

Alternative Building Strategies

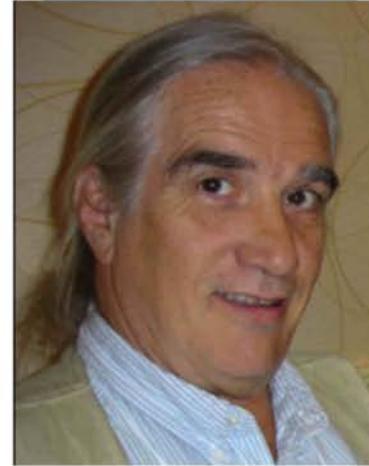
# Tribal Housing Needs and Straw Bale Technology: Housing Opportunities for Community and Economic Development in Indian Country



*Greener Homes National Summit  
ONAP-HUD, Denver, CO  
September 28-29, 2011*



**Intertribal Council On Utility Policy**  
[www.intertribalcoup.org](http://www.intertribalcoup.org)  
**Bob Gough, Secretary**



*Tribes Building Sustainable Homeland Economies*  
*P.O. Box 25, Rosebud, SD 57570*  
*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)

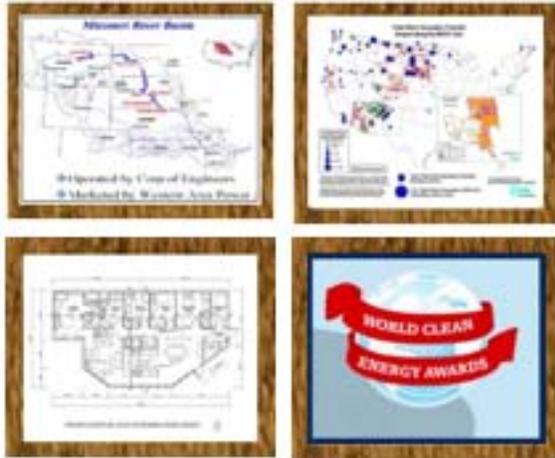
Member, Western Governors' *Clean and Diversified Energy Advisory Committee*  
[Westgov.org](http://Westgov.org)

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

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# Intertribal COUP Vision for Building Indigenous Sustainability

## Tribal Planning Utility, Energy and Housing



Tribes Building Sustainable Homeland Economies  
 P.O. Box 25, Rosebud, SD 57370  
[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

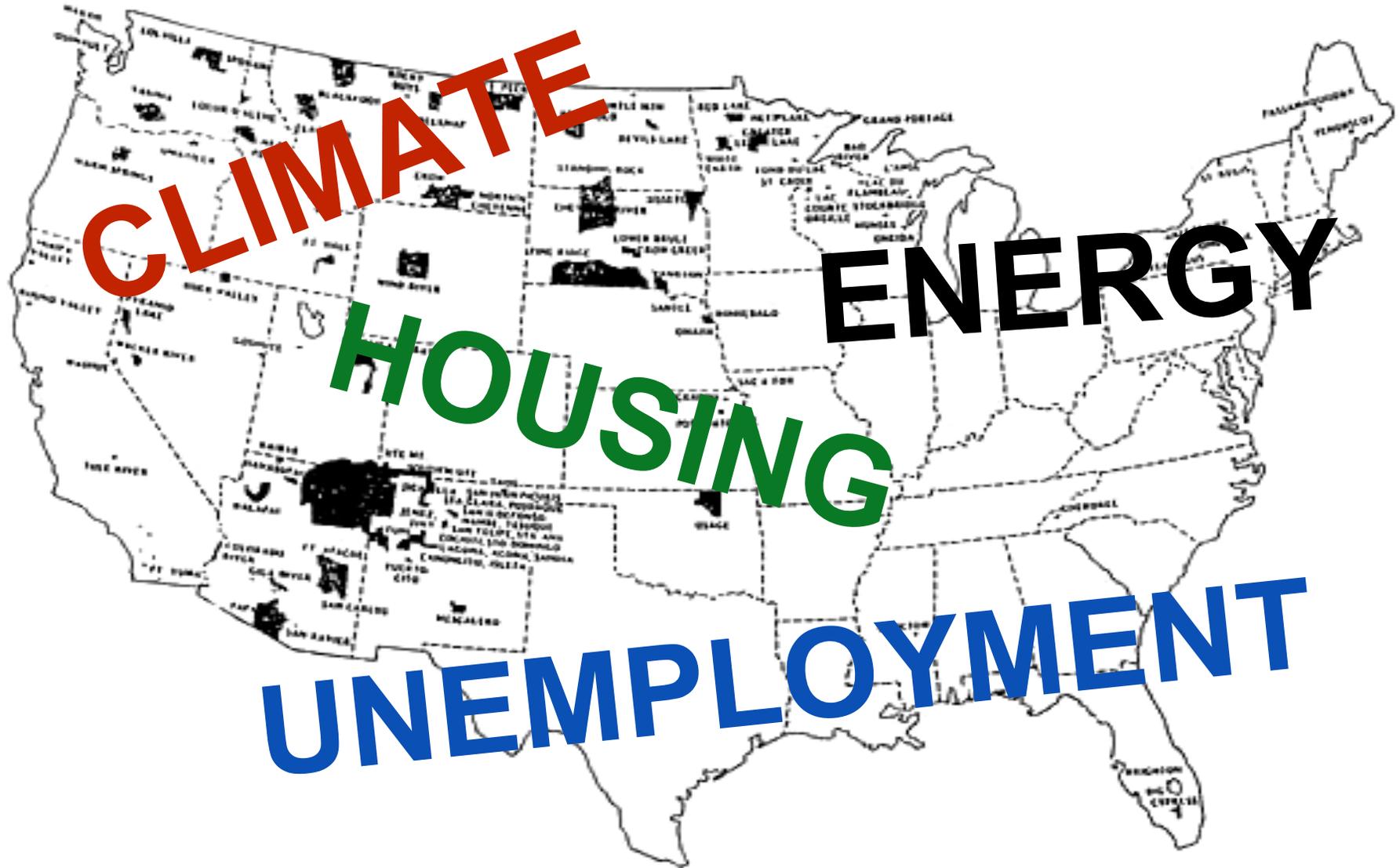


## Classroom

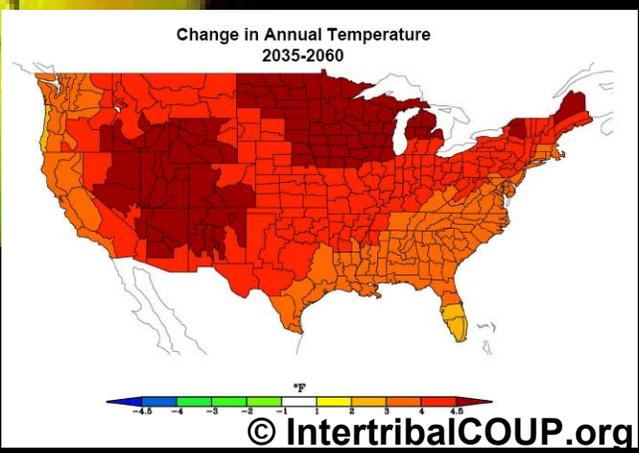
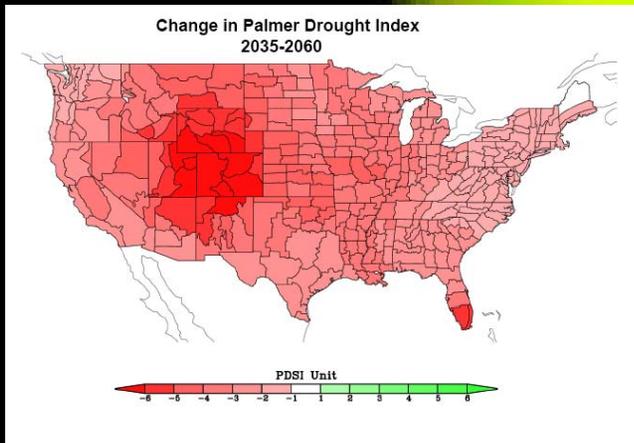
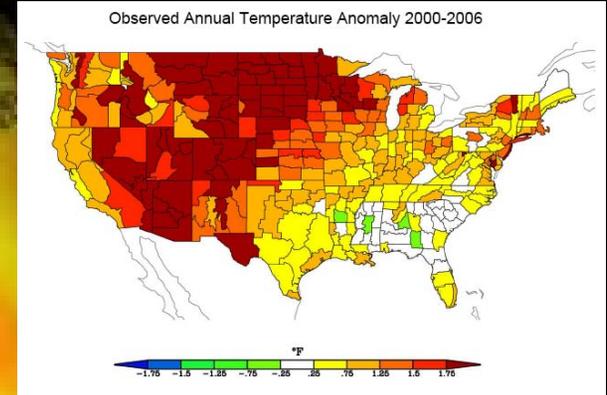
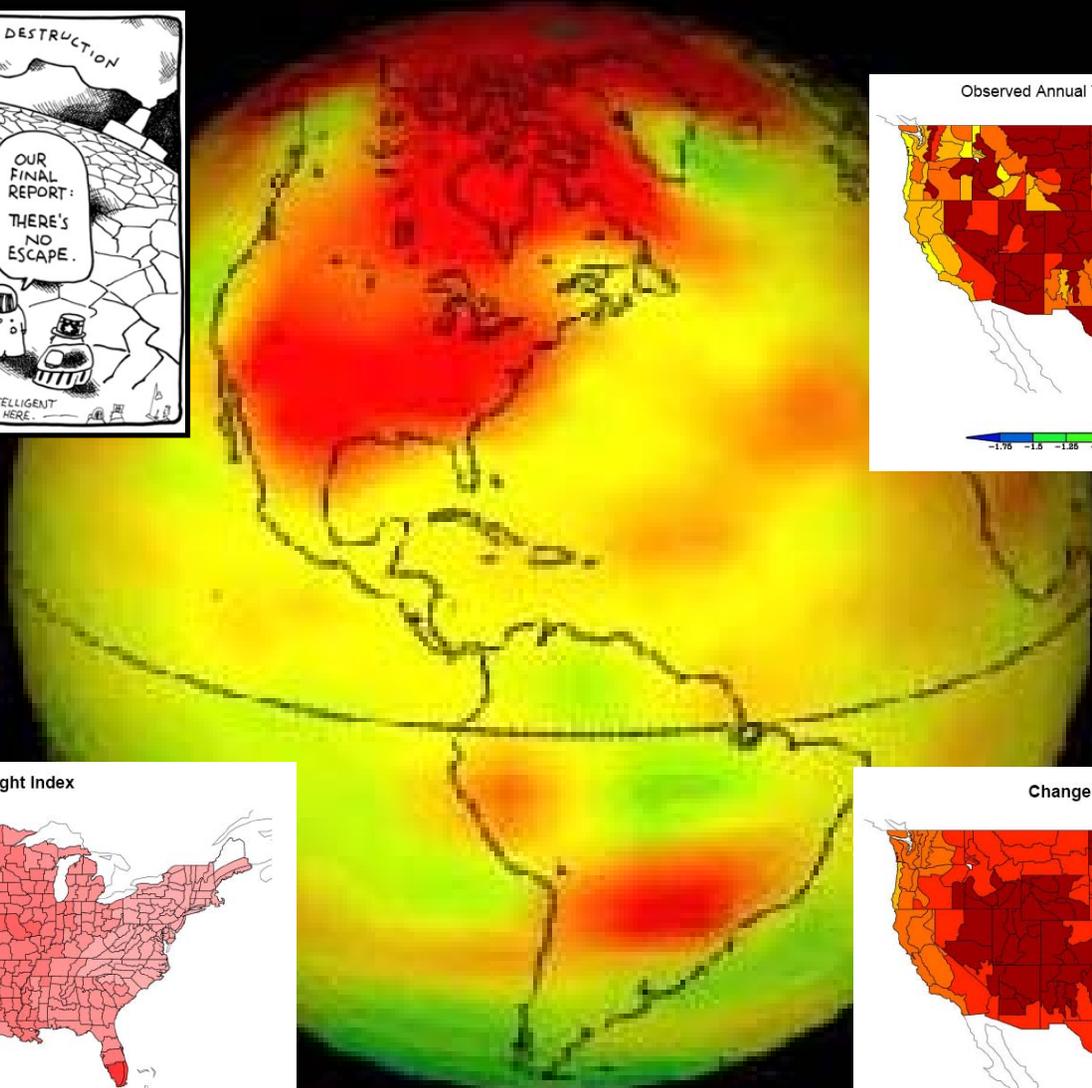
## Re-use and O&M



# Four Crises In Indian Country:



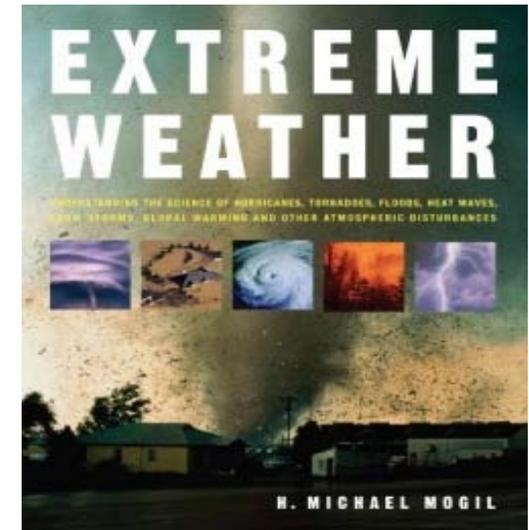
# CLIMATE CHANGE IS HERE!



# WEATHER EXTREMES 101



Climate Change is a statistical reality only appreciated over Time, while Weather Extremes are experienced in our daily lives!



# IMPACT OF HIGHER ENERGY COSTS ARE GREATER IN INDIAN COUNTRY

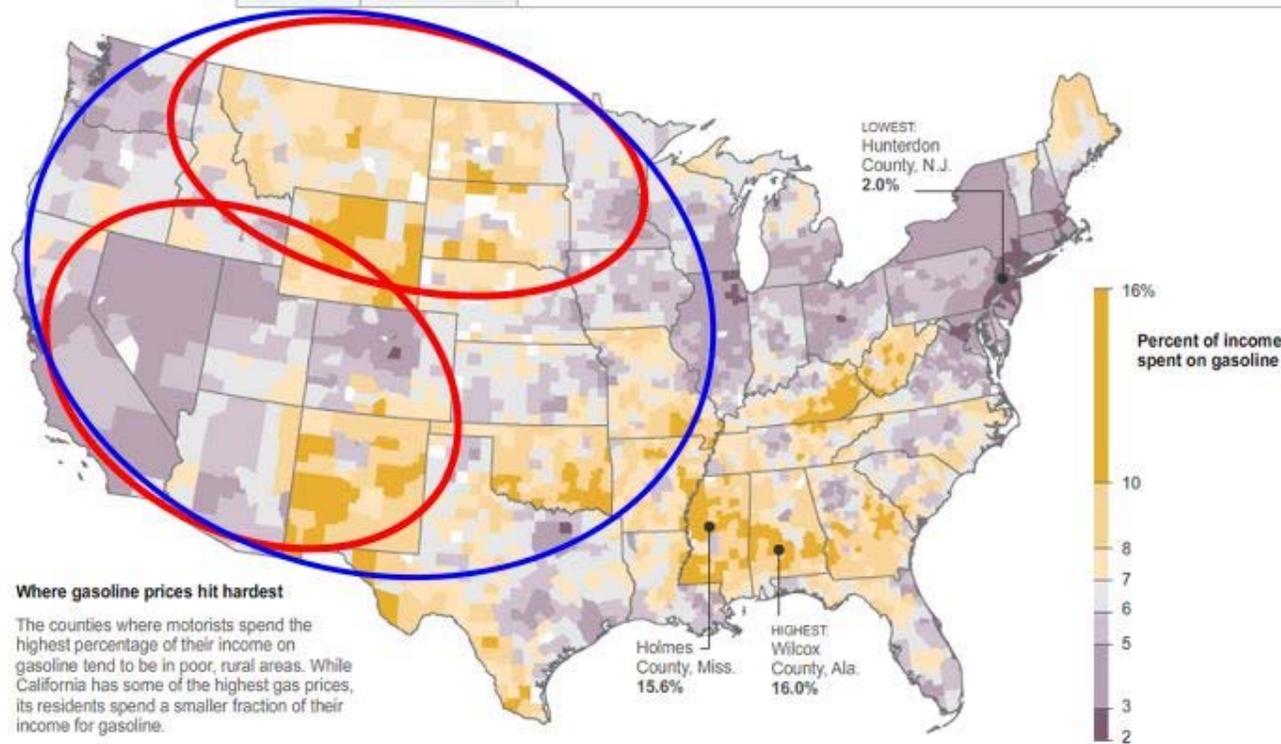
June 9, 2008

E-MAIL | FEEDBACK

## The Varying Impact of Gas Prices

Gas prices are high throughout the country, but how hard they hit individual families depends on income levels, which vary widely.

PERCENT OF INCOME ON GAS | GAS PRICES | MEDIAN INCOME



### Where gasoline prices hit hardest

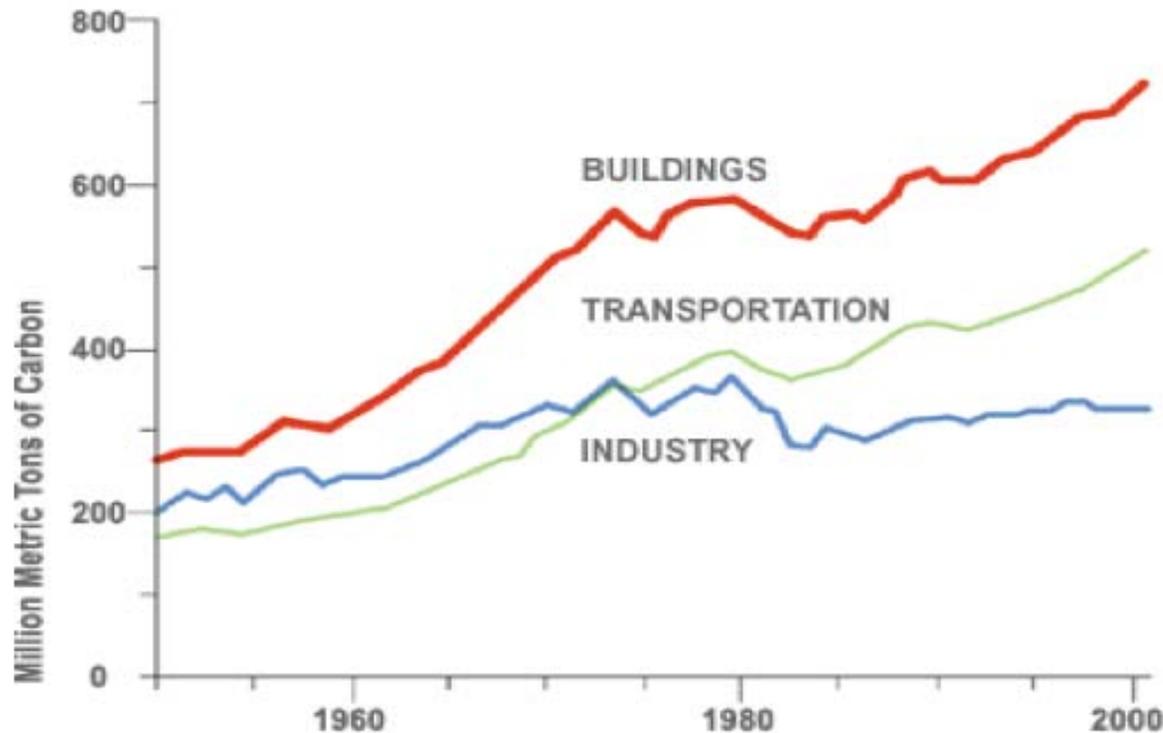
The counties where motorists spend the highest percentage of their income on gasoline tend to be in poor, rural areas. While California has some of the highest gas prices, its residents spend a smaller fraction of their income for gasoline.

Note: Monthly fuel costs were calculated using each county's average gas price multiplied by the average number of miles driven by drivers in that state, a figure estimated by the Transportation Department. The resulting dollar figure was divided by each county's median income, from the Census, giving the estimated share of income spent on gasoline shown here.

Sources: Oil Price Information Service, U.S. Census

Kevin Quealy / The New York Times

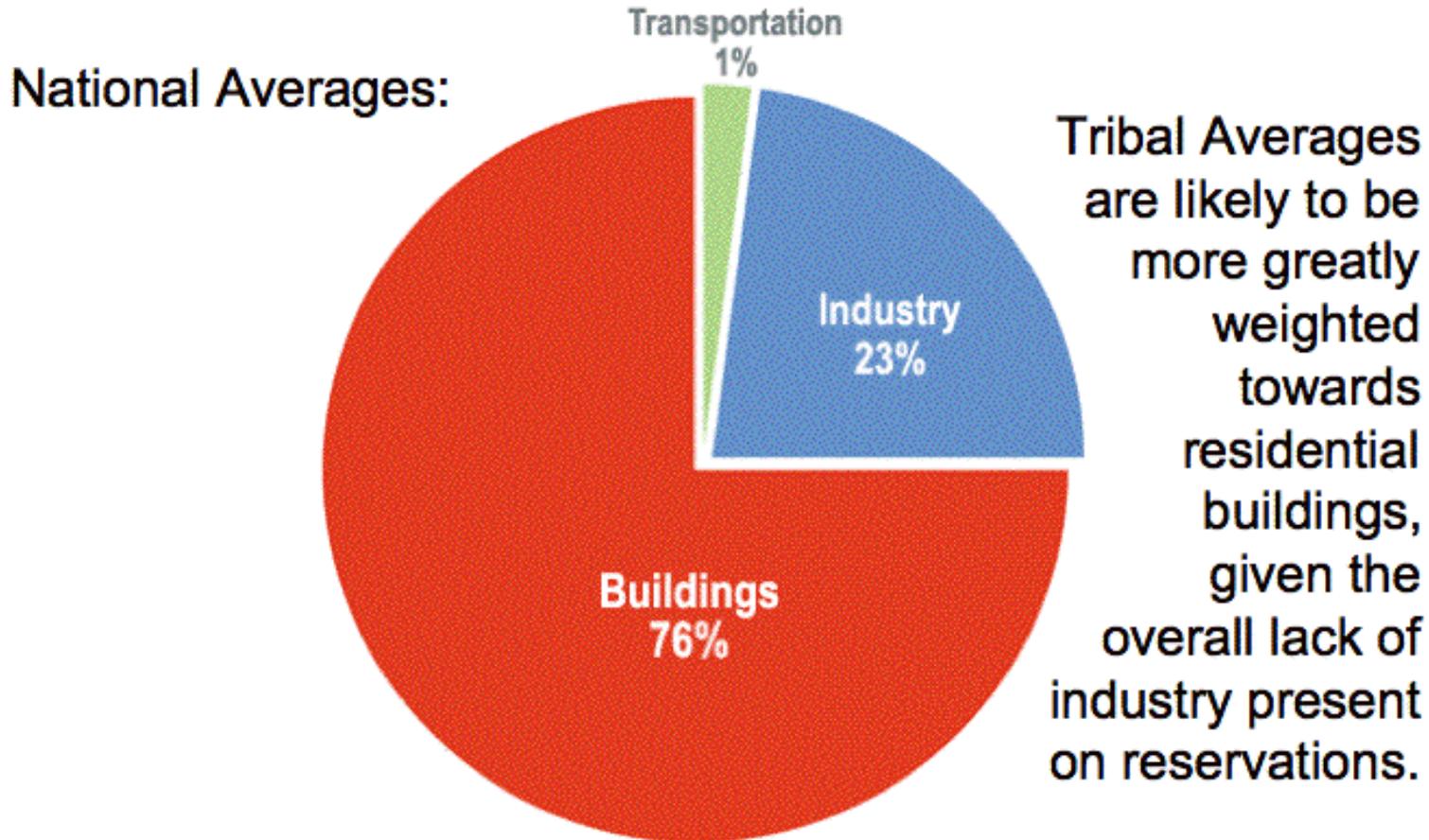
# CARBON EMISSIONS BY SECTOR



Source: [http://www.architecture2030.org/building\\_sector/index.html](http://www.architecture2030.org/building_sector/index.html)

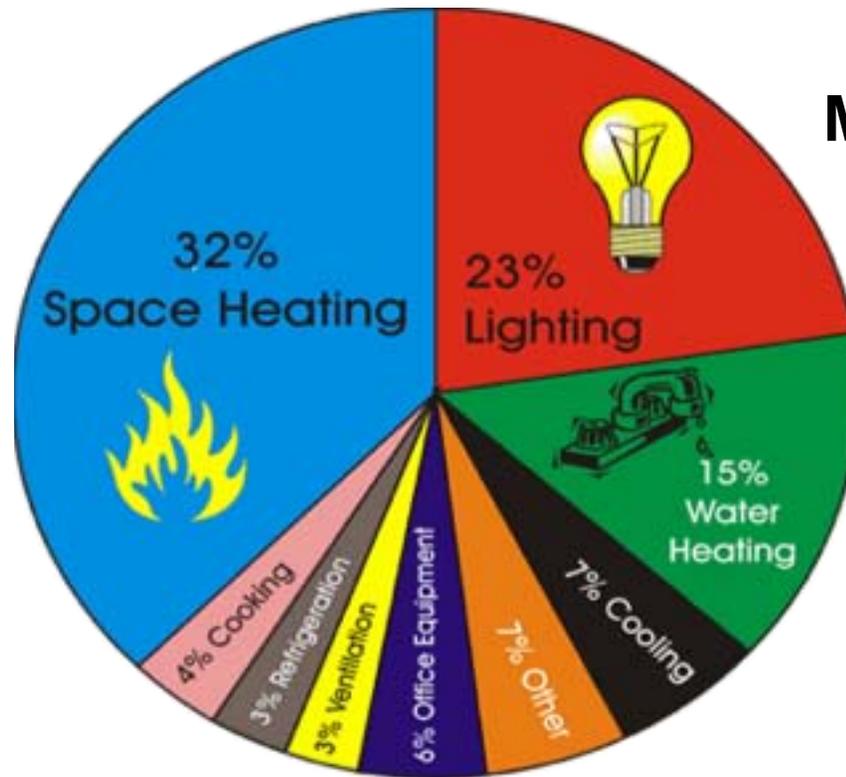
The building sector is responsible for the majority of carbon emissions -- emitting significantly more metric tons of carbon than the transportation and industrial sectors.

# Where does our electricity go?



# ENERGY CONSUMPTION BY BUILDINGS

Buildings are responsible for **40% of total annual U.S. energy consumption**

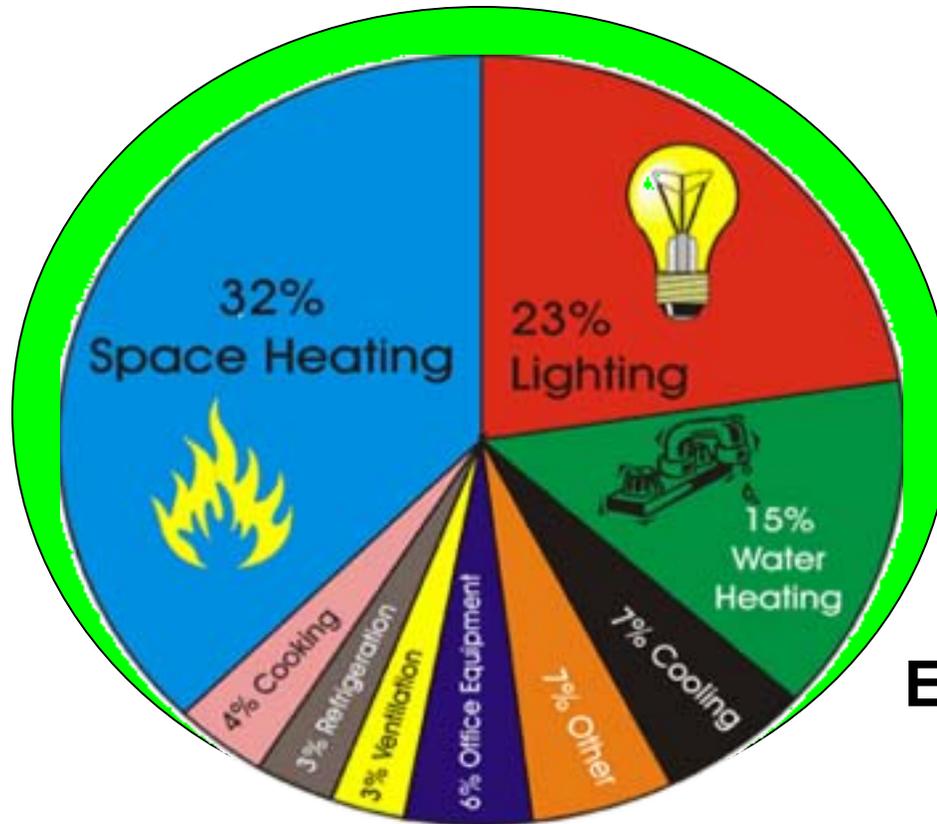


**Most building energy demand is supplied by off-site energy inputs that are neither Clean nor Energy Efficient**

Source: "How Energy is Used In Commercial Buildings," 2004, Energy Information Administration

# ENERGY CONSUMPTION BY BUILDINGS

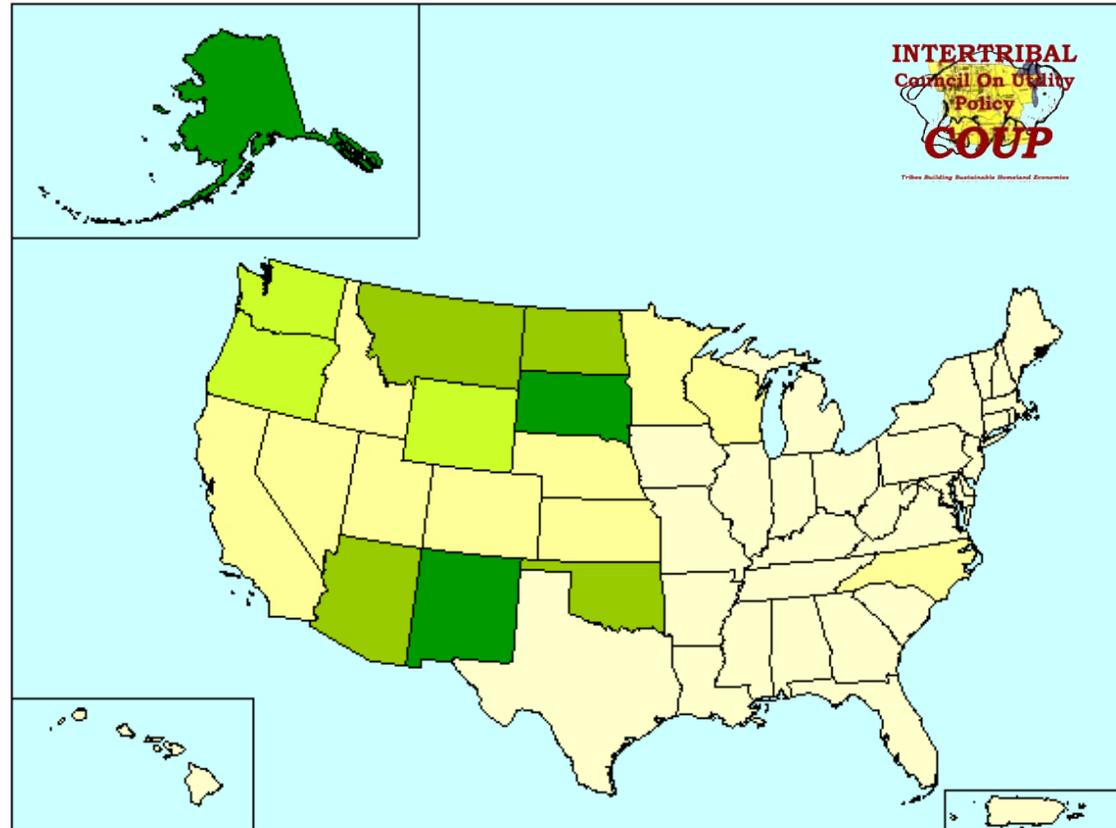
Buildings are responsible for **40% of total annual U.S. energy consumption**



**Up to 70% of residential energy demand could be 'Greened' by Energy Efficient Design and by Local Renewable Energy Applications**

Source: "How Energy is Used In Commercial Buildings," 2004, Energy Information Administration

# AMERICAN INDIAN POPULATION CONCENTRATIONS

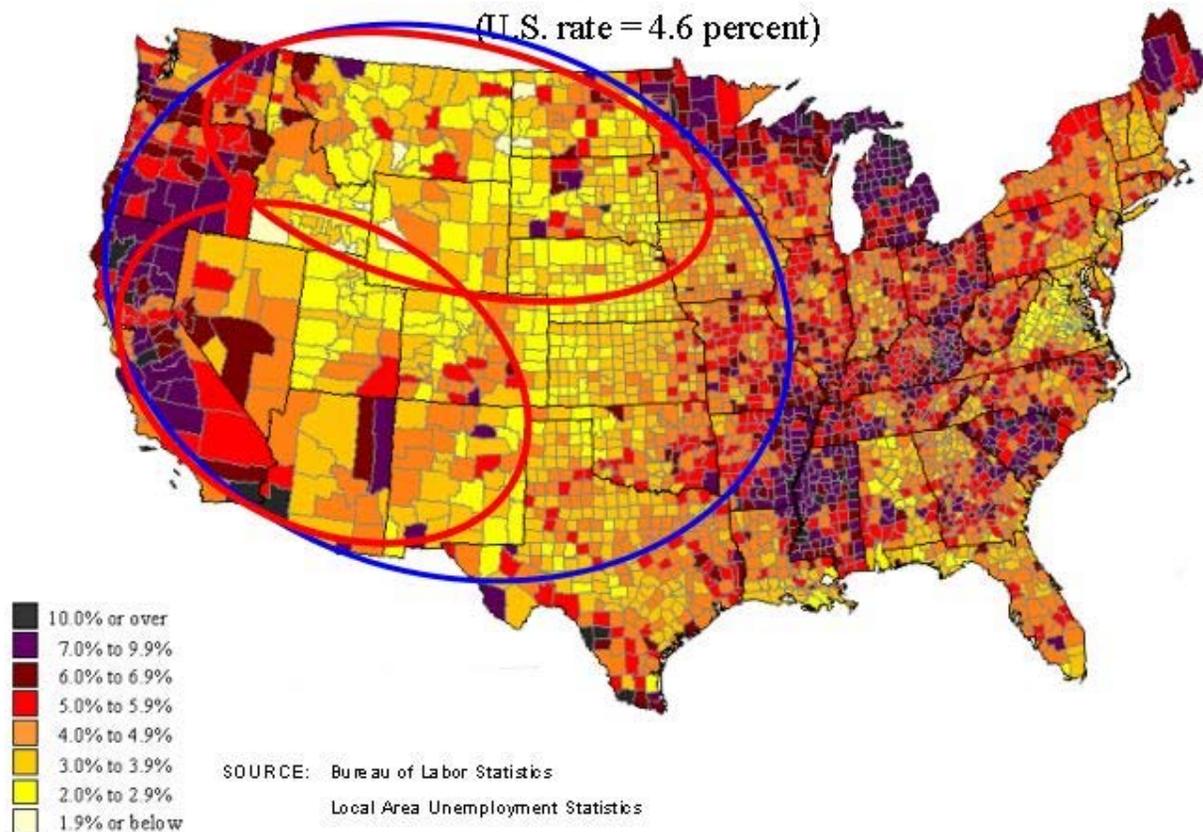


This is an image showing the population concentration of Native Americans and Alaskan Natives in 2008 by state, with darker shades of green indicating greater concentration.

# UNEMPLOYMENT RATE SIGNIFICANTLY HIGHER THROUGHOUT INDIAN COUNTRY

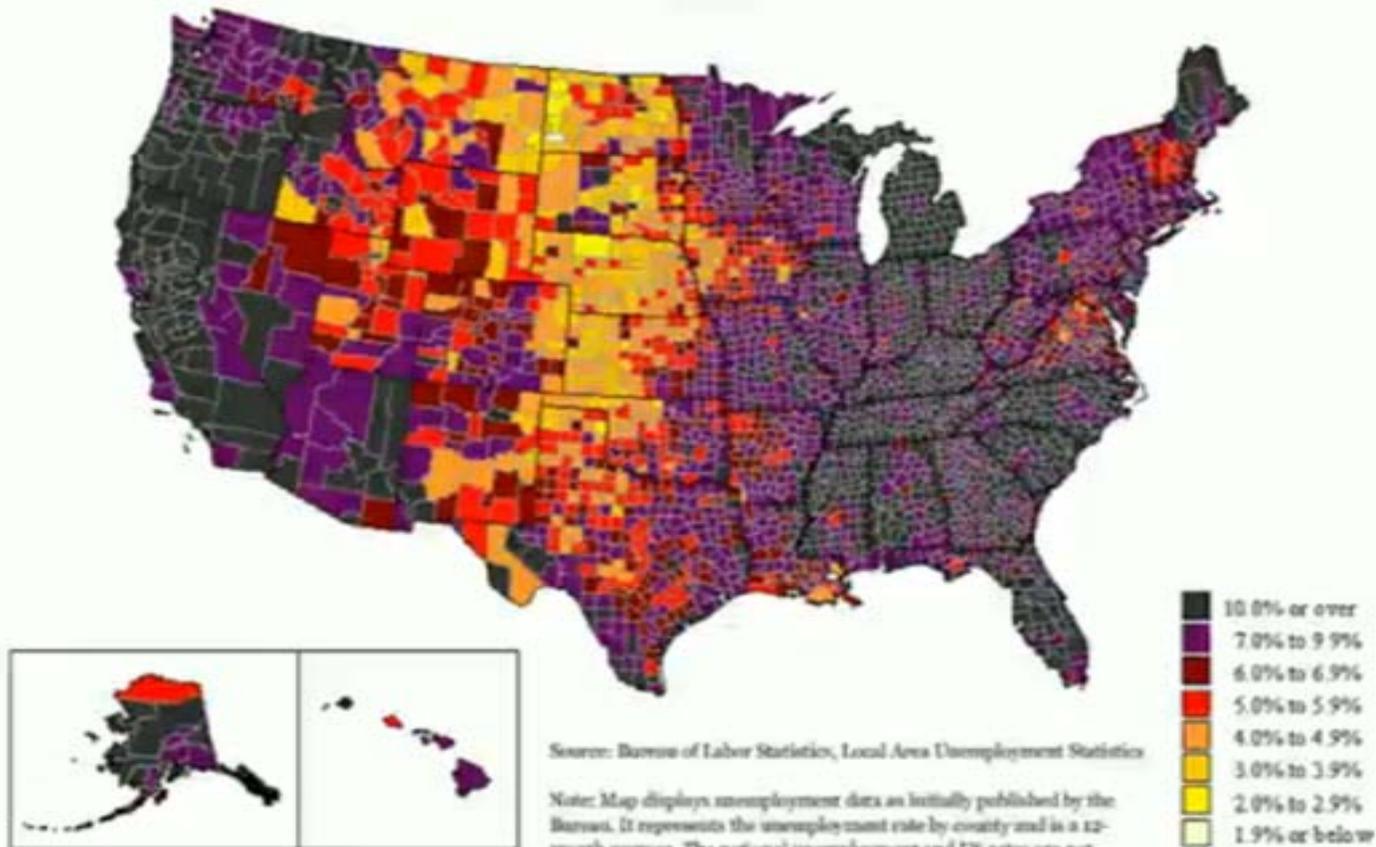
Unemployment rates by county,  
2007 annual averages

(U.S. rate = 4.6 percent)



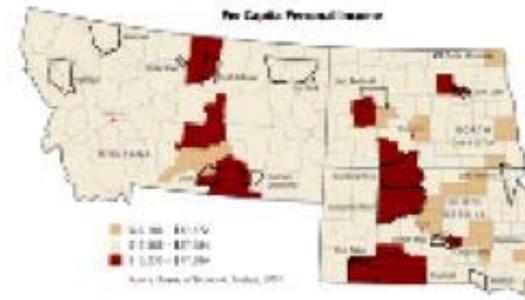
# UNEMPLOYMENT RATE SIGNIFICANTLY HIGHER THROUGHOUT INDIAN COUNTRY

Unemployment Rates by County  
November 2009  
9.0%

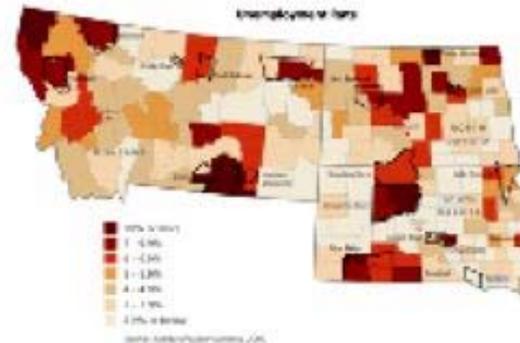


# PERSONAL INCOME, UNEMPLOYMENT AND INDIAN COUNTRY

Per Capita  
PERSONAL  
INCOME  
By County



UNEMPLOYMENT  
RATE  
By County



Most of these poorest counties include an Indian Reservation.)

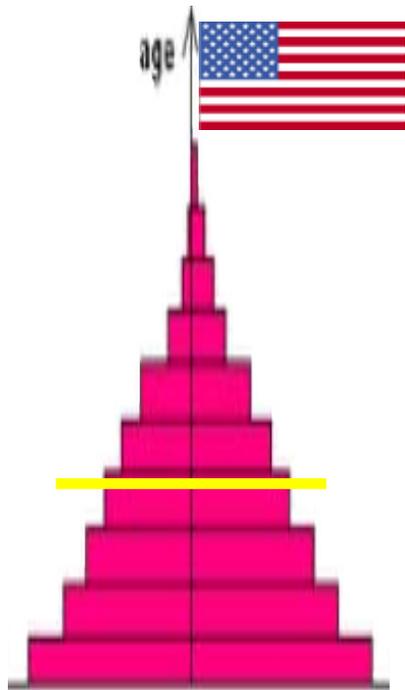
The darker the coloration, the worse the situation.  
Most of these “poorest” counties include Indian Reservations

# Population Statistics

## AVERAGE LIFE EXPECTANCY

75.6 Yrs Males  
80.8 Yrs Females

48 Yrs Males  
52 Yrs Females

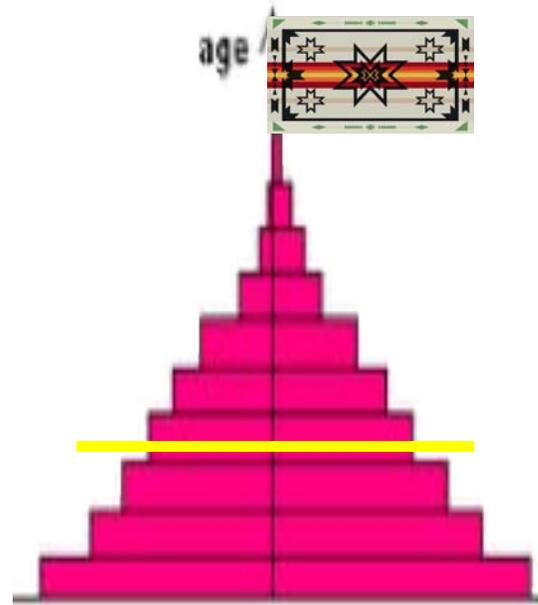


36.9 Yrs

2010 Census

General U.S.  
Population

## MEDIAN AGE

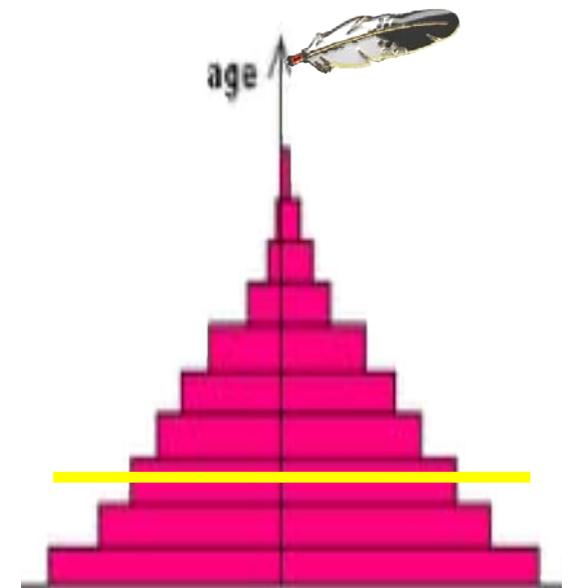


31.2 Yrs

2008 Census

On+Off-Reservation

American Indian Populations



Under 25 Yrs

2000 Census

On Reservation

# UNEMPLOYMENT RATE SIGNIFICANTLY HIGHER ON INDIAN RESERVATIONS

## Unemployment Estimates Differ from the Bureau of Indian Affairs Labor Force Report

The BIA Labor Force Report is based on the American Indian and Alaska Native population that lives on or near a reservation and is eligible for BIA-funded services. This population is only about one-third of the total American Indian and Alaska Native population.

Most other federal statistics use the total American Indian and Alaska Native population (including self-identified bi-racial individuals) to generate the statistics for this analysis.

Additionally, the Current Population Survey only counts as unemployed those individuals who are actively looking for work. The BIA Labor Force Report does not state this restriction.

<http://www.epi.org/page/-/pdf/ib289.pdf>



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# 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.

# CONVENTIONAL HOUSING



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## Our Housing Stock is on Life Support

Inspired by Randy Udall, CORE; Realization by Bob Gough



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# Housing



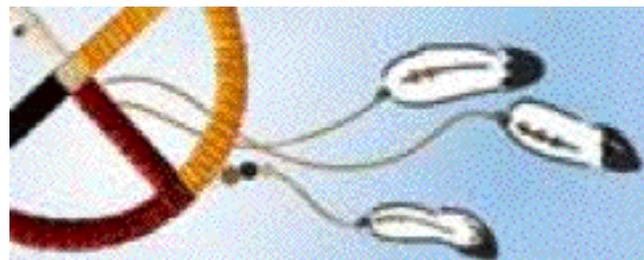
*Harsh weather, remoteness, chronic lack of economic opportunities and resources combine to create deplorable living conditions.*

There is a housing crisis in Indian country. Despite the Indian Housing Authority's (IHA's) recent efforts, the need for adequate housing on reservations remains acute. The legislature deplored the fact that there are 90,000 homeless or under-housed Indian families, that 30% of Indian housing is overcrowded, and less than 50% of it is connected to a public sewer" (March 10, 2004, Indian Country Today)

In addition, many American Indians are living in substandard housing. About 40% of on-reservation housing is considered inadequate (2003, Native American Indian Housing Council). The waiting list for tribal housing is long and overcrowding is inevitable. Most families will not turn away family members or anyone who needs a place to stay. It is not uncommon for 3 to 4 generations to live in a two-bedroom home.

Further diminishing the quality of reservation housing is the noticeable absence of utilities. While most Americans take running water, telephones, and electricity for granted, many reservation families live without these luxuries. This increases the potential for health risk, especially in the more isolated areas.

[http://www.nrcprograms.org/site/PageServer?pagename=airc\\_livingconditions](http://www.nrcprograms.org/site/PageServer?pagename=airc_livingconditions)



# *Native Wind* Powering America

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



FEMA Trailer Park, Oglala, Pine Ridge

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# Home on the Range

(or in the Solar Oven)

## on Great Plains

Seasonal Temperature Swing of 150 Degrees

**Summer Highs**

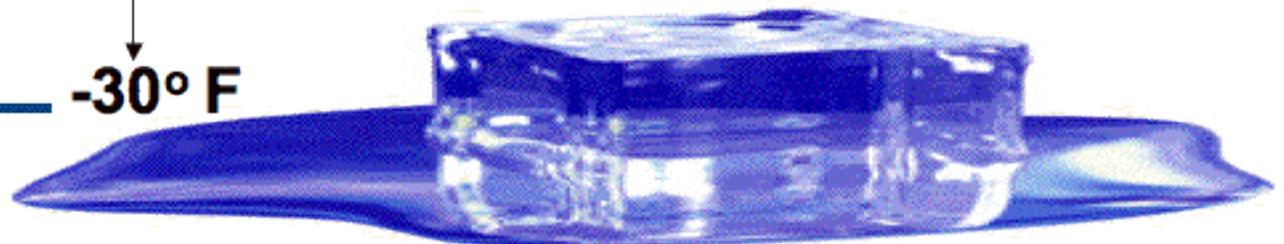
**120° F**

**Human  
Comfort  
Range**

**80° F  
60° F**

**Winter Lows**

**-30° F**



# TRIBAL SUSTAINABLE ENERGY DEVELOPMENT

## 19th AND 21st CENTURY MODELS

Sustainable, Affordable, Future-Proof and Efficient Homes

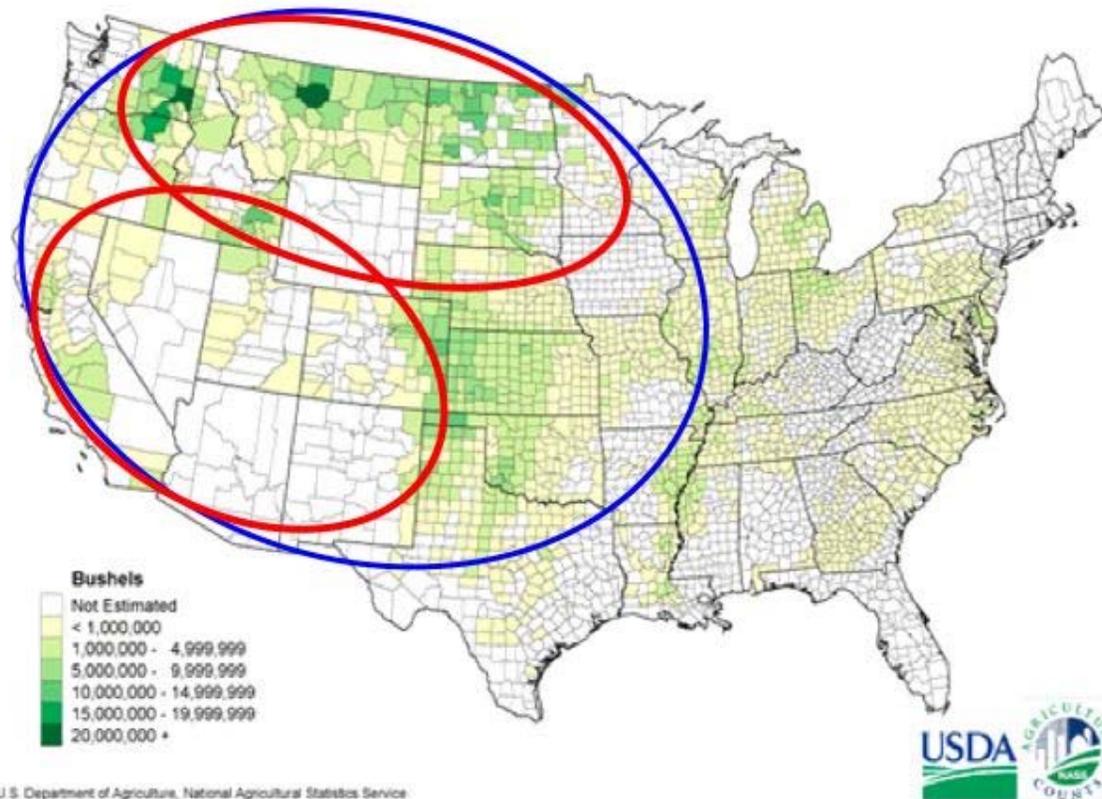


Both Built on a Base of Renewable Natural Resources

# STRAW RESOURCES ARE RELATIVELY ABUNDANT IN OR NEAR INDIAN COUNTRY

## Wheat Acres Harvested

All Wheat 2007  
Production by County



# RENEWABLE ENERGY AND GREEN CONSTRUCTION PRACTICES IN PUBLIC HOUSING

Notice PIH 2008-25 (HA) June 11, 2008

**DEFINING GREEN BUILDING.** For the purposes of this Notice, green building is a systems-based approach to achieving sustainable buildings that incorporates environmental considerations into every phase of the building process -- *design, construction, operation, maintenance, renovation, and deconstruction/demolition.*

Green building can provide the following advantages over conventional building:

- ✓ · Lower utility bills resulting in more affordable homes;
- ✓ · Better indoor environmental quality;
- ✓ · Preservation of natural resources;
- ✓ · Less national reliance on fossil fuels and reduced greenhouse gas emissions; and
- ✓ · Durability of building materials and structures.
- ✓ · More skilled local jobs for both men and women.

## NEED FOR HOUSING IN INDIAN COUNTRY

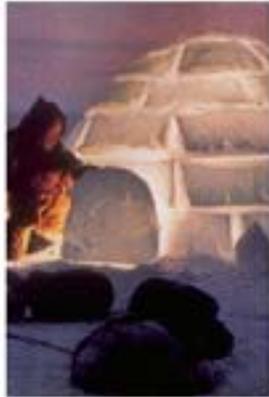
Indian Reservation Population	=	2.5 million
Indians who are homeless or living in over-crowded, substandard conditions	=	1.5 million or 60%
Waiting list for Reservation housing in 2003	=	200,000 homes
Estimated Housing Need	=	Over 500,000
Existing mobile homes/trailers	=	33%
Reservation unemployment	=	60% to 80%+
Reservation median age	=	under 25 yrs old
U.S. median age	=	36.9 yrs old



Sustainable, Affordable, Future-Proof, 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



*Tatanka Oti ~ Buffalo Lodge  
on the SGU Antelope Campus  
Rosebud Sioux Reservation*





## Intertribal COUP Green Jobs Initiative A Clinton Global Initiative (CGI) Commitment to Action



The Intertribal Council On Utility Policy (COUP) will provide technical assistance and human capacity building services in energy efficiency (Straw Bale Homes) and renewable energy (Utility and Community Scale Wind) development to COUP member Tribes under a Tribal Assessment Centers (TACs) demonstration project modeled after the successful U.S. Department of Energy (DOE) Industry Assessment Centers (IACs) program.



COUP President Patrick Spears accepting Clinton Global Initiative recognition for Intertribal COUP's Commitment from Mary Ellen Iskenderian of Women's World Bank

This CGI Commitment to Action seeks to leverage up to \$5 million in project financing over five years beginning October 1, 2011, in collaboration with SolarQuest® LLC (d.b.a., the Renewable Nations Institute) and collaborating tribal and non-tribal colleges and universities and reservation communities.

*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?*



# Alternative Building Strategies: Building Community Solutions for Native Nations with Straw Bale Construction

**Laura Bartels**

**GreenWeaver Inc.**

[www.greenweaverinc.com](http://www.greenweaverinc.com)

**Greener Homes National Summit**

**HUD-ONAP**

**Denver, Colorado**

**Sept, 2011**

