

# State Policy Support for Renewable Power Sources

**Blair Swezey**  
Principal Policy Advisor  
National Renewable Energy Laboratory  
Golden, Colorado



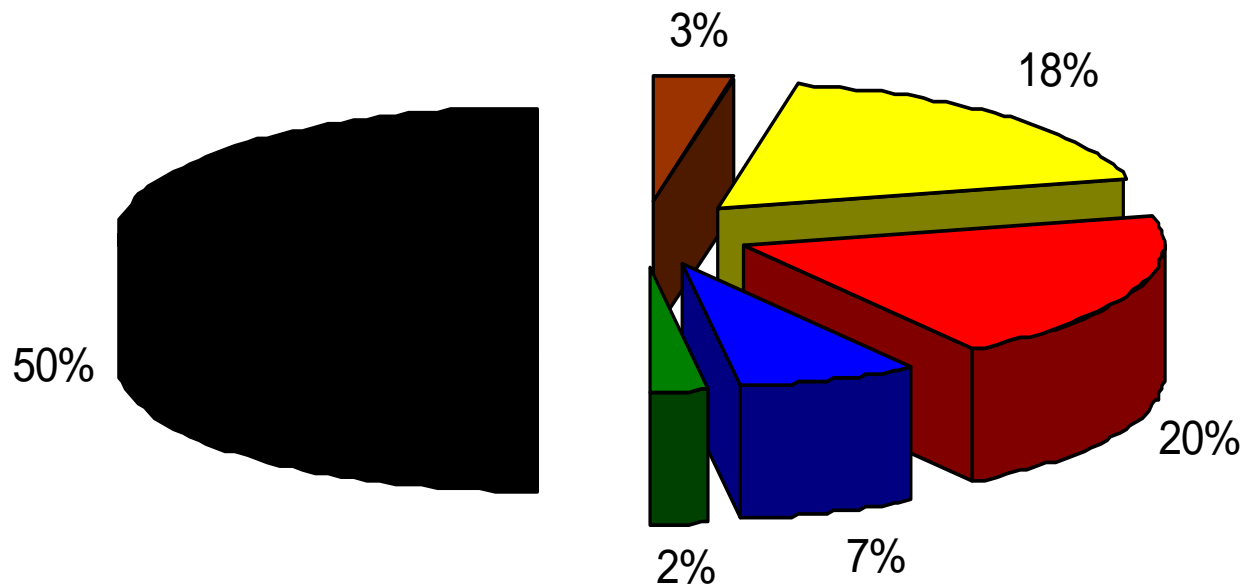
# What is Driving State Renewables Policies?

- “Cleaner” energy production
- No or low water consumption (for some RE)
- Waste reduction
- Fixed, predictable costs
- Use of local or in-state resources
- Local and statewide economic benefits
- Can be deployed in various system sizes
  - Utility-scale
  - Farms and ranches
  - Businesses
  - Homes

# What are the Issues?

- **Cost competitiveness**
  - Higher initial cost hurdle
- **Resource availability**
  - Nationally abundant
  - Regionally/locally specific
- **Technology maturity**
  - Technologies available, but continue to evolve
  - “Newness” involves investment risk, both real and perceived
- **Resource “variability”**
  - Some renewable energy technologies do not act like conventional technologies

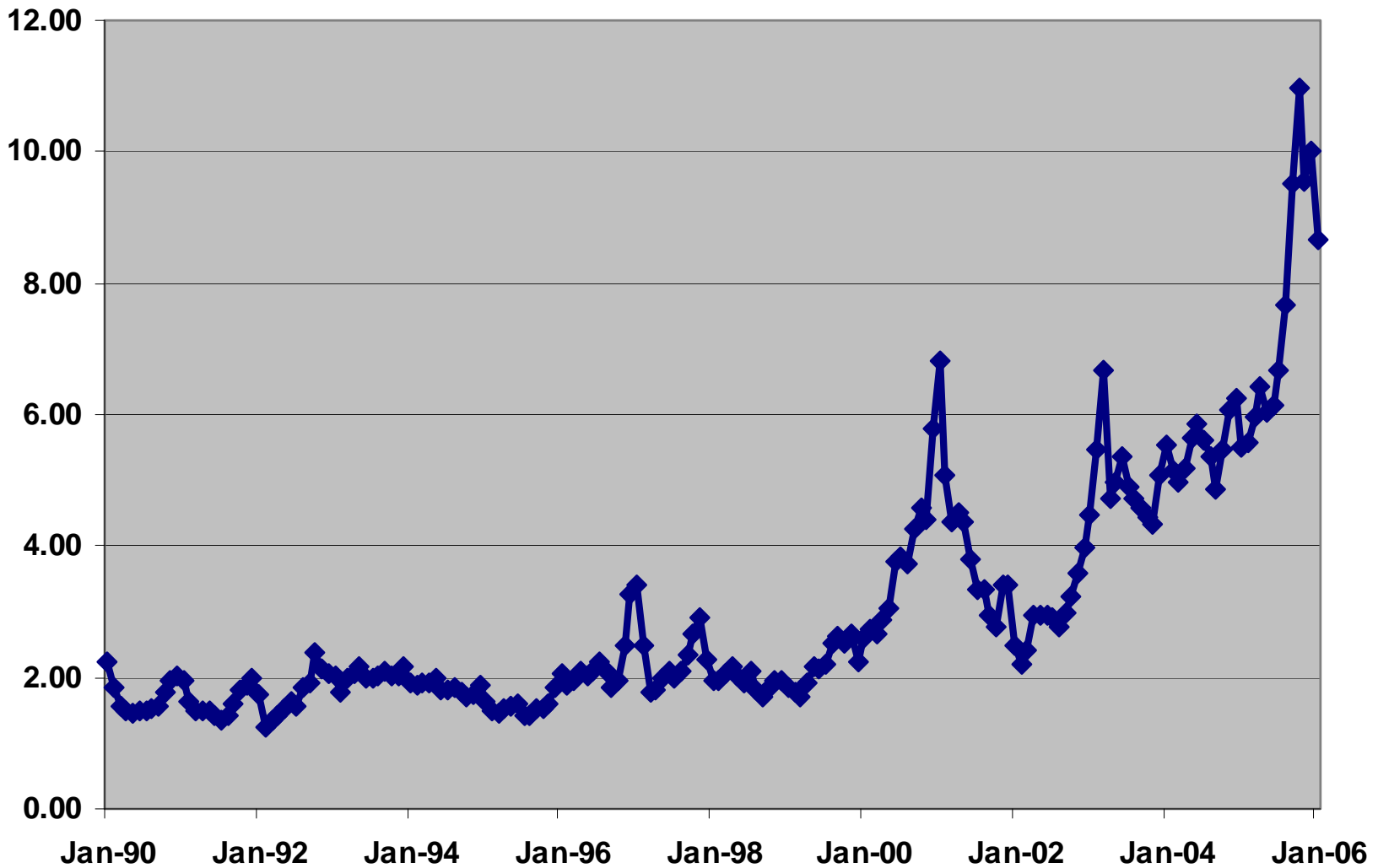
# U.S. Power Supply Mix – 2004



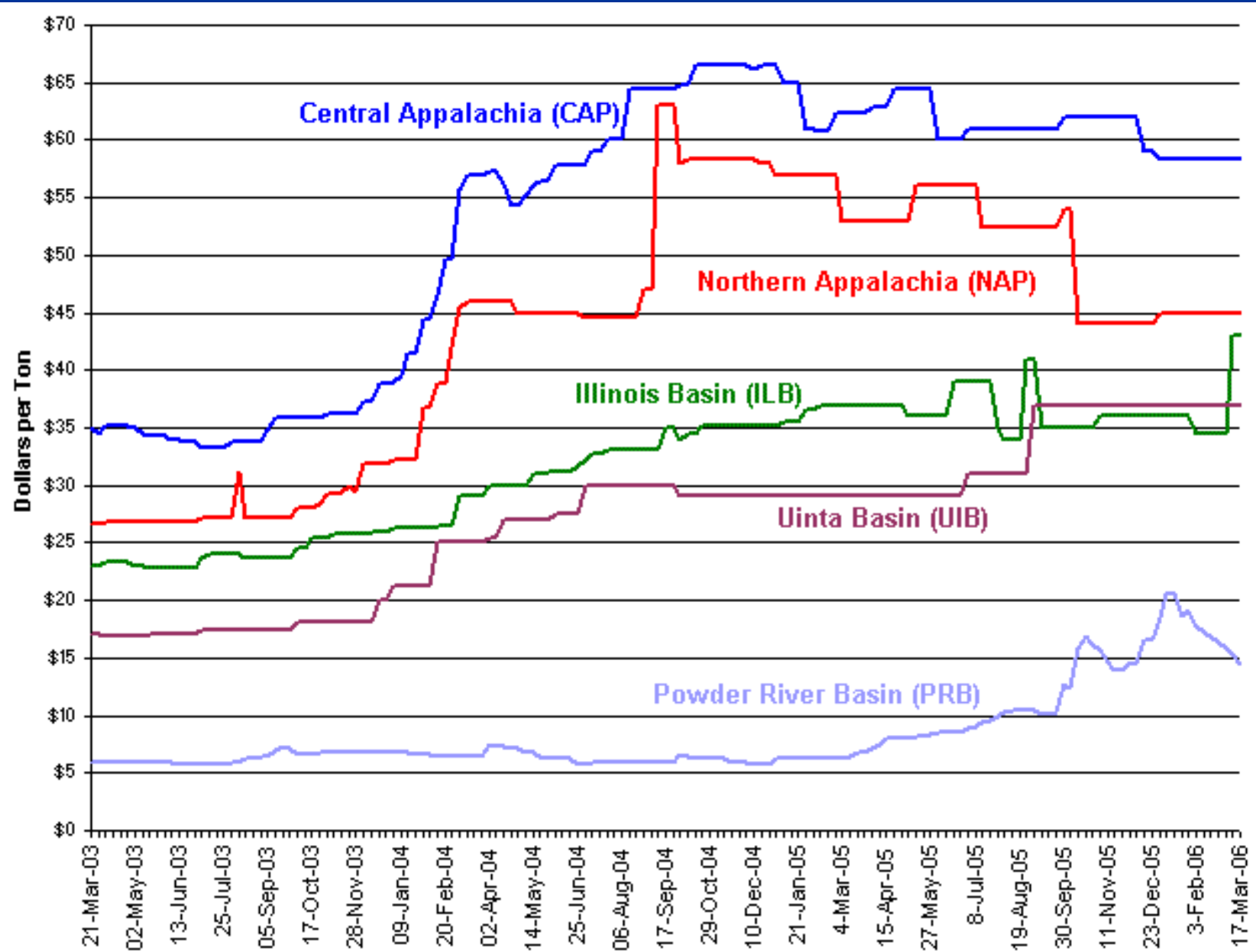
■ Coal ■ Oil ■ Nat Gas ■ Nuclear ■ Hydro ■ Renewables

# U.S. Natural Gas Price Trend

\$/Mcf (wellhead price)



# U.S. Coal Commodity Spot Price Trends



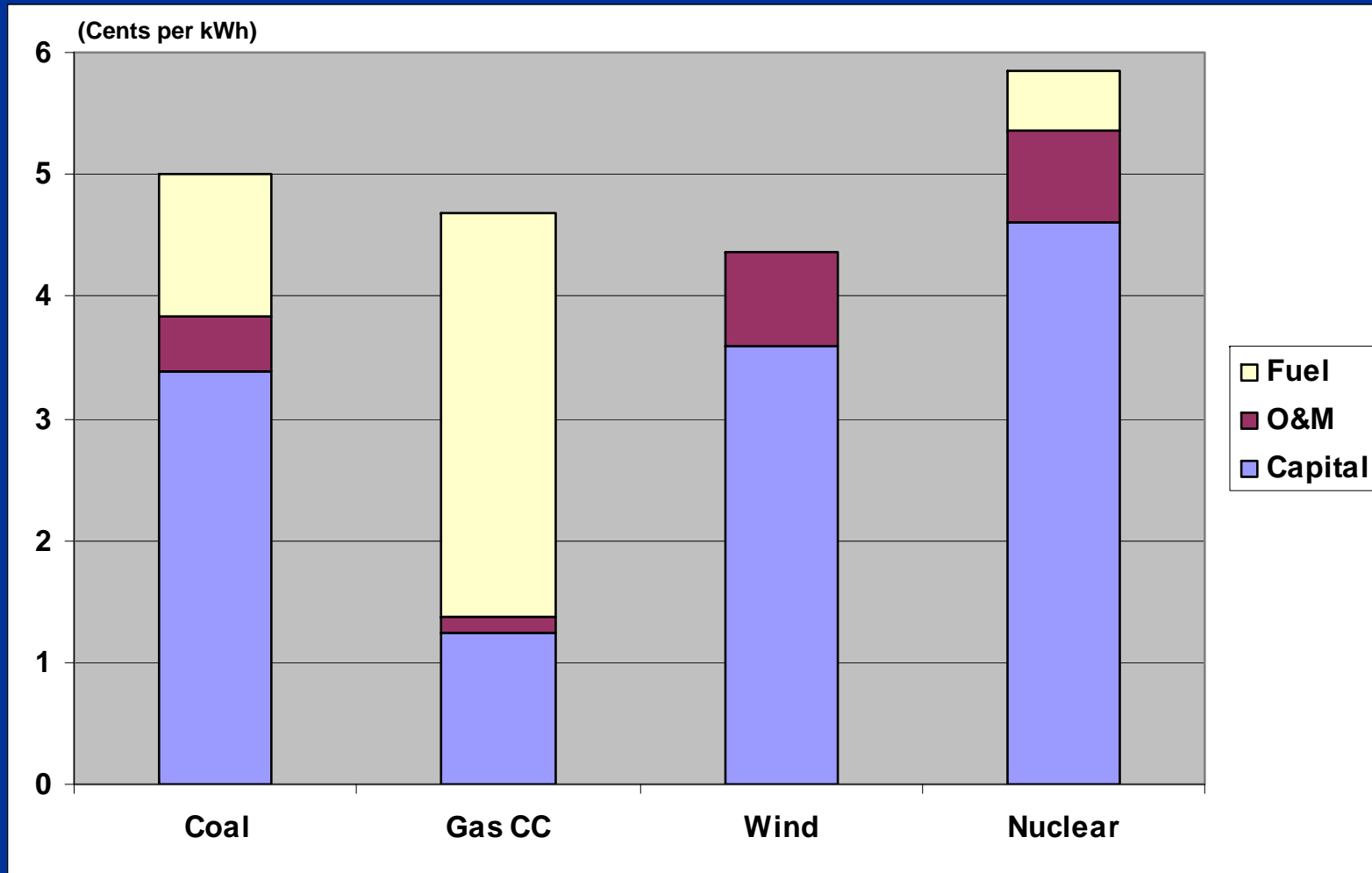
# Cost of New Electricity Generation Sources in Colorado

Wind	2.8 to 3.5¢/kWh
Hydro	3 to 4¢/kWh
Coal	4 to 5¢/kWh
Nat. gas	5 to 6¢/kWh
Solar	10 to 15¢/kWh

Source: Xcel Energy data published in the *Rocky Mountain News* (August 13, 2004)

# Levelized Electricity Costs for New Plants in 2010

(U.S. Energy Information Administration)





# Current State Policy Environment for Renewable Power Development

- **Renewable Portfolio Standards**
  - 20 states (+ D.C.) have enacted a renewable portfolio standard (RPS), ranging from 1% to 30% of total supply.
- **Renewable Energy Funds**
  - 15 states have established customer-funded programs to financially support development of renewable energy sources.
- **Financial Incentives**
  - Many states offer financial incentives of various types.
- **Net Metering**
  - 40 states (+ D.C.) offer net metering but policies vary by technology types and size limits.
- **Voluntary Green Power Markets**
  - Several states require utilities to offer a voluntary “green power” tariff to customers.
  - Renewable Energy Certificates (RECs)

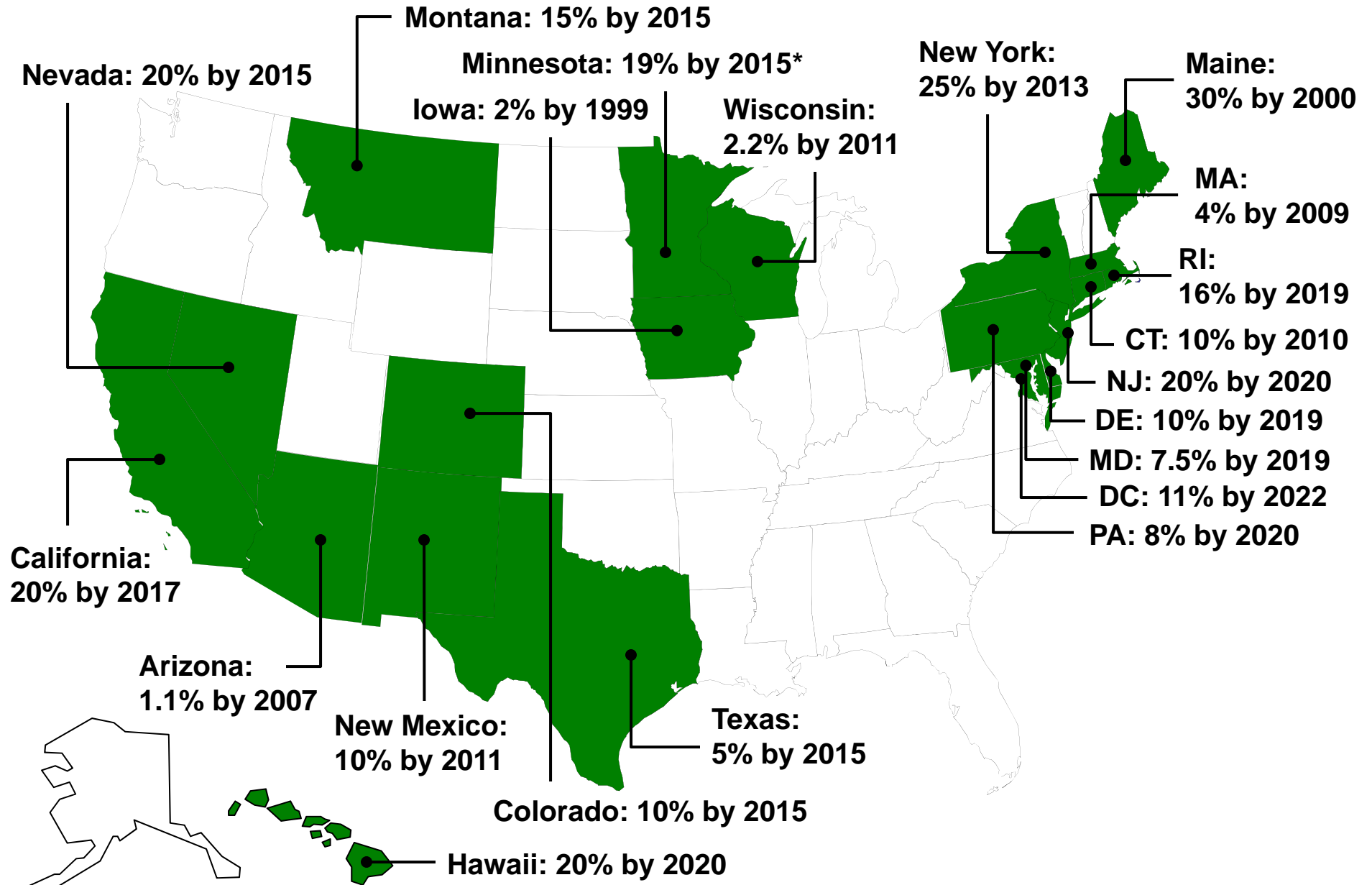
# Renewable Portfolio Standards

Requires utilities/suppliers to provide a certain amount or percentage of overall electricity supply from renewable energy sources.

## Current Status

- 20 states (+ DC) have RPS policies.
- RPS requirements range from 1.1% (AZ - old) to 30% (ME).
- Additional states have renewable energy goals (IL, MN, VT).
- Some states have increased the level (AZ, NV, NJ, TX), or are considering an increase in the level (IA, WI) or an acceleration of the compliance timeline (CA).
- Other states are considering an RPS (MI, WA).
- Some states are failing to meet near-term compliance requirements (MA, NV). Other states will comply early (CO, TX).

# State Renewable Electricity Standards

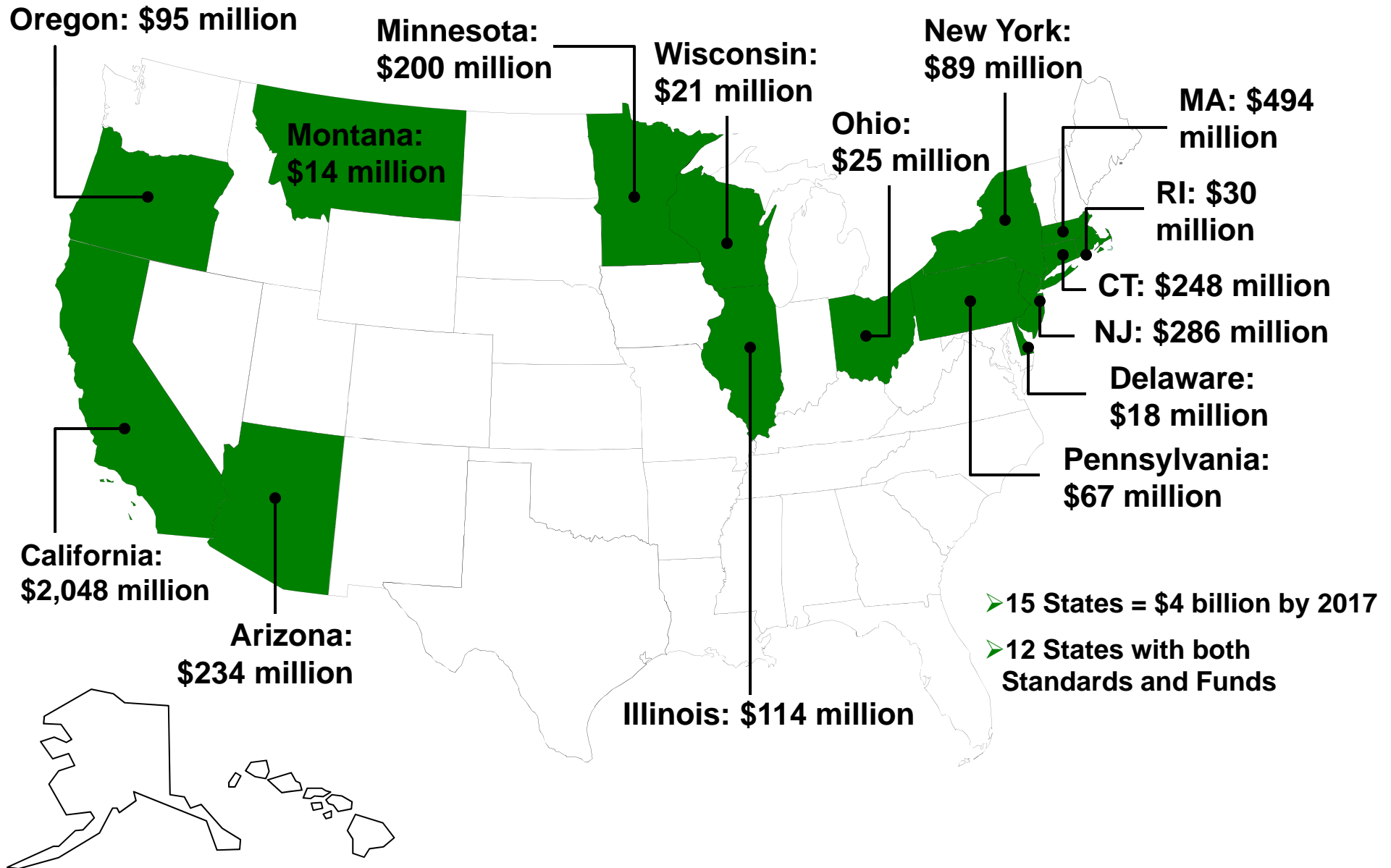


\*Includes requirements adopted in 1994 and 2003 for one utility, Xcel Energy.

# State RPS Policies are not Uniform

- RPS structure
- Standard levels
- Resource eligibility
- Tiers and set-asides
- Extra credit for certain resources/technologies
- Treatment of existing plants
- Start and end dates
- Cost caps
- Cost recovery mechanisms
- Obligated parties
- Procurement mechanisms
- Enforcement/penalties
- Compliance flexibility
- Use of renewable energy credits (RECs)
- Administration

# State Renewable Energy Funds

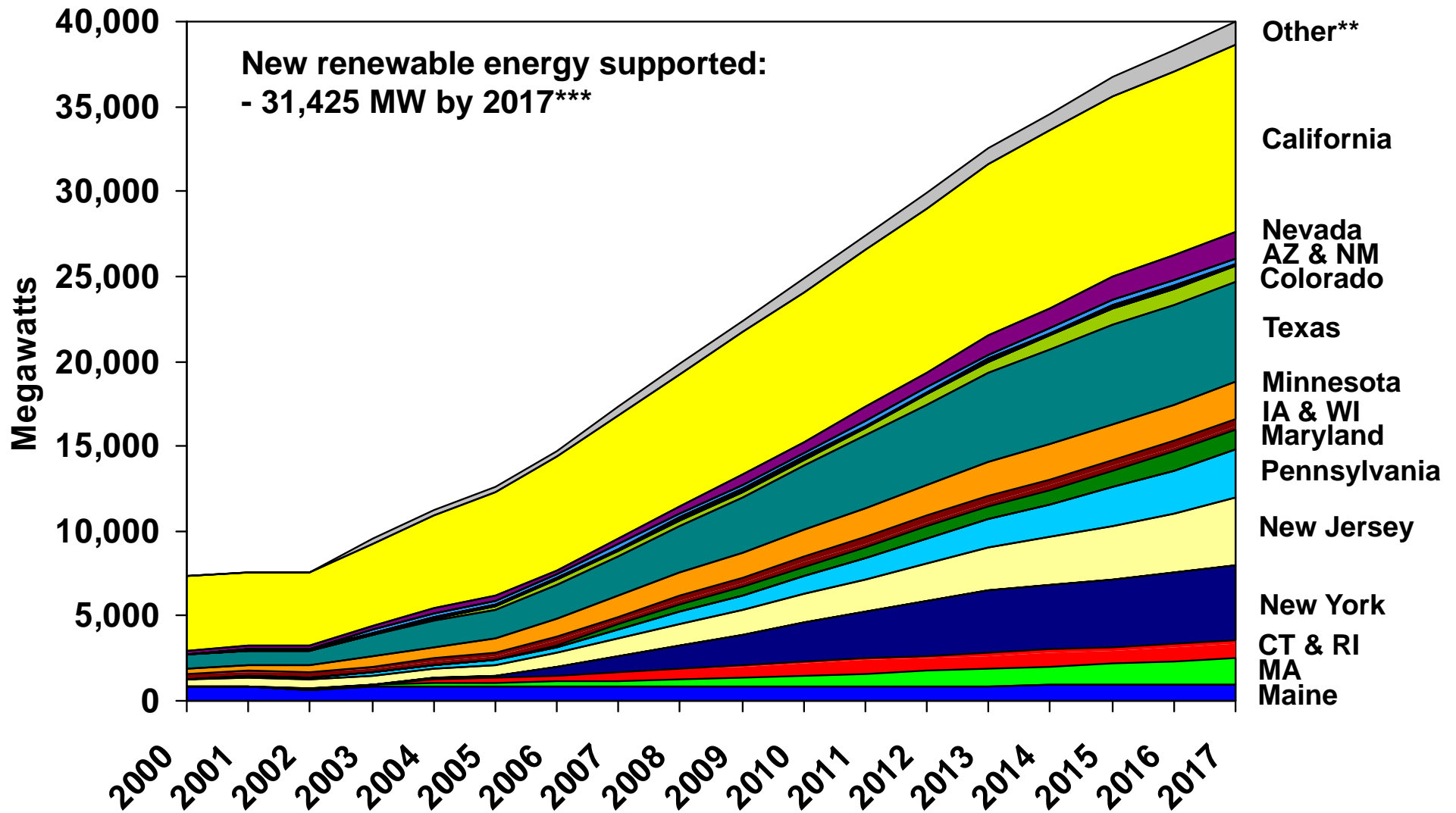


Source: Union of Concerned Scientists

# How are Renewable Energy Funds Used?

- **Provide financial incentives for system deployment.**
  - Production incentives, grants, customer rebates, etc.
- **Provide price guarantees for electricity output in order to facilitate project financing.**
- **Support development of in-state industry and delivery infrastructure.**
  - Resource assessments
  - Business development
  - Contractor training
  - Some states are taking an equity position in companies.
- **Educate the public about renewable energy options.**

# Renewable Energy Expected From State Standards and Funds\*



\*Projected development assuming states achieve annual RES targets.

\*\*Includes Delaware, Hawaii, Illinois, Montana, Ohio, Oregon, and Washington D.C.

\*\*\*If achieved, IA, IL, and MN goals would support an additional 5,300 MW by 2017.

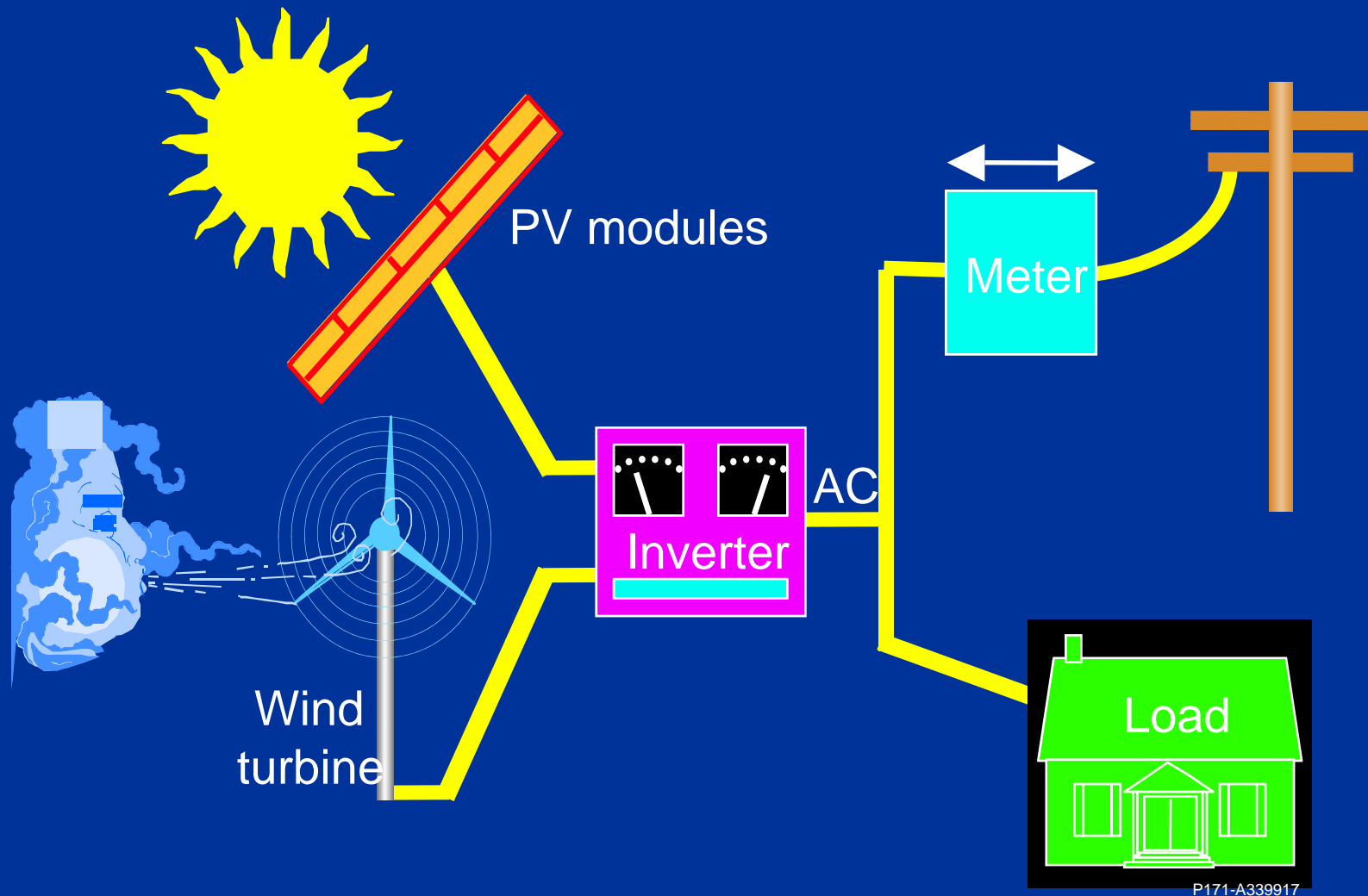
Source: Union of  
Concerned Scientists

# Types of State Financial Incentives

- Personal and Corporate Tax Incentives
- Grant Programs
- Industry Recruitment Incentives
- Loan Programs
- Production Incentives
- Property Tax Exemptions, Exclusions and Credits
- Sales Tax Exemptions
- Rebate Programs



# Net Metering On-Grid AC System without Storage



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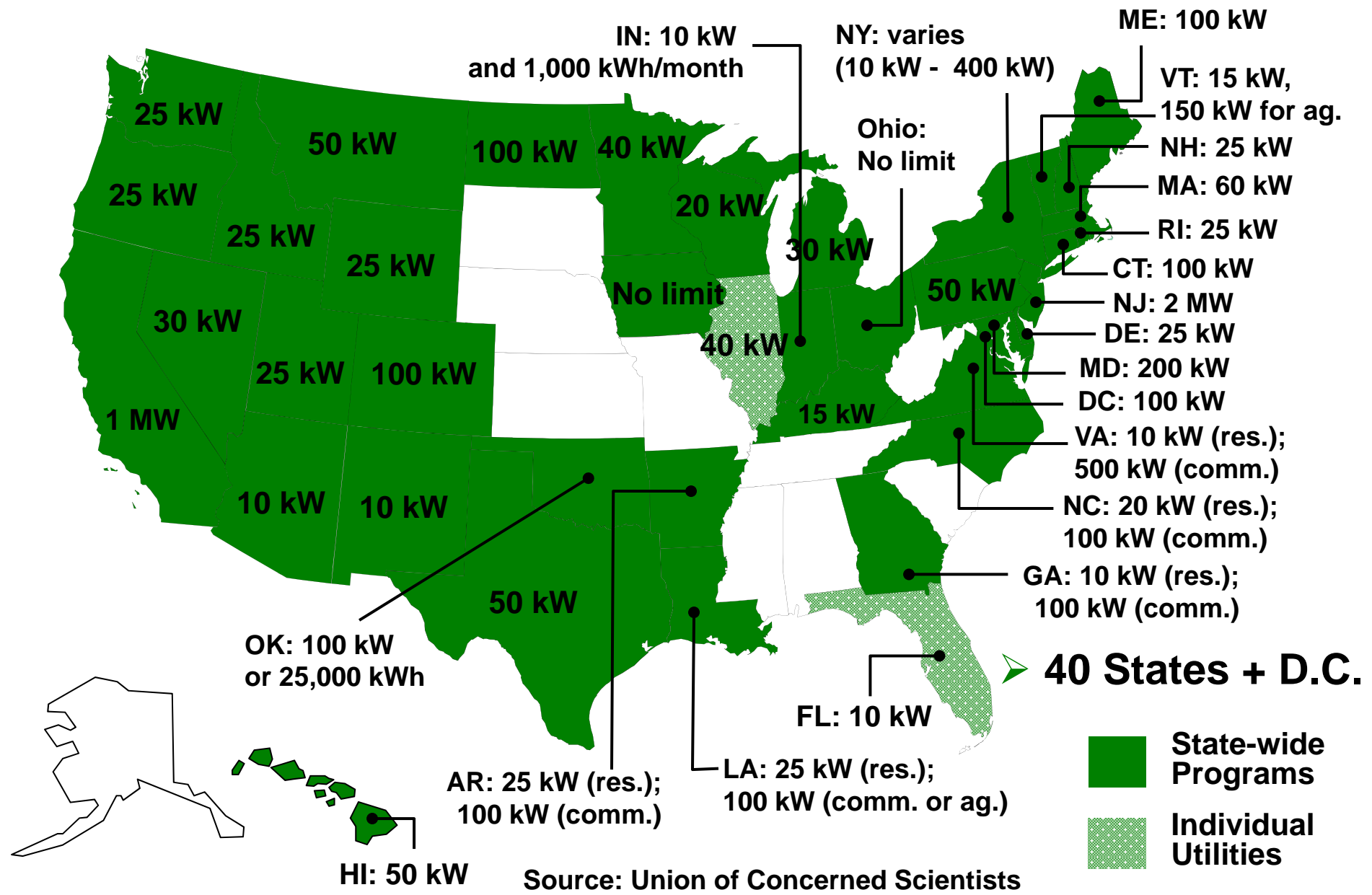
# Net Metering

- **Customer meter spins backward when the system generates power in excess of demand.**
- **Customer-generators can “bank” excess generation for later use and thus are credited at the retail rate for electricity generated.**
- **Provides significant improvement to the economics of customer-sited systems.**
- **40 states (+ D.C.) have enacted policies or otherwise offer some form of net metering.**
- **Federal EPACT 2005 energy law requires electric utilities to make a net metering service available upon request within three years.**

# Net Metering Policy Design Issues

- **Issues**
  - Determine qualifying technologies and capacity limits (range from <10kW to <1,000 kW).
  - Determine treatment of generation/consumption mismatch.
- **“Best Practices”**
  - Monthly carryover with annual true-up.
  - Interconnection issues addressed with standard contracts and uniform safety/insurance requirements.

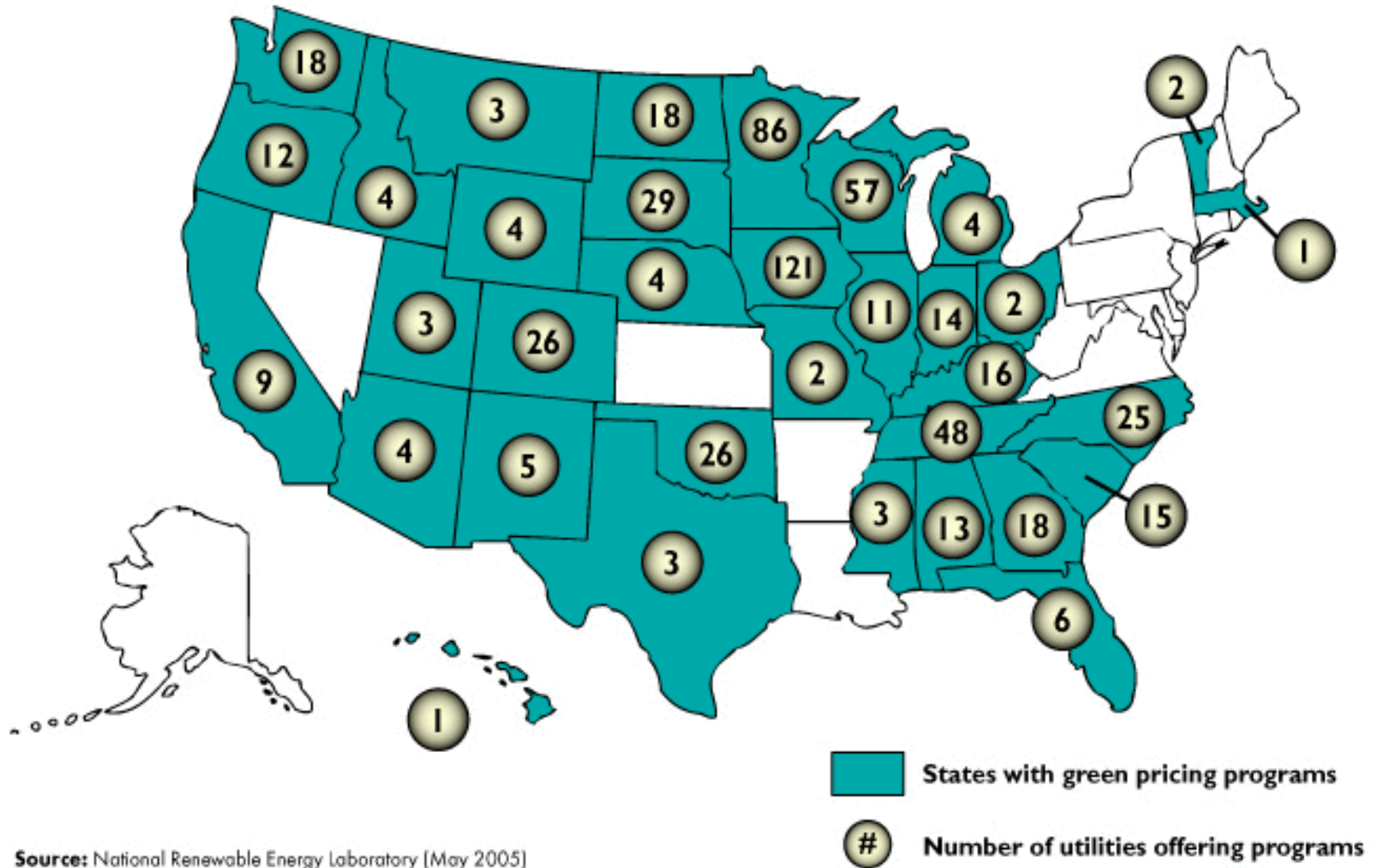
# Net Metering Programs



# “Green Power” Requirements

- “Green pricing” is a special tariff that utilities offer for the purchase of renewable energy either in 100-kWh blocks or as a % of the customer’s monthly use.
- Rate premiums generally range from 1¢/kWh to 3¢/kWh.
- While most utility green pricing programs are voluntary, several states require utilities to offer a purchase option.
  - (IA, MN, MT, NM, OR, and WA)
- A number of states have established green power purchasing targets for state government (“lead by example”):
  - MD – 6%; PA – 10%; NJ – 10%; NY – goal of 10% by 2005 and 20% by 2010; CT – 20% by 2010; ME – goal of 50%
- Counties and municipalities are also setting renewable energy purchase goals.

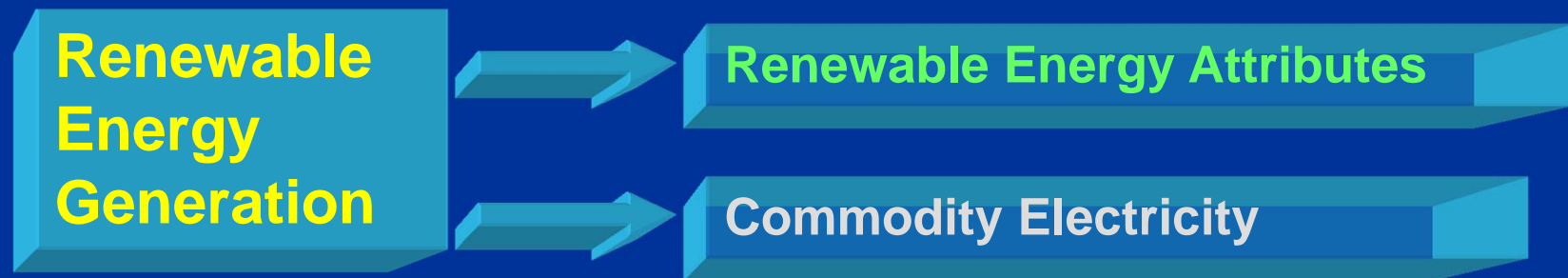
# Utility Green Pricing Activities



Source: National Renewable Energy Laboratory (May 2005)

# Renewable Energy Certificates (RECs)

## What is a REC?



- A REC represents the attributes of renewable energy sold separately from the commodity electricity
- RECs are also known as green tags, green tickets, renewable energy credits, tradable renewable energy certificates (TRCs)

# Advantages of RECs

- Monetizes the value of the attributes separately from the commodity electricity.
- Avoids issues of resource variability and load matching between the seller and the buyer.
- Avoids renewable electricity deliverability requirements.
- Can be sold across geographic boundaries.
- Allows consumers to support renewables even if their suppliers don't provide green power options.
- RECs from small, distributed projects can be aggregated.
- Can provide an additional revenue stream for renewable energy projects.



# Top 20 U.S. Green Power Purchasers

(as of March 20, 2006)

1. U.S. Air Force (1.07 billion kWh)
2. Whole Foods Market (463 million kWh)
3. Johnson & Johnson (306 million kWh)
4. U.S. Environmental Protection Agency (259 million kWh)
5. U.S. Department of Energy (160 million kWh)
6. Starbucks (150 million kWh)
7. HSBC North America (125 million kWh)
8. University of Pennsylvania (112 million kWh)
9. The World Bank Group (107 million kWh)
10. IBM Corporation (94 million kWh)
11. Safeway Inc. (87 million kWh)
12. U.S. GSA / Region 2 (76 million kWh)
13. City of San Diego, CA (65 million kWh)
14. NJ Consolidated Energy Savings Prog. (55 million kWh)
15. AMD / Austin, TX Facilities (52 million kWh)
16. WhiteWave Foods (50 million kWh)
17. Staples (49 million kWh)
18. Austin (TX) Independent School District (48 million kWh)
19. Mohawk Fine Papers Inc. (45 million kWh)
20. The Tower Companies (41 million kWh)



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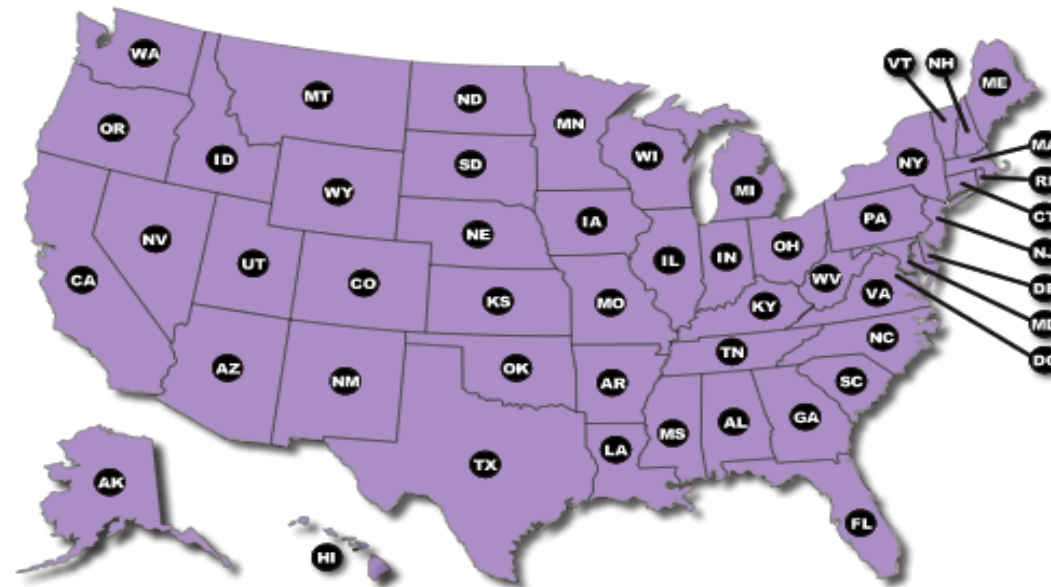
**Schools  
Going Solar**

**New / Updated  
Incentives**

The Database of State Incentives for Renewable Energy (DSIRE) is a comprehensive source of information on state, local, utility, and selected federal incentives that promote renewable energy. To access information, use the menu to the left or click on the maps below.



Federal Incentives



US Territory Incentives

Last Updated: 06/24/04



# The Green Power Network

[www.eere.energy.gov/greenpower](http://www.eere.energy.gov/greenpower)

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**TOP 10** Top Ten Utility Green Power Programs  
UPDATED FOR 2004

Total **NEW** renewables capacity!  
**1647338** kW  
For details, click the counter.

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## 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

### EPA Highlights 'Top 25' Green Power Purchasers

The U.S. Environmental Protection Agency's (EPA) Green Power Partnership released its list of the nation's "Top 25" green power purchasers. The U.S. Air Force leads the list with annual renewable energy purchases of 321 million kWh for Air Force bases across ...

[See full story...](#)

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The **Tenth National Green Power Marketing Conference** is scheduled for **October 24-26, 2005** in **Austin, TX.**

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