

# Voluntary Markets: Lay of the Land

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Green Power 101  
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# Big Picture: Green Power Market Status

- Voluntary green power markets give consumers choices to purchase electricity from renewable energy sources.
  - About 25% of U.S. utilities offer a green power program.
  - Competitive retail markets often provide green power options.
  - Renewable energy certificates (RECs) can be purchased nationwide.
- About 50% of consumers have option to purchase green power directly from their utility/power supplier
- Green power sales growth has averaged *nearly 50%* annually in recent years.
- Nonresidential purchases are increasingly driving the market
  - Nearly  $\frac{3}{4}$  of sales to nonresidential customers in 2006.

# Lay/Land

- Who
- What
- Where
- When
- How
- Why
- How Much
- What Next

# Who

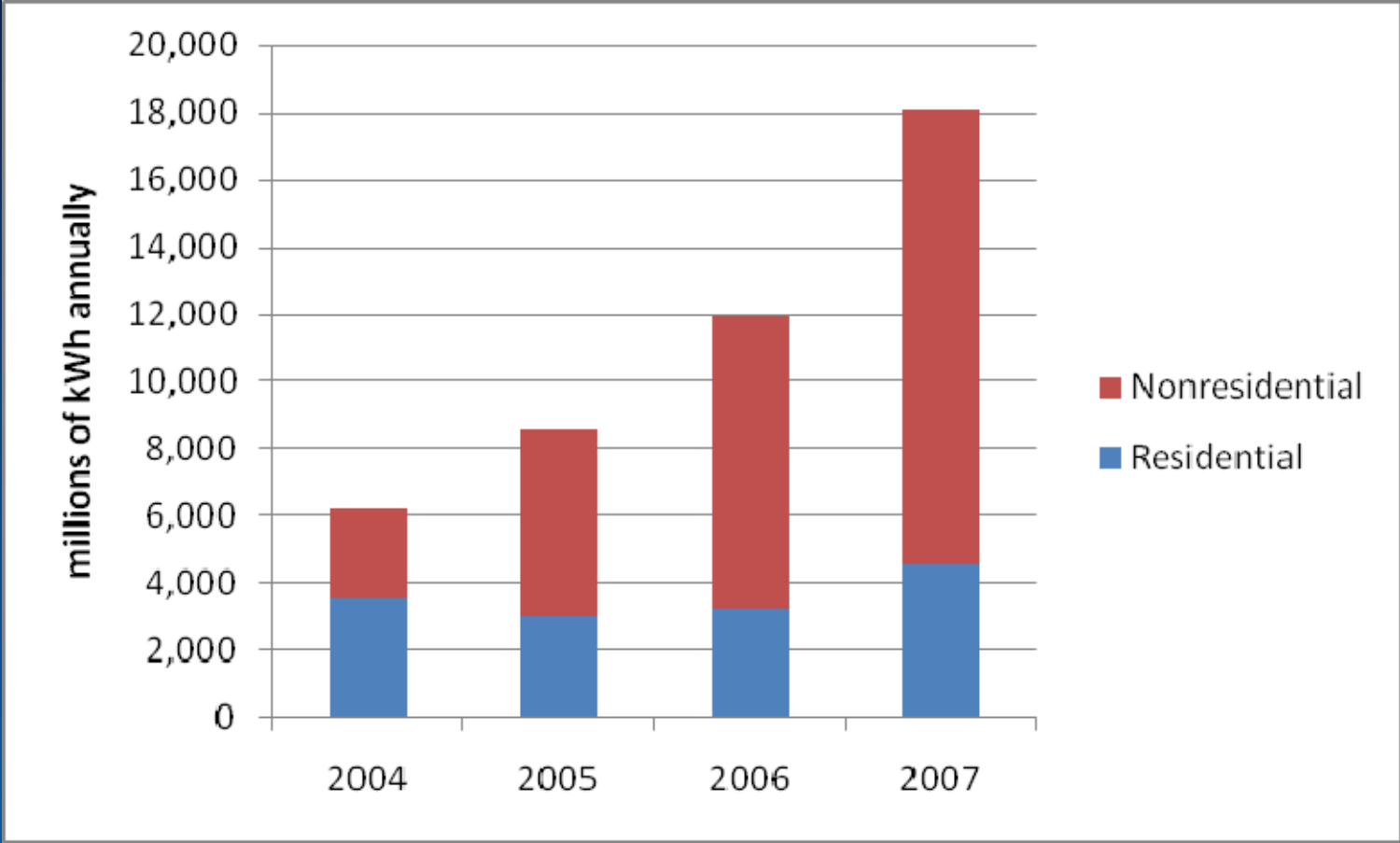
# Top 10 Utility Green Pricing Programs kWh Sold (2007 data)

Rank	Utility	Resources Used	Sales (kWh/year)
1	Austin Energy	Wind, landfill gas	577,636,840
2	Portland General Electric	Geothermal, biomass, wind	553,677,903
3	PacifiCorp	Wind, biomass, landfill gas, solar	383,618,885
4	Florida Power & Light	Biomass, wind, landfill gas, solar	373,596,000
5	Xcel Energy	Wind	326,553,866
6	Sacramento Municipal Utility District	Wind, landfill gas, small hydro, solar	275,481,584
7	Puget Sound Energy	Wind, solar, biomass, landfill gas	246,406,200
8	Basin Electric Power Cooperative	Wind	226,474,000
9	National Grid	Biomass, wind, small hydro, solar	180,209,571
10	PECO	Wind	160,000,000

# Top 10 Programs: Customer Participation Rate (2007 data)

<u>Rank</u>	<u>Utility</u>	<u>Customer Participation Rate</u>	<u>Program(s)</u>	<u>Program Start Year</u>
1	City of Palo Alto Utilities	20.4%	<i>Palo Alto Green</i>	2003
2	Lenox Municipal Utilities	14.3%	<i>Green City Energy</i>	2003
3	Silicon Valley Power	8.7%	<i>Santa Clara Green Power</i>	2004
3	Portland General Electric	8.5%	<i>Clean Wind, Green Source, Renewable Future</i>	2002
5	Sacramento Municipal Utility District	7.4%	<i>Greenergy</i>	1997
6	City of Naperville Public Utilities	6.7%	<i>Renewable Energy Program</i>	2005
7	Montezuma Municipal Light & Power	6.2%	<i>Green City Energy</i>	2003
8	River Falls Municipal Utilities	5.3%	<i>Renewable Energy Program</i>	2001
9	Holy Cross Energy	5.2%	<i>Wind Power Pioneers Local Renewable Energy Pool</i>	1998 2002
10	Lake Mills Light & Water	4.9%	<i>Renewable Energy Program</i>	2001

# Green Power Purchases by Customer Segment



# Top 20 U.S. Green Power Purchasers

(as of July 2008)

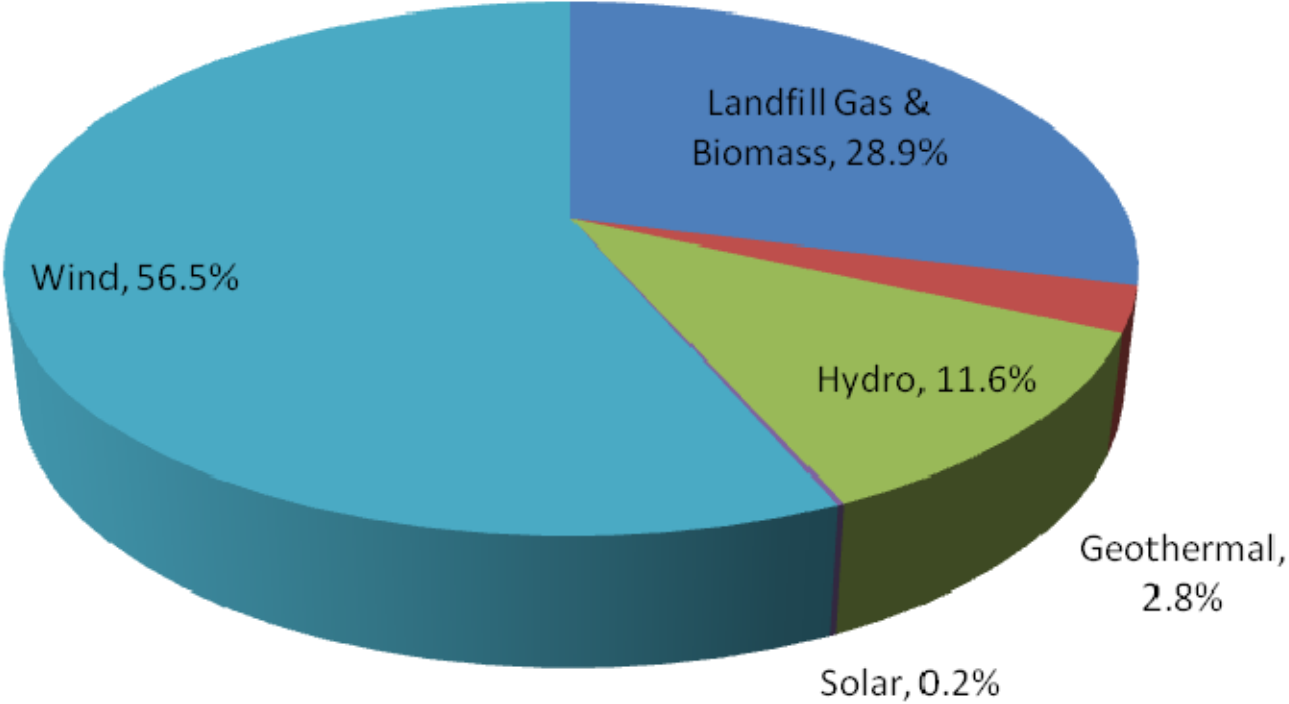
	<u>kWh/yr</u>
1. Intel Corporation	1,302,040,000
2. PepsiCo	1,105,045,154
3. U.S. Air Force	899,143,000
4. Wells Fargo & Company	550,000,000
5. Whole Foods Market	509,104,786
6. The Pepsi Bottling Company	470,216,838
7. Johnson & Johnson	434,854,733
8. Cisco Systems, Inc.	378,000,000
9. City of Houston	350,400,000
10. City of Dallas, TX	333,659,840
11. Commonwealth of Pennsylvania	300,000,000
11. HSBC North America	300,000,000
13. US EPA	299,331,375
14. Kohl's Department Store	236,017,000
15. Starbucks	205,000,000
16. University of Pennsylvania	192,727,000
17. DuPont Company	180,063,500
18. LA County Sanitation	171,144,000
19. US Dept of Energy	157,964,000
19. PepsiAmericas, Inc.	157,062,875
20. Vail Resorts	151,311,000

# Marketers and Brokers

- 20-25 active retail REC marketers
- More at the wholesale level
- ~14 active REC brokers
- The difference between them
- >20 GHG offset marketers

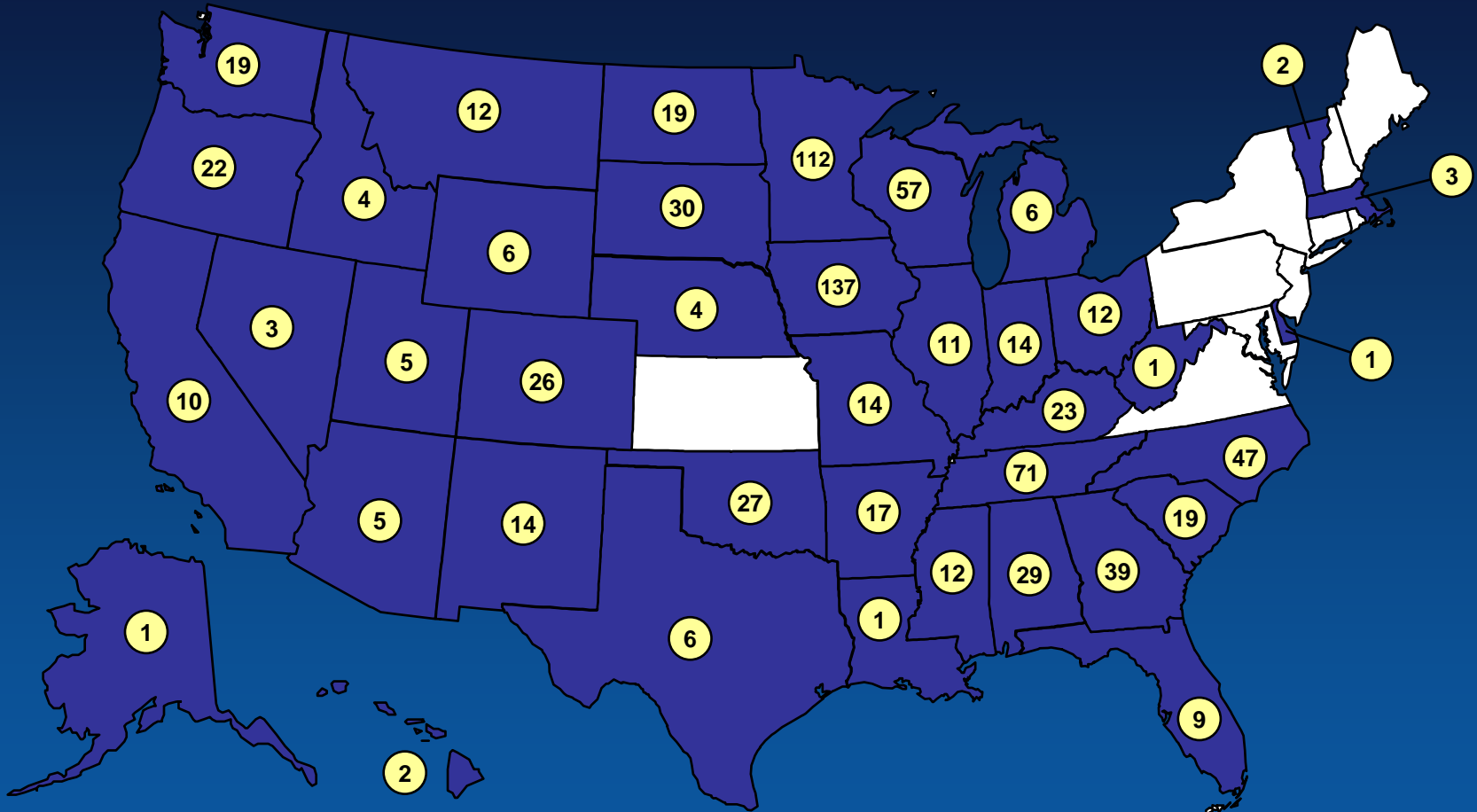
# What

# Sources of Green Power (2007 data)



# Where

# Utility Green Pricing Activities

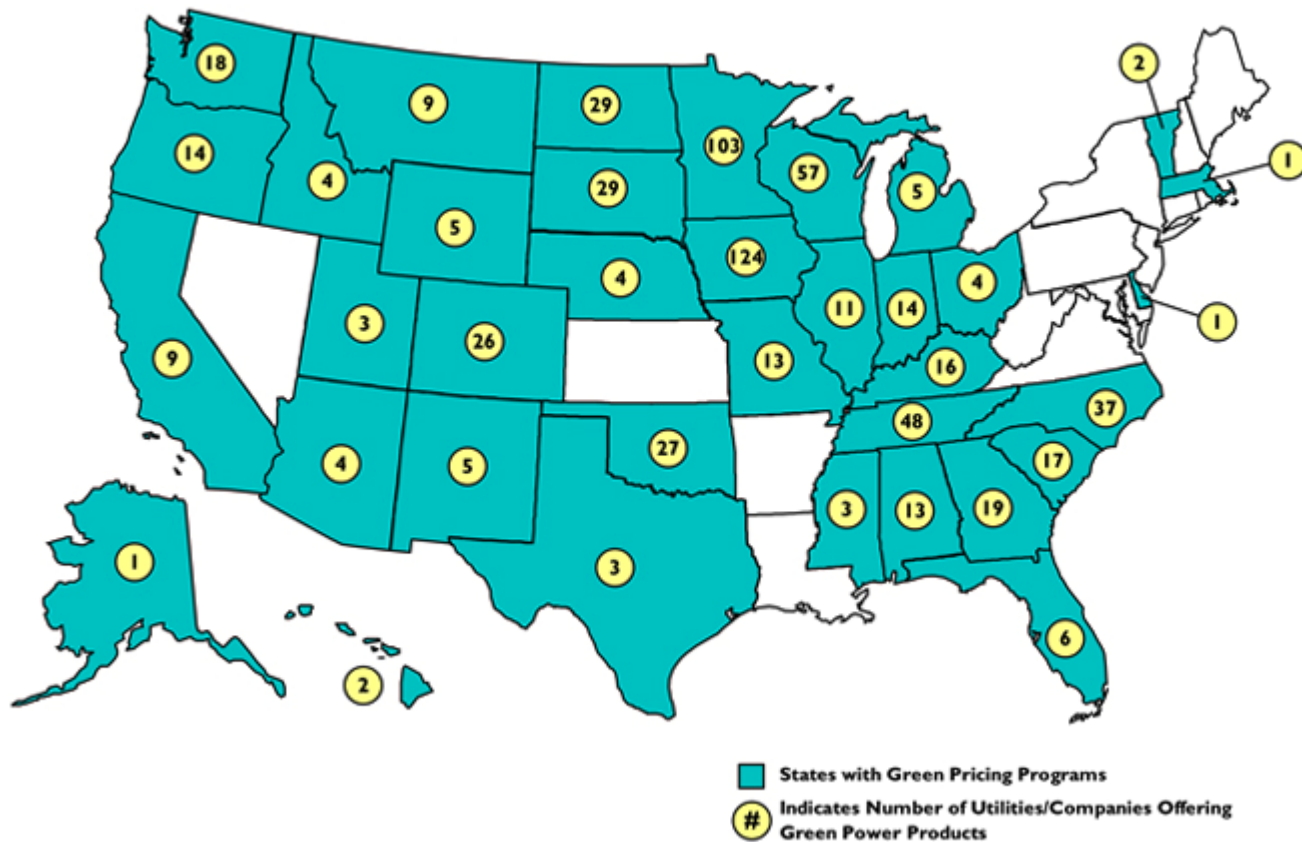


Source: National Renewable Energy Laboratory (September 2008)

- States with Green Pricing Programs
- # Indicates Number of Utilities/Companies Offering Green Power Products

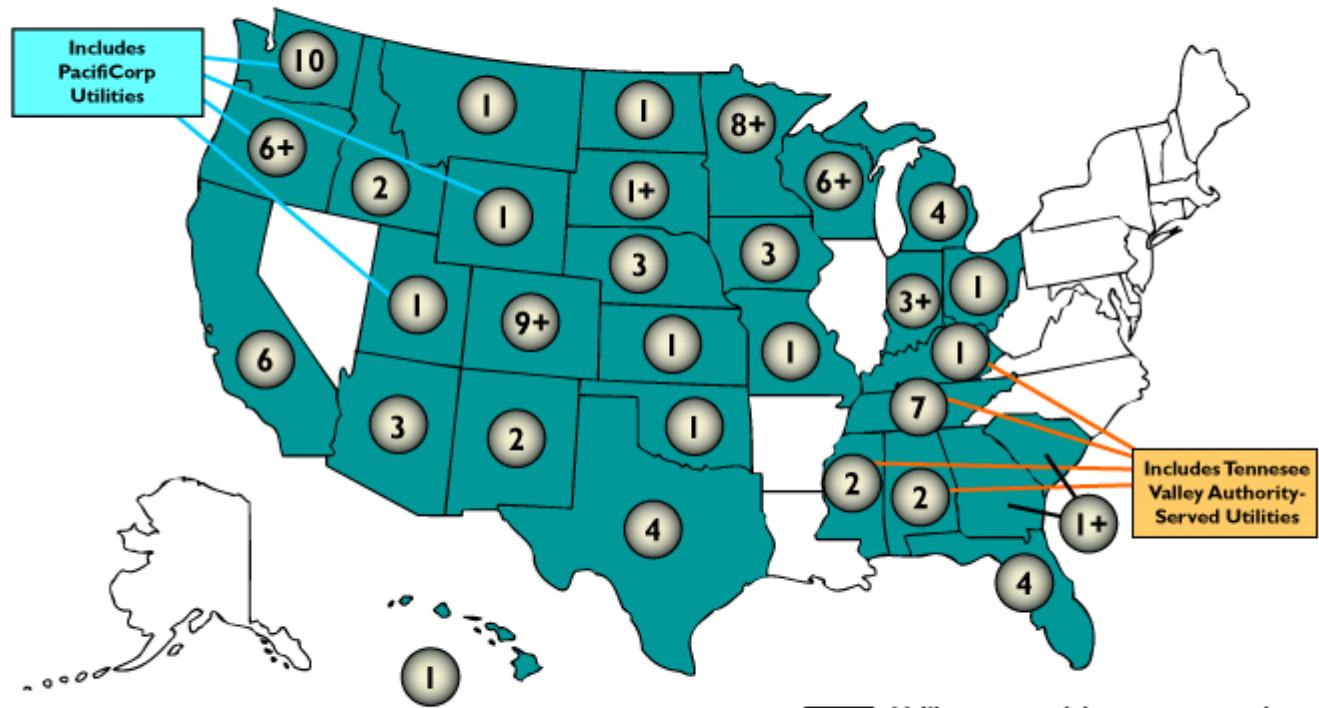
# When

# Utility Green Pricing Activities



Source: National Renewable Energy Laboratory (October 2006)

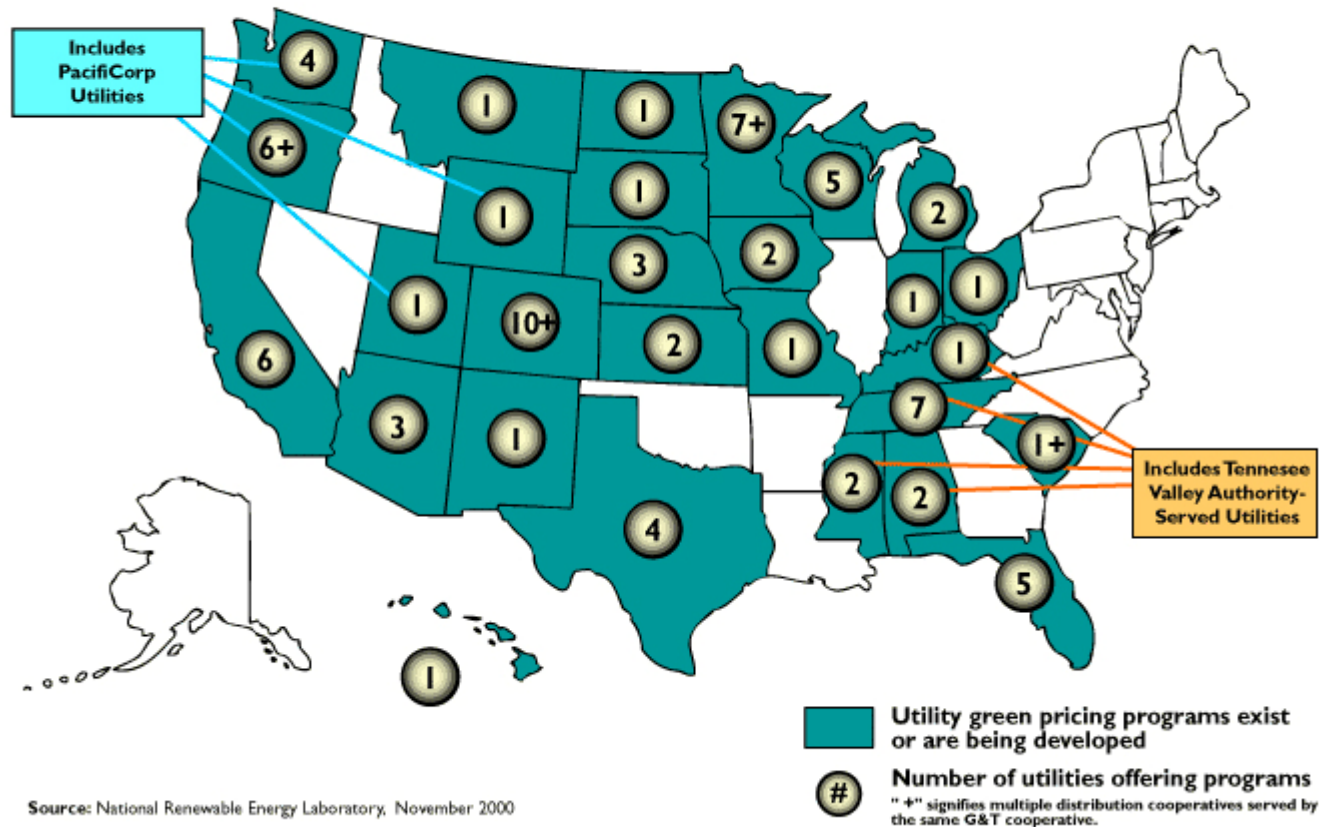
# Utility Green Pricing Activities



Source: National Renewable Energy Laboratory, February 2002

- Utility green pricing programs exist or are being developed
- # Number of utilities offering programs
- "+" signifies multiple distribution cooperatives served by the same G&T cooperative.

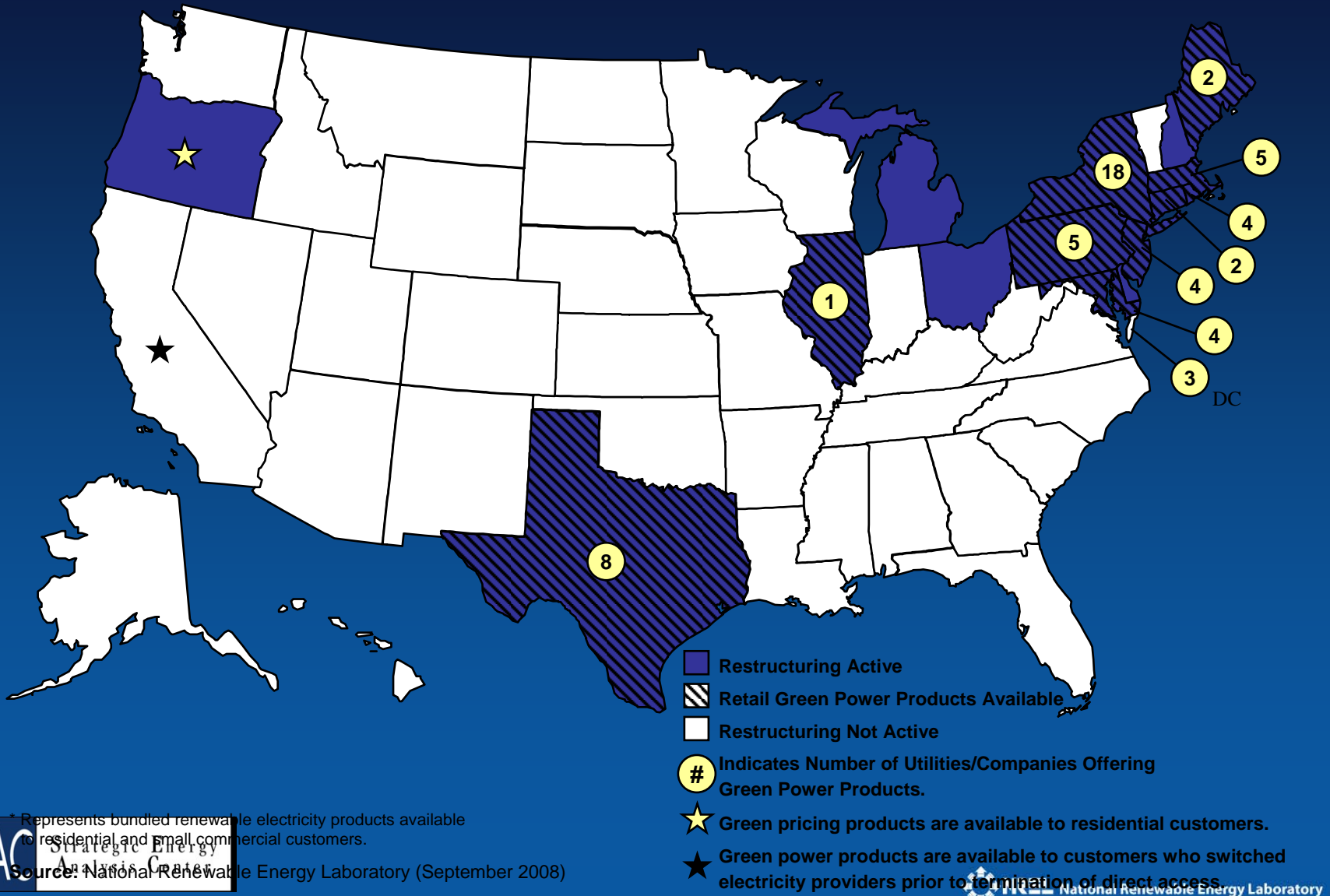
# Utility Green Pricing Activities



Source: National Renewable Energy Laboratory, November 2000

And now back  
to the  
present...

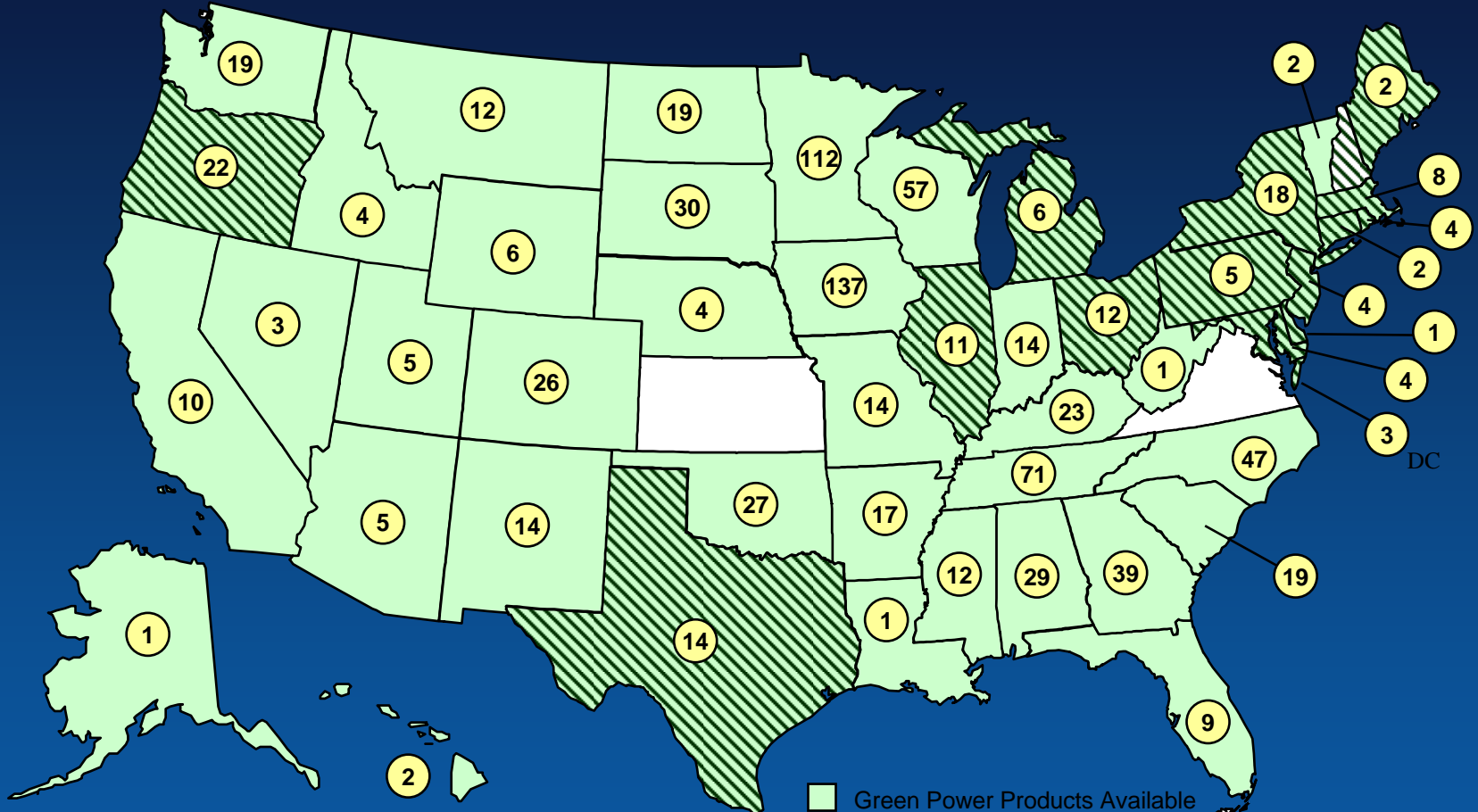
# Green Power Marketing Activity in Competitive Electricity Markets\*



\* Represents bundled renewable electricity products available to residential and small commercial customers.

Source: National Renewable Energy Laboratory (September 2008)

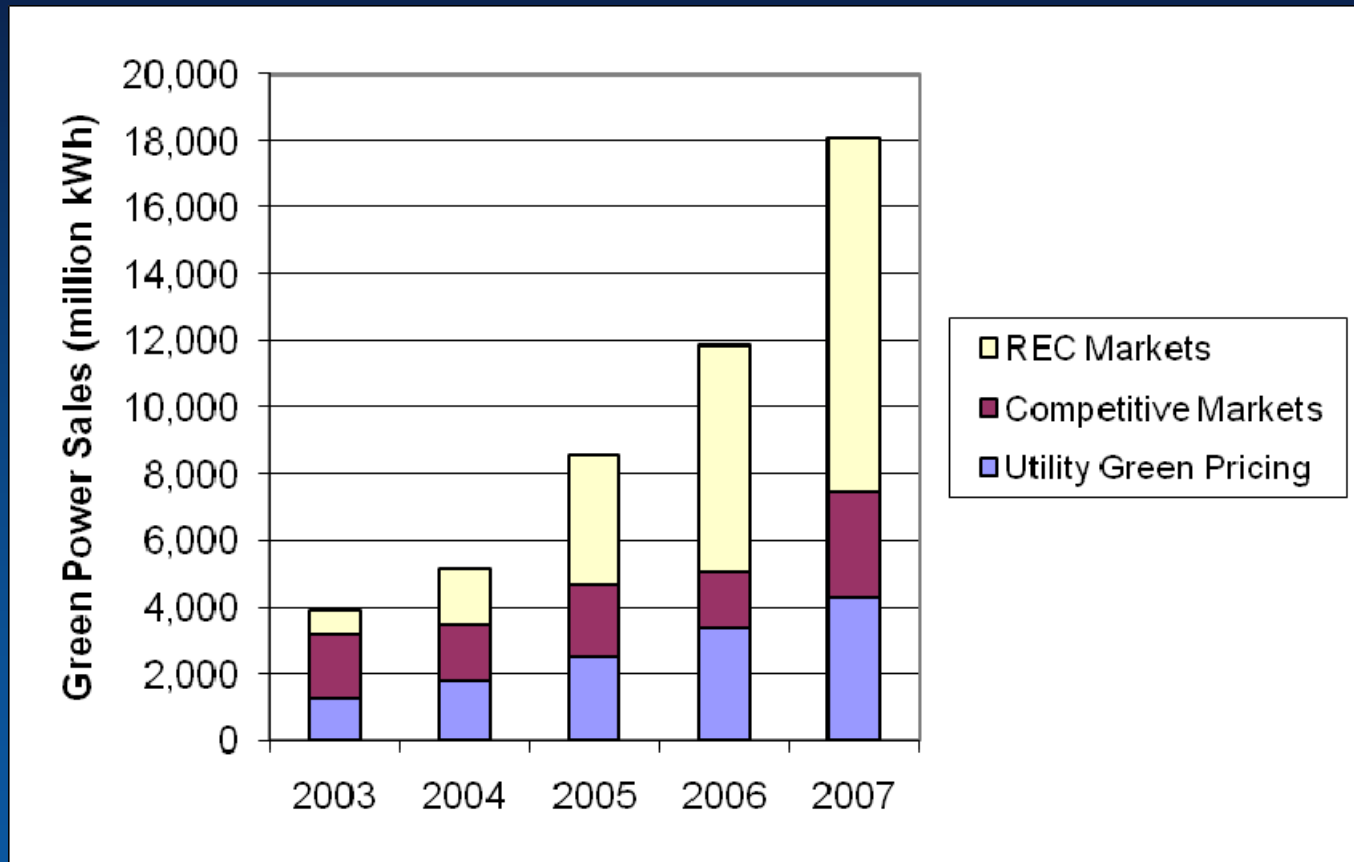
# States with Green Power Programs



- Green Power Products Available
- Restructured Electricity Market
- No Green Power Activity
- # Indicates Number of Utilities/Companies Offering Green Power Products

# How

# U.S. Voluntary Green Power Sales

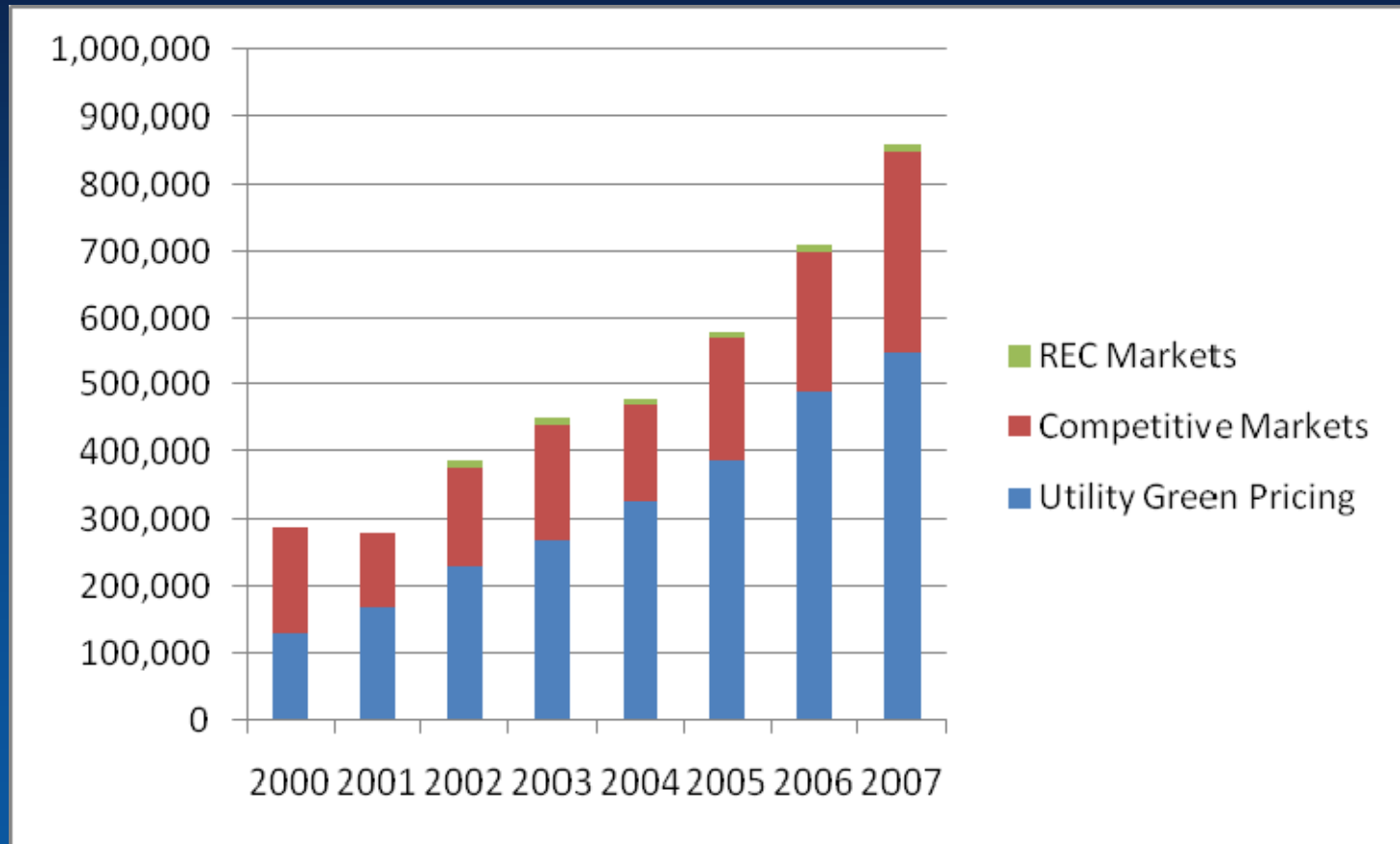


# U.S. Voluntary Green Power Sales

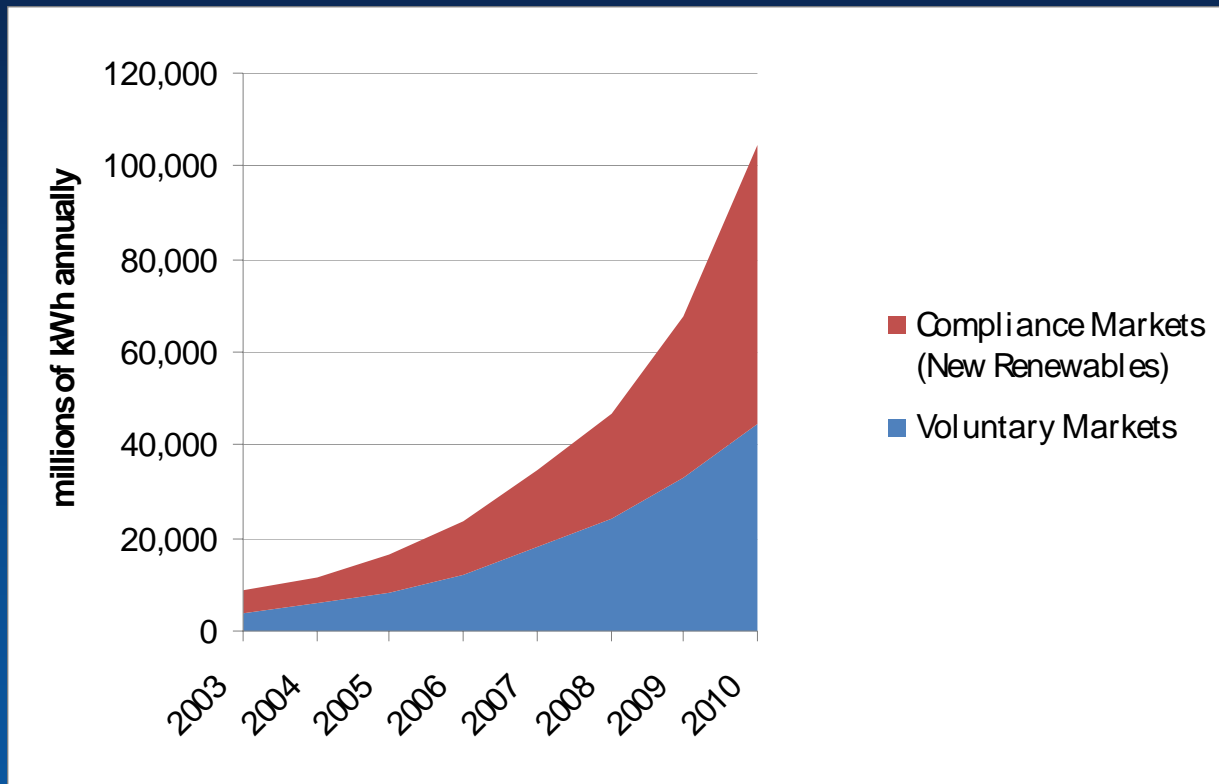
Millions of kWh	2003	2004	2005	2006	2007	Change '07/06
Utility Green Pricing	1,300	1,800	2,500	3,400	4,300	25%
Competitive Markets	1,900	2,700	2,200	1,700	3,200	88%
REC Markets	700	1,700	3,900	6,800	10,600	55%
Retail Total	3,800	6,200	8,500	11,900	18,100	53%

Note: Green-e certified 15.7 billion kWh of green power in 2007.

# Number of Customer Participants by Market Type



# Relative Size of RPS and Voluntary Markets



New RE only; voluntary market projections assume 35% growth rate from 2007; RPS data from LBL

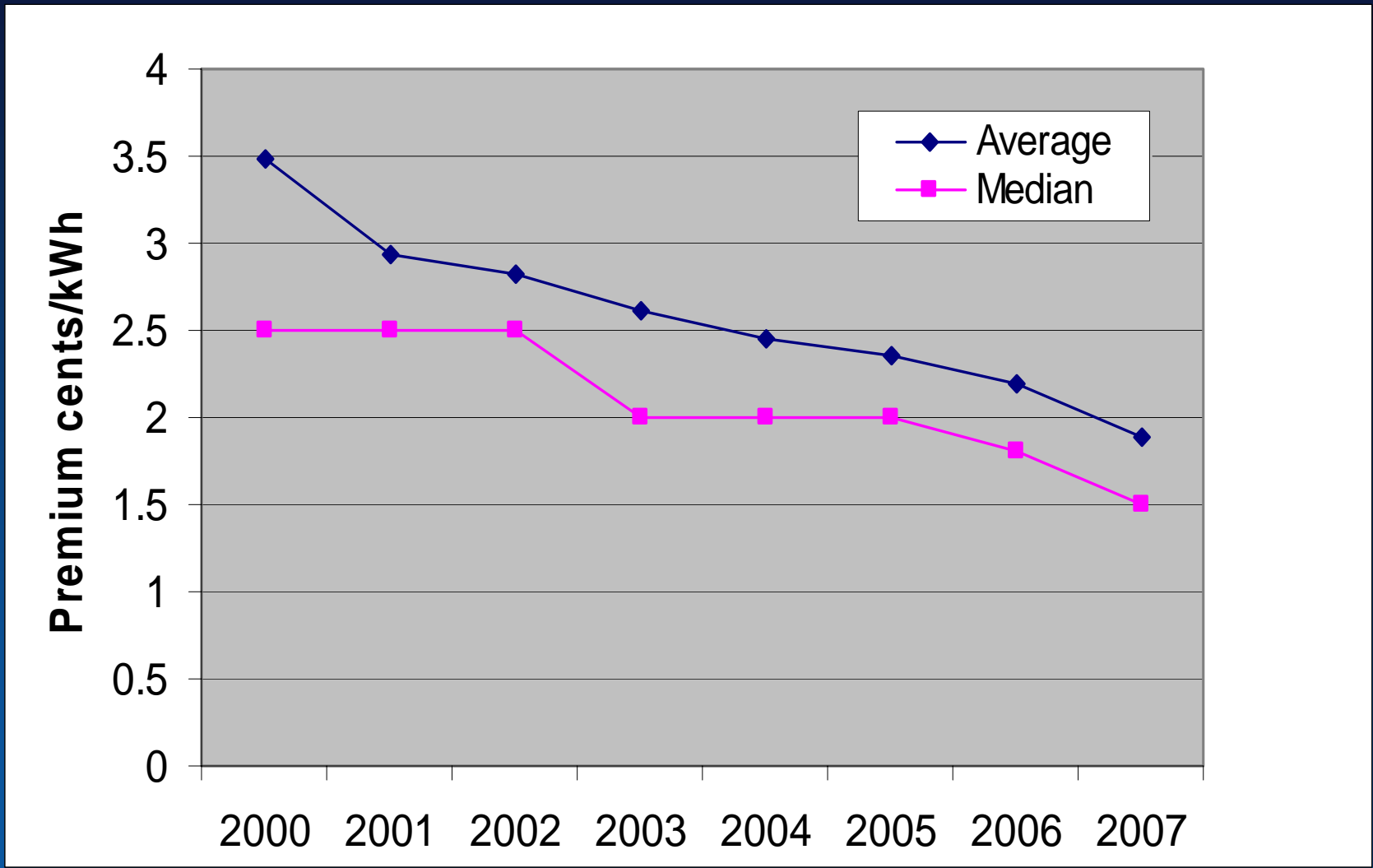
# Why

# What is Driving Growth in Green Power Markets?

- Nonresidential interest
- Larger purchases by consumers
- Greater number of programs
- Price premiums dropping
- Consumer awareness increasing
- Utility/marketer partnerships

# How Much

# Trend in Utility Green Power Premiums



# What Next

# Some Key Issues Going Forward

1. Will RPS policies affect demand for green power?
2. Will there be renewable energy supply shortages?
3. Impact of carbon regulation on demand for green power
4. Interaction with carbon offset markets

# More Information

U.S. Department of Energy  
Energy Efficiency and Renewable Energy  
Empowering your progress. Fueling a new energy.  
Clean. Innovative. Reliable. Affordable.

## The Green Power Network

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NEWS

Gander Mountain Greens Electricity Use  
March 2007

MGE to Expand Wind Power Program  
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Connecticut College Uses Green Power Purchase  
March 2007

Indiana State Government Makes Green Power Purchase  
February 2007

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EVENTS

EEUC 4th Annual Marketing Green Power Conference  
Chicago, IL | April 19-20, 2006

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FEATURES

Top Ten Utility Green Power Programs  
As of December 2005

Utility Green Pricing  
Green pricing is an optional service or tariff offered by utilities to customers in regulated electricity markets.

Green Power Marketing  
Green power marketing refers to selling green power in competitive retail and wholesale electricity markets.

Renewable Energy Certificates  
Renewable energy certificates represent the environmental attributes of electricity produced from renewable energy sources sold separately from commodity electricity.

State Policies  
A number of states have enacted policies requiring fuel mix disclosure or net metering, or mandating that electricity suppliers provide green power options.  
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Lead Story  
**Philly Airport Buys Wind Power**  
Philadelphia International Airport has entered into an agreement with PESCO Energy to purchase 13 million kWh of wind energy each year for the next ...  
[See full story...](#)

Can I Buy Green Power in My State?  
To find out what green power options are available in your state, please click on the [map](#) to the left.

Eleventh National Renewable Energy Marketing Conference  
Presentations from the Eleventh National Renewable Energy Marketing Conference held December 3-6, 2006 in San Francisco, CA.

Hot Off the Press

- [Green Power Network](http://www.eere.energy.gov/greenpower) web site  
<http://www.eere.energy.gov/greenpower>
- Recent reports on green pricing:  
<http://www.eere.energy.gov/greenpower/resources/featured.shtml>
  - *Trends in Utility Green Pricing Programs, 2006*
  - *Green Power Marketing in the U.S.: A Status Report*
  - *Utility-Marketer Partnerships: An Effective Strategy for Marketing Green Power?*
  - *Interaction of Compliance and Voluntary Renewable Energy Markets*
- [Barry\\_friedman@nrel.gov](mailto:Barry_friedman@nrel.gov)