8.4 TRANSMISSION GRID IMPACTS

Analyze and document the cost of any transmission grid upgrades or additions needed to address transmission grid reliability, stability, or voltage support impacts that could result from the retirement of any existing GMO coal-fired generating unit in the time period established in the IRP process.

Response: The GMO coal units identified for potential retirement in the IRP plan are Sibley Units 1, and 2, and Lake Road 4/6. The transmission grid impact of retirement of these small units should be minimal. Retirement of any of the larger GMO coal fired generators would necessitate the replacement of that supply with some other resource. It is not possible to identify all the necessary transmission upgrades that might be associated with retirement of a specific generating unit without knowing the specific location of the replacement generation. From the transmission perspective, the most advantageous location for replacement generation is the site of the retired generation where the transmission capacity utilized by the retired generation would be available for new resources.

8.5 DISTRIBUTED GENERATION POTENTIAL

Analyze and document the range of potential levels of distributed generation in GMO's service territory for the 20-year planning horizon and the potential impacts of each identified level of distributed generation, and in particular distributed solar generation, on GMO's preferred resource plan. The potential impacts should quantify both the amount of electrical energy the distributed generation is expected to provide to the grid and the amount of electrical energy that the distributed generation customers are expected to consume on site that will offset the amount that the company would normally provide to those customers.

Response: There is a substantial amount of uncertainty regarding distributed solar PV generation over a 20 year planning horizon. Nearly 100% of GMO's existing distributed solar generation is attributed to the Missouri law in which GMO paid up to $2.00/watt in rebates for customer installed solar generation. Pursuant to that Missouri law, a one-time rebate cap was established not to exceed $50M. Those funds were all committed in November of 2013 and have since been exhausted. Distributed solar generation installations as a result of the rebates realized its peak

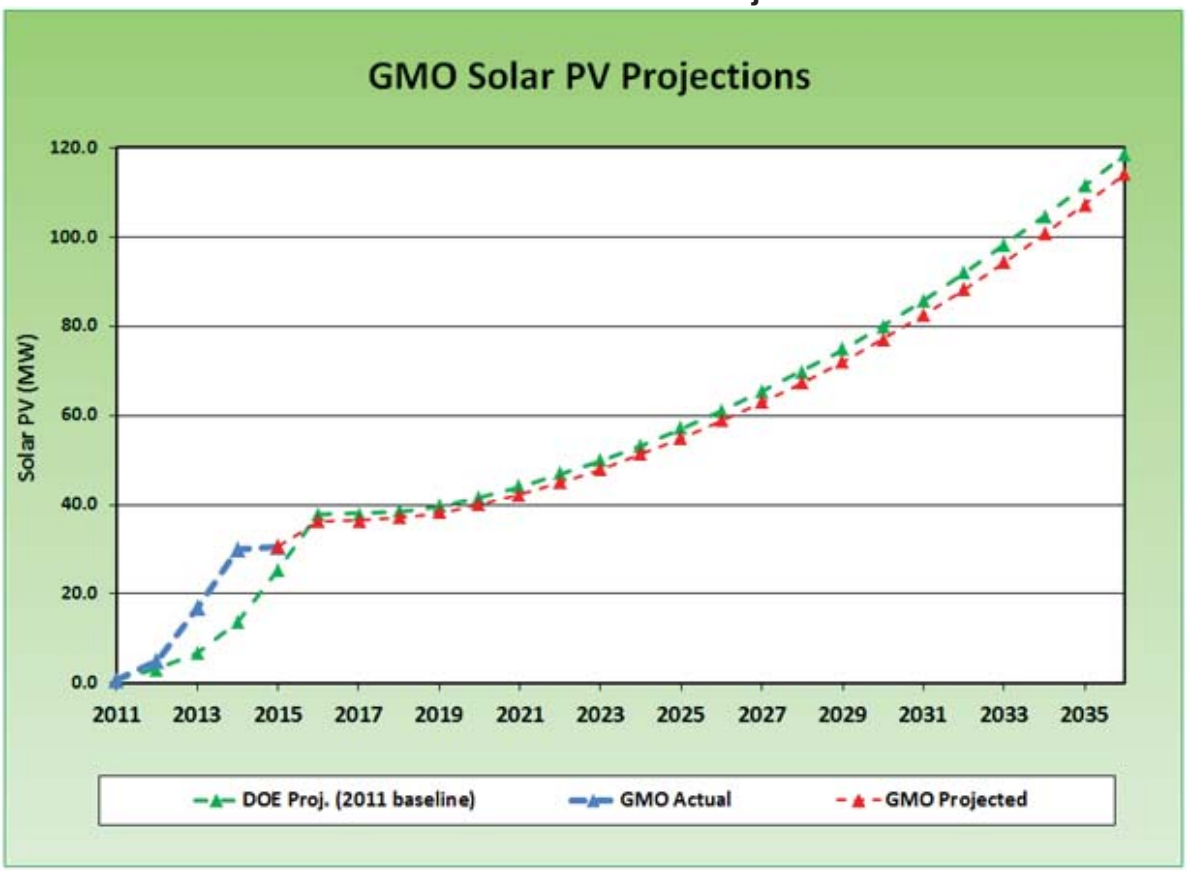
in 2013 and 2014, with approximately 12 MW of installed capacity per year. Subsequent to the rebate less than 1MW of solar generation was installed in 2015.

As of 2015 year end, GMO customers had 30.65 MW of distributed solar generation installed producing an estimated 44.3 GWH (@ 16.5% load factor) of which 19.8 GWH were exported to the grid and the remaining 24.5 GWH being consumed onsite by the customer.

The GMO load forecast includes the projected impact of distributed solar generation throughout the 20 year planning horizon. The end-use level load forecasts were developed using both primary PV data collected by GMO and secondary data and projections of PV adoption produced by the U.S. Department of Energy (DOE) for the West North Central Region of the U.S. DOE updates its projections at least once a year and we use the most recently available projections whenever we update our models.

Table 55 illustrates the level of distributed solar PV generation included in the current load forecast relative to the DOE forecasted growth for the region.

Table 55: GMO Solar PV Projections



Due to the uncertainty of future PV adoption rates without rebates and other incentives, GMO is participating in a 2016 EPRI supplemental research project, 'Forecasting Residential Solar Photovoltaic Adoption', which seeks to develop methods for forecasting PV adoption GMO will continue to track the development and cost of distributed generation and use the results of this EPRI project as well as the intake of Net Metering applications for future resource planning.

Distributed Combined Heat & Power Generation (CHP)

In the DSM Resource Potential Study conducted by Navigant for the GMO service territory in preparation for the 2015 Triennial IRP filing, Navigant conducted an analysis of CHP systems to identify opportunities for this technology. Navigant evaluated the cost effectiveness of CHP systems driven by a range of prime movers, system configurations, and usage levels. Steam turbines and gas turbines were the only technologies to pass the TRC test. Navigant found that no systems passed a participant test without incentives. However, Navigant found that when incentives on par with those offered elsewhere in the U.S. were included, the system that passed the TRC screen also passed the participant test. With incentives, Navigant determined that, for the GMO service area, 22.1 MW of capacity reduction from CHP was realistically achievable over a 20 year planning horizon.

While GMO did not incorporate a specific CHP incentive program for the 2016-2018 MEEIA implementation cycle, CHP projects will be considered in the Business Energy Efficiency Rebate – Custom Program. KCP&L and the implementation contractor will work with customers interested in CHP to determine project costs, cost-effectiveness, tax credits, and financing options.

In 2015, KCP&L engaged the Applied Energy Group (AEG) to conduct a Demand Side Management (DSM) Resource Potential Study which will be used in developing the 2018 Triennial IRP. AEG will reevaluate the potential for CHP technologies as a distributed generation resource.

Other Distributed Generation Technologies

GMO monitors the economic viability and potential impact other emerging distributed generation technologies (wind, bio, fuel cells, etc.). Currently we do not project that any other distributed generation technologies will be adopted at a significant enough level to have a measurable impact throughout the 20 year planning horizon.