MICHIGAN'S

21ST CENTURY ELECTRIC ENERGY PLAN

SUBMITTED TO

HONORABLE JENNIFER M. GRANHOLM

GOVERNOR OF MICHIGAN

BY

J. PETER LARK

CHAIRMAN, MICHIGAN PUBLIC SERVICE COMMISSION

JANUARY 2007

Jennifer M. Granholm
GOVERNOR

STATE OF MICHIGAN
PUBLIC SERVICE COMMISSION
DEPARTMENT OF LABOR & ECONOMIC GROWTH
ROBERT W. SWANSON
DIRECTOR

J. Peter Lark
CHAIRMAN

Laura Chappelle
COMMISSIONER

Monica Martinez
COMMISSIONER

January 31, 2007

The Honorable Jennifer M. Granholm
Governor of Michigan
P.O. Box 30013
Lansing, MI 48909

Dear Governor Granholm:

Attached please find Michigan's 21st Century Electric Energy Plan. I hereby submit the plan to you pursuant to Executive Directive No. 2006-02.

Very truly yours,

J. Peter Lark, Chairman
Michigan Public Service Commission

Acknowledgements

Electricity provided the power by which Henry Ford and other manufacturing pioneers transitioned Michigan's 19th Century agricultural economy into a 20th Century industrial leader. In the 21st Century it will continue to play a vital role in the transition of Michigan's economy into the digital age. Regulators and energy providers must ensure that the electric supply necessary to power Michigan through the next two decades is readily available, providing safe, reliable, affordable, and efficient power. To meet that goal, on April 6, 2006 Governor Jennifer M. Granholm signed Executive Directive No. 2006-02, directing the Chairman of the Michigan Public Service Commission to prepare a 21st Century Electric Energy Plan – a comprehensive energy plan to address the short and long term electric needs of the citizens of Michigan. As Executive Directive No. 2006-02 states, a reliable, safe, clean, and affordable supply of energy is critical to the public good.

It was important that construction of the Plan be a transparent and all-inclusive process. I actively sought input and welcomed participation from all individuals and organizations interested in Michigan's electric industry and energy future. Representatives from customer groups, business groups, jurisdictional[1] and non-jurisdictional utilities, independent transmission companies, environmental groups, energy efficiency advocates, independent power developers, and alternative and renewable energy providers were active in the planning stages.

The timeline for producing the Plan has been aggressive, and I am indebted to the Commission Staff for its thorough and rapid work. The first planning meeting was convened on April 24, 2006 and attended by over 160 industry stakeholders. Nearly 200 additional participants were added over the course of the following six-month planning process, ultimately representing over 150 organizations. Interested persons from this group were divided into four Workgroups – the Capacity Need Forum Update Workgroup (chaired by Paul Proudfoot, Manager of the Commission's Safety and Reliability Section), the Energy Efficiency Workgroup (chaired by Robert Ozar, Commission Engineer in the Regulated Energy Division), the Renewable Energy Workgroup (chaired by Tom Stanton, Coordinator of the Commission's Renewable Energy Program), and the Alternative Technologies Workgroup (chaired by Steve Kulesia, representing the Department of Environmental Quality) – which were further subdivided into Teams. Workgroups and Teams began meeting in earnest in early May and continued throughout the summer. In all, over 35 Workgroup/Team meetings and five large group meetings were held, and approximately 4,000 pages of documents were filed with, or prepared by, the Commission Staff.[2]

[1] The Commission's jurisdiction extends to investor owned electric utilities and cooperatively owned electric distribution companies in Michigan. The Commission's jurisdiction does not extend to municipal utilities.

[2] The website at < http://www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/index.htm> was used to post relevant information. Workgroup reports, membership lists, presentation handouts, participants' comments, and other draft documents, can be found on the website. The final Workgroup reports can also be found in Appendix Volume II. A complete list of participants can be found in Appendix Volume I, Section 6.

During June and July, strawman proposals for building new traditional and renewable generation, and for undertaking energy efficiency programming, were submitted by participants and several opportunities for comment were provided. The Staff also issued invitations to all participants for one-on-one colloquies to discuss policy issues. Over 35 individuals accepted and met with the Staff during September, October and November. The Workgroup Chairs drafted the final Workgroup reports, which were then submitted to me. These appear in the Appendices.

Despite the exceedingly short timeframe, the Plan is comprehensive in its scope and inclusive in its development. I would like to thank the following individuals for their highly instructive presentations: Vinson Hellwig, Michigan Department of Environmental Quality; Aldo Colandrea, DTE Energy; Lincoln Warriner, Consumers Energy; Dale Heydlauff, American Electric Power; Jacob Williams, Peabody Coal; Jeff Anthony, We Energies; Gale Horst, Whirlpool Corp.; Janet Brandt, Wisconsin Energy Conservation Corporation; and John Sarver, State Energy Office. I would like to extend my special thanks to George Stojic, and to Pat Poli, Paul Proudfoot, Tom Stanton, Rob Ozar, Steve Kulesia, Steve Paytash, Lisa Babcock, Julie Baldwin, Brian Mills, Jack Mason, Cathy Cole, Stacy Stiffler, Sheila Aleshire, Lisa Gold, and last, but certainly not least, Lois Gruesbeck, for their indispensable assistance in preparing the Plan.

J. Peter Lark, Chairman
Michigan Public Service Commission
January 31, 2007
Lansing, Michigan

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Copies of the 21st Century Electric Energy Plan, and Appendices I and II are available on the Michigan Public Service Commission's website at: http://www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/index.htm.

EXECUTIVE SUMMARY

This Plan provides the backbone for a growing 21st century Michigan economy by enhancing the state's ability to power itself through the use of renewable resources, energy efficiency measures, and the cleanest available utility-built generation. This is Michigan's first electric energy plan in 20 years, and it is sorely needed. During those 20 years the production and delivery of electric power was transformed by the introduction of regional wholesale markets and competition. Without a comprehensive electric supply plan, Michigan is left to the vagaries of the Midwest Independent Transmission System Operator (MISO)[3] energy market. Current trends with respect to wholesale market prices and transmission congestion suggest that future electric energy in the markets operated by MISO will be costly and volatile.[4]

The Plan looks at Michigan's electric needs for the next two to 20 years. Extensive modeling was done to enhance our understanding of Michigan's energy needs and to verify policy initiatives. As the Governor aptly stated, energy is critical to the public good, and enhancement of the public good is the underlying principle of the Plan. The Plan advances the goals of supporting economic development, improving environmental quality and promoting resource diversity, while ensuring reliable electric power.

This Plan will grow Michigan's 21st century economy by making investment in baseload generation possible, by fostering investment in energy efficiency programming and renewable energy, and by adopting procedures to enable the use of emerging technologies. Each of these areas will see job growth in the areas of design, construction, operation and maintenance, as the fundamentals of the Plan are put into place. The Plan strengthens the state's economy by

[3] MISO is the independent transmission organization serving Michigan. MISO operates the transmission systems of member companies in 15 states and the province of Manitoba, consisting of 100,000 miles of high voltage transmission lines. MISO is also responsible for coordination of electric reliability in this area, and for managing the Midwest's wholesale markets.

[4] For example, on August 3, 2006, wholesale market prices in Michigan increased from $33 per megawatt-hour (MWh) in the early morning to $475 per MWh in the evening. For the entire month of August, prices were above $100 per MWh for 20 percent of the on-peak hours, much higher than the average price for which our in-state utilities can deliver power to their customers.

enabling the growth and use of in-state generated resources, unleashing the entrepreneurial talent of developers of renewable and distributed resources and efficiency-related products, and by allowing the state to avoid undue reliance on energy produced by other states.

This Plan will protect customers by allowing utilities to meet their obligation to serve through utility-built generation that remains subject to the protections offered by state regulation - protections that require prudent and reasonable management of energy assets and concern for the consumer. By ensuring that utilities can meet their obligation to serve, and putting in place renewable energy and energy efficiency programs, Michigan can be certain of stable rates for all customers over the long term.

This Plan will protect our environment by requiring that all utilities, cooperatives, and alternative electric suppliers begin to grow their renewable energy portfolios and make efficiency a priority. Michigan currently generates about 105 million mega-watt hours (MWh) of electric power annually. Every MWh that is generated by a renewable resource or that is avoided through use of efficiency measures displaces a MWh of fossil-fuel-fired generation and its associated emissions. While protecting our health, these measures also make economic sense by making Michigan's electric capacity more reliable and affordable.

Michigan's peak electric demand is forecast to grow at approximately 1.2 percent per year over the next 20 years. At this rate, and given the long lead-time necessary for major plant additions, additional baseload generation[5] is projected to be necessary as soon as practicable but no later than 2015. No new baseload units have been built or even started in recent years,[6] due, at least in part, to the structure of Michigan's hybrid market that makes reasonable financing terms difficult, if not impossible, to obtain.

[5] Baseload refers to plants that are intended to run constantly at near-capacity levels. Such plants are highly capital intensive to build, but have low operating costs.

[6] The last new baseload plant began commercial operation 18 years ago.

Moreover, reliance on only traditional, central station generating units[7] that typically burn coal or natural gas, exposes Michigan's ratepayers to higher costs arising from fuel price volatility and future air emissions regulations. If new baseload generation is to be built, it must be within the context of a larger state policy that requires the use of renewable resources and energy efficiency measures first. These measures will promote job growth and the stability of Michigan's economy, protect the health of our citizens, and, if fully carried out, save money for Michiganians. Adoption of the Plan's recommendations is projected to lower Michigan's total electric generating costs over the next 20 years by $4 billion. Failure to adopt the Plan's recommendations will force Michigan to rely on natural gas fueled combustion turbines and volatile wholesale electric markets that modeling shows will cost significantly more than a portfolio that includes energy efficiency, renewable energy and traditional baseload generation. Two billion dollars of the cost savings is projected to arise from use of new baseload generation; and $2 billion of the cost savings is projected to arise from employment of energy efficiency and renewable energy programs.

The Plan proposes three major policy initiatives that will require a combination of regulatory action, executive or administrative proposals, and statutory changes to provide the state with access to an expanded portfolio of electric resources.

(1) Building New Generation Plant

The Plan provides the opportunity for utility-built generation, within the context of a comprehensive electric resource portfolio that includes renewable resource and energy efficiency measures. A utility that will need additional power supplies can choose to build new generation under one of two regulatory frameworks, the traditional regulatory approach or a new option recommended under the Plan. Under the traditional "used and useful" option, the utility could

[7] Most electricity in the U.S., including Michigan, is produced by large, centralized power plants fueled by fossil fuels (coal, natural gas, oil) or uranium. Central station plants produce many megawatts of power and usually serve thousands of customers.

follow existing procedures and request recovery of its costs in rates after the plant is built. Alternatively, a utility will be able to file an integrated resource plan that evaluates the ability of renewable resources, energy efficiency measures, external markets, and existing traditional generation to meet forecasted demand. This filing initiates a contested case proceeding allowing public input in the planning process. If the utility demonstrates a need for new baseload generation, the Commission may approve the decision to build the plant by issuing a Certificate of Need.

Once the Certificate of Need is granted, the utility would be required to competitively bid the engineering, procurement, and construction aspects of the project. The Commission, at its discretion, could extend its current policy of allowing recovery of financing costs during construction for pollution control investments to part, or all, of the financing costs of the proposed plant. The plant would not receive rate base treatment until it began commercial operation and the Commission determined its cost to be prudent. The Certificate of Need, however, precludes any later challenge to the usefulness of the plant. Creating the Certificate of Need option will enhance utilities' ability to obtain financing for such a project by reducing the risk that future revenues will not be available to cover the reasonable project costs.

To further enable utilities to construct new generation to meet expected needs, the Plan recommends additional regulatory measures to make it easier for utilities to predict customer demand and revenues available to cover reasonable power costs while maintaining Michigan's hybrid market. The Plan recommends that the Commission move toward rates based on the actual cost of serving customers, requires customers who cause a plant to be constructed to contribute to the plant's cost recovery, and imposes new time limits on customers who have left regulated service and wish to return.

(2) Renewable and Alternative Energy

The Plan recommends a statutorily required renewable energy portfolio standard implemented by the Commission with the flexibility to deal with changing circumstances, and cost implementation. The standard will apply to all load serving utilities in Michigan. The portfolio standard requires load serving entities to reach 10 percent of their energy sales from renewable energy options by the end of 2015. Entities could meet the standard by building and owning renewable generators, by contracting with in-state renewable generators, by buying qualifying renewable energy credits, or by making an alternate compliance payment. The Commission would be empowered to defer the standards if the cost was unexpectedly high, insufficient renewable power was available, or it posed a hardship on a utility's customers. The Commission would also be required to determine, contingent upon a review of the performance of the program prior to 2015, whether to extend the goal to 20 percent of energy sales from renewable energy options by the end of 2025.

A required RPS is a win-win proposition. It will encourage the creation of in-state jobs, reduce pollution and dependence on fossil fuels, diversify Michigan's fuel mix, and provide a measure of protection from potential expensive emissions regulations.

The Commission's rules, regulations and tariffs should be reviewed to assure that they do not obstruct development and adoption of distributed generation[8] and alternative energy technologies. The Plan recommends property tax relief be made available to homeowners who install solar, wind, fuel cell, or other small renewable generation resources. The Plan also recommends that the Commission be authorized to conduct a pilot program on solar applications, to establish distribution system use tariffs that allow distributed generators to use a utility's

[8] Distributed generation refers to small scale, non-utility generation that provides power at a site closer to the customer.

distribution system to move power to customers, and to increase the maximum participant size of its net metering program.

In addition to obtaining the benefits of portfolio diversity, greater protection of the distribution system is warranted. To harden the state's infrastructure, reduce distribution vulnerability, and enhance the beauty of Michigan, the Plan recommends that the Commission undertake an investigation of the cost of extending the requirement to bury power lines to poorly performing circuits, all secondary distribution line extensions (and primary lines on the same poles), and all primary and secondary lines along road rights-of-way that are undergoing reconstruction. If the cost is deemed reasonable, the Plan further recommends that the Commission undertake rulemaking to require this extension.

(3) Energy Efficiency

The Plan recommends creation of the Michigan Energy Efficiency Program, a comprehensive, statewide energy efficiency program. To assure performance and public accountability, a third party will administer the program under the supervision of the Commission. The program's initial funding level will be $68 million annually, and will be adjusted for the subsequent two years at the conclusion of a contested case (with a budget goal of $110 million by the third year of operation). The program will be funded by a non-bypassable surcharge.[9] The program administrator will receive performance-based incentive payments for achieving specific energy savings goals. The Commission will conduct a public proceeding every three years for all retail electric distribution utilities, to adjust the scope and goals of the program.

Resource modeling indicates that even a conservative energy efficiency program could, after 10 years, reduce Michigan electric peak demand by 660 MW resulting in long term cost

[9] An energy efficiency program with a budget of $110 million would require a non-bypassable charge of approximately one mill per kilowatt-hour (kWh) (a mill is one-tenth of one cent). For a customer taking 500 kWh of service per month, this would translate to a cost of about 50¢ per month.

savings to customers. Moreover, use of energy efficiency reduces use of fossil fuels and their attendant emissions, and can reduce exposure to unpredictable fuel prices and potential future air emissions restrictions.

The Plan also recommends that the Commission be authorized to require the use of active load management measures by utilities immediately. Active load management measures are estimated to reduce demand by 570 MW in 10 years. Pilot programs, designed to assist customers in managing their electric load and reducing their costs, are also recommended. These pilot programs will employ advanced metering infrastructure to provide real time price information to customers.

The Plan further recommends that the Governor direct the Department of Labor & Economic Growth (DLEG) to conduct a collaborative process to improve the energy efficiency of new construction in Michigan, and analysis and development of state appliance efficiency standards by the State Energy Office.

I. MICHIGAN'S ELECTRIC SUPPLY NEEDS THROUGH 2025

A. The Forecasting Process

Michigan relies on coal and nuclear fueled baseload generation units for about 83 percent of its annual electricity production, natural gas for about 13 percent of its annual production, and hydro-power and other sources for about 4 percent of its generation. Michigan's electric transmission network is integrated with a very large and complex electrical system comprising North America's Eastern Interconnection. The Eastern Interconnection stretches from Manitoba to the Florida Keys and from Canada's Atlantic Provinces to New Mexico, and consists of over half a million megawatts (MW) of interconnected generation capacity with large and diverse load centers.

The projected annual energy requirements and peak demands used in the modeling for the Plan are a compilation of forecasts prepared by each Michigan utility. These were compiled and aggregated into the three geographic areas used both in the Capacity Need Forum Report (CNF) and in the Plan analyses: Southeast Michigan, the balance of the Lower Peninsula, and the Upper Peninsula. The forecasts provided demand and energy projections for use in modeling the state's electric generation and transmission resource needs for the next two decades, and for use in assessing electric reliability. The reliability assessment was completed by MISO.

These three geographic regions within Michigan correspond to electric transmission operating areas. Southeast Michigan comprises the area served by the International Transmission Company (ITC). The balance of the Lower Peninsula is primarily served by the Michigan Joint Zone, including the Michigan Electric Transmission Company (METC), Wolverine Power Supply Cooperative, Inc., and certain municipal entities in the Michigan Public Power Agency and the Michigan South Central Power Agency.[10] The Upper Peninsula is served by the American Transmission Company (ATC).

The forecasted electric energy requirements and peak demands include all retail energy sales requirements for each of the three regions. This includes regulated investor owned utilities, regulated electric cooperatives, municipal utilities, and alternative electric suppliers. In other words, the forecast covers energy requirements for all customers.

[10] Although ITC and METC have recently merged, continued use of the three regions is helpful for modeling purposes.

B. Forecasted Demand[11]

Michigan's total electric generation requirements are expected to grow at an annual average rate of 1.3 percent from 2006 to 2025 – from 112,183 gigawatt hours (GWh) to 143,094 GWh. Southeast Michigan's generation requirements are expected to grow 1.2 percent annually, and growth for the balance of the Lower Peninsula is expected to average 1.4 percent. The Upper Peninsula's annual average growth rate is 0.9 percent for this period. Summer peak electricity demand is likewise expected to grow from 23,756 MW in 2006 to 29,856 MW in 2025, an annual average rate of growth of 1.2 percent. The expected peak load growth for Southeast Michigan and the balance of the Lower Peninsula is 1.2 percent per year, and for the Upper Peninsula it is 0.9 percent. These numbers represent a decrease by almost half from the forecasted demand in the CNF Report, due to lower forecasted sales growth. This change in the projected growth rate caused the Staff to undertake renewed reliability and expansion modeling efforts.

C. Forecasted Reliability

Electric energy is of little use to Michigan's economy if it is not reliable. Power outages lead to severe economic disruption. For example, it is estimated that the economic cost of the widespread August 2003 blackout on Michigan was close to $1 billion; and a single automotive plant can lose approximately half a million dollars within the first 5-10 minutes of a power interruption.

Although the combined METC and ITC regions satisfy general reliability standards for 2009, reliability modeling shows that the ITC region, analyzed separately, does not meet these

[11] Forecasting is based on normal weather patterns, but actual weather can and will vary significantly from the assumed normal. Additionally, forecasts cannot flawlessly capture business cycle impacts, trends in economic conditions, or market penetration of new products and services. As an example, The Detroit Edison Company's (Detroit Edison) forecasted peak for 2006 was 12,577 MW, but the actual summer peak was 12,778 MW or 13,091 MW if load interruptions had not been in effect – a difference of 4.1 percent; and Consumers Energy Company's (Consumers Energy) forecasted peak for 2006 was 8,710 MW, as compared to its actual peak of 8,994 MW – a difference of 3.3 percent. Despite these known weaknesses, forecasting remains the best way to begin to assess future needs.

standards beginning in 2009.[12] These results occur under a normal growth scenario. Though forecasting can never achieve perfection and the projected violation is small, this result indicates that additional generating resources will be required in the near term, and, as annual load growth of 1.2 percent continues, in the long term as well. If higher growth or transmission limitations should materialize, this will give rise to a more serious need in the Lower Peninsula.

Reliability in the Upper Peninsula is highly dependent on the timely completion of ATC's Northern Umbrella Project. This project will increase electric transmission into the UP to approximately 500 MW, or nearly half the UP's peak load, when completed. Failure to complete the project on schedule, however, would jeopardize electric reliability and could cause electricity prices to increase significantly in the Upper Peninsula.

We now have the benefit of nearly two years of developing and assessing scenarios and sensitivities involving a broad set of resource options. The sensitivities and scenarios used in the modeling allowed for analysis of: (1) the effects of broad changes to the demand and energy forecasts; (2) the impact of high fuel costs on resource selection; (3) the potential impact of greenhouse gas controls; and (4) resource combinations that can help manage future risk.

To meet near term potential reliability needs, the modeling selected natural gas fueled combustion turbine units to be added to the state's generating portfolio until a baseload generation plant, or its equivalent, could be constructed. The model selected combustion turbine units because of their short construction schedule of one to two years. These units are chosen because the model attempts to preserve reliability until it has time to add a baseload unit. Modeling, however, has shown that many of the combustion turbines can be eliminated or deferred through use of energy efficiency and renewable resource measures. Even with energy

[12]When assessing the reliability of the electric grid, the target reliability level widely used by regulators and utilities is 0.1 day in 1 year loss of load probability (LOLP), or 2 hours and 40 minutes per year. LOLP is the proportion of expected number of hours per year for which available generating capacity and transmission is projected to be insufficient to serve the daily peak demand. It does not correspond to an actual predicted outage, but is used to determine whether the risk of an outage is sufficiently low, given that that risk can never be zero. Reliability modeling for the Plan shows a violation of this general reliability standard for the ITC region by 2009, when it is forecast to experience approximately 0.3 days LOLP.

efficiency and renewable energy, however, the modeling demonstrates that new baseload generation should be brought online no later than 2015.

The modeling effort assessed a wide range of potential baseload unit technologies. Due to its price volatility, natural gas was not selected as a long term energy production fuel.[13] Nuclear power was also eliminated from consideration as a long term energy source during the first half of the planning period, due to the extremely long lead-time (assumed to be 12 years) required to bring a nuclear plant on-line. No new nuclear plants have been started in almost three decades, and issues regarding the permanent disposal of spent nuclear fuel remain unresolved. Failure of the Yucca Mountain repository to open in 1998 (as originally scheduled), and the lack of any present plan for acceptance of spent nuclear fuel at that site or any other, are significant deterrents. Nationally, there is renewed interest in nuclear power due to concerns about global warming and fuel costs, along with the incentives offered in the Energy Policy Act of 2005. Nuclear plants have no significant air emissions (including greenhouse gases), and new designs for nuclear plants are currently being evaluated. While nuclear power may be appropriate for consideration now, it will clearly not be available until the second half of our planning period, after 2015.

This leaves Michigan reliant on coal. Coal-fired generation is a major source of air pollutants, including mercury, nitrogen oxides and sulfur dioxide.[14] Perhaps more significantly, coal-fired plants are the major stationary source of carbon dioxide – the primary component of

[13] Price volatility results from many factors. Natural gas prices are highly vulnerable to extreme weather conditions (such as hurricanes or colder-than-normal winters), and are often linked to crude oil prices that are themselves changeable. Major crude oil producing nations include Iraq, Iran, Nigeria, and Venezuela.

[14] Michigan utilities have installed pollution control devices that have resulted in improvement in air quality. While Michigan still has 25 counties that are designated by the U.S. Environmental Protection Agency (EPA) as non-attainment for ozone, air quality monitoring shows that 24 of those counties are now in attainment of the ozone standard, and the Michigan Department of Environmental Quality (DEQ) has requested redesignation of those counties. The only remaining county, Allegan County, experiences ozone violations as a result of transport from the Chicago area. Coal plants do, however, contribute to violation of the PM2.5 (particulate matter of 2.5 micrometers or less) standard in Wayne County.

greenhouse gas. Michigan's coal fired generating units emit approximately 70 million tons of carbon dioxide emissions annually, or an estimated 40% of the state's total emissions. The urgent problem of global climate change is expected to be addressed at the federal level within the next five years. While there are no known state proposals to tax carbon dioxide, discussion at the federal level is heating up, and it would be imprudent not to consider that such a tax, or other greenhouse gas controls, could emerge in the near future. Hence, the emissions modeling scenario tested Michigan's potential financial exposure to a federal tax on carbon dioxide that begins with $10 per ton in 2010 and increases to $30 per ton in 2018. This causes generation costs to rise substantially. Carbon dioxide emissions regulation could raise the cost of electricity produced by conventional coal units by 1.5 to 2.0 cents per kilowatt-hour (kWh).

Utilities around the country are looking at integrated gasification combined cycle (IGCC)[15] technology, because of its potential for capture of carbon dioxide emissions. It is also possible that conventional plants can be retrofitted to achieve carbon capture. If IGCC[16] proves to be superior to other coal-based technologies, then air permitting agencies, including the DEQ and the EPA, as well as the Commission, may eventually require consideration of IGCC as an alternative to conventional coal-fired power plants before issuing any new permit or authority. In the meantime, the best protection against the risks associated with new coal-based generation is greater reliance on energy efficiency and renewable resource measures.

In sum, reliability modeling indicates that additional resources (from renewables, energy efficiency programming, or short-term generation options) will be needed to meet Michigan's

[15] IGCC is a power plant technology using synthetic gas (syngas) as a source of clean fuel. Syngas is produced in a gasification unit built for combined cycle purposes that gasifies coal. High sulfur coal, heavy petroleum residues, and even biomass are possible feed materials for the gasification process. IGCC offers higher thermal efficiency than conventional coal-fired technology, and currently appears to offer the lowest cost long term option for capture and storage of carbon dioxide emissions.

[16] In 2006, 4,000 MW of IGCC capacity is in the planning stage in the U.S., but only a handful of small demonstration projects/plants are currently operating in the U.S. Fitch Ratings, "Wholesale Power Market Update," October 25, 2006, p. 8.

electric needs by 2009, and additional baseload generation will be needed as soon as practicable but no later than 2015. The best way to obtain these additional resources is discussed in the sections below.

II. RECOMMENDATIONS FOR MEETING MICHIGAN'S ELECTRIC NEEDS

A. Integrated Resource Planning

It is important to remember that Michigan's baseload generating units are now an average of 48 years old. Modeling for the Plan assumed that older, less efficient units, totaling approximately 3,500 MW of capacity, will be retired by 2025.[17] Most of these retirements are baseload units for which there are no known plans for replacement.

In recent years, new electric generation in Michigan has been confined to natural gas fueled facilities. Natural gas fueled units represented about 10 percent of the state's generating capacity in 1992, but now represent about 29 percent of that generating capacity. These units were built by independent power producers. Many IPPs have recently gone through bankruptcy as natural gas prices over the past several years made even the most efficient of these units uneconomic to run for more than a few hours each year. Market prices driven by natural gas costs expose Michigan to volatile electricity prices.

Due to lower forecasted sales, the updated demand forecast shows a smaller increase than was predicted by the CNF Report. However, extensive modeling of Michigan's electric utility industry still demonstrates the need for additional electric generating resources in order to preserve electric reliability and provide affordable energy over the next 20 years. This modeling outcome is confirmed even in the presence of increased use of energy efficiency and renewable resources. It is also confirmed in the presence of expanded transmission and access to external

[17] Michigan's generating capacity, statewide, is presently approximately 27,000 MW. Each MW of capacity from a baseload coal plant is projected to cost approximately $1.6 million (excluding financing costs). A MW of capacity will serve about 500 residential customers.

markets, and reflects the diminishing availability of the MISO region's baseload generation capacity. Reserve margins in the region are expected to decline steadily over the next 10 years, and supply is likely to tighten. Recent estimates show that the cost of natural gas (or equivalent fuel) is often setting the wholesale on-peak prices within the MISO region. If regulated baseload capacity is not increased in the near future, natural gas prices will drive up wholesale costs and market prices for an increasing number of hours each year.[18]

The passage of 2000 PA 141 represented a major policy shift in the regulated electric utility industry. PA 141 encouraged the vertically integrated utilities to join independent regional transmission organizations such as MISO, or to divest their transmission operations. Michigan's investor owned utilities chose to divest their transmission assets. This state is now unique in that it is served primarily by independent, or stand-alone, transmission companies. This allows alternative electric suppliers (AES) access to wholesale power markets so that they can compete with incumbent, regulated electric utilities. By encouraging the development of independent third party transmission and retail choice of generation suppliers, the state has attempted to foster a competitive electric market.

In Michigan's restructured market, utilities have retained their generating assets. This has kept Michigan prices affordable compared to states that have required generation to be spun-off and prices to be fully deregulated.[19] This price advantage exists because the Commission uses the average, historical cost of building and maintaining generation plant to set rates. The Michigan ratemaking method for recovering the cost of building baseload generation (which is

[18] Midwest wholesale electricity market prices, also known as locational marginal prices, are set hourly by the highest priced generator selected by MISO to supply electricity and bring generation supply and demand into balance. All generators supplying power in that hour receive the same price based on the highest cost generator used in the hour, regardless of their actual costs. These prices are passed on to Michigan customers through the power supply cost recovery charges provided for in 1982 PA 304.

[19] *See, e.g.*, Rose, Kenneth, and Karl Meeusen, "2006 Performance Review of Electric Power Markets," August 27, 2006, p. 3, available at <http://www.ipu.msu.edu/programs/annual/pdfs/Annual06-Rose-reading.pdf> (visited on November 28, 2006); *The New York Times*, "Competitive Era Fails to Shrink Electric Bills," October 15, 2006, available at <http://www.nytimes.com> (visited on October 15, 2006).

the same method used in all states that have not deregulated generation) begins with the historical cost of a plant and reduces it for accumulated depreciation. Market pricing, on the other hand, tends to be based upon the current replacement cost of a plant. Since generating plant costs have typically been rising, unregulated prices have experienced an upward drift over the past several years. Market prices have also risen because most new generating units constructed over the past decade have been natural gas fueled, and natural gas prices have recently experienced record highs.

Michigan's current market structure is a two-part hybrid; it consists of a regulated utility sector and a competitive (customer choice) sector. Incumbent utilities still own and operate generating plants and sell power at regulated rates. At the same time, AESs market and sell to Michigan commercial and industrial customers at unregulated, market prices (AESs have chosen not to market to residential customers). Customers are permitted easy passage between these sectors. The ability of customers to move between the regulated and competitive markets creates permanent uncertainty about the size of the customer base for both utilities and AESs. This uncertainty makes planning and financing of expensive, long-lived baseload generating units very difficult. Because of their obligation to serve all potential customers in their territory, the utilities bear the responsibility to plan (and construct) for this load, despite the fact that customers may migrate at any time from the utilities' regulated rates to the competitive sector's market rates.

Protection against volatile market prices can be provided by a clean baseload generating plant. In Michigan's current hybrid market, however, it is not clear whether investor owned utilities (IOU) or independent power producers (IPP) would build this type of plant. Michigan's regulated utilities indicate that without increased revenue certainty, financing such a plant on

favorable terms is unlikely.[20] The same conclusion was reached by the Staff in the CNF Report. It is also clear that an IPP is unlikely to build a baseload plant[21] without a long term power purchase agreement (PPA) with a regulated utility. Major utilities, however, are unwilling to sign a long term PPA with an IPP. Customer migration is always possible, and this could lead to a utility and its shrinking customer base being saddled with rising fixed costs from the PPA.

Given this conundrum, the Commission Staff identified three possible approaches to addressing Michigan's electric capacity needs. First, PA 141 could be repealed and the market re-regulated. Second, the market could be fully deregulated, requiring utilities to sell off their generation resources. Third, new legislation could reduce the risks associated with building new generation, and promote sustainability of Michigan's hybrid market.

Michigan's electric restructuring represented a major policy initiative made by then Governor John Engler and the Legislature. Reversing the restructuring required by PA 141 is an option available to Governor Granholm and the Legislature. It would remedy the inability to site and build new baseload plant in Michigan. The drawback is that it forecloses an option for customers who find it desirable or economic to take service from a competitive supplier. The preservation of an option that prohibits Michigan from securing a sound electric future, however, may be unwise.

Deregulation, on the other hand, could lead to an unprecedented transfer of real economic wealth from ratepayers to the owners of the deregulated generation assets. Under this option, generating plant that is currently priced at its actual, depreciated historical value would be allowed to price at market rates. This would serve to significantly raise rates on all customers and further undermine Michigan's economy, while providing no additional certainty that new generation plant would be built. Moreover, wild volatility in electric markets would have a

[20] Wolverine Power Cooperative, Inc. (Wolverine) has recently begun to develop a new baseload power plant in Rogers City. Wolverine's member cooperatives, however, have non-bypassable charges on their distribution tariffs to fund the plant's development.

[21] In fact, since enactment of PA 141, no IPP has built a baseload power plant in Michigan.

severe negative effect on the state's economic security. Due to the turmoil created by fully deregulated markets (rates have risen in Maryland by 35-72 percent, in Illinois by 24-55 percent, and in Delaware by 59 percent), the Plan does not recommend this option.

To make Michigan's current electric market sustainable, and balance the interests of Michigan's various ratepayers, this Plan proposes legislative change to enable construction of new generation by authorizing the Commission to grant a Certificate of Need for utility construction of new baseload generation.[22] The legislation would require utilities that wish to seek a Certificate of Need to file an integrated resource plan (IRP) with the Commission. The IRP will detail how the utility plans to use energy efficiency, renewable energy, transmission,[23] existing regional resources, and new generation to meet its customers' needs. When a new generating unit is proposed in an IRP, the utility would request a Certificate of Need for the plant. The Commission would have 270 days to issue or deny a certificate. The Certificate of Need satisfies the traditional "usefulness" standard, and will remove the barrier to new generation development that is presented by having to prove a need for the plant after it is built, even where forecasted demand has changed in the meantime, or customers have migrated to AESs. The utility would still need to demonstrate that the plant's cost was prudent prior to being allowed cost recovery.

[22] The Commission's current rate treatment for new generation plant will also remain available.

[23] Recently, ITC and American Electric Power (AEP) signed a memorandum of understanding to study an extension of AEP's 765 kilovolt transmission system through Michigan. The current proposal is for an alternating current (AC) line. This proposal must be studied carefully, as new rights-of-way needed to build a major AC line can make construction expensive and delay the completion schedule. In addition, the nation's falling generation reserve margins, even with expanded transmission (but without significant new generation from other states), may mean that reliance by Michigan on external markets will not provide power at reasonable rates. However, the transmission expansion option should continue to be studied as a long term project that may, in the future, help integrate the Midwest energy markets.

The IRP will begin with a long term forecast of full service[24] demand and energy requirements, and will explain how the utility's plan fits into the state's overall electric capacity needs. The utility would be required to incorporate energy efficiency investment and renewable energy capacity (as outlined in this Plan) into its IRP. It would also be required to assess the availability and cost of external market power and transmission options that could help satisfy its capacity needs. Incorporating all these resources, the utility would need to demonstrate that a central station generating plant was required for meeting future demand. The IRP proceeding would be conducted as a contested case, with participation from interested parties.

If a Certificate of Need is granted, reasonableness and prudence of the decision to build the plant is not subject to later challenge. The Certificate of Need will allow the utilities to move forward with new generation to meet Michigan's growing demand.[25] If the utility receives a Certificate of Need from the Commission, then the utility must competitively bid the engineering, procurement, and construction (EPC) aspects of the project. The EPC contracts represent approximately 85 percent of a new plant's cost. Once it has competitively bid its EPC contract, the utility will supplement its IRP by filing a financing plan. After reviewing the financial plan, and if the Commission finds the utility's request to be reasonable, the Commission could, at its discretion, allow the utility to recover financing costs associated with the new plant construction, in the same way the Commission currently allows utilities to recover certain environmentally-related construction financing costs.[26]

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[24] The phrase "full service" refers to customers who take both generation and distribution services from the utility. It is also sometimes referred to as bundled service, meaning that the customer takes the complete package (bundle) of services from the utility. Customers whose generation is supplied by an AES are not full service customers, because they take only distribution service from the utility.

[25] Thus, the Plan recommends that Michigan join the other 35 states that currently require regulated utilities (and, in some cases, IPPs) to obtain approval from a siting board or a certificate of need from a regulatory commission prior to construction of a new power plant.

[26] *See*, March 14, 1980 order in Case No. U-5281, p. 76. Financing costs related to investment in pollution control equipment are treated as construction work in progress without an allowance for funds used during construction offset. This means that these financing costs may receive rate recovery treatment during construction of the plant.

State laws and policies governing rate recovery for new generating plants vary considerably, from traditional, after-the-fact prudence reviews in rate cases (20 states, including Michigan) to rate base treatment of construction costs prior to use of the plant (13 states). The latter treatment amounts to pre-approval of the entire cost of building the plant, including financing costs. The Plan proposes a middle course, authorizing a finding of need and potential approval of some or all of the financing costs alone, but not the actual construction costs until the plant becomes operational. Of course, no costs associated with construction of the plant will be approved absent a public hearing and finding by the Commission that the plant's costs are reasonable and prudent.

The Plan does not recommend mandatory competitive bidding for long term electric generation capacity secured through a PPA with an IPP. Competitive bidding for long term generation is currently required in only 13 states, and continues to be an option available to Michigan utilities as part of their strategy for meeting future capacity needs. While competitive bidding a PPA has some important advantages, it also exposes ratepayers to additional risks and costs.

For example, IPPs make use of highly leveraged construction financing that can lower their construction costs by making extensive use of debt. However, according to a presentation made by the Electric Power Supply Association (EPSA), an independent power producers' advocacy group, to last year's CNF, PPAs may be viewed as utility debt and may contribute to lower utility ratings by rating agencies. This would cause the required rate of return on all of a utility's investments to increase. State commissions have recognized this tendency of PPAs to be treated as the debt of a utility and have adjusted the bids of IPPs or addressed the issue in cost of capital proceedings to account for this treatment. PPAs entered into by Michigan utilities are likely to be viewed as debt because of the ability of the utilities' customers to leave utility service at any time. The cost advantage of an IPP's highly leveraged construction secured by a

PPA can only be accomplished by transferring the risk and resulting financial burden and costs onto the utility and its customers.

Moreover, IPP-built generation plant is, for ratemaking purposes, never paid off. Under regulatory practices in Michigan and throughout the country, utility owned power plants must be used to supply power to customers at the actual cost of the plant. Once a utility's generation plant cost has been fully recovered in rates, ratepayers will continue to receive power from the paid-off plant, potentially for a very long time, because the useful life of the plant exceeds its depreciated life. By contrast, when an IPP builds a plant, the generation is owned by a company that is not under the jurisdiction of the Commission. After the PPA has expired, the private owner can continue to sell the power into the wholesale markets indefinitely, even if the ratepayers of the utility purchasing power under that PPA have paid the full cost of the plant. In order for ratepayers to continue receiving power after the expiration of the PPA, they must purchase the power at existing market prices that are likely to be significantly higher than the actual cost of the fully depreciated plant.

Protection from construction cost overruns is frequently cited as one reason to make competitive bidding mandatory. This protection is already afforded by Michigan's hybrid market. Competitive markets work by allowing customers to take service from the low cost provider. If a utility invests too much money, or fails to complete a project within schedule, it risks losing customers to competitive suppliers. Michigan's hybrid market should serve as a check on excessive costs when a Michigan utility builds a baseload generating plant for its customers. Customers not happy with the rate impact of the utility construction are free to exercise their choice to leave the utility's generation service. Since the new plant's cost will be subject to a competitive bid process and customers will have the option to leave the utility for a choice supplier, there seems to be little to gain from requiring a competitive PPA solicitation.

IPPs – in Michigan or out-of-state – remain free to build generation and a customer base in any way they see fit. If they provide attractive rates, customers will migrate to them. Utilities may make use of PPAs, but for the reasons articulated above the Plan does not mandate that utilities competitively bid PPAs.

B. Cost Based Rates and Return to Service

The Plan recommends that the Commission move toward rates based on the actual cost of serving customers, and adopt a two-year return-to-service term.

As currently structured, regulated utilities have an obligation to serve all customers at regulated rates.[27] This includes large and small customers, customers with good load shapes and difficult load shapes, and customers who elect to take service from AESs. Michigan's experience has shown that the opportunity to leave and return to regulated rates can cause both an erosion of revenues for the utilities when customers leave for lower market prices, and sudden cost increases when rising market prices cause the same customers to return to utility service, requiring the purchase of additional high cost power on short notice.

This problem is exacerbated by a rate structure that is not based on the true cost-of-service.[28] Residential service is heavily subsidized by commercial customers, and may be subsidized by industrial customers. In order to subsidize residential service, regulated utilities must maintain non-competitive rates for commercial, and, to a lesser extent, industrial customers. The subsidy artificially inflates commercial and industrial customers' rates, giving those customers an incentive to leave the regulated market for the competitive market. Thus, customers are denied an accurate cost comparison, and the utilities may be denied their most valuable customers for reasons not based on cost.

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[27] *See*, June 3, 2004 order in Case No. U-14109, pp. 3-8.

[28] The Commission has recognized the necessity of moving to cost based rates and has begun this process in recent orders. *See*, December 22, 2005 orders in Case Nos. U-14399, U-14347; August 31, 2006 order in Case No. U-14838. Distribution rates for commercial and industrial choice customers are now based on the cost of providing the service.

If utility generation rates are not based on cost, migration of high margin customers occurs for reasons having nothing to do with the parties' competitive advantages in providing service. The Commission is then faced with a continuing need to consider raising rates for customers who remain with the incumbent utility due to diminished revenues caused by departing customers.[29] This policy hits the residential customer class particularly hard, since AESs select only customers that are profitable to serve, and so do not market to residential customers. Sending proper price signals based on the real cost of serving customers is an important step in assuring that migration decisions are made on a rational economic basis. Cost based rates will provide for a more stable customer choice program, since accurate price signals will govern the decision to move away from the utility to an AES, and vice versa.

In Michigan's unique hybrid market, all parties must assume a measure of risk if new baseload generation is to be built, including migrating customers. Currently, migrating customers avoid the full cost of maintaining the regulated system, but still benefit from that system. Whenever new baseload is added to the regulated system it serves to lower market prices and improve reliability for everyone, including those customers that are not paying any of the cost of building the new generation. Therefore, the Plan recommends that all customers who contribute to the need for the new plant must participate in paying for new baseload generation. The Commission has 270 days to issue the Certificate of Need, and during that time the utility must provide notice to its customers of the pendency of its request. The Plan recommends that the Commission initially fix the customer market to be served by any new baseload generation as of the date that the Certificate of Need is granted. On that date, customers will fall into three categories: (1) customers taking regulated service on that date, and customers who return to

[29] For example, in its November 23, 2004 order in Case No. U-13808, rates were increased for Detroit Edison by approximately $300 million to account for about 9,200 GWh of electric sales losses associated with the migration of commercial and industrial customers to AESs. When market prices began a sustained increase in 2004-2006, many of these customers returned to regulated service, forcing the utility to purchase more expensive power in the volatile wholesale market. Again, the increased cost of this power was passed on to all regulated customers, including the residential customers.

regulated service after that date, will see traditional rate base treatment of the cost of the new generation; (2) customers leaving regulated service after that date will carry a non-bypassable surcharge with them that reflects the customer's share of the cost of the new generating unit; and (3) customers off regulated service as of that date, and who never return to service, will pay nothing toward the cost of the new generation, despite receiving the indirect benefits just mentioned from the availability of regulated utility service and the new generation.

The Plan also recommends that the Commission fix the lead-time necessary to bring a returning full service customer back to regulated rates to two years from the date that the customer notifies the utility that it wishes to return. Customers may return to the utility's generation service 60 days after notification on a market-based tariff, and will remain on the market tariff for two years. This will give the utility a reasonable opportunity to arrange the necessary power supply for returning customers without causing undue rate increases on existing customers. Lengthening this lead-time will bring about greater certainty of customer base for both utilities and AESs, and make long term power planning more efficient.

C. Reliability Improvements

Electric reliability depends upon maintenance of operating reserves and planning reserves. Operating reserves are usually small and can cover immediate contingencies like a surge in load or a load-generation imbalance. Planning reserves are large, and are critical for addressing major unit or transmission line outages, unexpected weather, or unanticipated economic growth.[30] The utilities are expected to maintain planning reserves to assure electric reliability. Planning reserves are crucial at times like this past summer, when actual electric

[30] Operating reserve is the generating capability above firm daily system demand needed to cover potential shortages caused by daily load forecasting errors, scheduled and unplanned equipment outages, and local area protection. Operating reserves are provided by quick-start gas or oil fueled units that can be brought on-line within 10 minutes or less. The operating reserve is a subset of the planning reserve. Planning reserve is the difference between a utility's electric generating capacity (usually expressed in MW) and its anticipated annual peak load. The planning reserve assures that sufficient generation will be available over a longer period of time to meet load growth and unanticipated surges in demand caused by unusually hot or cold weather, and covers major, longer-term contingencies like the loss of a major generating unit or transmission line.

demand growth substantially outpaced the forecasted growth. Major unit outages occurred during this summer's heat wave without service disruption, largely due to the maintenance of planning reserves by regulated utilities. Planning and operating reserves are crucial for preventing the severe economic disruption that takes place when a blackout occurs.

Although AESs are required by MISO to maintain operating reserves, they are not required to carry planning reserves. Thus, currently, AESs are not required to satisfy generally accepted reliability standards. The obligation to maintain planning reserves may cause incumbent utilities to incur higher fixed costs than their AES competitors.

The Plan recommends that the Commission be authorized to require planning reserves for all jurisdictional utilities, electric cooperatives, and AESs in the state.[31] AESs should, however, be allowed to demonstrate that the electricity they purchase is already backed by adequate planning reserves. The legislation should permit the Commission to penalize a load serving entity that does not meet the reliability standards.

[31] The Plan does not recommend planning reserves be required of municipal utilities; that responsibility is inherent in city government.

III. RENEWABLE RESOURCES AND ALTERNATIVE TECHNOLOGIES FOR MICHIGAN

A. Renewable Resource Forecasting

"Renewable energy" means energy generated by solar, wind, geothermal, biomass (including waste-to-energy and landfill gas) or hydroelectric sources.[32] While there is wide variation among the utilities, approximately 3 percent of the total electricity currently sold to Michigan utility customers is generated by renewable energy sources. Twenty-four states currently have a renewable portfolio standard (RPS) program in place, with targets between 1.1 percent and 30 percent, and target years ranging from 2009 to 2022. Ten-thousand MW of new renewable generation was announced in the first eight months of 2006.[33] It is time for Michigan to join these states, to encourage development of wind turbines and biodigesters in Michigan in the near term, and solar and fuel cell applications in the longer term. A required RPS is a win-win proposition. It will encourage the creation of in-state jobs, reduce pollution and dependence on fossil fuels, and provide a measure of protection from potential expensive future emissions regulations.

The more renewable resources are present to improve fuel diversity, the less the price of electricity will increase in response to increased coal and natural gas costs. Fuel diversity and the use of indigenous resources – especially those not subject to price volatility and shortages – represent valuable safeguards to utility ratepayers. Renewable and alternative energy technologies also produce less air pollution and greenhouse gases than the existing fleet of

[32] MCL 460.10g(1)(f). Michigan does not have access to geothermal sources of power. Hydro-power was not modeled for the Plan because the small scale of such projects does not, at present, justify the expense associated with permitting. Likewise, solar power was not modeled. The comparatively high capital costs and low capacity factor make it difficult to forecast solar energy market potential in Michigan at this time. However, it is noteworthy that United Solar Ovonic LLC and Hemlock Semiconductor Corporation, two manufacturers of solar-related products, have recently expanded production capability in Michigan, and the market across the country is growing. As the scale of operations and technology continue to improve, the cost and performance of solar applications will likely lead to their growth in Michigan.

[33] Fitch Ratings, "Wholesale Power Market Update," October 25, 2006, p. 9.

central station power plants. For example, wind and solar energy produce zero emissions during normal operations.

Modeling indicates a potential for at least 1,100 MW, and up to 2,700 MW, of new electric power capacity development in Michigan from renewable resources with another 180 MW available from combined heat and power, or CHP.[34] Forecasting in this area is particularly problematic, in light of the rapid pace of technological advancements and policy changes that will affect renewables. It is thus important to revisit renewable resource modeling on a regular basis, and to expand the renewable portfolio when appropriate.

For purposes of the Plan, modeling was performed for biomass and wind resources. Electricity can be produced from three major sources of biomass: (1) combustion of cellulose-containing biomass such as wood and cornstalks; (2) anaerobic digestion of wastewater treatment plant waste, and cattle, swine and poultry waste; and (3) combustion of landfill gas.

Wind energy production from utility-scale wind generators was also modeled. Uncertainties about markets, interconnection and production costs, and renewable energy policy have currently slowed new wind development in Michigan, but this area shows great potential. Estimates for Michigan's wind energy resources were based on data that generally depict wind regimes in the state, but should be supplemented by local wind studies. Based on units in the MISO queue and discussions with wind energy participants in Michigan, a minimum of 525 MW of wind resources should be available in Michigan over the next few years. A more robust estimate based on policy changes contemplated in this Plan could yield 2,400 MW of wind capacity.

Renewable resource assessment modeling for the Plan shows that Michigan's electric supply portfolio can achieve 7-10 percent renewable energy by the end of 2015. Based on the

[34] CHP is useful when there is need for both electricity and process steam at a location. CHP facilities use fuel to make steam to turn an electric generator, and then use the leftover steam in the factory's processes.

energy forecast, this amounts to approximately 5,200 to 9,200 GWh of additional renewable energy by December 31, 2015. The resource assessment conducted for the Plan demonstrates that Michigan has ample resources available to meet this level of renewable energy for electricity production.

B. Renewable Portfolio Standard

The Plan proposes an RPS that requires all load serving entities[35] (LSEs) in Michigan to gradually increase the percentage of renewable energy in their electric generation resource portfolios, until a minimum of 10 percent of total electricity generation requirement is met from qualifying renewable resources by the end of 2015.[36] This proposal calls for passage of enabling legislation in 2007, and would require all LSEs to obtain 3 percent of their generation requirements from qualifying renewable resources by the end of 2009. From that time forward, each LSE would be expected to increase the percentage of new[37] renewable resources utilized to meet their generation needs, until the 10 percent level is reached by the end of 2015.[38] If an LSE is already above the three percent level, then it must obtain the next 7 percent from new sources by the end of 2015. Prior to 2015, the Commission will review the performance and impact of the RPS, and contingent upon the results of this review, the Plan recommends that the Commission be authorized to require a further goal of a 20 percent RPS to be met by 2025.

[35] The term Load Serving Entity (LSE) encompasses all entities providing electric retail sales service to Michigan customers. This includes investor owned utilities, cooperatively owned utilities, municipal utilities, and alternative electric suppliers with retail sales. The Commission does not have regulatory authority over municipal utilities, or utilities engaged only in wholesale sales. While the Plan recommends a renewable portfolio standard for municipal utilities, the Plan does not contemplate that the Commission would enforce such a standard.

[36] The quantity of renewable energy needed to achieve renewable portfolio targets will be based on each LSE's annual retail sales, measured in MWh.

[37] Pre-existing in-state renewable resources can be used until the utility meets the initial 3 percent target. The remaining seven percent must be obtained from new renewable sources.

[38] The proposed RPS would not require specific proportions of different renewable resource types, nor would it establish special treatment for any types. Instead, it would simply require LSEs to meet an overall percentage of qualifying renewable resources in their supply mix, and then let the LSEs achieve that goal by any means they find effective.

Under this RPS proposal, the risk of cost increases is reduced by allowing for: (1) rate impact limits, established by customer class; (2) one-year deferrals for LSEs that can demonstrate hardship in meeting the RPS target; and (3) reasonable alternate compliance payments (ACP) for LSEs with fewer than 100,000 customers, and for LSEs with more than 100,000 customers until the end of 2012. The ACP is a payment made to the energy efficiency fund (discussed in the following section) in lieu of meeting the RPS, and will make compliance easier for the smaller utilities.[39] For ease of administration, ACPs will be held in the energy efficiency fund, but will be used only for renewables projects.

The RPS will be met through the use of in-state renewable power. The Commission will develop rules allowing generators to initially self-certify their eligibility as renewable resources. LSEs would be authorized to meet their RPS obligations by building and owning renewable generation, by contracting with in-state renewable generators, or by buying qualifying renewable energy credits (REC) or ACPs. All reasonable compliance costs will be approved for cost recovery.

Most states with RPSs have incorporated REC trading. The Plan recommends that REC trading be approved for the Michigan RPS program. A REC is a unique, independently certified and verifiable record of the production of one megawatt hour of renewable energy. When employed in an RPS program, one REC is retired to represent each MWh of qualifying renewable energy sales to the LSE's customers. Renewable resources serve to improve Michigan's economy, help manage fuel costs, and reduce air emissions. To the degree that out-of-state RECs provide the same benefits, they should be recognized for use in Michigan. Thus, RECs may be purchased from out-of-state resources as long as the REC produced an air quality or economic benefit to Michigan. The Plan recommends that the Commission be charged with the task of finalizing details of the REC program.

[39] Twelve other states are experiencing success with ACPs.

ACP receipts, if any, will go into the energy efficiency fund and will thereafter be primarily dedicated to providing financial incentives for renewable energy systems in community-based renewables programs that will serve customers of the LSEs that are paying the ACP. In this way, ACP receipts will work to support the addition of in-state renewable resources and will leverage additional investment.

The Commission should be authorized to defer annual RPS targets for one year at a time if the LSE demonstrates hardship in meeting the target, or if it can be shown that the cumulative rate impact of meeting the RPS target exceeds an amount deemed reasonable by the Commission. The Commission should further be authorized to require remedies, issue and enforce penalties, or revoke licenses in response to LSEs that are found to be in violation of their RPS obligation. Prior to 2015, the Commission will conduct a study to determine the cost and performance impacts of the RPS, along with the availability and cost of renewable resources, and will consider adjustment of the RPS and associated deadlines. Contingent upon the results of this review, the Plan recommends that the Commission be authorized to require a further goal of a 20 percent RPS to be met by 2025.

C. Alternative Technologies and Distribution Reliability

The Alternative Technologies Workgroup concluded that although some alternative generation technologies are already in use, many other alternative technologies will play an important role in the future.[40] Nevertheless, from a regulatory standpoint, it is important that steps are taken now to make it easier to implement promising alternative technologies when they do become available. Thus, the Plan recommends that the Commission review tariff terms, and conditions of service, to identify and remove unnecessary barriers to renewable, alternative, and distributed energy applications.

[40] Alternative technologies include fuel cells, solar photovoltaic resources, and smart grid technologies.

The Plan proposes that net metering tariffs be made available for all qualifying renewable and CHP facilities less than 150 kW in size.[41] This size corresponds to a grade school or middle school. The Plan further recommends that the Commission be authorized to establish tariffs for the use of a utility's distribution system in order to transmit electricity to wholesale market nodes or customers. A fixed monthly service charge could be applied to ensure that net metering customers would continue to pay their fair share of distribution system and utility administrative expenses.

As the scale of solar photovoltaic (PV) production increases and performance continues to improve, solar based applications are likely to grow in Michigan. These applications have a number of benefits including protection from fuel cost increases and harmful air emissions, as well as job creation within Michigan. To encourage adoption of this technology the Plan calls for residential property tax relief for homeowners who add solar PV, wind, fuel cell, or other renewable energy installations to their homes. Because of solar energy's long term potential to meet on-peak energy needs, the Plan further recommends that the Legislature authorize the Commission to conduct a pilot program involving one or more utilities to investigate the impact of solar-generated electricity on distribution reliability and on managing summer power costs in Michigan.

Finally, on the issue of distribution reliability, an ongoing concern is the quality of power delivered to the end user. Distribution lines are particularly vulnerable to disruptions caused by weather or growing trees. Sometimes problems confined to specific circuits or local distribution areas are due to recurring faults on existing lines. At other times they may be due to failure of the circuit to handle growing loads. Customers indicate that distribution failures cost them thousands of dollars of lost product. When major storms occur, distribution outages can be widespread and service restoration may take several days.

[41] Net metering is currently available only to installations less than 30 kW in size.

The transformation of Michigan's economy from traditional manufacturing to computer-assisted, high precision, flexible manufacturing processes, along with the growing role of sophisticated communications, requires better distribution reliability. In the near term, underground placement of distribution lines will harden our infrastructure and reduce distribution vulnerability, as well as enhance the beauty of the state.

Underground wires do a better job of keeping electricity flowing to homes, businesses, and neighborhoods. Currently, underground distribution facilities are required for new residential subdivisions and commercial developments. When roads are dug up for pipeline installation or widening, opportunities are being missed to bury lines at a reduced price. The Plan proposes that the Commission undertake an investigation of the cost of extending the requirement of underground placement to: (1) poorly performing existing circuits, (2) all secondary distribution line extensions and primary lines on the same poles, and (3) all primary and secondary distribution lines that are subject to roadway reconstruction work.[42] If the cost is deemed reasonable, the Plan further recommends that the Commission undertake rulemaking to mandate this extension of the burial requirement. Transmission and sub-transmission lines will not be affected by this effort.

[42] A primary electrical distribution system delivers electricity from a substation to neighborhoods and back yards. It is operated at a voltage level that is too high for most customers to use. This higher voltage is used for efficiency in delivering electricity over long distances. A primary system, depending on the utility and the circuit, is usually operated at 4,800 volts to 14,400 volts. A secondary electric system is that part of a utility's system that actually connects to customers. Separating a primary system and a secondary system is a transformer that is used to bring the primary voltage down to levels that customers can use. The particular voltage depends on the customer's needs, and could include 480, 277, 240, 208 or 120 volts for a commercial or small industrial customer. Most, if not all, residences are served with a secondary voltage of 120 and 240 volts. Thus, the new standard would cover all residential neighborhoods, and many commercial and small industrial facilities.

IV. ENERGY EFFICIENCY FOR MICHIGAN

A. Forecasted Energy Savings

Energy efficiency means using less energy to provide the same level of service to the consumer.[43] Energy efficiency is a proactive and technology-driven process that yields long term benefits to energy consumers. It replaces costly new generation resources with end-use technology improvements. For example, modeling for the Plan showed that, in the absence of any energy efficiency programming, Michigan would need no fewer than four new 500 MW baseload units by 2015 to meet forecasted demand. With energy efficiency programming, the model decreased the forecasted need to two new baseload units on a staggered basis; and with the addition of the RPS, this projection has been decreased further to one new unit by 2015.

Energy efficiency makes strong business sense irrespective of economic conditions. Utility-administered energy efficiency programming efforts that began in the mid-1980s came to a halt by the mid-1990s, with the advent of utility restructuring initiatives and the resulting assumption that low-cost energy from competitive markets would render efficiency programs uneconomic. These assumptions have not proved true.

Michigan is in need of a comprehensive energy efficiency program. The Plan proposes a program that will be funded through a direct uniform charge on customers' bills, and administered by an independent third party working under a performance-based contract, to ensure that real energy savings goals are realized. Resource modeling indicates that even a conservative energy efficiency program could,[44] after 10 years, reduce Michigan electric peak demand by 660 MW and annual energy use by 4,952 GWh, resulting in long term cost savings to

[43] U.S. Department of Energy and U.S. Environmental Protection Agency, "National Action Plan for Energy Efficiency" (NAPEE), July 2006, p. 12. This important report can be viewed online at <http://www.epa.gov/cleanrgy/pdf/ActionPlanReport_PrePublication_073106.pdf>. The goal of the NAPEE is to create a sustainable, aggressive national commitment to energy efficiency.

[44] Because utility energy efficiency programming in Michigan ceased more than 10 years ago, Michigan has more potential savings available from the use of energy efficiency measures than many other states.

customers. By displacing traditional fossil fuel energy, the energy efficiency program alone could save Michigan $3 billion in electricity costs over the next 20 years. These results compare favorably to other statewide energy efficiency programs.[45]

In addition to savings from the third-party-administered energy efficiency program, Michigan utilities can also expand their ability to actively manage peak demand and encourage customers to do so, thereby shaving an additional 570 MW from peak demand. These measures will reduce the number of combustion turbines necessary in the short run to maintain electric reliability within Michigan. Under the Plan, utilities will also undertake pilot programs to gauge the ability of "real-time" electricity pricing to reduce energy consumption during high demand periods, making use of advanced metering and communications technologies.[46]

Advanced metering technologies involve using digital, two-way communication between meters and the utility, allowing many points on the grid to be monitored from a central location. These technologies will make it possible for utilities to reduce the loss of electricity from the lines, and will greatly increase their ability to instantly detect and correct faults on the system. Advanced metering will also allow for greater use of remote control of large appliances like air conditioners and water heaters, leading to reduced peak load.

Modeling also indicates that there is a significant energy savings potential from updating the Michigan commercial building code. For example, updating Michigan's commercial building code from the current 1999 ASHRAE Standard to ASHRAE Standard 90.1-2004 (2004)

[45] Fifteen states have enacted statewide energy efficiency programs. The proposal contained herein draws heavily from the highly-praised Vermont program.

[46] The cost of providing electric energy fluctuates over the course of the day and throughout the year. For example, the cost of providing electricity is normally highest during the afternoon and early evening in the summer, and lowest during the evening in the fall or spring. Rates charged to customers for electric service, however, are calculated on the average cost of providing service over a year and do not vary from month to month. Time-of-use rates are designed to more closely match the actual price of electricity with the rates that are charged to customers. Time-of-use rate methods result in higher rates for electricity during peak summer periods, and lower rates for the off-peak periods. Real time rates are a form of time-of-use rates that match customer rates directly to electricity prices incurred at the moment when the electricity is used.

is estimated to result in an annual electric energy savings of 477 GWh over a 10-year period. Additionally, peak demand could be reduced by 99 MW.

Finally, though most major appliances are covered by federal appliance efficiency standards, these standards are not all inclusive.[47] At least 10 electric products not covered by federal standards may be appropriate for state regulation, and could result in significant electric energy and demand savings.

The Plan makes five recommendations: (1) the Legislature should create the authorities and structures necessary for a comprehensive, statewide, third-party-administered energy efficiency program, and authorize the Commission to implement the program; (2) the Commission should be authorized to require implementation of utility programs for managing load; (3) the Commission should initiate pilot programs for investigating new ways customers can shave peak demand using advanced metering technologies; (4) the State Energy Office should undertake an investigation of the costs and benefits of mandating state appliance efficiency standards; and (5) DLEG should convene a collaborative process to improve the energy efficiency of new construction in Michigan. The first three recommended actions alone are forecasted to reduce peak demand over the next 10 years by 1,330 MW.

B. Statewide Energy Efficiency Program

The Plan recommends that the Commission be authorized to create the Michigan Energy Efficiency Program (MEEP) within the Michigan Public Service Commission. The statewide energy efficiency program would be administered by a third-party administrator (Program Administrator). The Program Administrator would operate in an independent capacity, and not as an officer, employee, or agent of the Commission or the state of Michigan, but under the guidance, budget determinations, and oversight of the Commission.

[47] *See,* The American Council for an Energy-Efficient Economy (ACEEE), and Appliance Standards Awareness Project (ASAP), "Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards," March 2006, available online at http://www.aceee.org/pubs/a062.htm.

Program expenses would be paid out of a new statewide public benefits fund, the Michigan Energy Efficiency Fund (MEEF). The MEEF would be created within the Department of Treasury and administered by the Commission. The MEEF would be funded through uniform electric utility surcharges, set by the Commission. The program's initial funding level will be $68 million annually, adjusted for the subsequent two years at the conclusion of a contested case (with a budget goal of $110 million by the third year of operation). All regulated investor owned utilities, retail electric cooperatives, municipal utilities, and AESs should be required to participate in the statewide MEEP.

There is an inherent conflict of interest between the utilities' dependence on sales for revenues and the need for aggressive promotion of energy efficiency programming. The incentive to increase sales is embedded in the utility, and has posed a significant hurdle in past efforts under utility administered energy efficiency programs. Use of a third-party administrator to manage a statewide energy efficiency program addresses this problem by taking administration of the program out of the hands of the utilities. A third-party administrator allows utilities to focus on their core business of generating, acquiring, and distributing electric energy.

Moreover, the creation of the MEEP allows for a true statewide program scope, resulting in several significant benefits. A statewide program will more effectively bring about change in the culture of energy use in the state. A statewide program also has particular benefits for small utilities, cooperatives and municipal utilities that may not have the sales base to support diverse energy efficiency programs. In addition, retail appliance vendors, businesses engaged in the provision of energy efficiency services, and their customers will benefit from consistent and comprehensive statewide programming. Finally, the economies of scale associated with a single

statewide program administrator will allow the spread of program administrative costs over a large customer base reducing the absolute level of required funding.[48]

Public input would be incorporated by way of the creation of a MEEP Advisory Committee. The MEEP Advisory Committee would be an independent body, appointed by the Chairman of the Commission. The committee would consist of Staff from the Commission, representatives of the regulated utilities, electric cooperatives, municipal utilities, AESs, customer groups, and consumer advocates. While the MEEP Advisory Committee would provide advice, it would have no authority over the Program Administrator. Nevertheless, the MEEP Advisory Committee is viewed as an essential link between stakeholders and the Program Administrator.

The Commission would initiate a competitive Request-for-Proposal (RFP) process to select the program administrator. The criteria for selection would be established in a contested case that will allow for public input. The Program Administrator will have no affiliation with retail electric providers. The Commission will select the Program Administrator, with advice from a five-member Screening Committee, chaired by the Chairman of the Commission, that would include the Director of the Department of Management and Budget, the Director of the Department of Treasury, as well as two outside experts in energy efficiency and programming appointed by the Chairman. The Program Administrator would be governed by the enabling legislation and Commission rules and orders, and would operate under a direct contract with the Commission. The Program Administrator would draw a base salary, but would also qualify for incentive payments for reaching concrete energy savings targets. The contract would be for a period of at least three years, with the possibility of renewal. The contract will define the scope of the services sought and the savings targets.

[48] State government is already carrying out a statewide program pursuant to Governor Granholm's Executive Directive No. 2005-4, *Energy Efficiency in State Facilities and Operations,* which requires reduced energy use in state buildings, and use of energy efficiency measures in state purchasing. In addition, all state capital outlay projects over $1 million must be designed and constructed in accordance with the Leadership in Energy and Environmental Design Green Building Rating System.

The Program Administrator will be compensated from the MEEF, and reimbursed from the MEEF for the actual costs incurred in promoting energy efficiency. The Program Administrator will be allowed to deliver energy efficiency programs either directly or through sub-contractors. The program structure would be reviewed every three years in subsequent proceedings. The Commission would, in the required triennial contested case proceeding, review and evaluate the MEEP, review and adjust the surcharge, develop and improve reconciliation and audit procedures, authorize the development of energy efficiency potential studies, verify savings claims, and review cost/benefit analyses. A summary of findings will be conveyed to the Legislature and Governor every three years, with the first due six months after the end of the initial three-year implementation period.

Money disbursed from the MEEF would be used for expenses related to program administration, education, marketing, research and development grants, evaluation studies and other oversight expenses as determined by the Commission and defined by the contract. In order to minimize adverse ratepayer impact, the MEEF should be permitted to obtain financing from non-utility capital sources such as private foundations, personal or corporate donations, and state or federal funding opportunities. The Program Administrator should be charged with the goal of facilitating the development of independent energy efficiency funding sources.[49]

Program spending in each utility's service territory would, as much as practicable, be proportional to the amount of funding provided by each utility. The Commission would be required to ensure that each utility recovers from its ratepayers and forwards to the MEEF the amounts that the Commission has adopted for the three-year period. Reconciliation of utility payments into the MEEF with amounts collected from customers via the MEEF charge should be done annually, with over or under recoveries carried forward into the next year.

[49] To the extent possible, related energy efficiency programs (such as Pay-As-You-Save™ (PAYS®)) should be administered under the umbrella of the MEEP program.

Michigan has a high level of commercial and industrial electric sales. Large electric users have proficient energy managers who can identify and undertake energy efficiency investments. Therefore, the Plan recommends a large industrial customer opt-out option. Large electric users designated as "manufacturers" with above 1 MW of load will be able to opt out of the statewide program after demonstrating that they have undertaken energy efficiency projects in their own facilities.

C. Load Management and Demand Response Programs

Active load management and passive demand response programs[50] are designed to decrease utility power supply costs by reducing utility peak loads. Load management refers to action taken by the utility to instantly decrease demand. An example of a program using active load management is Detroit Edison's air conditioning cycling program.[51] In this program, once a customer enrolls in the program and the required equipment is installed, the utility can send a signal that interrupts the customer's air conditioner or hot water heater during peak demand times. The customer takes no action (other than signing-up), but reaps the benefit of a reduced rate by allowing for the automatic reduction of demand. These programs have been shown to be very cost effective. Therefore, legislation should authorize the Commission to require utilities to engage in active load management programs.

Passive demand response programs rely on prices to incent consumer behavior. For example, the utility could provide customers with information regarding rates for various times-of-day, and allow the customer to make the decision to selectively limit use at expensive times.

Effective use of passive price controls requires information. In the Midwest electricity markets, wholesale prices are market-driven and can vary significantly from hour-to-hour, day-

[50] The terms active and passive correspond, in this context, to the utility's point of view. Active load management occurs when the utility takes instant action to cut load. Passive demand response occurs when load is reduced through a customer's instantaneous choice, without utility involvement.

[51] Detroit Edison's AC cycling program has approximately 250,000 participants. However, all other energy efficiency programs in Michigan have very low participation rates.

to-day, or season-to-season. There is currently no connection between the movement of wholesale prices and Michigan retail electric rates, because retail rates are generally set on an annual weighted-average cost basis. While these rates produce price stability at the retail level by smoothing out the dynamic movements in utility power costs at the wholesale level, they effectively break the connection between retail demand for electricity and wholesale prices. Thus, retail rates currently mask the impact of a customer's electricity-usage decisions on system costs.

Utilities have significant experience with load management measures, but not with demand response. The Plan recommends that pilot programs investigate passive demand response measures utilizing advanced metering. These pilot programs will assess quantitative impacts, technical feasibility, and operational aspects of these programs, providing both data and practical experience. Both retail customers of the regulated utilities and retail customers of AESs should be able to participate in demand response programs that allow the customer to rely on time-of-day pricing information to cut their demand at expensive times.

Legislation should authorize the Commission to require implementation of demand response programs if the pilot programs demonstrate they are cost effective and in the public interest.

D. Appliance Efficiency Standards

Based on the analysis developed by the ACEEE/ASAP,[52] the Plan proposes consideration of state specific appliance standards for appliance categories not subject to federal regulation, including DVD players and recorders, compact audio products, and walk-in freezers. The Plan proposes that the State Energy Office be directed by the Governor to provide further analysis and recommendations for the development of Michigan-specific appliance efficiency standards.

[52] *See*, *supra*, note 47.

Upon completion of its review, the State Energy Office should file with the Legislature a report and recommendations pertaining to appropriate legislation.

E. Building Code Update

Lighting is a major source of electricity consumption, and improvements in lighting efficiency typically show the largest savings impact of any efficiency program. Updating construction standards can result in highly cost-effective reductions in lighting related energy use. For example, updating the current Michigan Commercial Building Code to ASHRAE 90.1-2004 would provide electricity savings for new commercial construction of about 6 percent of total building electricity use and 25 percent of lighting demand. The incremental construction cost of achieving these savings is actually negative, with construction cost savings averaging 63 cents per square foot for commercial buildings. The Staff found that this is less than what developers are currently spending to comply with the outdated standards.

The Plan proposes that the Governor direct DLEG to conduct a broad based collaborative process, including participants from throughout the energy and construction industries, to improve energy efficiency of new residential and commercial construction. The process would result in recommendations to incorporate energy improvements in new construction, improve the cost-benefit analysis undertaken to evaluate new standards, and develop procedures to facilitate adoption of the latest codes and standards.

V. CONCLUSION

Michigan must have an energy plan that supports and underpins its 21st century economy. This Plan will grow Michigan's economy by making investment in baseload generation possible, and by fostering investment in energy efficiency programming and renewable energy. This Plan enhances the state's use of environmentally sensitive energy resources that will support economic growth and attract new investment, while protecting the

long term reliability and affordability of Michigan electricity. These initiatives will send a signal to the market that Michigan is a good place to do business, and a healthy place to live.

The Plan demonstrates that Michigan can diversify its energy resources by accessing a broad set of assets including renewables and the energy that is available through the use of efficiency measures. This resource diversification will lower the present value cost of powering Michigan's future by up to $4 billion over the next 20 years and lead to reduced dependence on fossil-fueled power plants, while enhancing our electric energy reliability. Without these actions, our state is left simply to buy energy from the wholesale market and hope for the best when it comes to availability and future prices. The Plan will prevent this from happening, and this is no small achievement. While implementation of the Plan will be challenging, it is the most important step the state can take to ensure safe, clean, reliable and affordable electric power for Michigan.

OUTLINE OF RECOMMENDATIONS

I. New Power Plant Construction Financing Program

A. Legislative Recommendations

1. This Plan recommends new legislation that allows a utility to file an integrated resource plan (IRP) seeking a Certificate of Need for construction of a new power plant.

    a. The IRP will include an assessment of alternative means to meet future demand for electricity, the cost of each option, the utility's plans to manage future fuel, environmental, and other risks, and a financial plan for constructing the plant. The IRP must also incorporate energy efficiency and renewable energy targets.

    b. Within 270 days of filing the IRP, the Commission may grant or deny a Certificate of Need. If granted, the need for the plant cannot be challenged in a future proceeding. Once the Certificate of Need is issued, the utility must competitively bid the engineering, procurement, and construction (EPC) costs of the new plant.

    c. Customers returning to full service will receive regulated rates two years from the date of notification that they wish to return. The utility will use its best efforts to provide electric service at market rates during that two-year time period. Customers leaving full service after a Certificate of Need has been granted will carry a surcharge with them for the new plant.

2. All load serving entities will be required to maintain planning reserves; and the Commission will be authorized to penalize entities that do not meet the reserve requirement.

B. Regulatory Recommendations

1. The Commission may, at its discretion, extend its present policy of allowing recovery of financing costs on investments in pollution control equipment to part, or all, new plant financing costs during construction. The new plant would receive rate base treatment only after it began to be used.

2. The Commission should move rates toward each customer class's cost of service.

II. Renewable Energy Program

A. Legislative Recommendations

1. This Plan recommends new legislation that establishes a renewable portfolio standard (RPS) for all load serving entities (LSE) in Michigan of 10 percent of load by the end of 2015. LSEs would have until the end of 2009 to reach the statewide average of 3 percent, and could rely on pre-existing sources. The remaining 7 percent must be new renewable resources, regardless of what percentage of renewables the LSE is currently using. The mix and type of renewable resources is at the discretion of the LSE. The Commission would be empowered to extend the RPS to 20 percent by 2025, after review prior to 2015.

a. Alternate compliance payments (ACP) can be made to the Commission for deposit in the energy efficiency fund by LSEs with fewer than 100,000 customers who cannot meet the RPS, and by LSEs with more than 100,000 customers through 2012. ACP receipts will go into the Michigan Energy Efficiency Fund for use on renewables projects.

b. A utility may seek a waiver from the RPS for one year based on hardship, or if compliance causes rates to rise above an amount deemed reasonable by the Commission.

c. Adoption of a renewable energy credit (REC) program, for use in complying with the RPS. Out-of-state RECs may be used if they produced an air quality or economic benefit to Michigan.

d. The Commission may impose penalties for non-compliance with the RPS.

e. Compliance may be met through any combination of construction or purchase of renewable generation, purchase of RECs, or ACP payments. All reasonable and prudent compliance costs will be approved for cost recovery.

f. The Commission should review the performance and goals of the RPS program prior to 2015, with the goal, if feasible, of extending the RPS to 20 percent by the end of 2025.

2. The Commission should be authorized to adopt distribution system use tariffs for transmitting customer-generated power over a utility's distribution system.

3. Legislation is recommended that will grant residential property owners relief from property tax for solar photovoltaic, wind, fuel cell, or other renewable resource installations.

4. Legislation is recommended that will authorize the Commission to conduct a pilot program to investigate expanded use of solar-generated electricity in Michigan, involving one or more utilities.

5. Legislation is recommended to authorize the Commission to review net metering tariffs available to renewable facilities up to 150 kW in size.

B. Regulatory Recommendations

1. The Commission should undertake an investigation of the cost, and, if deemed feasible, a rulemaking effort to require underground placement of poorly performing existing circuits, all secondary line extensions (and primary lines on the same poles), and primary and secondary lines undergoing reconstruction on rights-of-way.

III. Energy Efficiency Program

A. Legislative Recommendations

1. This Plan recommends new legislation that creates the Michigan Energy Efficiency Program (MEEP), a statewide energy efficiency program under the authority, oversight, and guidance of the Commission, applicable to all load serving entities; and the Michigan Energy Efficiency Fund (MEEF), a statewide public benefits fund created within the Department of Treasury and administered by the Commission. The MEEP will have an initial funding level of $68 million, with a budget goal of $110 million in the third year.

a. An independent Program Administrator will be selected after initiation of a contested case for determining selection criteria, and a competitive RFP process. Final selection will be made by the Commission with advice from a five-member Screening Committee, chaired by the Chairman of the Commission, and including the Directors of the DMB and the Department of Treasury, and two outside experts in energy efficiency appointed by the Chairman. The Program Administrator will operate under a three-year contract, with potential for renewal. The Program Administrator will receive incentive payments for achieving specific energy savings goals.

b. The Program Administrator may conduct energy efficiency programs or subcontract program components.

c. The MEEF will be funded through a nonbypassable surcharge set by the Commission. The selected amount will be collected from all retail ratepayers in Michigan. The MEEF will be used to pay the Program Administrator's salary, costs and incentives (if goals are met). Program spending in each utility's service territory would, as much as

practicable, be proportional to the amount of funding provided by each utility. The Commission will ensure recovery of the required amounts from ratepayers.

d. Every three years, the Commission should conduct a public hearing to review the program and the surcharge, and establish budgets and surcharges for the next three years. A summary of findings will be conveyed to the Legislature and Governor every three years.

e. Large manufacturing customers with billing demands of 1 MW or more of load may opt out of the program on a showing that they have undertaken a self-directed program.

f. The MEEP Advisory Committee would be an independent body, appointed by the Chairman of the Commission. The committee would consist of Staff from the Commission, representatives of the regulated utilities, electric cooperatives, municipal utilities, customer groups, and consumer advocates. The MEEP Advisory Committee would provide advice, but would have no authority over the Program Administrator.

2. The Commission should be provided with authority to require active load management programming immediately, and passive demand response programming by regulated utilities at the conclusion of pilot programs, if they are determined to be in the public interest.

B. Regulatory Recommendations

1. An Executive Directive should be issued to commence a collaborative process to assure that energy efficiency improvements will be incorporated into new Michigan residential and commercial construction. Upon completion of the collaborative process, the Department of Labor & Economic Growth should file a report with recommendations to the Legislature.

2. The State Energy Office should analyze and develop state appliance efficiency standards and file a report with the Legislature.

3. The Commission should commence a "Notice of Inquiry Into Demand Response Programs" to initiate a statewide collaborative process culminating in pilot demand response programs incorporating advanced metering technologies.

LIST OF ACRONYMS/TERMS

Acronym/Term	Definition
AC	Alternating current
ACEEE	American Council for an Energy-Efficient Economy
ACP	Alternate compliance payment – payments made to the Commission by load serving entities in lieu of meeting the RPS.
AEP	American Electric Power
AES	Alternative electric supplier
ASAP	Appliance Standards Awareness Project
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ATC	American Transmission Company
Baseload	Plants that are intended to run constantly near capacity levels. Such plants are highly capital intensive to build, but have low operating costs.
CHP	Combined heat and power
CNF	Capacity Need Forum
Commission	Michigan Public Service Commission
Consumers Energy	Consumer Energy Company
DEQ	Michigan Department of Environmental Quality
Detroit Edison	The Detroit Edison Company
Distributed generation	Small scale, non-utility generation that provides power at a site closer to the customers.
DLEG	Department of Labor & Economic Growth

Acronym/Term	Definition
EPA	Environmental protection Agency
EPC	Engineering, procurement, and construction
EPSA	Electric Power Supply Association
Full service	Customers who take both generation and distribution services from the utility.
GW	Gigawatt – a unit of power equal to 1,000 megawatts or one billion watts.
GWh	Gigawatt hour – a unit of energy equal to 1,000 megawatt hours.
Hybrid	Refers to the fact that Michigan has both a regulated electricity market and a competitive electricity market.
IGCC	Integrated gasification combined cycle
IOU	Investor owned utilities
IPP	Independent power producers
IRP	Integrated resource plan
ITC	International Transmission Company
kW	Kilowatt –a unit of electrical power equal to 1,000 watts.
kWh	Kilowatt hour – the basic unit of electric energy. It equals the total energy developed by the power of one kilowatt supplied to or taken from an electric current steadily for one hour. 1,000 watts consumed for one hour equals a single kilowatt hour.
LOLP	Loss of load probability
LSE	Load serving entity
MEEF	Michigan Energy Efficiency Fund
MEEP	Michigan Energy Efficiency Program

Acronym/Term	Definition
METC	Michigan Electric Transmission Company
MISO	Midwest Independent Transmission System Operator, Inc. – the independent transmission organization serving Michigan.
MW	Megawatt – a unit of electric power equal to 1,000 kilowatts or one million watts.
MWh	Megawatt hour – a unit of energy equal to 1,000 kilowatt hours.
NAPEE	National Action Plan for Energy Efficiency
Operating Reserve	Operating reserve is the generating capability above firm daily system demand needed to cover potential shortages caused by daily load forecasting errors, scheduled and unplanned equipment outages, and local area protection. Operating reserves are provided by quick-start gas or oil fueled units that can be brought on-line within 10 minutes or less. The operating reserve is a subset of the planning reserve.
PAYS®	Pay-As-You-Save™
PV	Photovoltaic
Plan	21st Century Electric Energy Plan
Planning Reserves	Planning reserve is the difference between a utility's electric generating capacity (usually expressed in MW) and its anticipated annual peak load. The planning reserve assures that sufficient generation will be available over a longer period of time to meet load growth and unanticipated surges in demand caused by unusually hot or cold weather; and covers major, longer-term contingencies like the loss of a major generating unit or transmission line.
PM2.5	Particulate matter of 2.5 micrometers or less
PPA	Power purchase agreement
RFP	Request for proposal
RPS	Renewable portfolio standard
REC	Renewable energy credit
Wolverine	Wolverine Power Cooperative, Inc.