VOLUME 6:

INTEGRATED RESOURCE ANALYSIS - REVISED

KCP&L GREATER MISSOURI OPERATIONS COMPANY (GMO)

INTEGRATED RESOURCE PLAN

CASE NO. EE-2009-0237

4 CSR 240-22.060

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PURPOSE: This rule requires the utility to design alternative resource plans to meet the planning objectives identified in 4 CSR 240-22.010(2) and sets minimum standards for the scope and level of detail required in resource plan analysis, and for the logically consistent and economically equivalent analysis of alternative resource plans.

SECTION 1: RESOURCE PLANNING OBJECTIVES

(1) Resource Planning Objectives. The utility shall design alternative resource plans to satisfy at least the objectives and priorities identified in 4 CSR 240-22.010(2). The utility may identify additional planning objectives that alternative resource plans will be designed to serve.

A total of eleven (11) alternative resource plans are included in this revised integrated analysis.

Nine alternative resource plans were devised in the stakeholder process to analyze several levels of supply-side resources that included base load generation and renewable resource inclusion, peak-load generation, and retirement scenarios. The nine plans were formulated within the Stakeholder Process. A history of the discussions that took place in that Process leading up to the nine plans and the methods utilized in this integrated analysis is detailed in the Updated October 22 Interim Report and is attached to this document as Appendix A. The current study documented by this volume also contains an update to the CO2 credit price and the long-term natural gas price. These modifications are also detailed in Appendix A.

Two additional alternative plans were developed by the company and included in the final revised study. These resource plans are proposed to study a contingency plan should DSM recovery be inadequate. These plans were developed to meet the needs of Paragraph 30 from Appendix 1 Stakeholder Process Agreement to the

Non-unanimous Stipulation and Agreement for Case No. EE-2009-0237. In this study these two plans are labeled Plan 10 and Plan 11. Plan 10 attempts to minimize NPVRR given updated CO2 and natural gas price forecasts at the agreed to level of DSM . Plan 11 modifies Plan 10 to a contingency level of DSM.

As required by Rule 22.010(2), demand-side resources were analyzed on an equivalent basis with supply-side resources. Net present value of revenue requirements [NPVRR] of each plan including probable environmental costs [PEC] was calculated. Minimization of NPVRR with PEC was used as the primary criteria for determination of the ordinal preference of a particular plan.

SECTION 2: PERFORMANCE MEASURES

(2) Specification of Performance Measures. The utility shall specify a set of quantitative measures for assessing the performance of alternative resource plans with respect to identified planning objectives. These measures shall include at least the following: present worth of utility revenue requirements, present worth of probable environmental costs, present worth of out-of-pocket costs to participants in demand-side programs, levelized annual average rates and maximum single-year increase in annual average rates. All present worth and levelization calculations shall use the utility discount rate and all costs and benefits shall be expressed in nominal dollars. Utility decision-makers may also specify other measures that they believe are appropriate for assessing the performance of resource plans relative to the planning objectives identified in 4 CSR 240-22.010(2)

GMO calculated each of the five (5) specified performance measures using the methods described below.

GMO has calculated a 20-year net present value of the revenue requirement [NPVRR] estimate of the individual plans. The calculation methodology consisted of simulating each alternative plan by use of the MIDAS™ model through 64 scenarios. Each scenario simulates a set of long-term market assumptions as described by the decision tree detailed in Volume 7, Risk Analysis and Strategy Selection, Section 4 of the original filing. These simulations calculate each alternative plan's annual revenue requirement for each of the risk tree scenarios. The annual revenue requirement is then discounted over the 20-year study period using a constant discounting factor and weighted for each scenario's expected probability. The NPVRR used for the ranking of plans includes probable environmental costs. Throughout this report, the term "NPVRR" is assumed to include the PEC unless otherwise stated.

The present worth of probable environmental costs are calculated by running an alternative plan through the MIDAS™ model process described in the preceding

paragraph. However the alternative plan for this simulation will not contain probable environmental costs in its annual revenue requirement calculation. To develop the probable environmental costs for each plan, the results of the runs without PEC are subtracted from the results of the runs with PEC. As the two processes are identical in structure, the outcomes of each branch of the two simulations can be directly compared and a probabilistic distribution developed.

The present worth of costs of DSM programs is calculated from the annual expected cash outlays for the DSM portfolio of programs included in an alternative resource plan. These annual costs are discounted using the same discount rate to develop NPVRR. This information is a part of the definition of the alternative plan and treated as an input component of the simulation. Therefore this value does not vary with the risk tree scenario and no meaningful risk distribution can be developed. Plans 1 through 10 utilize the same agreed to level of DSM. While Plan11 utilizes the contingency level of DSM.

Annual rates are developed by taking the annual revenue requirement as calculated for each plan under each of the 64 scenario endpoints. The value of each scenario annual revenue requirement is weighted by each scenario endpoint probability to determine the plan expected revenue requirement. This value is divided by the total kilowatt-hour net retail system load to arrive at an expected average retail rate. This process simulates perfect rate making. Levelized annual rates are 20-years of expected annual rates averaged over the plan horizon.

The maximum single-year increase in annual rates compares each expected annual rate increase or decrease as a percentage. The maximum rate increase is then reported.

A summary of these measures for each revised integrated analysis plan is included in Table 1 below. GMO holds that these measures are appropriate for assessing the performance of resource plans relative to the planning objectives identified in 4 CSR 240-22.010(2).

Table 1: Summary of Performance Measures

Plan	NPVRR ($MM)	Probable Environmental Costs ($MM)	DSM Costs ($MM)	Levelized Annual Rates ($/kw-hr)	Maximum Rate Increase
Plan 01	13,679	256	331.5	0.1498	17.65%
Plan 02	13,474	274	331.5	0.1480	14.72%
Plan 03	13,825	147	331.5	0.1522	14.75%
Plan 04	13,873	286	331.5	0.1521	15.05%
Plan 05	13,850	313	331.5	0.1520	17.65%
Plan 06	13,848	287	331.5	0.1520	17.65%
Plan 07	13,888	135	331.5	0.1518	17.67%
Plan 08	14,346	118	331.5	0.1540	20.99%
Plan 09	14,238	118	331.5	0.1525	21.04%
Plan 10	13,453	271	331.5	0.1477	14.71%
Plan 11	13,467	274	331.8	0.1476	14.65%

Tabular data that created Table 1: Summary of Performance Measures is provided on the work paper disc in an Excel file entitled “Table240-22.060(2)Plan Performance Measures.xlsx”

SECTION 3: ALTERNATIVE RESOURCE PLANS

(3) Development of Alternative Resource Plans. The utility shall use appropriate combinations of candidate demand-side and supply-side resources to develop a set of alternative resource plans, each of which is designed to achieve one (1) or more of the planning objectives identified in 4 CSR 240-22.010(2). The alternative resource plans developed at this stage of the analysis shall not include load-building programs, which shall be analyzed as required by section (5) of this rule.

Alternative resource plans were developed using a combination of various supply-side resources, demand-side resources, biomass retrofits with differences with respect to the timing of resource additions. In total, nine alternative resource plans were developed within the stakeholder process for the revised integrated resource analysis.

After an initial review of the results, the company identified two alternative resource plans as a contingency should DSM recovery be inadequate. These plans were developed to meet the needs of Paragraph 30 from Appendix 1 Stakeholder Process Agreement to the Non-unanimous Stipulation and Agreement for Case No. EE-2009-0237. In this study these two plans are labeled Plan 10 and Plan 11.

Plan 10 modifies the supply expansion plan to provide a new lowest NPVRR plan, given an update the company forecast of CO2 emissions and natural gas prices. Plan 10 continues the use of the DSM programs at the levels discussed in the Stakeholder Process.

Plan 11 takes the supply expansion plan from Plan 10 and adjusts the DSM level to the contingency level of DSM, should DSM cost recovery be deemed inadequate.

The complete set of all alternative resource plans used in the revised integrated analysis are detailed in the following tables.

Table 2: Revised Integrated Analysis Plan 1

	Plan 1: Install Prop C Wind and Solar, CT's, Additional 500 MW Wind Above Prop C beginning in 2012, Agreed to DSM, and Sibley 1&2 converted to 10% biomass usage					
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Agreed to DSM
2009	-	25	0			5.9
2010	75	0	0			31.8
2011	-	25	0	1.79		36.4
2012	-	0	0	0.03	100	80.0
2013	-	0	0	0.02		120.3
2014	-	100	0	2.80		149.1
2015	-	100	0	0.05		172.6
2016	-	75	0	0.11	200	189.5
2017	-	75	0	0.08	200	206.8
2018	-	75	0	5.02	100	223.6
2019	-	75	0	0.15		243.7
2020	-	100	0	0.20		263.9
2021	-	100	0	5.33	100	280.2
2022	-	125	0	0.24		296.6
2023	-	100	0	0.24	100	313.2
2024	-	100	0	0.32	100	330.0
2025	-	125	0	0.26		347.3
2026	-	125	0	0.32		356.4
2027	-	150	0	0.32		363.9
2028	-	25	154	0.35		371.5
2029	-	25	0	0.25		379.1

Table 3: Revised Integrated Analysis Plan 2

	Plan 2: Install Prop C Wind and Solar, CT's, Agreed to DSM, and Sibley 1&2 converted to using 10% biomass					
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Agreed to DSM
2009	-	25	0			5.9
2010	75	0	0			31.8
2011	-	25	0	1.79		36.4
2012	-	0	0	0.03		80.0
2013	-	0	0	0.02		120.3
2014	-	100	0	2.80		149.1
2015	-	100	0	0.05		172.6
2016	-	125	0	0.11	100	189.5
2017	-	125	0	0.08		206.8
2018	-	125	0	5.02	100	223.6
2019	-	150	0	0.15		243.7
2020	-	0	154	0.20		263.9
2021	-	0	0	5.33	100	280.2
2022	-	25	0	0.24		296.6
2023	-	25	0	0.24	100	313.2
2024	-	25	0	0.32		330.0
2025	-	50	0	0.26		347.3
2026	-	50	0	0.32		356.4
2027	-	75	0	0.32		363.9
2028	-	100	0	0.35		371.5
2029	-	100	0	0.25		379.1

Table 4: Revised Integrated Analysis Plan 3

	Plan 3: Retire Sibley Station, Install Prop C Wind and Solar, CT's, and Agreed to DSM					
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Agreed to DSM
2009		0				5.9
2010	25	0	0			31.8
2011	-	50	0		2	36.4
2012	-	50	0		0	80.0
2013	-	50	0		0	120.3
2014	0	75	0		3	149.1
2015	0	250	308		0	172.6
2016	0	100	154	100	0	189.5
2017	0	125	0		0	206.8
2018	0	125	0	100	5	223.6
2019	0	150	0		0	243.7
2020	0	0	154		0	263.9
2021	0	0	0	100	5	280.2
2022	0	25	0		0	296.6
2023	0	0	0	100	0	313.2
2024	0	25	0		0	330.0
2025	0	25	0		0	347.3
2026	0	50	0		0	356.4
2027	0	75	0		0	363.9
2028	0	100	0		0	371.5
2029	0	100	0		0	379.1

Table 5: Revised Integrated Analysis Plan 4

	Plan 4: Install Prop C Wind and Solar, CT's, Additional 500 MW Wind Above Prop C beginning in 2010, Agreed to DSM, Coal w/CCS, and Sibley 1&2 converted to 10%						
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Coal with CCS	Agreed to DSM
2009	-	25	0				5.9
2010	100	0	0		100		31.8
2011	-	0	0	1.79			36.4
2012	-	0	0	0.03			80.0
2013	-	0	0	0.02			120.3
2014	-	75	0	2.80			149.1
2015	-	100	0	0.05			172.6
2016	-	75	0	0.11	200		189.5
2017	-	75	0	0.08	200		206.8
2018	-	75	0	5.02	100		223.6
2019	-	75	0	0.15			243.7
2020	50	0	0	0.20		150	263.9
2021	50	0	0	5.33	100		280.2
2022	25	0	0	0.24			296.6
2023	50	0	0	0.24	100		313.2
2024	50	0	0	0.32	100		330.0
2025	25	0	0	0.26			347.3
2026	25	0	0	0.32			356.4
2027	-	0	0	0.32			363.9
2028	-	25	0	0.35			371.5
2029	-	50	0	0.25			379.1

Table 6: Revised Integrated Analysis Plan 5

	Plan 5: Install Prop C Wind and Solar, CT's, Additional 500 MW Wind Above Prop C beginning in 2010, Agreed to DSM, and Coal w/CCS						
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Coal with CCS	Agreed to DSM
2009	-	25	0				5.9
2010	75	0	0				31.8
2011	-	25	0	1.79			36.4
2012	-	0	0	0.03	100		80.0
2013	-	0	0	0.02			120.3
2014	-	75	0	2.80			149.1
2015	-	100	0	0.05			172.6
2016	-	75	0	0.11	200		189.5
2017	-	75	0	0.08	200		206.8
2018	-	75	0	5.02	100		223.6
2019	-	75	0	0.15			243.7
2020	50	0	0	0.20		150	263.9
2021	50	0	0	5.33	100		280.2
2022	25	0	0	0.24			296.6
2023	50	0	0	0.24	100		313.2
2024	50	0	0	0.32	100		330.0
2025	25	0	0	0.26			347.3
2026	25	0	0	0.32			356.4
2027	-	0	0	0.32			363.9
2028	-	25	0	0.35			371.5
2029	-	50	0	0.25			379.1

Table 7: Revised Integrated Analysis Plan 6

	Plan 6: Install Prop C Wind and Solar, CT's, Additional 500 MW Wind Above Prop C beginning in 2012, Agreed to DSM, Coal w/CCS, and Sibley 1&2 converted to 10%						
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Coal with CCS	Agreed to DSM
2009	-	25	0				5.9
2010	75	0	0				31.8
2011	-	25	0	1.79			36.4
2012	-	0	0	0.03	100		80.0
2013	-	0	0	0.02			120.3
2014	-	75	0	2.80			149.1
2015	-	100	0	0.05			172.6
2016	-	75	0	0.11	200		189.5
2017	-	75	0	0.08	200		206.8
2018	-	75	0	5.02	100		223.6
2019	-	75	0	0.15			243.7
2020	50	0	0	0.20		150	263.9
2021	50	0	0	5.33	100		280.2
2022	25	0	0	0.24			296.6
2023	50	0	0	0.24	100		313.2
2024	50	0	0	0.32	100		330.0
2025	25	0	0	0.26			347.3
2026	25	0	0	0.32			356.4
2027	-	0	0	0.32			363.9
2028	-	25	0	0.35			371.5
2029	-	50	0	0.25			379.1

Table 8: Revised Integrated Analysis Plan 7

	Plan 7: Retire Sibley Station, Install Prop C Wind, Solar, CC's, Additional 500 MW Wind Above Prop C, and Agreed to DSM					
Date	Sell PPA	Buy PPA	Install CC's	Install Wind	Install Solar	Agreed to DSM
2009	-	25	0			5.9
2010	75	0	0			31.8
2011	-	25	0		1.79	36.4
2012	-	0	0	100	0.03	80.0
2013	-	0	0		0.02	120.3
2014	0	75	0		2.80	149.1
2015	0	300	257		0.05	172.6
2016	0	25	257	200	0.11	189.5
2017	0	25	0	200	0.08	206.8
2018	0	25	0	100	5.02	223.6
2019	0	50	0		0.15	243.7
2020	0	50	0		0.20	263.9
2021	0	50	0	100	5.33	280.2
2022	0	75	0		0.24	296.6
2023	0	75	0	100	0.24	313.2
2024	0	50	0	100	0.32	330.0
2025	0	75	0		0.26	347.3
2026	0	75	0		0.32	356.4
2027	0	100	0		0.32	363.9
2028	0	125	0		0.35	371.5
2029	0	150	0		0.25	379.1

Table 9: Revised Integrated Analysis Plan 8

	Plan 8: Retire Sibley Station, Install Prop C Wind, Solar, CC's, Additional 1200 MW Wind Above Prop C, and Agreed to DSM					
Date	Sell PPA	Buy PPA	Install CC's	Install Wind	Install Solar	Agreed to DSM
2009	-	25	0			5.9
2010	75	0	0			31.8
2011	25	0	0	200	1.79	36.4
2012	50	0	0	200	0.03	80.0
2013	100	0	0	300	0.02	120.3
2014	0	0	0	300	2.80	149.1
2015	0	125	257	200	0.05	172.6
2016	0	150	0	100	0.11	189.5
2017	0	150	0		0.08	206.8
2018	0	150	0	100	5.02	223.6
2019	0	175	0		0.15	243.7
2020	0	200	0		0.20	263.9
2021	0	175	0	100	5.33	280.2
2022	0	200	0		0.24	296.6
2023	0	200	0	100	0.24	313.2
2024	0	200	0		0.32	330.0
2025	0	225	0		0.26	347.3
2026	0	225	0		0.32	356.4
2027	0	0	257		0.32	363.9
2028	0	25	0		0.35	371.5
2029	0	25	0		0.25	379.1

Table 10: Revised Integrated Analysis Plan 9

	Plan 9: Retire Sibley Station, Install Prop C Wind and Solar, CC's, CT's, Additional 1200 MW Wind Above Prop C, and Agreed to DSM						
Date	Sell PPA	Buy PPA	Install CC's	Install CT's	Install Wind	Install Solar	Agreed to DSM
2009	-	25	0				5.9
2010	75	0	0				31.8
2011	25	0	0		200	1.79	36.4
2012	50	0	0		200	0.03	80.0
2013	100	0	0		300	0.02	120.3
2014	50	0	0		300	2.80	149.1
2015	0	125	257		200	0.05	172.6
2016	0	0	0	154	100	0.11	189.5
2017	0	0	0			0.08	206.8
2018	0	0	0		100	5.02	223.6
2019	0	25	0			0.15	243.7
2020	0	25	0			0.20	263.9
2021	0	25	0		100	5.33	280.2
2022	0	50	0			0.24	296.6
2023	0	50	0		100	0.24	313.2
2024	0	50	0			0.32	330.0
2025	0	75	0			0.26	347.3
2026	0	75	0			0.32	356.4
2027	0	100	0			0.32	363.9
2028	0	125	0			0.35	371.5
2029	0	150	0			0.25	379.1

Table 11: DSM Contingency - Plan 10

	Plan 10: Install Prop C Wind and Solar, CT's, July 21st DSM, and Sibley 1&2 converted to 10% biomass usage					
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Agreed to DSM
2009	-	25	0			5.9
2010	25	0	0			31.8
2011	-	50	0	1.79		36.4
2012	-	25	0	0.03		80.0
2013	-	25	0	0.02	100	120.3
2014	-	75	0	2.80		149.1
2015	-	75	0	0.05		172.6
2016	-	100	0	0.11		189.5
2017	-	125	0	0.08		206.8
2018	-	125	0	5.02	100	223.6
2019	-	125	0	0.15		243.7
2020	-	150	0	0.20		263.9
2021	-	150	0	5.33	100	280.2
2022	-	0	154	0.24		296.6
2023	-	0	0	0.24	100	313.2
2024	-	25	0	0.32		330.0
2025	-	25	0	0.26		347.3
2026	-	50	0	0.32		356.4
2027	-	75	0	0.32		363.9
2028	-	75	0	0.35		371.5
2029	-	100	0	0.25		379.1

Table 12: DSM Contingency - Plan 11

	Plan 11: Install Prop C Wind and Solar, CT's, Jan 6th DSM, and Sibley 1&2 converted to 10% biomass usage					
Date	Sell PPA	Buy PPA	Install CT's	Install Solar	Install Wind	Contingent DSM
2009						
2010						
2011	-	75	0	1.79		11.7
2012	-	50	0	0.03		48.1
2013	-	75	0	0.02	100	79.8
2014	-	125	0	2.80		111.5
2015	-	125	0	0.05		143.2
2016	-	125	0	0.11		174.9
2017	-	125	0	0.08		206.5
2018	-	125	0	5.02	100	223.3
2019	-	125	0	0.15		243.2
2020	-	150	0	0.20		263.5
2021	-	150	0	5.33	100	279.6
2022	-	0	154	0.24		296.0
2023	-	0	0	0.24	100	312.6
2024	-	25	0	0.32		329.3
2025	-	25	0	0.26		346.5
2026	-	50	0	0.32		352.5
2027	-	75	0	0.32		354.9
2028	-	100	0	0.35		357.1
2029	-	125	0	0.25		364.0

Tabular data that created Table 2: Revised Integrated Analysis Plan 1 through Table 12: DSM Contingency - Plan 11 is provided on the work paper disc in an Excel file entitled “Table 240-22.060(3)GMO Revised Integrated Analysis Plans.xlsx”.

SECTION 4: ANALYSIS OF RESOURCE PLANS

(4) Analysis of Alternative Resource Plans. The utility shall assess the relative performance of the alternative resource plans by calculating for each plan the value of each performance measure specified pursuant to section (2). This calculation shall assume values for uncertain factors that are judged by utility decision-makers to be most likely. The analysis shall cover a planning horizon of at least twenty (20) years and shall be carried out with computer models that are capable of simulating the total operation of the system on a year-by-year basis in order to assess the cumulative impacts of alternative resource plans. These models shall be sufficiently detailed to accomplish the following tasks and objectives:

GMO analyzed the alternative resource plans incorporating critical uncertain factors identified from the preliminary risk analysis performed for the original filing and detailed in Volume 7, Section 2 of the filing for Case No. EE-2009-0237. All analysis covered at least twenty years and was conducted using the MIDAS™ computer model. MIDAS™ simulated year-by-year impacts and assessed cumulative impacts corresponding to each alternative resource plan.

The MIDAS™ model is sufficiently detailed to accomplish all tasks and objectives listed in Rule 4 CSR 240-22.060(4).

4.1 FINANCIAL IMPACT

(A) The financial impact of alternative resource plans shall be modeled in sufficient detail to provide comparative estimates of at least the following measures of the utility's financial condition for each year of the planning horizon: pretax interest coverage, ratio of total debt to total capital and ratio of net cash flow to capital expenditures;

GMO analyzed the financial impact of the alternative resource plans and comparatively estimated pretax interest coverage, ratio of total debt to total capital and ratio of cash flows to capital expenditures. This analysis is developed from the results of the annual reporting data from the output of the MIDAS™ model.

The results of these analyses are plotted in Figure 31 through Figure 33 in the Reporting Requirements, Section 6 of this Volume.

4.2 ANNUALLY ADJUSTED RATES

(B) The modeling procedure shall be based on the assumption that rates will be adjusted annually, in a manner that is consistent with Missouri law. This provision does not imply any requirement for the utility to file actual rate cases or for the commission to accord any particular ratemaking treatment to actual costs incurred by the utility;

GMO utilized the MIDAS™ model to simulate each alternative resource plan and measure financial and operational performance. Rates are calculated by taking the annual total revenue requirement [called Total Base Revenue within the model] and spread over the total retail energy load for the simulation year. This method of calculation produced annually adjusted rates. From a utility standpoint, these rates would be the outcome of a perfect continuous ratemaking process.

The development of annual total revenue requirement assumes a utility plant in ratebase from which a return is earned. This ratebase is subject to depreciation. Utility annual expenses flow directly to revenue requirement without any assumption of return or disallowance.

DSM expenses are treated as a capital expense and included in the total utility rate base. However the DSM expenditures are amortized in ten years and not at the longer assumed level for other utility supply assets.

4.3 RATE ELASTICITY

(C) The modeling procedure shall include a method to ensure that the impact of changes in electric rates on future levels of demand for electric service is accounted for in the analysis; and

The methods by which electric rates impact future levels of demand is detailed in Volume 3 of the original filing which details the load forecasting process.

4.4 DSM EQUIVALENCY

(D) The modeling procedure shall treat supply-side and demand-side resources on a logically consistent and economically equivalent basis. This means that the same types or categories of costs, benefits and risks shall be considered, and that these factors shall be quantified at a similar level of detail and precision for all resource types.

GMO utilized a method by which DSM costs are treated in a logically consistent manner with traditional supply-side resource costs. Both DSM and supply options were analyzed under identical risk assumptions.

SECTION 5: LOAD BUILDING PROGRAMS

(5) Analysis of Load-Building Programs. If the utility intends to continue existing load-building programs or implement new ones, it shall analyze these programs in the context of one (1) or more of the alternative plans developed pursuant to section (3) of this rule, including the preferred resource plan selected pursuant to 4 CSR 240-22.070(6). This analysis shall use the same modeling procedure and assumptions described in section (4) and shall include the following elements:

5.1 DEMAND IMPACT

(A) Estimation of the impact of load-building programs on the electric utility's summer and winter peak demands and energy usage;

GMO does not have any existing or proposed load-building programs.

5.2 RATE IMPACT

(B) A comparison of annual average rates in each year of the planning horizon for the resource plan with and without the load-building program;

GMO does not have any existing or proposed load-building programs.

5.3 PROBABLE ENVIRONMENTAL COST IMPACT

(C) A comparison of the probable environmental costs of the resource plan in each year of the planning horizon with and without the proposed load-building program; and

GMO does not have any existing or proposed load-building programs.

5.4 OTHER IMPACTS

(D) An assessment of any other aspects of the proposed load-building programs that affect the public interest.

GMO does not have any existing or proposed load-building programs.

SECTION 6: REPORTING REQUIREMENTS

(6) Reporting Requirements. To demonstrate compliance with the provisions of this rule, and pursuant to the requirements of 4 CSR 240-22.080, the utility shall prepare a report that contains at least the following information:

6.1 ALTERNATIVE PLANS

(A) A description of each alternative resource plan including the type and size of each resource addition and a listing of the sequence and schedule for retiring existing resources and acquiring each new resource addition;

Alternative resource plans were developed using combinations of supply-side resources, demand-side resources and unit retirements. Timing of additions and quantity of resources are varied. In total, eleven alternative resource plans were developed for integrated resource analysis. Table 13 represents an overview of each plan included in the revised integrated analysis over the 2009 through 2029 planning period.

Table 13: Overview of Alternative Resource Plans 1 - 11

	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5
DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM
Solar Begins: 2011	Mo. Prop C	Mo. Prop C	Mo. Prop C	Mo. Prop C	Mo. Prop C
Total Wind (MW)	900	400	400	900	900
Combined Cycle (MW)	0	0	0	0	0
Combustion Turbines (MW)	154	154	616	0	0
Coal With CCS (MW)	0	0	0	150	150
Coal Retirement (MW)	None	None	466	None	None

	Plan 6	Plan 7	Plan 8	Plan 9	Plan 10
DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM	Agreed to DSM
Solar Begins: 2011	Mo. Prop C	Mo. Prop C	Mo. Prop C	Mo. Prop C	Mo. Prop C
Total Wind (MW)	900	900	1600	1600	400
Combined Cycle (MW)	0	514	514	257	0
Combustion Turbines (MW)	0	0	0	154	154
Coal With CCS (MW)	150	0	0	0	0
Coal Retirement (MW)	None	466	466	466	None

	Plan 11
DSM	Contingent DSM
Solar Begins: 2011	Mo. Prop C
Total Wind (MW)	400
Combined Cycle (MW)	0
Combustion Turbines (MW)	154
Coal With CCS (MW)	0
Coal Retirement (MW)	None

Charts that describe each alternative resource plan including the amounts and timing of resource additions are shown in the tables in Section 3: of this document.

6.2 PERFORMANCE SUMMARY

(B) A summary tabulation that shows the performance of each alternative resource plan as measured by each of the measures specified in section (2) of this rule;

The performance of each plan using the measures specified in 4 CSR 240-22.060 (2) is detailed in Table 1: Summary of Performance Measures on page 5 of this document.

6.3 ALTERNATIVE PLAN PLOTS

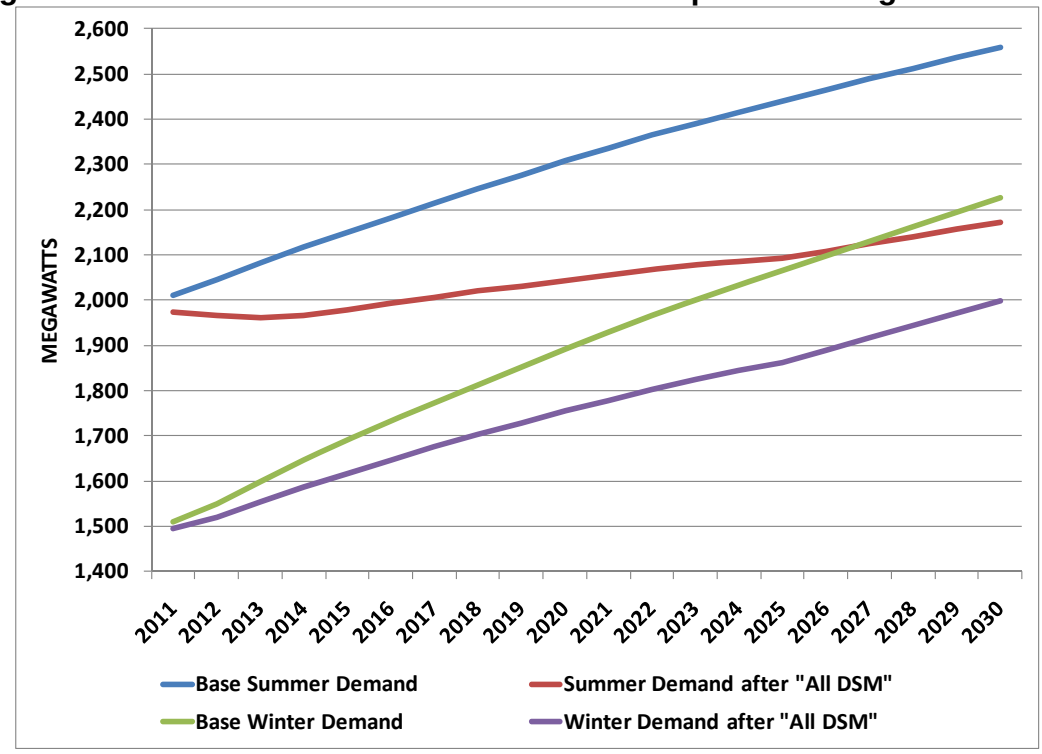
(C) For each alternative resource plan, a plot of each of the following over the planning horizon:

6.3.1 DSM IMPACT

1. The combined impact of all demand-side resources on the base-case forecast of summer and winter peak demands;

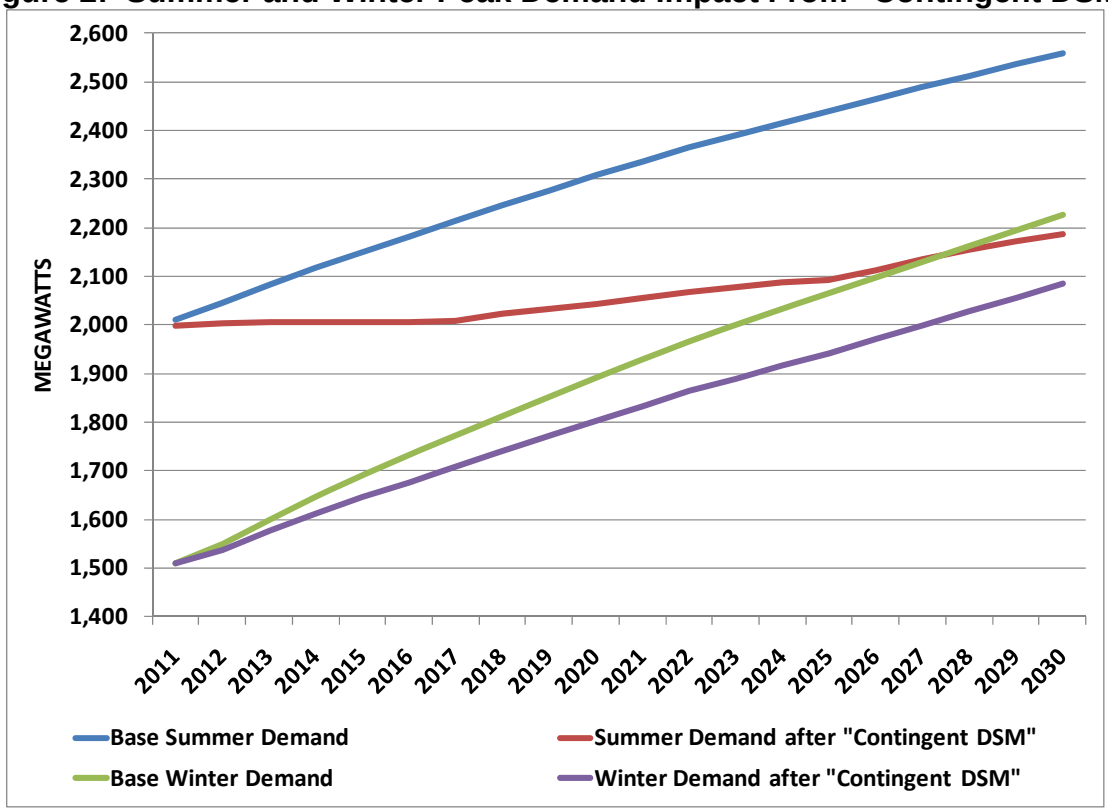
All alternative resource plans in the revised integrated analysis developed within the Stakeholder Process utilize the DSM portfolio of programs provided to the Process participants on July 21, 2010, [referred to as the "Agreed to DSM" portfolio]. The plans developed within the Process are Plans Nos. 01 through 09. Plan 10 also utilizes this level of DSM. Summer and Winter peak demand impact for these plans are provided in Figure 1 below. Tabular data that created Figure 1 is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(1)Summer and Winter DSM Peak Impact Agreed to DSM.xlsx".

Figure 1: Summer and Winter Peak Demand Impact From Agreed to DSM



All alternative resource plans in the revised integrated analysis developed as a contingency as defined in Paragraph 30 from Appendix 1 Stakeholder Process Agreement to the Non-unanimous Stipulation and Agreement for Case No. EE-2009-0237 utilize the DSM portfolio of programs identified as “Contingent DSM”. The plan developed within this contingency process is Plan 11. Summer and Winter peak demand impact for these plans are provided in Figure 2 below. Tabular data that created Figure 2 is provided on the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(1)Summer and Winter DSM Peak Impact Contingent DSM.xlsx”

Figure 2: Summer and Winter Peak Demand Impact From “Contingent DSM”

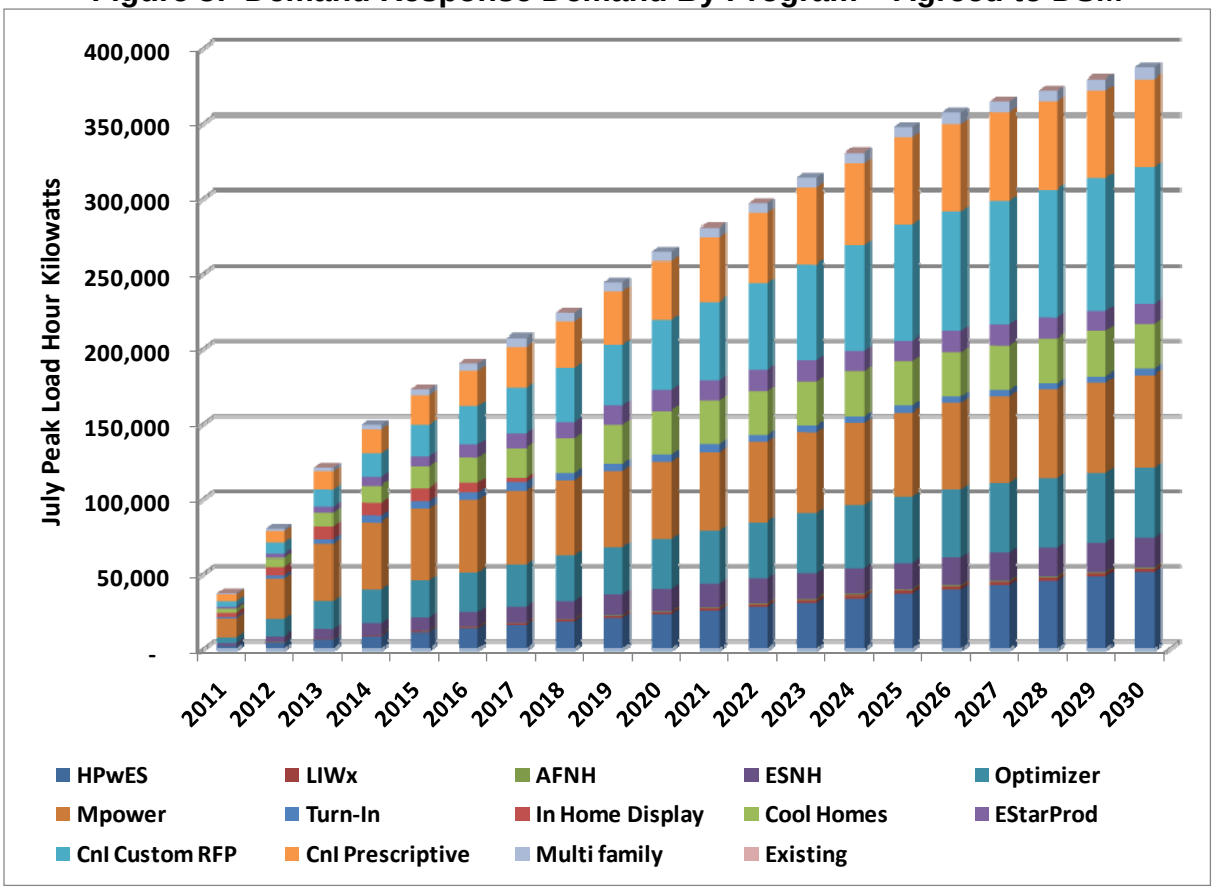


6.3.2 DSM PROGRAMS

2. The composition, by program, of the capacity provided by demand-side resources;

Each demand-side management (DSM) program has been evaluated to determine its capacity impact on peak system load. Peak system load occurs in the MIDAS™ simulation in July. The July peak load hour impact by program for the Agreed to DSM portfolio of programs is shown in Figure 3 below. Tabular data that created Figure 3 is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(2)DSM Program Peak Impact Agree to DSM.xlsx"

Figure 3: Demand Response Demand By Program – Agreed to DSM

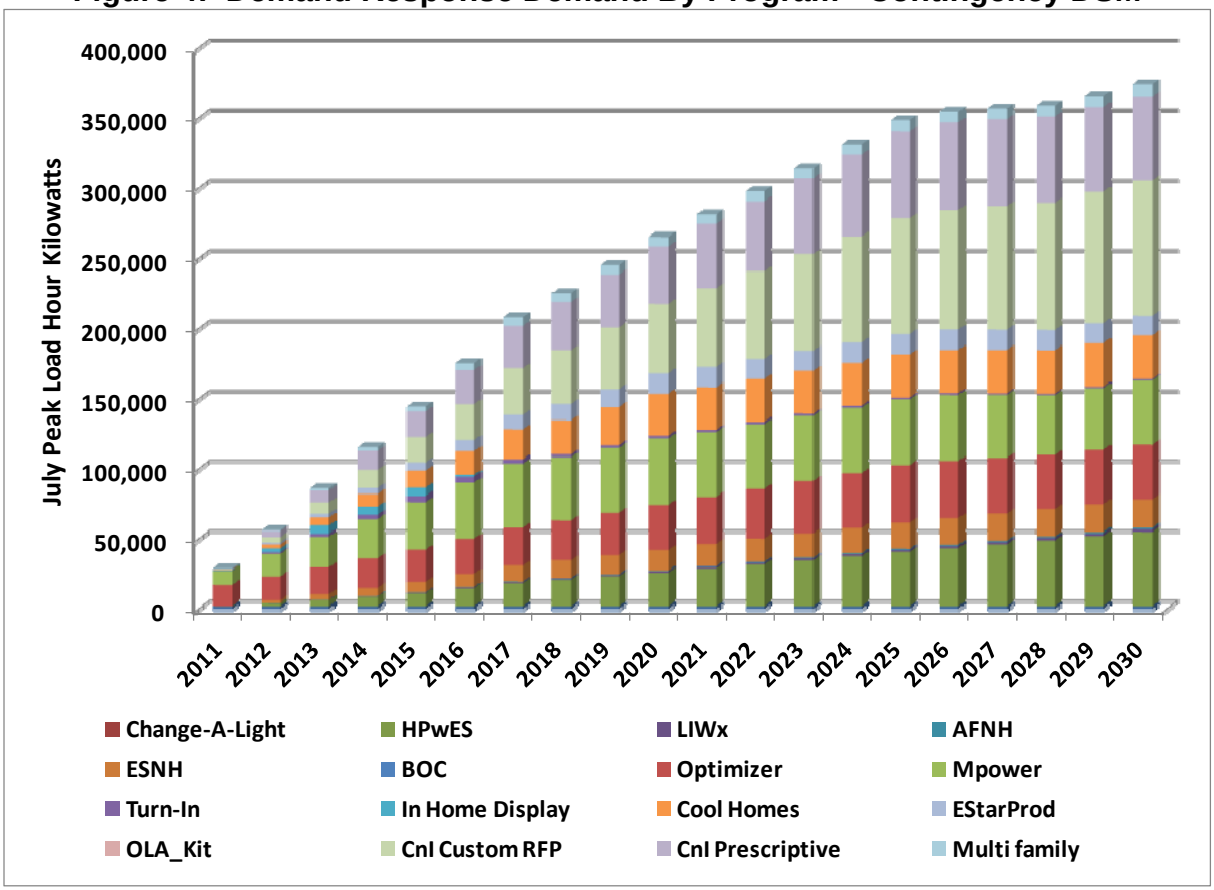


Note that certain programs do not impact peak load on the peak hour and are not included in this chart of peak hour impacts. The energy savings derived from each of these programs is included over the full life of the program.

The July peak load hour impact by program for the Contingency DSM portfolio of programs is shown in Figure 4 below. Tabular data that created Figure 4 is provided

on the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(2)DSM Program Peak Impact Contingency DSM.xlsx”

Figure 4: Demand Response Demand By Program - Contingency DSM



Note that certain programs do not impact peak load on the peak hour and are not included in this chart of peak hour impacts. The energy savings derived from each of these programs is included over the full life of the program.

6.3.3 SUPPLY RESOURCES

3. The composition, by supply resource, of the capacity (including reserve margin) provided by supply resources. Existing supply-side resources may be shown as a single resource;

The supply-side composition for each of the eleven alternative resource plans are shown in the figures below with superimposed forecasts of reserve margins.

Figure 5: Supply Resources - Plan 01

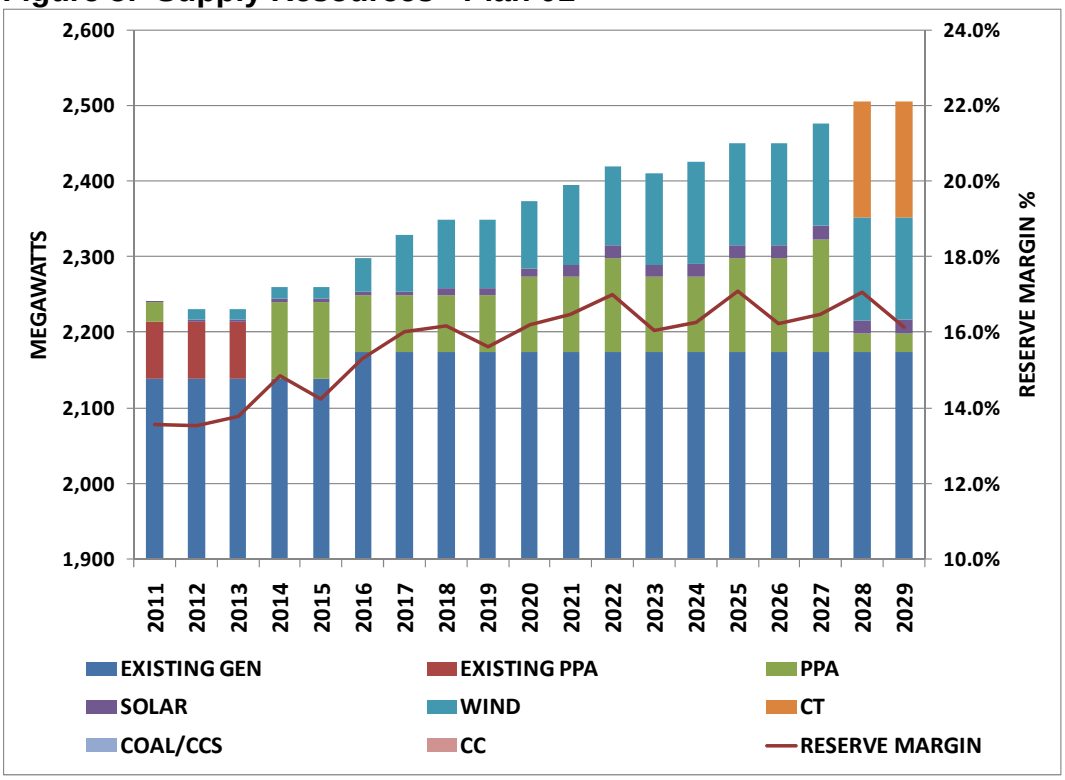


Figure 6: Supply Resources - Plan 02

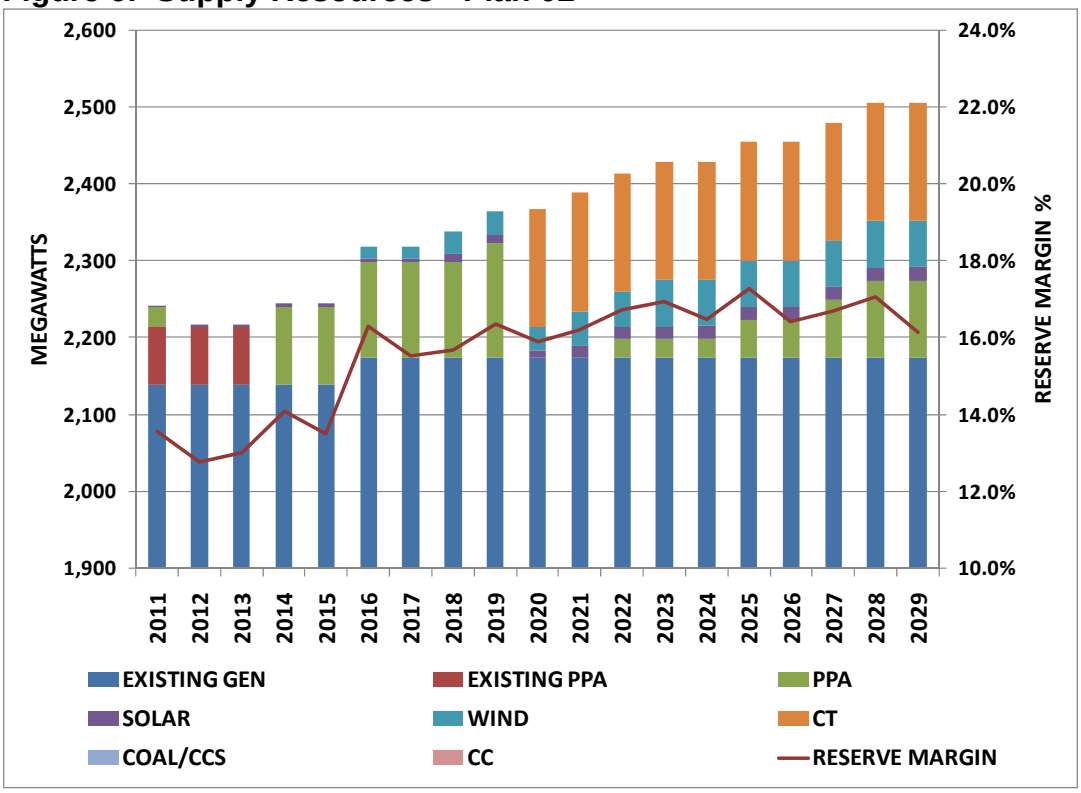


Figure 7: Supply Resources - Plan 03

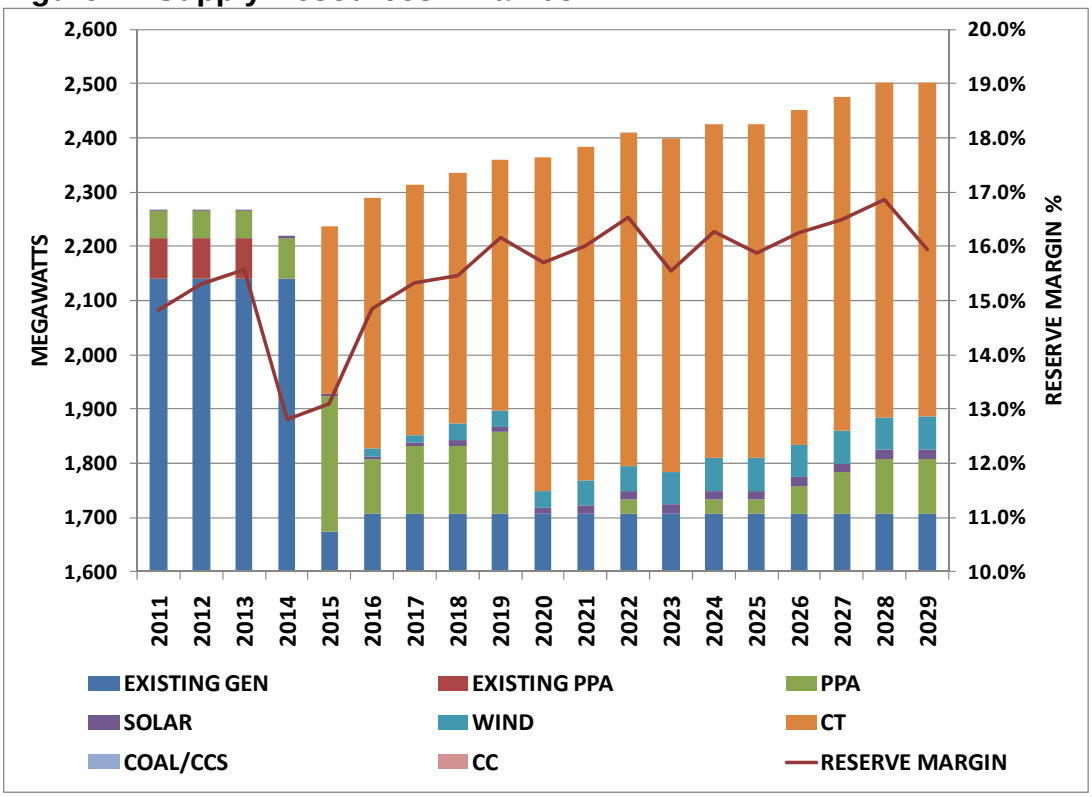


Figure 8: Supply Resources - Plan 04

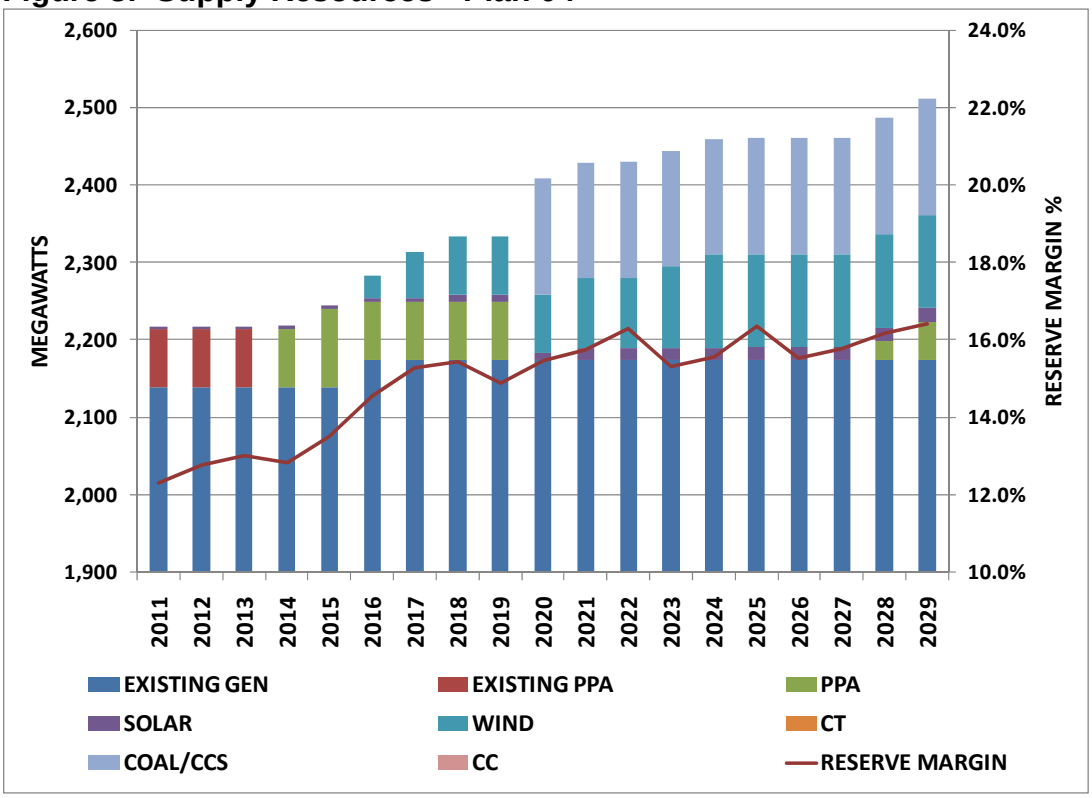


Figure 9: Supply Resources - Plan 05

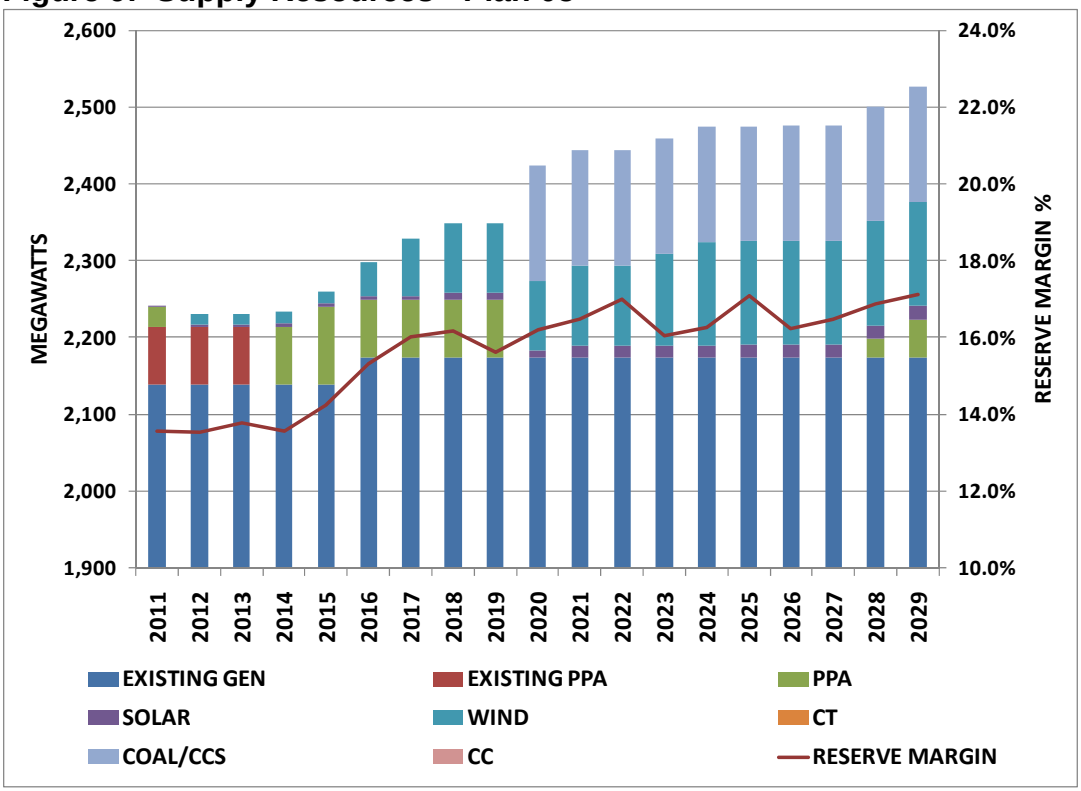


Figure 10: Supply Resources - Plan 06

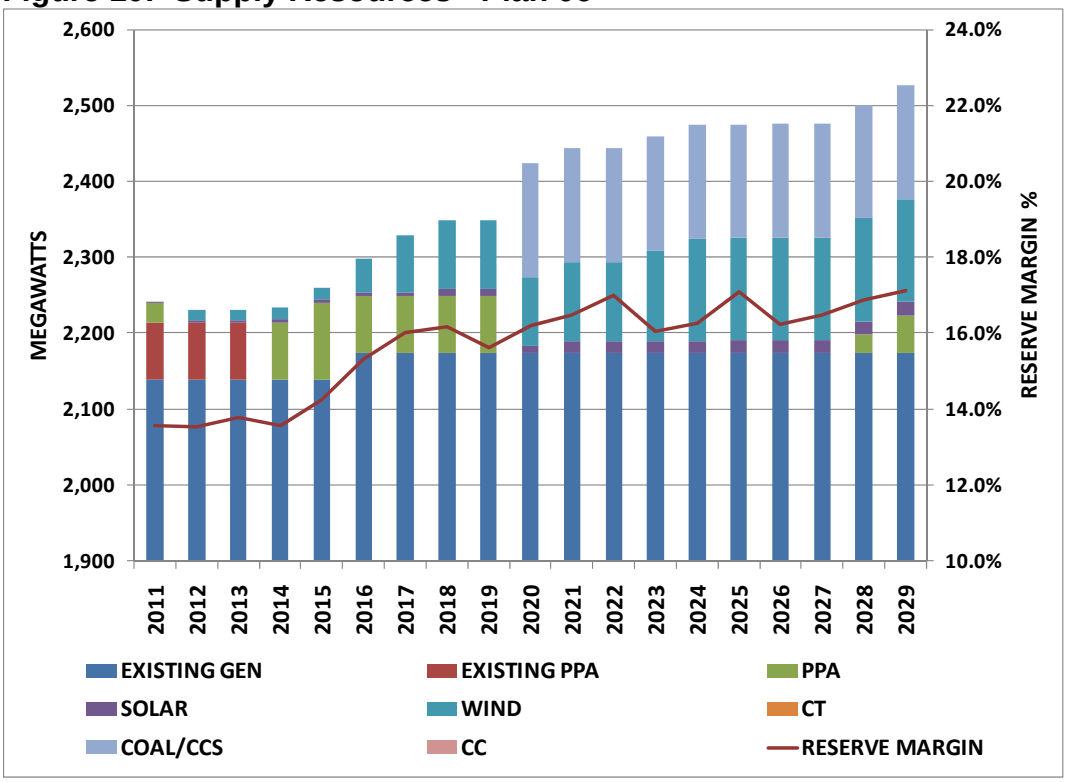


Figure 11: Supply Resources - Plan 07

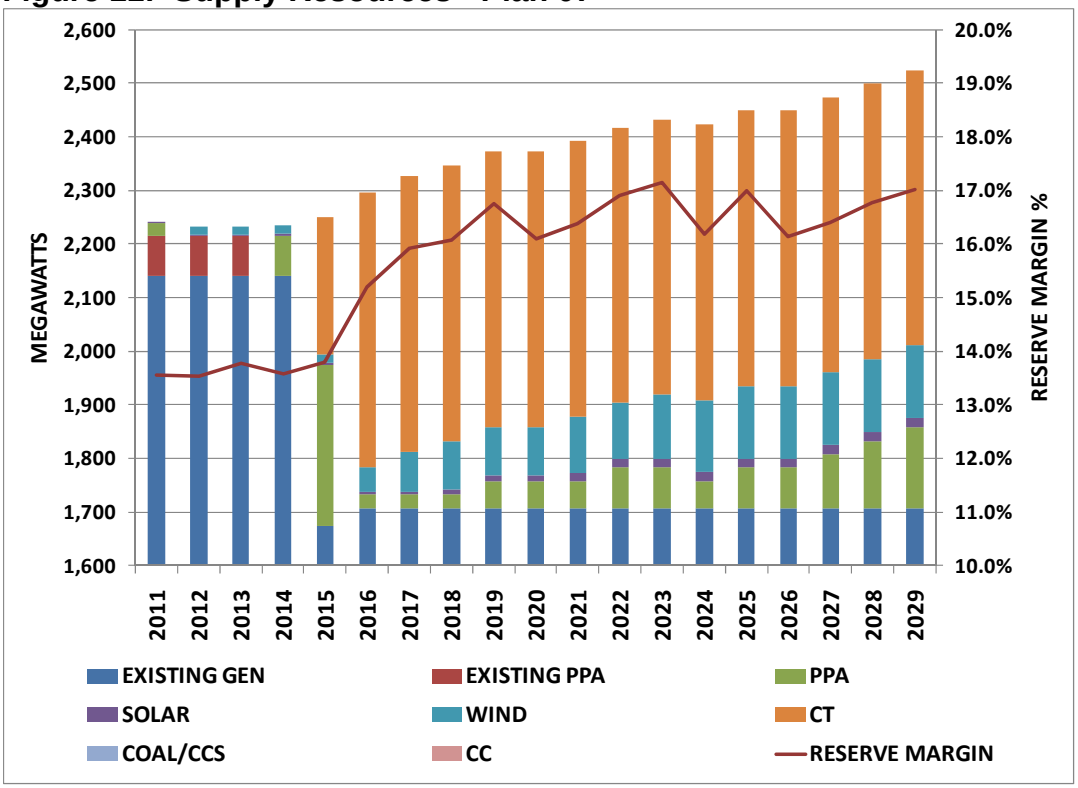


Figure 12: Supply Resources - Plan 08

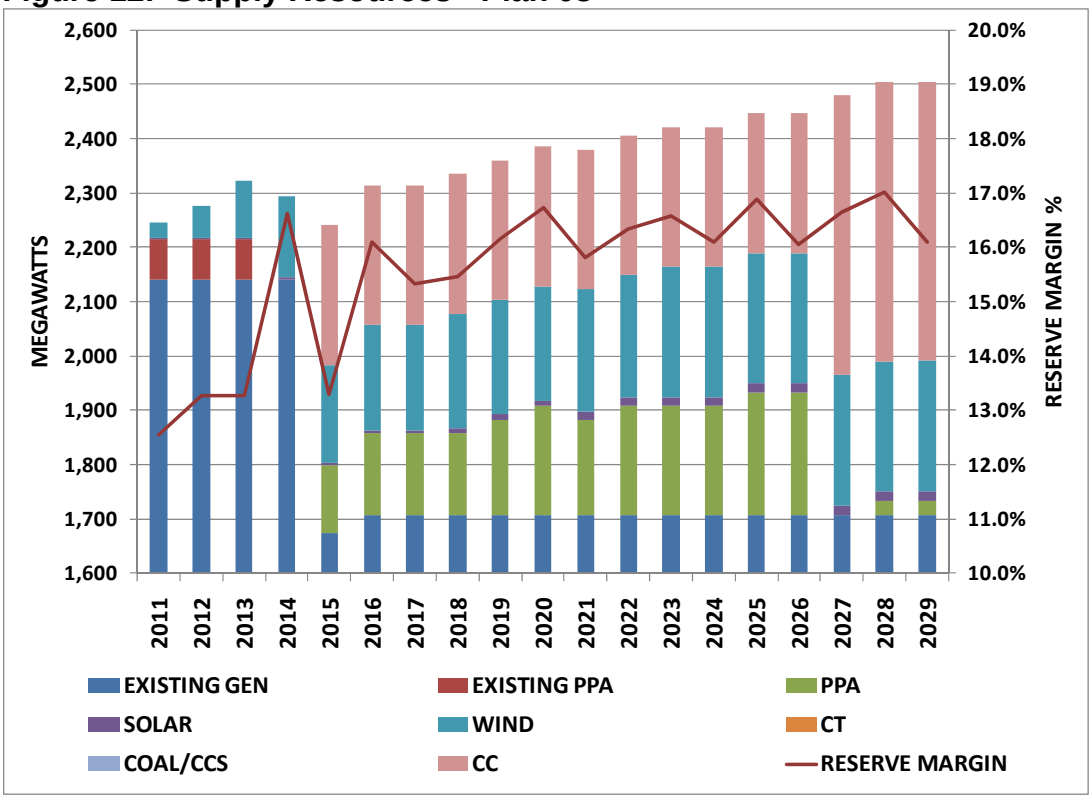


Figure 13: Supply Resources - Plan 09

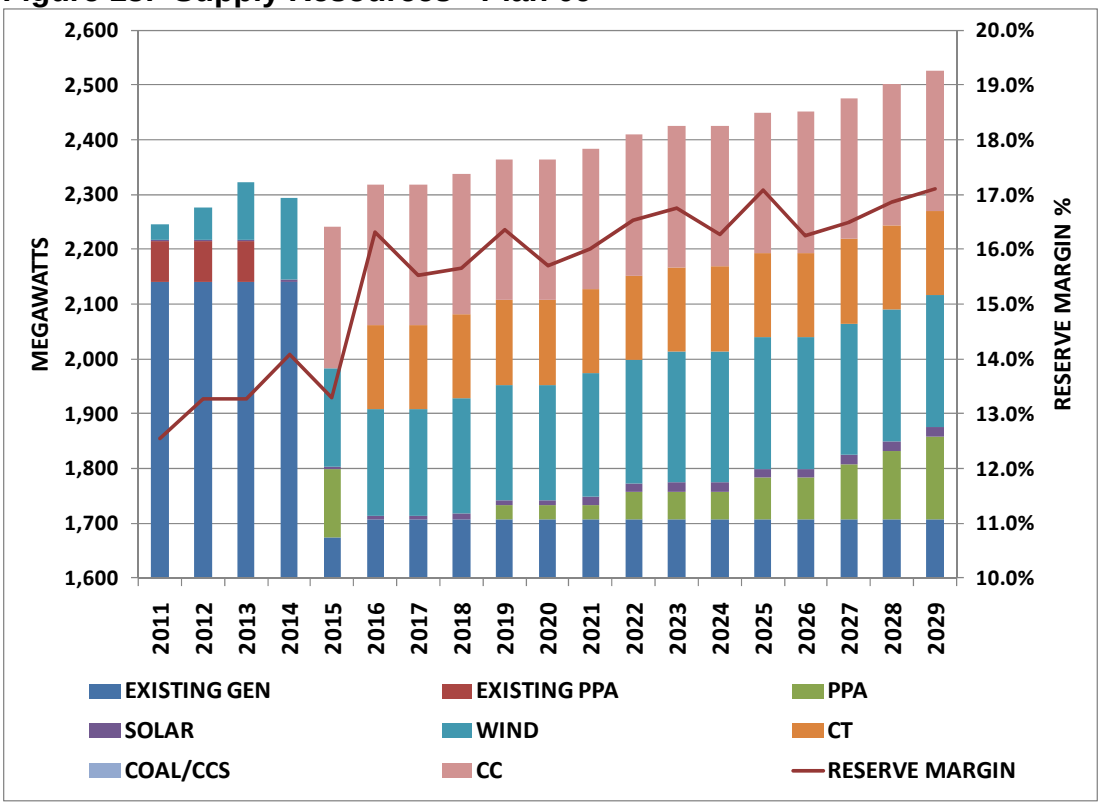


Figure 14: Supply Resources - Plan 10

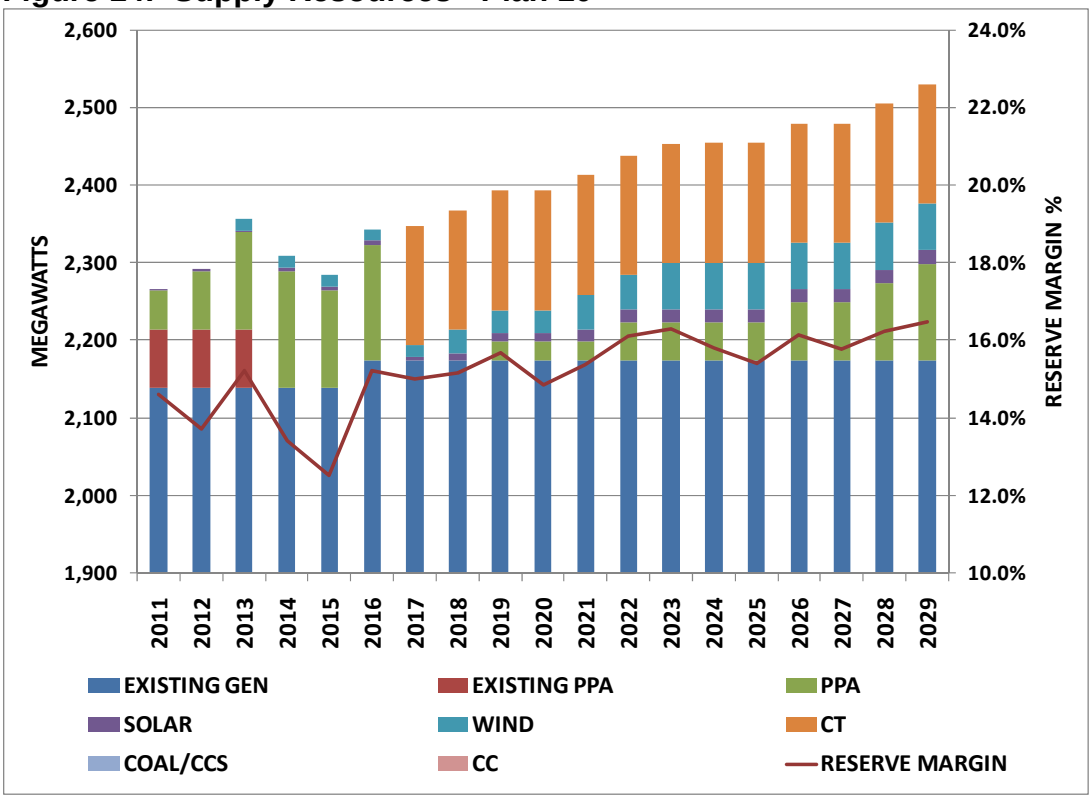
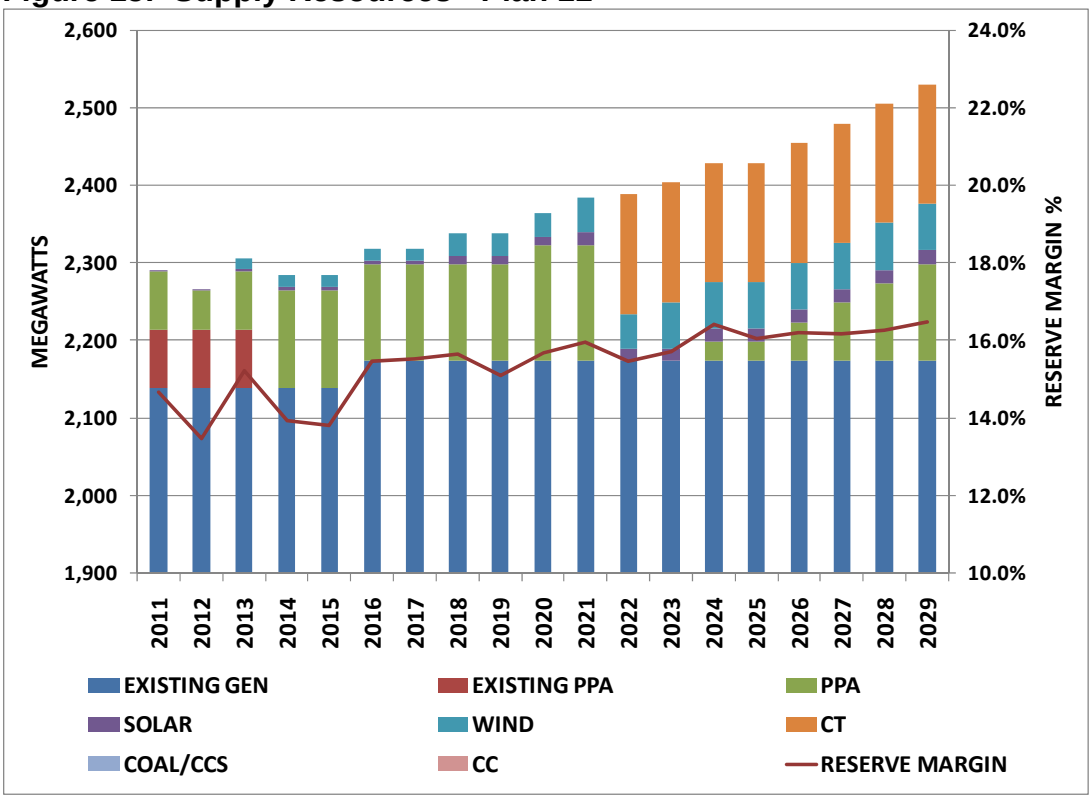


Figure 15: Supply Resources - Plan 11



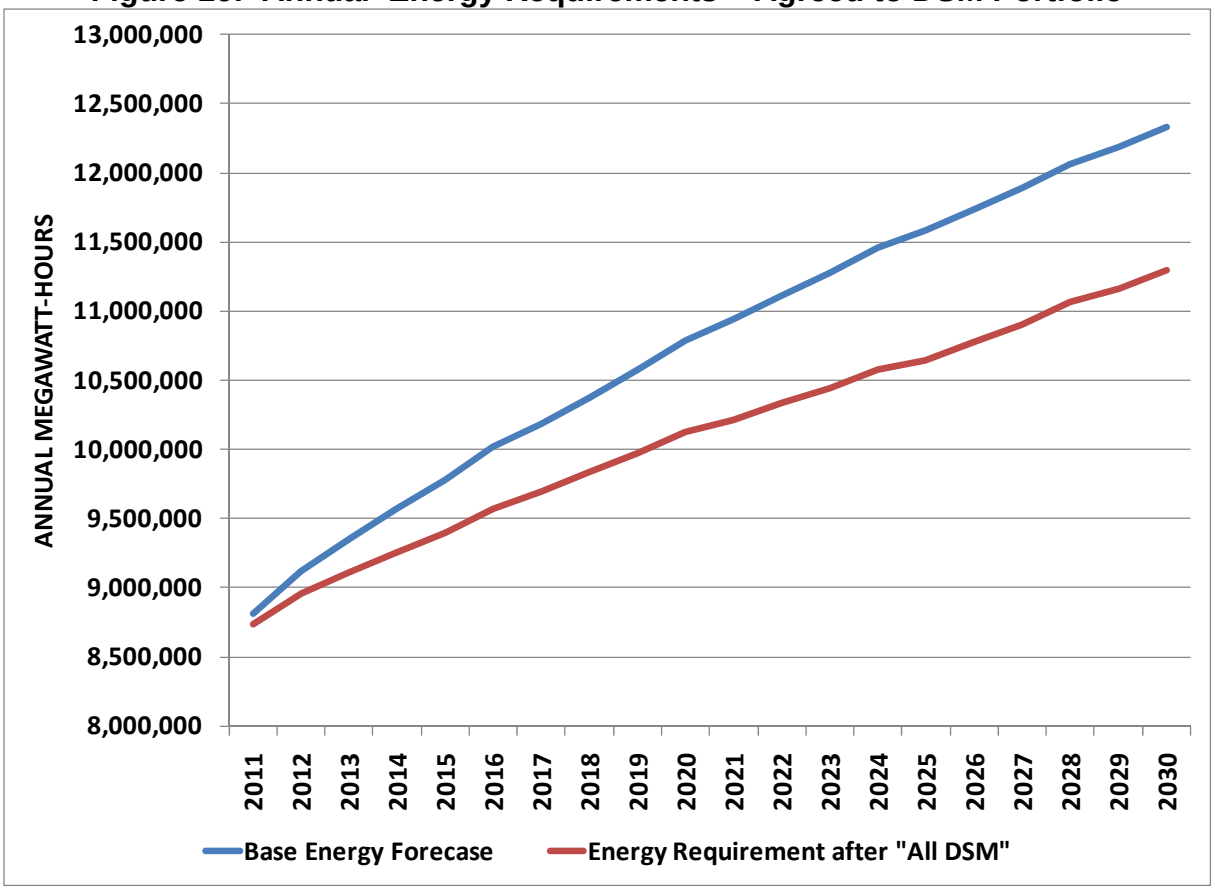
Note that the tabular data that created the eleven figures above is provided on the work paper disc in an Excel files entitled “Figure240-22.060(6)(C)(3)Supply Resources Plan01.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan02.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan03.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan04.xlsx”,“Figure240-22.060(6)(C)(3)Supply Resources Plan05.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan06.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan07.xlsx”,“Figure240-22.060(6)(C)(3)Supply Resources Plan08.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan09.xlsx”, “Figure240-22.060(6)(C)(3)Supply Resources Plan10.xlsx” and “Figure240-22.060(6)(C)(3)Supply Resources Plan11.xlsx”.

6.3.4 DSM ENERGY IMPACT

4. The combined impact of all demand-side resources on the base-case forecast of annual energy requirements;

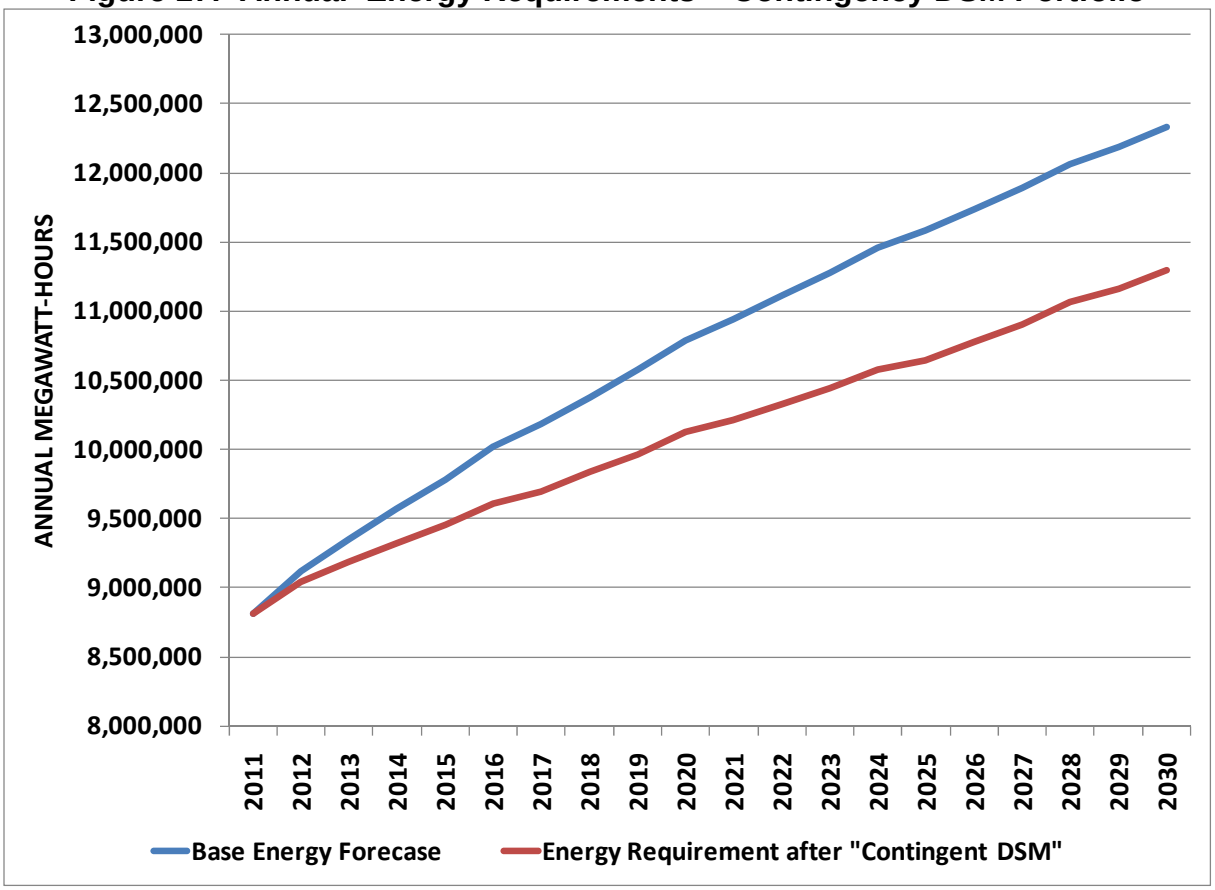
All alternative resource plans in the revised integrated analysis developed within the Stakeholder Process utilize the DSM portfolio of programs provided to the Process participants on July 21, 2010, [referred to as the Agreed to DSM portfolio]. The plans developed within the Process are Plans Nos. 01 through 09. Plan 10 also utilizes this level of DSM. The estimated impacts of these programs on the base case energy requirement for Plans Nos. 01 through 10 are shown in Figure 16 below. Tabular data that created Figure 16: Annual Energy Requirements – Agreed to DSM Portfolio is provided on the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(4)DSM Energy Requirement Impact Agreed to DSM.xlsx”.

Figure 16: Annual Energy Requirements – Agreed to DSM Portfolio



All alternative resource plans in the revised integrated analysis developed as a contingency as defined in Paragraph 30 from Appendix 1 Stakeholder Process Agreement to the Non-unanimous Stipulation and Agreement for Case No. EE-2009-0237 utilize the DSM portfolio of programs identified as “Contingent DSM”. The plan developed within this contingency process is Plan 11. The estimated impacts of these programs on the base case energy requirement for Plan 11 are shown in Figure 17 below. Tabular data that created Figure 17: Annual Energy Requirements – Contingency DSM Portfolio is provided on the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(4)DSM Energy Requirement Impact Contingent DSM.xlsx”.

Figure 17: Annual Energy Requirements – Contingency DSM Portfolio



It should be noted that the Annual Energy Requirement are further reduced by the effects of reduced line losses. The figures above both account for reduced line losses associated with each DSM portfolio.

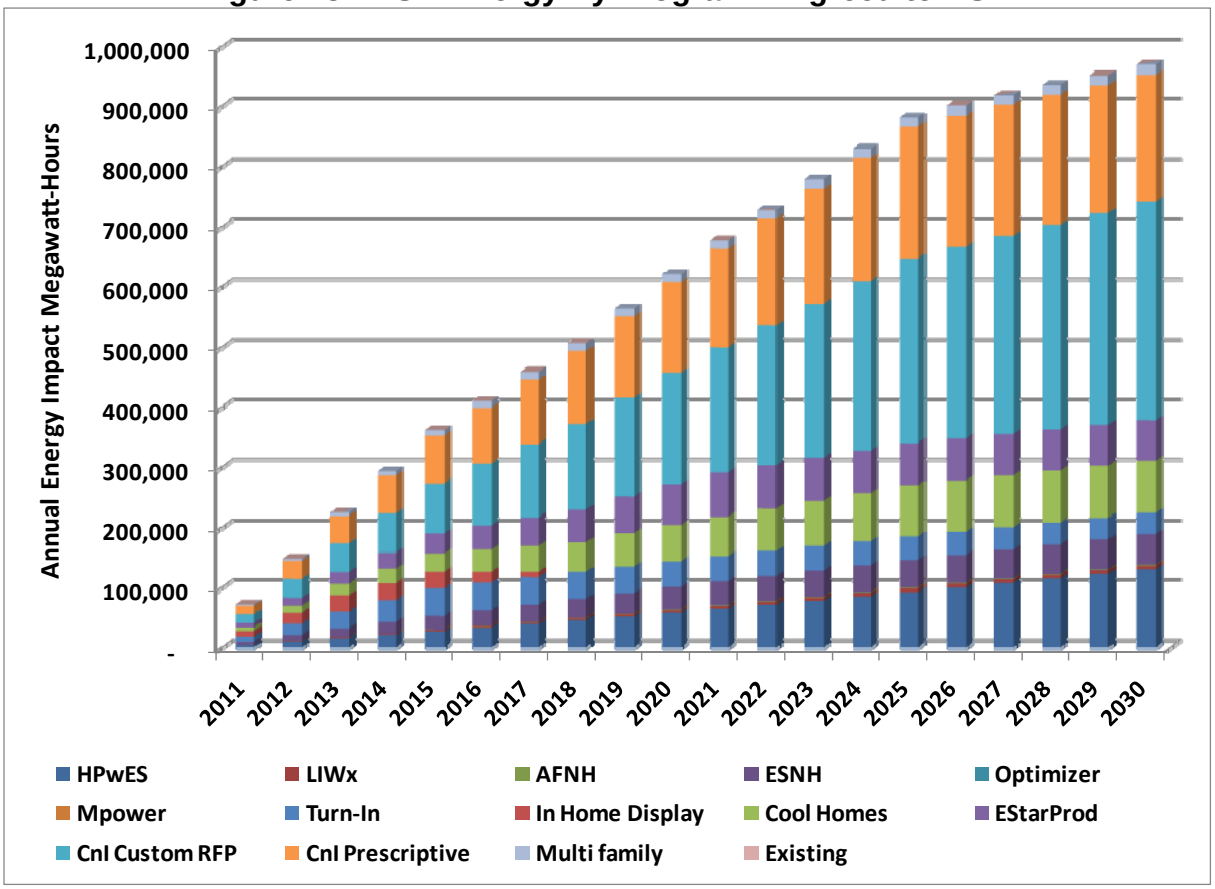
6.3.5 DSM ENERGY BY PROGRAM

5. The composition, by program, of the annual energy provided by demand-side resources;

All alternative resource plans in the revised integrated analysis developed within the Stakeholder Process utilize the DSM portfolio of programs provided to the Process participants on July 21, 2010, [referred to as the Agreed to DSM portfolio]. The plans developed within the Process are Plans Nos. 01 through 09. Plan 10 also uses this

level of DSM. The estimated energy impacts of these individual programs for Plans Nos. 01 through 10 are shown in Figure 18 below. Tabular data that created Figure 18: DSM Energy By Program – Agreed to DSM is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(5)DSM Program Energy Impact Agreed to DSM.xlsx".

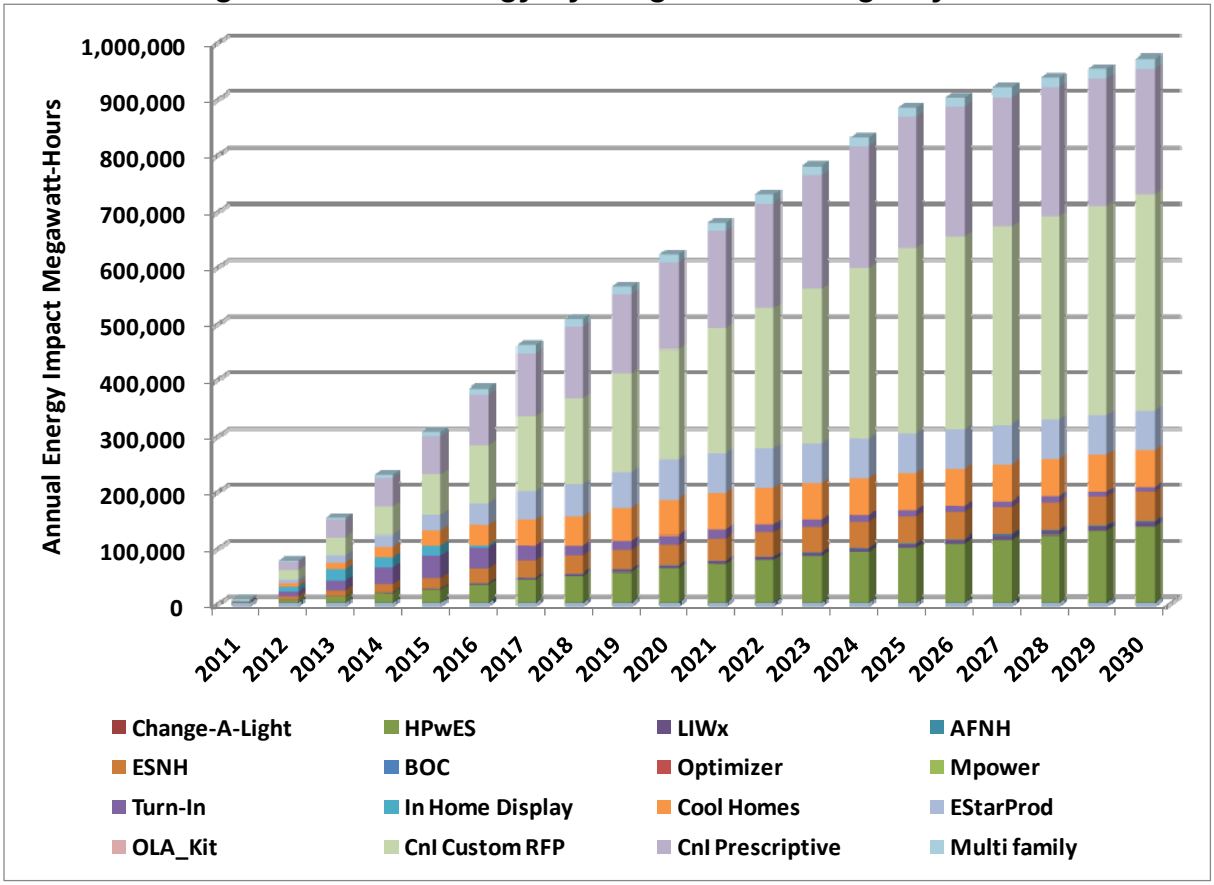
Figure 18: DSM Energy By Program – Agreed to DSM



All alternative resource plans in the revised integrated analysis developed as a contingency as defined in Paragraph 30 from Appendix 1 Stakeholder Process Agreement to the Non-unanimous Stipulation and Agreement for Case No. EE-2009-0237 utilize the DSM portfolio of programs identified as "Contingent DSM". The plan developed within this contingency process is Plan 11. The estimated energy impacts of these individual programs for Plan 11 are shown in Figure 19 below. Tabular data that created Figure 19: DSM Energy By Program - Contingency DSM is provided on

the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(5)DSM Program Energy Impact Contingency DSM.xlsx”.

Figure 19: DSM Energy By Program - Contingency DSM



6.3.6 ENERGY SUPPLY BY RESOURCE

6. The composition, by supply resource, of the annual energy (including losses) provided by supply resources. Existing supply-side resources may be shown as a single resource;

Energy supplied by resource for each plan is plotted in the following charts beginning with Figure 20 below.

Figure 20: Plan01 Generation

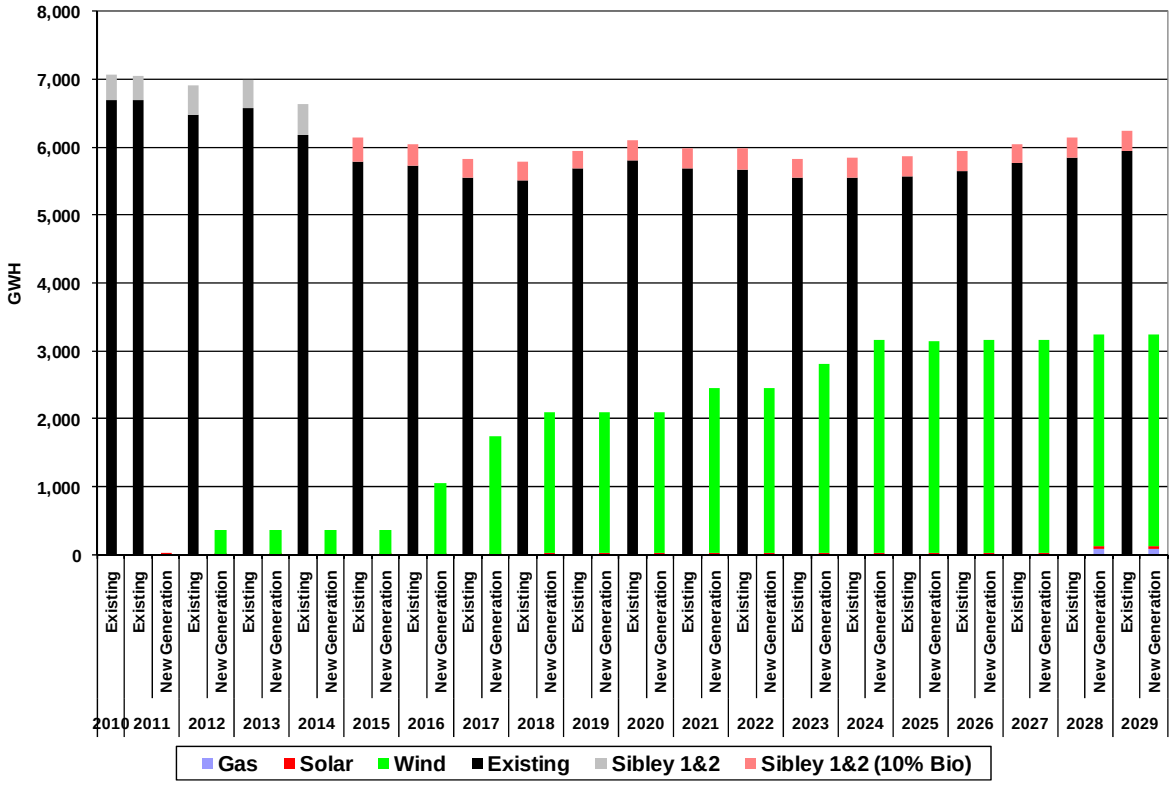


Figure 21: Plan02 Generation

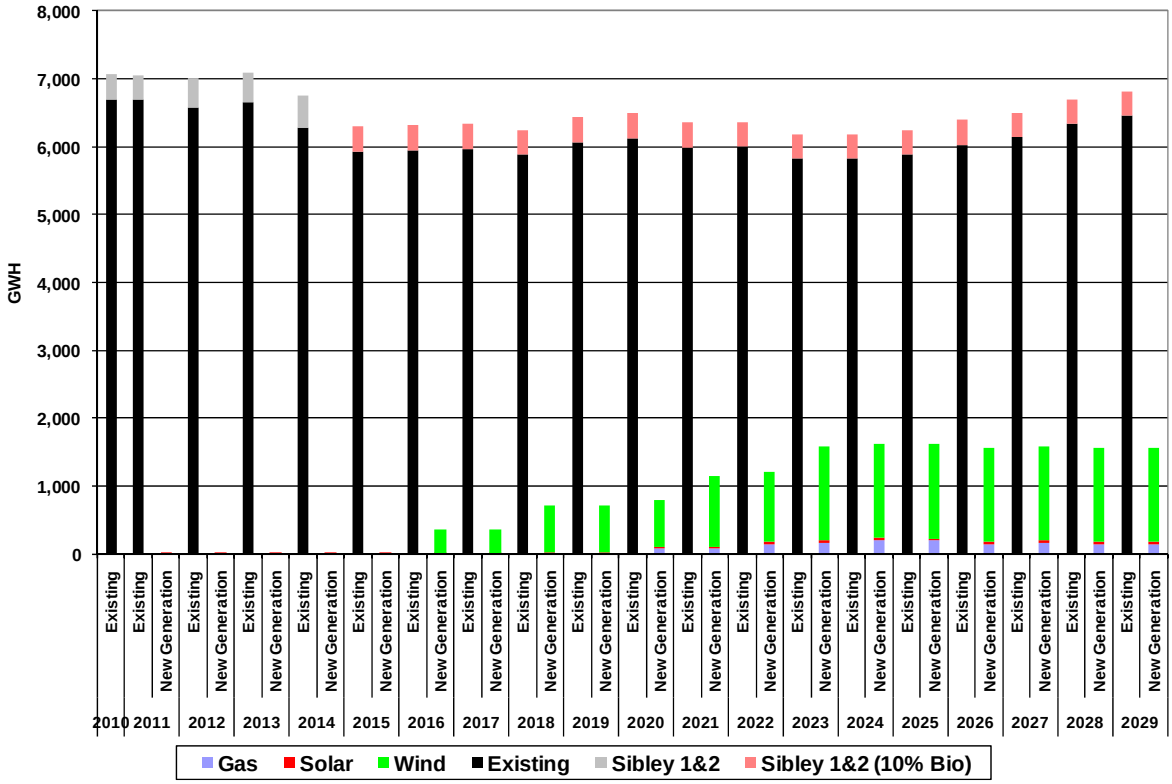


Figure 22: Plan03 Generation

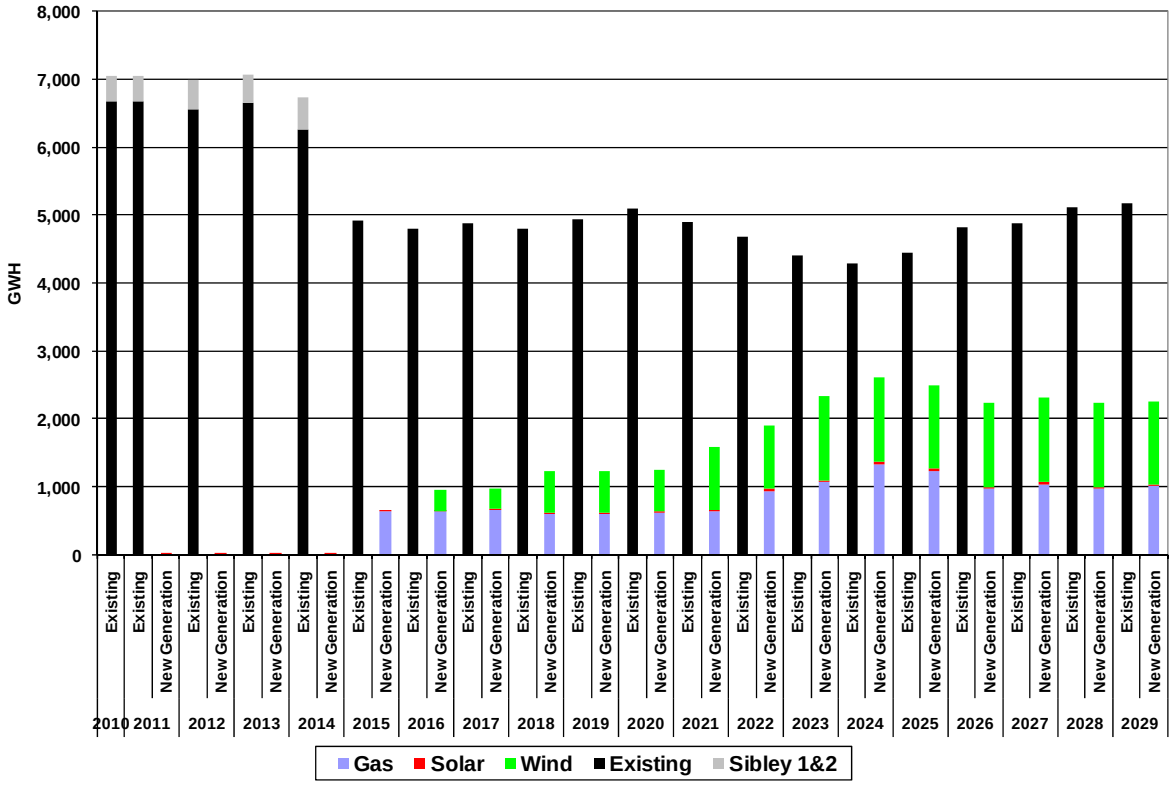


Figure 23: Plan04 Generation

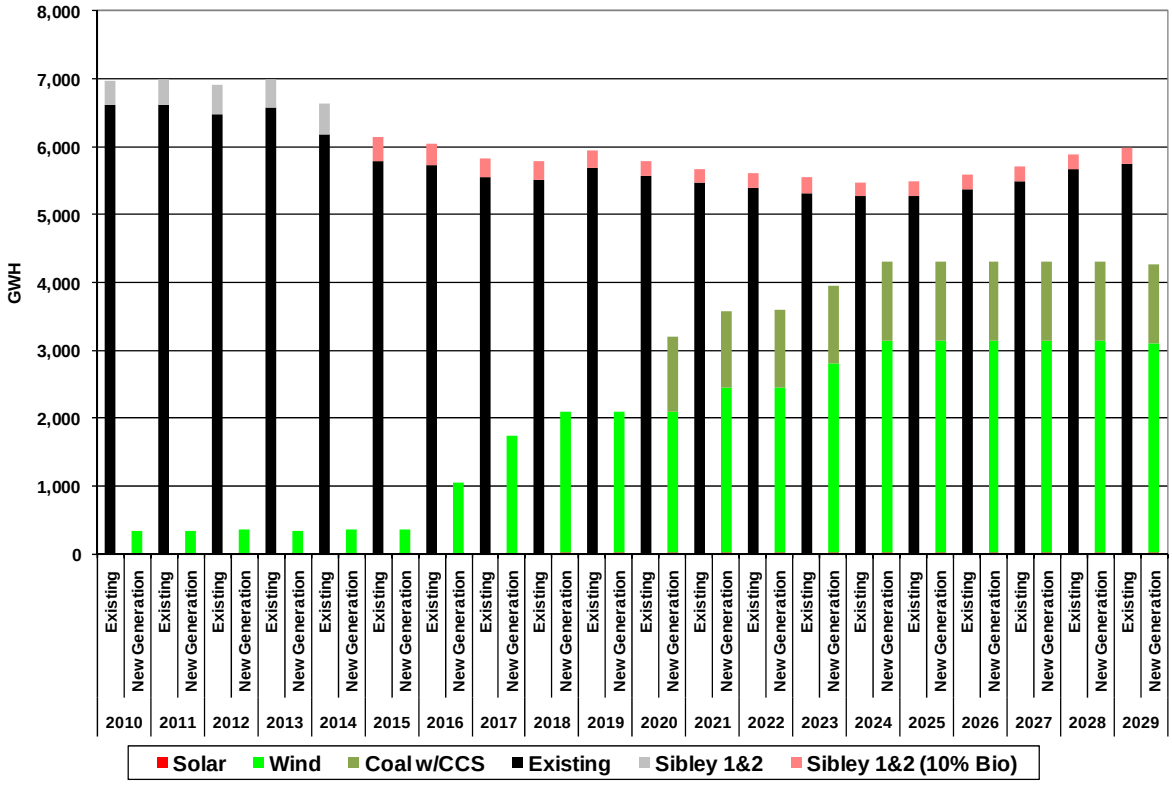


Figure 24: Plan05 Generation

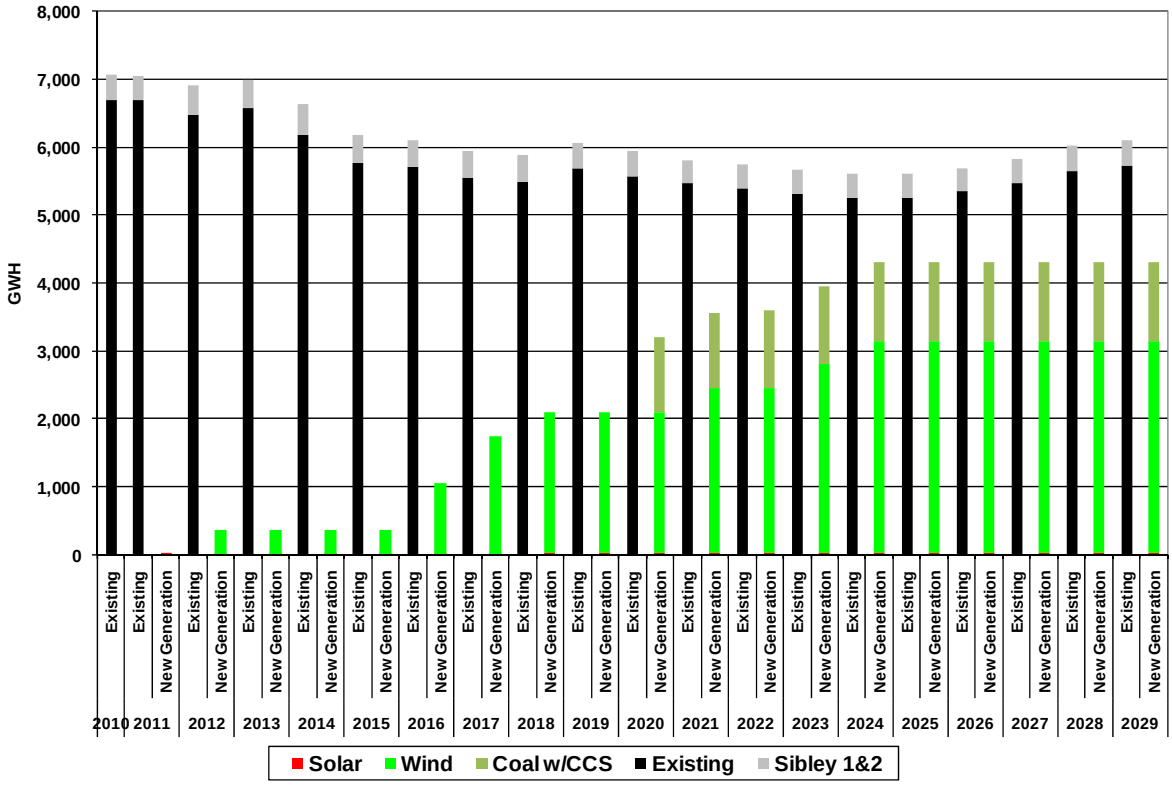


Figure 25: Plan06 Generation

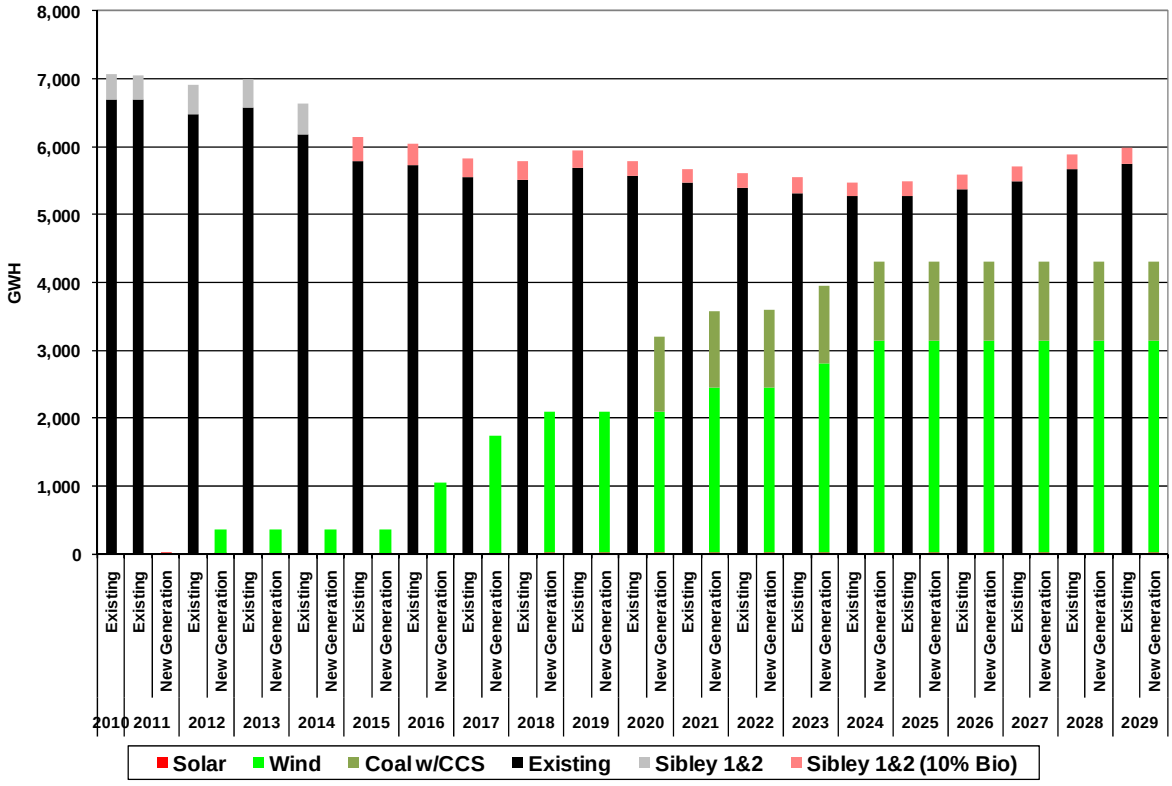


Figure 26: Plan07 Generation

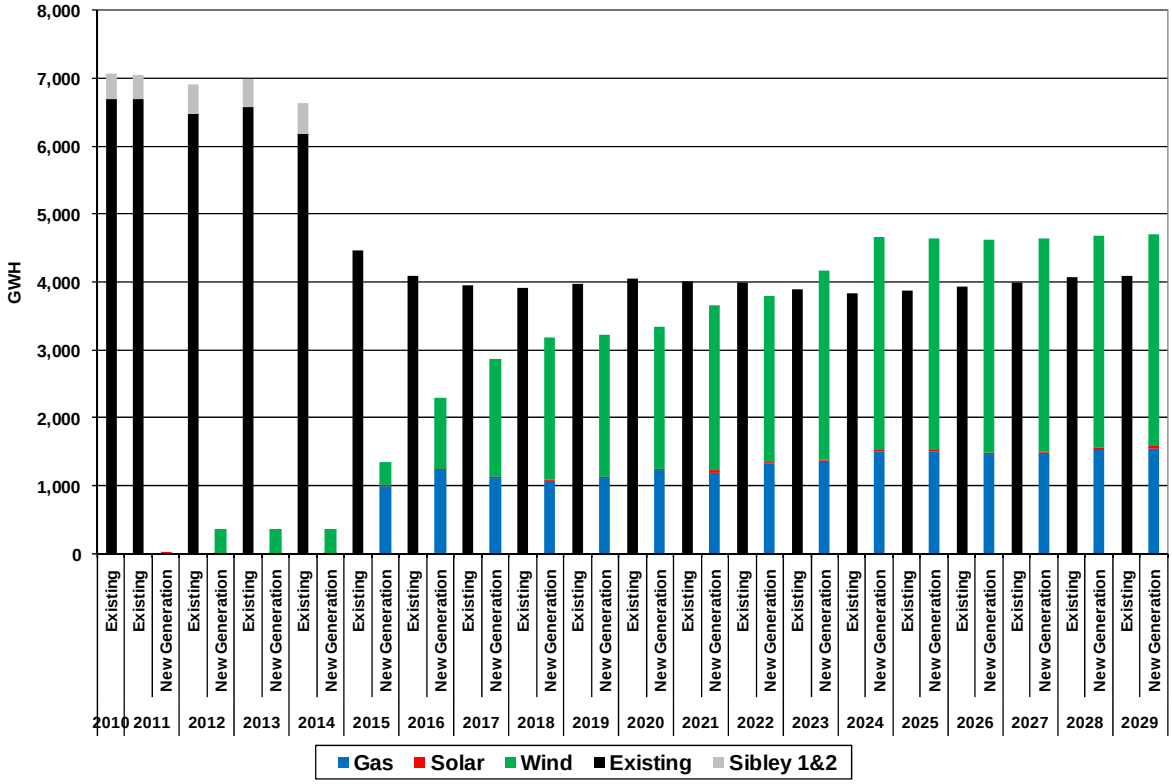


Figure 27: Plan08 Generation

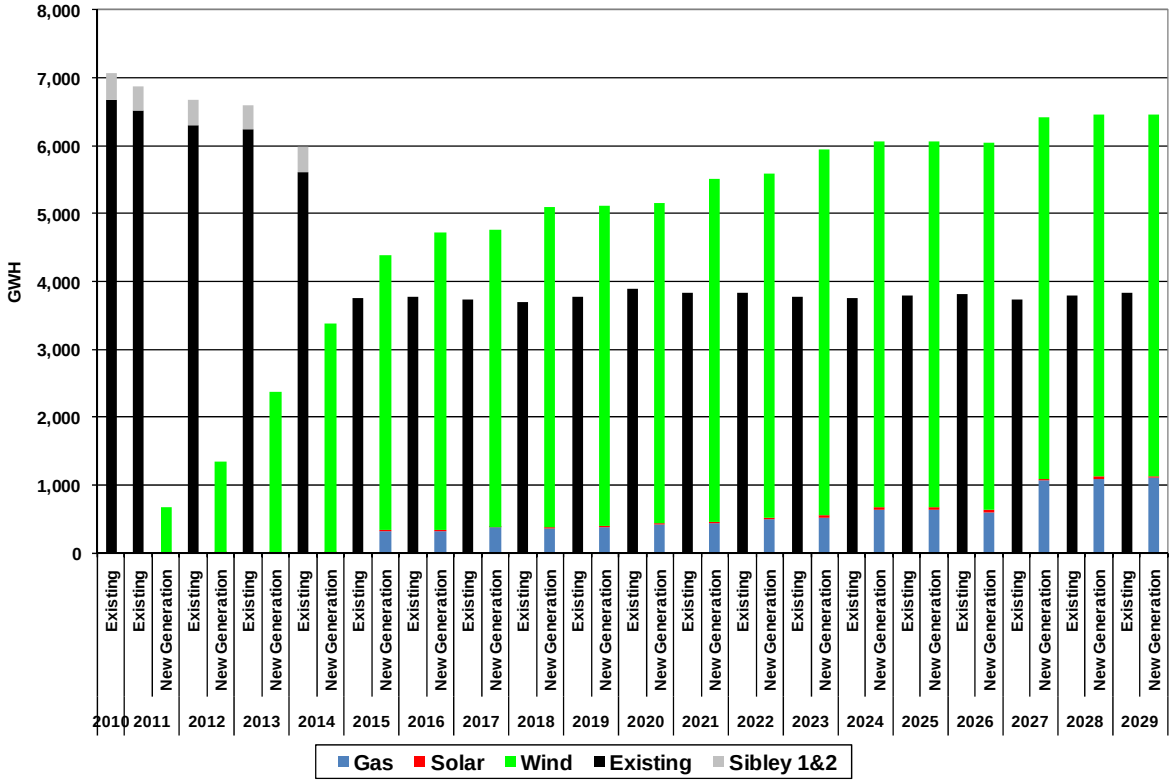


Figure 28: Plan09 Generation

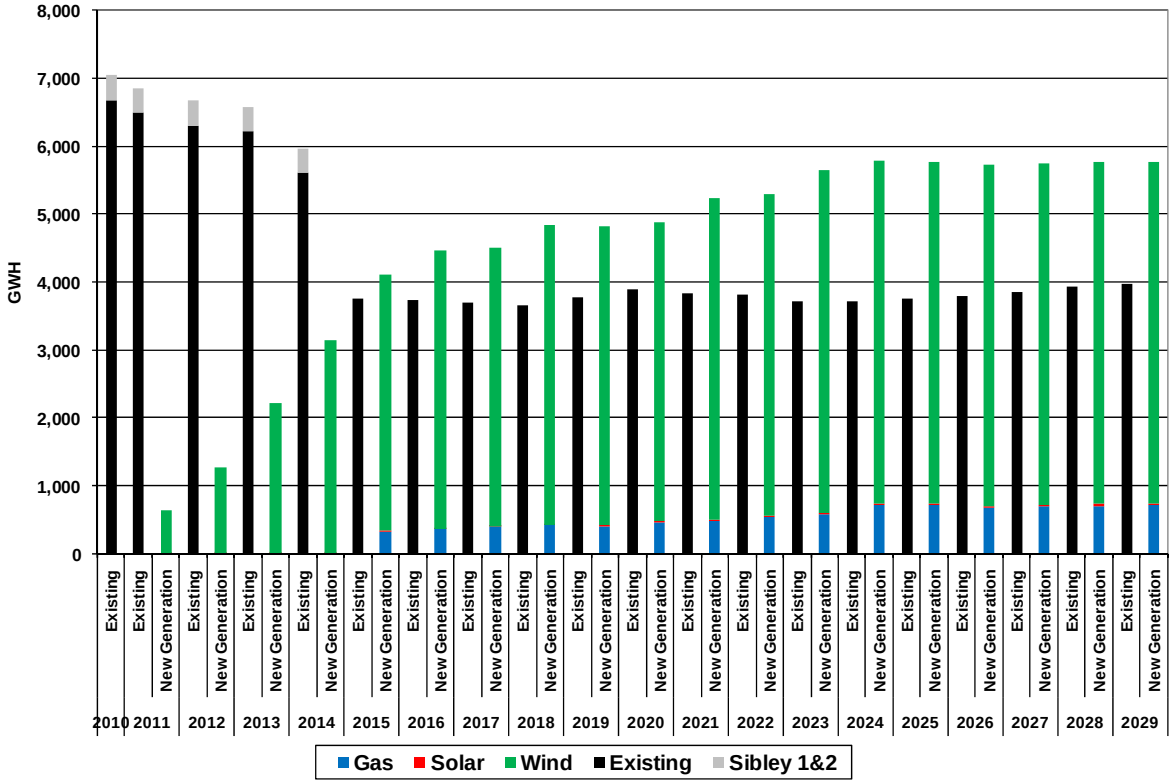


Figure 29: Plan10 Generation

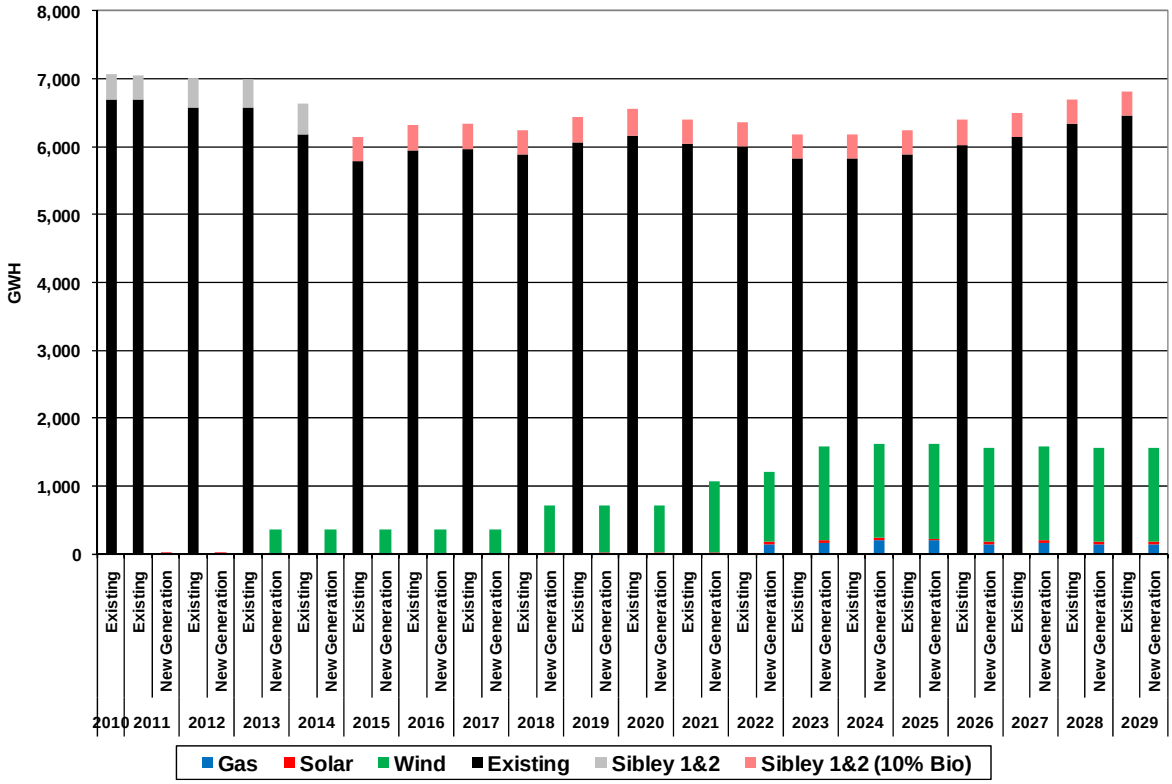
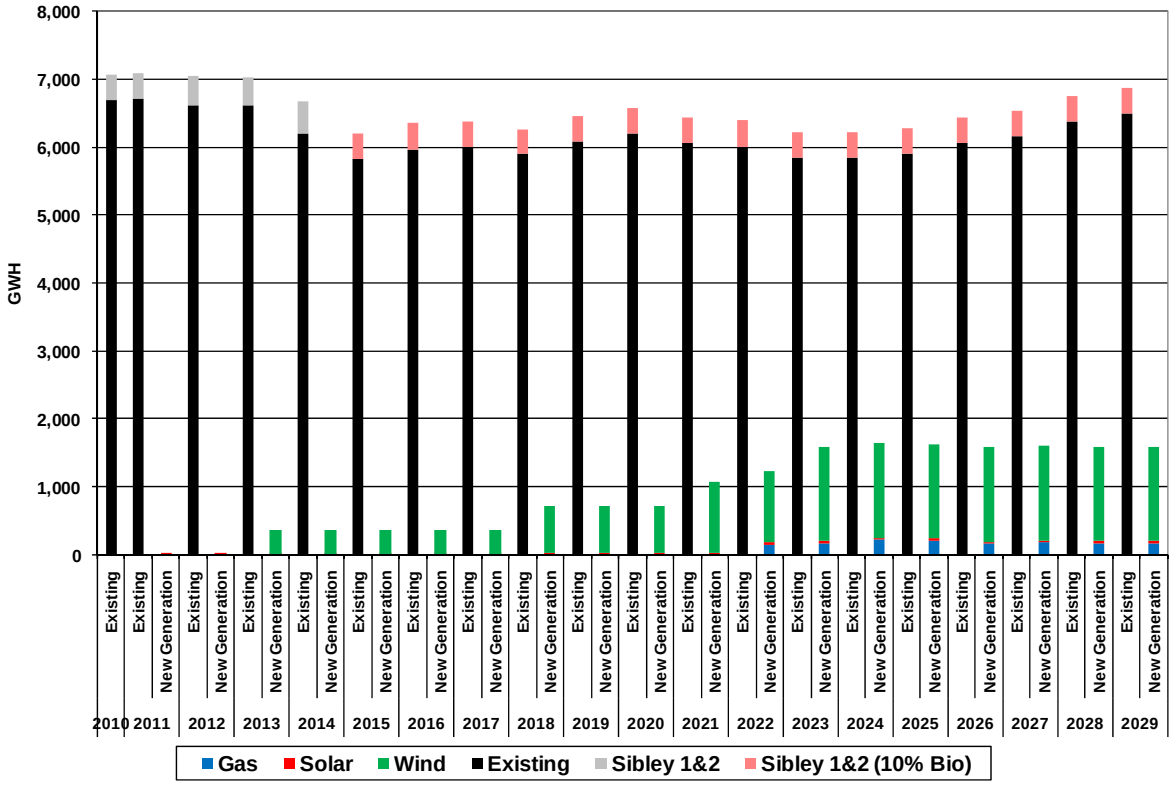


Figure 30: Plan11 Generation



Note that the tabular data that created the eleven figures above is provided on the work paper disc in an Excel files entitled “Figure240-22.060(6)(C)(6)Plan01-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan02-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan03-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan04-Gen.xls”,“Figure240-22.060(6)(C)(6)Plan05-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan06-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan07-Gen.xls”,“Figure240-22.060(6)(C)(6)Plan08-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan09-Gen.xls”, “Figure240-22.060(6)(C)(6)Plan10-Gen.xls” and “Figure240-22.060(6)(C)(6)Plan11-Gen.xls”.

6.3.7 FINANCIAL PERFORMANCE MEASURES

7. The values of the three (3) measures of financial condition identified in subsection (4)(A);

Plots of the values of the three measures of financial condition identified in subsection (4) (A) are given in Figure 31 through Figure 33 below. Tabular data that created these figures is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(7)Plan Financial Measures.xlsx".

Figure 31: PreTax Interest Coverage by Plan

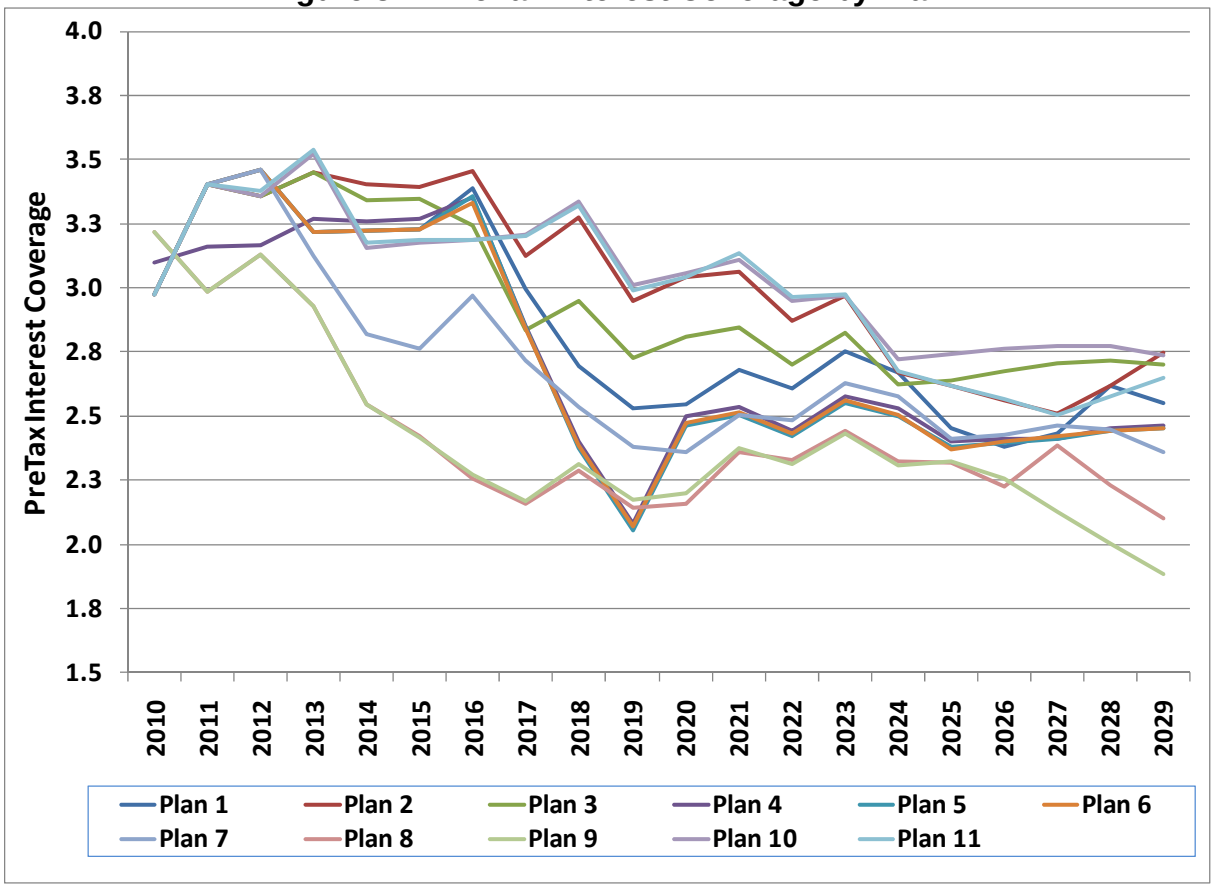


Figure 32: Ratio of Total Debt to Total Capital

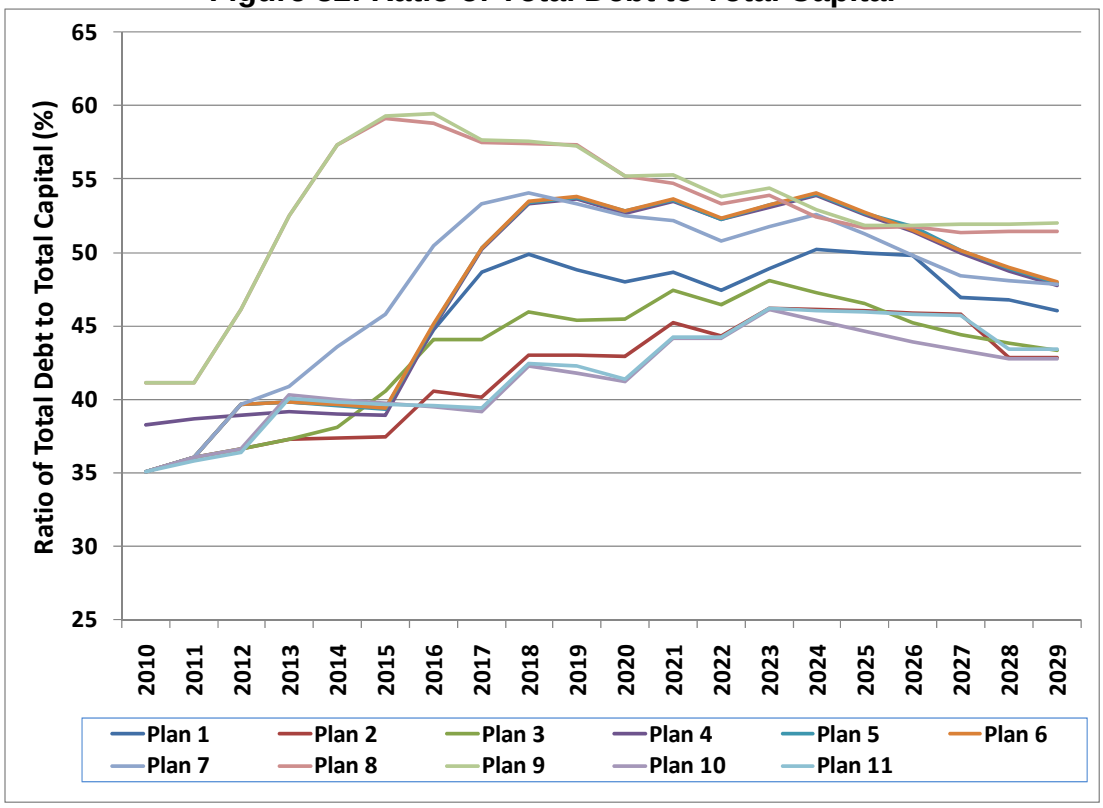
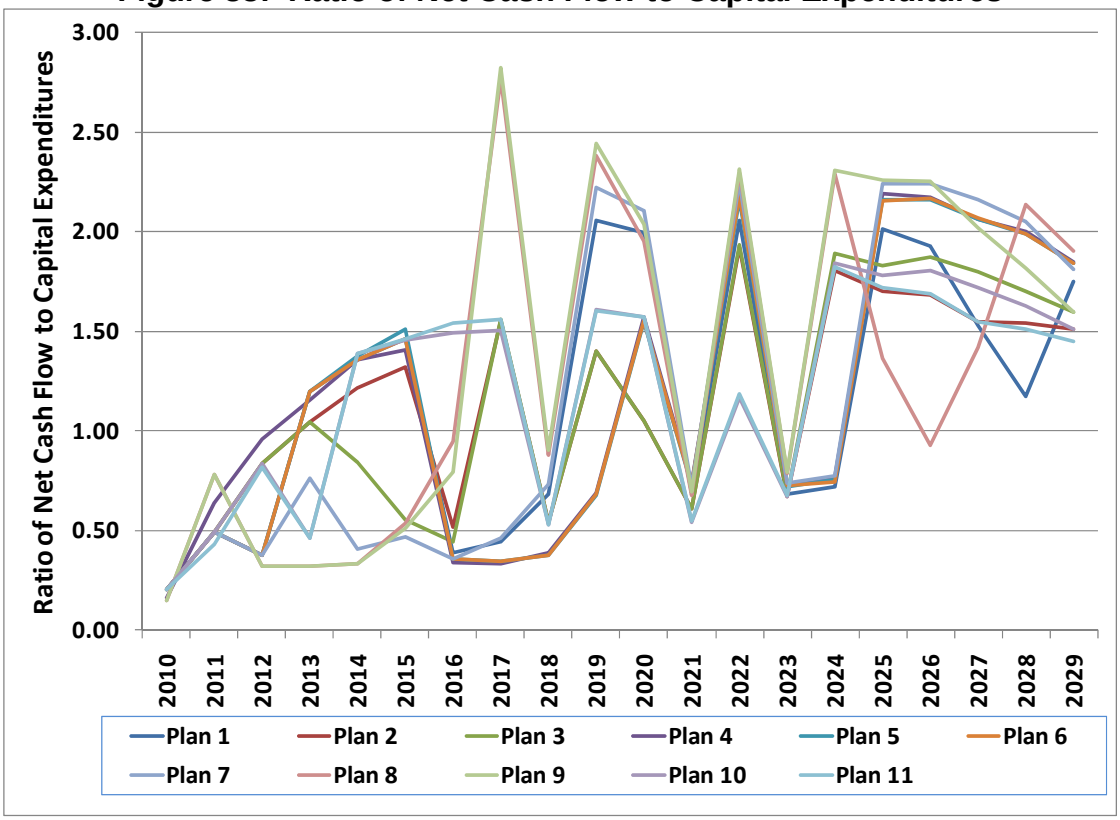


Figure 33: Ratio of Net Cash Flow to Capital Expenditures

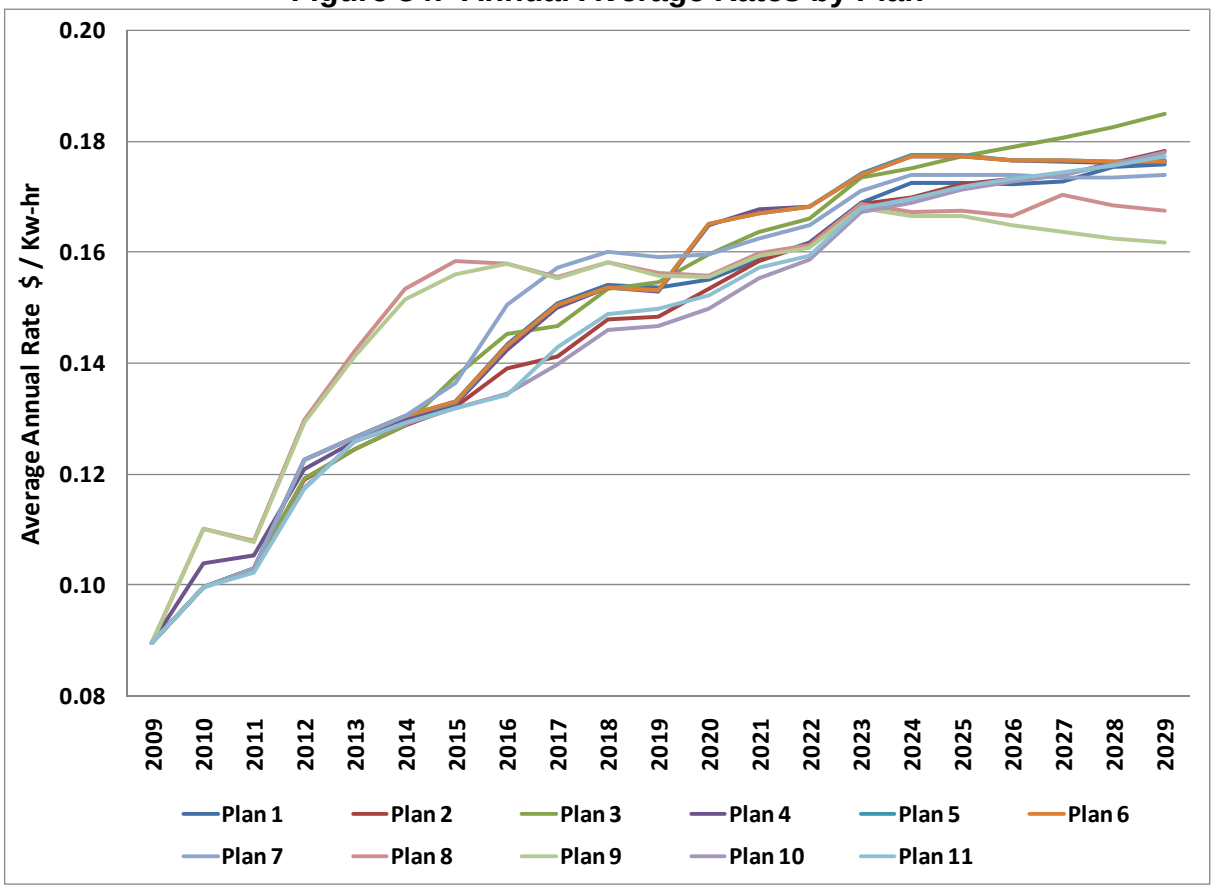


6.3.8 ANNUAL AVERAGE RATES

8. Annual average rates;

Annual average rates for all alternative plans are detailed in Figure 34. Tabular data that created Figure 34: Annual Average Rates by Plan is provided on the work paper disc in an Excel file entitled “Figure240-22.060(6)(C)(8)Annual Average Rates.xlsx”.

Figure 34: Annual Average Rates by Plan



6.3.9 ANNUAL ENVIRONMENTAL POLLUTANT EMISSIONS

9. Annual emissions of each environmental pollutant identified pursuant to 4 CSR 240-22.040(2)(B)1; and

Annual pollutant emissions are detailed in Figure 35 through Figure 37.

Figure 35: Annual SO2 Emissions by Plan

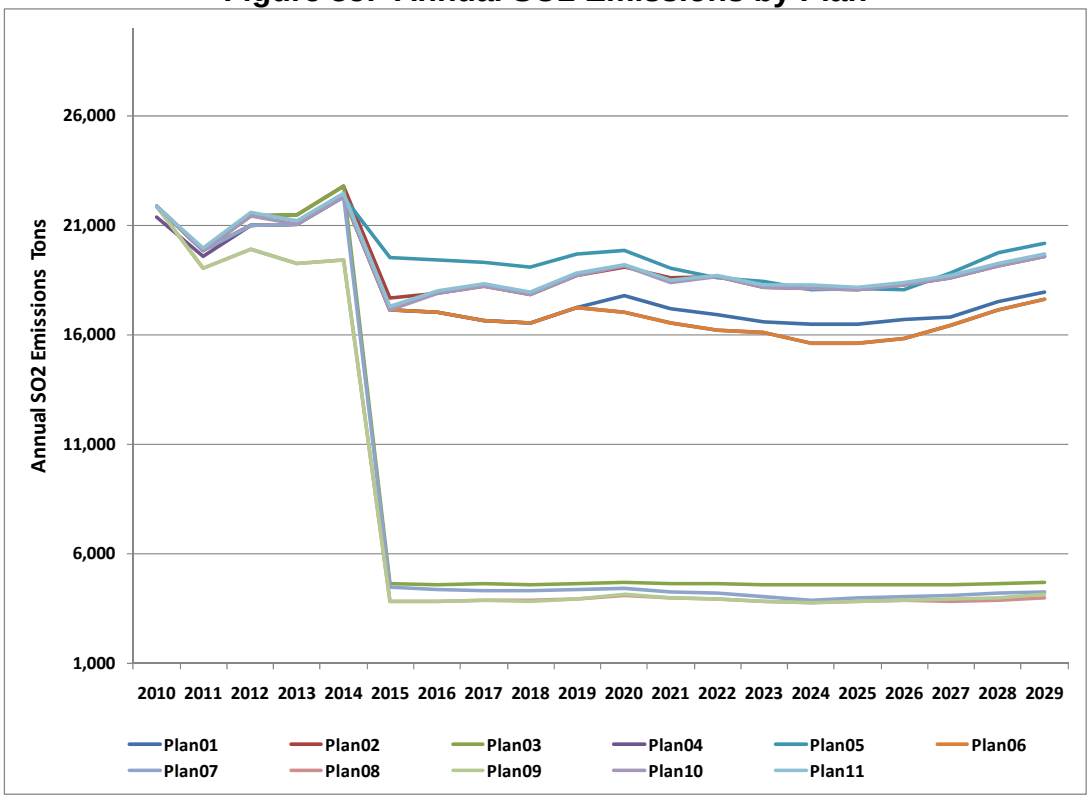


Figure 36: Annual NOx Emissions by Plan

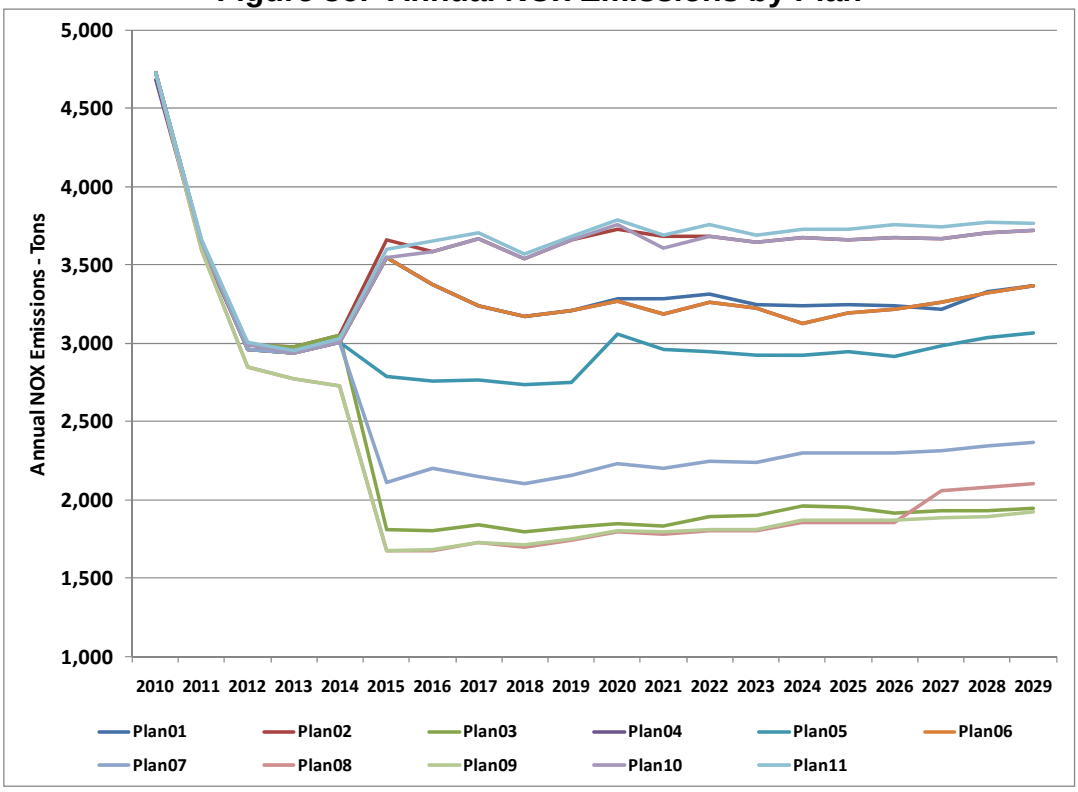
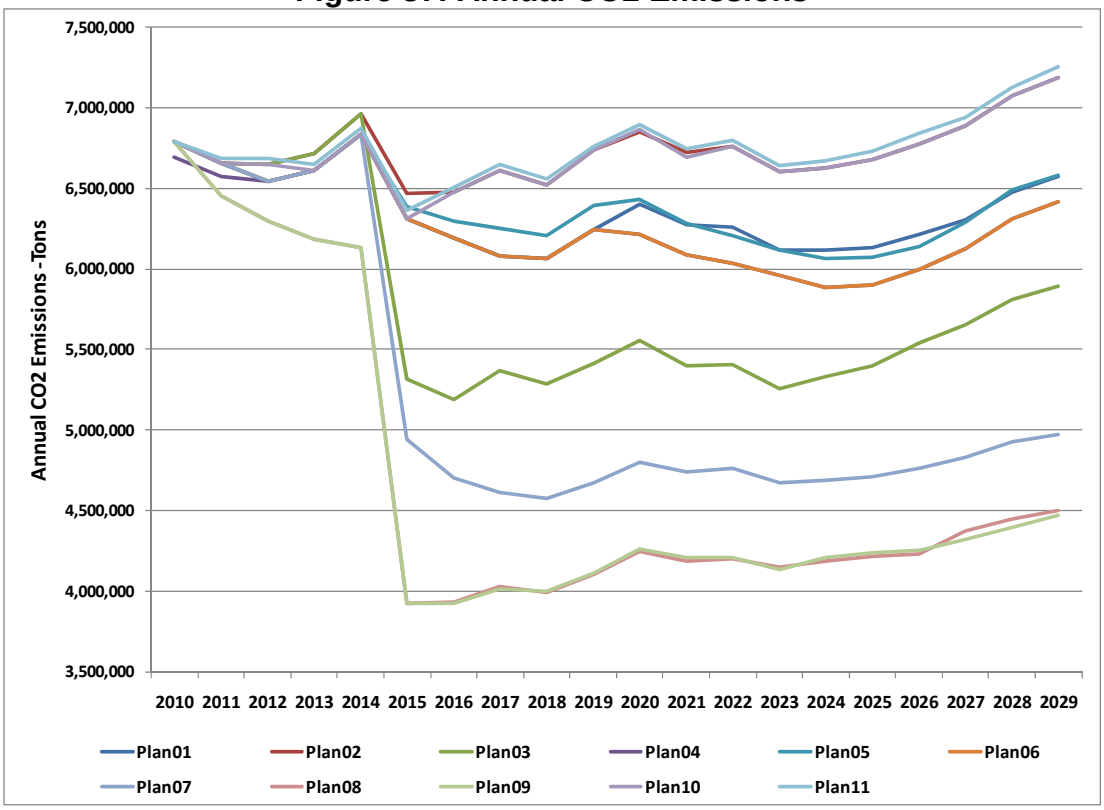


Figure 37: Annual CO2 Emissions



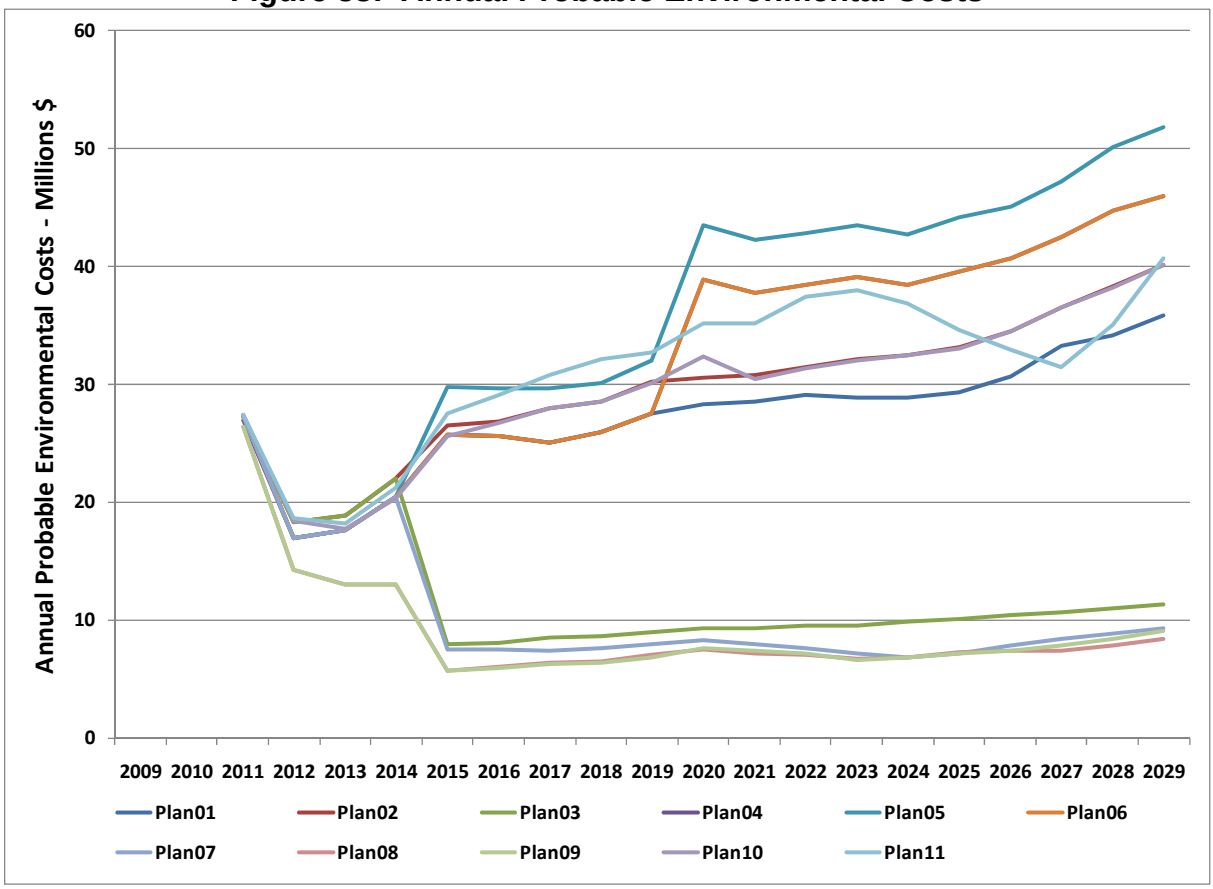
Note: Tabular data that created Figure 35: Annual SO2 Emissions by Plan, Figure 36: Annual NOx Emissions by Plan and Figure 37: Annual CO2 Emissions is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(9) AnnualEmissions.xlsx"

6.3.10 ANNUAL PROBABLE ENVIRONMENTAL COSTS

10. Annual probable environmental costs.

Annual probable environmental costs are shown in Figure 38 below. Tabular data that created Figure 38: Annual Probable Environmental Costs is provided on the work paper disc in an Excel file entitled "Figure240-22.060(6)(C)(10)AnnualPEC.xlsx"

Figure 38: Annual Probable Environmental Costs



6.4 RATE CHANGE IMPACT

(D) A discussion of how the impacts of rate changes on future electric loads were modeled and how the appropriate estimates of price elasticity were obtained;

The impact of price elasticity on future loads is discussed in detail in Volume 3 of the original filing.

6.5 MODELING SOFTWARE DESCRIPTION

(E) A description of the computer models used in the analysis of alternative resource plans; and

The MIDAS™ provides hourly chronological dispatch of all system generating assets including unit commitment logic that simulation the actual operation of the utility

system resources. The model contains all unit operating variables required to simulate the units. These variables include but are not limited to, heat rates, fuel costs, variable operation and maintenance costs, sulfur dioxide emission allowance costs, scheduled maintenance outages, forced and derate outages rates each on a per unit basis.

The model can also simulate capacity and energy purchases from or sales to a market in either a firm transaction or as a spot market transaction. In the case of market based transactions, all can be conducted with the impact of environmental credits factored in. The level of purchases or sales can also be limited to any range desired. For this IRP, GMO has limited the ability to purchase firm sales to a level consistent with the company's current operating methods and market conditions.

For a complete discussion of the operation of the MIDAS™ model please refer to Volume 7 of the original filing, Section 7.2. This section is the company response to Rule 4 CSR 240-22.070(7)(B).

6.6 LOAD BUILDING PROGRAMS

(F) A description of any proposed load-building programs, a discussion of why these programs are judged to be in the public interest and, for all resource plans that include these programs, plots of the following over the planning horizon:

GMO does not have any existing or proposed load-building programs.

6.6.1 AVERAGE RATES

1. Annual average rates with and without the load-building programs; and

GMO does not have any existing or proposed load-building programs.

6.6.2 ANNUAL UTILITY AND PROBABLE ENVIRONMENTAL COSTS

2. Annual utility costs and probable environmental costs with and without the load-building programs. .

GMO does not have any existing or proposed load-building programs.