State Notes

TOPICS OF LEGISLATIVE INTEREST

Spring 2015

Overview of Governor Snyder's Special Message on Energy
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Introduction

On March 13, 2015, Governor Rick Snyder delivered a special message on energy, "Ensuring Affordable, Reliable, and Environmentally Protective Energy for Michigan's Future", which offered a wide-ranging framework for the electricity and natural gas market in Michigan. The message covers the prices of electricity and natural gas, a discussion of the impacts of energy waste in the current system, concerns over electric and natural gas retail reliability, an outline of the energy system composition, and a section on environmental protection. The message also provides several "call to action" options for corrective behavior. This article will analyze some of the electricity and natural gas proposals in Governor Snyder's special message and examine experiences in other states. According to the U.S. Energy Information Administration (EIA), in 2012, Michigan produced 2,683 trillion British thermal units (BTU).[1] Twenty-six percent of Michigan's energy consumption is in the transportation sector, which is not a direct part of the Governor's special message. Within the special message there are four main themes with specific items in each theme. This article reviews a few of the topics in the special message including: energy waste, on-bill financing, and potential changes resulting from the Clean Power Plan.

Background

Setting energy policy and, more precisely, electricity and natural gas policy, often involves the use of key words like "affordability", "reliability", "clean", or "environmentally friendly" to demonstrate priorities and overall goals for a policy. On the surface, the following are typical statements for many energy policy initiatives in the United States:

"…Michigan's energy policy…will continue to safeguard Michigan consumers and utilities by ensuring an adequate energy supply at reasonable rates."[2]

"WHEREAS, it is critical to the public health, safety, economic welfare of the State of Michigan to have reliable, safe, clean, and affordable supplies of energy;"[3]

"We need to make sure that when we make those decisions, we have the right process to ensure the decisions focus on the pillars of a strong energy future: affordability, reliability, and protection of the environment."[4]

These priorities and goals are at times in conflict with each other. For example, if an energy system is to be reliable, it must build in excess supply that may be used only for a few hours on a few days per year. That means that the costs to keep these "peak" plants operational are charged to the ratepayer even if those plants never provide any load to the grid in a given year.

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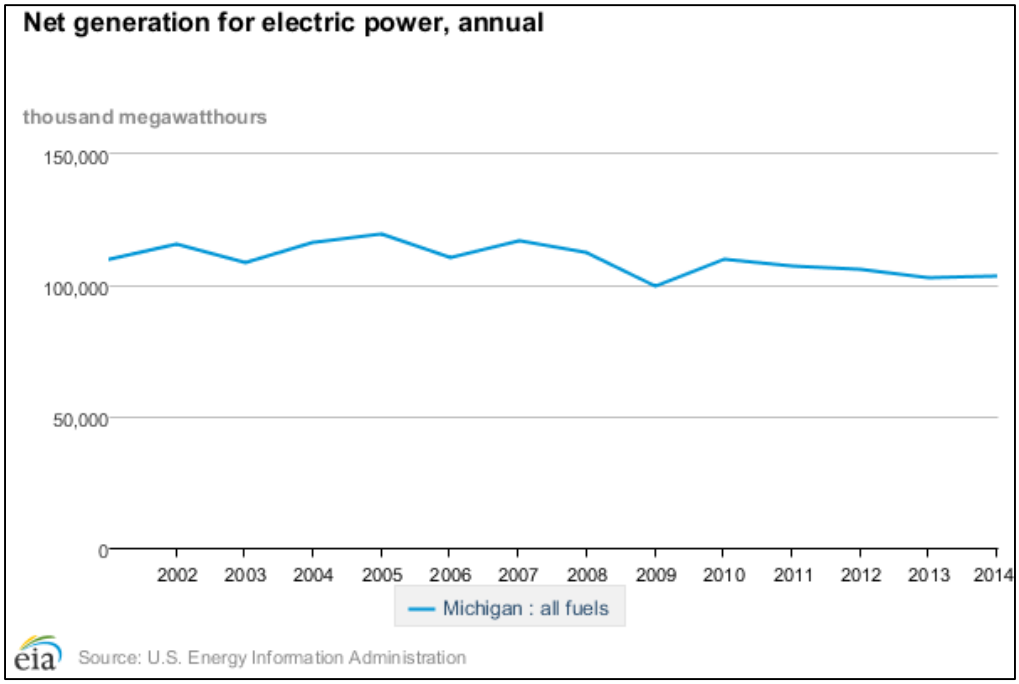
[1] U.S. Energy Information Administration, Michigan, State Energy Data Systems (SEDS)
[2] Governor John Engler, *South Bend Tribune* Michigan Briefs (Indiana), January 11, 2001
[3] Governor Jennifer Granholm, 21st Century Energy Plan - Executive Directive No. 2006-2, April 6, 2006
[4] Governor Rick Snyder, "Ensuring Affordable, Reliable and Environmentally Protective Energy for Michigan's Future"

Any electricity or natural gas policy will involve trade-offs to optimize the "values" and "norms" for a given system. Constraints are imposed by a fixed infrastructure delivering commodities, necessitating a required profitable rate of return for the utility. This ensures that supply is available when it is needed. Under this type of market, in Michigan from 1960 through 2000[5], total energy used in the electric power sector increased by 270%, but from 2000 to 2012 the increase was only 2.9%. (See Appendix 1.)

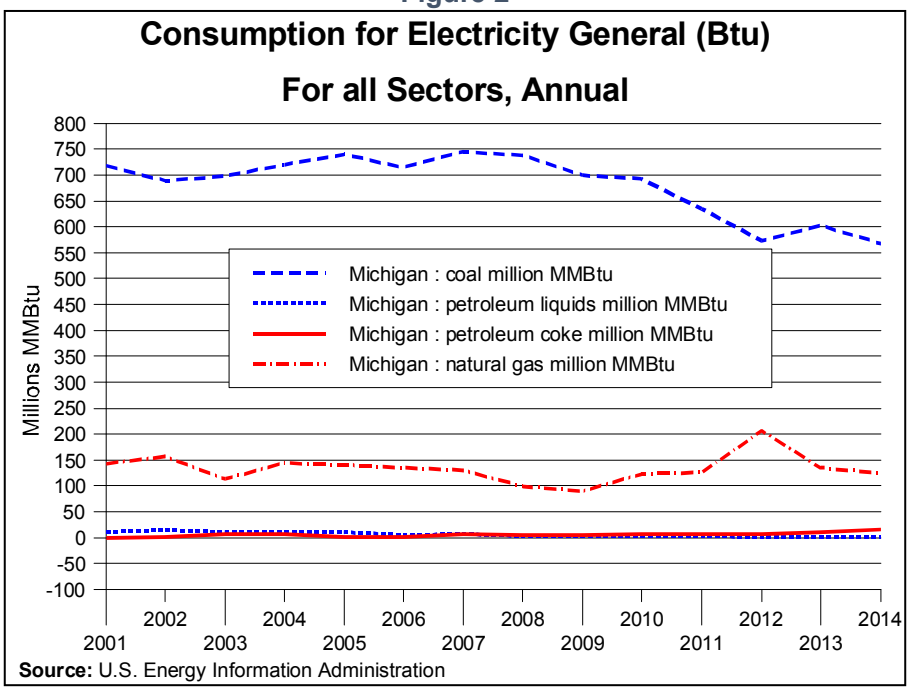
While this slow growth corresponds to recessionary pressures in Michigan, the growth in electricity demand has slowed nationwide. As stated in the 2014 U.S. Energy Information Administration's Annual Energy Report: "Growth of electricity demand (including retail sales and direct use) has slowed in each decade since the 1950s, from 9.8%/year from 1949 to 1959 to only 0.7%/year since 2000."[6] (See Figures 1 and 2.) As electricity demand has stagnated, the ability to spread capital cost across a growing ratepayer base has been diminished; this means that any new generation asset is paid for by a fixed pool of ratepayers. Both net electricity generation and natural gas consumption have seemingly hit a plateau in Michigan. (See Appendix 2.) To replace aging generation assets required to meet minimum base load requirements as well as Federal standards, utilities nationwide must determine the proper allocation of capital and the resulting cost recovery plans. Optimizing the utility business and impacts on society under several constraints creates trade-offs under which priorities of stakeholders will be debated and ultimately lead to a policy framework.

Figure 1



[5] See Note 1
[6] http://www.eia.gov/forecasts/aeo/MT_electric.cfm

Figure 2



Source: U.S. Energy Information Administration

Waste Elimination

Elimination of energy waste, otherwise known as energy efficiency, is projected by the Governor to replace 15% of the State's electricity generation portfolio. The assumption underlying this claim is that there are static energy efficiency savings. In other words, energy saved through efficiency will not be used elsewhere. This assumption is missing a factor, often cited in discussions of increased energy efficiency, known as "the rebound effect". As stated in an editorial in the journal *Energy Policy*: "In its broadest sense, the rebound effect is simply the interaction of energy use with the efficiency of energy use: lower the energy required to do something, and you will do a bit more of that thing."[7]

In practice, the "rebound effect" occurs as an individual operates more energy-efficient products, the per-unit cost of energy declines and, because the marginal cost to operate the product declines, the individual may use more of that product, thus negating some of the energy savings. Though the overall magnitude of the "backfire" or the increased energy use from productivity gains is in dispute[8], the underlying principle that reduction in the implicit energy price will lead to increased demand is fairly well accepted in the literature. Policymakers should keep the "rebound effect" in mind if there is an assumption of large energy savings in any electricity policy framework.

If the goal is 15% reduction from the elimination of energy waste, building in a minor direct and indirect rebound effect of 20% means that a 15% goal from efficiency savings would need a total of 18.75%

[7] Schipper, L., "On the rebound: the interaction of energy efficiency, energy use and economic activity. An introduction." *Energy Policy*, Volume 28, 2000 p. 351-353.

[8] Khazzoom , J. Daniel, "Economic Implications of Mandated Efficiency in Standards for Household Appliances", *Energy Journal*, Volume 1, issue Number 4, p. 21-40 (1980).

savings from the base. If the 15% is the baseline target, the overall energy savings will likely be in the neighborhood of 12% due to the increased demand resulting from an effective lower price. As the assumed savings from waste reduction increase and the implicit price of energy declines, the direct and indirect financial impact from increased energy productivity becomes more uncertain. Static analysis of energy savings requires an effort to estimate the baseline or an expectation that the overall savings will be lower than the baseline goal. At a high level, if legislators rely on a reduction in energy due to more efficiency, building in an assumption of a "rebound effect" is reasonable to estimate the probable impact of that policy.

On-Bill Financing (OBF)

Innovations in energy efficiency financing have led several states, such as California, Georgia, Kentucky, and Minnesota, to create OBF regimes with utilities, public finance entities, and nonprofit groups.[9] In Michigan, Public Act 408 of 2014 updated the mechanism for municipalities to establish energy efficiency programs for residential consumers in municipally owned electric service areas. Previously, this program had been available only to commercial and industrial customers.[10] Additionally, Cherryland Electric Cooperative had participated in an OBF program administered through Members First Credit Union.[11]

The basic idea entails an investment that will deliver energy savings. The debt for the new asset is serviced from the difference between the existing energy cost and the new energy costs from the more efficient asset. The reduction of the energy use becomes realized when energy efficiency improvements are made to the property. In the short run, there is no net reduction in the monthly bill for a ratepayer though there is a reduction of the overall consumption of electricity. Over the long run, with all other things equal, once the note is paid in full the monthly bill would decline. The amount of energy savings likely has an inverse relationship to the total upfront cost of the improvements. As the cost of the improvements increases, the length of the loan increases and the risk to the lender increases as well.

In some states, the utility acts as the lender and, in other states, nonprofit and other quasi-governmental organizations operate as the loan administrator.[12] Some of the advantages for the utilities to provide the OBF programs are obtaining data on the effects of upgrades for energy efficiency and using that information to assist in load planning. Additionally, if the utility is broadening business units into an energy services area, the knowledge gained from an OBF program may allow the utility to operate in a wider consumer space.

One issue that has been raised with the expansion of OBF into multifamily dwelling segments is the practicality of tying the debt to the meter. If a tenant participates in an OBF program without the consent of or advanced notice to the landlord, there may be difficulties with the liability for the obligation if the tenant surrenders the dwelling before the debt is completely serviced. At the outset, if the landlord takes depreciation associated with that asset, it may be difficult for the tenant to install a new furnace.

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[9] http://www.ncsl.org/research/energy/on-bill-financing-cost-free-energy-efficiency-improvements.aspx

[10] Public Act 408 of 2014 enacted the Michigan Utility Residential Clean Energy Program Act (MCL 460.961-460.971). A description of the legislation is available on the Michigan Legislature website: http://www.legislature.mi.gov/documents/2013-2014/billanalysis/Senate/pdf/2013-SFA-5397-L.pdf

[11] http://www.michigan.gov/documents/dleg/tidbitsmay_319906_7.pdf

[12] Ibid.

In a sub-metered apartment where electricity and natural gas charges are added to the rent, this problem is mitigated if the landlord participates in the program. Designing a policy that defines property rights and aligns incentives is critical to the success of an OBF program.

A related area of energy waste elimination financing is known as Property Assessed Clean Energy (PACE)[13]. This method is similar to the on-bill finance regime, but the upfront loan is specific to the property itself rather than to the owner[14]. In Michigan, there are currently two PACE programs operating: one in Ann Arbor and the other in Eaton, Genesee, Grand Traverse, Huron, Ingham, Macomb, Saginaw, Washtenaw, and Wayne Counties.[15] This method has a better track record with commercial properties compared to residential property.

With respect to single-family residential properties, the Federal Housing Finance Agency (FHFA) has issued statements concerning the priority of lienholders. "While FHFA supports energy retrofit financing programs to allow homeowners to improve energy efficiency, these programs must be structured to ensure protection of the core financing for the home and, therefore, cannot undermine the first lien-status of Fannie Mae and Freddie Mac mortgages...In issuing this statement, FHFA wants to make clear…that Fannie Mae and Freddie Mac's policies prohibit the purchase of a mortgage where the property has first-lien PACE loan attached to it."[16] This clarification statement makes participation in the PACE program very difficult for any single-family owner-occupied residential dwelling that has a mortgage. The more likely participants are industrial and commercial building owners that have larger returns from any energy efficiency investment and are not subject to FHFA rules.

Demand Response

One area mentioned in the affordability section of the Governor's special message is demand response or "peak shaving". These strategies are also known as management of the demand side of the electricity market. The main feature of any demand response program is to "…modify [reduce or shift] electricity customer electricity demand".[17] Demand response can be used as a resource planning tool to address electricity or natural gas prices by giving mainly large base load consumers an incentive to shift demand to an off-peak time. These types of programs have the ability to address the issue of resource adequacy without building new generation sources. There are two paths that the demand response programs can follow[18]:

- Direct cost recovery: a regulator-approved structure to facilitate the direct program operation of any demand side management program.
- Performance-based incentive: an allowance for a utility to realize a return for any avoided cost from demand management activities.

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13 http://energy.gov/eere/slsc/property-assessed-clean-energy-programs
14 http://www.nrel.gov/docs/fy10osti/47097.pdf
15 http://www.pacenow.org/resources/all-programs/#Michigan
16 http://www.fhfa.gov/Media/PublicAffairs/Pages/Statement-of-the-Federal-Housing-Finance-Agency-on-Certain-Super-Priority-Liens.aspx
17 http://www.dleg.state.mi.us/mpsc/electric/workgroups/demandresponse/aug3_07dte_dr_whitepaper.pdf
18 https://www.michigan.gov/documents/energy/Energy_Efficiency_Question_19_response_from_DTE_418741_7.pdf

One example of a demand response program is for thermostats to "speak" with grid administration and change air conditioner cycle frequencies on days in which the demand peaks are the highest, and thus manage the highest part of the peak in order to maintain grid integrity.

Another idea is that, with the deployment of smart-grid technologies, there is a capability for both real-time pricing and time-of-use pricing for consumers. Both of these pricing mechanisms can create incentives for consumers to shift their demand to off-peak hours when prices are lower. The result of increased demand in off-peak hours is a higher use of base-load generation and thus a greater return than otherwise would be realized. The more the demand is shifted in the intra-day time period, the less the need exists for construction of peak plants. Therefore, in theory, a lower rate for consumers will result. Demand-side management programs and deployment of "smart" home devices enable consumers to receive a more accurate cost of service electricity or natural gas tariff. Policymakers could evaluate the attractiveness of these types of programs and determine whether they fit into Michigan's policy choices.

Potential Responses to Clean Power Plan

On June 2, 2014, President Obama proposed a draft rule seeking to reduce carbon dioxide (CO_2) emissions by 30% below 2005 levels. This rule is known as the Clean Power Plan (CPP). The regulation, which is scheduled to be completed sometime in 2015, uses the Clean Air Act (CAA) as the legal mechanism to regulate carbon dioxide emissions from existing power plants. In 2007, the U.S. Supreme Court ruled, in *Massachusetts v. Environmental Protection Agency* (549 U.S. 497), that the Environmental Protection Agency (EPA) has the ability under Section 202(a)(1) of the CAA to regulate carbon dioxide. According to the decision, the EPA has the ability to regulate CO_2 if, in the EPA administrator's judgment, "air pollution may reasonably be anticipated to endanger public health or welfare". In December 2009, the EPA administrator found that current and projected future concentrations of CO_2 would endanger the public health and welfare of current and future generations. The ruling in *Massachusetts v. Environmental Protection Agency* has led the EPA to issue further restrictions on carbon dioxide emissions. Before the rule was proposed in June 2014, the most recent carbon dioxide regulation was an EPA proposal that would have placed emission restrictions of 1,100 pounds of CO_2 per megawatt hour on new coal-based power plants. The June 2014 proposed rule would expand the September 2013 CO_2 regulation for new plants and additionally regulate existing power plants.

Since the rule is primarily targeted at reducing the amount of carbon dioxide produced per megawatt hour of electricity generated, there are different approaches that the State of Michigan could take to meet the statewide threshold set under the draft rule. In order to allow states to determine their own path to reach the proposed CO_2 standards, the EPA has identified four "building blocks". These building blocks are formulated with the CAA in mind. The CAA provides for the EPA administrator to determine whether "…the best system of emission reduction…has been adequately demonstrated", to ensure that states will reduce pollution that has been identified.

The four building blocks that the EPA outlines are:

1) Making fossil fuel power plants more efficient.
   The EPA's example is making coal plants produce less CO_2 per unit of electricity generated.
2) Using more of low-CO_2 emitting sources.
   The example the EPA gives is using more natural gas in the fuel mix of the electricity generating portfolio.

3) Dispatching a greater number of zero- and/or low-emitting power sources.
   The EPA states that the use of nuclear, wind, solar, and hydroelectric power are ways to achieve this building block.
4) Increasing the efficiency of existing electricity generation.
   The EPA states that a 1.5% annual increase in efficiency would meet this pollution reduction strategy.

Additionally, the EPA allows states to choose whether the reduction is measured in percentage terms or in total amount of carbon dioxide. If a state chooses to reduce total emissions, it can set targets with other states and develop a regional regime to achieve the CPP standard that has been set by the EPA.

Given revisions of previous EPA rules on CO_2 and the CAA, there is a high likelihood that the draft rule will be revised and updated. Under the current draft rule though, the anticipated decision dates for submission of State Plans are as follows:

1. June 30, 2016 – Initial plan or complete plan due
2. June 30, 2017 – Complete individual plan due if state is eligible for a one-year extension
3. June 30, 2018 – Complete multistate plan due if state is eligible for two-year extension (with progress report due June 30, 2017)

The CPP Rule and Michigan

Under the proposed rule, each state will receive a state-specific goal that it must reach by 2030 with "meaningful progress" toward reductions by 2020. Each state will receive a targeted number of pounds of CO_2 per megawatt hour of electricity generated. In 2012, Michigan had 1,690 pounds per megawatt hour. Under the proposed rule, the State will have to meet a standard of 1,161 pounds per megawatt hour of electricity generated. This is a reduction of 31.3% in the CO_2 produced on a per-megawatt-hour basis. In the context of surrounding midwestern states, this is near the average in terms of the reduction required to meet the draft rule.

With the flexibility granted to the states under the draft rule, Michigan has the ability to craft policy and standards that are based on the recommendations of stakeholders and ultimately approved by the Legislature. The states have been issued different sets of reductions according to a formula (which bases the emissions rate on a total amount of CO_2 emissions divided by the amount of electricity generated in that state), as well as how well the states could meet a reasonably set emissions target.

With the target emission in place, the states have the opportunity to determine the policy that will achieve the emissions reduction outcome. If a state refuses to comply with the rule, the EPA will likely mandate a plan independently and, since a Federal agency will be operating within a state, the plan will have a lower degree of flexibility, and achieving the compliance standard could be more costly if it is set by EPA. If the rule survives the legal challenges that are expected, without a Michigan-specific plan, the State risks Federal oversight and an uncertain outcome for coal-fired electric-generating plants in the State.

Depending on the final outcome of the EPA/CPP rule-making process, there might be restrictions on the operational ability of existing coal generation, which could affect coal generation assets in Michigan. One proposed solution to avoid the potential Federal decrees of the CPP is through a multistate compact. The framework created by EPA allows states to partner with each other and with

the various stakeholders in the states to develop and administer feasible programs to meet the CO_2 emissions standards set by the EPA for existing power plants. This regime could safeguard a state's rights in the policy architecture and authority.

One advantage to a multistate compact is that many states may find it advisable to participate because "electric systems and electrical resources are commonly shared across state boundaries".[19] One analysis has pegged the cost of the 2030 marginal CO_2 abatement costs without regional cooperation for Michigan at $36 (in 2011 dollars per ton).[20] With Pennsylvania at $39 (in 2011 dollars per ton), Michigan ranks second-highest in abatement costs (without cooperation) compared with other geographically and economically similar states (Wisconsin $33, Minnesota $32, Indiana $13, Ohio $11, Illinois $6, and Iowa $0, all 2011 dollars per ton).[21] Depending on how the regional compacts are structured, the generation assets may have incentives to be located in states with the lowest estimated abatement costs. This is an area in which legislators and policymakers will need to stay well-informed in order to mitigate the risks of any policy action.

Table 1

Selected States Clean Power Plan Compliance Plan			
State	**2012 Rate (lbs/MWh)[22]**	**2030 Estimated Goal (lbs/MWh)[23]**	**Potential % Change**
Minnesota	1,470	873	(40.6)
Wisconsin	1,827	1,203	(34.2)
Illinois	1,894	1,271	(32.9)
Michigan	1,690	1,161	(31.3)
Pennsylvania	1,531	1,052	(31.3)
Ohio	1,850	1,338	(27.7)
Indiana	1,924	1,531	(20.4)

Source: EPA, Clean Power Plan, technical support data file

Conclusion

Governor Snyder's special message on energy mentions many strategies and goals. As the topics discussed in this paper demonstrate, there are a number of issues that legislators and policymakers will need to be aware of in the next few years. Depending on how the special message is translated into specific legislation, there are many different impacts that the overall plan may have on Michigan.

There are several considerations to be made and the acknowledgement of trade-offs is a first step in ranking priorities and goals for any policy. Though many ideas have been offered as a solution in the past, most if not all have been unachievable. Though a simplification, the basic question becomes, for any electric or natural gas market, is the market designed to service the marginal peak demand or to cover only the baseline energy needs? If the desire for reliability becomes the priority of the system, will customers accept a higher cost than if the priority of the market were to deliver the lowest rates?

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[19] http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Analysis_Group_EPA_Clean_Power_Plan_Report.pdf

[20] http://www.brattle.com/system/publications/pdfs/000/005/025/original/EPA%27s_Proposed_Clean_Power_Plan_-_Implications_for_States_and_the_Electric_Industry.pdf

[21] Ibid.

[22] http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-goal-computation.pdf

[23] Ibid.

If the system is designed to create the lowest possible rates for consumers, will ratepayers accept the risk that all of their needs might not be met on the days with the highest demand? These are difficult questions for legislators and policymakers, but a recognition of the trade-offs between priorities should frame any debate involving complex decisions and outcomes.

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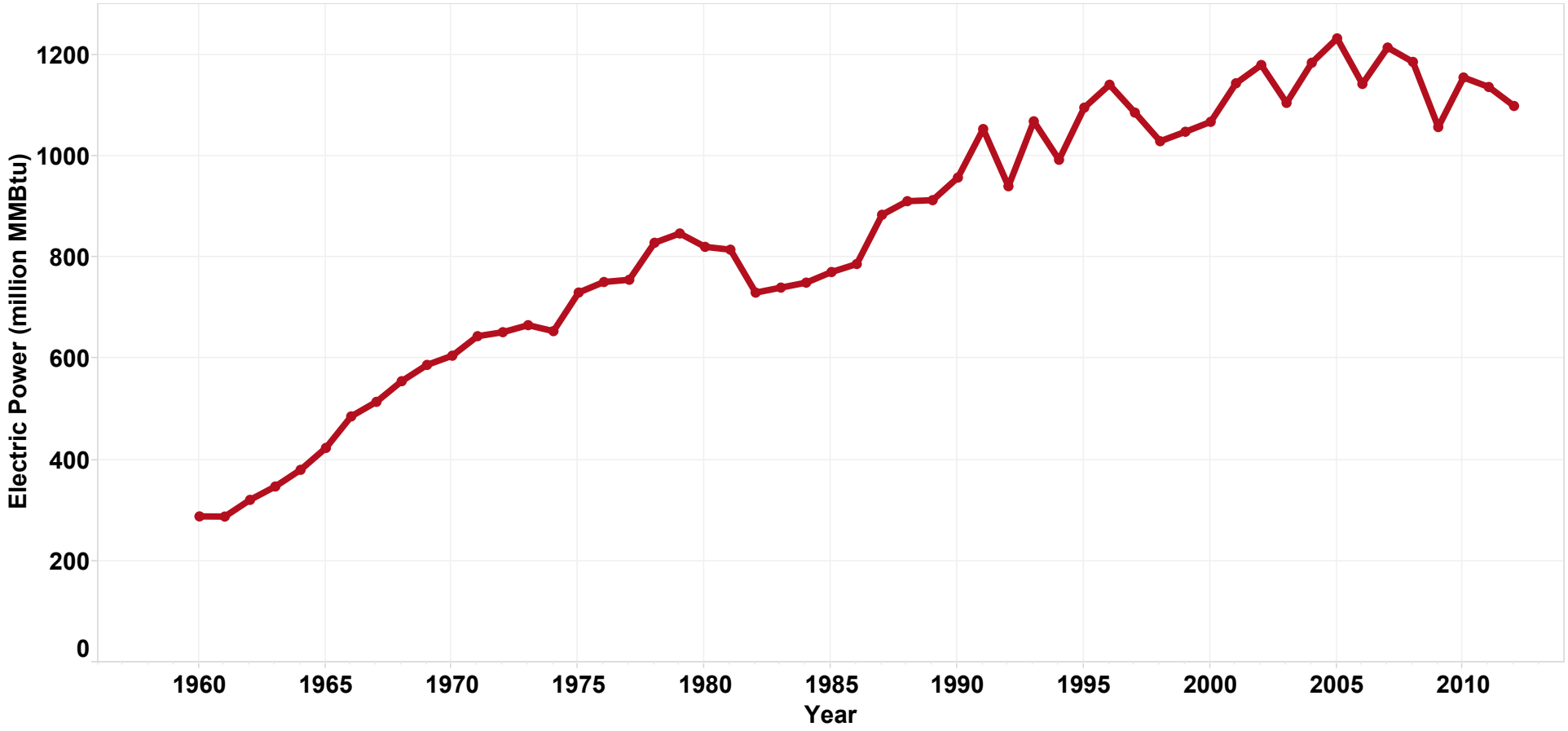
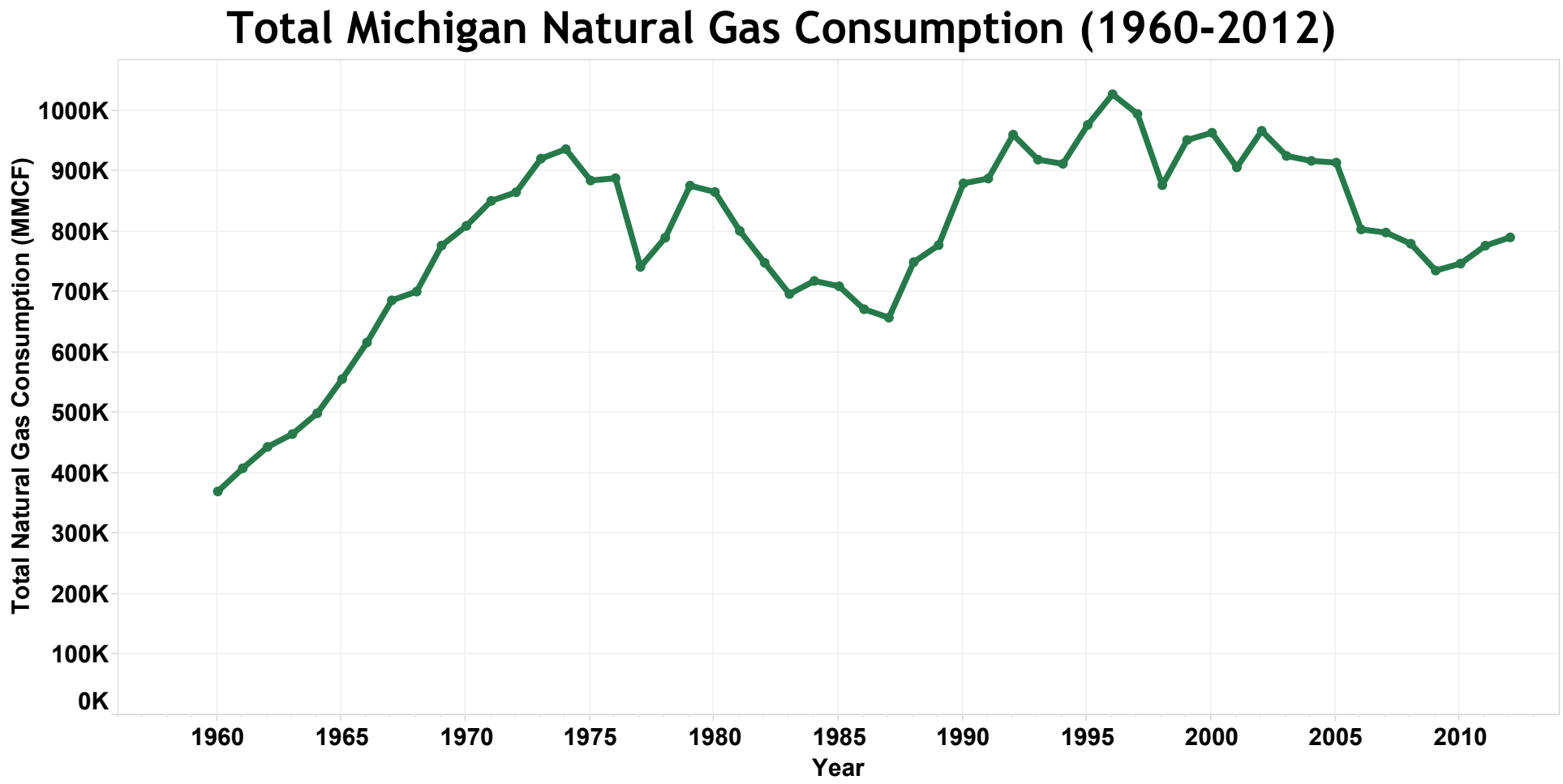
Total Michigan Electric Power Consumption 1960-2012



Appendix 1


Total Michigan Natural Gas Consumption (1960-2012)
Total Natural Gas Consumption (MMCF)
1000K
900K
800K
700K
600K
500K
400K
300K
200K
100K
0K
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Year

Appendix 2