Methane to Markets Seminar
ABAR – NARUC
May 27-28, 2010

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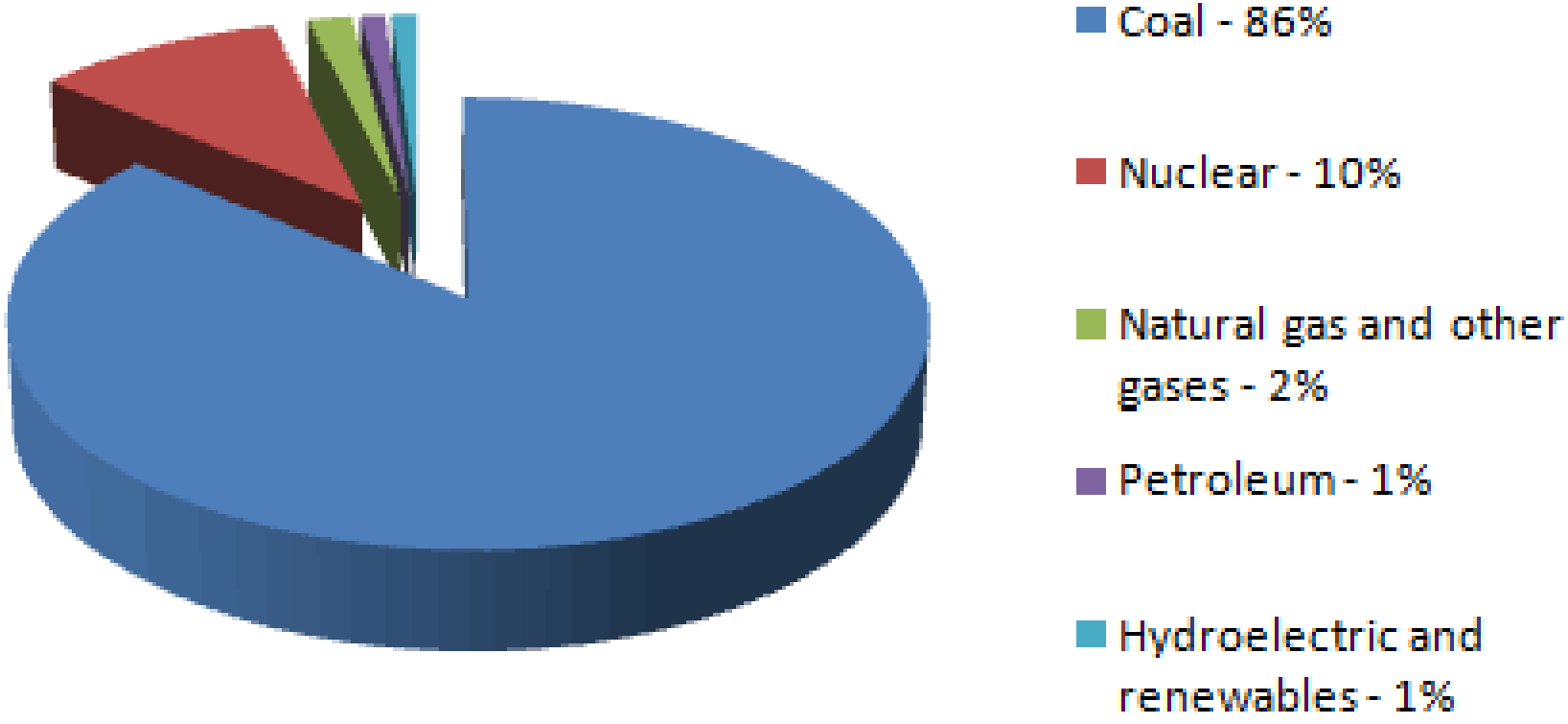
Ohio | Public Utilities Commission

Ohio Biomass Energy Program

Ohio Electric Generation by Fuel Source

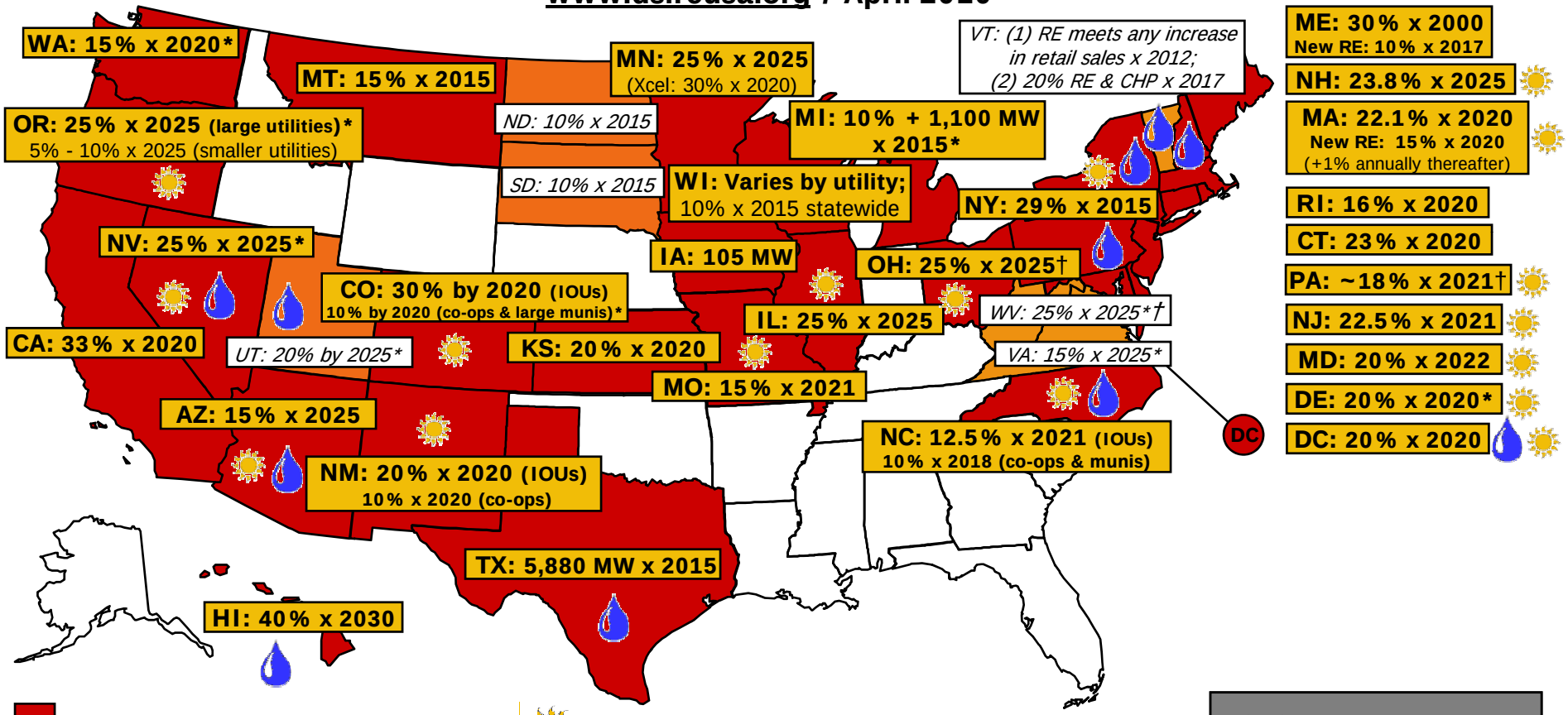


DSIRE
Database of State Incentives for Renewables & Efficiency

U.S. Department of Energy Energy Efficiency and Renewable Energy
North Carolina Solar Center
IREC

Renewable Portfolio Standards

www.dsireusa.org / April 2010



29 states + DC have an RPS
(6 states have goals)

Ohio Alternative Energy Portfolio Standard

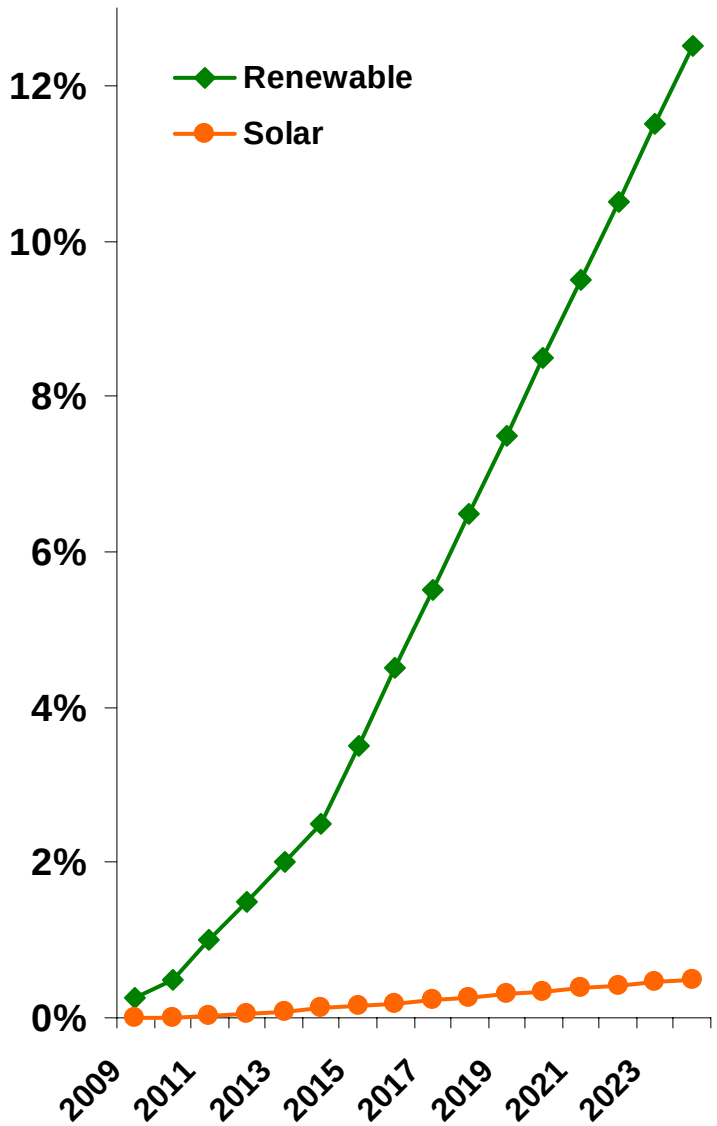
25% by 2025

- 25% of retail electricity sold by:
  - Ohio's electric distribution utilities - AEP, DP&L, Duke Energy, and First Energy, or;
  - Competitive electric service companies
- Must be generated from **alternative** sources:
  - **Renewable** energy sources
  - **Advanced** energy technology

AEPS Requirements

- A minimum of ½ of the energy must come from **renewable** sources
- At least ½ of **renewable** sources must be located in Ohio
- A minimum of ½ percent from **solar** resources
- Out of state resources must be shown to be deliverable to Ohio
- Facilities placed in service on 1/1/98 or later

Benchmarks



By end of year	Renewable Energy	Solar Energy
2009	0.25%	0.004%
2010	0.5%	0.01%
2011	1%	0.03%
2012	1.5%	0.06%
2013	2%	0.09%
2014	2.5%	0.12%
2015	3.5%	0.15%
2016	4.5%	0.18%
2017	5.5%	0.22%
2018	6.5%	0.26%
2019	7.5%	0.3%
2020	8.5%	0.34%
2021	9.5%	0.38%
2022	10.5%	0.42%
2023	11.5%	0.46%
2024 +	12.5%	0.5%

Qualified Renewable Resources

Solar

Wind

Hydroelectric

Geothermal

Fuel Cells

Storage

Biomass

Qualified Biomass Resources

- Biogas: landfill methane gas or

  anaerobic digestion of organic materials such as animal waste, biosolids, food waste, agricultural crops and residues, solid waste

- Agricultural crops, tree crops, crop by-products and residues
- Wood and paper manufacturing waste
- Forestry or vegetation waste
- Algae

Penalties

- Utilities and electric service companies subject to compliance payments if annual renewable and solar benchmarks are not met
- $45/MWh
- Solar $450/MWh in 2009 and declines over time
- Exceptions: force majeure; 3% cost cap

Renewable Energy Credits

- New Ohio renewable energy credit (REC) trading market created by new law in 2009
- 1 REC = 1 MWh of electricity generated
- Utilities may own renewable facilities or purchase RECs to meet the renewable portion of the standard
- PUCO will certify resources; established tracking systems will issue and track RECs
- RECs have a 5-year lifetime following their acquisition
- Energy and RECs may be sold as separate commodities

Advanced Energy Resources

- Clean coal
- Nuclear
- Fuel cells
- Customer Co-generation
- Advanced solid waste conversion
- Utility generation plant or demand-side management efficiency measures
- *RECs are not created from advanced resources

Impact

- Ohio ranks 4th among states in retail electric sales and 6th in net generation
- Ohio's emissions from electric generation, including, SO2, NOx and CO2, rank highly among states
- As the nation moves toward a lower carbon future, Ohio will need to incorporate low emission alternatives in its resource portfolio

Landfill Gas to Energy in Ohio

- Ohio has about 19 operational LFGE projects
- Both direct use and electricity projects
- Two high BTU projects
- 20 candidate landfills
- Using distributed energy resources offers local environmental, energy and economic benefits

State Regulation in Ohio

- Ohio EPA for landfill environmental permits
- Gas pipeline safety rules and inspections-PUC
  - Pipeline gas must be at least 900 BTU
- Ohio Power Siting Board
  - Must obtain a certificate for construction, operation, and maintenance of electric generating plants of 50 MW or larger, or
  - Gas lines greater than 125 pounds per square inch

Regulatory Exclusions

- In cases where a landfill gas facility is piping gas to another entity for use, the Commission has determined that the limited provision of gas service from a landfill does not subject the facility to regulation as a gas utility company.
- In cases where the landfill is making wholesale sales to gas suppliers, the Commission has granted relief for the regulation of these sales as a public utility.

Phoenix Golf Links near Columbus

- Economical and practical use of a closed landfill, helped with maintenance

- Landfill cap was upgraded and an 18-hole golf course was developed on top
- In exchange for a $1/year, 50-year lease, Petro Environmental pays costs of developing and maintaining the golf course

Phoenix Golf Links near Columbus

- A landfill gas extraction system was installed to recover landfill gas beneath the golf course
- 3 MW electricity production, grid-connected

SWACO Public Landfill

- Converts landfill methane gas into compressed natural gas (CNG) for vehicles
  - 12 vehicles so far: Honda Civics, Ford and Chevy pick-up trucks, a trash truck used for recycling, lawnmower

SWACO Public Landfill

- Phase 1:
  - 250,000 gasoline gallon equivalents of CNG
- Phase 2:
  - use all of the landfill gas for 10 million gasoline gallon equivalents (including pipeline use)

Rumpke Landfill, Cincinnati, Ohio

- High BTU landfill gas-to-pipeline project at largest landfill in Ohio
- Processing facility operated by Montauk Energy Capital and conveyed to Duke Energy pipeline for residential and commercial use
- Facility recovers 15 million cubic feet/day (removes carbon dioxide)
- Must meet gas distribution utility pipeline specifications
- University of Cincinnati purchases some of the gas for heating and power (48 MW)
- University agreement with Duke Energy: 24 MW of generation reserve capacity and 50,000 RECS for $10/REC

Hoffman Road Landfill / Bay View Water Reclamation Facility - Toledo

Methane recovered from the water treatment plant using anaerobic digesters will be combined with landfill gas to produce 5 MW of power

Hoffman Road Landfill / Bay View Water Reclamation Facility - Toledo

- Exhaust gases will be used in heat recovery steam boiler to produce 5 MW of electricity
- Power will be used on site at the facility

Municipal Utilities

- AMP-Ohio is a non-profit wholesale power supplier to municipal electric systems in Ohio
- Landfill gas was among the first renewable energy resources adopted by AMP and its member communities; provides a steady source of base load generation
- Contracted for 27 MW of capacity; 3 sites

Ohio Project Incentives

- Federal tax credits; state RECs
- State Advanced Energy Fund: grants for renewable generation projects; funding taken out of electric ratepayer bills
- Ohio Air Quality Development Authority: provides financing assistance, including state and federal tax incentives; issues project revenue bonds; finances power purchase agreements on a tax-exempt basis
- State/federal rules to promote grid interconnection

Ohio is fortunate to have Anderson Varejao, Power Forward, Cleveland Cavaliers of the U.S. NBA, from Santa Teresa, Brazil