Michigan Renewable Energy Program

2004-2005 Annual Report to the Michigan Public Service Commission

November 30, 2005

This page is intentionally blank.

Table of Contents

Table of Figures and Tables

This page is intentionally blank.

Acknowledgements

The Commission staff would like to thank all those who participated in the Michigan Renewable Energy Program (MREP) Collaborative, MREP Open Forum meetings held in 2004, and the development of this report. A number of representatives from utility, education, advocacy, technology, and renewable energy organizations, as well as Michigan Public Service Commission (MPSC or Commission) staff members, other state agencies, and U.S. Department of Energy (DOE) and National Renewable Energy Laboratory (NREL) staff all provided invaluable contributions to MREP efforts in 2004 and 2005. Everyone's hard work, dedication, expertise and cooperation in helping to bring this report to completion are greatly appreciated.

In particular, the MREP Collaborative wishes to thank our committee chairpersons and communications liaisons, who devoted many hours of their time to monthly MREP committee meetings during July through November, 2004, and on into 2005. Each committee chairperson was also a major author for the committee's section of this report and was invited to submit a brief statement of their own thoughts about their experience with the MREP process. Of course those statements, presented at the beginning of each committee report section, do not necessarily reflect the views of other MREP participants or the MPSC Staff, but they will introduce readers to some of the breadth and depth of viewpoints represented and ideas being explored in the MREP Collaborative.

Here, we thank all of the individuals who participated in MREP Collaborative committee meetings in 2004:

Biomass Committee

Chairperson: Dulcey Simpkins, PhD., Michigan Biomass Energy Program Coordinator

Communications Liaison: Thomas F. Schuelke, Schuelke & Associates, Inc.,

Rob Benninghoff, Wisconsin Public Service Corporation
Jeff Bernicke, DTE Energy
Ernie Birchmeier, Michigan Farm Bureau
Eric Corroy, Wisconsin Public Service Corporation
Dr. Abraham Engeda, MSU Department of Agricultural Engineering
Glen Erickson, MDEQ Air Quality Division
Dan Girvan, P.E., Resource Engineering, Inc.
M. Charles Gould, MSU Extension Ottawa County
Donald Johns, Michigan Independent Power Producers Association
Prof. David I. Johnson, MSU Department of Fisheries and Wildlife
Pat Keily, We Energies
Daniel Keathley, MSU Department of Forestry
Dan LaRouche, Performance & Reliability Group, Inc
Bette Marvin, North American Energy, Inc.
Gary Melow, Primary Power International
Prof. Ming-Chia Lai, Wayne State University Mechanical Engineering
Greg Mulder, Coffman Electrical Equipment
Terri Novak, MDEQ Agricultural Pollution Prevention
Tanya Paslawski, Michigan Public Service Commission Staff
Derek Price, Weston Energy Solutions, Inc
Michael Quah, NextEnergy
Mark Ritsema, Smithfield Beef Group
Tonia Ritter, Michigan Farm Bureau
Dr. Ajit Srivasta, MSU Department of Agricultural Engineering
Tom Stanton, Michigan Public Service Commission Staff
Norman J. Stevens, DTE Energy
Carolyn Upshaw-Royal, NextEnergy
Cathy Wilson, Consumers Energy

Solar Committee

Jennifer Alvarado, Chairperson, Great Lakes Renewable Energy Association

Kristen E. Brown, MPSC Staff
Eric Corroy, Wisconsin Public Service Corp.
Chad Dally, MSU Knight School of Environmental Journalism
Richard Orawiec, Back To The Future, Inc.
Robert Pratt, RGP Pro, Inc.
Father Charles Morris, Communications Liaison, Michigan Interfaith Power & Light

John Sarver, Michigan Energy Office
Christina Snyder, Sustainable Spaces
Greg Snyder, University of Michigan, Flint
Tom Stanton, MPSC Staff
Norman J. Stevens, DTE Energy

Wind Working Group (WWG)

Wind Working Group (WWG). John Sarver, Chairperson, Michigan Energy Office

Daniel Alberts; Graduate Student at Lawrence Technological University
Carl Anton; Ludington Board of Directors for Economic Development
Jim Bates, Southern Exposure Renewable Energy Co.
Evelyn Bergaila, Mason County Planning Commission
David Bertram, Michigan Townships Association
Kristen E. Brown, MPSC Staff
Eric Corroy, Wisconsin Public Service Corp.
Winton Dahlstrom, Helix Synergy, LLC
Jerry Decker, Midland Energy
John Dunlop, American Wind Energy Association
Dennis Elliott, National Renewable Energy Laboratory
Nancy Ferguson, Charlevoix County Planning Commission
Bill Fisher, Midland Energy
Dr. Robert Fletcher, Lawrence Technological University
Larry Flowers, National Renewable Energy Laboratory
David Gard, Michigan Environmental Council
Ben Gommel, Association for a Sustainable Future
Kurt Guter, Energy Conversions
John Wolar, Communications Liaison, Alternate Energy Solutions

Dr. Lynn Hamilton, Michigan State University
Bill Holmberg, EverPower Global
William Hui, US Department of Energy
Don Johns, Michigan Independent Power Producers Association & North American Wind Energy Co
Dr. David Johnson, Michigan State University
Joan Kalso
Will Kauth, Ann Arbor
Steven Kulesia, Department of Environmental Quality
Tom Martin, Michigan Energy Office
Rev. Charles Morris, Michigan Interfaith Power & Light
Gary Nowakowski, US Department of Energy
Skip Pruss, Department of Environmental Quality
Bonnie Ram, Energetics
Tonia Ritter, Michigan Farm Bureau
Steve Snell, City Manager of Mackinaw City
Tom Stanton, MPSC Staff
Norm Stevens, DTE Energy
Jim Steward, Mason County Michigan, People for Wind Turbine Regulation
Steve Stubleski; Consumers Energy
Susan Topp
Arthur Toy
Rich Vander Veen, Mackinaw Windpower
Byron Wise, Wisconsin Electric Co.

Economic Impacts Committee

James Croce, Chairperson, NextEnergy

Jeff Anthony, We Energies
Steve Arwood, Arwood Group/NextEnergy
Nancy Bacon, United Solar Ovonic
Mark Clevey, SBAM
Laura Cooper, Michigan Technological University
Abraham Engeda, Michigan State University
Dave Eserkaln, Wisconsin Public Service Corp
David Forsberg, U.P. Power Company
David Gard, Michigan Environmental Council
Allan Gregg, United Solar/Ovonics
Bill Holmberg, Ever Power Global
Don Johns, Michigan Independent Power Producers Association
Carolyn Upshaw-Royal, Communications Liaison, NextEnergy

Dan LaRouche, Performance & Reliability Group
David McMillan, Green Mountain Energy
Mark Miller, Bioenergy Industries, Inc
Greg Mulder, Coffman Electrical Equipment
Richard Polich, Energy Options & Solutions
Scott Sklar, The Stella Group
Tom Stanton, MPSC Staff
Norm Stevens, DTE Energy
Carolyn Upshaw-Royal, NextEnergy
Dan Voss, General Motors
Bob Welch, Lansing Community College

We also wish to thank NextEnergy for providing meeting space and teleconferencing capabilities

Financing Committee

Debra Rowe, PhD., Chairperson, Oakland Community College

Melvin W. Bredemeier, Alternate Energy Solutions, Inc
Eric Corroy, Wisconsin Public Service Corp.
Donald Johns, Michigan Independent Power Producers Association
Tom Stanton, MPSC Staff, Communications Liaison

Jim Leidel, Oakland University Facilities Management
Greg Mulder, Coffman Electrical Equipment
Norm Stevens, DTE Energy
Brian Wheeler, DTE Energy
Bruce Woodry, Sigma Capital Group, Inc

We also wish to thank Oakland Community College for providing meeting space.

Ratemaking & Net Metering Committee

Norm Stevens, Chairperson, DTE Energy

Jennifer Alvarado, Great Lakes Renewable Energy Association
Jim Ault, Michigan Electric & Gas Association
Laura Cooper, Michigan Technological University
Kent Curry, Indiana Michigan Power Co
Chad Dally, Michigan State University
David Forsberg, Upper Peninsula Power Co
David Gard, Michigan Environmental Council
Tom Stanton, Communications Liaison, MPSC Staff

Tom LaVere, Detroit Edison
Jackie Leshkovitz, Senate Research Staff
Mike Peters, Michigan Electric Cooperative Association
Tina Reynolds, Rep. Chris Kolb's Office
John Sarver, Michigan Energy Office
Steve Stubleski, Consumers Energy
Sharon Theroux, MPSC Staff
Catherine Wilson, Consumers Energy

MPSC Staff

Dan Blair, Regulated Energy Division.
Mick Hiser, Competitive Energy Division.
Alex Morese and Erika Vallance, Competitive Energy Division, for expert assistance with the MREP Website.
Judy Palnau, Commission Office, for press releases, publicity, and media relations.
Kristen E. Brown, MREP Student Assistant, for support during Summer 2005.
Tanya Paslawski, Commission Office, and Jeffrey Pillon, Competitive Energy Division, for assistance with data gathering.
Stacy Stiffler, MREP Student Assistant, for support during Fall 2005.
Erika Vallance, Competitive Energy Division, and Sheila Aleshire, Operations & Wholesale Markets Division, for typesetting and desktop publishing.
Angie Brunette, Louise Clark, Lisa Felice, and Erika Vallance for meeting, facilities, and equipment scheduling, communications assistance, and providing assistance to the many MREP visitors to MPSC's offices.

As MREP Coordinator for 2004-2005, it has been my great privilege and a pleasure to work on this project with the support of so many talented and dedicated people, from so many diverse backgrounds and interests. I believe all MREP participants are committed, each in our own way and to the best of our abilities, to helping guide Michigan's energy future along the path that will be best for Michigan's economy, environment, and society. I cannot thank everyone enough for all of the support and cooperation that have been extended to me as I have worked on this project. I look forward to more MREP progress in the future.

Tom Stanton, Coordinator
Michigan Renewable Energy Program

Executive Summary

This is the second report to the Michigan Public Service Commission (MPSC or Commission), on the Michigan Renewable Energy Program (MREP). It covers activities for 2004 and 2005.

The state legislature recognized the benefits of renewable energy by directing the Michigan Public Service Commission in Section 10r of Public Act 141 of 2000 [MCL 460.10r], Michigan's Customer Choice and Electricity Reliability Act, to establish the Michigan Renewables Energy Program (MREP). The Commission, in turn, directed its Staff to establish an MREP Collaborative to analyze various regulatory and policy options with the goal of promoting the use and development of renewable energy in the state.

In 2004 and 2005, the Commission issued several orders of great importance to the MREP effort. In May 2004, orders initiated a new renewable energy program for Consumers Energy and Detroit Edison, and directed Detroit Edison to issue a request for proposals (RFP) for its new renewable energy program. In a Detroit Edison rate case, the Commission affirmed its directions to Edison, to institute a renewable energy program.[1] In these orders, the Commission directed both Consumers Energy and Detroit Edison to begin collecting from all customers 5¢ per meter per month, to establish renewable resource funds. This represented the first time in Michigan electric utility history that funds would be available explicitly to support renewable energy development. Consumers Energy was slated to collect approximately $1.0 million per year and Detroit Edison approximately $1.3 million.[2]

This progress continued into early 2005, when, in January, the Commission approved a resource conservation plan for Consumers Energy, which includes a $5 million annual contribution to that Company's Renewable Resources Program (RRP).[3,4] In addition, the Commission directed Consumers Energy to file an application seeking approval of its RRP tariffs by March 31 and to issue a request for proposals by that same date so that commercial operation of the first renewable resources could begin by the end of 2005.[5] On March 31, 2005 (revised on April 25, 2005) Consumers Energy filed its application for its new renewable resource program tariff in MPSC Case No. U-14471, and on April 28, 2005, the Commission

---

[1] The Attorney General has appealed this Commission order. One of the claims in that appeal of the Commission's November 23, 2004 Order in Case No. U-13808, a major rate case for the Detroit Edison Company, is that the Commission does not have the requisite statutory authority to order a rate increase for the purpose of supporting renewable energy projects. Documents associated with Case No. U-13808 are available on the Commission's Website at http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=13808. See also Press Release.

[2] This order was appealed by the Attorney General, in Michigan Court of Appeals Docket 256180. See http://courtofappeals.mijud.net/documents/opinions/final/coa/20051122_c256180_46_256180.opn.pdf. In a November 22, 2005 unpublished decision, the Court reversed the "portion of the PSC's May 18, 2004 order authorizing [Consumers Energy Company] to impose a $0.05 per meter per month charge on all customers to finance green power projects…on the ground that the PSC lacked the statutory authority to approve such a surcharge." (p. 8).

[3] Case No. U-14031 Consumers Energy Company (resource conservation plan) 1/25/2005. See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-14031_01-25-2005.pdf and Press Release.

[4] This order has been appealed by the Attorney General, in Michigan Court of Appeals Docket 261027. The Attorney General claims the Commission does not have legal authority to establish a renewable energy charge. See http://courtofappeals.mijud.net/resources/asp/viewdocket.asp?casenumber=261027.

[5] U-13843 Mackinaw Power, LLC, and North American Wind Energy, LLC (green power pilot program) 1/25/2005. See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-13843_01-25-2005.pdf and Press Release.

approved it.[6] Consumers Energy began offering its customers new renewable energy service choices by October 1, 2005, and in its October 18, 2005 Order in Case No. U-14626, the Commission approved seven new power purchase agreements and one renegotiated agreement for Consumers Energy's renewable energy projects in Michigan.[7]

Detroit Edison submitted its proposal and associated renewable energy program tariff on July 1, 2005 (revised September 14, 2005) in Case No. U-14569.[8] Detroit Edison appears on schedule to begin offering its new choices by early 2006.

Public interest in energy efficiency and renewable energy increased markedly in 2004 and 2005, as natural gas and petroleum prices increased substantially. Over 3,000 letters from Michigan citizens were received by the Commission in conjunction with the Detroit Edison rate case, U-13808 and the Consumers Energy Resource Conservation Plan case, U-14031. There were more such letters, indicating customers' preference for the increased availability of renewable energy resources, than on any other topic in MPSC history.[9]

In a March 2005 Order in Case No. U-14346, the Commission approved a consensus agreement between the Staff and MPSC regulated utilities for a voluntary, statewide net metering program. MPSC Staff worked with the MPSC regulated utilities to complete net metering tariffs, which have now been accepted. A Website with information about each utility net metering program is under development, at http://www.michigan.gov/netmetering.

This report includes the following:

- Section 1 introduces the Michigan Renewable Energy Program (MREP), describes the MREP Collaborative's major activities in 2004, and includes general recommendations for continuing the Collaborative's work in 2005.

- Sections 2 through 4 are reports from the three MREP Committees that focused on renewable energy technologies: Biomass, Solar, and Wind Committees.

- Sections 5 through 7 are reports from the three MREP Committees that focused on policy options and the development of recommendations for possible Commission or legislative actions on renewable energy: Economic Impacts, Financing, and Ratemaking & Net Metering Committees.

- Section 8 describes and presents current and historical data on Michigan renewable energy production and consumption, including status reports on each of the voluntary green pricing offerings of Michigan utilities.

This Executive Summary concludes with a brief listing of the recommendations included in this report, and the work plans for each Committee for 2005.

---

[6] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14471.
[7] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14626 and Press Release.
[8] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14569.
[9] See, for example, letters on file at http://efile.mpsc.cis.state.mi.us/efile/docs/13808/0495.pdf and http://efile.mpsc.cis.state.mi.us/efile/docs/14031/0057.pdf.

Section 1, on general MREP Collaborative operations in 2005:

Section 2, Biomass Committee:

Section 3, Solar Committee:

Section 4, Wind Committee:

Section 5, Economic Impacts Committee:

1 MREP 2004 Activities and General Plans for 2005-2006

1.1 Introduction and Review of MREP Purpose and Goals

The first purpose of the MREP Collaborative is to encourage and provide an opportunity for continuing dialogue among all interested parties to identify and quantify the benefits to Michigan from increased renewable energy production and consumption. Second, to the extent there are significant benefits, which many Collaborative participants already believe is a certainty, then a vital function of the Collaborative will be to try to identify the most appropriate means to improve the prospects for renewable energy in Michigan. And, third, the Commission has requested that the Collaborative address some specific policy questions and provide consensus recommendations, if possible, for Commission or state legislative actions.

In the Commission's May 16, 2002 Order in Case No. U-12915 (p. 4), the Commission directed:

> …Staff should initiate an MREP collaborative that will assume policy analysis and recommendation functions. From time to time, the Commission may refer specific issues to the collaborative, beginning with those issues referred in this order. The collaborative may report to the Commission concerning the issues referred to it, and may bring other issues before the Commission. The collaborative may also recommend to the Commission legislative initiatives that it believes will advance the Commission's ability to fulfill the statutory mandate of Section 10r(6) [MCL 460.10r(6)]. The Staff shall structure the membership of the collaborative so as to include the interests of all affected persons.

The Commission has assigned specific policy analysis and recommendation functions, including possible tax rebates or exemptions, methods to encourage the development of renewable energy generation by residential and small commercial customers, including net metering, solar rights and easements, utility rates that will appropriately reward renewable energy generators that provide system benefits, implementation proposals for creative financing for renewable energy, renewable energy emissions credits, and options for utility incentives and performance standards (May 16, 2002 Order in Case No. U-12915, pp. 11, 16, and May 18, 2004 Order in Case No. U-12915, pp. 4-5, 7-8).

The 2003 annual report to the Michigan Public Service Commission (MPSC or Commission) on the Michigan Renewable Energy Program (MREP) began with this statement:

> Renewable energy is poised to provide significant benefits to Michigan by delivering increased energy efficiency, reliability, and security, economic development, employment retention and attraction, and improved environmental quality. Recent natural gas price increases could be mitigated, at least in part, by deploying cost-effective renewable energy systems to help displace fossil fuels and diversify supply portfolios. Renewable energy systems can augment utility system reliability and security by diversifying energy supplies and decentralizing energy facilities. Renewable energy has proven to be an important and rapidly growing segment of the energy industry, worldwide and across the nation.

From many indications, this understanding appears to have been correct. This year brought more good news about Michigan's renewable energy resource potential. There has also been more energy price volatility and continuing high prices for natural gas and petroleum products. Natural gas prices are currently running two to three times higher than just a few years ago, and crude oil prices topped $60 per barrel. Even coal prices have been affected. News headlines

broadly proclaimed "the end of cheap oil," and some of Michigan's largest corporations publicly touted their efforts to save energy and develop renewable resources.[10]

Although by some measures environmental quality has improved significantly over the past few decades, environmental concerns associated with energy production and consumption continue to mount, with growing evidence of serious global, regional, and local problems caused by the emissions and wastes associated with the use of fossil fuels. Global climate destabilization is considered by many to be a, or even *the,* primary threat to humanity's future.[11] Plus, the October 2004 ratification of the Kyoto treaty by the Russian Duma brought a fresh round of speculation that there will be increased pressure on both the U.S. government and all companies engaged in global markets to reduce greenhouse gas emissions.[12]

At the same time, there has been robust renewable energy growth throughout the U.S., in neighboring states, and around the world. Wind energy continues to be the fastest growing source of new electric power, worldwide, with annual growth rates reported at about 30 percent and projections for continued rapid growth. Solar energy, though much smaller than wind in terms of installed capacity, is reportedly growing at 20-25 percent per year. In fall 2004 Congress renewed the previously-expired wind energy production tax incentives and the market rapidly surged forward to fill demand that had been pent up during the previous months when the credits had temporarily expired. In October, G.E. Wind, the largest U.S. manufacturer of utility-scale wind generators, announced it had already received $1.3 billion in commitments for projects to be built in 2005.[13]

In 2004, the Commission issued several orders of great importance to the MREP effort. In May 2004, Commission orders initiated a new renewable energy program for Consumers Energy[14] and Detroit Edison was directed to issue a request for proposals (RFP) for its new renewable energy program. In a Detroit Edison rate case, the Commission affirmed its directions for that company to institute a renewable energy program.[15]

In these orders, the Commission directed both Consumers Energy and Detroit Edison to begin collecting from all customers 5¢ per meter per month, to establish renewable resource funds. This represents the first time in Michigan electric utility history that funds will be available explicitly to support renewable energy development. Consumers Energy will collect about $1.0

---

[10] For example, *National Geographic Magazine* offered cover stories on "The End of Cheap Oil" (June 2004; http://magma.nationalgeographic.com/ngm/0406/) and "Global Warming" (September 2004; http://magma.nationalgeographic.com/ngm/0409/). For examples of Michigan corporate interest, see Gunther, M., 2005, February 7, "Taking On The Energy Crunch," *Fortune, v151,* n3, http://www.fortune.com/fortune/technology/articles/0,15114,1020322,00.html, and the World Resources Institute Green Power Market Development Group, at http://www.thegreenpowergroup.org/.

[11] See, for example, Rischard (2002) and Speth (2004).

[12] See http://news.bbc.co.uk/1/hi/sci/tech/4269921.stm.

[13] See http://www.gepower.com/about/press/en/2004_press/101804.htm.

[14] This order has been appealed by the Attorney General, in Michigan Court of Appeals Docket 261027. The Attorney General claims the Commission does not have legal authority to establish a renewable energy charge. See http://courtofappeals.mijud.net/resources/asp/viewdocket.asp?casenumber=261027.

[15] The Attorney General also appealed this Commission order, in Michigan Court of Appeals Docket 264191. One of the claims of appeal of the Commission's November 23, 2004 Order in Case No. U-13808, a major rate case for the Detroit Edison Company, is that the Commission does not have the requisite statutory authority to order a rate increase for the purpose of supporting renewable energy projects. See Press Release. Associated documents are available on the Commission's Website at http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=13808.

million per year and Detroit Edison about $1.3 million, beginning in 2006. This progress continued into early 2005, when, in January, the Commission approved a resource conservation plan for Consumers Energy, which includes a $5 million annual contribution to that Company's Renewable Resources Program (RRP).[16,17] In addition, the Commission directed Consumers Energy to file an application seeking approval of its RRP tariffs by March 31 and to issue a request for proposals by that same date so that commercial operation of the first renewable resources could begin by the end of 2005.[18] On March 31, 2005 (revised on April 25, 2005) Consumers Energy filed its application for its new renewable resource program tariff in MPSC Case No. U-14471, and on April 28, 2005, the Commission approved it.[19] Consumers Energy began offering its customers new renewable energy service choices by October 1, 2005, and in its October 18, 2005 Order in Case No. U-14626, the Commission approved seven new power purchase agreements and one renegotiated agreement for Consumers Energy's renewable energy projects in Michigan.[20]

Detroit Edison submitted its proposal and associated renewable energy program tariff on July 1, 2005 (revised September 14, 2005) in Case No. U-14569.[21] Detroit Edison appears on schedule to begin offering its new choices by early 2006.

In a March 2005 Order in Case No. U-14346, the Commission approved a consensus agreement between the Staff and MPSC regulated utilities for a voluntary, statewide net metering program. MPSC Staff worked with the MPSC regulated utilities to complete net metering tariffs, which have now been accepted. A Website with information about each utility net metering program is under development, at http://www.michigan.gov/netmetering.

In spite of all these important indicators of progress, these actions in 2004 and 2005 have not yet translated into new renewable energy production or consumption in Michigan. Various MREP Collaborative participants engaged in extensive deliberations and reflection, trying to answer serious questions about MREP's purpose and the wisdom of various policy approaches for the support of renewable energy development and growth in Michigan. Other states seemed to be progressing more quickly towards greater renewable energy resource development.[22] Some Collaborative participants felt Michigan might be falling behind or losing out on important opportunities, by not already having in place a more substantial set of policies for the support of renewable energy. These policies include net metering for small-scale systems (now in 39 states, including Michigan),[23] renewable portfolio standards (20 states), and system benefits funds (all but 4 of the states with restructured electricity markets, and 2 more states that have

[16] Case No. U-14031 Consumers Energy Company (resource conservation plan) 1/25/2005. See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-14031_01-25-2005.pdf and Press Release.
[17] See note 14, p. 2.
[18] U-13843 Mackinaw Power, LLC, and North American Wind Energy, LLC (green power pilot program) 1/25/2005. See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-13843_01-25-2005.pdf and Press Release.
[19] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14471.
[20] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14626 and Press Release.
[21] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14569.
[22] For information about other states' renewable energy policies, see http://www.dsireusa.org.
[23] In March 2005, the Commission approved in Case No. U-14346 a net metering program for all MPSC-regulated electric utilities. See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14346 and Press Release. Basic information about Michigan utility company net metering programs will be posted on the MREP Net Metering Website, http://www.michigan.gov/netmetering.

not yet restructured). And, about 36 states already provide targeted financing and various incentives for renewable energy development.[24]

Other MREP Collaborative participants are not convinced that enough is known about renewable energy and how its benefits compare to other energy options, that policy makers can say with any certainty that additional taxpayer, ratepayer or utility support for renewable energy is warranted, or is the best available use of limited resources. As one participant put it, the MREP process can best serve the interests of Michigan citizens by continuing to analyze whether and what benefits are obtainable with renewable energy, rather than by being too quick to accept that such benefits have been already conclusively established.

Either way, perhaps Michigan could yet come out on top, by developing a unique set of policies that could do as much or more to advance the public good. MREP Collaborative participants remain acutely aware that state government resources are severely constrained. Thus, participants are making a concerted effort to engage in a deliberate process, as described in this report, to systematically identify policies, programs, or incentives that are both necessary and sufficient to make important differences in the production and consumption of Michigan renewable energy resources. Following the development of this kind of detailed assessment, MREP Collaborative participants intend to make selective recommendations for those changes likely to generate the greatest positive effects while using the least amount of taxpayer resources. In any case, the various MREP Collaborative committees worked diligently through summer and fall 2004 and on into 2005 to expand the ongoing dialogue about renewable energy policies for Michigan and to try to achieve consensus on practical means for ensuring progress toward a more diverse energy portfolio.

1.2 Review of Commission Directives to MREP Collaborative

The initial genesis for the MREP Annual Reporting requirement was in the Commission's May 16, 2002 Order in Case No. U-12915 (the generic MREP case, on the Commission's own motion). The Commission found that:

> [T]he Staff should prepare an annual report concerning the MREP. That report should include a review of the amount of power generated from renewable sources within Michigan, the percentage of power purchased by Michigan customers that is obtained from renewable energy sources, the number of customers producing power with their own renewable energy installations, use of the website authorized by this order, the number and aggregate capacity of renewable energy generators receiving third-party certification, the percentage and absolute change indicators of renewable penetration, and other factors that will permit the Commission to monitor the progress on the statutory mandate to educate customers and promote the use of renewable energy. The annual report should also include a summary of legislative action and recommendations from the [MREP] collaborative." (Order, p. 18).

In a subsequent August 18, 2003 Order in Cases Nos. U-12915 & U-13843, the Commission stated,

[24] Michigan does have some financial incentives targeting renewable energy businesses, but Michigan offers little in the way of consumer incentives at this time. See summaries of state policies at http://www.dsireusa.org. For information about Michigan financial incentives for renewable resources, see http://www.michigan.gov/netmetering.

> [T]he Staff should be directed to finish drafting its annual MREP report for 2003 by November 18, 2003. By that date, the Staff shall post the 2003 MREP report on the Commission's website." (Order, p. 5).

The 2003 MREP Report was posted on the Commission's Website. In a September 15, 2003 hearing in Cases Nos. U-12915 & U-13843, dates were set for the receipt of comments on the Staff report to be submitted by December 2 and reply comments by December 23, 2003. As noted in the Commission's May 18, 2004 Order in Cases Nos. U-12915 & U-13843, comments were received from 21 parties and reply comments from 8 parties. Later in the May 18 Order, the Commission directed Staff to "work cooperatively with members of the [MREP Ratemaking & Net Metering Committee] to develop a net metering program for the Commission's consideration in its next MREP report." (p. 5) In the May 18 2004 Order, the Commission formally approved the 2003 MREP Staff Report, and concluded,

> The Commission further directs the Staff to file its 2004 MREP report no later than November 30, 2004, wherein the progress of the directives in this order are to be discussed. (Order, p. 11).

Directives in the May 18, 2004 Order, in addition to developing a net metering program, included:

- Staff should "continue to coordinate efforts with other non-profit groups, state and federal agencies, including the Michigan Department of Labor and Economic Growth Energy Office, the Michigan Economic Development Corporation, the United States Department of Energy, and other renewable energy resource organizations." (p. 3)

- [E]ducation efforts regarding wind, solar, biomass, and hydroelectric energy should be emphasized in the 2004 MREP year. The collaborative should work cooperatively with Michigan colleges and universities willing to add renewable energy to the core curriculum. (p. 4)

- "The collaborative should also continue to work cooperatively with the Michigan Wind Working Group and other interested states, as suggested by the Staff, to develop a briefing paper on offshore wind energy development for the Great Lakes." (p. 4)

- "The solar subcommittee shall explore issues related to solar access rights or easements and how utility rates can be altered so that solar technologies can be appropriately rewarded when they provide system benefits." (p. 4)

- "[S]taff…keep the Commission apprised of progress on the MREP energy atlas project and on expansion of the MREP web site. … MREP web site postings should be presented in an informational, neutral format, which is fair, accurate, and reasonable fur use by all Michigan ratepayers." (p. 4)
- "The Commission finds that a cost/benefit analysis would be beneficial and directs the Staff to work cooperatively with those Michigan colleges and universities that would be willing to add renewable energy education to the core curriculum or undertake such research." (p. 6)

- "[Commission Staff should] work with the Department of Management and Budget to encourage efficiency and renewable energy resource use, which could produce cost savings to the state in the long run." (p. 6)

- "[Establish] a collaborative subcommittee to work with interested parties to prepare implementation proposals for appropriate approaches to creative financing for renewable energy." (p. 7)

- "[T]he collaborative should continue to encourage the Michigan Department of Environmental Quality to work cooperatively with the United States Environmental Protection Agency to amend emissions credit guidelines so that utilities can be rewarded for developing green power tariffs." (p. 7)

- "The Commission…encourages the legislature to explore ecological tax reform and directs that copies of the 2003 MREP report be made available to all state lawmakers." (p. 8)

- "[T]he Commission directs collaborative members to explore options for utility incentives and performance standards so that a consensus proposal can be developed." (p. 8)

In addition to these directives, the Commission also addressed some specific MREP issues in its October 14, 2004 Order in Case No. U-14231: *In the matter, on the Commission's own motion, to commence an investigation into future capacity requirements.* This Order assigned to Commission Staff the responsibility of leading a Capacity Need Forum (CNF),[25] and specifically directed Staff to include renewable resources in its investigation (p. 5). The Order further indicated that previous Staff work related to renewable resources under the MREP program might be supplemented but need not be duplicated (p. 5).

In a subsequent January 25, 2005 Order in Case No. U-13843, which included provisions for Consumers Energy's new Renewable Resources Program, the Commission referred some issues to both the MREP collaborative and CNF. The Commission indicated the 2005 MREP report will be due in November 2005 (p. 22). In this order, the Commission directed MREP and CNF participants to try to achieve consensus on calculating appropriate capacity value and avoided cost credits for wind resources and developing a proposed feed-in tariff or renewable portfolio standard. The Commission directed that those issues, including the Commission's legal authority to address them under existing law, should be referred to both MREP and CNF. The parties were directed "to raise these concerns and attempt to achieve consensus… ." (Order, p.20.) "If a consensus cannot be achieved," said the Commission, "then the… Staff [should] put forward a proposal for Commission consideration by the deadline set for delivery of the final report on the Capacity Need Forum, which is January 1, 2006." Also in the same Order, the Commission indicated it "welcomes detailed proposals… [for] "establish[ing] an appropriate incentive for Consumers, to help focus the company's managers on the task of developing a highly successful RRP." It referred this issue to the MREP collaborative for assessment, and indicated if a consensus cannot be achieved then Staff should include a proposal in the November 2005 MREP report.

[25] See http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf.

1.3 MREP 2004-2005 Committees and Activities

The general plan for MREP activities in 2004 and 2005 was developed through discussions among MPSC Staff and a core group of MREP Collaborative participants. Organized MREP activities into three technology oriented committees – Biomass, Solar, and Wind – and three policy oriented committees – Economic Impacts, Financing, and Ratemaking & Net Metering. Chairpersons were selected for the first five of these committees based on the recommendations of the core group and the willingness of various individuals to agree to act in the role of Chairperson. The Chairperson of the Ratemaking & Net Metering Committee was decided by the Committee, after volunteers were solicited at a Committee meeting. Each Committee was also asked to nominate a "communications liaison" to assist with agendas, minutes, and other communications within and among Committees.

The object of this organization was to concentrate the various MREP Collaborative participants in a manner that would best focus expertise on the specific tasks assigned by the Commission. Though in some respects progress has been slower than Staff and the organizers had hoped, this general organizational structure and operational approach does appear to be serving MREP well. It is expected that this approach will continue in the future, with the formation of ad hoc subcommittees or task forces as needed in order to undertake specific assignments.

Taking a big-picture view of the situation Michigan finds itself in today with respect to renewable energy advancement, MREP Collaborative participants believe it is imperative that Michigan citizens understand our state's long-term energy needs. The MPSC Capacity Need Forum report, due in January 2006, will provide a great deal of information about the state's future needs for electric power and energy and a review of various means for supplying them. The basic facts are that Michigan is experiencing continuing growth in demand for electricity and much of Michigan's existing energy infrastructure is already well past "middle age." Therefore, our state may need access to new electric generating facilities in the not too distant future.

No energy systems yet discovered are entirely without problems and trade-offs. Some current technologies emit air pollutants. Some rely on imported fuels. Some are still relatively much more expensive compared to others. Often, the costs or problems associated with energy options are visited on one population in one location while the benefits accrue to others, elsewhere. The point is, there may be no simple answers when it comes to Michigan's energy future but choices have to be made. The MREP Collaborative participants generally hope that the readers of this report will carefully consider available information, weigh for themselves the many benefits and costs associated with available energy technologies, and then make informed choices for Michigan's energy future.

1.3.1 Three Technology Committees

The three Technology Committees were asked to concentrate on the identification and quantification of available Michigan resources and appropriate energy conversion technologies. Technology Committees were also asked to identify important policy options for consideration, with the understanding that those policy options would be referred to one of the three Policy Committees, as appropriate.
Technologies were identified and described, and then classified into three different "Tiers," based on their market readiness.

Technologies already commercially available were classified as "Tier 1", and were further subdivided into two groups. "Tier 1A" includes technologies that are fully cost-effective in today's economy, while "Tier 1B" technologies are still so expensive that they require some financial support if more widespread adoption is to be encouraged. Appropriate government roles for the advancement of Tier 1A technologies could include government procurement, aggregated purchasing, and demonstrations, plus consumer education, information, and guidance. Government programs to support Tier 1A technologies may also provide easier access to financing, but no subsidies should be needed to encourage market development for this group. For Tier 1B, the same procurement and education supports may be practical, but for significant market development financial incentives or subsidies may be necessary. One possible support mechanism for Tier 1B technologies is for consumers, including government facilities, to acquire both energy efficiency and renewable energy measures, so that the resource and cost savings from efficiency improvements are used to underwrite investments in renewable energy. With this approach, consumers can simultaneously reduce their total energy costs while increasing the amount of renewable energy used to meet their needs.[26]

Tier 2 technologies are nearing commercialization. They have already been proven, in concept, and are expected to be market-ready soon. Tier 2 technologies are generally awaiting some combination of higher prices for traditional fuels, technological improvements, and market growth with accompanying expansion of manufacturing, in order to become fully cost effective. Appropriate government roles in the support of Tier 2 technologies are generally based on some combination of financial support for making necessary technological improvements and policy support for creating more favorable market conditions. Appropriate policies might include the elimination of subsidies that make traditional fuels appear cheaper than they are, and removing regulatory obstacles.

In addition, if policy makers determine that Tier 1B or Tier 2 technologies ought to be subsidized in order to support their entry into emerging markets, then the need for such policies should be systematically assessed. Individual system costs should be evaluated in order to determine the amount of assistance necessary to support implementation, and then some estimate of the total resource should be completed in order to understand the full nature of the funding gap that exists. For example, in considering possible subsidies to support anaerobic digesters for processing agricultural wastes, it will be important to understand both the level of financial support required to enable individual installations and the likely total number and size of installations necessary for the state or any sub-region to exploit a percentage or all of the available agricultural waste resources.

With the support of the MREP technology committees in identifying Tier 1B and Tier 2 technologies, the MREP Financing Committee has taken on the charge of completing this type of gap analysis, in order to provide policy makers with insights about options for more quickly expanding Michigan renewable energy production and consumption.

MREP Collaborative participants are acutely aware that any proposals for additional state government or utility ratepayer financial support are expected to be exceedingly difficult to implement during a time when the state's economy and government budget are both experiencing tough times. Nevertheless, it must be understood that the Michigan economy is

[26] This is an approach that the MREP collaborative has specifically suggested for applications where utility bills are ultimately paid by taxpayers, including State of Michigan facilities and our public universities, colleges, and schools. See the discussion of Recommendation 6.1 – First Things First: Energy Efficiency, on p. 40.

already suffering as a result of the balance of trade deficit that results from our state's dependence on fossil fuels. For example, Michigan electric utilities presently burn an estimated $900 million of coal each year, all of which is imported. Each $1 increase in the price of a therm of natural gas is estimated to result in the loss to Michigan's economy of about $500 million per year, because so much of that natural gas is imported. In a similar manner, each half-dollar per gallon increase in the price of fuel oil and diesel fuel has an effect of similar magnitude.[27] Consequently, the net effect of any taxpayer or ratepayer support for new technologies should be weighed against the effects associated with the status quo. Many studies already suggest that public policy and financial support for energy efficiency and renewable energy investments result in economic gains associated with reduced fossil fuel imports and the combined effects of in-state investment and employment, re-spending effects associated with employee income, and the increased discretionary spending that results from consumer energy savings.[28]

Tier 3 technologies are considerably further from commercialization. Some of them may be not much more than a glimmer in some inventor's eye, at this point, but they are already being discussed as plausible. At this time, Tier 3 technologies are simply being listed for future consideration by MREP, as technologies to watch for further developments.

The three technology committees were also asked to estimate market development potential for the various options, both with and without any additional funding support. The technology committees were asked not to make any assumptions yet about exactly what kind of funding might be offered, or what would be the best ways to leverage market growth. Instead, they were asked to simply explore how big the gaps are now between the current costs for various technologies compared to the market prices for energy against which the renewable energy options must compete.

Preliminary estimates of Michigan's market potential for wind energy development were provided through the wind map development supported by the State Energy Office and US Department of Energy.[29] Preliminary assessments are also being completed for a variety of Michigan biomass resources.[30] And, at least rough estimates of market potential are being developed for several solar technologies.[31] As MREP Collaborative work continues, it is expected that the technology committees will work to further refine their market analyses and consider how various levels and types of support might accelerate commercialization. When that work is completed, Collaborative participants could develop specific policy proposals. The current plan is for such proposal development to be conducted in working subcommittees, which will include representatives from all MREP committees, as appropriate.

---

[27] These calculations are based on 2004 total state consumption as reported in *Michigan Energy Appraisal: Semiannual Projections of Energy Supply and Demand Winter Outlook 2005-2006,* assuming such price increases result in 10% reductions in demand for natural gas (75% imported) and fuel oil and diesel fuel (96% imported). In this same publication, MPSC Staff estimate MPSC Staff estimate that motor gasoline price increases above 2004 levels will cost Michigan motorists an extra $2.4 billion in 2005. See http://www.dleg.state.mi.us/mpsc/reports/energy/05winter/ea-winter05.pdf.

[28] Many such studies have been reviewed by the MREP Economic Impacts Committee and a preliminary report will be available soon. See Section 5.1 Economic Impacts Committee Purpose, Goals, and Activities, p. 33, and Recommendation 5.1 – Future Modeling, p. 35.

[29] See Section 4.2.1 New Wind Map of Michigan, p. 27.

[30] See Section 2.1 Biomass Committee Purpose, Goals, and Activities and Recommendation 2.1 – Continue Biomass Resource Assessment, p. 18.

[31] See Section 3.1 Solar Committee Purpose, Goals, and Activities, p. 21.

One change anticipated for 2006 is the formation of a new Hydroelectricity Committee, in response to a request from interested parties. MREP Staff also invited representatives of the state's major geothermal energy contractors association to participate in forming a Geothermal Committee, but no action resulted to date.

1.3.2 Three Policy Committees

The general concept for MREP 2004 and beyond was for the Technology Committees to research and identify the cost effectiveness of existing and near-future technologies for application in Michigan, and thereby reliably estimate the potential need for various kinds of policy supports. The three Policy Committees were formed with the intent of exploring various policy options that might be employed in order to accomplish more rapid growth in Michigan of markets for Tier 1 and 2 technologies. The Economic Impacts Committee is exploring the likely effects in Michigan's economy of the more rapid introduction of those renewable energy technologies. Then, given more accurate information about the likely costs and benefits to Michigan's economy of various technology options, the Ratemaking & Net Metering Committee and Financing Committee will explore various policy options that might result in achieving the levels of growth supported by economic impacts studies.

More specifically, the plan is for the Economic Impacts Committee to explore the effects on Michigan's economy of specific increases in the application of various renewable energy technologies. Ideally, the Economic Impacts Committee will be able to provide enough specific information about the effects of various scales of renewable energy development so that the net value of recommended policy approaches can be determined. If the net effects appear favorable to Michigan, even if the state's citizens or utility ratepayers would have to subsidize the early developmental stages, then the Financing and Ratemaking & Net Metering Committees will attempt to identify options to make the appropriate level and type of support available, to achieve that much penetration. Ideally, the Financing and Ratemaking & Net Metering Committees will be able to provide specific information about the effectiveness and efficiency of various proposed policy options. In that case, the three policy committees could jointly recommend appropriate legislative and utility regulatory approaches.

By the end of 2005, these goals were still proving elusive, but at least some progress had been made on each of these fronts. MREP Collaborative participants remain dedicated to applying this rather comprehensive analytical approach to deliberations, in order to arrive at the broadest consensus on appropriate policy approaches for Michigan.

1.3.3 Michigan's new "EDGE2" Activities

In 2004 and 2005, several MREP Collaborative participants, including some of the MREP Committee chairpersons, also engaged in a multi-departmental project of Michigan state government, called Economic Development and Growth through Environmental Efficiency, or EDGE2. An EDGE2 workgroup was formed under the auspices of the Michigan Departments of Environmental Quality, Labor and Economic Growth, and Management and Budget, along with representatives from the Departments of Agriculture, Corrections, Natural Resources, and Transportation. The Department of Labor and Economic Growth was represented in EDGE2 workgroups by staff from the state Energy Office, Michigan Economic Development Corporation, the Public Service Commission, and the Department Director's Office.

The EDGE2 process is still in its formative stages. The purpose of the EDGE2 process is to generate for state government a series of policy recommendations about energy efficiency and clean-technology manufacturing. The first priority is about how the state of Michigan can best manage its own facilities to become an even better leader in demonstrating energy and resource efficiency and best-in-class fiscal management. A second priority is to investigate what the state can do to better encourage greater energy efficiency throughout the state, among all energy users. A third priority, but by no means least important, is for Michigan to support the development, recruitment and retention of clean-technology manufacturing for the 21st Century. In this context, clean-technology manufacturing means both: (1) utilizing the most efficient production processes available, including maximum deployment of energy efficiency technologies and the use of all practical renewable resources; and, (2) pollution prevention through innovative production techniques that minimize the use and release into the environment of all hazardous and toxic materials.

In keeping with the first EDGE2 priority, on Earth Day 2005, Governor Jennifer M. Granholm initiated Executive Directive 2005-04.[32] Goals of this Executive Directive include having state government reduce energy use by 10% in all state owned and operated buildings by 2008 and reduce state purchases of grid-based energy 20% by 2015. Provisions for efficiency will also apply to state purchasing and procurement, and for capital outlay projects over $1 million for state departments or agencies, universities, or community colleges. Michigan state facility managers have already made several advances in accordance with this Executive Directive, including purchasing and using more energy efficient light bulbs, adding hybrid cars to the state's fleet, and requiring newly acquired electronics and appliances to meet U.S. EPA Energy Star standards.[33] Partly in response to these efforts, Governor Granholm was recognized for leadership in energy policy by receipt of the 2005 Governor's Award from the National Energy Efficiency Forum and the 2005 Inspiring Efficiency Leadership Award from the Midwest Energy Efficiency Alliance.[34]

Where the MREP Collaborative focused primarily on the demand for renewable resources, how the demand might be stimulated, and what options are available for meeting additional demands, the EDGE2 process focused more on the supply. The EDGE2 Clean-Technology and Manufacturing sub-group attempted to catalog policy options available to the State of Michigan to support clean-technology adoption by existing manufacturers and attract to Michigan as much new clean-technology manufacturing as possible. Renewable energy technologies are one of the key targets for clean-tech manufacturing growth under investigation by EDGE2 participants. This is also clearly a major function of Michigan's NextEnergy program, and the NextEnergy incentives provided by the state legislature. Thus, a natural collaboration and division of labor has begun. NextEnergy and EDGE2 are focused more on the goal of increasing advanced energy technology manufacturing in Michigan, and MREP is focused more on how Michigan might increase market demand. The participants of EDGE2 and MREP are conscious of the similarities between these two projects, and are engaged in an ongoing dialogue about how the two projects can best complement one another.

---

[32] See Executive Directive 2005-04 at http://michigan.gov/gov/0,1607,7-168-36898-116177--,00.html.

[33] For information on State of Michigan energy efficiency and renewable energy efforts, see Case Studies at http://www.michigan.gov/cis/0,1607,7-154-25676_25679---,00.html. For U.S. EPA Energy Star, see http://www.energystar.gov.

[34] See details of these awards at http://michigan.gov/gov/0,1607,7-168-23442-120660--,00.html, and http://www.mwalliance.org/energypros/activities/conference/2005/recipients.php.

1.3.4 MREP Website, Teleconference and Webconference Capability

The only major change to the MREP Website in 2004 was the addition of a Calendar of Events system, beginning in September. The calendar is used to announce MREP Committee meetings and other renewable energy events in Michigan and neighboring states, such as conferences and workshops. At this time, events are incorporated into the calendar by MREP Staff, and anyone interested in having their events announced is welcome to contact MREP Staff to request a calendar entry.[35]

An automated email distribution list, mpsc-mrep@listserv.michigan.gov, is available, by subscription.[36] Participation in this distribution list grew from 75 at the end of 2003 to 147 by November 2004, and 186 by November 2005.

In 2004, MREP added teleconference and Webconference capabilities, to help minimize the need for MREP Collaborative participants to travel to attend meetings. In Executive Directive 2004-7, issued October 27, 2004, Michigan Governor Jennifer M. Granholm indicated:

> Departments and agencies shall encourage the use of teleconferencing, video conferencing, or web-based conferencing as an alternative to travel, when financially prudent. The current budget situation demands that only the most essential travel occur. Whenever teleconferencing, video conferencing, and/or web-based conferencing is a cost-effective alternative to travel, it should be utilized.

These capabilities have been used with much success and participants are learning to make the best use of these technologies. Now, practically all MREP meetings include at least a few teleconference participants and when meeting documents are available they are either emailed prior to the meetings, shared via Webconference, or both.

In 2005, work began on another major addition to the MREP Website, which is a new section on net metering, accessible at http://www.michigan.gov/netmetering. MPSC Staff is currently working with Michigan utilities to incorporate basic information on each company's net metering program into these Web pages.

1.3.5 MREP Open Forums

In 2004, MREP Staff and Collaborative participants were able to participate in open forums in four different Michigan communities:

- ***Muskegon***, September 23, 2004, at Grand Valley State University's Michigan Alternative and Renewable Energy Center (MAREC).
- ***Traverse City***, October 14, 2004, at Great Lakes Campus, Northwestern Michigan College
- ***Southfield***, October 21, 2004, at Lawrence Technological University; and,

[35] Anyone interested in having an event listed in the MREP Calendar should contact MREP Coordinator, Tom Stanton, at (517) 241-6086 or mailto:tstanton@michigan.gov.
[36] To subscribe, please see http://www.michigan.gov/mrep, and click on "MREP listserv" in the Spotlight section of the Web page.

- ***Ann Arbor***, October 28, 2004, at Ann Arbor City Hall.

These forums were advertised on the Internet and through press releases to local news media, and the interested public were invited to attend free of charge. Attendance ranged from just a handful in Southfield to well over 100 in a standing-room-only meeting in Traverse City. MREP staff and Collaborative participants welcome the opportunity to participate in similar forums in other communities, to the extent that time and available resources will allow.[37]

The Muskegon forum took place in the afternoon, prior to one of the annual MPSC Consumer Forum meetings in the early evening, and included an extensive tour of the newly dedicated MAREC facility.[38] It was hosted by staff from MAREC, including Executive Director, Imad Mahawili, PhD., Executive Director, Courtney Sherwood, Administrative Coordinator, and D.J. Potter, Fuel Cell Engineer, who led tours of the MAREC facility.[39]

Commission Chairman J. Peter Lark gave a keynote speech at the Traverse City event, which was held at NMC's new Great Lakes Campus. The forum in Traverse City was scheduled in conjunction with the 2004 annual Michigan Renewable Energy Conference, co-sponsored by the Great Lakes Renewable Energy Association and Northwestern Michigan College, and the Great Lakes Bioneers conference, co-sponsored by the Neahtawanta Center and SEEDS.[40] Jennifer Alvarado, of the Great Lakes Renewable Energy Association, Bill Queen, of Northwestern Michigan College, and John Sarver of the Michigan Energy Office were instrumental in planning and organizing the event.[41]

Though the meeting in Southfield was attended by the smallest number of interested people, a lively discussion was held among the participants and one result was that University of Michigan graduate students in attendance later volunteered to work on a briefing paper about possibilities for offshore wind energy development in Michigan's Great Lakes waters.[42] Lawrence Technological University staff Mark Brucki and Professor Robert Fletcher, PhD., along with LTU graduate student Daniel Alberts, were instrumental in arranging this forum. Norm Stevens, DTE Energy, gave a presentation on behalf of the MREP Ratemaking and Net Metering Committee.

The Ann Arbor forum was held in the City Council chambers. Robert Black, Chairman of the Ann Arbor Energy Commission and David Konkle, Ann Arbor Energy Coordinator coordinated the event. The 2.5-hour meeting included presentations from most of the MREP Collaborative Committees and a rather extensive question and answer session with lots of audience

---

[37] Anyone interested in hosting an MREP Open Forum should contact MREP Coordinator, Tom Stanton, at (517) 241-6086 or mailto:tstanton@michigan.gov.

[38] For information on the 2004 Consumer Forums, please see the Commission's Press Release at http://www.michigan.gov/mpsc/0,1607,7-159-1640_17280-98241--M_2003_5,00.html. The Consumer Forum schedule for 2005 included visits to six Michigan cities in the month of September. See http://www.michigan.gov/documents/2005ConsumerForumAlert_132178_7.pdf.

[39] For information on the MAREC center, see http://www.gvsu.edu/marec.

[40] For information, see the Neahtawanta Center's Website at http://www.nrec.org/, SEEDS at http://www.ecoseeds.org, and Great Lakes Bioneers at http://www.glbconference.org/.

[41] The 2005 Michigan Energy Efficiency and Renewable Energy Conference and Michigan Wind Energy Conference, held October 20 and 21 in Lansing, was organized by GLREA and Urban Options. See http://www.glrea.org.

[42] This paper, *Offshore Wind Energy Development in the Great Lakes: A Preliminary Briefing Paper for the Michigan Renewable Energy Program*, is now available on the MPSC Capacity Need Forum Website, http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf/othergen/other.htm.

participation. MREP Collaborative participants gave presentations about the various MREP Committees, including: Jennifer Alvarado, Great Lakes Renewable Energy Association and Christina Snyder, Sustainable Spaces, for the MREP Solar Committee; Dulcey Simpkins, PhD., Michigan Biomass Energy Program for the Biomass Committee; Norm Stevens, DTE Energy, for the Ratemaking & Net Metering Committee; and, John Wolar, Alternate Energy Solutions, for the Wind Working Group. The City of Ann Arbor made arrangements to broadcast the entire meeting on the City's cable-TV channel, and rebroadcast it several times in the following weeks.

1.4 General MREP Collaborative Recommendations, Goals, and Objectives for 2006

These are general recommendations for the MREP program for 2005 and beyond. Specific recommendations for the various MREP Committees appear at the end of each of the following sections of this report.

Recommendation 1.1 – Continue MREP Assignments

Progress on MREP assignments in 2004-2005 was slower than expected, but in part that was a result of attention being focused on specific renewable energy cases before the Commission and work focused on the Capacity Need Forum project. MREP should continue working on the projects that have been assigned by the Commission, and should continue to notify the Commission of progress. Though Collaborative participants welcome continuing input from the interested public and need continuing input from the Commission, it is not practical to stop the Collaborative process and put MREP activities on hold during public review and comment periods and while awaiting Commission MREP orders. Rather than engaging in a "start and stop" process, Collaborative participants believe the best approach is for the Committees to continue with the projects that have been started, and to provide more frequent progress reports to the Commission.

Recommendation 1.2 – Continue MREP Open Forums and Use Web and Teleconference Capabilities for MREP Meetings

MREP Open Forum meetings in 2004 proved quite effective at expanding the number of people involved in the ongoing dialogue process and in educating Collaborative participants about various technologies and different points of view. There is an interest in continuing to participate in Open Forum events when possible. MREP welcomes invitations from organizations interested in hosting Open Forum meetings in various locations around the State.[43]

Having a Web based Calendar system is proving helpful. MREP Staff should explore statistics on the use of that Calendar system in order to determine how much it is being used by visitors to the MREP Website, and a report should be developed and presented on use of the MREP Website in general. Based on the findings of that investigation, additional recommendations for MREP Website development should be discussed by the various MREP Committees.

Use of the Commission's Teleconference and Webconference capabilities should be continued. Practically every MREP meeting now includes at least some participation by telephone, and the Webconference capabilities have been used to good advantage on a few occasions. MREP

[43] Anyone interested in hosting an MREP Open Forum should contact MREP Coordinator, Tom Stanton, at (517) 241-6086 or mailto:tstanton@michigan.gov.

Staff should continue to investigate the best means of reducing travel costs for all MREP participants by utilizing such remote-meeting techniques.

Recommendation 1.3 – Continue MREP Website Development

The MREP Website and the associated email distribution list have proven to be valuable means of communication about renewable energy. In 2006, the Website should be expanded to include separate pages for each MREP committee. The present plan is for the MREP Website to emulate the Capacity Need Forum Website, by including meeting agendas and reports, presentations, draft working papers, and reports.[44] In addition, the Net Metering Website needs to be completed, so that interested customers can easily find the basic information they need to enter into a net metering relationship with their utility.

Recommendation 1.4 – Seek MREP Staffing and Funding

MREP should investigate options for increasing the commitment of state government staffing and possibly funding. More specific recommendations and examples of MREP requests for additional support are presented in the Committee reports, in particular from the Solar, Wind, and Financing Committees.

Recommendation 1.5 – Continue MREP Participation in EDGE2 Task Force

The EDGE2 activity is closely related to MREP's goals. Continued participation by MREP representatives in the EDGE2 Task Force process is recommended.

Recommendation 1.6 – Provide MREP Input for Capacity Need Forum

Activities of the Capacity Need Forum are closely related to MREP's goals. Continued participation by MREP representatives in the Capacity Need Forum and any related follow-up activities is recommended.

[44] See http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf.

This page is intentionally blank.

2 Biomass Committee

Observations from Committee Chairperson, Dulcey L. Simpkins, Ph.D.,
Michigan Biomass Energy Program Coordinator

Fossil fuels have delivered tremendous benefits to humanity. We have traveled farther, faster, and more often than at any other time in history. We can move things, people, and even earth and water, and are not bound by gravity or our own physiology. We can "multi-task" on dozen of appliances, motors and machines at any given time. We can survive climatic extremes and even venture into space. In this context, transitioning to less energy-intensive lifestyles and using lower energy-content renewable fuels is sometimes defined by those resistant to alternative energy as "sacrificing our quality of life." However, the ecological spoilage, social conflict, and income inequalities generated by maintaining this "quality of life" are not going to become apparent only when fossil fuels dwindle sometime in the distant future. The stark reality is that the future has arrived. And it isn't going to go away with wishful thinking or denial: According to the Energy Information Administration, world peak oil production will occur in within the next 50 years – if oil is not already in decline. Laws of supply and demand dictate that as oil reserves dwindle, costs will rise. Consequently, costs of food, pharmaceuticals, imports, shipping, and obviously of fuel and energy, will also rise. They may rise to a point where a majority of Americans will be disenfranchised and struggling to make ends meet in their daily lives. Alternative energy investment before this scenario unfolds would in fact be potential salvation of some sort of quality of life, not a sacrifice.

The technologies and practices needed to produce clean energy from biomass exist today, and are becoming increasingly green and efficient over time. We already produce electricity from wood, crop wastes and manure with emissions lower than existing coal plants. More advanced technologies, such as biomass gasification, promise to extract more useful energy per unit of biomass input while further reducing emissions. We can make transport fuels that approximate or equal the energy content of fossil fuels. New waste management processes make it possible for us to separate and reuse our organic waste for power, reduce landfill size, and displace fossil fuels at the same time. The forecast for the near future includes bio-based transport fuels made entirely from urban wastes, and the use of wood from decentralized plantations that recover degraded land and distribute electricity on localized networks. In short, biomass energy does not simply have promise: It works. Sustainable biomass energy production will require some changes from our routines and expectations of undiminished consumption, and more protection of environmental systems upon which biomass as well as biodiversity depend: In this regard, profitability and conservation can go hand-in-hand. Investment in biomass energy resources, as well as wind and solar power, will provide Michigan with tremendous opportunities to grow green businesses and provide citizens a renewable energy future that preserves our health and natural resources rather than degrades them.

This report begins to establish the basis by which Michigan can move into a leading position in the necessary transition to renewable energy resources derived from organic materials. With the proper investment of time, energy and resources from both public and private sectors, we can choose to take a sustainable path. Such a path will generate a cleaner environment, a growing new energy job sector, energy security, and an arguably improved quality of life over the "business as usual" path we will follow by default if we do not act. In 1976, President Carter warned, "We must face the prospect of changing our basic ways of living. This change will either be made on our own initiative in a planned way, or forced on us with chaos and suffering by the inexorable laws of nature." Now, with world energy security at high risk of political or military disruption, and the dangerous health and environmental consequences of fossil fuels more manifest, Michigan is well positioned to take the initiative and promote a self-reliant biomass energy strategy in an informed and efficient manner. I hope that the Biomass Committee's work helps policy makers, businesses, and citizens feel more confident in taking the bold steps that a sustainable energy future demands.

2.1 Biomass Committee Purpose, Goals, and Activities

The MREP Collaborative has adopted the two goals of more thoroughly exploring and, where possible, quantifying: (1) Michigan's renewable energy resources; and (2) the potential impacts of various regulatory and financial incentives for investing in various types of renewable energy. Each major renewable energy resource – biomass, solar, and wind – has an MREP Committee to focus on associated technologies and resource management strategies.[45] Completing technology assessments is more difficult for biomass than solar or wind technologies, though, due to the large variety of potential biomass energy feedstocks and associated energy conversion technologies. This effort should be worthwhile, however, because among all renewable resources biomass options are the most diverse, in some cases the least expensive, and in all cases the most versatile in terms of practical co-firing or the replacement of traditional fossil fuels in all forms; solid, liquid, and gas.

In three Committee meetings and a variety of sub-committee meetings and email exchanges in 2004 and 2005, interested parties from industry, government, agriculture, citizen groups and other sectors collaborated in compiling data on various biomass feedstocks, their variability and their viability. This process is ongoing, and eventually will provide the basis for an atlas of biomass energy sites and sources for Michigan. The atlas will not only include volumes of feedstocks but also information on their location, which is critical for assessing the economic viability of various conversion technologies, as well as for forecasting future biomass resource availability due to climate, geography, transportation costs, and other variables. Preliminary biomass energy data has been provided to the Capacity Need Forum, and a separate MREP report, *Biomass Energy Potential in Michigan*, will be published soon.

2.2 Biomass Committee Recommendations, Goals, and Objectives for 2006

Recommendation 2.1 – Continue Biomass Resource Assessment

The Biomass Committee should work with interested parties to continue biomass resource assessment, and include appropriate data in the MREP Renewable Energy Atlas project. The assessment should incorporate resources for all forms of biomass energy conversion, including electric power generation, liquid, and gas fuels.

Recommendation 2.2 – Identify Best Practices for Biomass Energy Policy Incentives

The Biomass Committee should systematically review promising policy approaches, evaluate their potential for application in Michigan, and share ideas with the other MREP committees.

Recommendation 2.3 – Develop Consensus Proposal for Biomass Self-Service Power

Costs and benefits of biomass self-service power facilities should be evaluated by the Biomass Committee, working in concert with the Economic Impacts Committee to evaluate direct and indirect economic, employment, and environmental impacts. If the impacts appear favorable, the Biomass Committee should work in concert with the other Technology Committees and the

[45] A new hydroelectricity committee is being formed in 2006, and MREP Staff supports formation of a geothermal committee. Interested parties are asked to contact MREP Coordinator, Tom Stanton, at (517) 241-6086 or mailto:tstanton@michigan.gov.

Financing and Ratemaking & Net Metering Committees, to try to achieve consensus on a proposal for utility rates or other financial incentives for biomass facilities used for self-service power generation.[46] Combined rates and incentives necessary to remove the barriers to more rapid adoption of farm-scale biomass facilities, in particular, should be researched.

Recommendation 2.4 – Identify Promising Biomass Markets and Develop Comprehensive Market Development Plan

The Biomass Committee should identify one or more target markets most likely to benefit from biomass energy technologies, and then develop a comprehensive plan for achieving significant development in those markets. Plans should include methods to familiarize and then educate target markets about biomass energy. To the extent that incentives are needed to encourage early adopters, the Biomass Committee should work with the Financing and Ratemaking & Netmetering Committees to develop proposals.

[46] The Michigan Customer Choice and Electric Reliability Act (2000 P.A. 141) affirms the right of persons to obtain "self-service power," which is further defined as "(e)lectricity generated and consumed at an industrial site or contiguous industrial site or single commercial establishment or single residence without the use of an electric utility's transmission and distribution system." (MCL 460.10a(13)(a). See http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=mcl-460-10. The net metering program provides utility rates, terms, and conditions of service for very small (less than 30 kW) self-service power. See p. 3. The MREP Ratemaking & Net Metering Committee will be investigating options for possible incentive rates for larger self-service power systems. See Recommendation 7.2 – Explore Policy Options for Self-Service Power, p. 48.

This page is intentionally blank.

3 Solar Committee

Observations from Committee Chairperson Jennifer Alvarado,
Executive Director, Great Lakes Renewable Energy Association

Renewable energy may not provide for all of our energy needs any time soon, but the citizens and businesses of Michigan should be able to take advantage of the renewable energy technologies that are available today. While Michigan chose not to be a pioneer in the renewable energy market, renewable energy programs were started in other states. There are currently 18 states with renewable energy portfolio standards, 34 with solar access laws, and in 2005, Michigan became the 39th to enact a net metering program. Until today, other states have served as the role models for much of the research that has been conducted on renewable energy recommendations for Michigan. It is time for Michigan to catch up with the majority of other states, by funding a statewide renewable energy program.

Twenty years ago, Michigan tax incentives encouraged residents to invest in 32,000 residential renewable energy systems, mostly for solar water- and air-heating. During this period, Michigan was seventh in the nation for manufacturing and sixth for utilizing solar energy systems. In 2001, Michigan offered a $3 per Watt incentive program for the purchase of solar photovoltaic systems. Within four months, the state approved 86 incentives. The entire $300,000 budget was exhausted and additional applicants were turned away. As these experiences demonstrate, a potential exists in Michigan for a robust renewable energy market. It seems that Michigan's renewable energy market will grow, again, if the state can find a way to make a suitable financial commitment.

In the coming months, the MREP Solar Committee will continue to research the economics of solar technologies in Michigan, gather data on solar technology installations in Michigan, and explore all available means for educating Michigan citizens about the benefits of solar energy. Committee participants are dedicated to the development of sound recommendations that will attract and grow Michigan renewable energy businesses, improve Michigan's environment, and provide access to practical, cost-effective renewable energy technologies for as many Michigan energy consumers as possible.

I want to sincerely thank the MREP Solar Committee participants for volunteering their time to help provide research and recommendations on the appropriate roles for solar energy technologies in Michigan's energy future.

3.1 Solar Committee Purpose, Goals, and Activities

The MREP Solar Committee convened in July and met eight times in 2004 and 2005. The Solar Committee provides a forum where diverse participants can exchange ideas pertaining to the development of solar energy technology markets in Michigan. The Committee seeks to identify both barriers to and opportunities for the increased deployment of solar energy in Michigan. Where barriers are identified, the Committee seeks policy solutions to remove or mitigate them.

Solar Committee participants have included representatives of academic institutions, private solar energy technology consultants, dealers and installers, utility company representatives, the State Energy Office and MPSC staff, and other interested groups and citizens. For 2004-2005, Jennifer Alvarado of the Great Lakes Renewable Energy Association (GLREA) serves as the committee chairperson and Father Charles Morris of Michigan Interfaith Power and Light (MiIPL) serves as the committee communications liaison.

The primary goals for the Solar Committee in 2004-2005 included research and recommendations on: (1) preliminary solar energy technology assessment and economic analysis; (2) policies to protect solar access or easements for those who install solar technologies and for property tax exemptions or reforms for solar and other renewable energy

technologies; (3) methods for including solar energy resources in a Michigan atlas of renewable resources; and (4) solar energy education. These issues will be explored in greater detail in separate topical reports in 2006.

A major task for the Solar Committee in 2004-2005 is to assess and classify solar energy technologies, based on the best available information about economic viability for Michigan and the current stage of technical and market development. Solar energy technologies are being classified based on market readiness.[47] In 2006, Solar Committee members will continue to develop this listing and categorization of technologies. The Committee is also providing a preliminary solar market assessment to the Capacity Need Forum. A separate MREP report, *Solar Energy Potential in Michigan*, will be completed in 2006.

The Committee is also working on proposals for solar energy education and marketing strategies for increasing solar technology market development. The Committee plans to coordinate such efforts with Michigan's colleges and universities, including those participating in curriculum development under NextEnergy grants.[48]

3.2 Solar Committee Recommendations, Goals, and Objectives for 2006

Recommendation 3.1 – Develop a Solar Energy "Green Map" for the MREP Atlas Project

The Solar Committee is cooperating with other Committees to work on the MREP Renewable Energy Atlas project. Solar technology installations are being identified that welcome visits from interested parties, where people can see demonstrations and learn more about the technologies. It is expected that a preliminary map will be available on the State Energy Office Website, by mid-2006.[49] This effort also represents a potential means for gathering additional data on the amount of solar energy presently being harnessed in the state and used by residents and businesses. As a part of this effort, the Committee intends to identify solar and other renewable energy systems in Michigan that are being monitored, in order to obtain as much data as possible about system performance in Michigan conditions. Where system data is publicly accessible, the intent is to make it readily available; through Web links, where practical.

Recommendation 3.2 – Develop Proposal for Michigan Solar Access and Easements

The Solar Committee is completing a report on its proposal for solar access legislation and mechanisms for securing solar property easements.

---

[47] See Section 1.3.1 Three Technology Committees, p. 7.

[48] In 2004, NextEnergy awarded grants to several Michigan institutions of higher education, for the development of advanced energy technology curriculum. See http://www.nextenergy.org/education/. MREP has continued to work closely with representatives from NextEnergy and participating education institutions.

[49] The State Energy Office Website is http://www.michigan.gov/energyoffice and a short-cut directly to Energy Office information about renewable energy is http://www.michigan.gov/eorenew. Links will be provided from MREP Web pages to relevant renewable energy resource maps housed on the Energy Office Website.

Recommendation 3.3 – Develop Proposal for Solar Property Tax Treatment

The Committee is completing a report on its proposal for solar property tax exemptions for small systems and for fair treatment of property taxes on commercial and industrial scale solar equipment.

Recommendation 3.4 – Explore and Develop Recommendations for Solar Energy Financial Incentives, Including Incentives for Net Metering

A variety of financial incentives for solar energy should be explored for possible application in Michigan. Examples include: sales tax rebates, income tax credits, low-interest financing, and aggregated purchasing. Special “do-it-yourself” training and support might also result in lower cost installations for many technologies. In conjunction with the other MREP technology committees, incentives for net metering installations will be considered. The Solar Committee will work with the Financing Committee to develop specific recommendations regarding these subjects, and they will be submitted to the Commission in a separate report.

Recommendation 3.5 – Use Education and Outreach Programs to Support Solar Energy in Michigan

Consumer education programs and activities are a valuable tool to assist with creating a market for solar energy technologies.

In addition, the Committee would like to offer presentations by experts at open meetings and to MPSC Commissioners and other State policy makers. This would provide an opportunity to share current technical information on solar technologies and their market potential in Michigan. Other target audiences for such presentations include utility personnel, and energy, architecture, and engineering professionals, students, and faculty.

The Solar Committee is developing specific recommendations regarding renewable energy education, and they will be submitted to the Commission in a separate report.

This page is intentionally blank.

4 Wind Working Group

Observations from Committee Chairperson John Sarver, Michigan State Energy Office

Wind Energy: Clean Power & Good Jobs

I would like to thank all the participants in the Michigan Wind Working Group who volunteer their time to discuss the many issues related to the development of wind energy in Michigan. There are technical and policy issues that need to be addressed before Michigan will be able to take advantage of our state's wind energy resources. While we discuss the various issues, it is important to keep in mind that wind power can provide clean power and good jobs for our state.

Electricity generation is responsible for 38% of U.S. carbon dioxide emissions, 64% of sulfur dioxide emissions, 23% of nitrogen oxide emissions, 23% of point source direct emissions of particulate matter, and 23% of mercury emissions. Electricity generation from wind energy resources will reduce air pollution.

Clean air, however, is not the only benefit from developing our wind energy resources. Two new studies have indicated that wind power can have a significant impact on Michigan's economy. According to a new study entitled *Renewing America's Economy* released by the Union of Concerned Scientists, a national renewable electricity standard of 20 percent by 2020 would produce a net gain of 4,900 jobs in Michigan. Renewable energy would create 2.3 times more jobs than generating electricity from new natural gas and coal power plants. According to a September 2004 report released by the Renewable Energy Policy Project (REPP), over 16,000 companies in the United States have the technical potential to become part of the growing wind turbine manufacturing business. The report estimates that more than 8,500 new jobs could be created in Michigan.

Clean air and good jobs… Sounds like a deal to me.

4.1 Wind Working Group Purpose, Goals, and Activities

Since the Commission's Michigan Renewable Energy Program order in May 2004, the Michigan Wind Working Group has been serving as the Wind Committee for the MREP process. The Michigan Wind Working Group began meeting in the Fall of 2002 to provide a forum for the exchange of information, create the opportunity for members to discuss and develop joint projects, help to increase consumer awareness about wind energy potential, and identify barriers and opportunities related to the development of wind energy.

The Wind Working Group began discussing state siting guidelines for wind generators at their September 19, 2003 meeting. The U.S. Department of Energy (DOE) sponsored a web conference on wind generator siting issues on December 9, 2003, for approximately 50 participants.

Wind Town Meetings were held in Lansing on November 18, 2003, and Marquette on January 17, 2004. The Great Lakes Renewable Energy Association, with funding provided by a special DOE grant, sponsored the Wind Town Meetings which attracted approximately 220 attendees. The Lansing Town Meeting included presentations by Thomas Ackermann (Energynautics Gmbh), Jeff Anthony (WE Energies), John Ernst (Otsego County), Michelle Montague (NEG Micon), Tanya Paslawski (MPSC), and John Wakeman (SUR Energy Systems). The Marquette Town Meeting included presentations by Jeff Anthony (WE Energies), John Dunlop (American

Wind Energy Association), John Wakeman (SUR Energy Systems), and Tom Stanton (MPSC Staff).

The Wind Working Group continued to discuss siting standards/guidelines for wind generators until Spring 2004. Robert Fletcher, Ph.D. from Lawrence Technological University provided briefings on sound levels, vibration and infrasound, falling ice, tower collapse and blade throw, and shadow flicker. These technical presentations from a neutral party were very helpful. The Energy Office, with input from WWG members, developed Draft Wind Energy System Siting Guidelines/Standards.[50]

A number of presentations were made at WWG meetings in 2004, including David Gard on wind energy developments in Germany, Richard Vander Veen on the Mackinaw Power project, John Wolar and Nancy Ferguson about the impact of wind generators on property values, and Jerry Decker on a recent trip to an Iowa wind farm. On October 5, 2004, the U.S. Department of Energy provided presenters on Offshore Wind Development (Bonnie Ram, Energetics), Michigan Wind Map (Dennis Elliott, National Renewable Energy Laboratory), and Wind Power Siting Issues (John Dunlop, American Wind Energy Association).[51]

At various WWG meetings, participants had the opportunity to discuss MPSC Orders related to renewable energy, net metering and other ratemaking approaches, financing options, and the economic impacts study that will now be undertaken by Michigan Department of Environmental Quality and NextEnergy, under a grant from the MPSC's Low-Income and Energy Efficiency Fund.[52]

The Michigan WWG continued to work on a number of issues and opportunities during 2005, and provided input to the Commission and MPSC Staff on a number of policy issues including net metering and future electric capacity needs.

Michigan State University Extension (MSUE) began a very successful workshop program in December 2004 to educate farmers and landowners about technical, economic, and legal issues related to wind power. Over 600 persons attended 10 workshops that were held through the Spring of 2005. MSUE has begun developing an anemometer loan program to assist interested landowners in identifying potential sites for wind energy production.[53]

The March 2005, WWG Meeting included presentations on a Capacity Values proposal for the MPSC Capacity Needs Forum and the University of Michigan student report on off-shore wind energy development.[54] In May, Dan Alberts, Lawrence Technological University, presented the results of the Delphi planning process and this led to a further review of the Energy Office's draft siting guidelines.[55] In July, MPSC and Energy Office staff met with Dept. of Environmental Quality and Dept. of Natural Resources staff to discuss siting issues related to off-shore wind power. In September, Professor Korford from Iowa State University presented research related to avian impacts to WWG members and interested parties.

---

[50] See Section 4.2.2 Wind Siting Guidelines, p. 28.
[51] Copies of these presentations are on the Energy Office Website, at www.michigan.gov/eoworkshops.
[52] See note 67, p. 35.
[53] See the MSUE Wind Energy Website at http://web1.msue.msu.edu/wind.
[54] Documents associated with both of these presentations are available on the Capacity Need Forum Website, at http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf/othergen/other.htm.
[55] Information about the Lawrence Technological University Wind Energy Delphi Project is available at http://www.ltu.edu/engineering/mechanical/delphi_wind.asp. For the draft Michigan Energy Office *Michigan Wind Energy System Siting Guidelines*, see http://www.michigan.gov/eorenew.

The WWG assisted the Great Lakes Renewable Energy Association to plan Michigan's first statewide Wind Energy Conference, held in Lansing on October 21, 2005. [56]

4.2 Wind Energy in Michigan

Michigan is considered by the US DOE as having good potential for wind power, but there has been little development of this resource to date.

In 1996 Traverse City Light and Power installed the first utility scale wind generator in Michigan, a 600 kW machine that provides power for approximately 200 households. The capital cost of approximately $650,000 was partially funded by a $50,000 grant from the Michigan Energy Office. The wind turbine was made possible because of community support, through a utility green rate program. The green rate premium of 1.58 cents/kWh amounts to a 17-23% increase depending on the subscribing customer's rate class.[57]

In July 2000, the Mackinaw City began researching the feasibility of constructing wind turbine generators. The City began working with Bay Windpower later in 2000, and worked out a lease and power purchase agreement. The two 900 kW wind generators went on line on December 3, 2001. The electricity from the two wind generators is sold at a premium to Consumers Energy green power customers.[58]

These are the only utility-scale wind generators in Michigan to date, but several wind power development companies have been exploring sites in Michigan for the past few years. Some proposed developments are nearly ready to go forward, if contracts for the sale of power can be completed. In August 2005, Consumers Energy entered into power purchase agreements with two proposed Michigan wind developments. One is for approximately 7 wind generators (about 10 MW), proposed for an as-yet-undisclosed location in the Lower Peninsula by Mackinaw Power, LLC. The other is for approximately 32 wind generators (about 50 MW) proposed to be located near Ubly, Michigan, in Huron County, by Noble Thumb Windpark I, LLC. The Commission approved those contracts in its October 18, 2005 Order in Case No. U-14626.[59]

4.2.1 New Wind Map of Michigan

In October 2004, AWS Truewind delivered new wind energy resource maps for Michigan to the Energy Office. The new maps were made possible by financial support from the U.S. Department of Energy. The wind energy resource maps are estimates of wind resources and are based primarily upon computer modeling using the MesoMap system, a numerical weather model which simulates the physics of the atmosphere. Also a wind flow model is used to refine the spatial resolution and account for localized effects of terrain and surface roughness. The maps of wind speed and power at 50-meters were validated by the National Renewable Energy Laboratory using data from over 90 wind measurement stations in Michigan; e.g., 35 airports, 20 Coast Guard stations, and other both public and proprietary data sources.

The wind speed maps show the predicted mean wind speed in Michigan at heights of 30 meters, 50 meters, 70 meters, and 100 meters above the effective ground level. Four maps

[56] See http://www.glrea.org/education/UTP/2005_Michigan_Wind_Energy_Conference_Presentations.html.
[57] See Traverse City Light & Power green rate program report, p. 60.
[58] See Consumers Energy green rate program report, p. 54.
[59] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14626 and Press Release.

were produced because average wind speeds are greater higher above the ground. The maps for heights greater than 50 meters have not been verified, however, because there are so few sources of data recorded at higher elevations. Thus, there is more certainty about the 30- and 50-meter data and the 70- and 100-meter maps are more speculative. A typical tower height for the current generation of utility-scale wind turbines – in the range of 750 to 2,000 kW rated capacity – is 70 meters. A typical height for installing small turbines, of up to 50 kW capacity for on-farm or residential use, is seldom more than about 30 meters.

The 50-meter wind power density map shows the predicted mean wind power, ranked by the National Renewable Energy Laboratory's (NREL) standard wind resource classes. The mean speed and power density describe different aspects of the wind resource. The mean speed is the easiest for most people to understand. Some experts regard the mean wind power, which depends on the air density and the cube of the wind speed, as a more accurate indicator of the wind resource when assessing wind project sites. The maps can be viewed at the Energy Office Website at www.michigan.gov/eorenew.

These wind energy resource maps are intended to be suggestive of areas that may be suitable for wind generators. Values represented for any geographic location may differ from actual conditions at that location. Although the maps are believed to accurately portray general information about Michigan wind energy, estimates for particular locations should be confirmed by on-site measurements, before purchase or installation of any wind power system. There is interest in having the State sponsor an anemometer loan program so that interested property owners can more readily evaluate their on-site potential for wind generators. Over time, it is expected that additional wind measurements will provide important supplemental data for these maps; either to confirm or more accurately describe Michigan's wind energy potential.

4.2.2 Wind Siting Guidelines

Draft guidelines for siting wind energy systems have been developed by the Energy Office with input from members of the Michigan Wind Working Group.[60] The intent for the draft guidelines is to provide recommendations that will balance the need for clean, renewable energy resources and the necessity to protect the public from risks to health, safety, and welfare. These draft guidelines are not intended to apply in urban areas. Workgroup participants generally believe that existing zoning and ordinance requirements in urban areas – including height, noise, and setback requirements – are adequate to protect public health, safety, and welfare.

The draft guidelines make a distinction between wind systems installed primarily for the purpose of providing self-service power, versus those intended to provide power for delivery through the utility grid. The draft guidelines indicate that wind energy systems for self-service power shall be a Permitted Use in all zoning classifications where structures of any sort are allowed. The draft guidelines also have a section for Wind Site Assessment and installation of meteorological data collection (usually called "met" towers).

Wind energy systems for grid delivery are considered a Special Land Use under the draft guidelines. Prior to the installation of these large wind energy systems, an application for a Special Land Use would be filed with the local government and include a site plan, applicant identification information, and proof of the applicant's public liability insurance, and would cover the following items: (1) property set backs, (2) lowest point of blade, (3) sound pressure levels,

[60] The most recent version of the Draft Guidelines is posted on the Energy Office Website at www.michigan.gov/eorenew.

(4) construction and electrical codes and interconnection standards, (5) FAA regulations, (6) falling ice, (7) visual impact, (8) environmental impact, (9) electromagnetic interference, (10) shadow flicker, (11) safety issues, (12) decommissioning, and (13) complaint resolution.

The Energy Office is seeking comments on the draft standards/guidelines before they are finalized. Lawrence Technological University graduate student, Daniel Alberts, conducted a modified Delphi method research process, to help educate participants and encourage dialogue, towards the development of a consensus on at least some siting issues (e.g., noise and wildlife impacts). Preliminary and final reports on this process were shared with WWG participants.[61] It is expected that this research might provide valuable input that can be used in finalizing the draft standards/guidelines.[62]

4.3.3 Agricultural Sector Outreach

Effective July 1, 2004, a $75,000 grant from the Energy Office was awarded to Michigan State University Cooperative Extension to adapt existing wind energy materials to the needs of Michigan farmers, work intensively with early adopters, develop a computer model for evaluating the economics and risks of a wind power investment, conduct workshops on wind power, and support travel to wind generator sites so farmers can see wind generators in operation. A smaller $15,000 grant to the Grand Traverse County Extension Office provided financial support for county staff to be active in the state program.

4.3 Wind Working Group Recommendations, Goals, and Objectives for 2006

Recommendation 4.1 – Complete and Enact Wind System Siting Guidelines

Energy Office and MPSC Staff recommend that draft Wind Energy System Guidelines be finalized and that legislation be enacted that will establish the guidelines as the default ordinance for siting wind generators unless a local jurisdiction decides to adopt their own ordinance. The Wind Working Group did not achieve consensus on this recommendation.

Recommendation 4.2 – Complete Wind Energy Resource Assessment

It is recommended that MPSC staff evaluate the contributions that wind energy can make to diversifying Michigan's energy resources and relieving transmission congestion between Michigan and other states. Variability in production is frequently mentioned as a disadvantage of wind power. MPSC staff should evaluate and determine what capacity contributions would exist if 1,000 MW of wind power were developed throughout Michigan. A separate report, *Wind Energy Potential in Michigan, 2006-2020,* is being developed for the Capacity Need Forum.[63]

---

[61] Information about the Lawrence Technological University Wind Energy Delphi Project is available at http://www.ltu.edu/engineering/mechanical/delphi_wind.asp.

[62] House Bills 4648 and 4649 would amend Michigan's Township and County Zoning Acts, respectively, to permit wind energy conversion systems in all zoning classifications, subject to certain restrictions. See http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=2005-HB-4648 and http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=2005-HB-4649.

[63] Copies of five draft reports, Wind – Capacity Factors, Wind – MI Energy Potential 2006-2020, Wind Capacity Credits, Wind Capacity Credits Presentation, and Briefing Paper on (continued on next page)

Recommendation 4.3 – Establish Anemometer Loan Program

The Energy Office should explore sponsoring an anemometer loan program, so that interested landowners can more readily evaluate their property's potential for wind power development.

Recommendation 4.4 – Support Tall-Towers Wind Measurement

The U.S. Department of Energy operates a grant program which offers support to states in order to conduct wind power measurements at heights representative of the latest generation of new wind generators (e.g. approximately 150 meters, or more). The Wind Working Group should coordinate with interested parties in Michigan and the Great Lakes States to try to obtain support for the installation of one or more of these tall-tower wind measurement projects in Michigan and very near the Great Lakes. All practical options should be explored for obtaining accurate wind energy data from more sites and from higher towers.

Recommendation 4.5 – Develop Wind Energy Information for MREP Atlas Project

More detailed analysis and reporting on the information provided by the new wind maps should be made available to assist people in understanding the data and how it can properly be used. To the extent possible, this data should be made available for easy access via the Internet.

Recommendation 4.6 – Identify Appropriate Capacity Values for Variable-Output Energy Supplies, Such As Wind

In conjunction with the Capacity Need Forum, MREP and WWG participants should develop a proposal for identifying the capacity values represented by variable-output energy supplies. If possible, the proposal should also include details about how such capacity values might be incorporated into Power Purchase Agreements.[64]

Recommendation 4.7 – Establish State Goals for Onshore Wind Development

Dennis Elliott, National Renewable Energy Laboratory, has used the new Michigan wind map to estimate that Michigan has an onshore wind energy potential of 16,560 MW. It is recommended that the State set a goal of 800 MW of wind power by 2010 and that state policies be adopted to encourage the development of this clean, Michigan energy resource.

Recommendation 4.8 – Adopt Appropriate Renewable Portfolio Standard

It is recommended that the State Legislature adopt a Renewable Portfolio Standard with a requirement for all state electric power suppliers to incorporate into their supply mix a minimum of 1.0% of new, in-state renewable energy resources, by December 2006, and that this

---

(continued from last page) Offshore Wind Energy Development in the Great Lakes, are available on the CNF Website, at http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf/othergen/other.htm.

[64] See note 63, p. 29.

requirement increase by a minimum of 0.5 percent per year, to reach a total of 10 percent by 2015. The Wind Working Group did not achieve a consensus on this recommendation.[65]

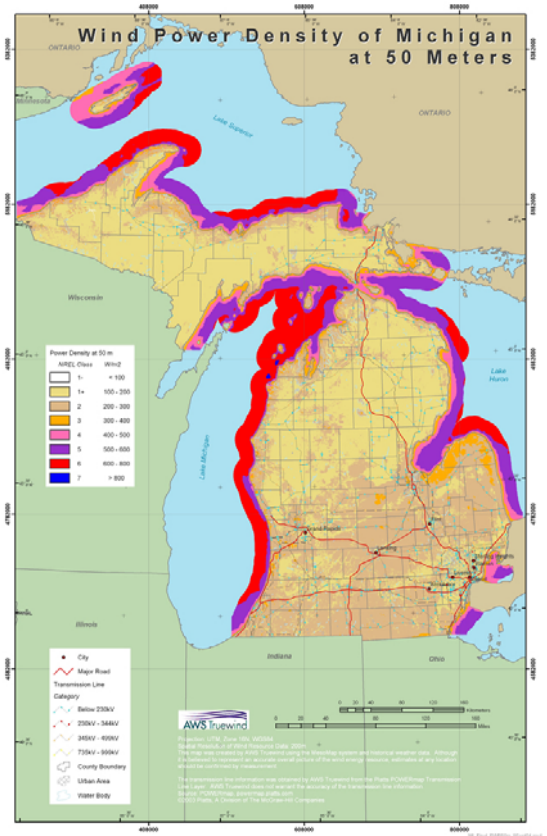
Recommendation 4.9 – Evaluate Offshore Wind Development

While it is premature to make any specific judgment or recommendation related to offshore development of wind generators, MPSC staff should work with the Michigan Wind Working Group and the Department of Environmental Quality to evaluate the resource potential and investigate potential permitting requirements and jurisdictional issues.

Recommendation 4.10 – Identify Priorities for Wind Energy Research

There are many scientific questions related to developing Michigan's wind energy resource that need to be researched. The Wind Working Group should identify these issues and help to obtain federal or private funding for the necessary research.

Figure 1: Michigan Wind Power Density (at 50 meters above ground)



[65] See also Recommendation 5.3 – Establish Renewable Energy Goals through Capacity Need Forum, p. 36, and Recommendation 7.3 – Explore Clean Energy Portfolio Options, p. 48. Also, House Bills 4154 and 4608, both introduced in 2005, propose renewable energy portfolio percentage requirements for Michigan electric utilities. See http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=2005-HB-4154 and http://www.legislature.mi.gov/mileg.asp?page=getObject&objName=2005-HB-4608.

This page is intentionally blank.

5 Economic Impacts Committee

Observations from Committee Chairperson James Croce, CEO, NextEnergy

The relationship between increased development and utilization of renewable energy and the economy has been argued for years, with various interests advancing their discreet, and often incomplete, views and opinions. The debate generally tends to rely upon quick "sound-bites" and emotion, rather than a comprehensive qualitative and quantitative analysis of the myriad of economic variables necessary to make informed decisions regarding policies to advance renewable energy. Our Committee was charged with "sorting wheat from chaff" in the renewable energy debate, and somehow forecasting the net economic impact on Michigan's economy of expanded renewable energy production and consumption. Only by exposing the truth regarding the economic impacts of renewable energy, can the State develop sound policy to increase our energy security and protect our environment. Our ultimate hope is that, as the economic tradeoffs are understood and exposed, we will replace the hype and sound-bites with solid data. Then the MREP Collaborative can recommend policies with assurance.

Of all the modeling contemplated and literature analyzed by the Committee, ultimately, only one basic question needs answering: Will renewable energy expansion in Michigan be a net job creator or killer? Fortunately, Michigan is not alone in its attempt to answer this question. The body of research and reports on this subject has rapidly increased over the past 12-18 months, and can be used as a guide in developing our own unique analyses. As such, the Committee reviewed about a dozen recently released economic impact studies and identified, in matrix format, their strengths and weaknesses. In "coming late to the party," Michigan can identify those analyses and researchers with the most comprehensive and realistic frameworks, for use in developing our own set of economic forecasts.

After a year at the helm of Michigan's alternative energy technology accelerator program, NextEnergy, I am convinced that, in the absence of proactive energy policy to stimulate market demand of renewables and energy efficiency, Michigan will lag the nation (and world) in capitalizing on the emerging "clean technology" marketplace. The fact is, alternative energy technology companies will be loath to site their businesses in markets where there is an absence of local demand. One can simply compare the "haves" (states with substantial, proactive renewable energy policies) with the "have-nots" for confirmation. The trick is figuring out how to strike just the right balance between protecting Michigan's existing energy intensive industries (by minimizing energy costs) and the undeniable, worldwide movement – with its associated job creation potential – aimed at reducing our dependence on a rapidly depleting and highly polluting resource base (fossil fuels).

Although our ambitions for 2004 exceeded our available time and resources, the Committee has done an excellent job framing the issue and exposing the debate as it is presently occurring around the nation. Clearly, much of our work remains to be completed, after the submission of this report. The Committee believes the Commission's Capacity Need Forum (Case No. U-14231) provides an ideal venue for undertaking the vital analytical work required to develop sound economic policy to encourage energy and economic diversity in Michigan.

I wish to express my gratitude for all the volunteers who worked so diligently in developing this section of the MREP report. I look forward to the ensuing months, as we conclude the important work we have started.

5.1 Economic Impacts Committee Purpose, Goals, and Activities

The Economic Impacts Committee's 2004 scope of work was to explore the business case for increasing renewable energy production and consumption in Michigan and then provide preliminary guidance and recommendations based on that assessment. The Committee intends to develop or acquire a comprehensive, meticulous, Michigan-specific account of the positive and negative impacts that are likely to result from policies encouraging or mandating the

increased use of renewable resources for meeting our future energy needs. This work will continue in 2005 and 2006.

Specific tasks assumed by the Economic Impacts Committee included: (1) Investigating the direct, indirect, and induced macroeconomic effects on Michigan's economy and employment from expansion of renewable energy production and use; (2) Reviewing how renewable energy development might already be supported, or at least supportable, through existing State economic development programs and incentives; and (3) Exploring feasible and reasonable legislative or regulatory proposals for new state economic development programs or incentives for renewable energy. The second and third tasks are being explored in concert with the MREP Financing Committee and the three MREP technology committees (biomass, solar, and wind).

The Economic Impacts Committee began its research agenda in 2004 by scrutinizing as many recently published studies on this general subject as could be found, and held extensive discussions among participants and with various researchers to ponder the design of Michigan-specific research that will more conclusively articulate how changes in Michigan's energy mix will affect the state's economy, employment, and environment. Many of the reviewed studies predict significant economic and job growth as a result of existing or proposed policies that favor renewable energy over traditional generation. Other studies conclude that carefully designed and implemented combinations of renewable energy supplies coupled with aggressive energy efficiency improvements can often satisfy energy needs at lower cost than traditional options.

The Committee generally finds such studies insightful, but participants know that overly broad or unrealistic assumptions and modeling omissions produce findings that are uncertain, at best, or even unreliable. Committee participants are also acutely aware that there is no widespread consensus in Michigan that enough is known about the benefits and costs of renewable energy to conclude, unequivocally, that greater public or utility resources should be invested in renewable energy, nor even that a significant expansion is warranted. Some Committee participants feel strongly, though, that comprehensive, conclusive proofs already exist, sufficient to support vastly increased public and utility investments in renewable resources. In any case, participants generally agree that the best, consensus-building approach at this time is to systematically increase available knowledge through the completion of methodically targeted, Michigan-specific research, and then broadly share those research results. The Committee fundamentally believes that such research is a necessary prerequisite to building a consensus on renewable resource policies. Given the Committee's time and resource constraints in 2004 and 2005, however, a finished research project of the required breadth and depth has not yet been produced. Considerable progress was made on the basic designs for a study, though, and the Committee is now prepared to offer specific recommendations about proceeding with the required research in 2006.

The Committee determined it would need to avail itself of Michigan-specific economic modeling research to explore key correlations, in order to begin fashioning a balanced viewpoint for making a solid business case for renewable energy in Michigan. Therefore, the Economic Impacts Committee formed two subgroups. One group was charged with the recruitment of representatives of Michigan manufacturers to the Committee, to obtain input about their concerns. It was also suggested that the committee utilize input from renewable energy technology manufacturers and developers, to increase the committee's capabilities for accurately modeling renewable energy industry sector growth that is likely to occur in Michigan. Fortunately, we were successful in recruiting representatives of two large energy users (General Motors and Dow Chemical) and a handful of renewable technology manufacturers and developers (BioEnergy Industries, Inc., Coffman Electrical Equipment, Green Mountain Power,

McKenzie Bay (wind), and United Solar. The second subgroup worked to determine the inputs that will be needed from the MREP technology committees and began to refine the scope of work for a Michigan-specific study of the economic impacts associated with the expanded production and consumption of renewable energy.

In addition, two organizations deserve special mention for their assistance with this report. The World Resources Institute's Green Power Market Development Group[66] provided cost information on biomass and wind energy as well as information regarding the elasticity of demand for energy resources. And, NextEnergy offered to co-fund research to analyze the economic impacts of increased production and consumption of renewable energy in the state. That research has not yet been completed, but NextEnergy remains committed to this undertaking. NextEnergy and the Economic Impacts Committee participants realize Michigan cannot pursue a comprehensive agenda to promote renewable energy without this information.[67]

Also, fortuitously, in early 2005, the University of Michigan School of Business selected NextEnergy as a sponsor for a multidisciplinary action project (MAP). Under the MAP program, four graduate students were assigned to work with NextEnergy during March and April to research the energy-related sectors of Michigan's economy and the emerging alternative and advanced energy industries. The major deliverable from the MAP team was a proposed approach for modeling the gross and net effects on Michigan's economy, and employment in the various affected sectors of the state's economy, that would be predicted to result from increased reliance on energy efficiency and renewable resources. This project culminated in May 2005 with the delivery of the students' project report and a presentation to NextEnergy and members of the MREP Economic Impacts Committee.

Preliminary findings from the Economic Impacts Committee's research, including a review of about two dozen studies conducted for the U.S. and various states, including Michigan, will be published in a separate MREP report.

5.2 Economic Impacts Committee Recommendations, Goals, and Objectives for 2006

Recommendation 5.1 – Future Modeling

The Committee intends to continue its efforts to produce a valid and reliable analysis of the benefits and costs associated with renewable energy expansion in Michigan, using a Michigan-specific economic impacts model. The Committee recommends integrating its research with the reports from the Capacity Need Forum, so that all supply and demand options are modeled in order to determine – in addition to their effects on basic energy production, consumption, and costs – their direct, indirect, and induced effects on Michigan's economy, employment, and environment. The Committee welcomes any specific directions or recommendations from the Commission with respect to the scope of such studies.

---

[66] See note 10, p. 2.

[67] The Commission announced June 30, 2005, the award of a $185,000 grant to the Michigan Department of Environmental Quality and Next Energy, for the completion of a detailed study intended to identify appropriate sources and quantities of energy efficiency and renewable energy feedstocks and technologies available for use in Michigan and then analyze the level of penetration for such technologies that will optimize net benefits to Michigan's economy. See Press Release. A final report on this project is expected by mid-2006.

Recommendation 5.2 – Interface with U-14231 Capacity Need Forum

The Committee requests the Commission appoint at least one representative of the MREP Economic Impacts Committee to be a member of the Capacity Need Forum. The Committee recommends that its research be shared with the Capacity Need Forum for its use in the preparation of preliminary and final reports to the Commission.

Recommendation 5.3 – Establish Renewable Energy Goals through Capacity Need Forum

The Committee requests the Capacity Need Forum to collaborate in determining a reasonable goal for expanding renewable energy production and consumption in Michigan in the next 5, 10, and 20 years. Based on the information received and analyzed to date, the Committee believes that a reasonable goal – for the purposes of preliminary discussion – is for renewable energy production in Michigan to be increased by an average of approximately 200 MW per year for the next five years, to reach approximately 1,000 MW of new production by the end of 2010.

6 Financing Committee

Observations from Committee Chairperson, Debra Rowe, Ph.D.
Professor of Environmental Systems and Behavioral Sciences. Oakland Community College
and Senior Fellow, Association of University Leaders for a Sustainable Future

One of the most important international economic development principles to be recognized in the 1990s is, as Gro Brundtland of the World Commission on Economic Development and past Chairperson of the World Health Organization recently related in a speech at University of Michigan, "Healthy economic development cannot occur without protections to maintain a healthy ecosystem" (29 October 2004).

Over twenty-five years, I have worked with the State of Michigan multiple times on reports and projects to plan for Michigan's energy future, including the potentials for renewable energies. Each time, the reports sat on the shelf while the actual introduction of renewable energies remained miniscule. During the earlier years, just the act of caring about the environment might have even labeled one as either a radical or an outlier from the societal norms. This time, I sense a change.

It has now become a mainstream concept to acknowledge that humans depend on natural ecosystems for sustenance and many of earth's ecosystems are being seriously threatened by humanity's collective actions, especially with regard to fossil fuel energy production and consumption. The connections between fossil fuel pollution and human health problems have now been scientifically established. The ongoing externalities from the burning of fossil fuels are finally beginning to be factored into government policy decisions. Increasing numbers of citizens and policy makers alike understand that the costs associated with our dependence on fossil fuels – even if they are not factored into energy prices in the marketplace – are ultimately charged somewhere else on society's balance sheet, and ultimately need to be addressed in policy decisions. These externalities include, but are not limited to, increased asthma and other respiratory illness and mercury poisoning, due primarily to fossil fuel emissions. Presently, the number one priority of the group, Physicians for Social Responsibility, is that one out of six women in the US have mercury levels in their bodies that put them at increased risk for giving birth to children with permanent cognitive impairment. The increased costs associated with health problems, associated with lost productivity, pain and suffering, while attributable in large part to fossil fuel combustion, is not presently included in market prices but is paid for by our society indirectly, often through government programs supported with our tax dollars.

The worldwide scientific consensus on climate change has caused dozens of mayors from throughout the US to disagree with the federal administration's lethargy regarding climate change and join forces with the countries that ratified the Kyoto protocol, to take action immediately to try to mitigate climate change by reducing fossil fuel consumption. These mayors understand the economic costs of not factoring climate change into our government planning and policy decisions.

The excellent news is, by strategically implementing just the right combinations of energy efficiency and renewable energy options to replace some of our existing fossil fuel consumption and meet future demand, the overall cost of energy can remain the same or decrease, while the indirect and external costs are reduced. That approach ultimately produces healthier and stronger local and state economies.

Our government agencies, such as the Public Service Commission, have both the opportunity and responsibility to consider full cost accounting, that incorporates into policy decisions the present and future costs of externalities. I am encouraged by the net metering consensus, the streamlining of Michigan's interconnection standards and procedures, and the catalytic atmosphere that the Commission has encouraged through the MREP process. I am still amazed, though, that MREP is un-funded and so understaffed.

The ultimate goal, of course, is to reduce emissions as much as possible while building a stronger economy. Through policies and programs that will increase investments in energy efficiency, renewable energies and pollution reduction technologies, I expect, this time around, the Public Service Commission will take much larger steps to create an economically and environmentally healthier future.

6.1 Financing Committee Purpose, Goals, and Activities

Access to cost-competitive financing remains a significant barrier to the increased development of both large- and small-scale renewable energy systems in Michigan. The primary purpose of the Financing Committee is to identify reasons why lower-cost financing is not readily available and suggest possible remedies.

Following the Commission's May 18, 2004 Order in Case No. U-12915, the Financing Committee was formed and asked to tackle the following four assignments: (1) to work with interested parties to prepare implementation proposals for appropriate approaches to creative financing for renewable energy; (2) to work with the Department of Management and Budget to encourage efficiency and renewable energy resource use for state facilities, which could produce long-run cost savings to the state; (3) to encourage the Michigan Department of Environmental Quality to work cooperatively with the United States Environmental Protection Agency to amend emission credit guidelines so that utilities can be rewarded for developing green power tariffs; and (4) to explore options for ecological tax reform.

The barriers to greater renewable energy development are numerous. They generally center around the facts that: (a) there is not yet a great deal of experience with renewable energy technologies; (b) current regulations and public policies, including financial subsidies, sometimes favor more well-established industries and infrastructures; (c) we currently lack full-cost accounting and pricing which would reflect in fossil fuel prices the negative effects associated with their production and consumption; and (d) new renewable energy technologies are currently forced to compete against existing utility infrastructure that is already partly or fully depreciated.[68] In addition, many of the renewable energy technologies that are trying to gain a foothold in today's energy markets are still, by and large, more expensive than their traditional, fossil-fuel alternatives. To be sure, that is in part because of existing subsidies and the externalized costs of fossil-fueled alternatives. It is also in part because today's markets for renewable energy technologies, though fast growing, are still rather small.

Another recent concern has been that government mandates, such as renewable portfolio standards, may be effectively swelling demands so rapidly for new renewable energy installations that manufacturing capability has not been able to keep up. With worldwide demand for wind and solar growing at rates approximating 25 to 30 percent per year, a seller's market may have been created, at least temporarily, with less downward pressure on prices, even as manufacturing capabilities and technological improvements both continue to increase. In any case, it is taking a long time to reach greater efficiencies and economies of scale and scope in manufacturing and production that are expected to further reduce purchase prices.

At least to some extent, a "Catch 22" situation exists, where ready access to lower cost capital would help make renewable alternatives more competitive, but because they aren't already more cost-competitive, their capital costs are higher. As with the early introduction of many

[68] This latter fact has been particularly influential in Michigan. As long as Michigan electric utilities have existing capacity to meet customer needs, and face uncertainty about their future customer loads due to the availability of electric customer choice (that is, choice of generation service supplier), utilities are unlikely to be interested in either constructing any new capacity of their own or entering into additional long-term purchase power agreements. Generally speaking, this situation has effectively forced proposed Michigan renewable energy sources to compete against the short-term variable fuel and operating costs of existing power plants, rather than the full capital and operating costs of other new power supply options. These are among the issues being explored by the Michigan Capacity Need Forum (see p. 6).

technologies into widespread commercial utilization, some form of government support and assistance – some pump priming – may be necessary to help overcome existing barriers.

6.2 Report on Financing Committee Activities

The Financing Committee met in person and by teleconference about once a month from July through October 2004, and then more frequently by teleconference in November 2005.

Several specific barriers to lower-cost financing were identified. They include:

- Various aspects of existing utility rate structures; some of which were developed in decades past, with little thought given to their possible effects on small-scale power generation technologies or on power supplies with highly variable output, such as many renewable energy sources.

- Lack of stability in public policies; such as on-again/off-again federal production incentives for wind and biomass energy, and ever-changing environmental regulations.

- Lack of utility or other large-scale financing options, which frequently results in the need for interested end-use customers to use their own lines of credit to install renewable energies. (Contrast this with utility companies' traditional access to lower cost financing and customers who have never been asked to pre-pay and personally finance their portion of the capital costs for new utility power plants).

- Sometimes unfamiliar financing options, combined with customer expectations of rapid payback on energy investments.

- Technology risks, and often risks associated in working with new or small companies, that are typically associated with the initial stages of commercialization for all technologies.

Because these kinds of barriers still exist today, it is more costly and difficult to obtain financing for renewable energy projects. Identifying options to overcome the negative impacts of such barriers is one general charge of the MREP Financing Committee. The Financing Committee is working on a separate MREP report which will include reviews of:

- ***Existing state of Michigan programs*** that could be enhanced to include renewable energy financing.

- ***New incentives and financing program possibilities*** that could enhance renewable energy deployment.

- ***Additional sources of revenue from green energy values*** – including emissions credits, renewable energy certificates, and ecological tax reform;[69] and,

- ***Encouraging renewable energy use in state facilities***, and more generally in facilities whose utility bills are paid with taxpayer dollars, including universities, colleges, schools,

[69] The related topics of utility green rates and other green pricing programs, and renewable portfolio standards, feed-in tariffs, renewable energy standard offers, or other similar options are also being discussed by the MREP Ratemaking & Net Metering Committee. See page 45.

and county and municipal government facilities, as one possible mechanism for helping to generate more market pull for renewable energy technologies.

6.3 Financing Committee Recommendations, Goals, and Objectives for 2006

While this section of the MREP annual report lists financing barriers and describes some of the many possibilities for addressing them, the Committee finds it needs to collect more specifics on what types and combinations of financing, regulatory and legislative initiatives are most appropriate for Michigan. Financing Committee participants are committed to the continued pursuit of this research agenda, but also seek additional technical support for some of these efforts, which will require some commitment of funds, either by the Commission or others, as described in some of the following recommendations.

Recommendation 6.1 – First Things First: Energy Efficiency

If the goal is to create healthier environments, stronger economies and healthier communities, the PSC and the Michigan state legislature should be creating programs that facilitate the installation of cost-effective energy efficiency and energy conservation technologies throughout the public and private sectors in the state.[70] Implementing renewable energy technologies without first implementing energy efficiency and energy conservation is "putting the cart before the horse." Many energy efficiency possibilities have higher returns on investments, produce greater energy effects, result in greater emissions reductions, and generate more job creation, per dollar invested, compared to renewable energies. Energy efficiency possibilities are often not implemented because of some of the same barriers that have prevented the more widespread deployment of renewable energy (e.g., initial cost, third party financing hesitancies, payback expectations, end-user misunderstandings and hesitancies, etc.). Any successful energy plan for Michigan should *first* include programs that address the barriers to energy efficiency. Furthermore, when energy efficiency improvements precede and conservation practices accompany renewable energy applications, even though renewable energy systems may supplant lower priced traditional resources, a consumer's total energy costs will frequently be the same or lower, although a greater portion of their needs are served by renewable energy.

Recommendation 6.2 – Secure MREP Staffing and Funding

The next steps for the Financing Committee are to prioritize specific financing possibilities. Completing this task will require quantifying the need for financial mechanisms to address specific barriers, and the analysis needs to be technology specific, since barriers vary depending on the technology. The following question has to be answered: "In order to meet goals for the penetration for biomass, solar, and wind energy production in Michigan, how big is the funding gap, and just what kind of a gap is it? It is beyond the expertise and volunteer time of this committee to analyze and prioritize all of the gaps and all of the possibilities. Funding is required to hire experts in the field to analyze the relative value of alternative financing

[70] The Commission initiated action on energy efficiency programming, through its October 18, 2005 Order in Case No. U-14667. In that order, the Commission directed its Staff to "prepare an overview of the status of electric and natural gas efficiency programs in Michigan and other states together with review of the most promising alternatives, including recommendations for action, to be filed and posted to the Commission's website by January 31, 2006." Following the filing of this report, the Staff will convene a public meeting "to review its report and begin developing consensus on a course of action." (Order, p. 6). See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-14667_10-18-05.pdf.

mechanisms (and enabling legislation, if necessary) and identify the most advantageous financing mechanisms in terms of benefits to the state economy, human health and the ecosystems on which we all depend. These experts would need to address not only the funding gap, but the regulatory barriers and operations gaps. They would also look at the existing financing mechanisms for clean energy throughout the world, as well as identifying new ones, and create a prioritized list of recommendations. One of the key criteria for prioritization is to assess which options create the best leverage of the state's powers to have the most effect while effectively balancing risk. It is crucial to do this analysis to move forward and it is important it be done quickly.

Committee participants believe some of the required assistance may be readily available from the Regulatory Assistance Project (RAP; http://www.raponline.org), the U.S. Department of Energy and National Renewable Energy Laboratory (NREL; http://www.nrel.org), and perhaps the Renewable Energy Policy Project (REPP; http://www.repp.org). The Financing Committee recommends the Commission investigate these options, which may be available at very little cost to the state.

In addition, the MPSC and State Energy Office should consider cooperating with, participating in, and joining regional and national organizations working on renewable energy policy development and designating staff or MREP Collaborative participants to represent Michigan in these forums. The three most prominent organizations identified by the Financing Committee thus far are:

1. Clean Energy States Alliance (CESA; http://www.cleanenergystates.org/), a multi-state coalition of clean energy funds working together to develop and promote clean energy technologies and to create and expand the markets for these technologies;

2. Midwest Combined Heat & Power Initiative (MW-CHPI; http://www.chpcentermw.org/01-03_coalitions.html), an alliance of environmental, industry, and government organizations formed to promote a doubling of the amount of installed clean, energy-efficient combined heat and power systems in the Midwest by 2010; and,

3. Midwest Energy Efficiency Alliance (MEEA; http://www.mwalliance.org/), a collaborative network for the advancement of energy efficiency in the Midwest for the support of sustainable economic development and environmental protection.

The Committee believes that participating in such organizations can be very helpful to Michigan, because they provide opportunities to learn from the experiences of other states that are working on similar problems and issues.

Recommendation 6.3 – Take Action As Soon As Possible, Using "Ready, Fire, Aim" Approach

Although some MREP recommendations may require legislative action or executive directives, and as such may only be recommended by the MPSC, the Commission can and should move forward on any programs within its direct purview to start to implement efficiency and renewable energy on a more systematic, statewide level. Some of the information needed to plan a healthy renewable energies future will become available only when implementation has begun and assessment data is gathered, so that lessons can be gleaned from initial results.

Recommendation 6.4 – Promote NextEnergy Tax Incentives

NextEnergy tax incentives already offer significant benefits to renewable energy companies operating in Michigan. This program would benefit from better promotion, so that more companies are aware of the available incentives and how they can best be applied to a variety of renewable energy initiatives. MREP should work in concert with NextEnergy to better promote existing incentives.

Recommendation 6.5 – Develop Proposal for Renewable Energy Trust Fund

Some states have public benefit trust funds that are specifically dedicated to renewable energy projects. Michigan should consider the establishment of such a fund. The Financing Committee will prepare a specific proposal for MPSC consideration.

Recommendation 6.6 – Hold MREP Summit Meeting

The Financing Committee proposes the Commission convene a renewable energy and energy efficiency summit meeting, including representatives from utility companies and competitive energy suppliers, MREP representatives, Commission Staff, and other interested parties, to discuss how Michigan can implement these technologies as completely as possible within the state, and help achieve consensus on legislative and regulatory prerequisites. The Committee believes that leadership is needed, particularly in order to engage top level managers and directors at Michigan utility companies.

The following three recommendations generally follow the first few steps in the process set out by Osborne and Hutchinson (2004) in their popular book, *The Price of Government*. The ultimate objective of the Financing Committee is to address financial barriers to more rapid renewable energy development. The process described by Osborne and Hutchinson (Chapter 3) offers useful guidance about how the Financing Committee can proceed with its work.

Recommendation 6.7 – Establish Goal for Renewable Energy Financing

Fulfilling this task requires completion of a systematic, realistic assessment both Michigan's renewable energy resource potential. That work has already begun, through the Capacity Need Forum process.[71] Once the resource potential is well understood, the next step is to analyze the extent to which various forms of financial assistance can materially advance the application of different technologies. Until this assessment is completed, it is impossible to accurately understand the magnitude of financing that might be necessary in order to Michigan to achieve its renewable energy potential.

[71] Preliminary assessments of some biomass resources and on- and off-shore wind energy potential for Michigan are being completed in conjunction with the MPSC Capacity Need Forum process. Another report, *Solar Energy Potential in Michigan*, is pending (see p. 22). These reports will also be posted on the MREP Web site. See http://www.dleg.state.mi.us/mpsc/electric/capacity/cnf/othergen/other.htm.

Recommendation 6.8 – Complete Cause-and-Effect Map for Renewable Energy Financing

The function of a cause-and-effect map is to model the expected effects associated with specific financing programs. Completing this task will make explicit the various assumptions that underlie different financing proposals.

Recommendation 6.9 – Generate and Distribute Requests for Results (RFRs)

Once appropriate renewable resource goals are established and models developed to demonstrate how various proposed financing programs are intended to operate, there is an expectation that requests for results (RFR's) can be developed for the completion of specific tasks. The intent of RFR's is to identify organizations best suited to completing those tasks.

The Financing Committee will develop a detailed work plan for implementing these last three recommendations, based on the process described by Osborne and Hutchinson, and will present it to the Commission for its review and approval, in a separate report.

This page is intentionally blank.

7 Ratemaking & Net Metering Committee

Observations from Committee Chairperson Norman J. Stevens P.E., DTE Energy

I've been asked to share my personal observations on the progress that the Ratemaking and Net Metering Committee has made since its creation in summer 2004 and its direction for the coming year. First and foremost, the support, openness and spirit of cooperation expressed by everyone participating on the committee needs to be acknowledged. Just as important to our success has been the understanding and support of the management of the organizations and companies the committee members represent.

Our focus has been on developing a foundation of communication, common understanding and trust upon which to build consensus. Clearly each party participating on the committee holds a view and has an obligation to obtain an agreement that is fair to its constituency. These views and obligations differ, even between the utilities. Our task in reaching consensus was to come up with a resolution that would be to the benefit of all. In that, I believe, everyone on the Committee feels the Net Metering Consensus has accomplished the objective.

Yet, there is still much more to accomplish.

In the coming months, the Ratemaking and Net Metering Committee will begin to address other topics that may prove to be more controversial. This will require additional education on the issues and an examination of alternative approaches and their associated benefits and pitfalls. But, as we have done with net metering, in order to gain consensus it is essential that the parties enter the discussions with openness to the opinions of others and a willingness to give serious consideration to innovative approaches that can be beneficial to all.

Renewable energy in Michigan and throughout the world is advancing in many ways. New benefits are emerging. Costs are declining. Technological breakthroughs are occurring. New native resources are being discovered and harvested. And as a result, today's approaches to advancing renewable energy use may not be the optimum tools.

We all realize that if, at the same price, a customer were given the choice of purchasing energy produced either from fossil fuels or from renewable resources, every time the decision would be for renewable energy. The underlying barrier to renewable energy commercialization has been its cost and its limited ability to be relied upon at time of demand. The common approach has been to use the regulated public utilities as a subsidy mechanism to fund the premiums that renewable energy requires. But in Michigan we no longer operate under the old regulated utility monopoly model that is still prevalent in most of the United States and Europe. With retail electric supply competition, new approaches to renewable energy market stimulation are needed.

We can work together either to remedy the cause or to treat the symptom of renewable energy costs. Mandates and subsidies are merely means of treating the symptoms. Our focus needs to be on means of reducing the capital cost, increasing energy production, achieving dispatchability, identifying new economic values, creating a payment structure that fairly compensates for the supply product components, and development of new premium energy market segments that place additional value on renewable energy.

As we examine regulatory approaches for advancing renewable energy use, we must be mindful of the potential pitfalls. We need to avoid creating an artificial demand for renewables through mandates that have the potential to exceed the supply, only to cause an unwarranted increase in prices. We need to be careful about causing long-term financial commitments to technologies that may quickly face obsolescence and be replaced with less costly advanced technologies. We need to avoid the temptation to use Michigan's regulated utilities as laboratories with which to develop renewable energy markets resulting in inflexible long-term energy contracts at premium prices. And, we need to be aware that, in Michigan, electric energy customers can quickly respond to new offerings of lower priced renewable energy alternatives from competing retail electric suppliers, thereby placing regulated utilities saddled with early commitments to high-priced renewable energy supply purchases at a competitive disadvantage.

7.1 Ratemaking & Net Metering Committee Purpose, Goals, and Activities

Over the course of meeting about once a month from its establishment in July 2004 through November 2004, the Ratemaking and Net Metering Committee grew to include representatives of a wide range of constituencies, including:

Alpena Power Company
American Electric Power
City of Ann Arbor, Energy Office
Consumers Energy
Detroit Edison
Great Lakes Renewable Energy Association
International Brotherhood of Electrical Workers
Lansing Board of Water & Light
MI Electric Cooperative Association (MECA)
MI Electric and Gas Association (MEGA)
MI Energy Office
MI Environmental Council
MI Farm Bureau
MI Legislative Service Bureau
MI Public Service Commission Staff
MI Senate Research Staff
MI State Representative Chris Kolb's Office
National Renewable Energy Laboratory
NextEnergy
Upper Peninsula Power Co.
We Energies
Wisconsin Public Service Corp.

Several items have been suggested for the Committee's agenda, involving the development of regulatory approaches to provide incentives for, remove barriers to, and promote the use of renewable energy. The foremost assignment for this Committee in 2004 was to try to achieve a consensus on the creation of a statewide net metering program for Michigan.

The Committee, to varying degrees, discussed several considerations for regulatory approaches to the development of renewable energy policy and programs. These included:

- What cost factors are affecting renewable energy developments in Michigan?
- What benefits will regulatory incentives have, compared to other approaches?
- Will proposed new or changed regulatory incentives be acceptable to all parties, or are they likely to be challenged through appeals to the MPSC or courts?
- Should new regulatory incentives be developed or existing ones changed to reflect utility restructuring and the resultant functional separation of utility services? If so, how?
- How should Customer Choice be reflected in renewable energy regulation, to assure that utilities are not treated inequitably or put at a competitive disadvantage?
- What emerging issues and potential benefits should be included in policies, to provide customer incentives and gain utility support for promoting customer participation?
- What linkages can be created to provide cross-program incentives (that is, between regulatory and non-regulatory approaches) to effectively increase renewable energy development in Michigan?

A vast majority of the Committee's time in 2004-2005 was spent in deliberations and discussions about net metering. The process typically included open group discussions followed by off-site meetings among utility representatives, led by MECA and MEGA. The purpose of off-site discussions was to try to reach consensus among participating utilities, prior to presenting proposals to the full Committee for consideration. MPSC Staff provided background materials regarding net metering provisions from other states and in draft Michigan legislation, and preliminary Staff recommendations for a net metering program. The Staff also presented

summary information on similar legislation and regulatory approaches from around the country.[72] Utility proposals were drafted using the information Staff provided as a starting point. Additional information was provided by some of the utilities to explain some of the more subtle differences and limitations in both the regulatory and practical implementation of various net metering approaches. This consensus development process may serve as a model to addressing other issues in the coming months.

7.2 Interconnection Standards Rulemaking

Interconnection Standards were an issue that needed to be addressed early by the committee since the several draft Michigan legislative proposals concerning Net Metering had included provisions requiring the development of statewide interconnection standards. The safety concerns of utility line workers were raised by a participant from the International Brotherhood of Electrical Workers (IBEW). Committee participants agreed that Interconnection Standards Rulemaking adopted by the Commission in August 2004 addresses the issues of technical and related safety standards for interconnections, and ought not to be duplicated by another set of standards to apply to net-metered systems.[73] It was further agreed that the Commission's newly established interconnection standards would be useful for determining eligible generator sizes for net metering applicability.

7.3 Net Metering

In its May 18, 2004 Order in Case No. U-12915, the Commission directed its Staff and the MREP Collaborative to try again to achieve consensus on the design of a net metering program for Michigan. The Commission stated:

> In addition to establishing a net metering subcommittee, the Commission finds that the Staff should work cooperatively with members of the subcommittee to develop a net metering program for the Commission's consideration in its next MREP report. Accordingly, the Commission directs the Staff to include in its evaluation of net metering a proposal for statewide implementation of net metering in Michigan. If consensus cannot be reached on a statewide net metering proposal on the part of MREP collaborative members, the Commission directs Staff to put forth a proposal of its design" (May 18, 2004 Order in Case No. U-12915, p. 5).

In response to that Order, the Staff established the MREP Regulatory and Net Metering Committee, and asked the Committee to try to reach a consensus on a net metering program for Michigan. Net Metering had been the topic of discussion and proposed legislation for several years in Michigan. Two bills in the Michigan House in 2003-2004 legislative session (HB4015 and HB4090) would have provided for a statewide net metering program for renewable energy systems and fuel cells on customers' sites, up to 100 kW. A bill introduced in the Michigan Senate (SB 0954) would have expanded net metering to include on-farm anaerobic digester

[72] The information presented by MPSC Staff to the Committee has been incorporated into the MPSC Staff Draft Evaluation Report on Net Metering; available on the MREP Website, http://www.mich.gov/mrep.
[73] Interconnection rules and standards and their administration were the subject of MPSC Cases Nos. U-12485, U-13745, U-14085, U-14089, and U-14091. See http://efile.mpsc.cis.state.mi.us/efile/.

systems, with no size limit. All three bills would have limited the program size to 0.5 percent of the in-state peak load for the previous year, for both utilities and AESs.

Through meetings held in July through October, 2004, the MPSC Staff and MPSC regulated utilities were able to agree on a consensus for a voluntary, statewide net metering program. That consensus was filed with the Commission in early December 2004, and was subsequently approved, with modification, in the Commission's March 29, 2005 Order in Case No. U-14346. [74] MPSC Staff then worked with the utilities to complete net metering tariffs, which have now been accepted. A Website with information about each utility net metering program is under development, at http://www.michigan.gov/netmetering.

7.4 Ratemaking & Net Metering Committee Recommendations, Goals, and Objectives for 2006

Work on development of a Net Metering program dominated the agenda of the Ratemaking & Net Metering Committee in 2004 and 2005, to the exclusion of other priorities. These recommendations and objectives remain to be addressed:

Recommendation 7.1 – Develop "De-Averaged Distribution System Credits" Pilot Program

Utilities should be encouraged to participate in the development of one or more pilot programs to provide financial incentives for renewable energy facilities to be installed and operated so that they help create and maintain utility distribution system benefits.

Recommendation 7.2 – Explore Policy Options for Self-Service Power

Ratemaking options should be explored for self-service power renewable energy systems, that are larger than the size limit for net metering (less than 30 kW).

Recommendation 7.3 – Explore Clean Energy Portfolio Options

Options should be explored with the intent of achieving consensus on a state renewable portfolio standard or other clean energy portfolio standard or other similar policy approach. All MREP committee participants should be invited to contribute towards trying to achieve consensus on an appropriate policy approach for Michigan.

Recommendation 7.4 – Explore Utility Incentives and Performance Standards

Options should be explored with the intent of achieving consensus on appropriate utility incentives and performance standards with respect to renewable energy production.

[74] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14346 and Press Release.

8 Data on Michigan Renewable Energy Production and Consumption

This section presents data on Michigan renewable energy production and consumption. The Commission has directed Staff and the MREP Collaborative to report annually on:

- The amount of power generated from renewable sources within Michigan;
- The percentage of power purchased by Michigan customers that is obtained from renewable energy sources;
- The number of customers producing power with their own renewable energy installations;
- Use of the MREP Website (reported in Section 1 of this report, on page 12);
- The number and aggregate capacity of renewable energy generators receiving third-party certification;
- Percentage and absolute change indicators of renewable energy penetration in Michigan; and,
- Other factors that will permit the Commission to monitor the progress on the statutory mandate to educate customers and promote the use of renewable energy.

The following tables provide these data.

Table 1: Capacity of Michigan Renewable Energy Generating Plants, by Technology (2002)

State = MICHIGAN			
	Technology	Number of Plants	Capacity (kW)
	Biomass	98	564,761
	Geothermal[1]	0	0
	Hydro	279	2,404,952
	Photovoltaic	17	122
	Solar Thermal	0	0
	Other	0	0
	Wind	7	2,457
Total(s) for State = MICHIGAN:		**401**	**2,972,292**

Sources: National Renewable Energy Laboratory, Renewable Electric Plant Information System (REPiS; http://www.nrel.gov/analysis/repis/online_access.asp) and, Electric Power Annual Database 1990-2003: Net Generation by State by Type of Producer by Energy Source (EIA-906; http://www.eia.doe.gov/cneaf/electricity/epa/generation_state.xls).

Notes: [1] "Geothermal" energy is defined in some federal legislation as having a heat source, in the ground, with a temperature of at least 122 degrees F. Under this definition, Michigan does not have any geothermal energy. Water source or earth coupled heat pumps, however, are often called "geothermal" and Michigan Public Act 141 of 2000 specifically includes geothermal energy as one type of renewable energy to be promoted through the MREP program.

Table 2: Percentage of Renewable Power Purchased by Michigan Customers

Company	Percentage of Renewable Sources, by Year				
	2000	2001	2002	2003	2004[1]
Alpena Power	11.2	13.0	13.3	11.4	12.5
American Electric Power (Indiana Michigan Power Co.)[2]	N/A	0.7	0.7	1.0	1.0
Cloverland Electric Co-op	49.7	45.5	45.3	43.0	46.3
Consumers Energy	3.8	4.8	4.6	4.5	5.0
Detroit Edison	N/A	1.4	1.4	1.2	1.1
Edison Sault	42	38.3	39.5	37.1	39.5
Upper Peninsula Power Co.[3]	12.0	12.0	17.0	12.0	11.0
We Energies	N/A	2.0	2.4	2.2	2.2
Wolverine Power Supply Co-op[4]	N/A	1.1	0.7	0.9	1.2
Wisconsin Public Service Corp.	2.1	2.2	2.6	2.8	2.9
Xcel Energy[5]	13.6	15.3	14.3	13.6	16.1
Regional Average[6]	N/A	1.4	1.4	1.4	1.0

Notes:

[1] In its May 18, 2004 Order in Cases Nos. U-12915 & U-13843, the Commission stated, "[T]he utilities' annual disclosure requirements should accurately reflect that green power customers are paying additional costs for renewable and environmentally-friendly energy and…utilities should not represent in future reports that they are providing these services to all rate classes." (Order, pp. 3-4). Data in Table 6, beginning with the 2004 reporting year, represents percentages of renewable sources for customers who are not participating in special voluntary green rate programs. Data on the green rate programs is presented elsewhere in this report.

[2] Includes hydroelectric and 0.1% or less from other renewable fuels. Data presented in MREP 2003 Report did not include hydroelectric.

[3] Upper Peninsula Power Co. renewable energy was significantly reduced in 2003 due to the failure of its hydroelectric facility near Marquette, which was damaged as a result of the failure of the dam at Silver Lake Basin in May 2003. On January 31, 2005, UPPCo announced its decision to restore Silver Lake as a reservoir for power generation, pending design approval from the Federal Energy Regulatory Commission. In November 2005, UPPCo reported that "new dam design requirements recommended by a panel of consultants could make restoring the Silver Lake Dam and refilling the reservoir economically unfeasible." UPPCo has delayed a decision until spring 2006, while design alternatives are further evaluated. See http://www.uppco.com/info/deadriver_results.asp.

[4] Wolverine Power Supply Cooperative is the sole supplier of electric generation service to four of Michigan's cooperative (member-owned) electric distribution companies: Cherryland Electric Cooperative, Great Lakes Energy, HomeWorks Tri-County Electric Cooperative, and Presque Isle Electric and Gas Co-op. Wolverine data for 2003 includes 0.51% and 2004 includes 0.66% of hydroelectricity. Previous years did not include hydroelectricity.

[5] Includes generation and purchases in Wisconsin. Data for Xcel reflects fiscal years, ending in October each year.

[6] The Regional Average Fuel Mix is calculated each year by MPSC Staff, as directed by the Commission in its orders in Case No. U-12487, dated June 5, 2001 and December 20, 2001. See http://www.dleg.state.mi.us/mpsc/electric/restruct/regional_disclosure/regional_notice.htm.

Table 3: Amount of Power Generated from Michigan Renewable Energy Sources

Company	Michigan Renewable Energy Generation (MWh)								
	Average Per Year 2001-2002			2003			2004[1]		
	Generation	Purchases	Total	Generation	Purchases	Total	Generation	Purchases	Total
Alpena Power	0	26,465	26,465	0	26,690	26,690	0	29,846	29,846
American Electric Power (Indiana Michigan Power Co.)	65,473	1,212	66,685	56,691	1,104	57,795	69,642	1,512	71,154
Cloverland Electric Co-op[2]	0	106,064	106,064	0	103,758	103,758	0	112,498	112,498
Consumers Energy[3]	319,488	1,511,467	1,830,955	386,312	1,353,319	1,739,631	445,077	1,512,941	1,958,018
Detroit Edison	75	792,802	792,877	62	685,963	686,025	62	585,927	585,989
Edison Sault	196,341	154,160	350,501	189,237	146,084	335,321	201,505	160,198	361,703
UPPCO	125,346	0	125,346	108,515	0	108,515	117,603	0	117,603
We Energies	388,765	0	388,765	383,700	239,811	623,511	373,195	244,938	618,133
Wolverine Power Supply Co-op[4]	0	18,589	18,589	0	25,337	25,337	0	40,131	40,131
Wisconsin Public Service Corp.[5]	37,488	0	37,488	34,736	0	34,736	32,660	0	32,660
Xcel Energy[6]	23,106	0	23,106	18,951	0	18,951	20,541	0	20,541
Statewide Total	1,156,082	2,504,695	3,660,777	1,178,204	2,478,308	3,656,512	1,260,285	2,575,493	3,835,778

Notes: [1] Data in Table 7, beginning with the 2004 reporting year, represents percentages of renewable sources for customers who are not participating in special voluntary green rate programs. Data on generation and purchases to serve the green rate programs is presented elsewhere in this report.

[2] Cloverland purchases its renewable energy from Edison Sault generation and purchases. Edison Sault data reported in this table does include the quantities sold to Cloverland. To avoid double-counting, Cloverland purchases are subtracted from the Statewide Total.

[3] Generation data includes hydroelectricity produced at Ludington pumped storage facility. Purchases data includes allocated share of spot purchases based on regional fuel mix.

[4] Wolverine Power Supply Co-op data for 2003 includes 13,649 MWh and 2004 includes 22,221 MWh of hydroelectricity. Data reported for previous years excluded hydroelectricity.

[5] Only 10,000 of approximately 400,000 WPSC customers are in Michigan. This generation data, however, includes the WPS system in Wisconsin.

[6] Xcel Energy operates hydroelectric facilities at Saxon Falls and Superior Falls, located on the Montreal River, which forms part of the state boundary between Michigan's Upper Peninsula and northern Wisconsin. The dams span the river, but the powerhouses are located in Michigan. These figures represent the total output of the Michigan generators. Electricity from these generators serves Xcel customers in three states, including Michigan.

8.1 Customers Producing Power with Their Own Renewable Energy Installations

The Commission requested data on the number of customers in Michigan who are producing power using their own, on-site renewable energy installations. Though Staff and MREP Collaborative participants are aware of some residential and small commercial wind and micro-hydroelectric installations in Michigan, since tax credits for such installations ended in the mid-1980's no reliable source of data about customer-owned systems has been available. What is available is partial data on installations of solar technologies, as reported in Table 4.

Table 4: Reported Michigan Solar Energy Technology Installations, 2001-2003

	2001		2002		2003		Total 2001-2003	
System Type	Number Sold	Total (ft^2 or watts)	Number Sold	Total (ft^2 or watts)	Number Sold	Total (ft^2 or watts)	Number Sold	Total (ft^2 or watts)
Solar (Air)	6	703 ft^2	1	450 ft^2	6	534 ft^2	13	1,687 ft^2
Solar (Liquid)	5	376 ft^2	0	0	5	488 ft^2	10	864 ft^2
Solar (Pool)	28	9,080 ft^2.	31	4,960 ft^2	2	360 ft^2	61	14,400 ft^2
Solar Electric (PV)	34	32,080 Watts	7	1,233 Watts	29	46,153 Watts	70	79,466 watts

Source: Great Lakes Renewable Energy Association (GLREA).

Notes: GLREA maintains an on-line registry for the identification of Michigan solar energy installations that meet the program criteria for inclusion in the US DOE's Million Solar Roofs program (http://www.millionsolarroofs.org/). GLREA also surveys Michigan renewable energy suppliers, asking them to identify the types, numbers, and sizes of renewable systems sold. Of 16 dealers and installers asked to participate, 7 (roughly 45%) completed the 2001 and 2002 surveys and 6 (37.5%) completed the 2003 survey.

Table 5: Michigan and U.S. Electric Generation by Fuel Type, 2003 and 2004

	Michigan		United States	
Fuel Type	2003	2004	2003	2004
Coal	62.6%		51.0%	
Nuclear	23.3%		20.1%	
Natural Gas	10.2%		17.2%	
Renewable Power[1]	2.5%		2.1%	
Petroleum	0.8%		2.8%	
Hydro	0.6%		6.8%	

Source: Data compiled from US DOE/Energy Information Adminsitration, *Electric Power Monthly*, September 2003, reporting data through June 2003, available at http://tonto.eia.doe.gov/ftproot/electricity/epm/02260309.pdf.

Notes: [1]The Energy Information Administration definition of Renewable Energy includes: wood, black liquor (from paper manufacturing), municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, biomass, geothermal, solar thermal, photovoltaic, and wind.

8.2 Michigan Utility Green Power Programs

Up to this point in time, the Commission has been working with the utilities on a voluntary approach to the expansion of renewable energy production and consumption in Michigan. There are 6 different Commission-approved utility "green pricing" or "green rate" tariffs, which allow customers to volunteer to pay a small price premium in order to receive greater percentages of their power from renewable resources. In addition, there are now three such programs offered by Michigan municipal electric utilities: Traverse City, Lansing, and Wyandotte.[75] The typical residential price premium has been on the order of $7.50 to $12.50 per month, with the added price of renewable energy ranging from about 2.0 to 3.0 cents per kilowatt hour. Price premiums in the new Consumers Energy and Detroit Edison programs are expected to be lower, in the range of 1.6 to 2.0 cents/kWh.

In a 2005 Consumers Energy order, the Commission stated:

> The Commission further notes evidence presented by the Staff and corroborated by Consumers' own research as reported in the company's October 25 comments, which indicates that utility green pricing programs in other states have achieved penetration rates averaging slightly more than 1% of all residential customers, and programs in operation for three or more years average 2%. The Commission finds that these penetration levels for customer participation can be used as a benchmark by Consumers, at least for the time being. (Jan. 25, 2005 Order in U-13843, p. 20).

[75] In Michigan, municipal electric utilities are not regulated by the Public Service Commission.

In the Detroit Edison Rate Case, the Commission stated:

> …Detroit Edison should implement a [renewable energy program], which should be available to all customers throughout Detroit Edison's service territory on a voluntary basis. That program should be able to accommodate approximately 1% of the company's residential sales prior to the end of calendar year 2006… . The company should target expansion of the program to be able to accommodate approximately 2%-3% of the company's residential sales prior to the end of calendar year 2008. Such is not an unreasonable goal for this program, and with the company's promotional assistance, it may prove to be at the low end of actual customer involvement. The REP must be open to all of Detroit Edison's customers. (Nov 23, 2004 Order in U-13808, p. 125).

Thus, the currently established "goal" for Michigan's two largest utilities' renewable energy green pricing programs is to achieve the equivalent level of about 1% of residential sales by the end of the first year and 2 percent by the end of the 3rd program year. That does not mean that green rate sales will be only to residential customers, but simply sets a reasonable estimate for the total penetration of program sales, based on evidence from similar programs operated by a few hundred utilities around the country. Detroit Edison has voluntarily set its own goal at the level of increasing renewable energy sales by 1% of the Company's total electricity sales each year (not only residential sales, but sales to all customer classes), from 2006-2010, so that the Company hopes to reach the level of 5% of total sales by the end of 2010.

The following sections provide brief reports on each of the green pricing programs and green rates presently being offered by Michigan electric utility companies. Data on numbers of participating customers by the end of 2004 is included in this report. Beginning with 2006, a separate MREP report on utility green power programs will be published once year-end data for the previous calendar year becomes available.

8.2.1 Cloverland Electric Cooperative

Cloverland's renewable energy program parallels Edison Sault's program in its entirety. As of November 2004, there were 17 Cloverland customers participating in the program.[76]

8.2.2 Consumers Energy Company

Consumers Energy Green Power Pilot Program. Data on Consumers Energy's Green Power Pilot Program (GPPP) is presented in Tables 6 and 7 (p. 55). Of the renewable energy purchased by Consumers' customers in 2004, nearly 70 percent went to serve residential customers. A bit more than 20 percent was purchased by industrial customers and the remainder, just under 10 percent, went to commercial customers.

Consumers' GPPP was originally slated to expire at the end of December 2004. Customers who had subscribed by then would be able to maintain their subscriptions for as long as they wanted, up to 17 years. In Case No. U-13843, Consumers submitted to the Commission a transition

[76] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=13949.

plan, which allows customers who participate in the GPPP program to continue purchasing renewable energy under a voluntary basis until a new program becomes available.[77]

Table 6: Consumers Energy Green Power Pilot Program
Purchases by Participating Customers and Supplier Deliveries, 2001-2004

Year	Annual Customer Purchases (kWh)	Supplier Deliveries (kWh)
2001	0	263,015
2002	3,298,687	2,583,892
2003	2,379,095	2,661,962
2004[1]	1,889,479	1,467,803
Totals	7,567,261	6,976,672
Note: [1]2004 data reported for 10 months, through October 2004.		

Table 7: Consumers Energy Green Power Pilot Program
Enrollments by Option as of November 1, 2004

	Consumers Energy Green Power Enrollment Option Selected (% of customer total usage, or purchase of designated block)				
Customer Type	**10%**	**50%**	**100%**	**Block**	**Total**
Residential	113	160	150	0	423
Commercial	13	5	0	1	19
Industrial	1	0	0	2	3
Total	127	165	150	3	445

Consumers Energy Green Generation[SM] Renewable Resource Program (RRP). On May 18, 2004, the Commission issued an order in Case No. U-13843,[78] directing Consumers Energy to implement a new renewable resource program and authorizing Consumers to collect a five-cent per meter per month, non-bypassable charge to create a renewable energy resource fund.[79] In response to this order, Consumers filed applications proposing a new renewable energy program as well as a transition plan to address customers and suppliers participating in the existing Green Power Pilot Program. Consumers set forth a set of principles to guide the development and implementation of a new program, which included the objective of developing a renewables industry in Michigan. In order to advance the program, Consumers sought to

[77] Documents in Case No. U-13843 are electronically filed on the Commission's Website, at http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=13843. Consumers' transition plans are described in documents 0171 and 0178.
[78] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=13843.
[79] This order was appealed by the Attorney General, in Michigan Court of Appeals Docket 256180. In a November 22, 2005 unpublished decision and opinion, the Court reversed the "portion of the PSC's May 18, 2004 order authorizing [Consumers Energy Company] to impose a $0.05 per meter per month charge on all customers to finance green power projects…on the ground that the PSC lacked the statutory authority to approve such a surcharge." (p. 8).

ensure the Company shareholders would not absorb the above-market costs associated with securing energy from renewable sources, which could place the Company at a disadvantage in competition with alternate energy suppliers.

The Company proposed using a competitive bid to identify renewable energy supplies and then award contracts as quickly as possible, up to the maximum amount of renewable energy that could be fully compensated from the renewable energy resource fund. Sources of energy to be considered for the new program would include all renewable sources as defined in PA 141, including wind, solar, geothermal, biomass, including waste-to-energy and landfill gas, or hydroelectric. The renewable energy secured through the competitive bidding process would be offered to customers through green-pricing options, in which customers voluntarily subscribe to blocks of energy and pay a premium on their monthly electric bill to help cover the above-market costs. Consumers Energy also proposed to expand the amount of renewable energy procured if the program becomes fully subscribed by voluntary participants or if any additional funding becomes available.

Additional funding for Consumer's Renewable Resources Program was made available with the approval of the Company's Resource Conservation Plan (RCP). The Commission approved the RCP in its January 24, 2005 Order in Case No. U-14031, which provided up to $5 million annually for the Company's Renewable Resources Fund.[80,81] With the additional funding, Consumers issued a request for proposals (RFP) seeking up to 265,000 MWh per year of new, Michigan-based renewable energy supply.

Consumers Energy filed its application for its new renewable resource program tariff in MPSC Case No. U-14471, and on April 28, 2005, the Commission approved it.[82] Consumers Energy began offering its customers new renewable energy service choices by October 1, 2005, and in its October 18, 2005 Order in Case No. U-14626, the Commission approved seven new power purchase agreements and one renegotiated agreement for Consumers Energy's renewable energy projects in Michigan.[83]

Preliminary information about subscriptions is promising. A large percentage of Green Power Pilot Program customers have elected to subscribe under the new Green Generation[SM] program, and the total number of subscribers has already doubled the number previously participating in the GPPP.

8.2.3 Detroit Edison Company

SolarCurrents® Program – As reported in 2003, Detroit Edison's solar electric green-pricing program, SolarCurrents®, ended on December 31, 2003. Both solar generating facilities continued to produce power and deliver it to the grid in 2004. The 28.4 kW SolarCurrents 1 facility, installed in 1996 and consisting of 6 fixed arrays, generated 34.5 MWh in 2003. The 2003 production from the 26.4kW SolarCurrents 2 facility, installed in 1997, totaled 39.9 MWh; with 19.4 MWh from the 13.2 kW tracking array and 20.5 MWh from the 13.2 kW fixed array.

---

[80] Case No. U-14031 Consumers Energy Company (resource conservation plan) 1/25/2005. See http://www.dleg.state.mi.us/mpsc/orders/electric/2005/u-14031_01-25-2005.pdf and Press Release.

[81] This order has been appealed by the Attorney General, in Michigan Court of Appeals Docket 261027. The Attorney General claims the Commission does not have legal authority to establish a renewable energy charge. See http://courtofappeals.mijud.net/resources/asp/viewdocket.asp?casenumber=261027.

[82] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14471.

[83] See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14626 and Press Release.

The company had originally planned to dismantle the Scio Township facility, SolarCurrents 1, and donate the 28.4 kW of solar-PV modules to schools participating in the SolarSchools® Program, which Detroit Edison franchised to the Great Lakes Renewable Energy Association. However, none of the 50 participating schools were thus far able to obtain the funding required to install the modules, so the array was left intact and generating, except for limitations due to the failure of some inverters, which have not been repaired due to their planned decommissioning. The Commission's May 18, 2004 Order in Case No. U-12915 directed Detroit Edison to issue a Request for Proposals for marketing a new Green Pricing initiative. The Company decided to retain the Scio Township array intact in anticipation of possibly including it as a renewable energy generator in a new retail renewable energy offering.

DTE Energy Hydrogen Demonstration Center[84] – The SolarCurrents 2 facility in Southfield was selected in 2003 to be the site of the DTE Energy Hydrogen Demonstration Center. The solar panels now supply renewable energy for the production of hydrogen. The Hydrogen Demonstration Center is the first totally integrated facility in the US that uses renewable energy to produce hydrogen from the electrolysis of water. The hydrogen is stored and delivered on-site to electric generators (currently fuel cells, with plans to incorporate other new hydrogen-based electric generation technologies in the future) and to a fueling station for hydrogen-powered vehicles. DTE Energy designed, constructed, owns and operates the facility, including the solar arrays, the landfill gas facility (a project of DTE Biomass Energy) which is the other supplier of renewable energy for this project, the hydrogen production and storage facilities, the electric generators (hydrogen fuel cells from PlugPower, a DTE company), and the hydrogen vehicle fueling station. BP (British Petroleum) has partnered in the project, providing funding for its operations and maintenance costs. DaimlerChrysler is providing hydrogen-powered vehicles that will be fueling at the facility. The US DOE provided half of the $3 million cost of the facility under a grant administered by the Michigan Energy Office. The electric production of the DTE Energy Hydrogen Demonstration Center may be a source of renewable energy for any future retail renewable energy program the Company may choose to offer.

SolarSchools® Program – The SolarSchools® program was franchised to the Great Lakes Renewable Energy Association (GLREA) in 2002 for a period of 3 years. GLREA obtained a $100,000 grant from the US DOE, plus matching funding from Detroit Edison and a $10,400 grant from General Motors (GM), to deliver the SolarSchools® program to 50 schools throughout Michigan for one year. Additional funding was received from GM and the DTE Energy Foundation to continue the program to several of the schools for an additional year. However, insufficient funding was available to continue the program with all 50 of the original participating schools. Detroit Edison offered to extend the franchise for another 3 years when it expired in May 2005, and is presently awaiting a response from the GLREA board of directors.

Green-Pricing Request for Proposals – In its May 18, 2004 Order in Case No. U-12915, the Commission directed Detroit Edison to issue a request for proposals (RFP) for a new renewable energy program by no later than August 16, 2004. In accordance with that order, the Company issued an RFP for a third party marketer to develop, implement and manage a renewable energy Green Pricing program for Detroit Edison's retail electric customers. In the RFP, the Company proposed a goal of providing electricity produced by renewable resources to 1 percent

[84] DTE Energy is the parent company of The Detroit Edison Company, which is an MPSC-regulated public utility. DTE Energy is a holding company, whose subsidiaries include several unregulated energy companies. The DTE Energy Hydrogen Demonstration Center is a project of some of DTE Energy's unregulated subsidiaries.

of its retail sales by the end of the first year of the program (2006), and increasing by 1 percent per year to attain 5 percent of retail sales (2.25 million MWh/year) by the end of the 5th year of the program (2010). Bidders were asked to provide full-service proposals, including financing the acquisition of renewable energy (or renewable energy certificates, called RECs) for the program, developing and cooperating with program marketing, implementing the program, and operating it for a period of 5 years. Detroit Edison stated in the RFP that its allowable payment for the energy value of the renewable energy would be limited to approximately 1.54 cents/kWh, based on the funding mechanism and cost recovery approach approved by the Commission for a similar program for Consumers Energy.[85]

The program design outlined in the Detroit Edison proposal is one in which the third-party marketer takes responsibility for the design and implementation of the green-pricing program, including the acquisition of RECs, pricing the retail offerings to customers, and marketing. In return, the third-party marketer will receive the green-price premiums customers pay.

Detroit Edison understands there is a desire to provide Michigan-produced renewable energy. In expectation that competition will spur development of competitively priced renewable energy supplies in Michigan, the Company asked bidders to include two renewable energy offerings: (1) Michigan-Made (sourced only within Michigan), and (2) Great Lakes Renewables (from Michigan, Minnesota, Wisconsin, Illinois, Indiana, Ohio, Pennsylvania, New York, Ontario and Quebec). It is hoped that having multiple offerings will provide Detroit Edison customers with meaningful choices of rates and encourage Michigan renewable energy producers to offer the most competitive prices.

Ten companies expressed an interest in the RFP and indicated an intention to bid. Of those, seven submitted proposals, including several creative approaches. Detroit Edison selected three bidders as semi-finalists, and is continuing discussions with them: 3 Phases Energy Services, Green Mountain Energy Company, and Sterling Planet. Under direction from the Commission in its November 23, 2004 Order in Case No. U-13808 (Detroit Edison Rate Case), Detroit Edison filed its proposal for a Renewable Energy Program on July 1, 2005.

Detroit Edison's proposal includes hiring a third-party program manager and marketer to run its program. That third party would shoulder the risk of lower than expected customer subscriptions in the program, but at the same time the third party stands to profit if the program is successful and sales increase. Detroit Edison's contractor would be expected to purchase renewable energy certificates from any eligible, independently certified renewable energy producers, including those outside of Michigan. Detroit Edison is of the opinion that expanding the potential market will serve to keep the incremental price of renewable energy as low as possible. Detroit Edison's contractor would be expected to encourage and support in-state project development to the extent possible, given the level of customer participation and prices offered by in-state developers. In a September 20, 2005 Order in Case No. U-14569, the Commission solicited public comments before considering the application.[86] Detroit Edison expects to be ready to offer new renewable energy purchase options to its customers within 120 days after Commission approval.

[85] The Commission's November 23, 2004 Order in Case No. U-13808 (pp. 120-127) authorized a 5¢ per meter per month charge for Detroit Edison customers, and the Commission indicated that accounting and cost recovery mechanisms Edison uses for its Renewable Energy Program need not be the same as the approach used by Consumers Energy.

[86] Public Comments were due October 14, 2005. The Commission has not yet issued any further determination in this case. See http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=14569.

8.3 Edison Sault Electric Company and We Energies

Edison Sault has an experimental renewable energy rider approved by the MPSC (see Edison Sault's tariff sheet 11.01). Renewable energy rates for Edison Sault (like Cloverland Electric Cooperative) are unique, because hydroelectric generation already represents approximately 40 percent of those companies' total supplies. Edison Sault customers who want to have an even greater portion of their power served from renewable sources can elect to receive either 60, 80, or 100 percent renewable energy. The increased charge is 2.04 ¢/kWh, for the customer's increased portion above the 40 percent hydroelectric base. Edison Sault purchases its renewable energy from its affiliated company, We Energies.

Edison Sault's participation rate is fairly low as ESE currently has 38 customers (about 0.2%) on the experimental tariff. The Company attributes the modest customer response to high satisfaction with its large hydroelectric power base and standard rates that are among the lowest in the State.

We Energies' Energy for Tomorrow® renewable energy program has become one of the largest and most successful utility green pricing programs in the country, as ranked by the US DOE's National Renewable Energy Laboratory.[87] We Energies has nearly 11,000 customers in Wisconsin and the Upper Peninsula of Michigan enrolled in Energy for Tomorrow®. Currently, over 360 customers are participating in Michigan's Upper Peninsula; an increase of over 1,300% from 2003. In fact, about 1.5 percent of We Energies' U.P. customers have subscribed to the Energy for Tomorrow® program, as compared to just over 1 percent of the Company's Wisconsin customers.

Energy for Tomorrow® customers pay a premium of 2.04 ¢/kWh for 100% renewable electricity, 1.02 ¢/kWh for 50%, and 0.51 ¢/kWh for 25%. Business customers can also purchase renewable electricity in blocks of 100 kWh, for 2.04 ¢/kWh. More information is available at www.we-energyfortomorrow.com.

8.2.5 Lansing Board of Water & Light

The Lansing Board of Water & Light (BWL) launched a renewable energy program in July 2001. Marketed under the name GreenWise Electric Power®, the portfolio is ½ MW from two small hydroelectric plants owned by Tower Kleber in Cheboygan County and ½ MW from landfill gas provided by Granger Electric in Lansing. Both power providers were required to be certified by the Michigan Independent Power Producers Association, based on criteria developed by a panel of ten state and local environmental organizations. The certification process included an audit of each facility based on PURPA's definition of "Small Power Production Facility," review of emissions and the satisfactory resolution of any prior environmental violations, and verification of the renewable fuel type and amount of power available.

The GreenWise® program offers customers 250-kWh blocks for $7.50 per month (3¢/kWh). A total of 2742 "blocks" of energy are available through the program (a total of one megawatt). Sales fluctuate between 650-740 blocks, or approximately 24-27% of the renewable energy purchased. Residential customer participation has been greater (84% of participating customers) compared to the commercial sector (16%).

[87] See the U.S. Department of Energy Green Pricing Web pages, at http://www.eere.energy.gov/greenpower/markets/pricing.shtml?page=0.

8.2.6 Traverse City Light & Power

In 1996, Traverse City Light & Power (TCL&P) became the first Michigan municipal electric utility, and one of the first in the US, to install a utility-scale wind turbine. At the time of construction, the 660 kW wind turbine was the largest in the country. It produces about 800,000 kW-hours of electricity a year, which meets the needs of the 125 residential and business customers on TCL&P's green rate. Electricity costs about 5.5 cents per kW-hour in a moderate wind regime of about 14.5 mph annual average winds at hub height. With the federal production incentive of 1.5 cents per kW-hour and the customer premium of 1.58 cents per kW-hour, this makes the wholesale cost of electricity from the wind turbine practically the same as the other power purchased by the utility. The typical TCL&P green tariff customer pays a monthly premium of approximately $7.85. Several TCL&P customers are on a waiting list to join the green rate, if current subscribers leave the program. TCL&P reports that few customers have left the program, except for those who have moved away from the TCL&P service territory. See: www.tclp.org/docs/wind_brochure.pdf.

Table 8: TCL&P Wind Generator Production, 2000-2004

Year	Net kWh Generated	Percent of TCL&P Annual Total Generation & Power Purchases
2000	754,452	0.27%
2001	857,792	0.24%
2002	895,800	0.30%
2003	760,669	0.23%
2004[1]	634,781	0.25% (estimated)
Note: [1] 2004 data reported for 11 months, through November 2004.		

8.2.7 Upper Peninsula Power Company and Wisconsin Public Service Corporation

Upper Peninsula Power Company (UPPCo) and Wisconsin Public Service Corporation (WPSC) both have voluntary renewable energy programs called *NatureWise*.

The UPPCo program became available following the Commission's December 20, 2002 Order in Case No. U-13497. Only 38 customers were participating by the end of 2004. Each 100 kWh block costs a premium of $4.00 (4¢/kWh) above the normal cost of electric service from UPPCO. Customers can purchase as many blocks as they choose and can discontinue at any time. The renewable power comes from wind turbines located in eastern Wisconsin, and power purchased from a Wisconsin farmer who generates electricity from on-site manure, using an anaerobic digester. See www.uppco.com/rates/naturewise_home.asp.

WPSC has 5 *NatureWise* customers in Michigan. Though WPSC has offered net metering to its customers in Michigan for many years, the Company had no net metering customers in Michigan at the end of 2004.

8.2.8 Wyandotte Municipal Services

Wyandotte Municipal Services electric utility announced a partnership with American Municipal Power-Ohio (AMP-Ohio) and Green Mountain Energy Company (www.greenmountain.com) for a new "green pricing" program. Green Mountain Energy provides a 100% renewable product option, consisting of wind, landfill gas, and hydroelectric power. Wyandotte's program is part of an ongoing effort among Green Mountain, AMP-Ohio, and Hometown Connections, a subsidiary of the American Public Power Association (APPA). Hometown Connections partnered with Green Mountain Energy to develop customized green pricing programs for utilities owned by local, regional and state governments to offer the Nature's Energy® brand of renewable electricity to their customers. (See press release.)

Starting in November 2004, Wyandotte's 12,800 electric customers can enroll in the Nature's Energy® program. The price premium is 1.5 ¢/kWh, or approximately $8-$10 per month for the average residential customer. Commercial customers can also participate by purchasing 1-MWh blocks for $15 each. A portion of the power for the program comes from the AMP-Ohio/Green Mountain Energy wind farm located near Bowling Green, Ohio. AMP-Ohio recently announced that two new 1.8-MW wind turbines would be added to the site this year, which will bring the total project capacity to 7.2 MW. Wyandotte estimates that participating customers purchasing 750 kilowatt-hours a month will avoid the release of an estimated 4.5 tons of CO2 per year, equivalent to not driving a car nearly 10,000 miles. Green Mountain Energy has also agreed to pay for a 1-kW solar unit and install it at a participating AMP-Ohio member community facility once 1,000 consumers subscribe to the program.

Wyandotte Municipal Services will retain 0.2¢/kWh ($2/MWh) of the price premium. Those funds will be used for renewable energy installations in Wyandotte or the purchase of additional energy from sustainable resources. The first proposed project is a 1-kW solar-PV system at one of Wyandotte's public schools, with computer capability for student monitoring of the solar panel's output as well as links via the Internet to other solar schools across the country for comparison and study.

Green Mountain Energy will be responsible for the energy supply and program management. Additionally, Green Mountain Energy and AMP-Ohio are also providing consumer marketing materials, a Web-based enrollment system (www.wyan.org), and staff training to help Wyandotte develop an efficient and cost-effective program. For more information, see the US DOE GreenPower Markets Web page about Green Mountain Energy.

8.4 Recommendations regarding MREP Data Collection and Reporting

Recommendation 8.1 – Report data annually.

MREP Staff and utilities should coordinate data collection and reporting on an annual basis, to best match the availability of utility year-end reports.

Net Metering program data will be available annually based on reports from Michigan utilities that will be submitted to Commission Staff by September 30 each year, reporting on the most recent 12 months ending June 30. That data can be reported as soon as possible after receipt from the utilities and collation by MREP Staff.

Annual utility production and consumption data is generally available to Commission Staff by May each year. MREP Staff propose to gather such data from the utilities, collate it, and report it, as soon as possible after its receipt.

Recommendation 8.2 – Post MREP Data on MREP Website.

All MREP data will be posted on the MREP Website, and will be updated annually. A separate annual data report will be provided to the Commission and interested parties annually, as soon as all of the data can be updated.

Appendix A – Bibliography

Barrett, James, Hoerner, J. Andrew, Mutl, Jan, Bailie, Alison, and Dougherty, Bill. (2005). *Jobs and the Climate Stewardship Act: How Curbing Global Warming Can Increase Employment*. New York: Natural Resources Defense Council; http://www.nrdc.org/globalWarming/csa/CSAjobs.pdf.

Brown, Lester R. (2001). *Eco-economy: Building an Economy for the Earth*. New York: Norton. See especially Chapter 5: Building the solar/hydrogen economy and Chapter 11: Tools for restructuring the economy. http://www.earth-policy.org/Books/Eco/

Cowart, Richard. (2001, June). *Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets.* Gardiner, ME: Regulatory Assistance Project; http://www.raponline.org/Pubs/General/EffReli.pdf.

Elliott, R. Neal, Anna Monis Shipley, Steven Nadel, and Elizabeth Brown. (2003, December). *Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies*. Washington, DC: American Council for an Energy Efficient Economy; http://www.aceee.org/energy/efnatgas-study.htm.

Energy Information Administration, U.S. Department of Energy. (2005, August). *Renewable Energy Trends 2004*; http://www.eia.doe.gov/cneaf/solar.renewables/page/trends/rentrends04.html.

Geller, Howard. (2003). *Energy Revolution: Policies for a Sustainable Future.* Washington, DC: Island Press; http://www.islandpress.org/books/detail.html/SKU/1-55963-964-4.

Green Pricing and Net Metering Programs 2003.
http://www.eia.doe.gov/cneaf/solar.renewables/page/greenprice/grnprcreport.pdf.

Gunther, Marc. (2005, January). "Taking On The Energy Crunch," *Fortune*;
http://www.fortune.com/fortune/technology/articles/0,15114,1020322,00.html.

Henderson, Hazel. (1988). *The Politics of the Solar Age: Alternatives to Economics.* Indianapolis, IN: Knowledge Systems, Inc; http://www.hazelhenderson.com/ordering/bookSolarAge.html

Kats, Greg, Leon Alevantis, Adam Berman, Evan Mills, and Jeff Perlman. (2003, October). *The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force.* Washington, DC: Capital E; http://www.cap-e.com/ewebeditpro/items/O59F3259.pdf

Kushler, Martin, Dan York, and Patty Witte. (2004, April). *Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies.* Washington, DC: American Council for an Energy Efficient Economy; http://www.aceee.org/pubs/u041.pdf.

Lawrence Berkeley National Laboratory. Electricity Markets and Policy, Renewable Energy Analysis and Assistance. *Renewable Energy Publications*. See http://eetd.lbl.gov/ea/EMP/re-pubs.html. See in particular:

Case Studies of State Support for Renewable Energy
This case study series by Berkeley Lab and the Clean Energy Group analyzes the innovative practices of state clean energy funds in support of renewable energy.

Easing the Natural Gas Crisis: Reducing Natural Gas Prices Through Increased Deployment of Renewable Energy and Energy Efficiency
Wiser, R., M. Bolinger, M. St. Clair. LBNL-56756. January 2005.

Evaluating Experience with Renewables Portfolio Standards in the United States
Wiser, R., K. Porter and R. Grace. LBNL-54439. March 2004

Evaluating State Markets for Residential Wind Systems: Results from an Economic and Policy Analysis Tool
Edwards, J., R. Wiser and M. Bolinger. LBNL-56344. December 2004

Policies and Market Factors Driving Wind Power Development in the United States
Bird, L., and B. Parsons, NREL, T. Gagliano and M. Brown, National Conference of State Legislatures, and R. Wiser and M. Bolinger, LBNL-53554. July 2003

Lovins, Amory B., et al. (2002). *Small is Profitable*. Old Snowmass, CO: Rocky Mountain Institute; http://www.smallisprofitable.org.

Lovins, Amory B., et al. (2004). *Winning the Oil Endgame*. Old Snowmass, CO: Rocky Mountain Institute; http://www.oilendgame.org.

Osborne, David and Hutchinson, Peter. (2004). *The Price of Government: Getting the Results We Need in an Age of Permanent Fiscal Crisis.* New York: Basic; http://www.perseusbooksgroup.com/basic/book_detail.jsp?isbn=0465053637

Prindle, Dietsch, Elliott, Kushler, Langer & Nadel. (2003, November). *Energy Efficiency's Next Generation: Innovation at the State Level.* Washington, DC: American Council for an Energy Efficient Economy; http://aceee.org/pubs/e031full.pdf.

Rischard, J.F. (2002). *High Noon: Twenty Global Problems, Twenty Years to Solve Them*. New York, Basic Books.

Rocky Mountain Institute. (2003). *The New Business Climate: A Guide to Lower Carbon Emissions and Better Business Performance*. Old Snowmass, CO: Rocky Mountain Institute; www.rmi.org/store/p12details2421.php.

Sawin, Janet. (2004). "Making Better Energy Choices," in *State of the World 2004*, Chapter 2 (pp. 24-43). Washington, DC: Worldwatch Institute; http://www.worldwatch.org.

Sawin, Janet. (2004). *Mainstreaming Renewable Energy in the 21st Century*. Washington, DC: Worldwatch Institute, Worldwatch Paper 169; http://www.worldwatch.org.

Sawin, Janet. (2003). "Charting A New Energy Future," in *State of the World 2003*, Chapter 5 (pp. 85-109). Washington, DC: Worldwatch Institute; http://www.worldwatch.org.

Scheer, Hermann. (2002). *The Solar Economy: Renewable Energy for a Sustainable Global Future*. London: Earthscan; http://shop.earthscan.co.uk/ProductDetails/mcs/productID/399/.

Schwartz, Peter, and Doug Randall. (2003, October) *An Abrupt Climate Change Scenario and Its Implications for United States National Security*. Emeryville, CA: Global Business Network; http://www.gbn.com/ArticleDisplayServlet.srv?aid=26231.

Speth, J. G. (2004). *Red Sky at Morning: America and the Crisis of the Global Environment*. New Haven, Yale University Press.