

Electric Generation Work Group Report to Governor's Task Force on Global Warming

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Electric Generation Sector Emissions and Assignment

43 Mt CO₂e in 2003, or 35% of total WI emissions

- 60% to 80% reduction from 1990 levels by 2050 = reduce BAU by 103 to 109 Mt CO₂e
- 1990 levels by 2020 = reduce BAU by 28 Mt CO₂e
- Determination of years by which sector can stabilize and then reduce sectoral emissions to 2003 levels.

Electric Work Group Interim Results

- Three Major Policy Recommendations
 1. Enhanced Renewable Portfolio Standard (RPS)
 2. Combined Heat and Power (CHP) incentives and regulatory changes
 3. Repeal 196.493 (a.k.a. nuclear moratorium), subject to certain conditions
- Policy Forum for Planning
- 8 Enabling Policies
- Preparation of Future Generation Scenarios

Electric Work Group Recommendation Revisions

Based upon consideration of the following:

- MGA Energy Summit
 - RPS targets
 - Transmission and infrastructure planning
- Public Comments
- Comments from Task Force Co-Chairs and Members
 - No early actions in interim recommendations

Electric Work Group

Recommendation Revisions

Public Comments (approximately 180 comments)

- Wind Siting Reform (approx. 160 comments)
 - Evenly split (pro/con)
 - Specific municipalities, developers and businesses
- Nuclear
- Renewable Portfolio Standard
- General Comments

1. Enhanced RPS

- Increase RPS from current Act 141 levels of 10% in 2015
 - Near unanimous support for 15% by 2020
 - More aggressive targets of 17.5% by 2020 and 25% by 2025 were supported when the definition of renewable resource was amended
 - **MGA targets of 20% by 2020 and 25% by 2025**
- Amend the definitions of renewable resource
 - Biogas, solar, and biomass for hot water and steam
 - Renewable credits
- **Extend credit banking to encourage early actions**
- **Hydro issue to be decided by Task Force (but decision is not required for modeling)**
- **Modeling should assume cost-sharing of transmission for western wind.**

2. Combined Heat and Power (CHP)

- Unanimous support for incentives and regulatory changes to encourage CHP
 - Amend WI Stat. § 196.192 (market-based compensation, rate and contracts).
 - Fund site specific feasibility studies
 - Consider incentive programs
- Utility-sized projects and district heating were not included due to insufficient work group evaluation
- **An Ad-Hoc Group will reconsider earlier CHP targets, utility-sized projects and incentives from Industry Work Group**

3. Repeal Nuclear Moratorium with Conditions

- Relax requirements to allow nuclear plants in WI by amending WI Stat. § 196.493 (2) (a)
- Additional requirements
 - Right-of-first refusal for WI utilities for electrical output
 - At least 75% of output must be contracted to WI utilities
 - All green attributes must go to WI utilities contracting for power
- Unanimous agreement that this option would not reduce greenhouse gas emissions in WI before 2020
- Uncertainties of technology and cost

4. Policy Forum for Planning

- This finding reflects the significant overlap between the generation and carbon tax/cap-and-trade/offset work group and the energy efficiency work group
- Statewide greenhouse gas reduction plan or target recommended to include, but is not limited, to some or all of the following:
 - Flexible carbon reduction program (e.g., cap-and-trade, carbon performance or portfolio std., ghg cost adder for generation planning)
 - Review and/or modification of Energy Priorities Law
 - Asset Management Plan (such as retirement, re-powering, etc.)
 - Utility-scale CHP
 - Carbon capture and storage (CCS) technology and siting
- Electrical transmission planning at the regional level
- **Near term action recommended: Evaluate opportunity and cost to maximize GHG reductions from existing generation**

Enabling Policies

- Wind power permitting reform
- Advanced renewable tariffs
- Electrical transmission planning for renewable and distributed generation
- Grants/loans/tax incentives for distributed generation
- Expand an existing, or create, a state-wide 501 (c)3 for tax-deductible renewable energy contributions
- Assess off-shore wind potential
- Carbon Capture and Storage study for WI
 - No promising geological formations
 - Evaluate a pipeline network for CO₂, synthetic natural gas and/or hydrogen
- Green tariff option for customers (e.g., Austin Power)

Work Group Scenarios

		1990	2003	2010	2015	2020	2025
BAU Emissions (2% growth)	CO2 (mMT)	33.4	43.1	50	55.6	61.8	68.7
	Elec. (mMWh)	47.8	60.1	69.1	76.2	84.2	92.9
BAU Emissions (0.5% growth)	CO2 (mMT)	33.4	43.1	44.6	45.8	46.9	48.1
	Elec. (mMWh)	47.8	60.1	62.2	63.8	65.4	67.1

Work Group Scenarios

		1990	2003	2010	2015	Increase From 2010 to 2015
BAU Emissions (2% growth)	CO2 (mMT)	33.4	43.1	50	55.6	5.6 million Tons
	Elec. (mMWh)	47.8	60.1	69.1	76.2	7.1 million MWh
BAU Emissions (0.5% growth)	CO2 (mMT)	33.4	43.1	44.6	45.8	1.2 million Tons
	Elec. (mMWh)	47.8	60.1	62.2	63.8	1.6 million MWh

Work Group Scenarios

Of the following options, the "Redispatch Existing System" option uses a different calculation than the other options.	Mw Increment	Million Mwh output	CO2 Removed Million Metric Tons	Energy Transfer "Mwh from" to "Mwh to"	Removal Cost Energy Displacement Only \$/Metric Ton CO2	Retrofit unit	Removal Cost New Unit Displacement \$/Metric Ton CO2
Redispatch Existing System		9.5	6.8	CL to CC	49.6		49.6
Distribution Upgrades		0.38	0.32	0 to CL/CC	756.3		739.7
Transmission Upgrades		0.13	0.11	0 to CL/CC	797.8		781.2
Hydro 500 Mw - CC Valued	500	3.7	3.1	0 to CL/CC	123.4		111.6
Hydro - 500 Mw Nuclear Valued	500	3.7	3.1	0 to CL/CC	134.0		122.2
Nuclear - 500 Mw	500	3.7	3.1	0 to CL/CC	51.4		39.7
Combined Cycle - 500 Mw Base	500	3.7	2.7	CL to CC	64.9		51.5
Combined Cycle - 500 Mw Cyclic	500	1.8	1.3	CL to CC	87.7		59.3
West Wind - 500 Mw	500	1.8	1.5	0 to CL/CC	83.3		76.6
WI Wind - 500 Mw	500	1.3	1.1	0 to CL/CC	52.0		45.3
Biomass Retrofit - 200 Mw @ 10% Cofire	200	0.1	0.2	0 to CL	66.1	Retrofit unit	66.1
New Unit Biomass - 80 Mw	80	0.6	0.5	0 to CL/CC	68.2		56.5
CHP - 500 Mw (50 MW projects)	500	3.7	2.1	COG to CL/CC	66.5		49.4

GHG Optimization for Existing Generation: Model Input Assumptions

- TAG and Co-Chairs will develop model inputs for this scenario
- Consideration will be given to:
 - MISO rules
 - Leakage
- Recognize that implementation will require other work such as cost allocations and utility service territory issues