

# Greening of the Tribal Workforce Preparing Indian Country for the New Green Economy

Denver, Colorado

April 12, 2010



*Tribes Building Sustainable Homeland Economies*  
P.O. Box 25, Rosebud, SD 57570  
[IntertribalCOUP.org](http://IntertribalCOUP.org)

**Bob Gough, Esq.**

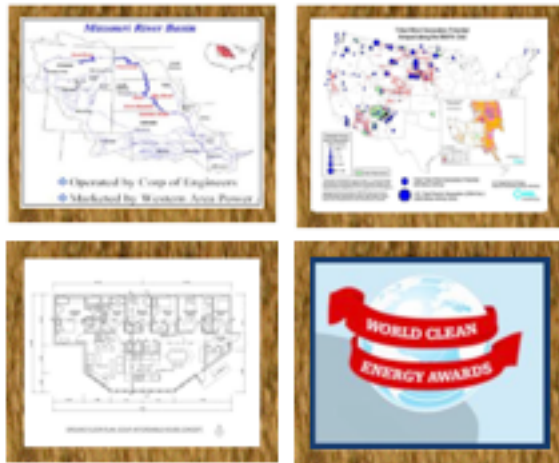
Intertribal Council On Utility Policy  
Secretary, [IntertribalCOUP.org](http://IntertribalCOUP.org)  
Director, [NativeWind.org](http://NativeWind.org)  
Senior Advisor, [NativeEnergy.com](http://NativeEnergy.com)

Member, Western Governors' *Clean and Diversified Energy Advisory Committee*  
[Westgov.org](http://Westgov.org)

Consultant, Wind Powering America Program, Native American Initiative  
[WindPoweringAmerica.gov](http://WindPoweringAmerica.gov)

# Intertribal COUP Vision for Building Indigenous Sustainability

## Tribal Planning Utility, Energy and Housing



## INTERTRIBAL Council On Utility Policy COUP

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 P.O. Box 25, Rosebud, SD 57570  
[www.IntertribalCOUP.org](http://www.IntertribalCOUP.org)  
[www.NativeWind.org](http://www.NativeWind.org)  
[www.NativeEnergy.com](http://www.NativeEnergy.com)

## Economic Development

### Utility and Community Scale Wind



## Training Hands On



## Carbon Offsets



## Policy Collaboration



## Efficient, Affordable Straw Bale Housing



## Classroom

## Re-use and O&M





*Based on renewable wind energy and building affordable, energy efficient housing, using local materials such as straw bales, a sustainable Tribal economy could provide quality jobs and healthy housing for growing reservation populations.*

*Over one-half of Indian Country is 18 years or younger, and will need both homes and jobs. Why not create good jobs building wind turbines and healthy, affordable, and energy efficient homes?*



# INTERTRIBAL COUNCIL ON UTILITY POLICY

>>>> P.O. Box 224, Ft. Pierre, SD 57532 Phone: 605-280-7999 <<<<

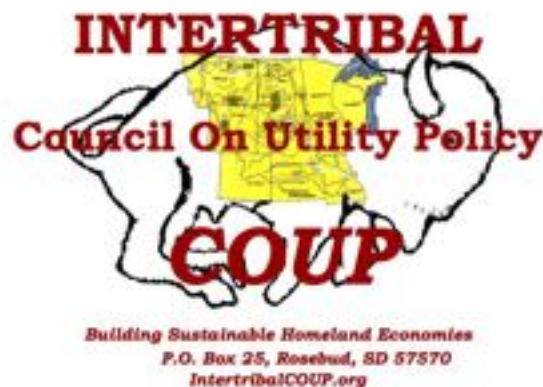
President Patrick Spears < [Patspears25@gmail.com](mailto:Patspears25@gmail.com) > Secretary Bob Gough < [Gough.Bob@gmail.com](mailto:Gough.Bob@gmail.com) >

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## **Intertribal COUP Straw Bale *SAFE Homes* Initiative Sustainable, Affordable, Future-proof and Energy Efficient Home**

*Intertribal COUP envisions a future that puts Tribes on the leading edge of true sustainability, a future in which Tribes can depend on their own natural resources and their own trained workforce to address the critical triple bottom line of "People, Planet, Profit" for Sustainable, Affordable, Future-proof and Energy Efficient Homes.*



See: [http://www.eesi.org/062008\\_Straw-Bale\\_Construction](http://www.eesi.org/062008_Straw-Bale_Construction)



Your result for The Green Footprint Test ...

## 👉 **Average Polluter** 👈

*Your eco-impact is 64%*



When faced with a decision between green and brown, you usually pick the brown option. You drive to work. You live on burgers and fries. You throw most of your garbage in the dumpster, recycling only when you get a deposit refund. If everyone lived like you, we'd need six Earths. The scary part: you're about average for North America. This test is based loosely on the [Ecological Footprint Quiz](#). See the [Redefining Progress](#) website for more information on how the footprint is calculated, and how you can make a difference.

E.O. Wilson has claimed that in order for every person on earth to live the lifestyle of a healthy American, we would need six earths tethered together in order to have the necessary arable acreage.



**If the rest of the world consumed resources at the same rate as the United States, ...**

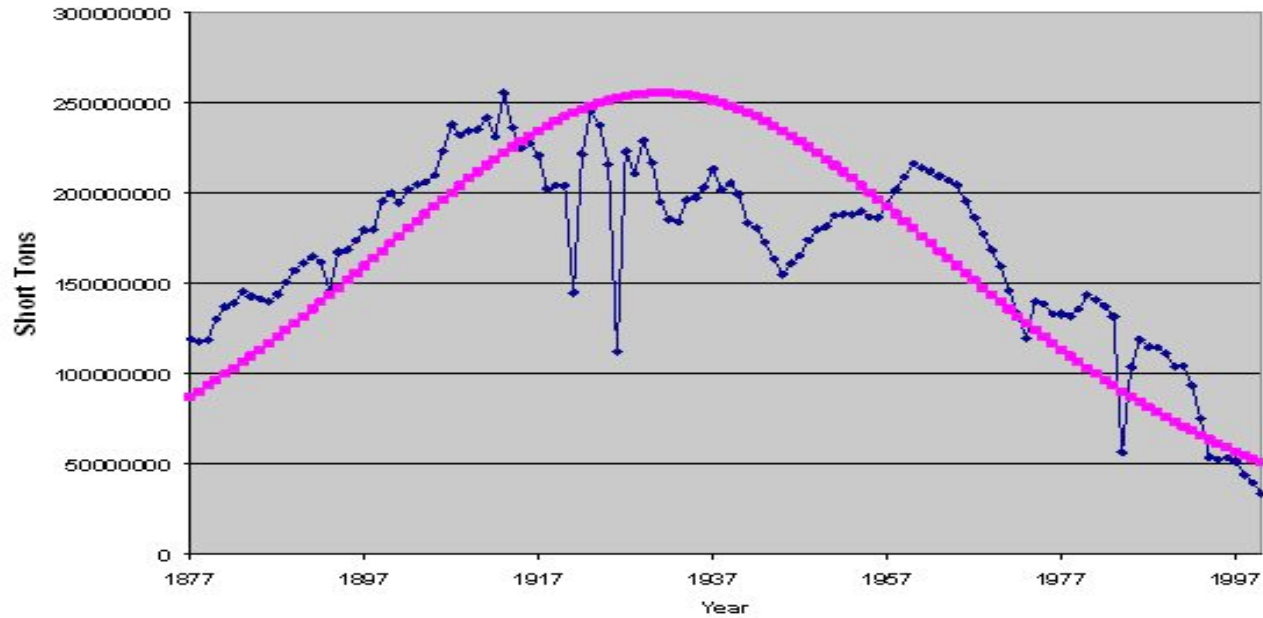




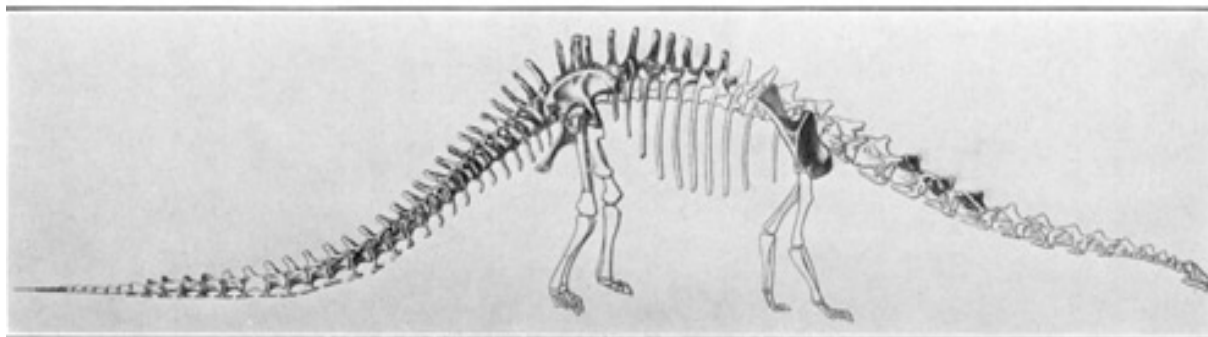
**If the rest of the world consumed resources at the same rate as the United States, we would need six Earths to meet the demand for natural resources.**

# A Hubbert Curve for Coal

**Figure 3: U.K. Coal Production 1877-2000 and Hubbert Curve**



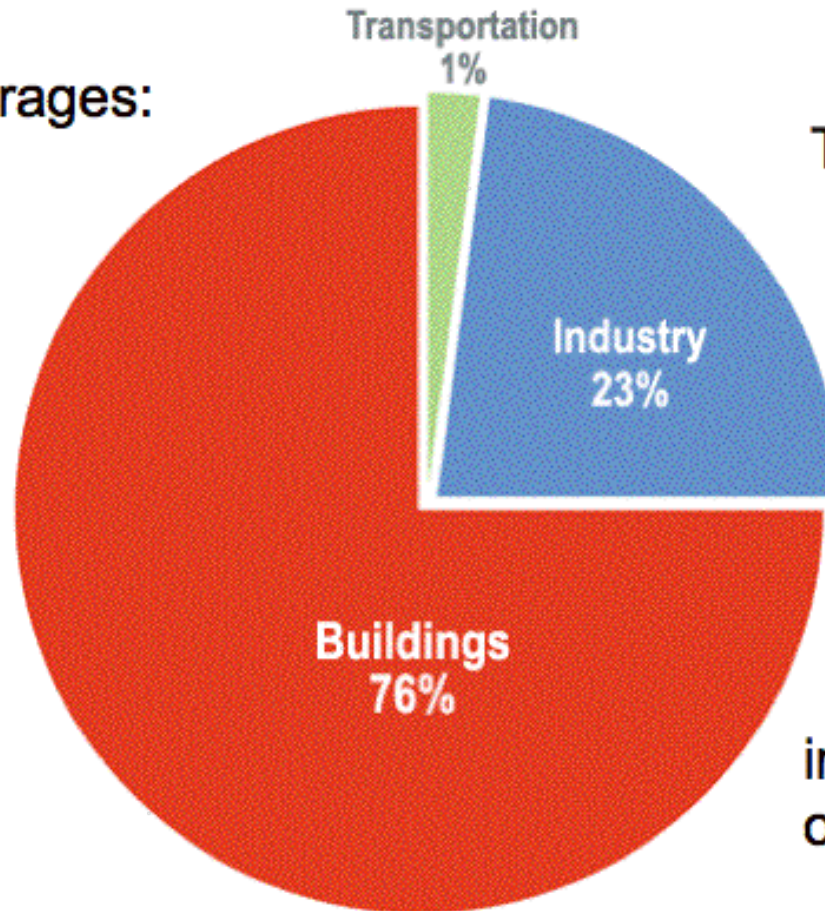
[www.theoil drum.com/node/2697](http://www.theoil drum.com/node/2697)





# Where does our electricity go?

National Averages:



Tribal Averages are likely to be more greatly weighted towards residential buildings, given the overall lack of industry present on reservations.

# REZ INTENSIVE CARE UNIT



© 2008 IntertribalCOUP.org

## Our Housing Stock is on Life Support

Inspired by Randy Udall, CORE; Realization by Bob Gough

© 2008 IntertribalCOUP.org







# Sustainable **AF**fordable **Efficient** **SAFE Homes**

*Capital Cost + Operating Cost = Affordability*  
*Mass + Insulation = Comfort*



## 1. Energy

- Reduce load and heating and cooling cost
- Stretch energy assistance funding
- Reduce imports of high cost materials



## 2. Employment & Economic Development

- Create training & job opportunities
- Create value added businesses



## 3. Health

- Reduce in overcrowding
- Reduce IEQ related medical expenses
- Reduce absenteeism from work and school





# Tribal Energy Development from the 19th to 21st Century

For Centuries on the Great Plains  
Native Peoples Transformed  
The Gifts of the Buffalo  
Into Homes and a  
Way of Life ...



Today, Tribes  
Look to Affordable  
And Efficient Homes of Local,  
Natural Materials and to Renewable Energy  
As a Sustainable Path for the Generations to Come

After the buffalo, the history of Indian housing has been one of sequential disaster relief, from tar paper shacks, to inefficient HUD homes and now to FEMA trailers. Tribes need affordable, healthy homes for very young and growing populations.

# Intertribal COUP S.A.F.E. Homes Initiative

**Sustainable:** Potential for long-term maintenance of wellbeing, which depends on the wellbeing of the natural world and the responsible use of natural resources.

**Affordable:** Dwelling units whose total housing costs are deemed “affordable” to those that have a median income. Often applied to rental housing that is within the financial means of those in the lower income ranges of a geographical area, the concept is applicable to both renters and purchasers in all income ranges.

**Future-proof:** Exclusive process of trying to anticipate future developments, so that action can be taken to minimize possible negative consequences, and to seize opportunities.

**Energy Efficient:** Practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction.



# TRIBAL SUSTAINABLE ENERGY DEVELOPMENT

## 19th AND 21st CENTURY MODELS

Natural, Sustainable, Affordable and Efficient Homes



Built on a Base of Renewable Energy Resources



## Straw Bale Technology ... It's Not Rocket Science



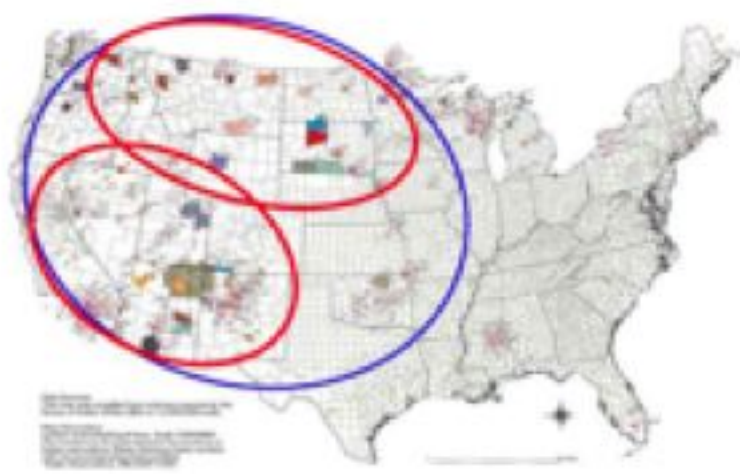
**But It Is Sustainable**



# INDIAN RESERVATIONS

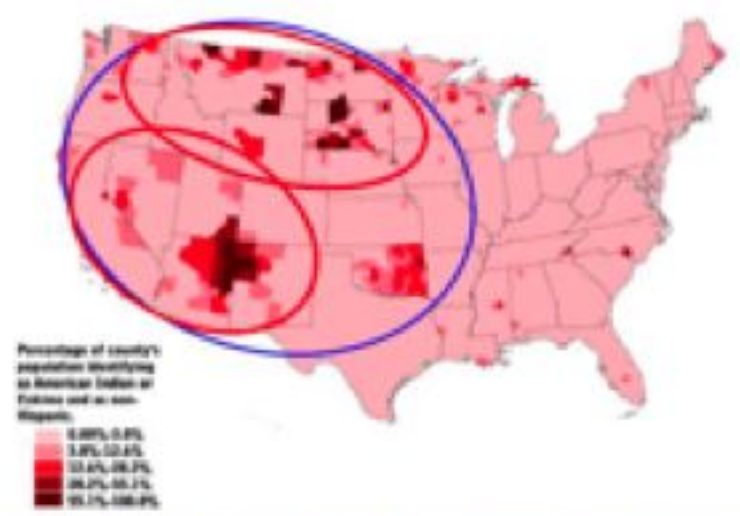
## American Indian Reservations

Indian Reservations in the Continental United States



# RESERVATION POPULATIONS

## American Indian Reservation Populations



# STRAW RESOURCES ARE RELATIVELY ABUNDANT IN OR NEAR INDIAN COUNTRY

## Wheat Acres Harvested

All Wheat 2007  
Production by County



# TRIBAL COLLEGE / VOTECH TRAINING



Development Of Tribal College and University Training Courses for Reservation Job Creation and Employment



## The Oldest and Newest Straw Bale Houses In South Dakota



**Built in 1921 in southern  
Todd County, SD**

**Built in 2009 as part of  
the COUP/SGU Train  
the Trainers Program**



... Both on the Rosebud Sioux Indian Reservation



# OPTIMIZING AND EXTENDING RESOURCES



Standard Log House  
R-Value: 11 to 16  
Logs Per House: 50 to 60



Straw Bale House  
Post & Beam  
R Value = 37 to 40  
Logs Per House: 10 to 12

# OPTIMIZING AND EXTENDING RESOURCES

## Standard Log House

Logs Per House: 50 to 60



The number of 24 ft logs in a single Log House (1) could be used to build up to six (6) Post and Beam Straw Bale Houses each with at least twice as much insulative capacity.

## Straw Bale House

Logs Per House: 10 to 15



Straw Bale building technology can help close the over 200,000 housing deficit in Indian Country by providing quality sustainable, affordable and energy efficient homes and creating local green collar jobs with the use of local, natural materials.



# Conditions Are Ideal for Using Strawbale for Building Construction on Many U.S. Indian Reservations

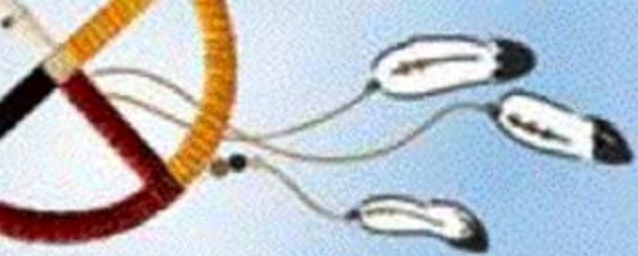


- **Semi-arid climatic conditions on Northern Great Plains are ideal for construction and long-term maintenance of strawbale buildings**
- **Great Plains Reservations are located in rural North American pasture & grain belt (Strawbale construction techniques originally developed in Nebraska)**
- **Seasonal temperature swings of over 150 degrees F require housing designed for significant heating and cooling to maintain acceptable levels of comfort**

© Intertribal COUP.org

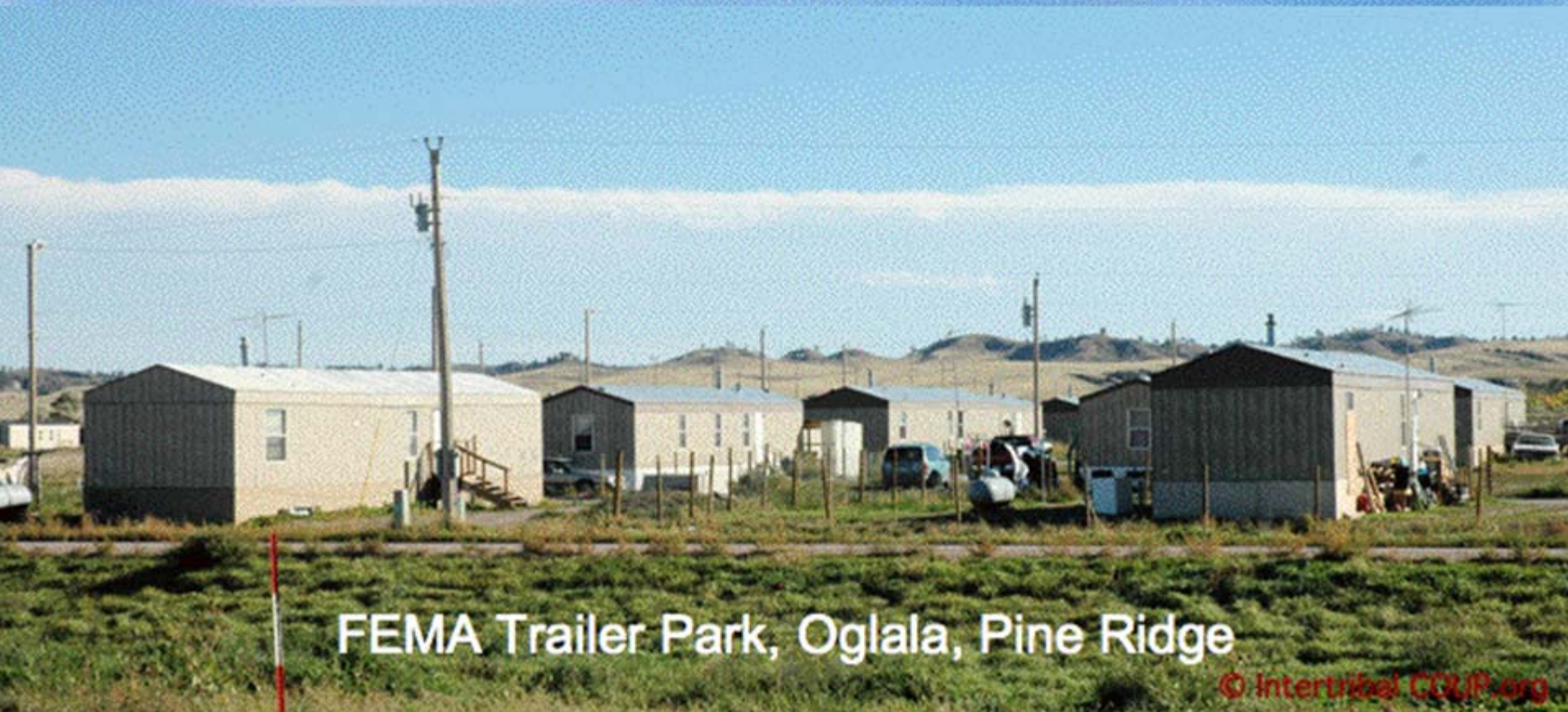
Intertribal COUP held a series of Tribal housing charettes in North and South Dakota developing straw bale and stick built conceptual designs.





# *Native Wind* Powering America

[WWW.ENERGYINDEPENDENCEDAY.ORG](http://WWW.ENERGYINDEPENDENCEDAY.ORG)



FEMA Trailer Park, Oglala, Pine Ridge

© Intertribal COUP.org





# Disaster Relief Housing, Pine Ridge, SD

# Home on the Range

(or in the Solar Oven)

## on Great Plains

Seasonal Temperature Swing of 150 Degrees

**Summer Highs**

**120° F**

**Human  
Comfort  
Range**

**80° F  
60° F**

**Winter Lows**

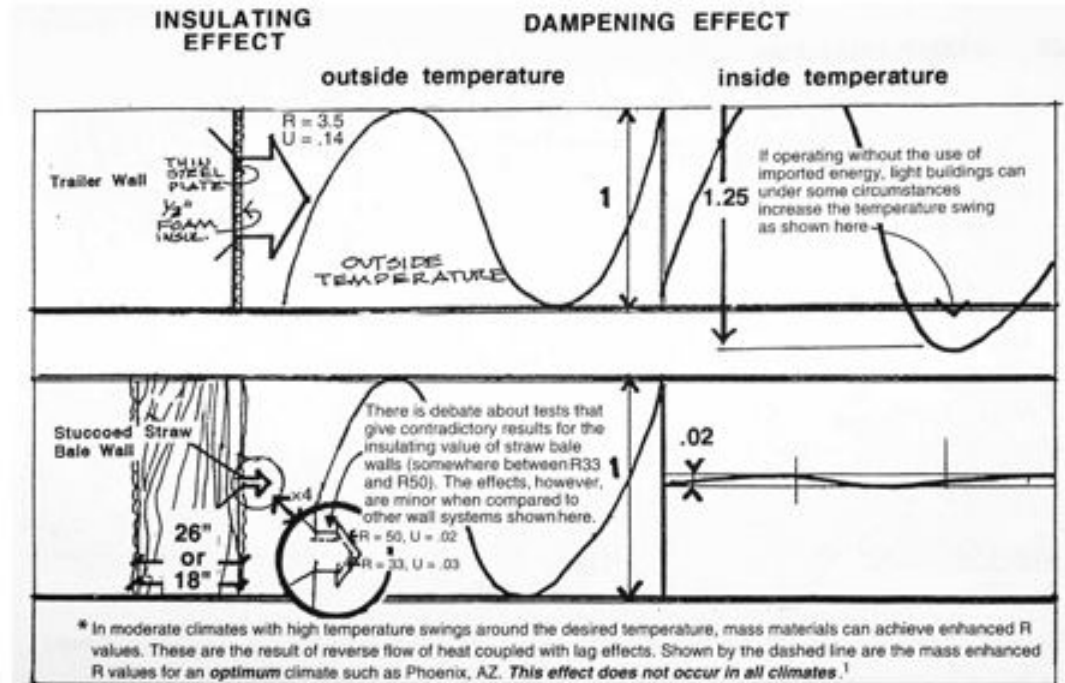
**-30° F**





# INSULATION + MASS = COMFORT

R 3.14 + minimal mass VS. R 30 + distributed mass



# PASSIVE SURVIVABILITY

## Mass



## Insulation



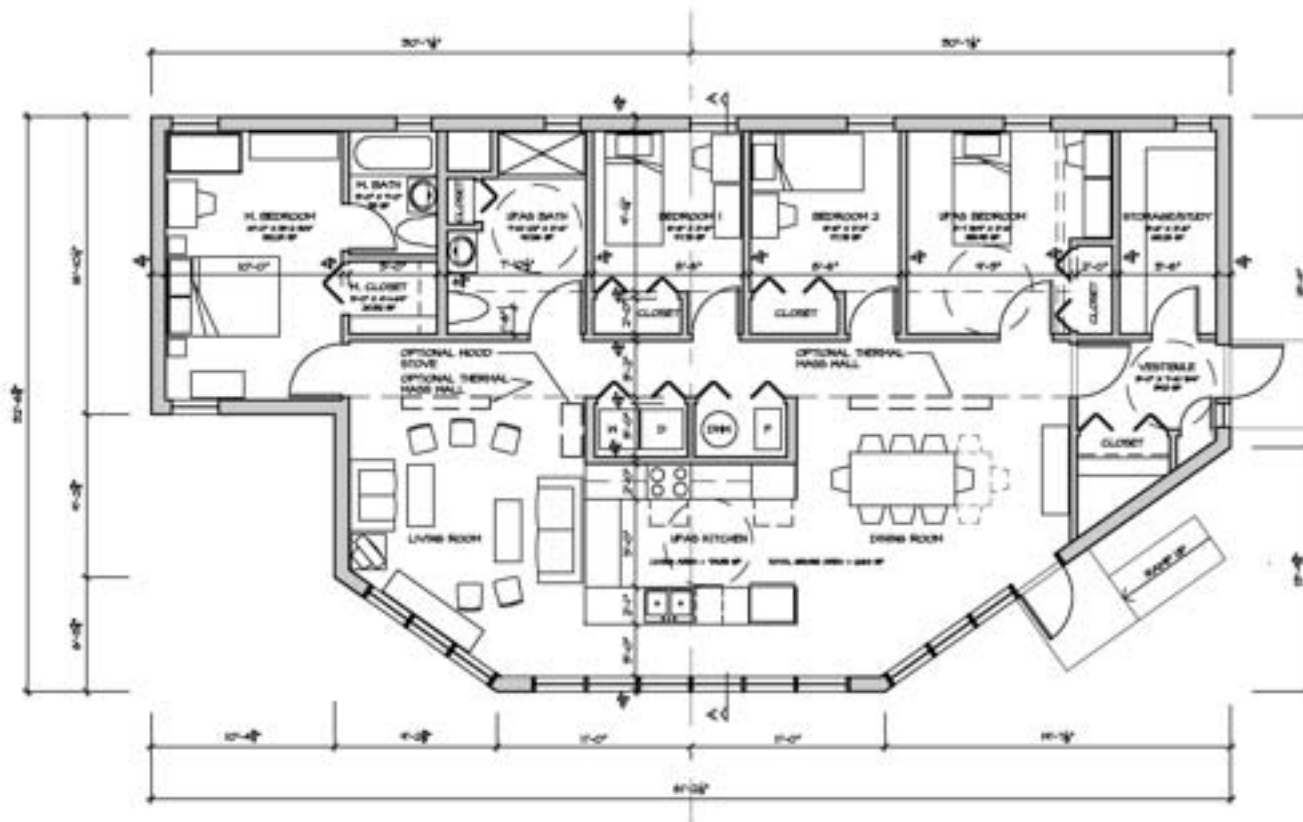


## ORIENTATION AND INSULATION

- House fronts with window and door facing North
- R-19 Value at best, depending upon construction and installation



# What Women Want: Large Living Areas / No Hallways



GROUND FLOOR PLAN: ICoup AFFORDABLE HOUSE CONCEPT





# COUP FEMA Trailer Wrap Design Concept



# Cultural Traditions of Owner-Constructed Housing of Natural Materials



## Traditional Lakota Buffalo Hide Tipi

15 to 20 new buffalo hides  
required every two years



## Conventional Post and Beam Straw Bale House

With thousands of years of seasoned “green” cultural histories, Tribes recognize the value homes built with Natural Materials.





© Sinte Gleska University/Intertribal COUP 2009

COUP SGU Buffalo Lodge Straw Bale Building prior to Plastering





COUP SGU Buffalo Lodge Straw Bale Building Window Wrap Installation:  
Used to seal out water leakage along the window frame.





COUP SGU Buffalo Lodge Straw Bale Building Exterior Plastering:  
Portland-Lime plaster mix applied as a rough or scratch coat.





**Sustainability in Housing ~ Summer 2009**

**Straw Bale Building Initiative**

**Buffalo Lodge Project for Tribal College Faculty & Students**

Sinte Gleska University - Antelope Campus Rosebud Sioux Indian Reservation



Developed by

**Intertribal Council On Utility Policy (COUP)**

GreenWeaver - Straw & Timber Craftsmen

Environmental Design Partners - One World Design Architecture

Development Center for Appropriate Technology - 3DE

**Sinte Gleska University**

Institute of Technologies - Buffalo Ranch Program

**Oglala Lakota College Applied Science General Construction**

**United Tribes Technical College**

**American Indian Higher Education Consortium**

Rosebud, Oglala, Turtle Mtn., Ft. Berthold, Flandreau Sante, Lower Brule, Yankton

With Support from

**Rosebud Sioux Tribe - Sinte Gleska University - Intertribal COUP**

Department of Energy - Tribal Energy Program

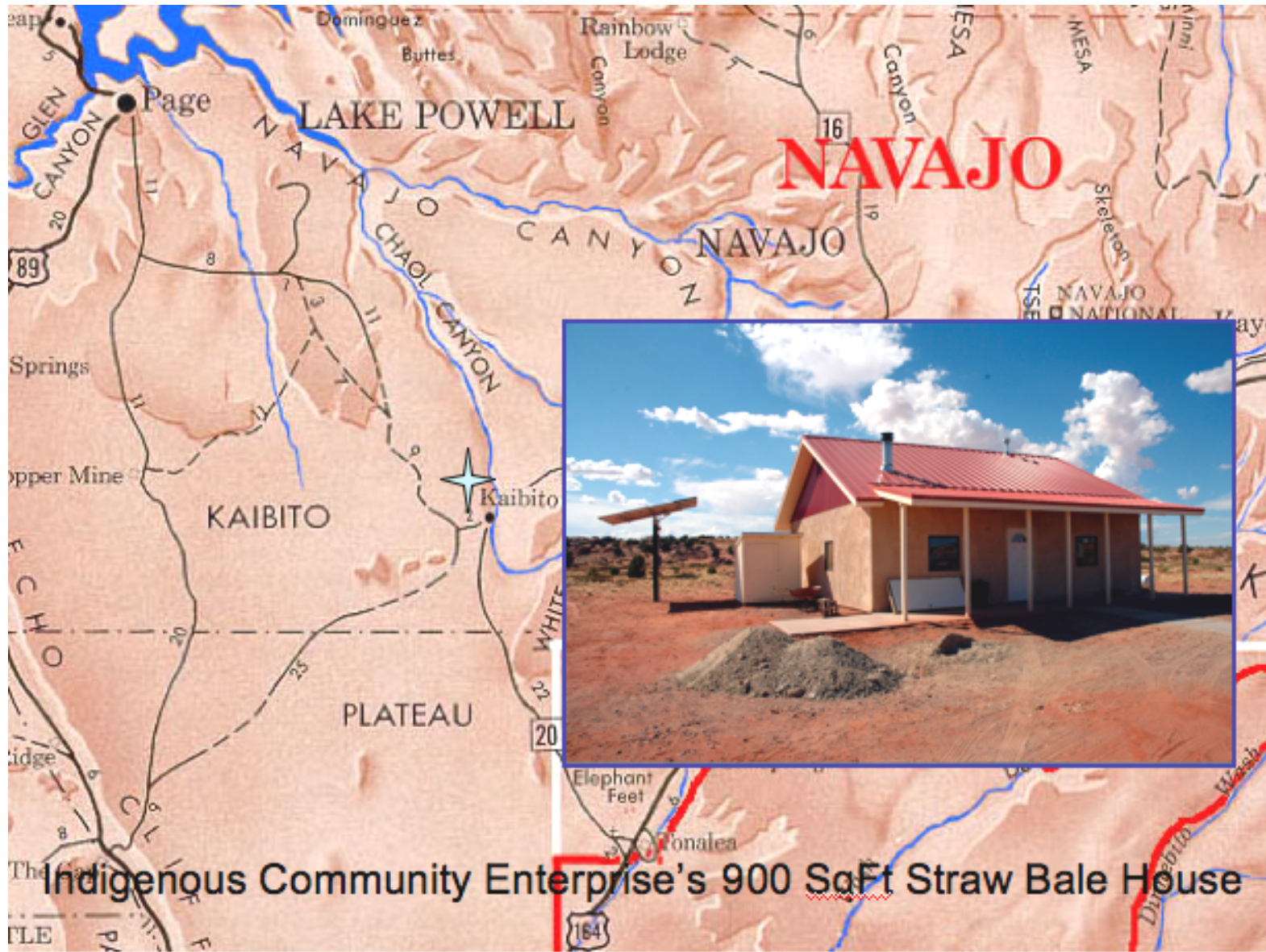
Department of the Interior - Office of Indian Energy and Economic Development

South Dakota Community Foundation - Greiner Family Foundation

Untours Foundation - USDA NRC RC&D







“ICE HOUSE” Indigenous Community Enterprise Straw Bale Home

# INTERTRIBAL COUP STRAW BALE BUILDING TECHNOLOGIES



2009 TRAININGS AT SGU / UTTC



## TRIBAL COLLEGE / VOTECH TRAINING



[www.aihec.org](http://www.aihec.org)

**Development Of Tribal College and University Training  
Courses for Reservation Job Creation and Employment**





# PRESENT FUNDING STREAMS INTO INDIAN COUNTRY

LIHEAP FUNDS = **\$4.5 M/08**  
NEW RENEWABLE ENERGY  
FUNDING = UNDER **\$3 M/YR**

PRESENT INDIAN HOUSING  
FUNDING = **~\$650 M/YR**  
NEW HOUSING = **\$260 M/YR**

Near all of these meager energy funds leave for the purchase of off-reservations fuels or technology.



Most of these tribal housing funds quickly leave the Reservations for materials or prefab houses and labor.



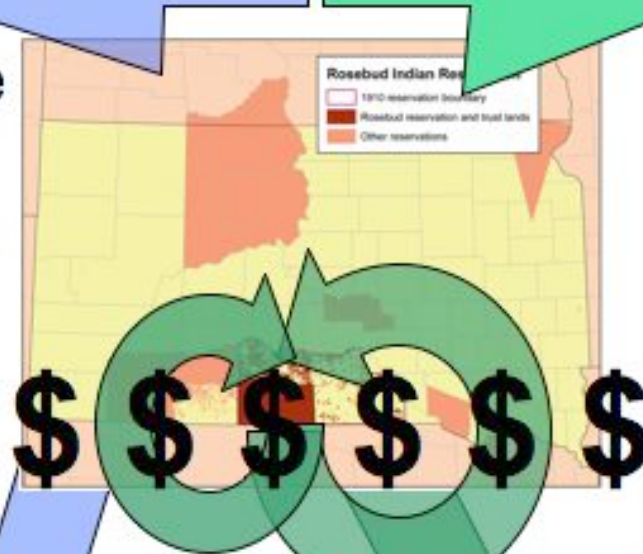


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Significant renewable energy development requires tremendous increases in dollars to Indian Country.



Utilization of local, natural materials would keep more housing dollars associated with employment and materials on the Reservations.





NATIVE PEOPLES-NATIVE HOMELANDS  
CLIMATE CHANGE WORKSHOP

- Final Report -  
Nancy G. Maynard, Editor

CIRCLES OF WISDOM

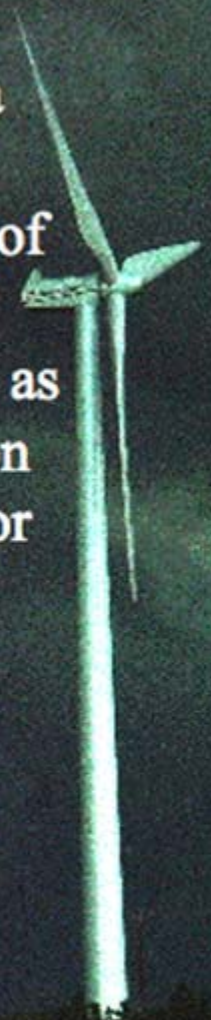


U.S. Global Change Research Program

OCTOBER 26 - NOVEMBER 1, 1998  
Albuquerque Convention Center  
Albuquerque, New Mexico

Sponsors:  
The National Aeronautics and Space Administration  
American Indian Chamber of Commerce of New Mexico  
City of Albuquerque

“Entering the 21st century, a prime Native strategy encourages the development of sustainable homeland economies to ensure survival as Nations and for the restoration of a more balanced climate for Mother Earth. The Strategy includes the protection of naturally diverse ecosystems and the use of renewable energy technologies.”



[www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf](http://www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf)

[www.EnergyIndependenceDay.org](http://www.EnergyIndependenceDay.org)

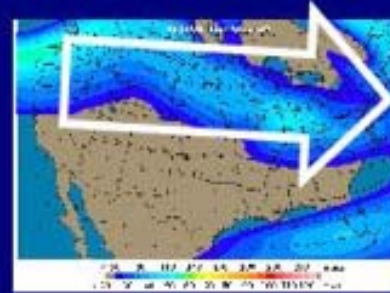


Intertribal Council On Utility Policy



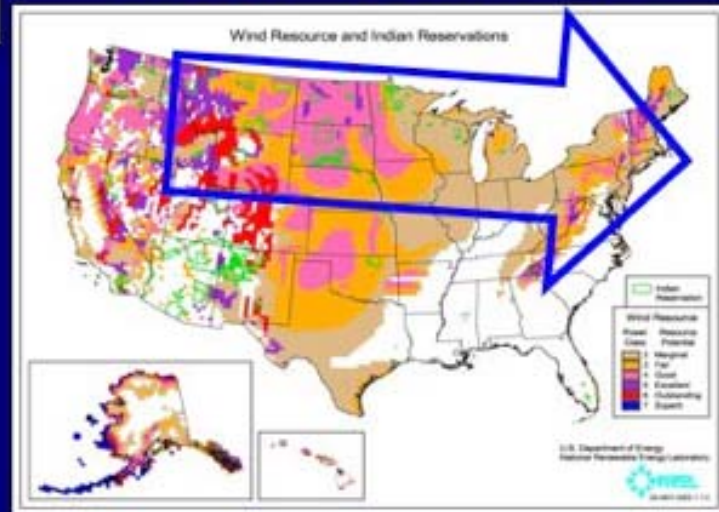
# TRIBAL COLLEGE WORKFORCE TRAINING

## Tribal Colleges and Wind Resources



Prevailing Windshed

- **Climate/Natural Resource monitoring training/projects**
- **Meteorological Data Centers**
- **Wind Development Training courses for Reservation job creation and employment**
- **Wind Forecasting along the Windshed for value-add firm power sales into the market**



# Intertribal COUP Wind Training Program



**KILI RADIO**  
25th ANNIVERSARY CELEBRATION

Marking a New Beginning  
in Energy Independence

**Come on over  
to KILI Radio**  
**Thursday,  
July 31  
1:00 PM**

Celebrate our new  
wind turbine and our  
25th year on the air  
as *The Voice of the  
Lakota Nation!*

- Join us for a Community Feast
- Hear speakers on Native energy issues
- Listen to great music by Keith Socola and local artists
- Participate in a solar heating panel installation of the station!

Sponsored by  
KILI Radio,  
Waste the Earth and  
Indefinite Council  
On Utility Policy.  
For more info:  
605-687-3002  
http://www.kiliradio.org

The Pine Ridge Reservation has some of the best wind resources in the country. Wind can help us achieve energy self-sufficiency and protect Mother Earth from the pollution caused by coal and uranium.

**TATE**  
Bringing Power to KILI  
Making a good future for the coming generations





# WIND IN THE U.S.

- The U.S. wind energy industry installed over 10,000 MW of new wind power generating capacity in 2009, the largest year in U.S. history, and enough to power the equivalent of 2.4 million homes or generate as much electricity as three large nuclear power plants.
- America's wind power fleet of 35,000 MW will avoid an estimated 62 million tons of carbon dioxide annually, equivalent to taking 10.5 million cars off the road.
- America's wind power fleet will conserve approximately 20 billion gallons of water annually that would otherwise be lost to evaporation from steam of cooling in conventional power plants.

American Wind Energy Association, April 8, 2010

# WIND IN THE U.S.

- Approximately 85,000 people are employed in the wind industry today and hold jobs in areas as varied as turbine component manufacturing, construction and installation of wind turbines, wind turbine operations and maintenance, legal and marketing services, transportation and logistical services, and more.
- To ensure a skilled workforce across the wind energy industry, 205 educational programs now offer a certificate, degree, or coursework related to wind energy. Of these 205 programs, the largest segments are university and college programs (45%) and community colleges or technical school programs (43%).

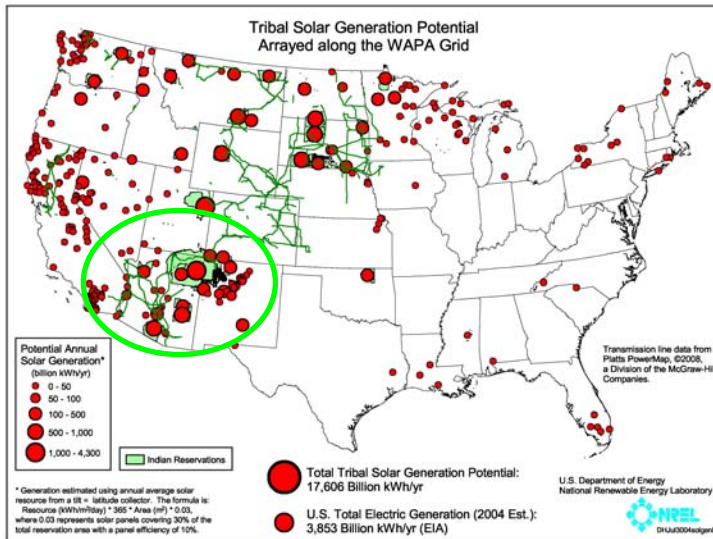
American Wind Energy Association, April 8, 2010



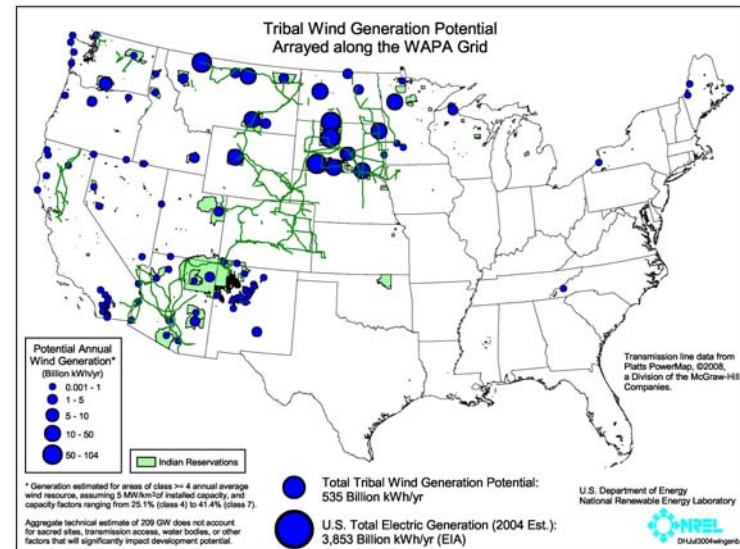
# Tribal Sun & Wind Could Help De-Carbonize Federal Grid:

Over 4,500 Megawatts of “Shovel Ready” **Tribal Renewable Energy Projects** Could Support Plans to De-Carbonize the Western Area Power Administration Transmission Grid through Federal Supplemental Power Purchases.

## Tribal Solar



## Tribal Wind



Tribal land solar potential equals 4.5 times the U.S. annual load. A Tribal plan for a “panel ready” solar covering of 335 miles of CAP to generate over **1,500 MWs of solar electricity** and could save about 50,000 acre feet of water annually.

Conservative estimate (over 200 GW Potential) based on wind resource at 50 meters, while today’s turbines stand over 200 meters. Some **3,000 MWs of Tribal wind** are “shovel ready” in the Northern Great Plains.

This is our Country’s Greatest Opportunity to Rebuild our “National Renewable (Hydropower) Energy Grid” with Clean Energy and Create Sustainable Energy Economies for the Poorest Communities in America: Our Tribal Homelands!



*Speakers (l-r): Laura Bartels, Sandy Wiggins, Bob Gough, and David Eisenberg*

## **Straw-Bale Construction: Harvesting Its Potential As an Affordable and Energy-Efficient Building Strategy**

**Friday, June 20, 2008  
10:00 a.m. - 11:30 a.m.  
485 Russell Senate Office Building**

On June 20, the **Environmental and Energy Study Institute (EESI)** hosted a briefing about straw-bale construction and how it can help address some of our most serious national policy challenges, such as record energy prices and unemployment, inadequate supply of affordable housing, the threat of climate change, and pressing needs in transportation and infrastructure funding. The modern building industry places heavy demands on the energy and transportation sectors. Straw is a locally-sourced, widely available, and renewable resource that builders, architects,

See: [http://www.eesi.org/062008\\_Straw-Bale\\_Construction](http://www.eesi.org/062008_Straw-Bale_Construction)



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*Over one-half of Indian Country is 18 years or younger, and will need both homes and jobs. Why not create good jobs building wind turbines and healthy, affordable, and energy efficient homes?*





**Sitting Bull**

So ...  
**“Let Us Put Our  
Minds Together and  
See What Life We  
Will Make for Our  
Children.”**