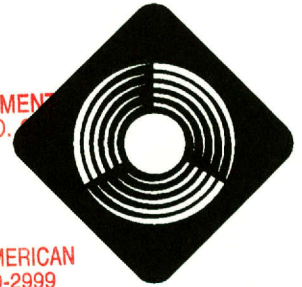


# Renewable Energy Resources for Texas

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**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

SECO FACT SHEET NO. 8

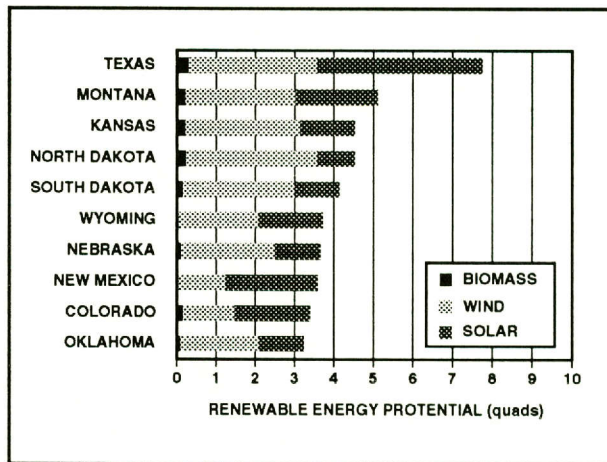
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## HIGHLIGHTS

- ◆ Texas has more renewable energy potential than any other state
- ◆ With proper technology, renewable resources can meet a growing fraction of the state's energy needs
- ◆ Every Texas community has opportunities to use clean renewable energy affordably
- ◆ Developing native renewable resources will help the state's economy

## SUMMARY

Due to its size and diverse climate, Texas has tremendous potential to harness clean, renewable energy resources such as wind, solar and biomass. These resources are abundant, large enough in fact to meet all of the state's energy needs. The key lies in developing technologies that can tap this immense non-polluting resource affordably and reliably. Such technologies are now becoming commercially available. A move toward renewables would also



**Texas is #1 in renewable potential**  
*This figure, based on data from a study conducted for the United Nations, indicates that Texas has more potential to develop clean renewable energy resources than any other State.*

spur the local economy, create jobs and increase the tax base. Doing so would benefit the wind and solar rich rural regions of west and south Texas, where jobs and economic development are sorely needed.

## RENEWABLES HAVE "TEXAS SIZE" POTENTIAL

Texas has copious amounts of oil, gas, coal and uranium. But the state's renewable resources make those fossil fuel resources look tiny. The wind, solar and biomass potential in Texas is equal to 4,330 quadrillion BTUs per year, or about 400 times the state's annual energy

diet. While smaller than Texas solar potential, wind energy alone could provide eight times as much power as all of the state's electric generation plants combined. Clearly, we only need to tap into a small fraction of the enormous potential of renewables to meet our state's growing energy needs.

Texas' abundance of renewable resources is richest in wind, solar and biomass, which is useful energy derived from plants or animals. The potential of other renewable resources is limited. For instance most of the state's hydropower has already been developed. And Texas



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**Uses for renewable energy** *The various forms of renewable energy have many different uses and are sufficiently abundant to meet Texas energy needs of 10 quads/yr.*

has scant potential in wave energy, tidal energy and geothermal (heat from the ground).

The real question for renewables is not whether there is enough resource, but rather when will technologies be available that allow this

enormous potential to be used reliably and affordably. In some cases, such as wind energy and landfill gas, the answer is now. Another renewable ready for use is Building Climatology, which refers to knowledge of the local climate used to design buildings that are comfortable but use little energy. This underutilized "resource" could save

Texas billions of dollars in ongoing energy costs while improving the livability of structures.

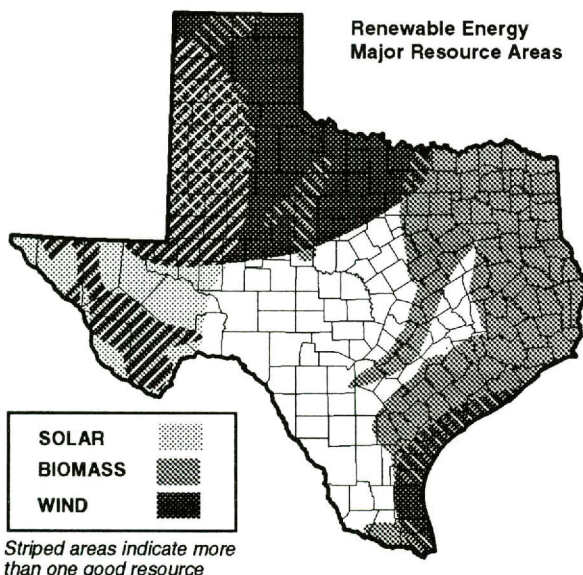
## WHERE ARE THE RESOURCES LOCATED?

No matter where you are in Texas, renewable energy resources are, more than likely, all around you. Passive solar heating, photovoltaics, solar water heaters and ground source heat pumps are practical just about everywhere in Texas. Other small to medium scale technologies, such as landfill gas-to-energy projects and water pumping windmills, can be suitable in many communities across the state.

However, for large scale renewable power projects involving wind and solar power, commercial developers will seek out the best locations in the State. For wind and solar, the best potential areas are in south

RESOURCE	TOTAL PHYSICAL RESOURCE (quads/yr)	ACCESSIBLE RESOURCE (quads/yr)	ENERGY DENSITY: GOOD TEXAS SITE (MJ/m <sup>2</sup> /yr)	PRIMARY ENERGY USES*				NON-ENERGY USES
				ELEC.	HEAT	MECH.	TRANS.	
SOLAR	4,300	250	8,000	✓	✓			Food, feed, and fiber Water supply; flood control
WIND	12	4	15,000	✓		✓		
BIOMASS	13	3	45	✓	✓		✓	
WATER	3	1	10	✓	✓	✓		
GEOHERMAL	1	1	3	✓	✓			
BUILDING CLIMATOLOGY	0.6	.26	430	✓	✓			

\* ELEC. = Electricity, MECH. = Mechanical, TRANS. = Transportation



**Areas suitable for large renewable energy facilities** *Many regions in Texas have exceptional renewable resources capable of supporting large commercial energy production facilities such as power plants and refineries. West Texas has great sunshine and wind, east Texas has loads of biomass and the Texas panhandle is blessed with good sun, wind and biomass.*

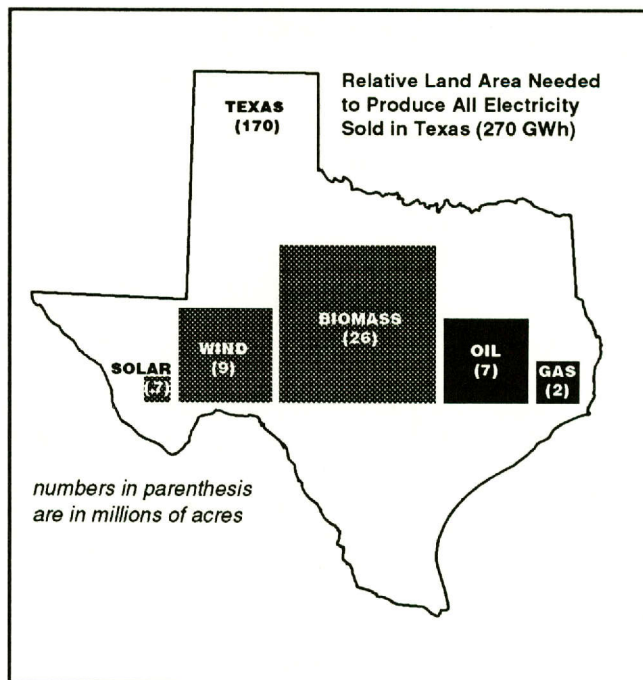
Texas, west Texas and the Panhandle. The best biomass resources are concentrated in East Texas and the Panhandle. When you add it all up, Texas has opportunities to benefit from clean, renewable energy sources in every community in the state.

## RENEWABLE ENERGY USES

Renewable energy resources provide the same energy services that we now get from fossil fuels including generating electricity, providing heat, driving mechanical equipment and powering vehicles. Renewable energy is manifest in nature in many forms, each of which is best suited for certain applications. Biomass, which is material derived from plants or animals and then used for energy, is particularly versatile. The solar energy stored in the chemical compounds of biomass can make liquid fuels (like ethanol) for cars, gaseous fuels (like methane) that can be burned in place of natural gas, or solid fuels like wood chips that can be burned like coal.

## LAND USE

A common misconception is that renewable energy use requires too



**Land requirements of various Texas energy sources** Each square shows the relative land area needed by different energy resources to produce enough electricity for the entire State of Texas. Oil wells and wind turbines produce about the same amount of energy per unit of land area.

much land to be practical. In reality, renewable energy has similar land use requirements as the oil and gas on which Texans now rely. The similarities between oil pump jacks and wind turbines is particularly striking—one machine per 40 acres each producing the equivalent of about 9 barrels of oil a day. The only difference is that one pulls energy from the ground and the other pulls energy from the sky. Also renewable energy use can co-exist with other traditional land uses. For instance, cattle can graze around wind turbines, and solar equipment can be placed on the roofs of factories, shopping centers and individual houses, over parking lots and along roadways.

### DEFINITION

Renewable Energy refers to any energy resource that is naturally regenerated over a short time scale and derived directly from the sun (such as thermal, photochemical, and photoelectric), indirectly from the sun (such as wind, hydropower, and photosynthetic energy stored in biomass), or from other natural movements and mechanisms of the environment (such as geothermal and tidal energy). Renewable energy does not include energy resources derived from fossil fuels, waste products from fossil sources, or waste products from inorganic sources.

## ORGANIZATIONS

American Solar Energy Society  
2400 Central Ave., G-1  
Boulder, CO 80301  
303-443-3130

Energy Center  
University of Texas at El Paso  
P. O. Box 645  
El Paso, Texas 79968  
1-888-879-2887

Florida Solar Energy Center  
1679 Clearlake Road  
Cocoa, FL 32922  
407-638-1000

Passive Solar Industries Council  
1511 K Street, Suite 600  
Washington, DC 20005  
202-628-7400

Texas Solar Energy Society  
P. O. Box 1447  
Austin, TX 78767-1447  
512-326-3391  
e-mail: [info@txses.org](mailto:info@txses.org)  
<http://www.txses.org>

Texas Renewable Energy Industries  
Association  
P. O. Box 16469  
Austin, TX 78761  
512-345-5446

## RESOURCES

### TEXAS RENEWABLE ENERGY EDUCATION CAMPAIGN

Texas is in the midst of a major campaign to develop thought-provoking educational materials on renewable energy. The campaign includes: (1) the first-class video, "The Infinite Power of Texas," (2) 20 fact sheets for students and adults, and (3) a powerful World Wide Web site on the Internet. Begin your search for Texas-specific information on renewable energy at:

<http://www.InfinitePower.com>

### INTERNET SITES:

<http://www.InfinitePower.com/factsheets/fs8.html>

*Center for Renewable Energy and Sustainable Technology (CREST)*

A comprehensive educational resource for renewables. A good place to start your search.

<http://solstice.crest.org>

*Department of Energy.* Web pages run by the Department of Energy on everything from cooling your home naturally to selecting a new water heater.

[www.eren.doe.gov/erec/factsheets/factsheets.html](http://www.eren.doe.gov/erec/factsheets/factsheets.html)

*Florida Solar Energy Center.* Information on photovoltaics, batteries, alternative buildings systems, solar heaters. The center is developing a test house which relies exclusively on PV power. [www.fsec.ucf.edu](http://www.fsec.ucf.edu)

*El Paso Solar Energy Association.* Lots of good information. [www.epsea.org](http://www.epsea.org)

### BOOK:

*Texas Renewable Energy Resource Assesment: Survey, Overviews, and Recommendations.*

Virtus Energy Research Associates, 1995. ISBN 0-9645526-0-4. Detailed summary of each renewable energy resource in Texas. (source: SECO, 512-463-1889)

### POSTER:

*Our Energy Sources Are Outstanding in the Field.* (source: SECO, 512-463-1889)

(web version: [www.infinitepower.com/poster1.html](http://www.infinitepower.com/poster1.html))



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