$8.89	$74.17
AUGUST	$0.00	$61.51	$0.00	$9.48	$70.99
SEPTEMBER	$0.00	$32.76	$0.00	$9.71	$42.47
OCTOBER	$13.34	$7.31	$0.00	$9.95	$30.59
NOVEMBER	$38.54	$0.00	$0.00	$10.06	$48.61
DECEMBER	$62.26	$0.00	$0.00	$10.18	$72.44
Total	$296.49	$235.66	$0.00	$117.00	$649.15

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

HOME ENERGY ANALYSIS BASED ON PRESENT THERMAL EFFICIENCY

	HEATING KWH	COOLING KWH	WATER HEATING KWH	BASE KWH	TOTAL KWH	LF %	DEMAND KW*
JANUARY	1,016.52	0.00	0.00	114.40	1,130.92	1.00	2.99
FEBRUARY	762.39	0.00	0.00	113.10	875.49	0.77	2.38
MARCH	592.97	0.00	0.00	110.50	703.47	0.62	1.96
APRIL	232.95	0.00	0.00	107.90	340.85	0.30	1.03
MAY	0.00	245.09	0.00	105.30	350.39	0.31	1.06
JUNE	0.00	443.05	0.00	101.40	544.45	0.48	1.56
JULY	0.00	652.79	0.00	98.80	751.59	0.66	2.08
AUGUST	0.00	615.08	0.00	105.30	720.38	0.64	2.00
SEPTEMBER	0.00	327.57	0.00	107.90	435.47	0.39	1.28
OCTOBER	190.60	73.06	0.00	110.50	374.15	0.33	1.12
NOVEMBER	550.62	0.00	0.00	111.80	662.42	0.59	1.86
DECEMBER	889.46	0.00	0.00	113.10	1,002.56	0.89	2.69
Total	4,235.52	2,356.63	0.00	1,300.00	7,892.15	0.58	

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
Account: Trans. Bld. # 5

THE FOLLOWING ANALYSIS IS BASED ON:

INDOOR WINTER DESIGN TEMPERATURE	72.00
OUTDOOR WINTER DESIGN TEMPERATURE	05.00
INDOOR SUMMER DESIGN TEMPERATURE	76.00
OUTDOOR SUMMER DESIGN TEMPERATURE	102.00

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING LOAD,BTU/HR	COOLING LOAD,BTU/HR
CEILING	958	948
DOORS	695	413
FLOOR	4,882	0
INFILTRATION	3,714	1,049
MISCELLANEOUS	0	2,678
DUCTS	0	0
WALLS	3,642	1,631
WINDOWS	466	544
TOTAL	14,358	7,264

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

Prepared For: Ft. Sill Apache
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HEATING FUEL PRICE	$0.07/KWH	HSPF = 3.413
COOLING FUEL PRICE	$0.1/KWH	SEER = 6
AVERAGE HEATING DEGREE DAYS	3321	
AVERAGE COOLING HOURS	1247	

HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING COST	COOLING COST	WATER HEATING	BASE LOAD	TOTAL
JANUARY	$64.85	$0.00	$0.00	$10.30	$75.15
FEBRUARY	$48.64	$0.00	$0.00	$10.18	$58.82
MARCH	$37.83	$0.00	$0.00	$9.95	$47.77
APRIL	$14.86	$0.00	$0.00	$9.71	$24.57
MAY	$0.00	$21.49	$0.00	$9.48	$30.96
JUNE	$0.00	$38.84	$0.00	$9.13	$47.97
JULY	$0.00	$57.23	$0.00	$8.89	$66.12
AUGUST	$0.00	$53.92	$0.00	$9.48	$63.40
SEPTEMBER	$0.00	$28.72	$0.00	$9.71	$38.43
OCTOBER	$12.16	$6.40	$0.00	$9.95	$28.51
NOVEMBER	$35.13	$0.00	$0.00	$10.06	$45.19
DECEMBER	$56.74	$0.00	$0.00	$10.18	$66.92
Total	$270.21	$206.61	$0.00	$117.00	$593.81

OKLAHOMA ASSOCIATION OF ELECTRIC COOPERATIVES

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HOME ENERGY ANALYSIS BASED ON IMPROVED THERMAL EFFICIENCY

	HEATING	COOLING	WATER HEATING	BASE	TOTAL	LF	DEMAND
	KWH	KWH	KWH	KWH	KWH	%	KW*
JANUARY	926.43	0.00	0.00	114.40	1,040.83	1.00	2.78
FEBRUARY	694.82	0.00	0.00	113.10	807.92	0.78	2.22
MARCH	540.42	0.00	0.00	110.50	650.92	0.63	1.83
APRIL	212.31	0.00	0.00	107.90	320.21	0.31	0.98
MAY	0.00	214.87	0.00	105.30	320.17	0.31	0.98
JUNE	0.00	388.42	0.00	101.40	489.82	0.47	1.42
JULY	0.00	572.30	0.00	98.80	671.10	0.64	1.88
AUGUST	0.00	539.24	0.00	105.30	644.54	0.62	1.82
SEPTEMBER	0.00	287.18	0.00	107.90	395.08	0.38	1.18
OCTOBER	173.71	64.05	0.00	110.50	348.25	0.33	1.05
NOVEMBER	501.82	0.00	0.00	111.80	613.62	0.59	1.74
DECEMBER	810.62	0.00	0.00	113.10	923.72	0.89	2.50
Total	3,860.12	2,066.06	0.00	1,300.00	7,226.18	0.58	

This program was developed by OKLAHOMA COOPERATIVE EXTENSION SERVICE AGRICULTURAL ENGINEERS at OKLAHOMA STATE UNIVERSITY
All loads calculated using procedures in Cooling and Heating Load Calculation Manual....ASHRAE GRP 158.
No capacity factors or multipliers have been applied to any heating or cooling loads.
* Diversified demand based on REA Bulletin 45-2 (N > 1500)
All energy costs are estimates based on information available, these costs will vary depending on climatic conditions and living habits of occupants.