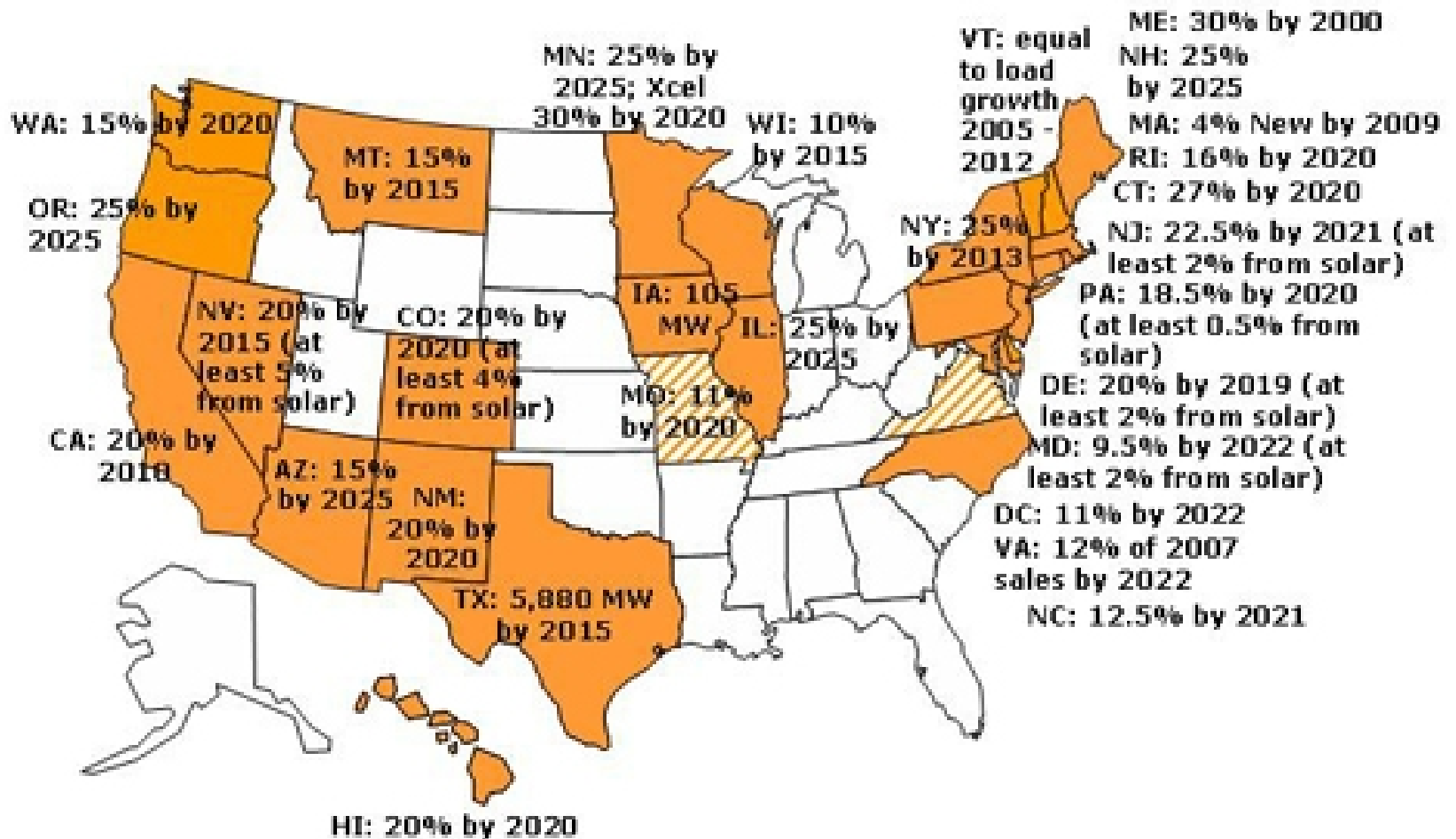


Government Economic Development Incentives for BioMass Power Projects

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Renewable Portfolio Standards

- More than 25 states and the District of Columbia have set RPS requirements, potentially requiring more than 61,000 MW of new renewable energy projects by 2030, with biomass expected to provide most of this additional generation given its cost advantage.



Mandatory RPS



RPS implemented through voluntary utility commitments

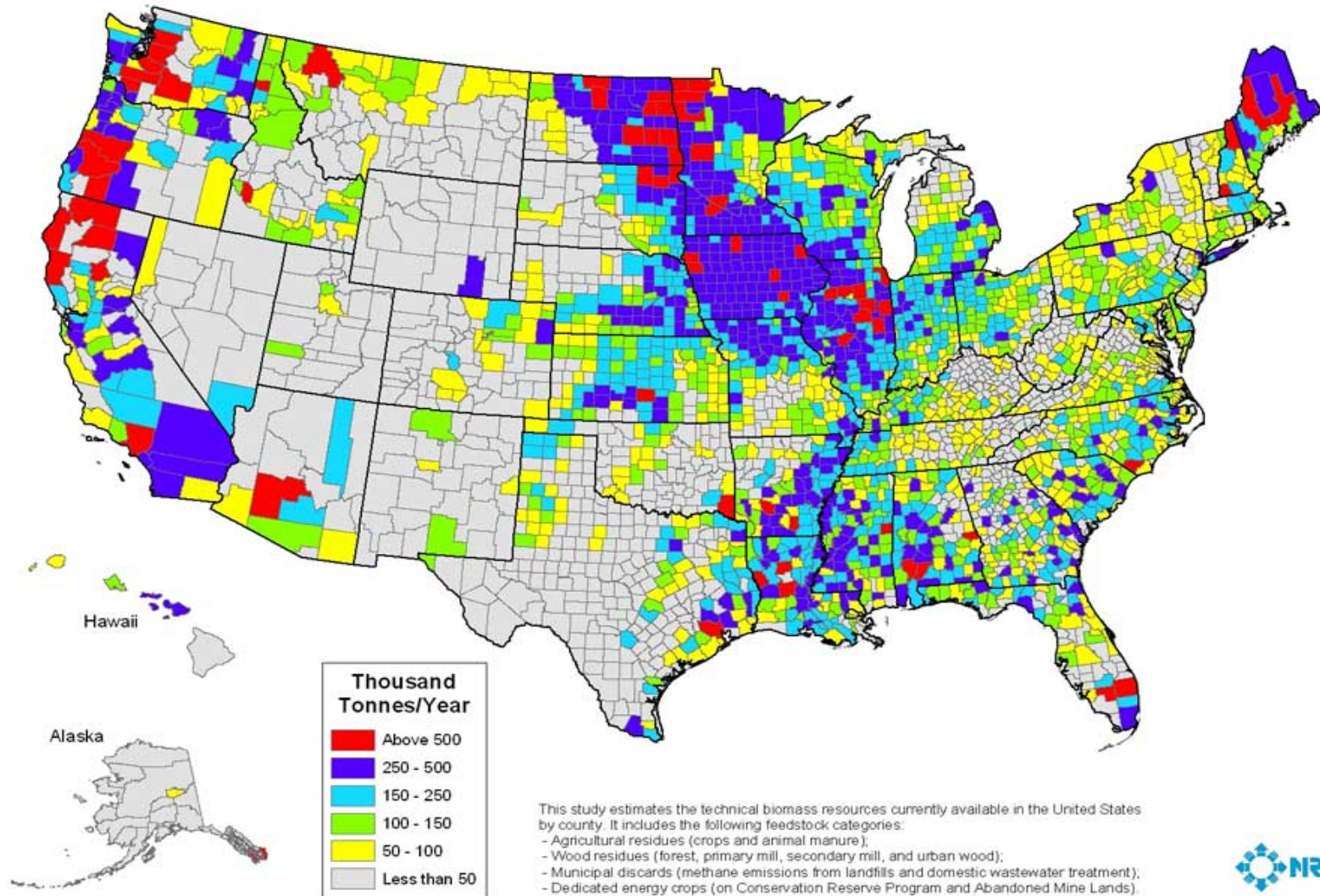
- Biomass' relies on legislation or regulation to compete with fossil fuels in the near term based on the environmental attributes of renewable energy.
- Renewable energy certificates (RECS), represent the environmental attributes of renewable energy are being sold in wholesale and retail markets across the U.S. The electricity generated by biomass can be sold at market price and the RECs typically sell from 1.5-2.5¢/kWh which could provide an additional revenue stream.

- Biomass is currently the largest domestic source of renewable energy providing 2.8% of total U.S. energy consumption. Wood is the largest feedstock accounting for 70% of U.S. biomass consumption for energy.
- However, other feedstocks can also be used including grassy crops, woody crops, food crops, agricultural residue, forestry residue, organic municipal waste, organic industrial waste, and landfill gas.
- Today biomass is mostly used for cogeneration in industrial processes which have biomass waste such as pulp and paper. From a grid standpoint, very little biomass is used to generate electricity directly or co-fired with coal.

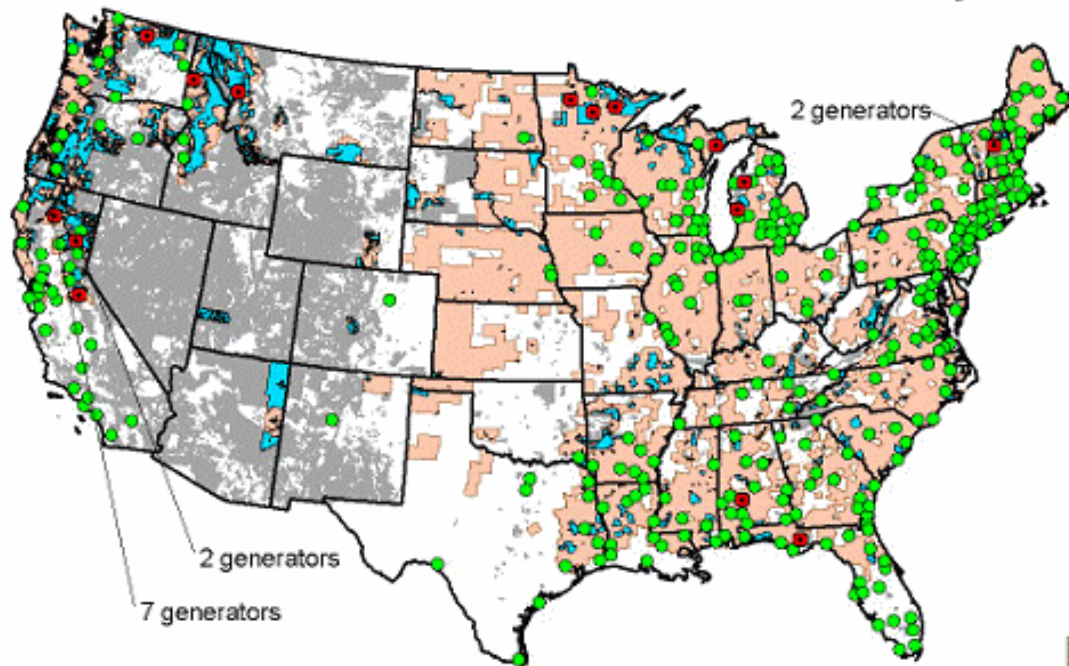
The Future of Biomass-Fueled Generation

- The U.S. Energy Information Administration (EIA) forecasts primary energy production from biomass in 2030 to be the largest source of renewable energy in the U.S. at 54% of the total renewable energy production.
- The U.S. has a total of 2,263 million acres of land. It is estimated that half of all this land has potential for growing biomass.
- The Biomass Research and Development Act included a goal that biomass will supply 5 percent of the nation's power, 20 percent of its transportation fuels, and 25 percent of its chemicals by 2030 – this works out to 1 billion dry tons of biomass feedstock per year.
- Producing 1 billion dry tons of biomass feedstock annually will require significantly increasing existing feedstocks, developing new perennial feedstock crops, optimizing crop management systems, improving yields, and reducing production costs. Changes will also need to be made in collection, storage, transportation, and processing of the feedstock.

Biomass Resources Available in the United States



Federal lands, lower 48 States, with biomass resource potential of 5,000 or greater



- Area within Federal lands with a biomass resource potential of 5,000 or greater
- Area not on Federal lands with a biomass resource potential of 5,000 or greater
- Lands under Federal management
- ● Electric generating plants (469) using biomass energy
- Plants (23) using biomass energy located on Federal lands



- 13% % of biomass resource potential areas classified 5,000 or greater that are located on Federal lands
- 24% % of Federal lands with biomass resource potential of 5,000 or greater
- 4.9% % of biomass electric energy generated using biomass from Federal lands
- ● 1.4% % of U.S. electric energy generated with biomass fuels

Ratings are in units of potential kilowatts per county. Areas with ratings of 5,000 or higher have high potential for energy generation using biomass as a fuel

Source of biomass resource potential measures:
 U.S. DOE
 National Renewable Energy Laboratory
 Source of biomass inputs and biomass plant locations:
 EIA
 EPA Egrid database (1998)

KEY BUSINESS DRIVERS

Climate Change

- Consensus is that something needs to be done to stop it, and the focus is on the reduction of greenhouse gas emissions.
- The generation of electricity emitted 41% of the CO₂ from fossil fuel combustion in 2005 accounting for the largest portion (33%) of U.S. greenhouse gas emissions in 2005.
- Biomass generally has better environmental characteristics than coal or natural gas.
- Biomass can also reduce CO₂ when used in a closed-loop process. This is where electricity is generated from purpose-specific feedstocks grown only as fuel.

National Security

- The U.S. has plenty of forest and agriculture, but oil and natural gas is heavily imported and subject to political and weather related supply and pricing disruptions.
- Domestic biomass electrical generation should ease the country's dependence on foreign gas imports and improve our energy security.

Price of Fossil Fuels

- The price of the major fossil fuels for electricity generation - natural gas and coal - have increased sharply in the last decade.
- Natural gas wellhead prices have increased 177% from 1997 to 2006.
- In the same timeframe, bituminous coal prices have increased 39%.

Government Support

- Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 authorized the Secretary of Energy to pursue an aggressive national program of research, development, demonstration, and commercial application of renewable energy. Specific areas of focus for projects included conversion of cellulosic biomass to liquid fuels, ethanol and ethanol byproduct processes, *direct combustion or gasification of biomass, and biofuels energy systems.*

Renewable Energy Production Credit

- The Renewable Energy Production Credit (REPC) created to promote renewable energy generation.
- Currently equals 1.9¢/kWh for each kWh of electricity produced and sold by a qualified resource for 10 years the date the facility was originally placed in service.
- Qualified resources include wind, closed-loop biomass, open-loop biomass, geothermal energy, solar energy, small irrigation power, municipal solid waste, and refined coal.
- set to expire on December 31, 2008, which means that generating facilities must be in operation by that date to be eligible for the credit. The credit has expired several time before and been renewed, but often with a delay. The start-stop nature of the credit hinders the development of renewable energy, such as biomass, because it interferes with long-term planning.
- Renewable Energy Production Incentive (REPI), a cash payment instead of a tax credit, is available to non-profit producers such as municipal utilities and coops. There is a Minnesota program that operates along these same lines - MRECP

- The REPC and REPI are of tremendous value to biomass-fueled generating plants because they help lower the COE. And because the REPC is an after tax subsidy, it has an effect bigger than its value. A 1.90¢/kWh tax credit is roughly equal to a reduction in cost of 30¢/kWh. This makes a COE of 8 ¢/kWh for biomass-fueled generation effectively the same cost as fossil-fueled generation at 5 ¢/kWh.

Barriers To Success

- Supply infrastructure is one of the biggest barriers to expansion of biomass-fueled generation.
- Most biomass feedstocks are lightweight, bulky, and have a low energy density.
- This means that large quantities are needed and the cost of transportation limits most supply to a distance of 50-100 miles from the generating facility.
- This requirement for a generating plant to be close to a limited supply has limited the size of biomass facilities to an average of 20 MW preventing them from achieving economies of scale in production.

Permitting Barriers

- Permitting issues are also major barriers to the development of biomass-fueled generation.
- These issues can impact not only where the plant is located, but also its ability to get the feedstock it required.
- One major issue is air quality regulations which regulate the emissions created by combustion, dust from transporting, storing and handling the feedstock, and any contaminants that might be in the feedstock (i.e., pesticides, preservatives, chemicals). These create high and expensive hurdles which must be met.
- Current regulations tend to ignore the alternative impact of the biomass if it were not used as a feedstock which typically produce more pollution (i.e. open burning).

Minnesota Jobs Opportunities Building Zones (JOBZ)

- Unlimited project scale.
- Minimal paperwork.
- Criteria based on capital investment and financial performance rather than body count.
- Eligibility.
- Focus on Minnesota regions with biomass potential.

New Markets Tax Credits

- The New Markets Tax Credit (NMTC) Program permits taxpayers to receive a credit against Federal income taxes for making qualified equity investments in designated Community Development Entities (CDEs).
- The credit provided to the investor totals 39 percent of the cost of the investment and is claimed over a seven-year credit allowance period. In each of the first three years, the investor receives a credit equal to five percent of the total amount paid for the stock or capital interest at the time of purchase. For the final four years, the value of the credit is six percent annually.
- Investors may not redeem their investments in CDEs prior to the conclusion of the seven-year period.

Tax Increment Financing (TIF)

- Cities use increased taxes generated by projects in TIF districts to pay off bonds issued to fund development costs. The businesses compensate the cities by paying taxes they normally would have to pay regardless.
- TIF and JOBZ therefore are mutually exclusive. Companies in JOBZ zones do not pay property taxes that would be captured to pay TIF bonds.

Minnesota Small Business Development Loan Program (SMDP)

- The Small Business Development Loan Program makes fixed-asset, first-lien, fixed-rate loans to aid job growths and manufacturing expansions by issuing tax-exempt Industrial Development Bonds (IDBs).
- IDB eligibility limited to manufacturing industries, but co-generation projects by manufacturing companies may be eligible, as long as they increase employment and use some of the electricity in their processes.
- Total project costs can't exceed \$20 million. Although the program is authorized to lend up to 80 percent of project cost, SMDP usually makes loans ranging from \$1 million to \$5 million with a maximum term of 20 years. Collateral includes the assets financed and the owners' personal guarantees.

Minnesota Investment Fund

The loans can finance 30 percent of the project's capital cost up to a maximum of \$500,000. 50 percent of other debt in the project must come from a commercial lender. The term is usually 10 years or less, and eligible industries are manufacturing and technology.

USDA Rural Development

- *Loan Guarantees*
- *Eligible areas* are rural.
- *Guaranteed percentage* of the loan is negotiated with the agency. The maximum generally is 80% for loans up to \$5 million; 70% for loans between \$5 and \$10 million; and 60% for loans above \$10 million.
- *Rates and terms.* Rates may be fixed or variable. Maximum term for working capital is 7 years, for machinery and equipment, 15 years and for real estate, 30 years. Balloons are not allowed.
- *Minimum equity* of 20% is required in a new business and 10% in an existing business.
- *Eligible purposes* include buildings, equipment, and permanent working capital.

Minnesota's Renewable Energy Standard

- Renewable electricity must account for 30% of Xcel Energy's total retail electricity sales by 2020, and 25% of the retail electricity sales of other utilities by 2025. Eligible technologies under the standard include solar, wind, hydro electric facilities less than 100 megawatts (MW), hydrogen and biomass, which include landfill gas, anaerobic digestion and municipal solid waste as well as plants and trees.
- The Public Utilities Commission must establish a program for tradable Renewable Energy Credits (RECs) by January 1, 2008.
- Biomass's ability to provide baseload power may be particularly attractive to utilities because the standard is based on energy sales rather than capacity.
- But biomass power costs will have to be reasonably competitive because escape clauses in the legislation relax the standard if meeting it will be prohibitively expensive.

Community-Based Energy Development (C-BED)

- In the 2007 legislative session the tariffs were extended to all renewable energy project, including biomass.
- a specific rate structure made available to locally owned renewable energy projects that would have difficulty securing financing under traditional rate structures.
- A C-BED tariff offers a higher rate during the first 10 years of the contract than during the final ten years, but is structured in such a way that the present value of the project for the utility is equal to that of a typical rate agreement. This greatly improves the viability of the project for project developers by increasing revenues during debt repayment, but does not detract from the net present value of the project from the utility's perspective.
- The C-BED tariffs are available to projects for which at least 51% of gross revenues from the power purchase agreement will flow to qualifying owners. Qualifying owners include Minnesota residents, limited liability companies composed of Minnesota residents, Minnesota cooperatives and non-profits, or Minnesota political subdivisions and local governments.

NextGen Energy Board

The NextGen Energy board was allocated grant money to support bioenergy projects. Bioenergy is defined as transportation fuels, commercial heat, industrial process heat or electrical power derived from cellulosic material. Grants are available for research, technical assistance, equipment and business plan development.

Minnesota Department of Commerce Renewable Energy Research Grants

- \$2,250,000 FY 2008 and \$2,000,000 FY 2009 to provide competitive, cost-share grants to fund renewable energy research in Minnesota.
- Projects will focus on the application and evaluation of existing or relatively near term opportunities and needs of the state's renewable energy industry.

Biomass Working Group

Governments should provide funding or incentives to projects meeting the following criteria:

- Projects using advanced technologies and practices that are not already commercial technologies or well-established practices. Projects would include commercial scale ups of qualifying technologies.
- Projects using ligno-cellulosic biomass in novel ways to produce energy in any form – liquid fuels, gas, heat, or electricity – or new biobased products, or
- Projects that expand the range of value added products from conventional biofuel plants, or
- Projects that otherwise seek to demonstrate or commercialize a new use of any biomass material to produce energy or high value products.
- Where possible, public financing should go into projects that have a local ownership stake, and include some promise of local hire, prevailing wage standards, and a commitment to worker training.
- Where possible, support existing projects and technologies that help demonstrate the development and sustainability of biomass feedstock supply.

Bio-based Product Procurement

USDA required to create a comprehensive program for designating bio-based product.

States should adopt bio-based product procurement rules and the federal list of bio-based products.

- As with the federal rules, state agencies should be required to procure bio-based products provided that:
 - They are available.
 - They are near cost-competitive relative to the fossil-based equivalent.
- Whatever rules are adopted, they should be consistent throughout the region.
- States should expand the program further by creating a regional certification program and promoting it through education and through incentives for participation by business.
- States should consider joint procurement with other states using shared standards to increase their market power.

Questions?