

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Enhanced Renewable Portfolio Standard (RPS)
3. **Policy Type:** Legislation amending existing RPS, with new minimum renewable standards (between 15% by 2020 and 25% by 2025) and a revised definition of renewable resources.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
 Sector: Electric utility  
 Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Assuming 0.5%/yr growth in electric sales after 2010 results in an RPS of 25% by 2025 reducing CO<sub>2</sub>e emissions by 9.7 million metric tons in 2020 and 15.2 million metric tons in 2025.
6. **Estimated Costs:** Administrative costs will be negligible (incremental to existing program).

The increases in annual electric cost (in millions 2007\$) relative to the business as usual (0.5%/yr electric sales growth) case for 2020 and 2025 are shown in the following table for a range of capital costs for wind generation and assumptions about whether or not the RPS will replace future new unit additions (Capacity):

	2020 (RPS = 17.5%)		2025 (RPS = 25%)	
	Replaces Energy & Capacity	Replaces Energy Only	Replaces Energy & Capacity	Replaces Energy Only
Wind Capital Cost = \$1,650/kw	247	311	388	489
Wind Capital Cost = \$2,215/kw	438	502	688	790

These estimates are based on the projected costs for wind projects developed in Wisconsin; the resource with the lowest current costs. Other resources, including biomass and solar, may be used by utilities to meet the RPS, but insufficient data were available to estimate the costs of these other technologies in Wisconsin.

7. **Specific Description of Policy Proposal:** The revised standard would increase the renewable target to a level between 15% by 2020 and 25% by 2025, and amend the definition of eligible renewable resources. Current law (2005 ACT 141 with a RPS of 10% by 2015) would continue for implementation and enforcement of the enhanced RPS, including any authority to adjust the standards based on hardship.

The definition of renewable resource used to produce electricity is expanded to allow the following: (1) Biogas produced in Wisconsin that is placed into the natural gas pipeline. (2) Thermal energy from solar or biomass that is produced in Wisconsin that displaces the combustion of fossil fuel. Utilities can acquire the renewable attributes from these displacement strategies and apply them to their renewable electricity requirements using the appropriate conversion factors.

Further amendment of the definition of renewable resources starting in 2015 to include renewable credits (credits for renewable generation serving non-native loads) were necessary to get support in the electrical generation work group to meet the RPS target of 25% of electric sales by 2025. The addition of large hydroelectric in the definition of renewable resources (e.g., hydroelectric projects greater than the ACT 141 limit of 60MW) did not reach consensus in the work group (large hydroelectric increased the support for a higher RPS target by some members who supported this option, but caused a greater decrease in support by other members who opposed this option). Large imports of wind power from western states and hydroelectric power from Manitoba were found to be constrained by transmission capacity and associated expansion costs.

8. **Timetables, Duration and Stringency Option:** The timetable is implicit in this policy recommendation. Duration is until changed by law. This policy should be regarded as stringent as a result of PSC enforcement authority identical to the enforcement provisions of the existing RPS (2005 ACT 141).
9. **Explanation of Rough Estimate of GHG Reductions:** Meeting the new RPS standard assuming a 0.5%/yr growth in electric sales after 2010 would require 11.5 million Mwh and 18.1 million Mwh in 2020 and 2025 respectively (in excess of 2003 renewable generation)
10. **Rough Estimate of Costs for Selected Years:** Incremental administrative costs of the revised RPS are estimated to be negligible because the PSCW already has in place the infrastructure for regulating this requirement. The other costs are potential impacts on electric rates. This impact will depend on the projected costs of power and energy from the mix of renewable resources employed to meet the requirement compared with the estimated cost of coal and gas-fired generation that is displaced, including carbon adders.
11. **Barriers to Implementation:** The major barrier to implementation of this policy is the need for legislation to amend to the existing standard. Opposition may

come from electric customers who believe that this requirement will materially increase their electricity costs.

12. **Other Factors:** Meeting the enhanced RPS under business-as-usual growth in electrical demand will entail greater difficulty than future scenarios that include reduced electrical demand forecasts. Enabling policies for the enhanced RPS include wind power siting reform, advanced renewable tariffs and transmission siting support.

## Wisconsin Global Warming Task Force Work Group Policy Template

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Enhanced Renewable Portfolio Standard (RPS)
3. **Policy Type:** Legislation amending existing RPS, with new minimum renewable standards of 20% by 2020 and 25% by 2025 and a revised definition of renewable resources.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
 Sector: Electric utility  
 Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Energy Efficiency recommendations could reduce electric energy growth to 0.5% per year beginning in 2010. With that assumption, the achievement of an RPS of 25% by 2025 would reduce CO<sub>2</sub>e emissions by 9.7 million metric tons in 2020 and 15.2 million metric tons in 2025.
6. **Estimated Costs:** Administrative costs will be negligible (incremental to existing program).

The increases in annual electric cost (in millions 2007\$) relative to the energy efficiency impacted business as usual (0.5%/yr electric sales growth) case for 2025 are shown in the following table for a range of capital costs for wind generation and assumptions about whether or not the RPS will replace future new unit additions (Capacity):

2025 (RPS = 25%)		
	Replaces Energy & Capacity (\$ millions)	Replaces Energy Only (\$ millions)
Wind Capital Cost = \$1,650/kw	388	489
Wind Capital Cost = \$2,215/kw	688	790

These estimates are based on the projected costs for wind projects developed in Wisconsin; the resource with the lowest current costs. Other resources, including

biomass and solar, may be used by utilities to meet the RPS, but insufficient data were available to estimate the costs of these other technologies in Wisconsin.

7. **Specific Description of Policy Proposal:** The revised standard would increase the renewable target to a level of 20% by 2020 and 25% by 2025, and amend the definition of eligible renewable resources. Current law (2005 ACT 141 with a RPS of 10% by 2015) would continue for implementation and enforcement of the enhanced RPS, including any authority to adjust the standards based on hardship. The existing 10% target for 2015 was not changed because of the significant lead time necessary for utilities to plan, permit and construct renewable energy systems. The time limit for banking renewable generation in excess of the utility requirements in 2015, however, was removed to encourage early actions.

The definition of renewable resource used to produce electricity is expanded to allow the following: (1) Biogas produced in Wisconsin that is placed into the natural gas pipeline. (2) Thermal energy from solar or biomass that is produced in Wisconsin that displaces the combustion of fossil fuel. Utilities can acquire the renewable attributes from these displacement strategies and apply them to their renewable electricity requirements using appropriate conversion factors.

Further amendment of the definition of renewable resources starting in 2015 to include renewable credits (credits for renewable generation serving non-native loads) were necessary to get support in the electrical generation work group to meet the RPS target of 25% of electric sales by 2025. These renewable resource credits could be purchased from within the state or from sources in other states.

The addition of large hydroelectric in the definition of renewable resources (e.g., hydroelectric projects greater than the ACT 141 limit of 60MW) did not reach consensus in the work group (large hydroelectric increased the support for a higher RPS target by some members who supported this option, but caused a greater decrease in support by other members who opposed this option). Large imports of wind power from western states and hydroelectric power from Manitoba were found to be constrained by transmission capacity and would result in associated transmission expansion costs.

8. **Timetables, Duration and Stringency Option:** The timetable is implicit in this policy recommendation. Duration is until changed by law. This policy should be regarded as stringent as a result of PSC enforcement authority identical to the enforcement provisions of the existing RPS (2005 ACT 141).
9. **Explanation of Rough Estimate of GHG Reductions:** Meeting the new RPS standard assuming a 0.5%/yr growth in electric sales after 2010 would require 11.5 million MWh and 18.1 million MWh in 2020 and 2025 respectively (in excess of 2003 renewable generation).

10. **Rough Estimate of Costs for Selected Years:** Incremental administrative costs of the revised RPS are estimated to be negligible because the PSCW already has in place the infrastructure for regulating this requirement. The other costs are potential impacts on electric rates. This impact will depend on the projected costs of power and energy from the mix of renewable resources employed to meet the requirement compared with the estimated cost of coal and gas-fired generation that is displaced, including carbon adders.
11. **Barriers to Implementation:** The major barrier to implementation of this policy is the need for legislation to amend to the existing standard. Opposition may come from electric customers who believe that this requirement will materially increase their electricity costs.
12. **Other Factors:** The targets of the enhanced RPS are consistent with the targets signed by the Governors of Wisconsin and surrounding states at the Midwestern Governor's Association Energy Summit in November, 2007. Meeting the enhanced RPS under business-as-usual growth in electrical demand will entail greater difficulty than future scenarios that include reduced electrical demand forecasts. Enabling policies for the enhanced RPS include wind power siting reform, advanced renewable tariffs and transmission siting support.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Enhanced Renewable Portfolio Standard (RPS)
3. **Policy Type:** Legislation amending existing RPS, with new minimum renewable standards of 20% by 2020 and 25% by 2025 and a revised definition of renewable resources.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Energy Efficiency recommendations could reduce electric energy growth to 0.5% per year beginning in 2010. With that assumption, the Working Group evaluated the enhanced RPS for the “Business as Usual” Scenario (2%/yr growth) and the “Enhanced Energy Efficiency” Scenario (0.5%/yr growth). The following table shows the impact on CO2 reductions associated with the achievement of an RPS of 25% by 2025 for the aforementioned scenarios:

CO2 Reductions In Million Metric Tons		
	Business as Usual (2%/yr Growth)	Enhanced Energy Efficiency (0.5%/yr Growth)
2020	11.6	9.7
2025	19.5	15.2

6. **Estimated Costs:** Administrative costs will be negligible (incremental to existing program).

The increases in annual electric cost (in millions 2007\$) relative to the two scenarios are shown in the following tables for a range of capital costs for wind generation and assumptions about whether or not the RPS will replace future new unit additions (Capacity):

Business as Usual Scenario (2%/Yr Growth)

2025 (RPS = 25%)		
	Replaces Energy & Capacity (\$ millions)	Replaces Energy Only (\$ millions)
Wind Capital Cost = \$1,650/kw	612	742
Wind Capital Cost = \$2,215/kw	979	1,109

Enhanced Energy Efficiency (0.5%/Yr Growth)

2025 (RPS = 25%)		
	Replaces Energy & Capacity (\$ millions)	Replaces Energy Only (\$ millions)
Wind Capital Cost = \$1,650/kw	388	489
Wind Capital Cost = \$2,215/kw	688	790

These estimates are based on the projected costs for wind projects developed in Wisconsin and the West (Wisconsin projects are assumed to have the lowest current costs). The following amounts of Wisconsin and West wind projects (based on nameplate capacity) are included in the cost estimate:

Wind Nameplate Mw Capacity For 25% RPS in 2025		
	Business as Usual (2%/yr Growth)	Enhanced Energy Efficiency (0.5%/yr Growth)
Wisconsin	7,500 (assumed maximum for Wisconsin)	6,891
West	1,020	0

Other resources, including biomass and solar, may be used by utilities to meet the RPS, but insufficient data were available to estimate the costs of these other technologies in Wisconsin.

7. **Specific Description of Policy Proposal:** The revised standard would increase the renewable target to a level of 20% by 2020 and 25% by 2025, and amend the definition of eligible renewable resources. Current law (2005 ACT 141 with a RPS of 10% by 2015) would continue for implementation and enforcement of the enhanced RPS, including any authority to adjust the standards based on hardship. The existing 10% target for 2015 was not changed because of the significant lead time necessary for utilities to plan, permit and construct renewable energy systems. The time limit for banking renewable generation in excess of the utility requirements in 2015, however, was removed to encourage early actions.

The definition of renewable resource used to produce electricity is expanded to allow the following: (1) Biogas produced in Wisconsin that is placed into the natural gas pipeline. (2) Thermal energy from solar or biomass that is produced in Wisconsin that displaces the combustion of fossil fuel. Utilities can acquire the renewable attributes from these displacement strategies and apply them to their renewable electricity requirements using appropriate conversion factors.

Further amendment of the definition of renewable resources starting in 2015 to include renewable credits (credits for renewable generation serving non-native loads) were necessary to get support in the electrical generation work group to meet the RPS target of 25% of electric sales by 2025. These renewable resource credits could be purchased from within the state or from sources in other states.

The addition of large hydroelectric in the definition of renewable resources (e.g., hydroelectric projects greater than the ACT 141 limit of 60MW) did not reach consensus in the work group (large hydroelectric increased the support for a higher RPS target by some members who supported this option, but caused a greater decrease in support by other members who opposed this option). Large imports of wind power from western states and hydroelectric power from Manitoba were found to be constrained by transmission capacity and would result in associated transmission expansion costs.

8. **Timetables, Duration and Stringency Option:** The timetable is implicit in this policy recommendation. Duration is until changed by law. This policy should be regarded as stringent as a result of PSC enforcement authority identical to the enforcement provisions of the existing RPS (2005 ACT 141).

9. **Explanation of Rough Estimate of GHG Reductions:** Meeting the new RPS standard for the two scenarios will require the following amounts of Mwh from renewable energy resources(in excess of 2003 renewable generation).

Enhanced RPS Mwh Output (in Million Mwh)		
	Business as Usual (2%/yr Growth)	Enhanced Energy Efficiency (0.5%/yr Growth)
2020	13.8	11.5
2025	23.3	18.1

10. **Rough Estimate of Costs for Selected Years:** Incremental administrative costs of the revised RPS are estimated to negligible because the PSCW already has in place the infrastructure for regulating this requirement. The other costs are potential impacts on electric rates. This impact will depend on the projected costs of power and energy from the mix of renewable resources employed to meet the requirement compared with the estimated cost of coal and gas-fired generation that is displaced, including carbon adders.
11. **Barriers to Implementation:** The major barrier to implementation of this policy is the need for legislation to amend to the existing standard. Opposition may come from electric customers who believe that this requirement will materially increase their electricity costs.
12. **Other Factors:** The targets of the enhanced RPS are consistent with the targets signed by the Governors of Wisconsin and surrounding states at the Midwestern Governor’s Association Energy Summit in November, 2007. Meeting the enhanced RPS under business-as-usual growth in electrical demand will entail greater difficulty than future scenarios that include reduced electrical demand forecasts. Enabling policies for the enhanced RPS include wind power siting reform, advanced renewable tariffs and transmission siting support.

## Wisconsin Global Warming Task Force Workgroup Template For Presentation Policy Options

1. **Workgroup:** Generation and Delivery (Supply-Side) Subgroup
2. **Policy Name:** Streamlining development of electric transmission to interconnect renewable resources and distributed generation
3. **Policy Type:** Initiate a study group and/or open a PSC docket to evaluate changes to the state-wide and regional electrical transmission system that would facilitate increased electrical generation by renewable and/or low-carbon resources. The study group and/or PSC docket would also direct the evaluation and/or participation of Wisconsin in negotiations with other states, MISO and FERC regarding regional transmission system expansion and cost allocation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utility.  
Sub-sectors: Transmission Utilities, Distribution Utilities, MISO, FERC
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy would not directly reduce greenhouse gas emissions by itself. It is an enabling policy to allow the greater expansion of renewable and lower-carbon generating options.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a proceeding to develop and implement improvements in transmission support for low-carbon resources.
7. **Specific Description of Policy Proposal:** Based on generation costs alone, the estimated cost of wind projects developed in MN, IA, and the Dakotas are less than wind projects in Wisconsin due to the higher capacity factors from these western states. These lower generation costs would be more than offset by higher transmission costs. Additional analysis, however, is required to actually determine the amount of transmission that would need to be built, the costs and Wisconsin's share of the costs. It is unknown what share Wisconsin would pay for the additional transmission – it could range from as little as 15% to 80-100%, depending on the policies adopted at FERC and the amount of benefit Wisconsin would receive from the interconnections.

Changes in generation-transmission interconnection processes are needed at the regional level to enable the connection of large amounts of wind generation. The currently defined tariffs of the Midwest ISO for interconnecting generation are designed in such a way that the first wind generator to create a need for additional transmission must pay for the entire project, with subsequent wind generators being free riders. This discourages the initial connection of wind generation.

There is an effort underway at MISO to discuss revising the process. Wisconsin

should be an active participant in that effort if out-of-state wind generation is to be available to meet native load.

There are also efforts underway to evaluate the impacts that the connection of a large amount of variable (i.e. wind generation) resources onto the transmission grid will create. Studies from Minnesota presented to the electrical generation work group indicate that although the issues are significant, large amounts of variable energy can be accommodated by the electrical generation and transmission system in that state. There are no comparable studies of the transmission system in Wisconsin.

8. **Timetables, Duration and Stringency Option:** The study group and/or PSC docket would be convened by July 1, 2008 and would issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy directive is necessary to evaluate the transmission changes necessary to meet an enhanced renewable portfolio standard and to enable low-carbon and distributed generation to displace higher carbon generation sources.
10. **Rough Estimate of Costs for Selected Years:** Uncertain. The study commissioned in Minnesota to evaluate the transmission and reliability implications of greater wind penetration in that state cost over one million dollars.
11. **Barriers to Implementation:** Primary barriers are the financial cost of the improvements.
12. **Other Factors:**
  - There are generating facilities in Wisconsin with greenhouse gas emission rates much lower than conventional baseload coal plants, such as some natural gas combined-cycle plants, that have transmission constraints that do not allow them to displace additional high-carbon generators.
  - Additional policy options recommended by the generation work group, such as advanced renewable tariffs and combined heat and power incentives, may have different transmission implications depending on where in the state they are developed.
  - The magnitude of the greenhouse gas reductions being discussed by the Task Force will require changes in the electrical generation system in Wisconsin that are greater than the planning capacity of any single utility.

## Wisconsin Global Warming Task Force Workgroup Template For Presentation Policy Options

1. **Workgroup:** Electrical Generation Work Group.
2. **Policy Name:** Streamlining development of electric transmission to interconnect renewable resources and distributed generation
3. **Policy Type:** Initiate a study group and/or open a PSC docket to evaluate changes to the state-wide and regional electrical transmission system that would facilitate increased electrical generation by renewable and/or low-carbon resources. The study group and/or PSC docket would also direct the evaluation and/or participation of Wisconsin in negotiations with other states, MISO and FERC regarding regional transmission system expansion and cost allocation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utility.  
Sub-sectors: Transmission Utilities, Distribution Utilities, MISO, FERC
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy would not directly reduce greenhouse gas emissions by itself. It is an enabling policy to allow the greater expansion of renewable and lower-carbon generating options.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a proceeding to develop and implement improvements in transmission support for low-carbon resources.
7. **Specific Description of Policy Proposal:** Based on generation costs alone, the estimated cost of wind projects developed in MN, IA, and the Dakotas are less than wind projects in Wisconsin due to the higher capacity factors from these western states. These lower generation costs would be more than offset by higher transmission costs. Additional analysis, however, is required to actually determine the amount of transmission that would need to be built, the costs and Wisconsin's share of the costs. It is unknown what share Wisconsin would pay for the additional transmission – it could range from as little as 15% to 80-100%, depending on the policies adopted at FERC and the amount of benefit Wisconsin would receive from the interconnections.

Changes in generation-transmission interconnection processes are needed at the regional level to enable the connection of large amounts of wind generation. The currently defined tariffs of the Midwest ISO for interconnecting generation are designed in such a way that the first wind generator to create a need for additional transmission must pay for the entire project, with subsequent wind generators being free riders. This discourages the initial connection of wind generation.

There is an effort underway at MISO to discuss revising the process. Wisconsin

should be an active participant in that effort if out-of-state wind generation is to be available to meet native load.

There are also efforts underway to evaluate the impacts that the connection of a large amount of variable (i.e. wind generation) resources onto the transmission grid will create. Studies from Minnesota presented to the electrical generation work group indicate that although the issues are significant, large amounts of variable energy can be accommodated by the electrical generation and transmission system in that state. There are no comparable studies of the transmission system in Wisconsin.

8. **Timetables, Duration and Stringency Option:** The study group and/or PSC docket would be convened by July 1, 2008 and would issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy directive is necessary to evaluate the transmission changes necessary to meet an enhanced renewable portfolio standard and to enable low-carbon and distributed generation to displace higher carbon generation sources.
10. **Rough Estimate of Costs for Selected Years:** Uncertain. The study commissioned in Minnesota to evaluate the transmission and reliability implications of greater wind penetration in that state cost over one million dollars.
11. **Barriers to Implementation:** Primary barriers are the financial cost of the improvements.
12. **Other Factors:**
  - There are generating facilities in Wisconsin with greenhouse gas emission rates much lower than conventional baseload coal plants, such as some natural gas combined-cycle plants, that have transmission constraints that do not allow them to displace additional high-carbon generators.
  - Additional policy options recommended by the generation work group, such as advanced renewable tariffs and combined heat and power incentives, may have different transmission implications depending on where in the state they are developed.
  - The magnitude of the greenhouse gas reductions being discussed by the Task Force will require changes in the electrical generation system in Wisconsin that are greater than the planning capacity of any single utility.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Carbon Capture and Storage (CCS) Study for Wisconsin
3. **Policy Type:** Create a Commission to work collaboratively with Midwest partners to evaluate and recommend possible opportunities for geologic sequestration of CO<sub>2</sub> from Wisconsin's utility sector. Continue this work to deep current with advancements in technology and adaptations for Wisconsin GHG reduction policies.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** CCS is a strategy for reducing greenhouse gas emissions from baseload electrical generation. The magnitude of greenhouse gas reductions from this technology depends on the type of capture (e.g., pre-combustion or post-combustion) and the type of fuel. In some cases, CCS implemented at a facility burning or co-firing biomass can have an even larger reduction impact on greenhouse gas emissions.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a Commission to evaluate CCS. The Commission should have representatives from Department of Natural Resources, Public Service Commission, and University representatives. In addition, utility, independent power producer, environmental, industrial, and other representatives should be included in the Commission.
7. **Specific Description of Policy Proposal:** The PSC and DNR would be requested to form a Commission to evaluate the technical and economic potential, and infrastructure requirements, for CCS deployment in Wisconsin. The absence of promising geological formations in Wisconsin for carbon storage will likely result in the need to either transport carbon dioxide by a pipeline system that does not currently exist or transport of low or non-carbon gaseous fuels (e.g., synthetic natural gas or hydrogen) in the current natural gas or future hydrogen pipelines. As with the electrical transmission grid, planning the future gas pipeline infrastructure in the state is not well suited to any individual utility or industry in Wisconsin.
8. **Timetables, Duration and Stringency Option:** The CCS Commission would convene by July 1, 2008 and would issue its initial findings and recommendations by December 31, 2008. The report will be reviewed and updated annually. As

the technology becomes more available, Wisconsin needs to achieve rapid deployment.

The timeline for deploying CCS that would be available to lower greenhouse gas emissions from the electrical sector in Wisconsin is strongly dependent on the pace of carbon storage implementation in adjacent states. The carbon disposal opportunities closest to the major baseload power plants in Wisconsin are the oil and gas fields, coal seams, and deep saline aquifers found in relatively uniform layers across a wide area of Illinois, Indiana, and Kentucky in the geological feature known as the Illinois Basin.

The implementation timeline for CCS is also dependent on the technology used. We assume that the construction of a new IGCC plant with CCS or the retrofit of an existing plant with CCS in Wisconsin is not likely for at least 10 or more years. In Illinois, CCS from a coal or petroleum coke plant producing synthetic natural gas and selling carbon dioxide for enhanced oil recovery may be possible in as early as two or three years.

9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if CCS is found technically and economically feasible, the findings and recommendations of the Commission would inform those responsible for assisting in the development of this technology for Wisconsin and would provide a foundation for planning the infrastructure necessary for CCS.
10. **Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC and DNR on task force matters.
11. **Barriers to Implementation:** There should not be barriers to convening the CCS Commission. There may be legal and other barriers to any recommended actions issued by the Commission.
12. **Other Factors:** The workgroup discussed the potential of CCS and concluded that the future feasibility and cost of this technology was no more certain than other large-scale greenhouse gas reduction options, such as nuclear. The goals for carbon reduction need to be established in a state-wide PSC planning forum where the uncertainties in technology availability can be evaluated. The safety and environmental risks of either carbon dioxide pipelines or geologic storage sites for captured CO<sub>2</sub> would also need to be addressed to gain public acceptance of this option. The U.S. Department of Energy and numerous foreign countries are sponsoring research in this area. Three large-scale (greater than one million metric tons of CO<sub>2</sub> per year) projects are currently using geologic storage, but the scale of CCS necessary to have a significant impact on regional greenhouse gas emissions is much greater.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Carbon Capture and Storage (CCS) Study for Wisconsin
3. **Policy Type:** Create a Commission to work collaboratively with Midwest partners to evaluate and recommend possible opportunities for geologic sequestration of CO<sub>2</sub> from Wisconsin's utility sector. Continuation of this work is recommended to keep current with advancements in technology and adaptations for Wisconsin GHG reduction policies.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** CCS is a strategy for reducing greenhouse gas emissions from baseload electrical generation. The magnitude of greenhouse gas reductions from this technology depends on the type of capture (e.g., pre-combustion or post-combustion) and the type of fuel. In some cases, CCS implemented at a facility burning or co-firing biomass can have an even larger reduction impact on greenhouse gas emissions.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a Commission to evaluate CCS. The Commission should have representatives from Department of Natural Resources, Public Service Commission, and University representatives. In addition, utility, independent power producer, environmental, industrial, and other representatives should be included in the Commission.
7. **Specific Description of Policy Proposal:** The PSC and DNR would be requested to form a Commission to evaluate the technical and economic potential, and infrastructure requirements, for CCS deployment in Wisconsin. The absence of promising geological formations in Wisconsin for carbon storage will likely result in the need to either transport carbon dioxide by a pipeline system that does not currently exist or transport of low or non-carbon gaseous fuels (e.g., synthetic natural gas or hydrogen) in the current natural gas or future hydrogen pipelines. As with the electrical transmission grid, planning the future gas pipeline infrastructure in the state is not well suited to any individual utility or industry in Wisconsin.
8. **Timetables, Duration and Stringency Option:** The CCS Commission would convene by July 1, 2008 and would issue its initial findings and recommendations by December 31, 2008. The report will be reviewed and updated annually. As

the technology becomes more available, Wisconsin needs to achieve rapid deployment.

The timeline for deploying CCS that would be available to lower greenhouse gas emissions from the electrical sector in Wisconsin is strongly dependent on the pace of carbon storage implementation in adjacent states. The carbon disposal opportunities closest to the major baseload power plants in Wisconsin are the oil and gas fields, coal seams, and deep saline aquifers found in relatively uniform layers across a wide area of Illinois, Indiana, and Kentucky in the geological feature known as the Illinois Basin.

The implementation timeline for CCS is also dependent on the technology used. We assume that the construction of a new IGCC plant with CCS or the retrofit of an existing plant with CCS in Wisconsin is not likely for at least 10 or more years. In Illinois, CCS from a coal or petroleum coke plant producing synthetic natural gas and selling carbon dioxide for enhanced oil recovery may be possible in as early as two or three years.

9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if CCS is found technically and economically feasible, the findings and recommendations of the Commission would inform those responsible for assisting in the development of this technology for Wisconsin and would provide a foundation for planning the infrastructure necessary for CCS.
10. **Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC and DNR on task force matters.
11. **Barriers to Implementation:** There should not be barriers to convening the CCS Commission. There may be legal and other barriers to any recommended actions issued by the Commission.
12. **Other Factors:** The workgroup discussed the potential of CCS and concluded that the future feasibility and cost of this technology was no more certain than other large-scale greenhouse gas reduction options, such as nuclear. The goals for carbon reduction need to be established in a state-wide PSC planning forum where the uncertainties in technology availability can be evaluated. The safety and environmental risks of either carbon dioxide pipelines or geologic storage sites for captured CO<sub>2</sub> would also need to be addressed to gain public acceptance of this option. The U.S. Department of Energy and numerous foreign countries are sponsoring research in this area. Three large-scale (greater than one million metric tons of CO<sub>2</sub> per year) projects are currently using geologic storage, but the scale of CCS necessary to have a significant impact on regional greenhouse gas emissions is much greater.

## Wisconsin Task Force on Global Warming Wisconsin Geologic Carbon Sequestration Study

- 1. Workgroup:** Electric Generation and Supply
- 2. Policy Name:** Wisconsin Geologic Carbon Sequestration Study
- 3. Policy Type:** Create a Commission to work collaboratively with Midwest partners to evaluate and recommend possible opportunities for geologic sequestration of CO<sub>2</sub> from Wisconsin's utility sector. Continuation of this work is recommended to keep current with advancements in technology and adaptations for Wisconsin GHG reduction policies.
- 4. Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utility  
Sub-Sector: Distribution utilities
- 5. Estimated Greenhouse Gas Emissions Reduction Impact:** CCS is a strategy for reducing greenhouse gas emissions from baseload electrical generation. The magnitude of greenhouse gas reductions from this technology depends on the type of capture (e.g., pre-combustion or post-combustion) and the type of fuel. In some cases, CCS implemented at a facility burning or co-firing biomass can have an even larger reduction impact on greenhouse gas emissions.
- 6. Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a Commission to evaluate CCS. The Commission should have representatives from Department of Natural Resources, Public Service Commission, and University representatives. In addition, utility, independent power producer, environmental, industrial, and other representatives should be included in the Commission.
- 7. Specific Description of Policy Proposal:** The PSC and DNR would be requested to form a Commission to evaluate the technical and economic potential, and infrastructure requirements, for CCS deployment in Wisconsin. The absence of promising geological formations in Wisconsin for carbon storage will likely result in the need to either transport carbon dioxide by a pipeline system that does not currently exist or transport of low or non-carbon gaseous fuels (e.g., synthetic natural gas or hydrogen) in the current natural gas or future hydrogen pipelines. As with the electrical transmission grid, planning the future gas pipeline infrastructure in the state is not well suited to any individual utility or industry in Wisconsin.
- 8. Timetables, Duration and Stringency Option:** The CCS Commission would convene by July 1, 2008 and would issue its initial findings and recommendations by December 31, 2008. The report will be reviewed and updated annually. As the technology becomes more available, Wisconsin needs to achieve rapid deployment.

The timeline for deploying CCS that would be available to lower greenhouse gas emissions from the electrical sector in Wisconsin is strongly dependent on the pace of carbon storage implementation in adjacent states. The carbon disposal opportunities closest to the major baseload power plants in Wisconsin are the oil and gas fields, coal seams, and deep saline aquifers found in relatively uniform layers across a wide area of Illinois, Indiana, and Kentucky in the geological feature known as the Illinois Basin.

The implementation timeline for CCS is also dependent on the technology used. We assume that the construction of a new IGCC plant with CCS or the retrofit of an existing plant with CCS in Wisconsin is not likely for at least 10 or more years. In Illinois, CCS from a coal or petroleum coke plant producing synthetic natural gas and selling carbon dioxide for enhanced oil recovery may be possible in as early as two or three years.

- 9. Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if CCS is found technically and economically feasible, the findings and recommendations of the Commission would inform those responsible for assisting in the development of this technology for Wisconsin and would provide a foundation for planning the infrastructure necessary for CCS.
- 10. Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC and DNR on task force matters.
- 11. Barriers to Implementation:** There should not be barriers to convening the CCS Commission. There may be legal and other barriers to any recommended actions issued by the Commission.
- 12. Other Factors:** The workgroup discussed the potential of CCS and concluded that the future feasibility and cost of this technology was no more certain than other large-scale greenhouse gas reduction options, such as nuclear. The goals for carbon reduction need to be established in a state-wide PSC planning forum where the uncertainties in technology availability can be evaluated. The safety and environmental risks of either carbon dioxide pipelines or geologic storage sites for captured CO<sub>2</sub> would also need to be addressed to gain public acceptance of this option. The U.S. Department of Energy and numerous foreign countries are sponsoring research in this area. Three large-scale (greater than one million metric tons of CO<sub>2</sub> per year) projects are currently using geologic storage, but the scale of CCS necessary to have a significant impact on regional greenhouse gas emissions is much greater.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Off-shore Wind Study
3. **Policy Type:** Commission a study group to assess the technical and economic potential for wind generation in the Great Lakes, with cooperation of the other Great Lakes states.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy could ultimately result in the siting of off-shore wind generation. Given the relatively high wind potential in the Great Lakes, this policy could result in increased options for meeting the state's RPS standards.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a study group to evaluate off-shore wind potential. The study group would likely have Department of Natural Resources, Public Service Commission, and Board of Commissioners of Public Lands representatives. In addition, utility, independent power producer, environmental, commercial fishing, commercial shipping, riparian, and other representatives should be included in the study group.
7. **Specific Description of Policy Proposal:** The PSC, DNR, and BCPL would be requested to form a study group to evaluate the technical and economic potential for wind generation in the Great Lakes bordering Wisconsin. Among other issues, this group would evaluate the wind potential in Lake Michigan and Lake Superior, costs of development of wind facilities in the lakes, public trust issues related to wind development in the lake bed, avian impact issues, potential riparian owner concerns, and effective regulatory approaches to addressing siting issues. The study group would also evaluate whether the state should explore a partnership with Michigan regarding the development of off-shore wind facilities in Lake Michigan.
8. **Timetables, Duration and Stringency Option:** The study group would convene by July 1, 2008 and would issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if off-shore

wind development is found technically and economically feasible, the findings and recommendations of the study group may assist in the development of off-shore wind projects, which would help the state meet its present and potentially its enhanced RPS standards.

10. **Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC, DNR, and BCPL on task force matters.
11. **Barriers to Implementation:** There should not be barriers to convening the off-shore wind task force. There may be legal and other barriers to any recommended actions issued by the study group.
12. **Other Factors:** N/A

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electric Generation Work Group
2. **Policy Name:** Off-shore Wind Study
3. **Policy Type:** Commission a study group to assess the technical and economic potential for wind generation in the Great Lakes, with cooperation of the other Great Lakes states.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy could ultimately result in the siting of off-shore wind generation. Given the relatively high wind potential in the Great Lakes, this policy could result in increased options for meeting the state's RPS standards.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a study group to evaluate off-shore wind potential. The study group would likely have Department of Natural Resources, Public Service Commission, and Board of Commissioners of Public Lands representatives. In addition, utility, independent power producer, environmental, commercial fishing, commercial shipping, riparian, and other representatives should be included in the study group.
7. **Specific Description of Policy Proposal:** The PSC, DNR, and BCPL would be requested to form a study group to evaluate the technical and economic potential for wind generation in the Great Lakes bordering Wisconsin. Among other issues, this group would evaluate the wind potential in Lake Michigan and Lake Superior, costs of development of wind facilities in the lakes, public trust issues related to wind development in the lake bed, avian impact issues, potential riparian owner concerns, and effective regulatory approaches to addressing siting issues. The study group would also evaluate whether the state should explore a partnership with Michigan regarding the development of off-shore wind facilities in Lake Michigan.
8. **Timetables, Duration and Stringency Option:** The study group would convene by July 1, 2008 and would issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if off-shore

wind development is found technically and economically feasible, the findings and recommendations of the study group may assist in the development of off-shore wind projects, which would help the state meet its present and potentially its enhanced RPS standards.

10. **Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC, DNR, and BCPL on task force matters.
11. **Barriers to Implementation:** There should not be barriers to convening the off-shore wind task force. There may be legal and other barriers to any recommended actions issued by the study group.
12. **Other Factors:** N/A

## Wisconsin Task Force on Global Warming Great Lakes Wind Study

1. **Workgroup:** Electric Generation and Supply
2. **Policy Name:** Great Lakes Wind Study
3. **Policy Type:** Commission a study group to assess the technical and economic potential for wind generation in the Great Lakes, with cooperation of the other Great Lakes states.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utility  
Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy could ultimately result in the siting of off-shore wind generation. Given the relatively high wind potential in the Great Lakes, this policy could result in increased options for meeting the state's RPS standards.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a study group to evaluate off-shore wind potential. The study group would likely have Department of Natural Resources, Public Service Commission, and Board of Commissioners of Public Lands representatives. In addition, utility, independent power producer, environmental, commercial fishing, commercial shipping, riparian, and other representatives should be included in the study group.
7. **Specific Description of Policy Proposal:** The PSC, DNR, and BCPL would be requested to form a study group to evaluate the technical and economic potential for wind generation in the Great Lakes bordering Wisconsin. Among other issues, this group would evaluate the wind potential in Lake Michigan and Lake Superior, costs of development of wind facilities in the lakes, public trust issues related to wind development in the lake bed, avian impact issues, potential riparian owner concerns, and effective regulatory approaches to addressing siting issues. The study group would also evaluate whether the state should explore a partnership with Michigan regarding the development of off-shore wind facilities in Lake Michigan.
8. **Timetables, Duration and Stringency Option:** The study group would convene by July 1, 2008 and would issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any additional GHG reductions. However, if off-shore wind development is found technically and economically feasible, the findings and recommendations of the study group may assist in the development of off-shore wind projects, which would help the state meet its present and potentially its enhanced RPS standards.

- 10. Rough Estimate of Costs for Selected Years:** There would be relatively limited governmental administrative costs with this policy. These governmental costs would mostly involve the time spent by representatives of the PSC, DNR, and BCPL on task force matters.
- 11. Barriers to Implementation:** There should not be barriers to convening the off-shore wind task force. There may be legal and other barriers to any recommended actions issued by the study group.
- 12. Other Factors:** N/A

## Wisconsin Global Warming Task Force Electric Generation Work Group

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Policy Forum for Planning in the Electric Generation Sector
3. **Policy Type:** PSC proceeding and possible authorizing legislation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy to address the implementation of specific greenhouse gas reduction efforts for the electric sector.
6. **Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC.
7. **Specific Description of Policy Proposal:** The forum would develop a state-wide greenhouse gas reduction plan or target that includes, but is not limited to, some or all of the following policies:
  - o Re-dispatch of today's generating units with attentions to carbon
  - o Incorporation of greenhouse gas cost adder into the generation planning process.
  - o Review and/or modification of the Energy Priorities Law
  - o An asset management plan (such as retirement, re-powering, etc.)
  - o Utility-scale Combined Heat and Power (CHP)
  - o Availability of Carbon Capture and Storage (technology and siting)

Numerous scenarios were developed by the work group that considered generation options with outcomes that could further reduce greenhouse gas emissions. To address the feasibility of these options and the cost issues for greenhouse gas reductions in Wisconsin absent federal mandates, the utilities and the public should have a common planning forum to establish GHG reduction need, timeframes and least cost. The planning policy forum needs to consider the implementation of policy options that include a flexible approach to achieve greenhouse gas reductions prior to design and approval of individual utility plans to comply with these policies.

Higher levels of greenhouse gas reductions would not necessarily be achieved efficiently, or in a timely fashion, without planning for statewide greenhouse gas reductions.

8. **Timetables, Duration and Stringency Option:** If the PSC believes it has the authority to conduct this planning forum and address the implementation issues including cost-of-service ratemaking principles without changes in their legislative authority, it could convene a proceeding at any time. However, if legislative changes are necessary, then proposed changes to PSC authority and rules must first be approved.
9. **Explanation of Rough Estimate of GHG Reductions:** This enabling policy does not directly result in GHG reductions but would assist in maximizing reductions in a fair and equitable manner.
10. **Rough Estimate of Costs for Selected Years:** Dependent on planning duration and any pre-work requiring legislative review and approval.
11. **Barriers to Implementation:** Time to implement this policy forum may be significant. Current utility proceedings may be delayed if directly connected to GHG planning.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Policy Forum for Planning in the Electric Generation Sector
3. **Policy Type:** PSC proceeding and possible authorizing legislation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy to address the implementation of specific greenhouse gas reduction efforts for the electric sector.
6. **Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC.
7. **Specific Description of Policy Proposal:** The forum would develop a state-wide greenhouse gas reduction plan or target that includes, but is not limited to, some or all of the following policies:
  - o Re-dispatch of today's generating units with attentions to carbon
  - o Incorporation of greenhouse gas cost adder into the generation planning process.
  - o Review and/or modification of the Energy Priorities Law
  - o An asset management plan (such as retirement, re-powering, etc.)
  - o Utility-scale Combined Heat and Power (CHP)
  - o Availability of Carbon Capture and Storage (technology and siting)

Numerous scenarios were developed by the work group that considered generation options with outcomes that could further reduce greenhouse gas emissions. To address the feasibility of these options and the cost issues for greenhouse gas reductions in Wisconsin absent federal mandates, the utilities and the public should have a common planning forum to establish GHG reduction need, timeframes and least cost. The planning policy forum needs to consider the implementation of policy options that include a flexible approach to achieve greenhouse gas reductions prior to design and approval of individual utility plans to comply with these policies.

Higher levels of greenhouse gas reductions would not necessarily be achieved efficiently, or in a timely fashion, without planning for statewide greenhouse gas reductions.

8. **Timetables, Duration and Stringency Option:** If the PSC believes it has the authority to conduct this planning forum and address the implementation issues including cost-of-service ratemaking principles without changes in their legislative authority, it could convene a proceeding at any time. However, if legislative changes are necessary, then proposed changes to PSC authority and rules must first be approved.
9. **Explanation of Rough Estimate of GHG Reductions:** This enabling policy does not directly result in GHG reductions but would assist in maximizing reductions in a fair and equitable manner.
10. **Rough Estimate of Costs for Selected Years:** Dependent on planning duration and any pre-work requiring legislative review and approval.
11. **Barriers to Implementation:** Time to implement this policy forum may be significant. Current utility proceedings may be delayed if directly connected to GHG planning.

## Wisconsin Global Warming Task Force Work Group

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Wind Siting Reform
3. **Policy Type:** Legislation that reforms the siting process for wind projects under 100MW
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities, Public Service Commission, counties, municipalities, towns, and the wind energy industry
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Wind siting reform is an enabling policy to an enhanced RPS, and would contribute to the overall reduction of greenhouse gases in the RPS.
6. **Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC but reduced costs for wind power producers and consumers.
7. **Specific Description of Policy Proposal:** This policy recommendation includes the following elements (1) definitions of large and small wind energy systems; (2) a requirement for the PSC to draft uniform standards for siting large and small wind energy systems; (3) creation of an optional process for PSC review of projects under 100 MW; (4) a mechanism for allowing parties to appeal a decision rendered by a local jurisdiction to the PSC; (5) extending Chapter 227 judicial review provisions to wind projects permitted by local jurisdiction and (6) a prohibition on local ordinances restricting meteorological test towers. The new standards adopted by the PSC for wind projects under 100 MW would not require an alternative site as part of the permit application.
8. **Timetables, Duration and Stringency Option:** Once the legislation is enacted, the PSC would have a specified period of time to adopt emergency rules establishing uniform standards for permitting wind projects. These standards would apply to PSC-reviewed wind projects as well as those reviewed by local jurisdictions. These rules would remain in effect indefinitely.
9. **Explanation of Rough Estimate of GHG Reductions:** Today, at least 400 MW of wind projects currently under development are subject to local restrictions that prevent them from going forward. Four hundred forty MW of wind power operating at a capacity factor of 29% should produce one million MWH per annum, which in turn should reduce emissions by 925,000 metric tons per year (CO<sub>2</sub> equivalent). Continued contributions from these smaller wind resources

could reduce 1.4 million metric tons CO2 equivalents by 2020 and 1.85 million metric tons CO2 equivalents by 2025. (See RPS template for full potential of renewable resources.)

10. **Rough Estimate of Costs for Selected Years:** N/A
11. **Barriers to Implementation:** This policy recommendation could generate opposition from specific municipalities.
12. **Other Factors:** The wind power permitting reform recommendation was considered by the generation working group as an enabling policy necessary to meet the supply requirements of an enhanced RPS with the economic benefits of in-state wind generation.

## Wisconsin Global Warming Task Force Work Group

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Wind Siting Reform
3. **Policy Type:** Legislation that reforms the siting process for wind projects under 100MW to make it comparable to the process for projects 100 MW and greater.

4. **Affected Sectors, Sub-Sectors and/or Entities:**

Sector: Electric utility  
Sub-Sector: Distribution utilities, Public Service Commission, counties, municipalities, towns, and the wind energy industry.

5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Wind siting reform is an enabling policy to an enhanced RPS, and would contribute to the overall reduction of greenhouse gases in the RPS.

6. **Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC but reduced costs for wind power producers and consumers.

7. **Specific Description of Policy Proposal:** This policy recommendation includes the following elements: (1) definitions of large and small wind energy turbines; (2) a requirement for the PSC to draft uniform standards for siting large and small wind energy turbines; (3) creation of an optional process for PSC review of projects under 100 MW; (4) a mechanism for allowing parties to appeal a decision rendered by a local jurisdiction to the PSC; (5) extending Chapter 227 judicial review provisions to wind projects permitted by local jurisdiction, and (6) a prohibition on local ordinances restricting meteorological test towers. The new standards adopted by the PSC for wind projects under 100 MW would not require an alternative site as part of the permit application.

8. **Timetables, Duration and Stringency Option:** This proposal calls for the enactment of legislation, the process for which would include opportunities for public input by local groups and others. If the legislation is enacted, the PSC would have a specified period of time to adopt rules establishing uniform standards for permitting wind projects. Local groups and others will be able to raise concerns and suggestions regarding the rules during this process. These regulatory standards would apply to PSC-reviewed wind projects as well as those reviewed by local jurisdictions. These rules would remain in effect indefinitely. Regardless of whether wind siting decisions are made by local jurisdictions or the PSC, local groups and others would continue to be able to provide input relevant to such decision making.

9. **Explanation of Rough Estimate of GHG Reductions:** Today, at least 400 MW of wind projects currently under development are subject to local restrictions that prevent them from going forward. Four hundred forty MW of wind power operating at a capacity factor of 29% should produce one million MWH per annum, which in turn should reduce emissions by 925,000 metric tons per year (CO<sub>2</sub> equivalent). Continued contributions from these smaller wind resources could reduce 1.4 million metric tons CO<sub>2</sub> equivalents by 2020 and 1.85 million metric tons CO<sub>2</sub> equivalents by 2025. (See RPS template for full potential of renewable resources.).

10. **Rough Estimate of Costs for Selected Years:** N/A.

11. **Barriers to Implementation:** This policy recommendation could generate opposition from specific municipalities.

12. **Other Factors:** The wind power permitting reform recommendation was considered by the generation working group as an enabling policy necessary to meet the supply requirements of an enhanced RPS with the economic benefits of in-state wind generation.

## Wisconsin Task Force on Global Warming Wind Siting Reform

- 1. Workgroup:** Electric Generation and Supply
- 2. Policy Name:** Wind Siting Reform
- 3. Policy Type:** Legislation that reforms the siting process for wind projects under 100MW to make it comparable to the process for projects 100 MW and greater.
- 4. Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric utility  
Sub-Sector: Distribution utilities, Public Service Commission, counties, municipalities, towns, and the wind energy industry.
- 5. Estimated Greenhouse Gas Emissions Reduction Impact:** Wind siting reform is an enabling policy to an enhanced RPS, and would contribute to the overall reduction of greenhouse gases in the RPS.
- 6. Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC but reduced costs for wind power producers and consumers.
- 7. Specific Description of Policy Proposal:** This policy recommendation includes the following elements: (1) definitions of large and small wind energy turbines; (2) a requirement for the PSC to draft uniform standards for siting large and small wind energy turbines; (3) creation of an optional process for PSC review of projects under 100 MW; (4) a mechanism for allowing parties to appeal a decision rendered by a local jurisdiction to the PSC; (5) extending Chapter 227 judicial review provisions to wind projects permitted by local jurisdiction, and (6) a prohibition on local ordinances restricting meteorological test towers. The new standards adopted by the PSC for wind projects under 100 MW would not require an alternative site as part of the permit application.
- 8. Timetables, Duration and Stringency Option:** This proposal calls for the enactment of legislation, the process for which would include opportunities for public input by local groups and others. If the legislation is enacted, the PSC would have a specified period of time to adopt rules establishing uniform standards for permitting wind projects. Local groups and others will be able to raise concerns and suggestions regarding the rules during this process. These regulatory standards would apply to PSC-reviewed wind projects as well as those reviewed by local jurisdictions. These rules would remain in effect indefinitely. Regardless of whether wind siting decisions are made by local jurisdictions or the PSC, local groups and others would continue to be able to provide input relevant to such decision making.
- 9. Explanation of Rough Estimate of GHG Reductions:** Today, at least 400 MW of wind projects currently under development are subject to local restrictions that prevent them

from going forward. Four hundred forty MW of wind power operating at a capacity factor of 29% should produce one million MWH per annum, which in turn should reduce emissions by 925,000 metric tons per year (CO<sub>2</sub> equivalent). Continued contributions from these smaller wind resources could reduce 1.4 million metric tons CO<sub>2</sub> equivalents by 2020 and 1.85 million metric tons CO<sub>2</sub> equivalents by 2025. (See RPS template for full potential of renewable resources)

**10. Rough Estimate of Costs for Selected Years:** N/A

**11. Barriers to Implementation:** This policy recommendation could generate opposition from specific municipalities.

**12. Other Factors:** The wind power permitting reform recommendation was considered by the generation working group as an enabling policy necessary to meet the supply requirements of an enhanced RPS with the economic benefits of in-state wind generation.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Relax restrictions on construction of new nuclear plants
3. **Policy Type:** Legislation revising statutory restrictions on approval of new nuclear plants.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
 Sector: Electric utility  
 Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Compared to current statewide average CO2 emissions for electric generation, 1000 MW of new nuclear generation would reduce greenhouse gas emissions by approximately 6.2 million metric tons per year.
6. **Estimated Costs:** Uncertain. For purposes of work group discussions, the increase in annual electric costs (in millions 2007\$) relative to the business as usual (0.5%/yr electric sales growth) case for a 1,000 Mw nuclear plant are shown in the following table for a range of capital costs for nuclear generation and assumptions about whether or not the nuclear plant will replace future new unit additions (Capacity):

	2030	
	Replaces Energy & Capacity	Replaces Energy Only
Nuclear Capital Cost = \$3,760/kw	248	354
Nuclear Capital Cost = \$5,415/kw	399	472

7. **Specific Description of Policy Proposal:** Under Wisconsin’s “nuclear moratorium” law (§ 196.493, Wis. Stats.), the Public Service Commission (PSC) may not authorize the construction of a nuclear plant unless it finds that a facility will be available for the disposal of high-level waste from all Wisconsin nuclear plants, and that the proposed plant is economically advantageous to ratepayers based on specified factors. This proposed policy would not mandate or encourage new nuclear plant construction, but would relax the requirement of finding that a facility will be available for the disposal of high level waste from all Wisconsin

nuclear plants. Specifically, the policy would revise § 196.493(2)(a) to allow the PSC to authorize the construction of a nuclear plant, under specified conditions described below.

Concern has been expressed over whether Wisconsin utilities would actually pursue new nuclear plants, given the decisions by these utilities to sell their existing nuclear plants. If Wisconsin utilities do not pursue new nuclear plants, the primary beneficiaries of a relaxation of the restriction in § 196.493(2)(a) would likely be merchant generating companies. A merchant generating company could potentially sell the output of a new nuclear unit to out-of-state customers. In this case, Wisconsin consumers would not benefit from the plant, and greenhouse gas emissions associated with serving Wisconsin load would not be affected. To address this concern, the conditions under which the PSC could approve the construction of a new nuclear plant by an entity other than a utility without making the determinations in § 196.493(2)(a) would include all of the following requirements:

1. Wisconsin utilities must be granted the right-of-first refusal to purchase the output of the proposed plant.
  2. At least seventy-five percent of the capacity of the proposed plant must be contracted to Wisconsin utilities under long-term power purchase agreements.
  3. All green attributes from the facility must go to the Wisconsin utilities to which the plant output has been contracted.
8. **Timetables, Duration and Stringency Option:** Legislation should be enacted prior to the conclusion of the 2010 legislative sessions. This would allow the development and construction of new nuclear generation in the state within the 2020 – 2030 timeframe.
9. **Explanation of Rough Estimate of GHG Reductions:** The estimated GHG reductions are based on an estimated statewide average GHG emission rate of 1,850 lbs per MWh and an assumed capacity factor of 85% for the new nuclear unit.
10. **Rough Estimate of Costs for Selected Years:** The lack of recent nuclear plant construction experience in the United States makes it difficult to estimate the cost of constructing a new plant. The costs provided with this policy are shown in the table above (in 2007 dollars). Other cost projections are available, some higher and some lower. If new nuclear plants prove more costly than available alternatives, such plants will presumably not be pursued and the proposed policy will have no effect on ratepayer costs. If, on the other hand, new nuclear plants prove more economical than available alternatives, the proposed policy will potentially reduce ratepayer costs relative to maintaining today's nuclear moratorium.

11. **Barriers to Implementation:** The primary barrier to implementation of this policy is the need for legislation to amend § 196.493. Opposition is likely since the proposed amendment would potentially result in the generation of additional nuclear waste in Wisconsin prior to the availability of a permanent waste repository. Although the work group believes that the three requirements in Section 7 are necessary to ensure that Wisconsin receives the energy and carbon benefits of any new nuclear plants in state, there may be interstate commerce or other legal challenges to these requirements.
  
12. **Other Factors:** Uncertainty regarding the cost and timing of new nuclear plants makes it difficult to project the emission reductions that may be achieved as a result of this policy, or the cost of achieving these reductions. However, the only relatively near-term prospect for large-scale, carbon-free baseload generating capacity other than nuclear is coal with carbon capture and storage (CCS) or biomass gasification. These options also faces significant uncertainties regarding technology, cost and timing, as well as legal and regulatory issues that must be addressed to allow for implementation.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Relax restrictions on construction of new nuclear plants
3. **Policy Type:** Legislation revising statutory restrictions on approval of new nuclear plants.
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
 Sector: Electric utility  
 Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Compared to current statewide average CO2 emissions for electric generation, 1000 MW of new nuclear generation would reduce greenhouse gas emissions by approximately 6.2 million metric tons per year.
6. **Estimated Costs:** Uncertain. For purposes of work group discussions, the increase in annual electric costs (in millions 2007\$) relative to the business as usual (0.5%/yr electric sales growth) case for a 1,000 Mw nuclear plant are shown in the following table for a range of capital costs for nuclear generation and assumptions about whether or not the nuclear plant will replace future new unit additions (Capacity):

	2030	
	Replaces Energy & Capacity	Replaces Energy Only
Nuclear Capital Cost = \$3,760/kw	248	321
Nuclear Capital Cost = \$5,415/kw	399	472

7. **Specific Description of Policy Proposal:** Under Wisconsin’s “nuclear moratorium” law (§ 196.493, Wis. Stats.), the Public Service Commission (PSC) may not authorize the construction of a nuclear plant unless it finds that a facility will be available for the disposal of high-level waste from all Wisconsin nuclear plants, and that the proposed plant is economically advantageous to ratepayers based on specified factors. This proposed policy would not mandate or encourage new nuclear plant construction, but would relax the requirement of finding that a facility will be available for the disposal of high level waste from all Wisconsin

nuclear plants. Specifically, the policy would revise § 196.493(2)(a) to allow the PSC to authorize the construction of a nuclear plant, under specified conditions described below.

Concern has been expressed over whether Wisconsin utilities would actually pursue new nuclear plants, given the decisions by these utilities to sell their existing nuclear plants. If Wisconsin utilities do not pursue new nuclear plants, the primary beneficiaries of a relaxation of the restriction in § 196.493(2)(a) would likely be merchant generating companies. A merchant generating company could potentially sell the output of a new nuclear unit to out-of-state customers. In this case, Wisconsin consumers would not benefit from the plant, and greenhouse gas emissions associated with serving Wisconsin load would not be affected. To address this concern, the conditions under which the PSC could approve the construction of a new nuclear plant by an entity other than a utility without making the determinations in § 196.493(2)(a) would include all of the following requirements:

1. Wisconsin utilities must be granted the right-of-first refusal to purchase the output of the proposed plant.
  2. At least seventy-five percent of the capacity of the proposed plant must be contracted to Wisconsin utilities under long-term power purchase agreements.
  3. All green attributes from the facility must go to the Wisconsin utilities to which the plant output has been contracted.
8. **Timetables, Duration and Stringency Option:** Legislation should be enacted prior to the conclusion of the 2010 legislative sessions. This would allow the development and construction of new nuclear generation in the state within the 2020 – 2030 timeframe.
9. **Explanation of Rough Estimate of GHG Reductions:** The estimated GHG reductions are based on an estimated statewide average GHG emission rate of 1,850 lbs per MWh and an assumed capacity factor of 85% for the new nuclear unit.
10. **Rough Estimate of Costs for Selected Years:** The lack of recent nuclear plant construction experience in the United States makes it difficult to estimate the cost of constructing a new plant. The costs provided with this policy are shown in the table above (in 2007 dollars). Other cost projections are available, some higher and some lower. If new nuclear plants prove more costly than available alternatives, such plants will presumably not be pursued and the proposed policy will have no effect on ratepayer costs. If, on the other hand, new nuclear plants prove more economical than available alternatives, the proposed policy will potentially reduce ratepayer costs relative to maintaining today's nuclear moratorium.

11. **Barriers to Implementation:** The primary barrier to implementation of this policy is the need for legislation to amend § 196.493. Opposition is likely since the proposed amendment would potentially result in the generation of additional nuclear waste in Wisconsin prior to the availability of a permanent waste repository. Although the work group believes that the three requirements in Section 7 are necessary to ensure that Wisconsin receives the energy and carbon benefits of any new nuclear plants in state, there may be interstate commerce or other legal challenges to these requirements. The work group acknowledges that public challenges will be raised in the legislative process and in the PSC siting process.
  
12. **Other Factors:** Uncertainty regarding the cost and timing of new nuclear plants makes it difficult to project the emission reductions that may be achieved as a result of this policy, or the cost of achieving these reductions. However, the only relatively near-term prospect for large-scale, carbon-free baseload generating capacity other than nuclear is coal with carbon capture and storage (CCS) or biomass gasification. These options also face significant uncertainties regarding technology, cost and timing, as well as legal and regulatory issues that must be addressed to allow for implementation. As a result, the majority of the working group members believe nuclear power should be available as an option in Wisconsin, although this proposal was strongly opposed by several work group members.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electric Generation and Supply Work Group
2. **Policy Name:** Green Tariff Option for Customers – Feasibility Study
3. **Policy Type:** Directive to Public Service Commission to study the feasibility of new renewable tariff approaches (with legislation, if necessary amending Wis. Stat. Section 196.192) to allow retail customers to enter into long term arrangements with renewable energy providers for renewable capacity and energy.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Under this proposal, the PSC would investigate the feasibility of tariffs designed to allow retail customers to have an option of contracting directly with renewable energy providers. For every additional megawatt hour of energy that is purchased from renewable energy providers, an estimated 1,850 pounds of CO<sub>2</sub> emissions are avoided.
6. **Estimated Costs:** The overall cost per year to develop and implement this policy would be limited to administrative time of the PSC and utilities to conduct a study and investigate tariff options, assessing the implementation issues including the recommended accounting for the billing and cost recovery treatment for the tariff.
7. **Specific Description of Policy Proposal:** The development of a green tariff option for customers is an enabling policy to further encourage the development of renewable energy in the state. This policy directs the Public Service Commission to study the feasibility of market-based pricing options for customers. Tariff proposals would be designed to accommodate individual contracts between retail customers and renewable energy providers that are longer-term, fixed price contracts for energy and capacity. Renewable energy that resulted from the implementation of these tariff proposals would not count toward Renewable Portfolio Requirements of utilities.
8. **Timetables, Duration and Stringency Option:** This feasibility study should be conducted in 2008 so that implementation recommendations could be considered in 2009.

9. **Explanation of Rough Estimate of GHG Reductions:** The study recommended in this policy, if implemented, would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under these tariffs.
10. **Rough Estimate of Costs for Selected Years:** There would be limited governmental administrative costs to conduct the study and implement the recommendations. There would be administrative costs for the utilities in the development of the tariffs and application of the tariff rules for the customers who want their energy service under this tariff option.
11. **Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to establish this tariff option for retail customers.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electric Generation and Supply Work Group
2. **Policy Name:** Green Tariff Option for Customers – Feasibility Study
3. **Policy Type:** Directive to Public Service Commission to study the feasibility of new renewable tariff approaches (with legislation, if necessary amending Wis. Stat. Section 196.192) to allow retail customers to enter into long term arrangements **through their utilities** with renewable energy providers for renewable capacity and energy.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Under this proposal, the PSC would investigate the feasibility of tariffs designed to allow retail customers to have an option of contracting **through their utilities** with renewable energy providers. For every additional megawatt hour of energy that is purchased from renewable energy providers, an estimated 1,850 pounds of CO<sub>2</sub> emissions are avoided.
6. **Estimated Costs:** The overall cost per year to develop and implement this policy would be limited to administrative time of the PSC and utilities to conduct a study and investigate tariff options, assessing the implementation issues including the recommended accounting for the billing and cost recovery treatment for the tariff.
7. **Specific Description of Policy Proposal:** The development of a green tariff option for customers is an enabling policy to further encourage the development of renewable energy in the state. This policy directs the Public Service Commission to study the feasibility of market-based pricing options for customers. Tariff proposals would be designed to accommodate individual contracts between retail customers and renewable energy providers **through their utilities** that are longer-term, fixed price contracts for energy and capacity. Renewable energy that resulted from the implementation of these tariff proposals would not count toward Renewable Portfolio Requirements of utilities.
8. **Timetables, Duration and Stringency Option:** This feasibility study should be conducted in 2008 so that implementation recommendations could be considered in 2009.

9. **Explanation of Rough Estimate of GHG Reductions:** The study recommended in this policy, if implemented, would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under these tariffs.
10. **Rough Estimate of Costs for Selected Years:** There would be limited governmental administrative costs to conduct the study and implement the recommendations. There would be administrative costs for the utilities in the development of the tariffs and application of the tariff rules for the customers who want their energy service under this tariff option.
11. **Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to establish this tariff option for retail customers.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electric Generation and Supply Work Group
2. **Policy Name:** Incentives for Renewable (‘climate friendly’) Energy Development – Tax Deductibility of Payments Made by Customers
3. **Policy Type:** Re-design the administration of existing utility rate programs for customers who want their utility service from renewable energy by allowing an existing non-profit organization or a new, non-profit organization to collect the customer contributions for these programs.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Under this proposal, additional utility customers would select these rate options due to its favorable tax treatment, resulting in an increase in the amount of renewable energy generated in the state. For every additional megawatt hour of energy that is purchased by the utility from renewable energy providers, an estimated 1,850 pounds of CO<sub>2</sub> emissions are avoided.
6. **Estimated Costs:** The overall cost per year to develop and implement this policy would be limited to administrative time of the non-profit organization to structure the funding mechanisms for these new renewable energy projects. There would be no incremental costs to utilities to administer this voluntary renewable supply option because utility programs already exist today that have similar structures from a customer service perspective.
7. **Specific Description of Policy Proposal:** This program would create incentives for customers to enroll in utility service options from renewable energy supply by making the amounts that they contribute tax deductible, to the extent allowed by law. Efficiencies could be gained in the collection and distribution of funds to renewable energy providers by establishing a statewide organization for this purpose, rather than utility specific program alternatives. A model for this program already exists: Wisconsin Public Service Corporation’s SolarWise program provides funding for the installation of solar panels on schools with monies collected by a non-profit 501(c) 3 foundation that the company established for this purpose. Renewable energy that resulted from the implementation of this policy would not count toward Renewable Portfolio Requirements of utilities.

8. **Timetables, Duration and Stringency Option:** This policy could be implemented as soon as the non-profit organization can be established to administer the statewide program. Existing utility programs could be modified to work through this new organization.
9. **Explanation of Rough Estimate of GHG Reductions:** The incremental renewable energy supply resulting from this policy would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under this program.
10. **Rough Estimate of Costs for Selected Years:** There would be additional administrative costs for this program associated with the staffing and functioning of the non-profit organization. These added costs could be charged to the users (utilities and renewable energy suppliers). A common state plan should be less costly to administer than individual programs in each utility.
11. **Barriers to Implementation:** Some change in state revenue planning would need to occur to acknowledge the changes in state and federal tax collections.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electric Generation and Supply Work Group
2. **Policy Name:** Incentives for Renewable ('climate friendly') Energy Development – Tax Deductibility of Payments Made by Customers
3. **Policy Type:** Re-design the administration of existing utility rate programs for customers who want their utility service from renewable energy by allowing an existing non-profit organization or a new, non-profit organization to collect the customer contributions for these programs.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Under this proposal, additional utility customers would select these rate options due to their favorable tax treatment, resulting in an increase in the amount of renewable energy generated in the state. For every additional megawatt hour of energy that is purchased by the utility from renewable energy providers, an estimated 1,850 pounds of CO<sub>2</sub> emissions are avoided.
6. **Estimated Costs:** The overall cost per year to develop and implement this policy would be limited to administrative time of the non-profit organization to structure the funding mechanisms for these new renewable energy projects. There would be no incremental costs to utilities to administer this voluntary renewable supply option because utility programs already exist today that have similar structures from a customer service perspective.
7. **Specific Description of Policy Proposal:** This program would create incentives for customers to enroll in utility service options from renewable energy supply by making the amounts that they contribute tax deductible, to the extent allowed by law. Efficiencies could be gained in the collection and distribution of funds to renewable energy providers by establishing a statewide organization for this purpose, rather than utility specific program alternatives. A model for this program already exists: Wisconsin Public Service Corporation's SolarWise program provides funding for the installation of solar panels on schools with monies collected by a non-profit 501(c) 3 foundation that the company established for this purpose. Renewable energy that resulted from the implementation of this policy would not count toward Renewable Portfolio Requirements of utilities.

8. **Timetables, Duration and Stringency Option:** This policy could be implemented as soon as the non-profit organization can be established to administer the statewide program. Existing utility programs could be modified to work through this new organization.
9. **Explanation of Rough Estimate of GHG Reductions:** The incremental renewable energy supply resulting from this policy would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under this program.
10. **Rough Estimate of Costs for Selected Years:** There would be additional administrative costs for this program associated with the staffing and functioning of the non-profit organization. These added costs could be charged to the users (utilities and renewable energy suppliers). A common state plan should be less costly to administer than individual programs in each utility.
11. **Barriers to Implementation:** Some change in state revenue planning would need to occur to acknowledge the changes in state and federal tax collections.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Advanced Renewable Tariff Development (longer term fixed price tariffs to stimulate the deployment of renewable generation projects under 15 MW).
3. **Policy Type:** PSC proceeding and possible authorizing legislation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** The development of advanced renewable tariffs is an enabling policy to an enhanced RPS, and would contribute to the achievement of overall reductions of greenhouse gases in the RPS. It is expected that this policy would expand the development of smaller scale projects and that these projects would be brought to market more quickly with this policy.
6. **Estimated Costs:** The overall cost per year to develop this policy would be limited to administrative time of the PSC and utilities to establish an implementation approach and cost recovery treatment for the tariff.
7. **Specific Description of Policy Proposal:** The advanced renewable tariff policy should encompass the following principles:
  - a. Tariffs should be set according to specific production costs of a particular generation technology;
  - b. The tariffs should include a rate of return comparable to the utilities' allowed return;
  - c. The tariffs should be fixed over a period of time that allows for full recovery of capital costs;
  - d. Renewable energy credits acquired through these tariffs can be rate-based or sold through a utility's voluntary renewable energy program;
  - e. When the fixed term of the tariff ends (capital costs of project have been recovered), the energy from these systems can be acquired through the utility's parallel generation tariff or through a negotiated purchased power agreement.

A utility may apply generation purchased under these tariffs toward its current Renewable Portfolio Standard or any successor renewable energy obligation, unless the output is resold through a voluntary renewable energy program at retail.

8. **Timetables, Duration and Stringency Option:** This policy should be developed and implemented by 2009. If the PSC believes it has the authority to establish advanced renewable energy tariffs without legislation, it could convene a proceeding at any time to determine the production costs of various distributed renewable resources such as solar, wind, small hydro, landfill gas, biogas, and other biomass sources.
9. **Explanation of Rough Estimate of GHG Reductions:** The development of advanced renewable tariffs is an enabling policy to an enhanced RPS. If the enhanced RPS is not adopted, this policy should be done so that smaller scale renewable projects are encouraged in the state. As a stand-alone policy, if utilities supplied 2% of their sales with distributed renewable resources by 2020 (above current requirements), and 3% by 2025, this would result in reductions of 1.5 million tons/yr by 2020, and 2.25 million tons/yr by 2025.
10. **Rough Estimate of Costs for Selected Years:** The cost to develop this tariff is administrative only and can be considered part of traditional utility ratemaking. The cost to fully implement an advanced renewable tariff is dependent on tariff design principles.
11. **Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to set advanced renewable tariffs and impose targets on utilities.
12. **Other Factors:** It is recognized that advanced renewable tariffs would likely result in increased costs per unit of electrical output compared to utility-scale renewable projects but that these costs are justified by the economic and environmental advantages from encouraging distributed small-scale generation. Establishing a single tariff approach across the state may result in unequal cost impacts to each utility because of different land use patterns, with less expensive biogas-type projects more available in rural areas compared to more expensive solar projects in urban areas. This policy recommendation is not cost-of-service ratemaking by each utility and, therefore, may be challenging from a PSC rules- and -ratepayer equity perspective.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Advanced Renewable Tariff Development (longer term fixed price tariffs to stimulate the deployment of renewable generation projects under 15 MW).
3. **Policy Type:** PSC proceeding and possible authorizing legislation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** The development of advanced renewable tariffs is an enabling policy to an enhanced RPS, and would contribute to the achievement of overall reductions of greenhouse gases in the RPS. It is expected that this policy would expand the development of smaller scale projects and that these projects would be brought to market more quickly with this policy.
6. **Estimated Costs:** The overall cost per year to develop this policy would be limited to administrative time of the PSC and utilities to establish an implementation approach and cost recovery treatment for the tariff.
7. **Specific Description of Policy Proposal:** The advanced renewable tariff policy should encompass the following principles:
  - a. Tariffs should be set according to specific production costs of a particular generation technology;
  - b. The tariffs should include a rate of return comparable to the utilities' allowed return;
  - c. The tariffs should be fixed over a period of time that allows for full recovery of capital costs;
  - d. Renewable energy credits acquired through these tariffs can be rate-based or sold through a utility's voluntary renewable energy program;
  - e. When the fixed term of the tariff ends (capital costs of project have been recovered), the energy from these systems can be acquired through the utility's parallel generation tariff or through a negotiated purchased power agreement.

A utility may apply generation purchased under these tariffs toward its current Renewable Portfolio Standard or any successor renewable energy obligation, unless the output is resold through a voluntary renewable energy program at retail.

8. **Timetables, Duration and Stringency Option:** This policy should be developed and implemented by 2009. If the PSC believes it has the authority to establish advanced renewable energy tariffs without legislation, it could convene a proceeding at any time to determine the production costs of various distributed renewable resources such as solar, wind, small hydro, landfill gas, biogas, and other biomass sources.
9. **Explanation of Rough Estimate of GHG Reductions:** The development of advanced renewable tariffs is an enabling policy to an enhanced RPS. If the enhanced RPS is not adopted, this policy should be done so that smaller scale renewable projects are encouraged in the state. As a stand-alone policy, if utilities supplied 2% of their sales with distributed renewable resources by 2020 (above current requirements), and 3% by 2025, this would result in reductions of 1.5 million tons/yr by 2020, and 2.25 million tons/yr by 2025.
10. **Rough Estimate of Costs for Selected Years:** The cost to develop this tariff is administrative only and can be considered part of traditional utility ratemaking. The cost to fully implement an advanced renewable tariff is dependent on tariff design principles.
11. **Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to set advanced renewable tariffs and impose targets on utilities.
12. **Other Factors:** It is recognized that advanced renewable tariffs would likely result in increased costs per unit of electrical output compared to utility-scale renewable projects but that these costs are justified by the economic and environmental advantages from encouraging distributed small-scale generation. Establishing a single tariff approach across the state may result in unequal cost impacts to each utility because of different land use patterns, with less expensive biogas-type projects more available in rural areas compared to more expensive solar projects in urban areas. This policy recommendation is not cost -of -service ratemaking by each utility and, therefore, may be challenging from a PSC rules - and -ratepayer equity perspective.

## Wisconsin Global Warming Task Force Workgroup

1. **Workgroup:** Electrical Generation Work Group
2. **Policy Name:** Incentives and/or mandates for Combined Heat and Power (CHP) construction, upgrades, and/or replacement.
3. **Policy Type:** Incentives, information and regulatory changes to encourage investment in combined heat and power generation and distribution systems.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility and industry
  - Sub-Sector: Distribution utilities and industrial facilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy is estimated to result in the deployment of 250 MW of CHP by 2020 and an additional 250 MW of CHP by 2030. The deployment of these CHP units will result in a reduction of 1.1 million metric tons of CO<sub>2</sub>e by 2020 and 2.1 million metric tons of CO<sub>2</sub>e by 2030 compared to “business as usual.”
6. **Estimated Costs:** The increase in annual cost (in 2007 \$) to deploy the CHP policy is estimated to range from \$53 million/yr to \$71 million/yr by 2020, and \$106 million/yr to \$143 million/yr by 2030. These estimates are based on the projected costs for deploying 5 units of 50 MW by 2020 and an additional 5 units of 50 MW by 2030. In addition, feasibility studies are expected to cost up to \$250,000 per industrial site.
7. **Specific Description of Policy Proposal:**

Establish policies, incentives and information to decommission older, high emission sources and replace these units with CHP systems and to identify and install new CHP systems. Emphasis should be on projects that maximize the thermal host load in order to maximize efficiencies. Potential candidates include the cyclone boiler installations within Wisconsin. This policy does not include the retirement and replacement or repowering of electrical utility boilers, an option incorporated into the planning forum recommendation from the generation work group.

Specific components of the policy proposal include the following:

- (1) Amend Wis. Stat. §196.192 (market-based compensation, rates and contracts) to allow large customers to contract with utilities for the purchase of power and steam from more energy efficient systems. A model could be 2007 Pennsylvania Act 36, where large customers with 15 megawatts of load can establish bilateral contracts for power, contingent upon PSC review & approval of those contracts.
- (2) Fund site specific feasibility studies through Focus on Energy regarding industrial boiler retirement and/or installation of CHP systems.
- (3) Consider

- incentive programs through Focus on Energy to provide funding for the installation of CHP systems. We cannot fully recommend the incentive option at this time, because the incentive could be very large based on what other states are currently providing (\$6 million or more for a project the size of a cyclone boiler using the proposed policy in Illinois, based on incentives of \$1 per watt of installed nameplate capacity for renewable-fuelled projects and \$0.5 per watt for non-renewable fuelled projects).
8. **Timetables, Duration and Stringency Option:** Funding for individual feasibility studies should be made available as soon as possible. Implementation of policies and investment in projects take place over the following 10-20 years.
  9. **Explanation of Rough Estimate of GHG Reductions:** Emission reductions are based on an assumption of the installation of 500 MWs of CHP projects with a capacity factor of 85% and an effective heat rate of 4,900 Btu/Kwh.
  10. **Rough Estimate of Costs for Selected Years:** Costs are based upon estimated capital costs for 50 MW combined-cycle CHP facilities adjusted for increased efficiencies due to cogeneration (4,900 Btu/Kwh heat rate). Incremental administrative costs of implementing CHP policies are estimated to be negligible.
  11. **Barriers to Implementation:** The barriers to implementing a CHP policy include the availability of appropriate thermal host sites in the state, the long term commercial viability of the thermal host and regulatory barriers (new source review laws, prohibitions on investor owned utilities from installing CHP projects and contracting with the customers in Wis. Stat. §196.192, etc.). Additional barriers identified in the generation group include the uncertainty of future natural gas prices (if the CHP units are operated on natural gas as opposed to biomass or synthetic/biogas) and infrastructure cost allocations.
  12. **Other Factors:** N/A

## Wisconsin Global Warming Task Force Workgroup

**1. Workgroup:** Electrical Generation Work Group

**2. Policy Name:** Re-dispatch existing generation to lower carbon dioxide emissions.

**3. Policy Type:** PSC and DNR public planning forum

**4. Affected Sectors, Sub-Sectors and/or Entities:**

Sector: Electric utilities

**5. Estimated Greenhouse Gas Emissions Reduction Impact:** The maximum available re-dispatch of existing natural gas combined-cycle power plants, approximately 9 million MWh, would reduce greenhouse gas emissions by approximately 6.5 million metric tons of CO<sub>2</sub> per year. The potential for CO<sub>2</sub> emission reductions from dispatching coal plants with the lowest greenhouse gas emission rates before coal plants with higher greenhouse gas emission rates has not been estimated but could be substantial given the wide range of coal plant efficiencies in Wisconsin. The actual greenhouse gas emission reductions that would occur from implementation of this policy are difficult to estimate.

**6. Estimated Costs:** The estimated cost for the maximum re-dispatch of existing natural gas combined-cycle power plants (approximately 9 million MWh statewide) has been estimated at approximately \$325 million per year, equivalent to approximately \$50/metric ton of CO<sub>2</sub>. The cost to re-dispatch natural gas plants is strongly dependent on the cost differential between natural gas and coal. It is much more difficult to estimate the cost and reduction potential for opportunistic re-dispatch of natural gas plants or the potential for greater dispatch of more efficient coal plants before less efficient coal plants. In all cases, the cost of reducing greenhouse gas emissions through re-dispatch at each utility will be compared under this policy proposal, on a cost per ton basis, with the other near-term options available to each utility.

**7. Specific Description of Policy Proposal:** This policy would require each electrical utility in Wisconsin to present a plan to reduce greenhouse gas emissions in specified increments beginning in 2009 and ending with the implementation of any federal or regional cap and trade program. The plan would identify the opportunities for re-dispatching existing generation that the utility is able to make in order to meet specified reductions and the projected costs of such measures. Near-term alternatives to re-dispatching existing generation, such as installing additional low-carbon generation, installing renewable generation in excess of ACT 141 requirements, and retiring old units would also be identified and compared to the costs of re-dispatching existing generation. The intent of this policy is for utilities to provide plans to the state for reducing near-term greenhouse gas emissions in a consistent format.

The plans would be reviewed by the PSC and DNR in a forum that would allow for public analysis and comment. When this docket is completed, individual utilities will present their final greenhouse gas reduction plans to the PSC in a proceeding. Based on

the utility plan and the public comments, the PSC will set a greenhouse gas emission goal for each utility and a determination of whether the cost of the plan is reasonable for rate recovery. The costs of implementation of the plans will be recoverable in the next rate case of each utility. The utilities would then make good faith commitments to achieve their plans. The plans would sunset with the implementation of any regional or federal cap-and-trade program.

The PSC is directed to open a docket for this proceeding and establish a schedule for planning discussions and decisions. This docket should be opened as soon as possible, and no later than October 1, 2008.

**8. Timetables, Duration and Stringency Option:** The timetable is implicit in the policy description. This policy will sunset with the implementation of a cap-and-trade program that covers the electrical utility sector (the first year in which reductions for a given source are required). The greenhouse gas reduction plans would not be legally enforceable, but public reporting of the degree to which a utility is meeting the plan would be required every 6 months until the end of this policy. Plans would be revised and re-submitted every two years until the end of this policy.

**9. Explanation of Rough Estimate of GHG Reductions:** The estimated reduction of greenhouse gas emissions from re-dispatching existing generation is based on the lower carbon content of natural gas fuel and the higher thermodynamic efficiency of existing combined cycle power plants in Wisconsin compared to the existing coal plants. For combined heat and power facilities in Wisconsin, greenhouse gas emissions are reduced from the production of heat that would otherwise be produced by additional fossil fuel generation. Greenhouse gas reductions can also occur when more efficient coal plants are dispatched at a greater frequency than would occur under business-as-usual, producing electricity that would otherwise come from less efficient coal plants.

**10. Rough Estimate of Costs for Selected Years:** The rough estimate of costs for maximum re-dispatch of natural gas combined cycle power plants is based on current fuel prices (natural gas and coal) and existing operations and maintenance costs at natural gas combined-cycle and coal power plants in Wisconsin. These cost estimates have been made using PROMOD®, a security constrained economic dispatch and locational marginal price model used by utilities and the Public Service Commission of Wisconsin to simulate electrical generation and transmission.

The computer modeling of re-dispatch costs, however, utilize average fuel costs and cannot identify the opportunity for lower-cost re-dispatch during periods of lower natural gas prices. Higher natural gas prices would increase the cost of this policy, or reduce the magnitude of greenhouse gas emissions that may be reduced by this policy for a given target cost per metric ton of carbon dioxide avoided by re-dispatch.

**11. Barriers to Implementation:** This policy option may result in increased electrical rates. Thus, the degree of support and/or opposition to this policy will depend on the societal value of reducing carbon dioxide emissions. It should be noted that other

benefits are also associated with re-dispatch, such as the reduced emissions of NO<sub>x</sub>, SO<sub>x</sub>, particulates and mercury, reduced coal and ash transport emissions and reduced water consumption of natural gas-combined cycle power plants compared to conventional coal plants in Wisconsin.

**12. Other Factors:** The intent of this policy is to reduce greenhouse gas emissions from the electrical generation sector prior to cap-and-trade in the most cost-effective manner possible. Thus, while natural gas combustion turbines (i.e., peakers) have a lower greenhouse gas emission profile than baseload coal plants, these units have much higher fuel and operation and maintenance costs than existing natural gas combined cycle power plants or coal plants. The intent of this policy proposal is to encourage greater utilization of natural gas combined-cycle power plants (currently used as intermediate-load units), combined-heat and power plants, and the more efficient baseload coal plants than would occur under business-as-usual.

**Re-dispatch was discussed by the Electrical Generation Work Group in previous meetings as part of a policy titled “Transmission system expansion to support new renewables/low-emitting generation.” This recommendation also has similar implementation steps as was recommended in the policy planning forum proposal from the work group. This present policy is more specifically targeted at near-term greenhouse gas reductions from the electrical generation sector.**

## Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Wisconsin Geologic Carbon Sequestration Study
3. **Policy Type:** Create a Commission to work collaboratively with Midwest partners to study and recommend possible opportunities for geologic sequestration of CO<sub>2</sub> from Wisconsin's utility sector. Continuation of this work, through annual revision, is recommended to keep current with advancements in technology and adaptations for Wisconsin greenhouse gas (GHG) reduction policies.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy and does not directly result in any GHG emission reductions.
6. **Estimated Costs:** There should be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in the proposed Commission.

**Funding Sources:** The study is to be completed within the PSC operating budget.

7. **Specific Description of Policy Proposal:** Carbon sequestration, also referred to as carbon capture and storage (CCS), is a strategy for reducing GHG emissions from baseload electric generation. The PSC and DNR should form a Commission to evaluate the technical and economic potential, and infrastructure requirements, for CCS deployment in Wisconsin. In addition to the DNR and PSC, representatives from the University System, independent power producers, environmental groups, industrial groups, and others should be included on the Commission.

### **Background.**

The absence of promising geological formations for storage in Wisconsin will likely result in the need to either transport CO<sub>2</sub> by a pipeline system that does not currently exist, or transport low or non-carbon gaseous fuels (e.g. synthetic natural gas or hydrogen) in the current natural gas or future hydrogen pipelines. As with the electric transmission grid, planning the future gas pipeline infrastructure in the state is not well suited to any individual utility or industry in Wisconsin.

The timeline for deploying CCS to lower GHG emissions from Wisconsin's electric generation sector is strongly dependent on the pace of carbon storage implementation in adjacent states. The carbon storage opportunities closest to Wisconsin's major baseload power plants are the oil and gas fields, coal seams, and deep saline aquifers found in

relatively uniform layers across a wide area of Illinois, Indiana, and Kentucky in the geological feature known as the Illinois Basin.

The implementation timeline for CCS is also dependent on the technology used. For Wisconsin we assume that the construction of a new IGCC plant with CCS, or the retrofit of an existing plant with CCS, is not likely for at least 10 years. In Illinois, CCS from a coal or petroleum coke plant producing synthetic natural gas, and selling CO<sub>2</sub> for enhanced oil recovery, may be possible in 2 or 3 years.

- 8. Timetables, Duration and Stringency Option:** The CCS Commission should convene by July 1, 2008 and should issue its initial findings and recommendations by December 31, 2008. The report will be reviewed and updated annually.

As discussed in section 7, deployment of CCS in Wisconsin is assumed to be at least 10 years away. However, as CCS technology becomes more available, Wisconsin needs to achieve rapid deployment.

- 9. Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any direct GHG emission reductions. However, if CCS is found technically and economically feasible, the findings and recommendations of the Commission would inform those responsible for assisting in the development of this technology for Wisconsin and would provide a foundation for planning the infrastructure necessary for CCS.

The magnitude of GHG reductions from this technology depends on the type of capture (e.g. pre-combustion or post-combustion) and the type of fuel. In some cases, CCS implemented at a facility burning or co-firing biomass can have an even larger reduction impact on GHG emissions.

- 10. Rough Estimate of Costs for Selected Years:** As identified in section 6 there would be relatively limited governmental administrative costs with this policy. If the timeline suggested here is followed, most of these costs should conclude by January 2009. Some costs may be required beyond this time for annual updates.

- 11. Barriers to Implementation:** There should not be barriers to convening the CCS Commission. There may be legal and other barriers to any recommended actions issued by the Commission.

- 12. Other Factors:** The work group discussed the potential of CCS and concluded that the future feasibility and cost of this technology was no more certain than other large-scale GHG reduction options, such as nuclear. The goals for GHG reduction need to be established in a state-wide PSC planning forum where the uncertainties in technology availability can be evaluated (see the Policy Forum for Planning in the Electric Generation Sector template). The safety and environmental risks of either CO<sub>2</sub> pipelines, or geologic storage sites for captured CO<sub>2</sub>, would also need to be addressed to gain public acceptance of this option. The U.S. Department of Energy and numerous foreign countries are sponsoring research in this area. Three large-scale (greater than one million metric tons of CO<sub>2</sub> per year) projects are

currently using geologic storage, but the scale of CCS necessary to have a significant impact on regional GHG emissions is much greater.

**13. Related Policies:**

- None

## Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Great Lakes Wind Study
3. **Policy Type:** Commission a study group to assess the technical and economic potential for wind generation in the Great Lakes, with cooperation of the other Great Lakes states.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy and does not directly result in any greenhouse gas (GHG) emission reductions.
6. **Estimated Costs:** There should be limited governmental administrative costs associated with this program. These costs would result mostly from the state's involvement in the proposed study group.

**Funding Sources:** The study is to be completed within the PSC operating budget.

7. **Specific Description of Policy Proposal:** The PSC, DNR, and the Board of Commissioners of Public Lands should be requested to form a study group to evaluate the technical and economic potential for wind generation in Lake Michigan and Lake Superior. Among other issues, this group should evaluate costs of development of wind facilities in the lakes, public trust issues related to wind development in the lake bed, avian impact issues, potential riparian owner concerns, and effective regulatory approaches to addressing siting issues. The study group should also evaluate whether Wisconsin should explore a partnership with Michigan regarding the development of off-shore wind facilities in Lake Michigan.

The study group should likely have representatives from the DNR, PSC and the Board of Commissioners of Public Lands. In addition, utility, independent power producer, environmental, commercial fishing, commercial shipping, riparian, and other representatives should be included.

8. **Timetables, Duration and Stringency Option:** The study group should convene by July 1, 2008 and should issue its findings and recommendations by December 31, 2008.
9. **Explanation of Rough Estimate of GHG Reductions:** This policy, standing alone, would not result in any GHG emission reductions. However, if off-shore wind development is found technically and economically feasible, the findings and recommendations of the study group may assist in the development of off-shore wind projects, which would help the state meet its present, and potentially its Enhanced, Renewable Portfolio Standard requirements.

**10. Rough Estimate of Costs for Selected Years:** As identified in section 6 there would be relatively limited governmental administrative costs with this policy. If the timeline suggested here is followed, these costs should conclude by January 2009.

**11. Barriers to Implementation:** There should not be barriers to convening the off-shore wind study group. There may be legal and other barriers to any recommended actions issued by the study group.

**12. Other Factors:** N/A

**13. Related Policies:**

- Enhanced Renewable Portfolio Standard (RPS)

## Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Green Tariff Option for Customers – Feasibility Study (Green Tariff Study)
3. **Policy Type:** Directive to the PSC to study the feasibility of new renewable tariff approaches (with legislation, if necessary amending Wis. Stat. Section 196.192)
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy which will not result in any direct greenhouse gas (GHG) emission reductions until renewable resources are developed in accordance with study recommendations.
6. **Estimated Costs:** The overall annual cost to develop and implement this policy would be limited to administrative time of the PSC and utilities to conduct a study and investigate tariff options, assessing the implementation issues, including the recommended accounting for the billing, and cost recovery treatment for the tariff.

**Funding Sources:** The study would be completed within the PSC operating budget.
7. **Specific Description of Policy Proposal:** The development of a green tariff option for customers is an enabling policy to further encourage the development of renewable energy in Wisconsin. This policy directs the PSC to study the feasibility of market-based pricing options for customers that would be designed to accommodate individual contracts between retail customers and renewable energy providers. These contracts would be implemented through their utilities and would be longer-term, fixed price contracts for energy and capacity. Renewable energy that resulted from the implementation of these tariff proposals would not count toward Renewable Portfolio Standard requirements of utilities.
8. **Timetables, Duration and Stringency Option:** This feasibility study should be conducted in 2008 so that implementation recommendations could be considered in 2009.
9. **Explanation of Rough Estimate of GHG Reductions:** The results of the study recommended in this policy, if implemented, would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under these tariffs.
10. **Rough Estimate of Costs for Selected Years:** There would be limited governmental administrative costs to conduct the study and implement the recommendations. There would be administrative costs for the utilities in the development of the tariffs and application of the tariff rules for the customers who want their energy service under this tariff option.

**11. Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to establish this tariff option for retail customers.

**12. Other Factors:** The tariff option recommended by this policy requires further study by the PSC. This policy recommendation is unlike other tariff proposals because it considers a relationship between a third party energy provider and the customer through the utility. It is not clear if this can be accommodated without changes in utility law. The purpose of this policy is to encourage further implementation paths for renewable energy use by Wisconsin customers and encourage additional development of renewable resources in the state. The tariff described in this policy proposal would provide an option for customers and renewable energy providers that would not otherwise be available. The contracting terms, legal considerations for retail energy marketing and protection for grid access are just a few of the reasons that a study is needed.

**13. Related Policies:**

- None

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Task Force Co-Chairs
2. **Policy Name:** Modify Moratorium on Construction of New Nuclear Plants (Modify Nuclear Moratorium)
3. **Policy Type:** Legislation revising statutory provisions relating to nuclear plants
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy and is not likely to result in any direct greenhouse gas (GHG) emission reductions prior to the 2022 GHG emissions reduction goal.

6. **Estimated Costs:** There are minimal costs associated with this recommendation

**Funding Sources:** Any costs of developing legislation would be absorbed through state operating budgets and any resultant PSC action would be completed within the agency's operating budget.

7. **Specific Description of Policy Proposal:** Under Wisconsin's current "nuclear moratorium" law (§ 196.493, Wis. Stats.) the PSC may not authorize the construction of a nuclear plant unless it finds that a federal facility (or facility outside the country) will be available for the disposal of high-level waste from all Wisconsin nuclear plants, and that the proposed nuclear plant is economically advantageous to ratepayers based on specified factors.

This proposal would modify the terms of this moratorium, as follows:

A. The proposed modifications to the moratorium would be effective upon the latter of (1) enactment into law of a 25% by 2025 renewable portfolio standard consistent with the Task Force's Enhanced Renewable Portfolio Standard template or (2) final approval by the PSC and, where required, approval by Joint Finance, of revised energy efficiency goals, and related spending and program requirements, consistent with the Task Force's Enhanced Conservation and Energy Efficiency Program template.

B. The proposed modifications would:

1. Add a new Certificate of Public Convenience and Necessity (CPCN) provision to Section §196.493 (2) (b) Wis. Stats. requiring that the proposed nuclear plant must be built to meet Wisconsin electricity needs at a cost that is reasonable and advantageous to customers in comparison with available alternatives, taking account of emission reductions benefits. If such a nuclear plant is a plant to be built and owned by a party other than a Wisconsin utility, the output would need to be sold to Wisconsin utilities to meet the needs requirement. In any event, any new nuclear plant, regardless of any

changes in ownership or operational responsibility during the life of the plant, would be subject to regulation by the PSC on a basis that is comparable to the regulation that would apply to such a plant if owned and operated by a Wisconsin public utility.

2. Replace Section §196.493 (2) (a) Wis. Stats., dealing with the requirement of a federally licensed nuclear waste disposal facility, with a requirement that to obtain a CPCN, the PSC must find that the nuclear waste plan for the plant is economic, reasonable, stringent, and in the public interest, given the safety and other risks presented by such waste.
  3. The proposed CPCN requirements for a nuclear plant would apply to any proposed nuclear unit regardless of size and include any replacement of any existing nuclear unit.
  4. In addition to the existing right of the PSC to apply for extension of the 180-day time limit to act on a CPCN, an additional extension could be sought by the PSC in the case of a nuclear plant for a reasonable, but defined period.
- 8. Timetables, Duration and Stringency Option:** The passage of the legislation is contingent upon the criteria described in section 7.A.
- 9. Explanation of Rough Estimate of GHG Reductions:** N/A
- 10. Rough Estimate of Costs for Selected Years:** N/A
- 11. Barriers to Implementation:** This proposal would meet the same challenges faced by any legislation
- 12. Other Factors:** This recommendation is not a recommendation by the Task Force that a new nuclear plant be built. However, it would allow utilities to prudently plan and propose that alternative, if they believe it is the most cost-effective and beneficial means to meet GHG reduction goals and their obligations to serve over the long term. Whether such plants are built will depend on the success of the state's conservation and efficiency and renewable programs, the need for new generation driven by actual load growth and plant retirements, the economics of nuclear power, the feasibility of alternatives, and addressing nuclear fuel issues in a manner acceptable to federal and state regulators.
- The conditions in section 7.A. are intended to provide assurance that all cost-effective conservation and efficiency measures will be pursued as a first priority and that any need for a nuclear plant will be determined after taking account not only of costs and benefits (including emissions reductions) of available supply-side alternatives, but also of demand-side reductions achieved through a comprehensive, aggressive conservation and efficiency effort, other demand-side measures and a challenging renewable resources requirement.
- 13. Related Policies:**
- Enhanced Conservation and Energy Efficiency Program
  - Enhanced Renewable Portfolio Standard

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Task Force Co-Chairs
2. **Policy Name:** Rate Mitigation Strategies
3. **Policy Type:** PSC investigation
4. **Affected Sectors, Sub-Sectors and/or Entities:**  
Sector: Electric Utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy that would not directly result in any greenhouse gas (GHG) emission reductions.
6. **Estimated Costs:** To be determined, with the expectation of minimal administrative costs.  
  
**Funding Sources:** PSC operating budget
7. **Specific Description of Policy Proposal:** Given the expected high fixed costs of new baseload generation and other utility investments required to meet GHG emission reduction goals, this policy calls for the PSC to investigate rate mitigation strategies, such as: (1) levelization of cost recovery in rates of high capital cost, low-carbon and GHG reduction projects to avoid early year rate shock; and (2) on a voluntary basis, securitization of related debt to lower interest costs and allow for more highly leveraged capital structures for particular projects that will not adversely affect bond ratings. Any such mechanisms must provide an opportunity for utilities to invest significant equity capital in such projects. Such mechanisms should be designed to lower total return costs for customers and, at the same time, incent utility investments in low carbon and GHG reduction projects.
8. **Timetables, Duration and Stringency Option:** The PSC should establish an expeditious time frame for this activity.
9. **Explanation of Rough Estimate of GHG Reductions:** This is an enabling policy that would not directly result in any emission reductions.
10. **Rough Estimate of Costs for Selected Years:** Administrative costs for this investigation are expected to be minimal, but a detailed analysis of the associated costs has not been completed.
11. **Barriers to Implementation:** Although PSC can open this investigation on existing authority, actual implementation of rate mitigation strategies may require new legislation and/or rule development. For example, the existing environmental trust financing mechanism was created through legislation.
12. **Other Factors:** N/A

**13. Related Policies:**

- Improved Rate Designs
- Aligning Interests

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Tax Incentives for Renewable Energy Development (Tax Incentives for Renewables)
3. **Policy Type:** Redesign of, or additional renewable electrical energy program, to allow customers to make tax deductible contributions for renewable energy development
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility, participating non-profits
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** Under this proposal, additional utility customers would select renewable energy rate options due to favorable federal, as well as state, tax treatment, resulting in an increase in the amount of renewable energy generated in the state.<sup>1</sup> For every additional MWh of energy that is purchased by the utility from renewable energy providers, an estimated 1,850 pounds of CO<sub>2</sub> emissions are avoided.
6. **Estimated Costs:** The overall annual cost to develop and implement this policy would be limited to administrative time of the non-profit organization(s) that would be responsible for structuring the funding mechanisms for the relevant projects. If today's utility programs that already exist for customers continue to be offered, there would be no incremental administration costs to utilities. However, should existing utility programs continue, and this policy be implemented as an *additional* customer program, then there would be some additional utility administrative costs in support of this new program opportunity.

**Funding Sources:** Administrative costs of the non-profit organization(s) would be funded through revenues collected from customers and renewable resource suppliers. Any loss of state tax revenues would have to be absorbed within the state budget.
7. **Specific Description of Policy Proposal:** Develop a new customer program option administered by a non-profit organization(s) (existing or new) to allow customers to make potentially tax deductible donations to fund an increase in their utility's renewable energy or to fund directly additional renewable resource projects in the state. Utilities would provide customers *information* regarding this program through their bills and other communications to customers, but the contributions by the customer would be made to the non-profit organization(s).

This program would create incentives for customers to support the development and use of additional renewable energy by making the amounts that they contribute tax deductible, to

---

<sup>1</sup> This policy template provides incentives for the use and development of renewable electrical energy. After the policy in this template is implemented, the state should likely evaluate whether a similar program for biogas and potentially other sources of non-electrical renewable energy would encourage their development and use.

the extent allowed by law. A model for this program already exists: Wisconsin Public Service Corporation's SolarWise program. SolarWise provides funding for the installation of solar panels on schools with monies collected by a non-profit 501(c)(3) foundation that the company established for this purpose. Renewable energy that results from the implementation of this policy would not count toward Renewable Portfolio Standard requirements of utilities.

- 8. Timetables, Duration and Stringency Option:** This policy could be implemented as soon as a non-profit organization can be established to administer the statewide program or separate non-profit organizations can be established for each utility. Existing utility programs could be modified to work through this organization(s).
- 9. Explanation of Rough Estimate of GHG Reductions:** The incremental renewable energy supply resulting from this policy would reduce 1,850 pounds of CO<sub>2</sub> for every MWh contracted under this program.
- 10. Rough Estimate of Costs for Selected Years:** There would be additional administrative costs for this program associated with the staffing and functioning of the non-profit organization(s). These added costs could be collected from the participating utility customers and renewable energy suppliers. Efficiencies could be gained in the collection and distribution of funds to renewable energy providers by establishing a single statewide organization for this purpose, rather than using utility specific program alternatives and multiple non-profit organizations.
- 11. Barriers to Implementation:** Some change in state revenue planning would need to occur to acknowledge the changes in state and federal tax collections.
- 12. Other Factors:** The option of continuing to have local customer programs like SolarWise should be considered. Also, utilities should have the option to either participate through a state program or to participate through their own program.
- 13. Related Policies:**
  - None

## Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Streamline Transmission Improvements for Increased Renewable and Distributed Generation (Transmission Improvements)
3. **Policy Type:** If not already being accomplished by the Midwestern Governors Association Energy Security and Climate Stewardship platform efforts and/or the Midwest Independent Transmission System Operator (MISO) study efforts, then the PSC should initiate a study group and/or open a PSC docket to evaluate changes to the state-wide and regional electric transmission system that would facilitate increased electric generation by renewable and/or low-carbon resources. The study group and/or PSC docket would also direct the evaluation and/or participation of Wisconsin in negotiations with other states, MISO and Federal Energy Regulatory Commission (FERC) regarding regional transmission system expansion and cost allocation.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-sectors: Transmission Utilities, Distribution Utilities, MISO, FERC
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy would not directly reduce greenhouse gas (GHG) emissions. It is an enabling policy to allow the greater expansion of renewable and lower-carbon generating options.
6. **Estimated Costs:** There would be limited governmental administrative costs associated with this program. These costs would mostly involve the state's involvement in a proceeding to develop and implement improvements in transmission support for low-carbon resources.

**Funding Sources:** To be determined

7. **Specific Description of Policy Proposal:** Based on generation costs alone, renewable and/or low carbon projects (including wind projects) developed in Minnesota, Iowa, and the Dakotas are estimated to be cheaper than similar projects developed in Wisconsin due to higher capacity factors. However, when actually considering the importation of electricity to Wisconsin from projects in these states, the lower generation costs could be more than offset by higher transmission costs. Additional analysis, however, is required to actually determine the amount of transmission that would need to be built to adequately lower transmission costs for importation of electricity from projects in these states, the costs of building this transmission and Wisconsin's share of the costs. Wisconsin's share of the additional transmission costs could range from as little as 15% to 80 - 100%, depending on the policies adopted at FERC and the amount of benefit Wisconsin would receive from the interconnections.

Changes in generation-transmission interconnection processes are needed at the regional level to enable the connection of large amounts of wind generation. The currently defined tariffs of MISO for interconnecting generation are designed in such a way that the first wind

generator to create a need for additional transmission must pay for the entire project, with subsequent wind generators being free riders. This discourages the initial connection of wind generation. There is an effort underway at MISO to discuss revising the process. Wisconsin should be an active participant in that effort if out-of-state wind generation is to be available to meet native load.

There are also efforts underway to evaluate the potential impacts of connecting a large amount of variable (i.e. wind generation) resources onto the transmission grid. Studies from Minnesota presented to the work group indicate that although the issues are significant, large amounts of variable energy can be accommodated by the electric generation and transmission system in that state. There are no comparable studies of the transmission system in Wisconsin.

- 8. Timetables, Duration and Stringency Option:** The PSC should determine the scope of work needed to implement this policy within one month after the task force report is accepted by the governor and implement as soon as possible after this date.
- 9. Explanation of Rough Estimate of GHG Reductions:** This policy directive is necessary to evaluate the transmission changes necessary to meet an Enhanced Renewable Portfolio Standard and to enable low-carbon and distributed generation to displace higher carbon generation sources.
- 10. Rough Estimate of Costs for Selected Years:** The minimal administrative costs identified in section 6 will be limited to the completion of this study.
- 11. Barriers to Implementation:** Other than associated administrative costs, there are no significant barriers to forming this study group and/or opening this PSC docket.
- 12. Other Factors:**
  - There are generating facilities in Wisconsin with GHG emission rates much lower than conventional baseload coal plants, (i.e. natural gas combined-cycle plants) that have transmission constraints which prevent them from displacing additional high-carbon emitting generators.
  - Additional policy options recommended by this and other work groups, such as Advanced Renewable Tariffs and Co-Generation incentives, may have different transmission implications depending on where in the state they are developed.
  - The magnitude of the GHG reductions being discussed by the Task Force will require changes in the electric generation system in Wisconsin that are greater than the planning capacity of any single utility.
- 13. Related Policies:**
  - Enhanced Renewable Portfolio Standard (RPS)

## Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Wind Siting Reform
3. **Policy Type:** Legislation that reforms the siting process for wind projects less than 100MW to make it comparable to the process for projects 100 MW and greater.
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities, the PSC, counties, municipalities, towns, and the wind energy industry
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This policy would not directly reduce greenhouse gas (GHG) emissions. Wind Siting Reform is an enabling policy to an Enhanced Renewable Portfolio Standard (RPS), and would contribute to the overall reduction of GHG emissions in the RPS.
6. **Estimated Costs:** Implementation of this option would result in increased costs resulting from greater workload at the PSC, but reduced costs for wind power producers and consumers.

**Funding Sources:** Rule development would be completed within the PSC operating budget.
7. **Specific Description of Policy Proposal:** This policy recommendation includes the following elements: (1) definitions of large and small wind energy turbines; (2) a requirement for the PSC to draft uniform standards for siting large and small wind energy turbines; (3) creation of an optional process for PSC review of projects less than 100 MW; (4) a mechanism for allowing parties to appeal a decision rendered by a local jurisdiction to the PSC; (5) extending Chapter 227 judicial review provisions to wind projects permitted by local jurisdiction; and (6) a prohibition on local ordinances restricting meteorological test towers. The new standards adopted by the PSC for wind projects less than 100 MW would not require an alternative site as part of the permit application.
8. **Timetables, Duration and Stringency Option:** This proposal calls for the enactment of legislation, the process for which would include opportunities for public input by local groups and others. If the legislation is enacted, the PSC would have a specified period of time to adopt rules establishing uniform standards for permitting wind projects. Local groups and others will be able to raise concerns and suggestions regarding the rules during this process. These regulatory standards would apply to PSC-reviewed wind projects as well as those reviewed by local jurisdictions. These rules would remain in effect indefinitely. Regardless of whether wind siting decisions are made by local jurisdictions or by the PSC, local groups and others would continue to be able to provide input relevant to such decision making.

**9. Explanation of Rough Estimate of GHG Reductions:** Today, at least 400 MW of wind projects currently under development are subject to local restrictions that prevent them from going forward. 440 MW of wind power operating at a capacity factor of 29% should produce approximately one million MWh annually, which in turn should reduce annual emissions by approximately 925,000 metric tons of CO<sub>2</sub>e. Continued contributions from these smaller wind resources could reduce 1.4 million metric tons of CO<sub>2</sub>e annually by 2020 and 1.85 million metric tons of CO<sub>2</sub>e annually by 2025. (See Enhanced RPS template for full potential of renewable resources)

**10. Rough Estimate of Costs for Selected Years:** N/A

**11. Barriers to Implementation:** This policy recommendation could generate opposition from specific municipalities.

**12. Other Factors:** The Wind Siting Reform recommendation was considered by the work group as an enabling policy necessary to meet the supply requirements of an Enhanced RPS with the economic benefits of in-state wind generation.

**13. Related Policies:**

- Enhanced Renewable Portfolio Standard (RPS)

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Electric Generation and Supply
2. **Policy Name:** Advanced Renewable Tariff Development (Renewable Tariffs)
3. **Policy Type:** PSC proceeding and possible authorizing legislation
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric utility
  - Sub-Sector: Distribution utilities
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** The development of Advanced Renewable Tariffs is an enabling policy to an Enhanced Renewable Portfolio Standard (RPS) and so it does not directly lead to any greenhouse gas (GHG) emission reductions. It would contribute to the achievement of overall reductions of GHG emissions in the RPS. It is expected that this policy would expand the development of smaller scale projects and that these projects would be brought to market more quickly with this policy.
6. **Estimated Costs:** The overall annual cost to develop this policy would be limited to administrative time of the PSC and utilities to establish an implementation approach and cost recovery treatment for the tariff.

**Funding Sources:** Establishment of these tariffs would be completed within the PSC operating budget.
7. **Specific Description of Policy Proposal:** The Advanced Renewable Tariff policy should encompass the following principles:
  - A. Tariffs should be set according to specific production costs of a particular generation technology
  - B. The tariffs should include a rate of return comparable to the utilities' allowed return
  - C. The tariffs should be fixed over a period of time that allows for full recovery of capital costs
  - D. Renewable energy credits acquired through these tariffs can be rate-based or sold through a utility's voluntary renewable energy program
  - E. When the fixed term of the tariff ends (capital costs of project have been recovered), the energy from these systems can be acquired through the utility's parallel generation tariff or through a negotiated purchased power agreement.

A utility may apply generation purchased under these tariffs toward its current RPS or any successor renewable energy obligation, unless the output is resold through a voluntary renewable energy program at retail.

- 8. Timetables, Duration and Stringency Option:** This policy should be developed and implemented by 2009. If the PSC believes it has the authority to establish advanced renewable energy tariffs without legislation, it could convene a proceeding at any time to determine the production costs of various distributed renewable resources such as solar, wind, small hydro, landfill gas, biogas, and other biomass sources.
- 9. Explanation of Rough Estimate of GHG Reductions:** The development of Advanced Renewable Tariffs is an enabling policy to an enhanced RPS. If the Enhanced RPS is not adopted, this policy should be done so that smaller scale renewable projects are encouraged in Wisconsin. As a stand-alone policy, if utilities supplied 2% of their sales with distributed renewable resources by 2020 (above current requirements), and 3% by 2025, this would result in reductions of 1.5 million metric tons/yr of CO<sub>2</sub>e by 2020, and 2.25 million metric tons/yr of CO<sub>2</sub>e by 2025.
- 10. Rough Estimate of Costs for Selected Years:** The cost to develop this tariff is administrative only and can be considered part of traditional utility ratemaking. The cost to fully implement an Advanced Renewable Tariff is dependent on tariff design principles.
- 11. Barriers to Implementation:** It is not clear whether legislation would be required to provide the PSC with the authority to set advanced renewable tariffs and impose targets on utilities.
- 12. Other Factors:** It is recognized that Advanced Renewable Tariffs would likely result in increased costs per unit of electrical output compared to utility-scale renewable projects, but that these costs are justified by the economic and environmental advantages from encouraging distributed small-scale generation. Establishing a single tariff approach across the state may result in unequal cost impacts to each utility because of differences in renewable resource potential within their service territory boundaries and other variables. As an example, some utilities may have lower cost biogas projects due to land use patterns and existing customer business choices. Some utilities will be advantaged with solar project applications due to building sizes and weather conditions. This policy recommendation requires an examination of these service territory inequities. The benefits expected to be achieved by this proposal will require a solution to these cost inequities. A cost recovery approach may be challenging from a PSC rules-and-ratepayer equity perspective.
- 13. Related Policies:**
  - Enhanced Renewable Portfolio Standard (RPS)

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Task Force Co-Chairs
2. **Policy Name:** Amended Strategic Energy Assessment (Amended SEA)
3. **Policy Type:** PSC proceeding and report
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric Utilities
  - Sub-Sector: Generation
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** This is an enabling policy to address the implementation of specific greenhouse gas (GHG) reduction efforts for the electric generation sector and would not directly result in any emission reductions.
6. **Estimated Costs:** To be determined, with the expectation of minimal administrative costs.

**Funding Sources:** PSC and utilities will cover costs from their operating budgets.

7. **Specific Description of Policy Proposal:** The current Strategic Energy Assessment (SEA) should be reopened, with all utilities subject to the SEA required by October 15, 2008 to prepare, document and file comprehensive GHG emissions inventories for their systems, using recognized standards on a consistent basis (such as the internationally recognized GHG Protocol), as determined by the PSC. These filings should include reasonable estimates of emissions associated with imported power. They should present this information in detail in a format accessible to others for expert review and analysis and also in a summary format easily understood by the public. In conjunction with these filings, each utility should:
  - Identify the actions currently being taken or planned to be taken during the next three years (including, but not limited to, conservation and efficiency measures in its service area and renewable resource deployment), that will reduce its GHG emissions, showing estimated reductions, costs and other relevant information; and,
  - Identify other actions that are not included in its current actions or plans that could be taken by it during this period to further reduce its GHG emissions, such as dispatch modifications and early unit retirements, and identify the potential emissions reductions available, the associated costs and any other relevant information.

Upon review of all this information after public input and examination of leakage issues, each utility would be asked by the PSC to set voluntary, near-term (prior to implementation of a Cap and Trade Program) GHG emission reduction goals for its systems, including in its internal operations, just as many other major businesses are doing, and to report regularly on progress. Future rate filings should identify any reduction measures included in the cost-of-service and recovery of reasonable and prudently incurred costs to meet goals consistent with the PSC's Assessment should be permitted.

- 8. Timetables, Duration and Stringency Option:** This policy calls for the development of voluntary GHG reduction plans and should not be considered stringent. The timetable for this policy is ambitious and is based on statutory requirements. PSC was required to complete a draft of the SEA by July 1, 2008. PSC must hold a non-contested case public hearing no later than 90 days after issuing the draft, and must complete the final SEA within 90 days after the hearing. This means the SEA must be completed by the end of 2008. This policy requires utilities to submit information by October 15, 2008, leaving PSC with approximately 2 months to incorporate the supplemental information into the SEA. Although this policy proposal is focused on the current SEA, PSC may routinely require similar information as part of each future SEA.
- 9. Explanation of Rough Estimate of GHG Reductions:** This policy will not directly result in GHG reductions but it will lead to the development of voluntary near-term reduction goals for each utility. The amount of reductions that might be included in those plans cannot be predicted.
- 10. Rough Estimate of Costs for Selected Years:** A detailed analysis of the costs associated with this policy has not been completed. Again it is important to note that this policy does not directly require capital expenditures for GHG reductions, but such expenditures may be necessary as part of the voluntary plans developed by each utility.
- 11. Barriers to Implementation:** PSC has broad statutory and regulatory authority to request information from utilities for the SEA. However, PSC is under a statutory schedule for completing the SEA and adhering to that schedule will be more difficult as a result of this policy. Utilities will be on a tight schedule to compile the necessary information described in this policy and PSC will be on a very tight schedule to analyze that information and include it in the final SEA.
- 12. Other Factors:** One alternative a utility may wish to pursue may be to join the Chicago Climate Exchange and make voluntary commitments through that vehicle, provided that the SEA process and reporting requirements discussed above are fulfilled. In addition, utilities should be encouraged to join the Climate Registry.
- 13. Related Policies:**
- Enhanced Conservation and Energy Efficiency Program
  - Improved Rate Designs
  - Aligning Interests
  - Demand Response, Load Management
  - Cap and Trade Voluntary Programs
  - Enhanced Renewable Portfolio Standard

# Wisconsin Task Force on Global Warming Policy Template

1. **Work Group:** Task Force Co-Chairs
2. **Policy Name:** Enhanced Renewable Portfolio Standard (RPS)
3. **Policy Type:** Legislation amending existing RPS
4. **Affected Sectors, Sub-Sectors and/or Entities:**
  - Sector: Electric
  - Sub-Sector: Distribution utilities and retail electric cooperatives
5. **Estimated Greenhouse Gas Emissions Reduction Impact:** To be determined. The Electric Generation and Supply work group estimated that a similar policy proposed by their work group could reduce GHG emissions by 11.6 MMt in 2020 and 19.5 MMt in 2025, compared to business-as-usual.
6. **Estimated Costs:** To be determined. The Electric Generation and Supply work group estimated that the annual costs associated with a similar policy proposed by their work group could range between \$612 million and \$1,109 million above business-as-usual costs in 2025 (based on 2007 dollars). In terms of costs, there may be significant differences between that policy proposal and this one.

**Funding Sources:** Electric rates paid by utility customers and cooperative members

7. **Specific Description of Policy Proposal:** Wisconsin's existing RPS law (§ 196.378, Wis. Stats.) requires electric providers (electric utilities and retail electric cooperatives) to increase their use of renewables to generate electricity. The overall effect of the law is to require 10% of Wisconsin's total electric energy consumption in 2015 (and thereafter) to originate from specific "renewable resources" as defined in the law. Requirements vary for each electric provider depending on their average renewable energy percentage in the years 2001-2003. Individual electric providers can meet their RPS requirement by generating electricity from renewable resources or by purchasing renewable resource credits from another provider. Compliance deadline extensions (a.k.a. "off ramps") can be granted by the PSC if despite reasonable efforts to comply, there will be undesirable impacts on reliability, unreasonable increases in rates, or delays as a result of receiving required siting or permitting approvals or transmission constraints.

This policy would modify the existing RPS through legislation as follows:

A. New Minimum Standards

- The current 2015 RPS should be amended to move the 10% requirement forward from 2015 to 2013 in order to accelerate early reductions of emissions through renewable energy substitution. The post-2013 standards will be 20% by 2020 and 25% by 2025.
- To meet the post-2013 standards a minimum amount of each electric provider's renewable energy should be required to come from Wisconsin-based renewable energy resources, including any Great Lakes wind and renewable energy credits from Wisconsin

sources. This requirement should increase reliability and decrease the need for expensive, difficult to site new transmission, as well as stimulate growth of jobs in Wisconsin. The Wisconsin source RPS minimum by 2020 would be 6% and 10% by 2025. Conversely, the maximum amount of renewable energy from out-of-state used to meet the RPS would be 14% for the 2020 standard and 15% for 2025 standard. These requirements are minimums that are likely to be exceeded if Wisconsin-based sources are the most economic alternatives. Whether this will be the case is impossible to predict. It will depend, among other factors, on whether Great Lakes wind is feasible at a reasonable cost, cost-effective development of the state's bio-energy and solar potential, the construction of major transmission improvements to the west and the cost responsibility for such facilities assigned to Wisconsin.

B. Changes to the Definition of "Renewable"

- The definitions of renewable energy and renewable resources in the existing RPS law would be expanded to include the thermal portion of Wisconsin cogeneration projects fired with biomass (in addition to the electric portion of such projects which is covered by the current definition), as well as biogas produced in Wisconsin that is put in the gas pipeline system, solar water heating and other verifiable renewable applications in an electric provider's service area that displace fossil fuel use by the electric provider. The revised definition of renewable resources would also remove the existing 60 MW size restriction on new hydroelectric facilities, but only for the purposes of meeting the non-Wisconsin portion of the standards after 2013. This change would permit purchases of hydroelectric power from any large project, including new Manitoba projects, to qualify post-2013. This recommendation does not constitute endorsement of any new hydroelectric projects planned by Manitoba Hydro. The First Nations and others have strongly voiced concerns about the impacts of the existing hydro system on the First Nations and the environment, including concerns about the licensing status of the existing projects. The Task Force recognizes that the construction of proposed new plants by Manitoba is likely to be controversial and involve complex issues. These issues, as well as the licensing of any new plants, and any conditions imposed in any new licenses or on existing projects must be resolved under Canadian law, treaties with the First Nations and any agreements reached by affected parties. This recommendation is based on the premise that the concerns of the First Nations related to the existing hydro system and any new proposed projects, including issuance of final licenses, will be resolved before new projects are built, as Manitoba Hydro has indicated. The Task Force cannot predict whether new plants will be built or, if so, when or under what conditions, or whether the related transmission necessary for export of energy to the U.S. will be built. This recommendation simply recognizes that: (1) hydroelectric generation is a renewable resource regardless of size, (2) the output of any new plants built by Manitoba that is exported to the U.S. and displaces fossil fuel generation will reduce GHG emissions, and (3) the Manitoba Hydro system can provide significant storage benefits that will enhance the value of U.S. wind power, provide renewable resource diversity and enable more efficient use of major new transmission built to access wind resources to the west of Wisconsin.
- To incent the conversion of existing Wisconsin industrial coal-fired boilers and other customer-owned coal-fired boilers to biomass prior to implementation of a Cap and Trade

Program, electric providers should be permitted to purchase renewable energy credits for such conversions. In the alternative, where an industry wishes to deploy its capital elsewhere, by contract with the affected industry, an electric provider may install and own a replacement boiler, supply process steam and heat to the industry on a contract basis and utilize the equivalency credits directly.

C. Changes to the Treatment of Renewable Resource Credits

- To meet the revised standards in this Proposal and incent early action on a cost-effective basis, renewable resource credits (a.k.a. renewable energy credits or RECs) available for compliance should not expire after four years, but have an unlimited carry-forward life. A Wisconsin source requirement, coupled with credit carry-forwards, will stimulate quicker development of the state's renewable resource potential and provide related business and job benefits, enhance electric system reliability and reduce transmission costs and transmission losses.
- There should be no limit on the use of renewable energy credits to meet the revised standards in this Proposal, so long as the underlying resource for the REC qualifies as a "renewable resource" under Wisconsin law, and only Wisconsin sources may be used to meet the Wisconsin minimum source requirements. Use of the Midwest Renewable Energy Tracking System (M-RETS) credits would be available for the remainder of the requirements regardless of source location. In addition, to mitigate rate impacts, the PSC should have the authority, but not the obligation, to allow the use of credits from other programs that are comparable in terms of stringency and verification to (M-RETS).

D. Other Changes

- To enable electric providers to meet the new, more aggressive RPS recommended in this Proposal in a timely manner and to avoid the need for compliance deadline extensions, the revised RPS should: (1) stream-line the regulatory approval (for all affected agencies) and siting process for renewable projects; (2) encourage proposals that encompass multiple projects, with multi-project, integrative plans for acquisition of sites, equipment and contractors, (3) allow for PSC approval of multi-year commitments for acquisition of necessary equipment in a timely manner, with appropriate recovery of development costs; (4) provide additional resources for the PSC to process applications; (5) encourage larger electric providers to partner on projects with smaller electric providers; and (6) remove existing siting and equipment transportation barriers.

All other provisions of the existing RPS law would apply to the revised portfolio standards in this Proposal, including the existing "off ramp" provisions for compliance deadline extensions. In the event that a compliance deadline is extended with respect to the in-state RPS minimum, the remedy may be to waive the in-state source requirement, while maintaining the integrity of the overall RPS.

- 8. Timetables, Duration and Stringency Option:** The timetable is implicit in this policy recommendation. Duration is until changed by law. This policy should be regarded as stringent as a result of PSC enforcement authority identical to the enforcement provisions of the existing RPS (2005 Act 141).

- 9. Explanation of Rough Estimate of GHG Reductions:** A detailed analysis of the emission reductions associated with this policy has not been completed. Preliminary estimates can be made based on calculations done by the Electric Generation and Supply work group in association with a similar proposal for an Enhanced RPS policy, which called for the same targets in 2020 and 2025 but was different in other details. The amount of energy needed to meet the 2020 and 2025 targets will depend on total demand for electricity. Two scenarios were considered by the work group, based on business-as-usual (2% growth per year) and the proposed Enhanced Conservation and Energy Efficiency policy (0.5% growth per year). The work group concluded that meeting the RPS targets in their proposed policy under these two scenarios would require the following amounts of MWh from renewable energy resources (in excess of 2003 renewable generation):

Enhanced RPS MWh Output (in Million MWh, in excess of 2003 renewable generation)		
	Business-as-usual (2%/yr Growth)	Enhanced Conservation and Energy Efficiency (0.5%/yr Growth)
2020	13.8	11.5
2025	23.3	18.1

The work group estimated the following associated impact in terms of CO<sub>2</sub> reductions:

CO <sub>2</sub> Reductions In Million Metric Tons (MMt)		
	Business-as-usual (2%/yr growth)	Enhanced Conservation and Energy Efficiency (0.5%/yr growth)
2020	11.6	9.7
2025	19.5	15.2

- 10. Rough Estimate of Costs for Selected Years:** A detailed analysis of the costs associated with this policy has not been completed. Preliminary estimates can be made based on calculations done by the Electric Generation and Supply work group in association with a similar proposal for an Enhanced RPS policy, which called for the same targets in 2020 and 2025. However, it is important to note that the work group's policy proposal did not allow for new large hydropower projects and did not include minimum in-state renewable generation targets. The differences between the two proposals may have a significant impact on costs and further analysis may be necessary to understand those impacts.

Incremental administrative costs of the Enhanced RPS are estimated to be negligible because the PSC already has in place the infrastructure for regulating this requirement. The other costs are potential impacts on electric rates. These impacts will depend on demand growth, as well as the projected costs of power and energy from the mix of renewable resources employed to meet the requirement compared with the estimated cost of coal- and gas-fired

generation that is displaced, including carbon adders. The Electric Generation and Supply work group estimated the following increases in annual electric costs based on their proposal for an Enhanced RPS and a range of assumptions about demand and cost variables:

Increases in Annual Electric Cost - Business-as-usual (2%/yr Growth)		
2025 (RPS = 25%), (in millions 2007 \$)		
	Replaces Energy & Capacity	Replaces Energy Only
Wind Capital Cost = \$1,650/kW	612	742
Wind Capital Cost = \$2,215/kW	979	1,109

Increases in Annual Electric Cost - Enhanced Conservation and Energy Efficiency (0.5%/yr Growth)		
2025 (RPS = 25%), (in millions 2007 \$)		
	Replaces Energy & Capacity	Replaces Energy Only
Wind Capital Cost = \$1,650/kW	388	489
Wind Capital Cost = \$2,215/kW	688	790

These estimates are based on the projected costs for wind projects developed in Wisconsin and the West (Wisconsin projects are assumed to have the lowest current costs). The following amounts of Wisconsin and West wind projects (based on nameplate capacity) are included in the cost estimate:

Wind Nameplate MW Capacity For 25% RPS in 2025		
	Business-as-usual (2%/yr growth)	Enhanced Conservation and Energy Efficiency (0.5%/yr growth)
Wisconsin	7,500 (assumed maximum for Wisconsin)	6,891
West	1,020	0

Other resources, including biomass and solar, may be used by electric providers to meet the Enhanced RPS, but insufficient data were available to estimate the costs of these other technologies in Wisconsin.

**11. Barriers to Implementation:** The major barrier to implementation of this policy is the need for legislation to amend 2005 Act 141. Opposition may come from electric customers who believe that this requirement will materially increase their electricity costs. The new requirements for Wisconsin-based renewables could potentially face legal challenges based on the Interstate Commerce Clause of the U.S. Constitution. Questions have been raised in other states that already have in-state RPS requirements, but to date none of those state laws have been challenged in court on that basis. The drafters of the Enhanced RPS legislation should carefully examine the Interstate Commerce Clause issue and draft the in-state requirement to minimize the risk of a successful Interstate Commerce Clause challenge.

**12. Other Factors:** The targets of the proposed Enhanced RPS are consistent with the targets of the Midwestern Governors Association Energy Security and Climate Stewardship Platform adopted in November, 2007, although the Platform also endorses a 30% by 2030 target not included in this proposal. Also, for the purposes of the MGA targets, the definition of renewable is somewhat more limited.

Meeting the Enhanced RPS under business-as-usual growth in electric demand will entail greater difficulty than future scenarios that include reduced electric demand through energy conservation and efficiency programs and other factors.

Enabling policies for the Enhanced RPS include Wind Siting Reform, Great Lakes Wind Study, Advanced Renewable Tariff Development and Electric Transmission and Distribution Improvements.

**13. Related Policies:**

- Enhanced Energy Efficiency and Conservation Programs
- Incentives for Co-Generation/Combined Heat and Power (CHP)
- Electric Transmission and Distribution Improvements
- Advanced Renewable Tariff Development
- Wind Siting Reform
- Great Lakes Wind Study