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Integrated Resource Plan

Executive Summary

Consumers Energy Company (“Consumers Energy” or the “Company”), prepared this Integrated Resource Plan (“IRP”) to evaluate the projected energy and capacity requirements of its electric customers through 2040, and to identify the most cost-effective means of meeting those requirements. The IRP considers customer costs, energy and demand requirements, electric system reliability, fuel source diversity, operational flexibility, regulatory and economic risk, and environmental considerations under an array of future scenarios and sensitivities in determining the most reasonable and prudent means to provide customers with an economic and reliable supply of electricity for the next 25 years.

The results of this analysis show a large need for capacity and energy supply beginning in April 2016. The need for new power supply is primarily caused by the planned suspension of operations of seven of the Company’s smaller coal-fueled electric generating units (“Seven Small Coal Units”). The loss of the Seven Small Coal Units reduces the Company’s baseload electric generation resources by 926 MW (17%).

The suspension of operations of the Seven Small Coal Units is caused by enforcement of the U.S. Environmental Protection Agency’s 2012 Mercury and Air Toxics Standards (“MATS”). The Company determined that installing air quality control systems on the Seven Small Coal Units necessary to meet MATS emissions requirements is uneconomic compared to other electric resource alternatives. The MATS rule takes effect on April 16, 2015, and imposes stringent limitations on emissions of mercury, acid gases, certain metals, and organic constituents from coal and oil fueled electric generating units. The Company requested and was granted an extension of the compliance date for ten of its twelve coal-fueled generating units to April 16, 2016, by the Michigan Department of Environmental Quality. Accordingly, the operation of the Seven Small Coal Units will be suspended by April 16, 2016.

The analysis conducted for this IRP shows that the combined need for both electric energy and capacity is best met with a high capacity factor resource. The resource type that most economically fills this need is a natural gas-fueled combined cycle electric generating plant with a nominal output of approximately 700 MW.

The Company’s resource planning department personnel conducted a detailed and robust analysis for this IRP that included five distinct alternative scenarios that are based on a wide range of different assumptions about future operating, regulatory, and economic conditions. The scenarios analyzed included:



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- a “Business As Usual” Scenario based on a future in which policies and economic conditions continue on their current trajectory without substantial deviations;
- a “Distributed Generation” Scenario where lower cost distributed generation technologies challenge the traditional hub and spoke model of central generation and the complex transmission and distribution systems over time;
- a “Deregulation” Scenario with greater choice in customer electric supply options;
- a “Legislation and Regulation” Scenario where more renewables and energy reduction programs are driven by federal and state policies;
- an “Abundant Natural Gas” Scenario where low cost and abundant domestic natural gas resources are available and federal and state policies are adopted favoring natural gas as the fuel of choice.

Additionally, fifteen sensitivities were analyzed in conjunction with these scenarios. These sensitivities were evaluated to ensure that the IRP was robust and adequately considered the resource planning impacts of a breadth of possible future conditions. These sensitivities include: high and low growth of customer demand, higher levels of energy optimization, increased demand response resources, increased renewable portfolio standards, introduction of carbon emission cap and trade programs, high and low natural gas prices, higher and lower retirements of Michigan and Midcontinent Independent System Operator (“MISO”) generation resources over the study time horizon, lower market capacity prices, and higher reserve margin requirements. Not all sensitivities were analyzed in conjunction with all scenarios. This array of scenarios and sensitivities covers the likely range of possible uncertainties that the Company’s customers face in the future, and constitutes a robust analysis of the risk inherent under different future conditions that affect resource decisions.

A comprehensive array of resource options were evaluated in the analysis that included natural gas-fueled electric generation resources of both simple cycle combustion turbine and combined cycle technology, advanced supercritical pulverized coal resources with and without carbon capture and sequestration, integrated gasification combined cycle resources, nuclear resources, renewable wind powered generation resources, and market capacity and energy purchase alternatives. This array of possible generation technologies was developed after applying screening criteria to a larger set of potential resources. The screening criteria included commercial availability, cost, scale, resource type (e.g., peaking, intermediate, baseload), and technical viability. In addition, under several of the scenarios and sensitivities, increased levels of demand side management resources including energy optimization, demand control and demand response were included. Several potential opportunities to purchase an existing facility were considered. These were ultimately rejected due to customer rate impacts, long-term economics, the lack of Michigan Job creation/positive impact on the local economy, operational



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and environmental risk considerations, and other factors. Finally, a specific project proposed to be located in Thetford Township, Genesee County, Michigan, was also considered in the analysis. This project is a 2x1 natural gas-fueled combined cycle plant (two combustion turbine – electric generator sets exhausting into two heat recovery steam generators feeding a single steam turbine - electric generator set) of approximately 700 MW in size. This unit was included in the analysis because of unique site specific cost and system advantages that were not necessarily applicable to the generic combined cycle options of similar size that were also considered.

These resources were subjected to a rigorous series of modeling analyses using the Strategist® resource optimization software developed by Ventyx Inc. Economic and regulatory assumptions made under the scenarios and sensitivities for Consumers Energy’s electric distribution system were also applied to the Lower Peninsula of Michigan and the MISO footprint. Each scenario was developed using the Strategist optimization model.

This analytical framework yielded a set of outcomes from which the Company selected twelve distinctly different resource plans for each of the five scenarios and fifteen sensitivities. The results from this analysis strongly indicates that the best plan of action for Consumers Energy’s customers is to develop a nominal 700 MW natural gas-fueled combined cycle generating plant with a commercial operation date of mid-2017 and purchase short-term capacity and energy from MISO markets to satisfy remaining demand plus reserve requirements. Additionally, siting the combined cycle plant at the Thetford site offered more economic benefits than comparable generic combined cycle plants of similar size and configuration due to the existence of significant electric transmission and natural gas transmission facilities terminating at the Thetford site. The IRP also indicates that additional resource acquisition steps will be required in the future, which could include additional natural gas-fueled or renewable energy generation, additional market purchases, or additional demand reduction actions. The analysis performed for this IRP has generated a resource plan that is consistent with Michigan’s statutory requirements and the Michigan Public Service Commission’s Order in Case No. U-15896, and will help Consumers Energy continue to provide customers with reliable and cost effective electricity service.