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Biomass Power Policy

and

Information Resources

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NC Solar Center

www.ncsc.ncsu.edu

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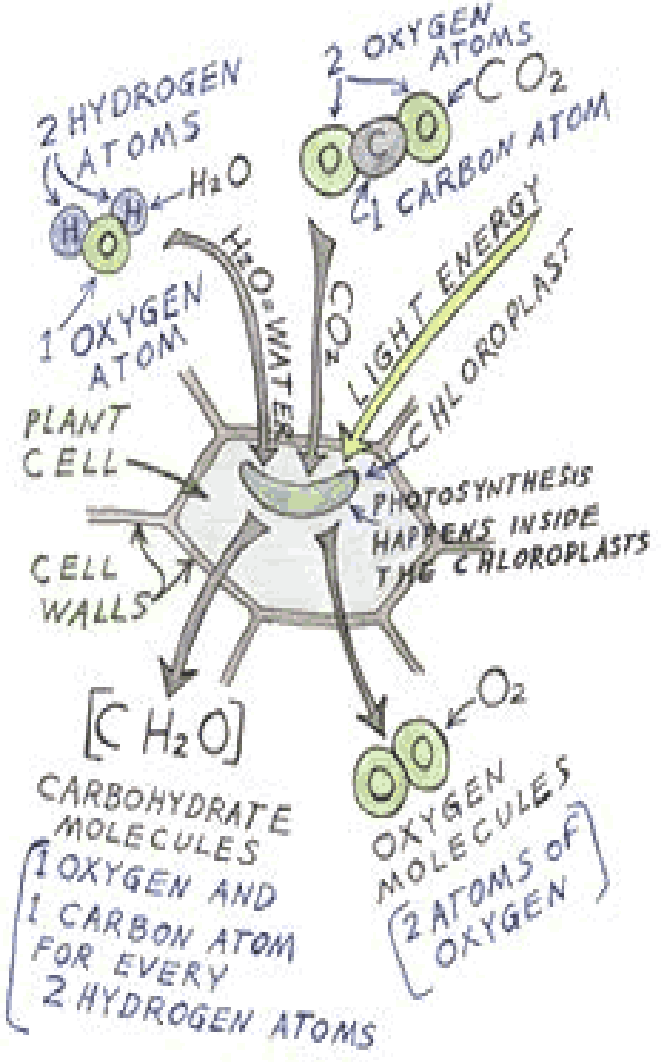
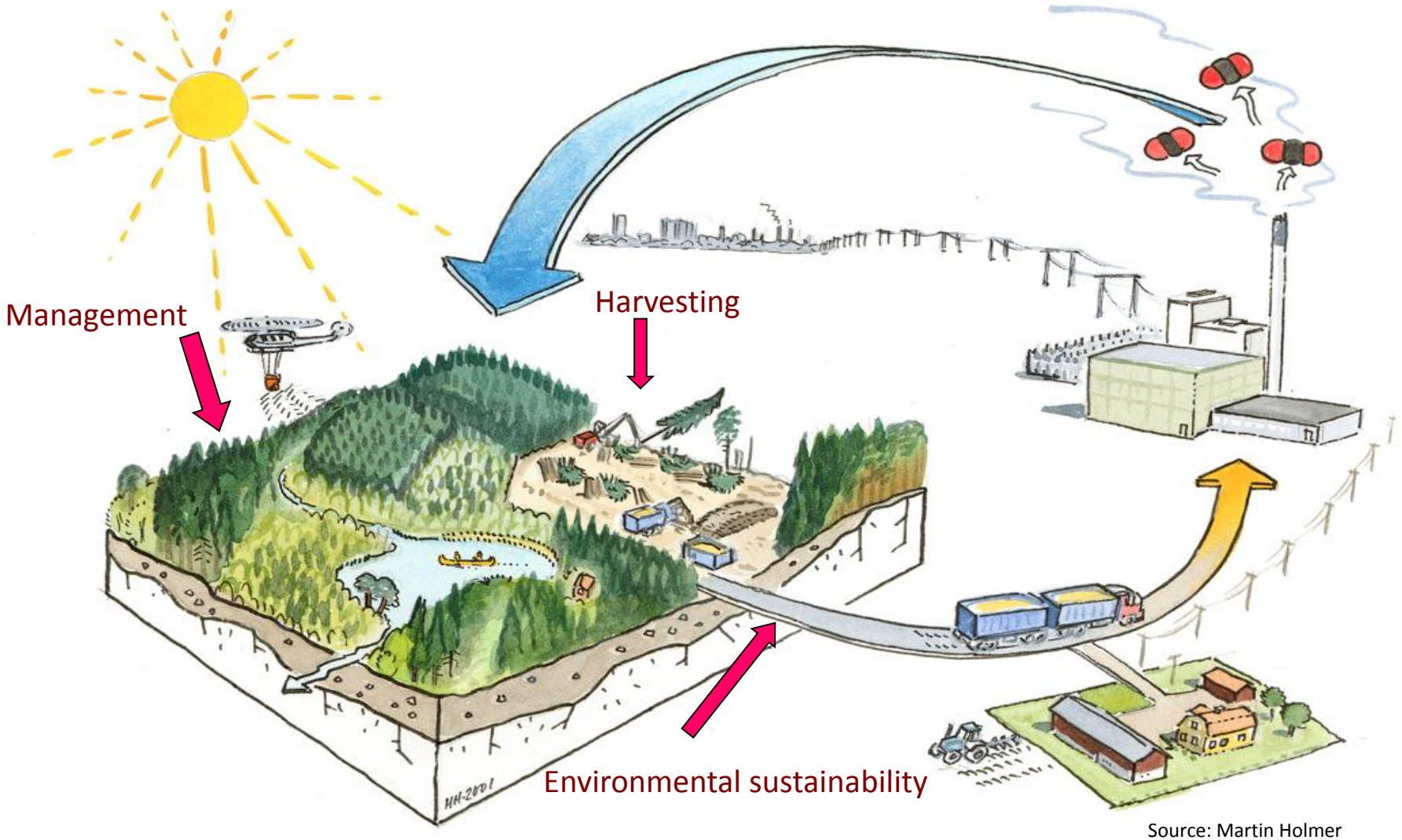
NC's most widely deployed solar collector?

Woody Biomass from Solar Power

$$6\ CO_2 + 6\ H_2O + \text{Sunlight} \xrightarrow{\text{nutrients}} (CH_2O)_6 + 6\ O_2$$

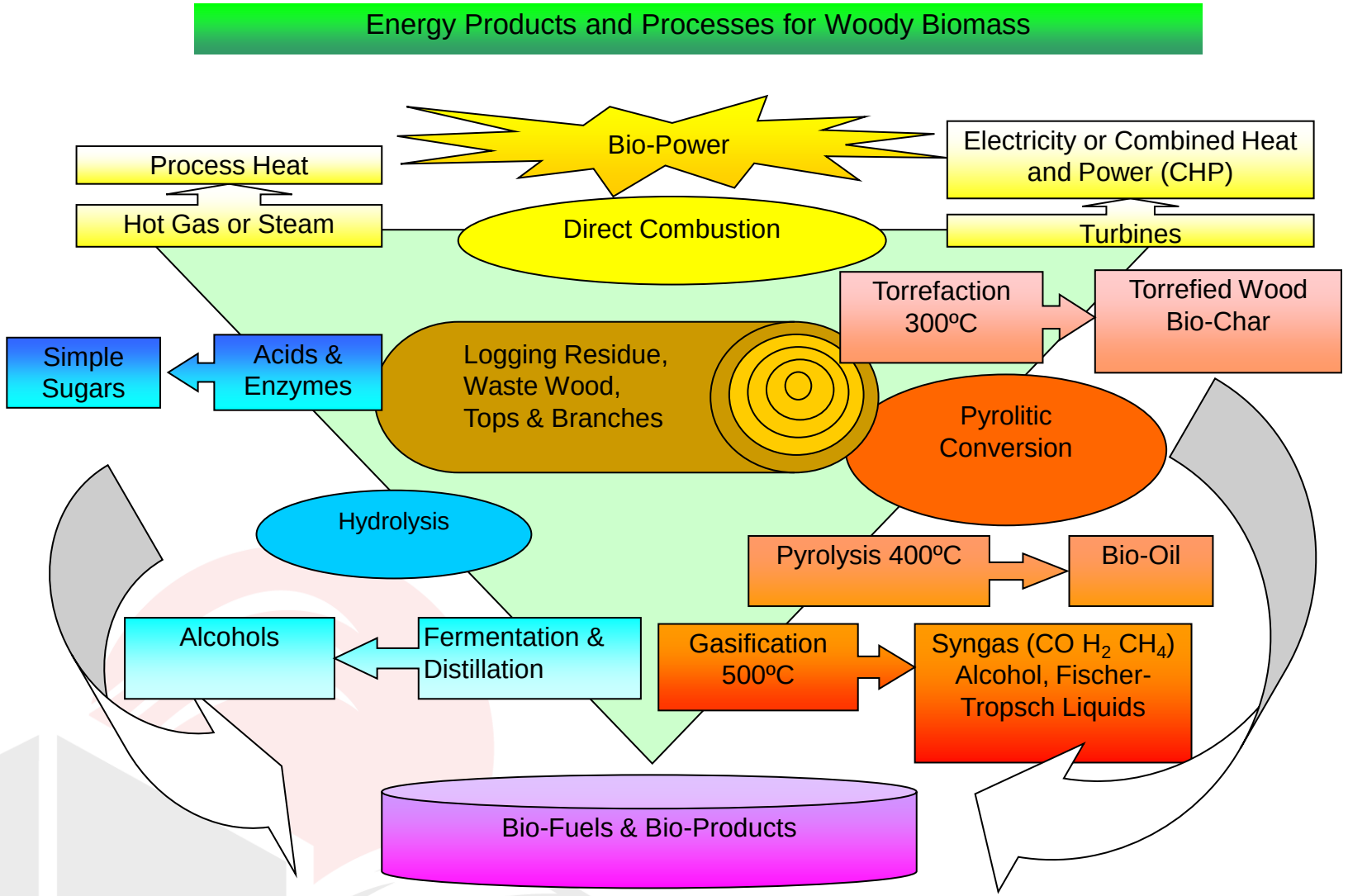


Biomass R&D Act of 2000



Source: Martin Holmer

Energy Conversion Technologies



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Chris Hopkins-NCSU

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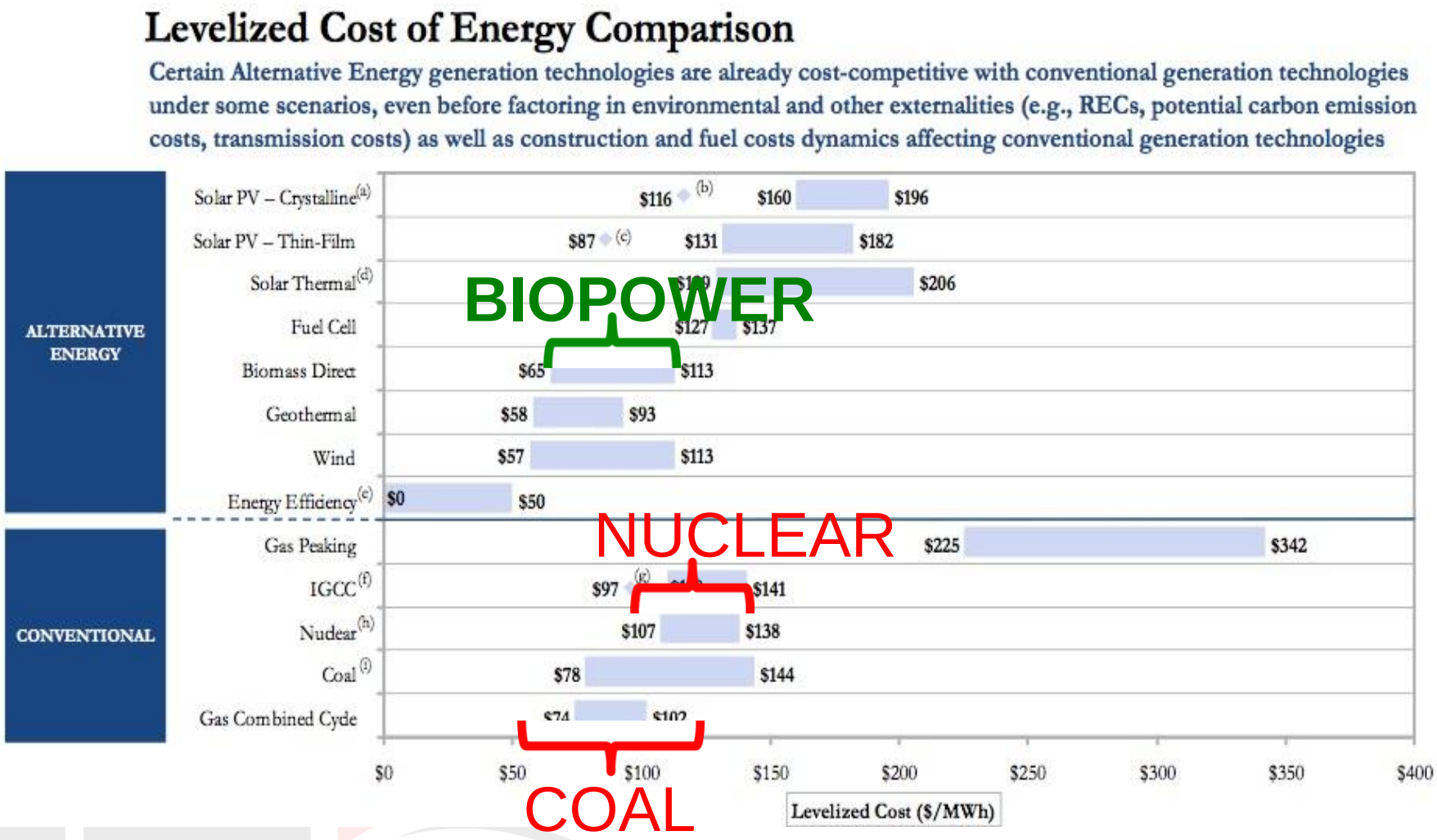
Biopower is Cost-Competitive



Source: Lazard's Levelized Costs of Energy, 2009

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What are local “issues” that push adoption of Biomass Power

- **Agricultural community** is politically strong and owns renewable energy resource
- **Economic development** opportunities for depressed regions that need jobs
- **Air quality and climate change** issues can make strange bedfellows
- **Energy security and independence** perceived as critical need
- **Price Volatility and Escalation** – How much will fuel cost next year?
- **Business community** has turned a corner – green for marketing & touting social responsibility
- **Distributed Generation Technologies** are coming to market at higher efficiencies and lower emissions

Information Resources

- DOE Information Bridge http://www.osti.gov/bridge/basicsearch.jsp
  - Search “Biomass” to find 10101 publications, so refine your search from there
- 25x25 http://www.25x25.org/index.php
- Database of State Incentives for Renewables & Efficiency (aka DSIRE) http://www.dsireusa.org/

The DSIRE Project

Database of State Incentives for Renewables & Efficiency

- Created in 1995
- Managed by NC Solar Center in partnership with IREC
- Funded by U.S. DOE
- ~2,700 RE & EE financial incentives & regulatory policies
- Federal, State, Local, Utility
- ~ 500,000 visitors/month

www.dsireusa.org

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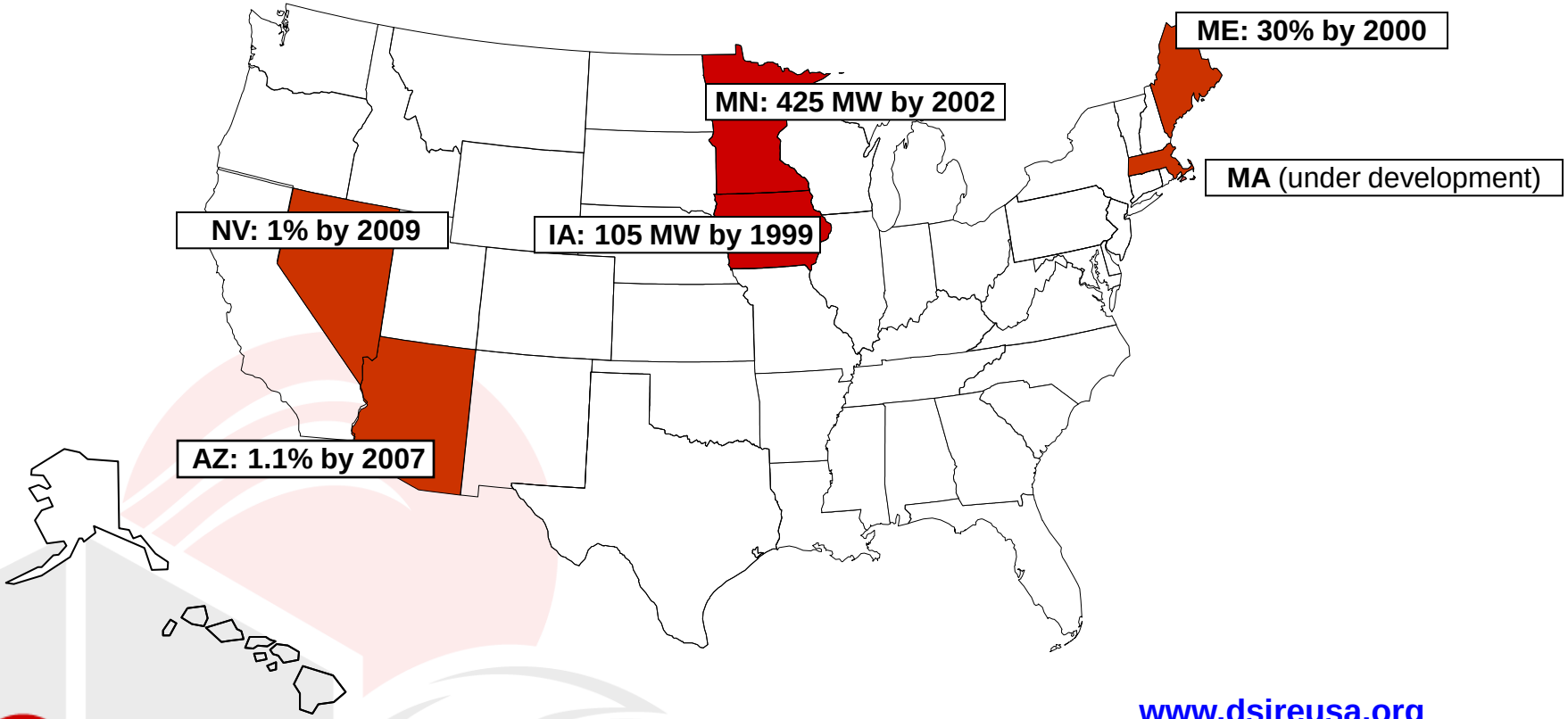
Renewable Portfolio Standards, 1997
A Governmental Mandate for Renewables



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DSIRE™

Database of State Incentives for Renewables & Efficiency

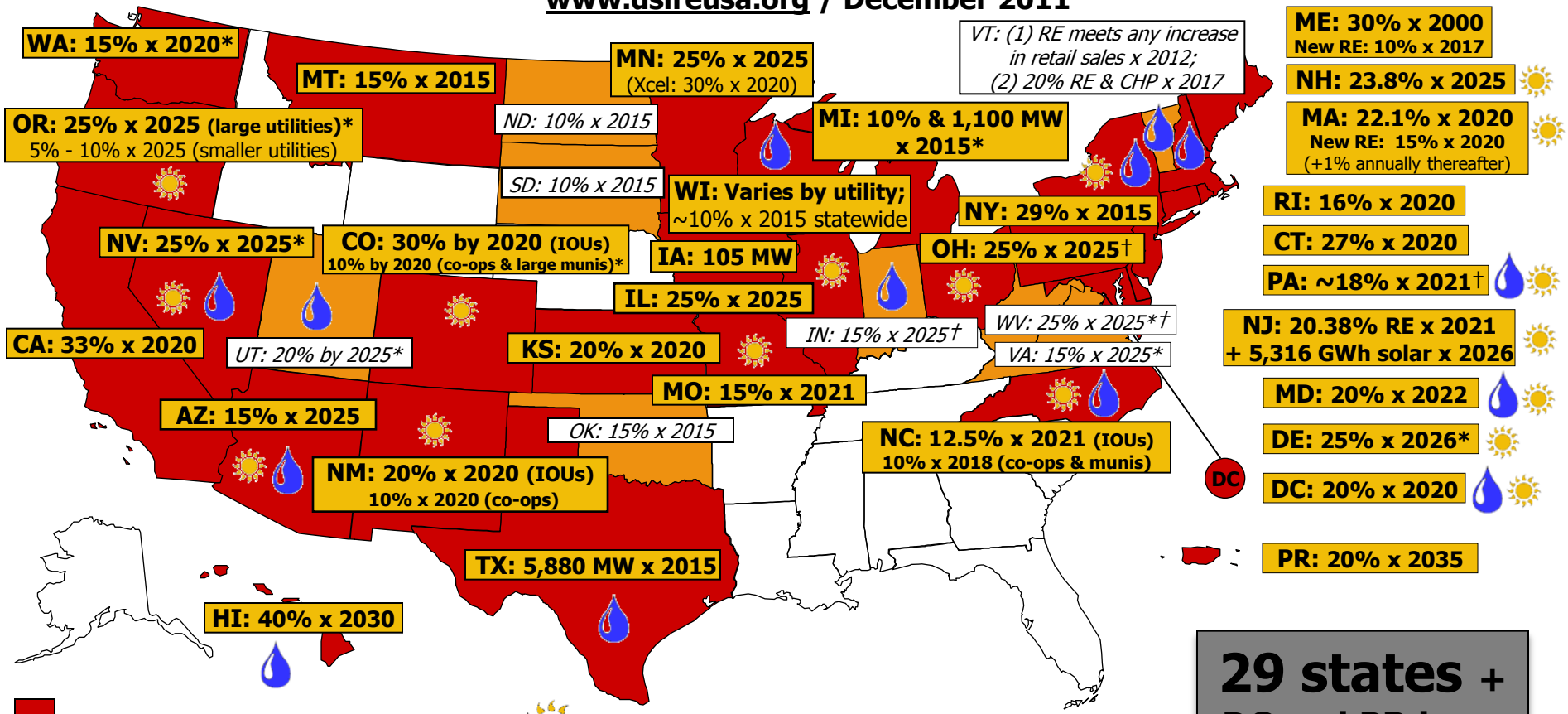
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

IREC Interstate Renewable Energy Council

North Carolina Solar Center

RPS Policies

www.dsireusa.org / December 2011



Renewable portfolio standard

Renewable portfolio goal

Solar water heating eligible

Minimum solar or customer-sited requirement

* Extra credit for solar or customer-sited renewables

† Includes non-renewable alternative resources

29 states + DC and PR have an RPS

(8 states have goals)

DSIRE™
Database of State Incentives for Renewables & Efficiency

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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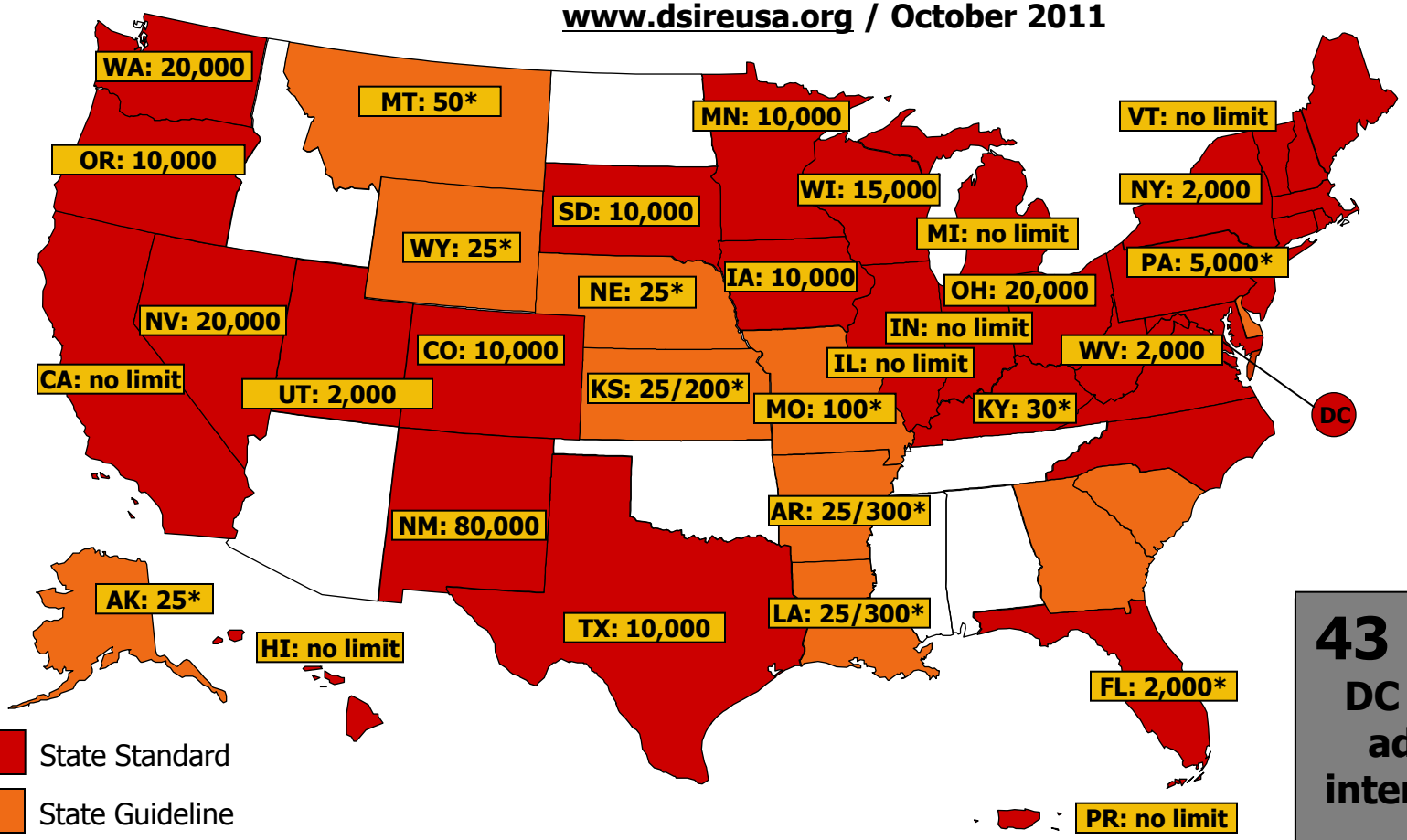
North Carolina Solar Center

Interconnection Policies

www.dsireusa.org / October 2011



ME: no limit
NH: 1000*
MA: no limit
CT: 20,000
RI: no limit
NJ: no limit
MD: 10,000
DE: 20,000*
DC: 10,000
VA: 20,000
NC: no limit
SC: 20/100
GA: 10/100*

State Standard

State Guideline

* Standard or Guideline only applies to net-metered systems

43 States + DC & PR have adopted an interconnection policy

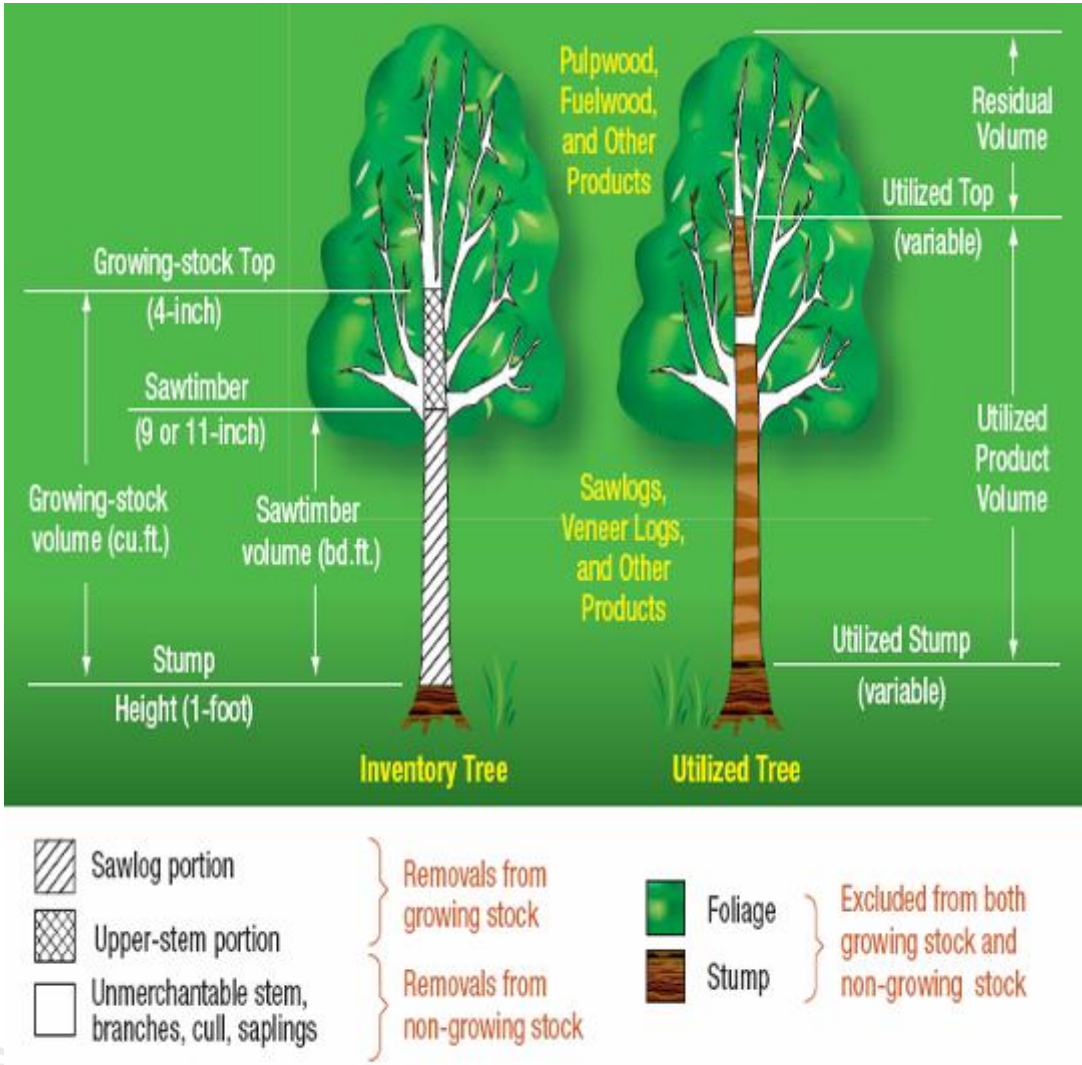
Notes: Numbers indicate system capacity limit in kW. Some state limits vary by customer type (e.g., residential/non-residential). "No limit" means that there is no stated maximum size for individual systems. Other limits may apply. Generally, state interconnection standards apply only to investor-owned utilities.

UNC - Chapel Hill CFB Cogeneration Plant

Wood residues

The conversion of woody biomass to energy poses a unique opportunity to address three issues in much of the Southeast:

- The need to restore forest health
- The need to find renewable energy alternatives
- The need to provide economic development in rural communities



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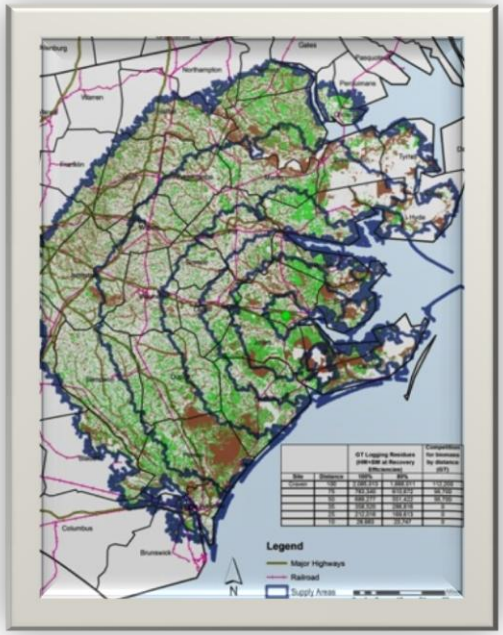
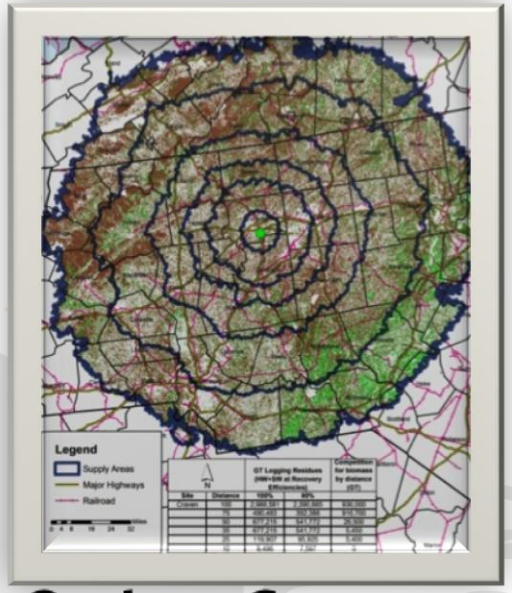
There is a significant proportion of wo available from gleaning logging residues.

Biomass harvests can reduce site preparation costs and speed replanting.

Biomass markets can make management of poor quality stands profitable by making pre-commercial thinnings into commercial thinnings.





Distance-based Assessment

- Determine Biomass Resources Based on Cost-effective Transportation Networks
- Site Specific
- Data from Border States

Supply Area	Average Whole-tree Chips Supply Potential; (85% recovery efficiency) (gt/yr)	Potential Drain on Whole-tree Chips (gt/yr)	Net Average Whole-tree Chips Supply Potential (gt/yr)	Whole Tree Chips Potential of Standing Timber Over 5 inches (Non-Merchantable Portion) (85% Recovery Efficiency) (gt/yr)
60-mile	2,269,681	924,691	1,344,990[1]	17,001,257[1]
50-mile	1,669,102	664,162	1,004,940[1]	12,342,261[1]
40-mile	999,003	372,029	626,973[1]	7,549,427[1]
30-mile	531,889	194,646	337,243[1]	4,066,791[1]
20-mile	213,441	56,374	157,066[2]	1,714,256[1]
10-mile	40,199	9,832	30,367[2]	320,342[1]

Do we have some questions?

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