Chapter 9 - Appendix A Candidate Resource Plans

Table 9.A.1 Type, Size, Timing of Resource Addition/Retirement¹

	Plan B1: Con					_															
		2011	2012	2013	2014	2015	<u>2016</u>	<u>2017</u>	<u>2018</u>	2019	<u>2020</u>	2021	2022	<u>2023</u>	2024	<u>2025</u>	<u>2026</u>	2027	2028	2029	20
	Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,
	Total plant upgrades/adjustmts	2	6	30	34	38	-59	11	- 11	11	41	41	41	41	41	41	41	41	41	41	
+	Meramec retirement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Renewables	0	0	8	8	8	12	12	16	16	20	21	24	26	29	31	34	37	39	41	
+	Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-47	-78	-105	-137	-171	-205	-239	-287	-333	-372	-412	-450	-489	-526	-567	-606	-642	-675	-708	
-	Demand response	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-20	-83	-158	-236	
÷	New primary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
_	Capacity position after adjustmts	-67	295	659	618	604	476	512	483	426	411	358	302	245	184	119	75	67	61	58	
	Purchases(+) or sales(-)	67	-295	-659	-618	-604	-476	-512	-483	-426	-411	-358	-302	-245	-184	-119	-75	-67	-61	-58	
	Plan B2: Co	ombine	ed Cv	cle - N	uke 3	0% -	Prop	C Ren	ewabl	es - L	ow Ri	sk DS	M - M	er co	ıtinue	s - No	r cont	tinues			
		2011	2012	2013	2014	2015			2018		2020				2024	2025	2026	2027	2028	2029	2
	Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1
-	Total plant upgrades/adjustmts	2	6		34	38	15	85	85	85	91	91	91	91	68	69	69	69	69	69	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Renewables	0	0	8	8	8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
	Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-49	-69	-88	-111	-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	
	Demand response	0	0		0	0	-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	
	New primary supply side	0	0		0	0	0	0	0	0	-111	0	0	0	0	0	0	0	480	480	
		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Capacity position after adjustmts	-66	286		593	567	513	569	534	461	407	332	258	178	73	-17	-103	-194	185	85	
	Purchases(+) or sales(-)	66	-286		-593	-567	-513	-569	-534	-461	-407	-332	-258	-178	-73	17	103	194	-185	-85	
	DI DA C		1.0	6.			n	C.D.				· 1 D									
	Plan B3: Con	2011	2012	2013	201 4	2015	_		2018		2020		2022				2026	2027	2028	2029	
	Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	
	Total plant upgrades/adjustmts	2	6	30	34	38	15	85	85	85	91	91	91	91	68	69	69	69	69	69	
	Meramec retirement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		0	0		8	8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
	Noranda termination	0	0	_	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-49	-69	-88	-111	-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	
	Demand response	0	0		0	0	-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	
	New primary supply side	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	692	
		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	092	
	2 11 2	-66	286		593	567	513	569	534	461	407	332	258	178	73	-17	-103	-194	-295	297	
	Capacity position after adjustmts Purchases(+) or sales(-)	-66	-286		-593	-567	-513	-569	-534	-461	-407	-332	-258	-178	-73	17	103	194	295	-297	
	n, n, c,												B011								
					1/01	1 ^		~ 7						- Mer							
	Plan B4: Comb		_					_												2020	
		2011	2012	<u>2013</u>	2014	<u>2015</u>	<u>2016</u>	2017	<u>2018</u>	2019	<u>2020</u>	2021	2022	2023	2024	<u>2025</u>	<u>2026</u>	2027	2028	2029	
	Existing capacity position	<u>2011</u> -117	2012 211	<u>2013</u> 516	2014 440	<u>2015</u> 387	<u>2016</u> 318	2017 250	2018 168	<u>2019</u> 65	<u>2020</u> -22	<u>2021</u> -116	<u>2022</u> -212	<u>2023</u> -311	<u>2024</u> -412	<u>2025</u> -520	<u>2026</u> -626	<u>2027</u> -736	<u>2028</u> -852	-969	-
	Existing capacity position Total plant upgrades/adjustmts	2011 -117 2	2012 211 6	2013 516 30	2014 440 34	2015 387 38	2016 318 15	2017 250 85	2018 168 85	2019 65 85	2020 -22 91	2021 -116 91	2022 -212 91	2023 -311 91	202 <u>4</u> -412 68	2025 -520 69	2026 -626 69	2027 -736 69	2028 -852 69	-969 69	-
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement	2011 -117 2 0	2012 211 6	2013 516 30 0	2014 440 34 0	2015 387 38 0	2016 318 15 0	2017 250 85 0	2018 168 85 0	2019 65 85 0	2020 -22 91 0	2021 -116 91 0	2022 -212 91 0	2023 -311 91 0	2024 -412 68 0	2025 -520 69 0	2026 -626 69 0	2027 -736 69 0	2028 -852 69 0	-969 69 0	-
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables	2011 -117 2 0	2012 211 6 0	2013 516 30 0 8	2014 440 34 0 8	2015 387 38 0 8	2016 318 15 0 12	2017 250 85 0 12	2018 168 85 0 17	2019 65 85 0 17	2020 -22 91 0 20	2021 -116 91 0 21	2022 -212 91 0 23	-311 91 0 26	-412 68 0 28	-520 69 0 31	2026 -626 69 0 33	2027 -736 69 0 36	2028 -852 69 0 39	-969 69 0 41	-
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination	2011 -117 2 0 0	2012 211 6 0 0	516 30 0 8 0	2014 440 34 0 8 0	2015 387 38 0 8	2016 318 15 0 12	2017 250 85 0 12	2018 168 85 0 17 0	2019 65 85 0 17 0	2020 -22 91 0 20	2021 -116 91 0 21 0	2022 -212 91 0 23 0	2023 -311 91 0 26 0	2024 -412 68 0 28	2025 -520 69 0 31	2026 -626 69 0 33	2027 -736 69 0 36 0	2028 -852 69 0 39	-969 69 0 41	-
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency	2011 -117 2 0 0 0 -49	2012 211 6 0 0 0 0 -69	2013 516 30 0 8 0 -88	2014 440 34 0 8 0 -111	2015 387 38 0 8 0 -134	2016 318 15 0 12 0 -154	250 85 0 12 0 -172	2018 168 85 0 17 0 -189	2019 65 85 0 17 0 -201	2020 -22 91 0 20 0 -206	2021 -116 91 0 21 0 -216	2022 -212 91 0 23 0 -223	2023 -311 91 0 26 0 -228	-412 68 0 28 0 -232	-520 -520 69 0 31 0 -235	2026 -626 69 0 33 0 -235	2027 -736 69 0 36 0 -235	2028 -852 69 0 39 0 -236	-969 69 0 41 0 -235	-
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response	2011 -117 2 0 0	2012 211 6 0 0	2013 516 30 0 8 0 -88	2014 440 34 0 8 0	2015 387 38 0 8	2016 318 15 0 12	2017 250 85 0 12	2018 168 85 0 17 0	2019 65 85 0 17 0	2020 -22 91 0 20	2021 -116 91 0 21 0	2022 -212 91 0 23 0	2023 -311 91 0 26 0	2024 -412 68 0 28	2025 -520 69 0 31	2026 -626 69 0 33	2027 -736 69 0 36 0	2028 -852 69 0 39	-969 69 0 41	-
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency	2011 -117 2 0 0 0 -49	2012 211 6 0 0 0 0 -69	2013 516 30 0 8 0 -88 0	2014 440 34 0 8 0 -111	2015 387 38 0 8 0 -134	2016 318 15 0 12 0 -154	250 85 0 12 0 -172	2018 168 85 0 17 0 -189	2019 65 85 0 17 0 -201	2020 -22 91 0 20 0 -206	2021 -116 91 0 21 0 -216	2022 -212 91 0 23 0 -223	2023 -311 91 0 26 0 -228	-412 68 0 28 0 -232	-520 -520 69 0 31 0 -235	2026 -626 69 0 33 0 -235	2027 -736 69 0 36 0 -235	2028 -852 69 0 39 0 -236	-969 69 0 41 0 -235	-
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response	2011 -117 2 0 0 0 -49	2012 211 6 0 0 0 -69	2013 516 30 0 8 0 -88 0	2014 440 34 0 8 0 -111	2015 387 38 0 8 0 -134 0	2016 318 15 0 12 0 -154 -14	2017 250 85 0 12 0 -172 -49	2018 168 85 0 17 0 -189 -75	2019 65 85 0 17 0 -201 -93	2020 -22 91 0 20 0 -206 -111	2021 -116 91 0 21 0 -216 -121	2022 -212 91 0 23 0 -223 -133	2023 -311 91 0 26 0 -228 -145	2024 -412 68 0 28 0 -232 -157	2025 -520 69 0 31 0 -235 -167	2026 -626 69 0 33 0 -235 -185	2027 -736 69 0 36 0 -235 -202	2028 -852 69 0 39 0 -236 -213	-969 69 0 41 0 -235 -229	-
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side	2011 -117 2 0 0 0 -49 0	2012 211 6 0 0 0 -69 0	2013 516 30 0 8 0 -88 0 0	2014 440 34 0 8 0 -111 0	2015 387 38 0 8 0 -134 0	2016 318 15 0 12 0 -154 -14	2017 250 85 0 12 0 -172 -49	2018 168 85 0 17 0 -189 -75	2019 65 85 0 17 0 -201 -93 0	2020 -22 91 0 20 0 -206 -111	2021 -116 91 0 21 0 -216 -121	2022 -212 91 0 23 0 -223 -133	2023 -311 91 0 26 0 -228 -145	2024 -412 68 0 28 0 -232 -157	2025 -520 69 0 31 0 -235 -167	2026 -626 69 0 33 0 -235 -185	2027 -736 69 0 36 0 -235 -202	2028 -852 69 0 39 0 -236 -213 410	-969 69 0 41 0 -235 -229 410	
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side	2011 -117 2 0 0 0 -49 0 0	2012 211 6 0 0 0 -69 0	2013 516 30 0 8 0 -88 0 0 0 0 643	2014 440 34 0 8 0 -111 0 0	2015 387 38 0 8 0 -134 0 0	2016 318 15 0 12 0 -154 -14 0	2017 250 85 0 12 0 -172 -49 0	2018 168 85 0 17 0 -189 -75 0	2019 65 85 0 17 0 -201 -93 0	2020 -22 91 0 20 0 -206 -111 0	2021 -116 91 0 21 0 -216 -121 0	2022 -212 91 0 23 0 -223 -133 0	2023 -311 91 0 26 0 -228 -145 0	2024 -412 68 0 28 0 -232 -157 0	2025 -520 69 0 31 0 -235 -167 0	2026 -626 69 0 33 0 -235 -185 0	2027 -736 69 0 36 0 -235 -202 0	2028 -852 69 0 39 0 -236 -213 410	-969 69 0 41 0 -235 -229 410	
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-)	2011 -117 2 0 0 0 -49 0 0 0 -66	2012 211 6 0 0 0 -69 0 0 0 286 -286	2013 516 30 0 8 0 -88 0 0 0 643 -643	2014 440 34 0 8 0 -111 0 0 0 593 -593	2015 387 38 0 8 0 -134 0 0 0 567 -567	2016 318 15 0 12 0 -154 -14 0 0 513 -513	2017 250 85 0 12 0 -172 -49 0 0 569 -569	2018 168 85 0 17 0 -189 -75 0 0 534 -534	2019 65 85 0 17 0 -201 -93 0 0 461 -461	2020 -22 91 0 20 0 -206 -111 0 407 -407	2021 -116 91 0 21 0 -216 -121 0 0 332 -332	2022 -212 91 0 23 0 -223 -133 0 0 258 -258	2023 -311 91 0 26 0 -228 -145 0 0 178 -178	2024 -412 68 0 28 0 -232 -157 0 0 73 -73	2025 -520 69 0 31 0 -235 -167 0 0 -17	2026 -626 69 0 33 0 -235 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194	2028 -852 69 0 39 0 -236 -213 410 0 115 -115	-969 69 0 41 0 -235 -229 410 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts	2011 -117 2 0 0 0 -49 0 0 0 -66	2012 211 6 0 0 0 -69 0 0 286 -286	2013 516 30 0 8 0 -88 0 0 643 -643 e - No	2014 440 34 0 8 0 -111 0 0 0 593 -593	2015 387 38 0 8 0 -134 0 0 0 567 -567	2016 318 15 0 12 0 -154 -14 0 0 513 -513	2017 250 85 0 12 0 -172 -49 0 0 569 -569	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab	2019 65 85 0 17 0 -201 -93 0 0 461 -461	2020 -22 91 0 20 0 -206 -111 0 407 -407	2021 -116 91 0 21 0 -216 -121 0 0 332 -332 isk D	2022 -212 91 0 23 0 -223 -133 0 0 258 -258	2023 -311 91 0 26 0 -228 -145 0 178 -178	2024 -412 68 0 28 0 -232 -157 0 0 73 -73	2025 -520 69 0 31 0 -235 -167 0 0 -17	2026 -626 69 0 33 0 -235 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194	2028 -852 69 0 39 0 -236 -213 410 0 115 -115	-969 69 0 41 0 -235 -229 410 0	
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con	2011 -117 2 0 0 0 -49 0 0 -66 66	2012 211 6 0 0 0 0 -69 0 0 286 -286	2013 516 30 0 8 0 -88 0 0 643 -643 e - No 2013	2014 440 34 0 8 0 -111 0 0 593 -593	2015 387 38 0 8 0 -134 0 0 567 -567	2016 318 15 0 12 0 -154 -14 0 513 -513	2017 250 85 0 12 0 -172 -49 0 0 569 -569	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab	2019 65 85 0 17 0 -201 -93 0 0 461 -461	2020 -22 91 0 20 0 -206 -111 0 407 -407	2021 -116 91 0 -216 -121 0 0 332 -332 isk DS	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 -258	2023 -311 91 0 26 0 -228 -145 0 178 -178 Vier co	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 entrol	2025 -520 69 0 31 0 -235 -167 0 0 -17 17	2026 -626 69 0 33 0 -235 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194	2028 -852 69 0 39 0 -236 -213 410 0 115 -115	-969 0 41 0 -235 -229 410 0 15 -15	
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position	2011 -117 2 0 0 0 -49 0 0 -66 66 2011 -117	2012 2111 60 00 00 -699 0 0 286 -286	2013 516 30 0 8 0 -88 0 0 643 -643 e - No 2013 516	2014 440 0 8 0 -111 0 0 0 593 -593 Secor 440	2015 387 38 0 8 0 -134 0 0 567 -567 2015 387	2016 318 15 0 12 0 -154 -14 0 0 513 -513	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Re 2017 250	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab 2018 168	2019 65 85 0 17 0 -201 -93 0 0 461 -461	2020 -22 91 0 20 0 -206 -111 0 0 407 -407 -407	2021 -116 91 0 21 0 -216 -121 0 0 332 -332 isk D	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 -258	2023 -311 91 0 26 0 -228 -145 0 178 -178 Vier co	2024 -412 68 0 28 0 -232 -157 0 0 73 -73	2025 -520 69 0 31 0 -235 -167 0 0 -17 17	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 -2026 -626	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 ntinues 2027	2028 -852 69 0 39 0 -236 -213 410 0 115 -115	-969 69 0 41 0 -235 -229 410 0 15 -15	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts	2011 -117 2 0 0 -49 0 0 -66 66 mbined	2012 2111 66 00 00 -69 0 0 0 286 -286 Cycl 2012 211 6	2013 516 30 0 8 8 0 0 0 0 643 -643 516 30	2014 440 0 8 8 0 -111 0 0 0 593 -593 Secor 2014 440 34	2015 387 38 0 0 8 8 0 0 -134 0 0 0 567 -567 4dary 2015 387 38	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Frop 2016 318 -59	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Rec 2017 250 11	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab 2018 168 11	2019 65 85 0 17 0 -201 -93 0 0 461 -461 2019 65	2020 -22 91 0 0 -206 -111 0 0 407 -407 -407	2021 -116 91 0 21 0 -216 -121 0 0 332 -332 isk Ds 2021 -116 41	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 2022 -212 41	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 Mer cc 2023 -311 41	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 ontroli 2024 -412 41	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 led - N 2025 -520 41	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 Nor cor 2026 -626 41	2027 -736 69 0 36 0 -235 -202 0 -194 194 	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 -115 -852 41	-969 69 0 41 0 -235 -229 410 0 15 -15 -969 41	
-	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement	2011 -117 2 0 0 0 0 -49 0 0 0 -66 66 nbined -117 -211 -117 2	2012 2111 66 00 00 -69 0 0 2866 -286 1 Cycl 2012 211 6	2013 516 30 0 8 8 0 0 -88 0 0 0 643 -643 e - No 2013 516 30 0	2014 440 0 8 8 0 -111 0 0 0 593 -593 Secor 2014 440 0	2015 387 38 0 0 8 8 0 0 -134 0 0 0 567 -567 2015 387 38	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prop 2016 318 -59	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Re 2017 250 11	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab 168 11 0	2019 65 85 0 17 0 -201 -93 0 0 461 -461 les -1 2019 65 11	2020 -22 91 0 0 -206 -111 0 0 407 -407 -407 -2020 -22 41 0	2021 -116 91 0 21 0 -216 -121 0 0 332 -332 2021 -116 41 0	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 2022 -212 41 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 Mer cc 2023 -311 41 0	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -73 -412 41 0	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 17 16d - N 2025 -520 41 0	2026 -626 69 0 33 3 0 -235 -185 0 0 -103 103 2026 -626 41 0	2027 -736 69 0 36 0 -235 -202 0 -194 194 ntinues 2027 -736 41 0	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 : : : : : : : : : : : : :	-969 69 0 41 0 -235 -229 410 0 15 -15 -969 41 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables	2011 -117 2 0 0 0 0 0 -49 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2012 2111 66 00 00 -69 0 0 2866 -286 1 Cycl 2012 2111 6 0 0	2013 516 30 0 8 8 0 0 0 -88 0 0 0 643 -643 e - No 2013 516 30 0 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0	2014 440 34 0 8 8 0 -1111 0 0 0 593 -593 Secor 2014 440 34	2015 387 38 0 8 8 0 -134 0 0 0 0 567 -567 2015 387 38 0 8	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Propp 0 12 2016 318 -59 0	2017 250 85 0 12 0 -172 -49 0 0 0 569 -569 2017 250 11 0	2018 168 85 0 17 0 -189 -75 0 0 534 -534 newab 168 11 0 17	2019 65 85 0 177 0 -201 -93 0 0 461 -461 2019 65 11 0	2020 -22 91 0 0 -206 -111 0 0 407 -407 -407 -2020 -22 41 0 0	2021 -116 91 0 21 0 -216 -121 0 0 332 -332 2021 -116 41 0 21	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 0 2022 -212 41 0 23	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 4er cc 2023 -311 41 0 26	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -73 -412 41 0 28	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 2025 -520 41 0 31	2026 -626 69 0 33 3 0 -235 -185 0 0 -103 103 2026 -626 41 0 33	2027 -736 69 0 36 0 -235 -202 0 -194 194 ntinues 2027 -736 41 0 36	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 2028 -852 41 0 39	-969 69 0 41 0 -235 -229 410 0 15 -15 -15 -2029 -969 41 0 41	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination	2011 -117 2 0 0 0 0 -49 0 0 0 0 -66 66 -66 -66 -66 -06 -0	2012 2111 60 00 00 -699 00 0286 -286 Cycl 2012 211 60 00	2013 516 30 0 8 8 0 0 -88 0 0 0 643 -643 516 30 0 0 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0	2014 440 0 8 8 0 0 -1111 0 0 0 593 -593 Secor 2014 440 34 0 8	2015 387 388 0 8 0 -134 0 0 0 567 -567 2015 387 38 0 0	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prop 2016 318 -59 0	2017 250 85 0 12 0 -172 -49 0 0 0 569 -569 2017 250 11 0	2018 168 85 0 17 0 -189 -75 0 0 534 -534 168 111 0 17 0	2019 65 85 0 17 0 -201 -93 0 461 -461 2019 65 11 0 17 0	2020 -22 91 0 0 -206 -111 0 0 407 -407 -407 -2020 -22 41 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2021 -116 91 0 -216 -121 0 0 332 -332 -116 41 0 21 0	2022 -212 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 0 0 222 -212 41 0 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 41 0 26 0 0 178 -2023 -311 41 0 0 0 0 0 0 0 0 0 0 0 0 0	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -73 -412 41 0 28 0	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 2025 -520 41 0	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 -2026 -626 41 0 33 0	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 ntinues 2027 -736 41 0 36 0	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 -115 -852 41 0 39 0	-969 69 0 0 41 1 0 0 -235 -229 410 0 15 -15 -15 -2029 41 0 0 41 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency	2011 -117 2 0 0 0 0 -49 0 0 0 -66 66 2011 -117 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2012 211 6 0 0 0 0 -69 0 0 286 -286 Cycl 2012 211 6 0 0	2013 516 30 0 8 8 0 0 -88 0 0 0 643 -643 516 30 0 0 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0	2014 440 0 8 8 0 0 -111	2015 387 388 0 8 0 -134 0 0 0 567 -567 387 38 0 0 -134	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -513 -Prop 2016 318 -59 0 12 0	2017 250 85 0 12 0 -172 -49 0 0 569 -569 2017 250 11 0 0	2018 168 85 0 17 0 -189 -75 0 0 534 -534 168 111 0 17 0 -189	2019 655 85 0 177 0 -201 -93 0 0 461 -461 2019 65 11 0 0 -201 -7	2020 -222 91 0 0 -206 -111 0 0 407 -407 -407 -2020 0 0 0 0 0 0 0 0 0 0 0 0 0	2021 -116 91 0 -216 -121 0 0 332 -332 -116 41 0 21 0 -216	2022 91 0 23 0 -223 -133 0 0 258 -258 -212 -212 41 0 23 0 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 -178 -311 41 0 26 0 0 -223 -311 -311 0 0 -223 -311	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -412 41 0 28 0 0 -232 -232 -232 -232 -232 -232 -3	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 2025 -520 41 0 31 0 -235	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 2026 -626 41 0 33 0 -235	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 -736 41 0 0 36 6 0 0 0 0 194 194 -735 0 0 0 0 0 0 0 0 0 0 0 0 0	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 -852 41 0 39 0 0 -236 -236 -213 410 0 0 115 -115 -852 410 0 0 0 0 0 0 0 0 0 0 0 0 0	-969 69 0 0 41 0 0 -235 410 0 0 15 -15 -2029 969 41 0 0 41 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response	2011 -117 2 2 0 0 0 0 -49 0 0 -66 66 2011 -117 2 2 0 0 0 0 0 0 -49 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2012 2111 66 00 00 00 -699 00 2866 -286 2012 2111 66 00 00 00	2013 516 30 0 8 8 0 0 -88 0 0 643 -643 516 30 0 8 8 0 0 0 6 6 3 5 6 6 6 6 6 6 6 6 6 6 6 6 6	2014 440 0 8 8 0 0 -1111 0 0 0 34 440 0 0 0 0 0 0 0 0 0 0 0 0 0	2015 387 38 0 0 8 0 0 -134 0 0 567 -567 2015 387 38 0 0 8 0 0	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prop 2016 0 12 0 0 -154 -14 -14 0 0 -154 -154 -154 -154 -154 -154 -154 -154	2017 250 85 0 12 0 -172 -49 0 0 569 -569 2017 250 11 0 0 -172 49	2018 168 85 0 17 0 -189 -75 0 0 534 -534 168 111 0 17 0 -189 -75	2019 655 85 0 177 0 -201 -93 0 0 461 -461 0 17 0 0 -2019 65 11 0 -2019 -2019 93	2020 -222 91 0 0 -206 -111 0 0 407 -407 -407 -202 41 0 0 0 -206 -111 0 0 -207 -207 -208 -208 -209 -2	2021 -116 91 0 21 0 -216 -121 0 332 -332 isk D0 21 0 0 21 -116 41 0 21 -216 -216 -216 -322 -322 -322 -116 -121 -116 -121 -116 -121	2022 91 0 23 0 -223 -133 0 0 258 -258 -212 41 0 23 0 0 -223 -133 0 0 258 -258	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 -178 -178 -178 -2023 -311 41 0 26 0 0 -228 -145 0 0 0 0 0 0 0 0 0 0 0 0 0	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -412 41 0 28 0 0 -232 -157 -57	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 2025 -520 41 0 31 0 -235 -167 -520 -17 -520 -17 -17 -17	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 Nor column 2026 -626 41 0 33 0 -235 -185 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 194 0 36 41 0 36 0 -235 -202 -20	2028 -852 69 0 39 0 -236 -213 410 0 115 -115 2028 -852 41 0 39 0 0 -236 -213 -213 -213 -213 -215	-969 69 0 0 41 1 0 0 -235 -229 410 0 15 -15 -25 41 0 0 0 41 1 0 0 -235 -229 -229 -229 -225 -225 -229 -229 -22	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side	2011 -117 2 0 0 0 0 -49 0 0 0 -66 66 -66 -66 0 0 0 0 0 0 0 0 0	2012 211 6 0 0 0 0 0 0 0 0 0 286 -286 2012 211 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2013 516 30 0 8 8 0 0 0 0 643 -643 516 30 0 0 643 516 30 0 0 643 516 643 516 643 516 643 644 645 646 647 647 647 647 647 647 647	2014 440 0 8 8 0 -111 0 0 593 -593 Secoti 2014 440 8 0 0 -111 0 0	2015 387 38 0 8 0 -134 0 0 567 -567 387 38 0 0 -134 0 0	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prope 2016 318 -59 0 12 0 -154 -14	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Re 2017 250 11 0 -172 -49 0 -72 -72 -49 0 0 -172 -49 0 0 0 -172	2018 168 85 0 17 0 -189 -75 0 0 534 -534 168 11 0 17 0 -189 -75 0 0 0 0 0 0 0 0 0 0 0 0 0	2019 65 85 0 17 0 -201 -93 0 461 -461 les - I 2019 65 51 10 0 -201	2020 -22 91 0 0 -206 -111 0 407 -407 -407 -202 41 0 0 -206 -111 0 0 -206 -111 0 0 0 0 0 0 0 0 0 0 0 0 0	2021 -116 91 0 -216 -121 0 0 332 -332 isk DS 2021 -116 41 0 -216 -121 0 0 -216 -121 -116 -11	2022 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 2022 41 0 23 0 0 -212 41 0 -223 0 0 0 0 0 0 0 0 0 0 0 0 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 41 0 26 0 -223 -311 41 0 -228 -311 41 0 0 -248 -348	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 entrol 41 0 28 41 0 28 0 -232 -157 0 0 0 7 3 -3 -412 41 0 0 -412	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 17 19 19 10 0 31 0 -20 -10 -10 -10 -10 -10 -10 -10 -1	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 Nor core -626 41 0 33 0 -235 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 2027 -736 41 0 36 0 0 0 -235 -202 0 0 0 -235 -202 0 0 0 -235 -202 0 0 0 0 0 0 0 0 0 0 0 0 0	852 69 0 39 0 -236 -213 410 0 115 -115 -115 852 41 0 39 9 0 0 0 0 0 0 0 0 0 0 0 0 0	-969 69 0 0 41 1 0 0 -235 2229 410 0 15 -15 2029 41 0 0 0 15 -25 2029 41 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side	2011 -117 2 0 0 0 -49 0 0 -66 66 2011 -117 2 0 0 0 0 -49 9 -49 9 -66 66 -66 -66 -66 -66 -66 -66 -66 -	2012 2111 66 00 00 00 00 00 2866 -286 1 Cycl 2012 2111 60 00 00 00 00 00 00 00 00 00 00 00 00	2013 516 30 0 8 8 0 0 0 0 0 0 643 -643 516 30 0 0 8 0 0 0 0 0 0 0 0 0 0 0 0 0	2014 440 34 0 8 8 0 -111 0 0 593 -593 Secori 440 8 8 0 -111 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	2015 387 38 0 0 -134 0 0 0 0 567 -567 387 38 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prop 2016 318 -59 0 12 0 0 -154	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Re 2017 250 11 0 -172 -49 0 0 -172 -49 0 0 -569 -172 -19 -19 -19 -19 -19 -19 -19 -19	2018 168 85 0 177 0 -189 -75 0 0 0 534 -534 168 111 0 0 -189 -75 0 0 0 0 0 0 0 0 0 0 0 0 0	2019 65 85 0 17 0 -201 -93 0 461 -461 les -1 2019 65 11 0 -201 -93 0 0 461 -93 0 0 -201 -93 0 0 0 0 0 0 0 0 0 0 0 0 0	2020 -22 91 0 0 -206 -111 0 407 -407 -407 -202 40 0 0 0 -206 -111 0 0 0 -206 -111 0 0 0 0 0 0 0 0 0 0 0 0 0	2021 -116 91 0 -216 -121 0 0 0 332 -332 -116 41 0 0 -216 -121 -116 -121 0 0 0 0 0 0 0 0 0 0 0 0 0	2022 91 0 23 0 -223 -133 0 0 258 -258 SM - 1 2022 -212 41 0 23 0 0 -213 0 0 0 0 0 0 0 0 0 0 0 0 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 Mer cc 2023 -311 40 0 -228 -311 40 0 0 -228 -311 0 0 0 0 0 0 0 0 0 0 0 0 0	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 -73 -412 41 0 28 0 0 -232 -157 0 0 0 7 7 3 -157 -15	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 17 19 19 10 10 10 10 10 10 10 10 10 10	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 -2026 -626 41 33 0 -235 -626 -626 -626 -626 -626 0 0 0 0 0 0 0 0 0 0 0 0 0	2027 -736 69 0 36 0 -235 -202 0 0 194 194 0 36 0 0 0 0 0 0 0 0 0 0 0 0 0	852 899 0 0 -236 -213 410 0 115 -115 -115 -115 -115 -115 -2028 -852 41 0 0 -236 -213 -213 -213 -213 -213 -214 -215 -2	-969 69 0 0 41 0 0 -235 -229 410 0 0 15 -15 -25 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side New secondary supply side Capacity position after adjustmts Purchases(+) or sales(-) Plan C1: Con Existing capacity position Total plant upgrades/adjustmts Meramec retirement Renewables Noranda termination Energy efficiency Demand response New primary supply side	2011 -117 2 0 0 0 0 -49 0 0 0 -66 66 -66 -66 0 0 0 0 0 0 0 0 0	2012 2111 66 00 00 00 00 00 2866 -286 Cycll 2012 2111 60 00 00 00 00 00 00 00 00 00 00 00 00	2013 516 30 0 8 8 0 0 0 0 0 0 643 30 0 0 0 0 0 0 0 0 0 0 0 0 0	2014 440 0 8 8 0 -111 0 0 593 -593 Secoti 2014 440 8 0 0 -111 0 0	2015 387 38 0 8 0 -134 0 0 0 0 567 -567 387 38 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2016 318 15 0 12 0 -154 -14 0 0 513 -513 -Prop 2016 318 -59 0 12 0 0 -154	2017 250 85 0 12 0 -172 -49 0 0 569 -569 C Rec 2017 250 11 0 12 0 0 -172 -49 0 0 -172 -29 -172 -29 -20 -172 -20 -20 -20 -20 -20 -20 -20 -2	2018 168 85 0 17 0 -189 -75 0 0 534 -534 168 11 0 17 0 -189 -75 0 0 0 0 0 0 0 0 0 0 0 0 0	2019 65 85 0 177 0 -201 -93 0 0 461 -461 0 17 0 0 -201 -201 9 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2020 -22 91 0 0 -206 -111 0 0 407 -407 -407 -407 -2020 0 0 0 0 0 -2020 -111 0 0 0 0 0 0 0 0 0 0 0 0 0	2021 -116 91 0 -216 -121 0 0 0 332 -332 -116 41 0 0 -216 -121 -116 -121 0 0 0 0 0 0 0 0 0 0 0 0 0	2022 -212 91 0 -23 0 -223 -133 0 0 258 -258 -212 41 0 23 0 -212 -212 0 0 0 0 0 0 0 0 0 0 0 0 0	2023 -311 91 0 26 0 -228 -145 0 0 178 -178 -178 -18 0 0 0 -2023 -311 41 0 0 0 0 -228 -345 -145 0 0 0 0 0 0 0 0 0 0 0 0 0	2024 -412 68 0 28 0 -232 -157 0 0 73 -73 entrol 41 0 28 41 0 28 0 -232 -157 0 0 0 7 3 -3 -412 41 0 0 -412	2025 -520 69 0 31 0 -235 -167 0 0 -17 17 17 19 19 10 10 10 10 10 10 10 10 10 10	2026 -626 69 0 33 0 -235 -185 0 0 -103 103 Nor core -626 41 0 33 0 -235 -185 0 0 -103 103	2027 -736 69 0 36 0 -235 -202 0 0 -194 194 2027 -736 41 0 36 0 0 0 -235 -202 0 0 0 -235 -202 0 0 0 -235 -202 0 0 0 0 0 0 0 0 0 0 0 0 0	852 69 0 39 0 -236 -213 410 0 115 -115 -115 852 41 0 39 9 0 0 0 0 0 0 0 0 0 0 0 0 0	-969 69 0 0 41 1 0 0 -235 2229 410 0 15 -15 2029 41 0 0 0 15 -25 2029 41 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

¹ For the 14 final candidate resource plans: 4 CSR 240-22.060(6)(A)

	Plan C2: Comb	2011	2012	2013	2014												2026			2029	203
	.	_	_	_	_	2015	2016	2017	_	2019	2020	2021	_	2023	2024	2025		2027	2028	_	_
	Existing capacity position	-117		516		_	277	209	127	24	-63	-157	-253	-352	-453	-561	-667	-777	-893	-1,010	-1,1
		2	6	30		38	-31	39	39	39	69	69	69	69	69	69	69	69	69	69	
	Meramec retirement	0	-	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Renewables	0		8	8	8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
	Noranda termination	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-49		-88		-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	-2
	Demand response	0	0	0	0	0	-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	-2
۲	New primary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	600	(
+	New secondary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Capacity position after adjustmts	-66	286	643	593	567	426	482	447	374	344	269	195	115	33	-58	-144	-235	264	164	
	Purchases(+) or sales(-)	66					-426	-482	-447		-344	-269	-195	-115	-33	58	144	235	-264	-164	
	Tarchases(-) of sales(-)	- 00	-200	-015	-555	-50,	-120	-102		-57.4	-511	-207	-133	-113	-55			233	-201	-101	
	Plan C3: Comb	hined (Cycle.	Com	hined	Cycle	- Pro	n C Re	newa	bles -	Low B	lisk D	SM - 1	Mer r	etire '	2016	- Nor	continu	es		
	Than con com-	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	20
	Pullation on order or order or		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_				_
	Existing capacity position	-117	211				318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
۰	Total plant upgrades/adjustmts	2	6	30		38	-59	11	11	11	41	41	41	41	41	41	41	41	41	41	
۲	Meramec retirement	0	0	0	0	0	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-8
۲	Renewables	0	0	8	8	8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
H	Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-49	-69	-88	-111	-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	-2
	Demand response	0				0	-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	-2
-	New primary supply side	0					600	600	600	600	600	600	600	600	600	600	600	600	600	600	-
-	New secondary supply side	0		0			000	000	000	000	000	000	000	0	000	000	600	600	600	600	
_		-66				567	185	241	206	133	103	28	-46	-126	-	-299	215	124	23	-77	-1
		_																			
	Purchases(+) or sales(-)	66	-286	-643	-593	-567	-185	-241	-206	-133	-103	-28	46	126	208	299	-215	-124	-23	77	1
	Plan H1: Co	mbine	d Cyc	le - Nı	ıke 30)% - <u>1</u>	Prop C	Rene	wable	s - Lo	w Ris	k DS!	М - Ме	r ret	ire 20	16 - N	or co	ntinues			
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	20
	Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
F	Total plant upgrades/adjustmts	2	6	30	34	38	-59	11	- 11	11	41	41	41	41	41	41	41	41	41	41	
	Meramec retirement	0		0	0		-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-1
-	Renewables	0		8		8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
-		0	_	_	_		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		_	-	-	_	-		-	_ ~		-		_	_		-			-		-
-	Energy efficiency	-49				-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	-2
	Demand response	0					-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	-2
۲	New primary supply side	0		0	0	0	600	600	600	600	600	600	600	600	600	600	600	600	600	600	- 6
+	New secondary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	480	480	480	480	480	4
=	Capacity position after adjustmts	-66	286	643	593	567	185	241	206	133	103	28	-46	-126	-208	181	95	4	-97	-197	-3
	Purchases(+) or sales(-)	66	-286	-643	-593	-567	-185	-241	-206	-133	-103	-28	46	126	208	-181	-95	-4	97	197	3
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,																				
	Plan H2: Con	nbined	Cycle	e - Sin	nple C	vcle -	Prop	C Ren	ewabl	les - L	ow Ri	sk DS	M - M	er re	tire 20	016-1	Nor co	ntinue	S		
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	20
	Politica con cita a caltica	_	_	_		_		_	_	_		_	_	_	_		_	-736	-852	-969	_
	Existing capacity position	-117	211	516			318	250	168	65	-22	-116	-212	-311	-412	-520	-626				-1,0
	Total plant upgrades/adjustmts	2					-59	11	11	11	41	41	41	41	41	41	41	41	41	41	
۲	Meramec retirement	0		_			-854	-854	-854		-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-8
۲	Renewables	0	0	8	8	8	12	12	17	17	20	21	23	26	28	31	33	36	39	41	
۲	Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Energy efficiency	-49	-69	-88	-111	-134	-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	-2
	Demand response	0	0	0	0	0	-14	-49	-75	-93	-111	-121	-133	-145	-157	-167	-185	-202	-213	-229	-3
	New primary supply side	0	0	0	0	0	600	600	600	600	600	600	600	600	600	600	600	600	600	600	(
+	New secondary supply side	0					0	0	0	0	0	0	0	0	0	0	692	692	692	692	(
	Capacity position after adjustmts	-66							206		103	28	-46	-126			307	216	115	15	
		-66								-133		-28	46			299		-216	-115	-15	
	Purchases(+) or sales(-)	00	-286	-643	-393	-307	-185	-241	-200	-133	-103	-28	40	126	208	299	-307	-210	-115	-13	
	n, 174 o												2025			•016					
	Plan H3: Comb				_																-
		2011	2012	2013	2014		<u>2016</u>			2019	2020	2021	_	2023	2024	_	2026	2027	2028	2029	20
	Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
	Total plant upgrades/adjustmts	2	6	30	34	38	-59	11	11	11	41	41	41	41	41	41	41	41	41	41	
+	Meramec retirement	0	0	0	0	0	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-8
		0					12	12	17	17	20	21	23	26	28	31	33	36	39	41	
	Renewables	_					0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+	Renewables Noranda termination		0																		
+	Noranda termination	- 40	20				-154	-172	-189	-201	-206	-216	-223	-228	-232	-235	-235	-235	-236	-235	-2
+	Noranda termination Energy efficiency	-49									400		4	4			400				
+	Noranda termination Energy efficiency Demand response	-49 0	0	0	0	0	-14	-49	-75	-93	-111	-121	-133	-145		-167	-185	-202	-213	-229	
+	Noranda termination Energy efficiency	-49	0	0	0	0					-111 600	-121 600	-133 600	-145 600	-157 600	-167 600	-185 600	-202 600	-213 600	-229 600	
+	Noranda termination Energy efficiency Demand response New primary supply side	-49 0	0	0	0	0	-14	-49	-75	-93											-2
	Noranda termination Energy efficiency Demand response New primary supply side	-49 0 0	0	0	0 0	0	-14 600 0	-49 600	-75 600	-93 600 0	600	600	600	600	600 410	600	600	600	600	600	(

Plan R0					_								contin							
	2011	_	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	<u>2024</u>	2025	2026	2027	2028	2029	203
Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
Total plant upgrades/adjustmts	2	6	30	34	38	15	85	85	85	91	91	91	91	68	69	69	69	69	69	
Meramec retirement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Renewables	0	0	8	8	8	12	12	16	16	20	21	24	26	29	31	34	37	39	41	
Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Energy efficiency	-48	-85	-134	-210	-306	-407	-507	-603	-688	-758	-825	-883	-927	-955	-977	-989	-1.000	-1.006	-1.009	-1.0
Demand response	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
New primary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
New secondary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Capacity position after adjustmts	-66		688	692	739	752	854	873	855	847	821	785	733	639	557	466	370	262	151	
Purchases(+) or sales(-)	66		-688	-692	-739	-752	-854		-855	-847	-821	-785	-733	-639	-557	-466	-370	-262	-151	
Turchases(+) or saies(-)	- 00	-302	-000	-072	-/35	-132	-034	-0/5	-055	-047	-021	-/03	-,55	-037	-557	-400	-570	-202	-151	
Plan R1		rimar			ndary	_				RAP I	SM -	Mer	contro	lled -	Nor c					
	2011	2012	2013	2014	2015	<u>2016</u>	2017	2018	2019	2020	2021	2022	2023	<u>2024</u>	2025	<u>2026</u>	2027	2028	2029	203
Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
Total plant upgrades/adjustmts	2	6	30	34	38	-59	11	11	11	41	41	41	41	41	41	41	41	41	41	
Meramec retirement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Renewables	0	0	8	8	8	12	12	16	16	20	21	24	26	29	31	34	37	39	41	
Noranda termination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Energy efficiency	-48	-85	-134	-210	-306	-407	-507	-603	-688	-758	-825	-883	-927	-955	-977	-989	-1,000	-1,006	-1,009	-1,0
Demand response	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	·
New primary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
New secondary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Capacity position after adjustmts	-66	302	688	692	739	678	780	799	781	797	771	735	683	612	529	438	342	234	123	
Purchases(+) or sales(-)	66	_	-688	-692	-739	-678	-780		-781	-797	-771	-735	-683	-612	-529	-438	-342	-234	-123	
	<u>. </u>				_		_										_			
Plan R2: 1	2011	2012	2013	2014	2015	2016	2017	wable 2018	s - KA 2019	2020	M - M 2021	2022	2023	onver 2024	t - No: 2025	2026	2027	2028	2029	203
Existing capacity position	-117	_	516	440	387	277	209	127	24	-63	-157	-253	-352	-453	-561	-667	-777	-893	-1.010	-1.1
Total plant upgrades/adjustmts	2		30	34	38	-31	39	39	39	69	69	69	69	69	69	69	69	69	69	-1,1
Meramec retirement	0		0	0	0	-51	0	0	0	0	0	0	0	0	0	0	0	0	0	
Renewables	0	-	8	8	8	12	12	16	16	20	21	24	26	29	31	34	37	39	41	
	-	-	0	_	_															
Noranda termination	0		-	0	0	0	0		0	0	0		0	0	0	0	0	0	0	
Energy efficiency	-48		-134	-210	-306	-407	-507	-603	-688	-758	-825	-883	-927	-955	-977	-989	-1,000	-1,006	-1,009	-1,0
Demand response	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	-
New primary supply side	0		0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
New secondary supply side	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Capacity position after adjustmts	-66		688	692	739	665	767	786	768	784	758	722	670	599	516	425	329	221	110	
Purchases(+) or sales(-)	66	-302	-688	-692	-739	-665	-767	-786	-768	-784	-758	-722	-670	-599	-516	-425	-329	-221	-110	-
Plan R3:	No Pr	rimary	- No	Secon	dary -	Prop	C Rei	newab	les - R	AP D	SM -	Mer r	etire 2	2016 -	Nor	contin	ues			
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	202 4	2025	2026	2027	2028	2029	20.
Existing capacity position	-117	211	516	440	387	318	250	168	65	-22	-116	-212	-311	-412	-520	-626	-736	-852	-969	-1,0
Total plant upgrades/adjustmts	2		30	34	38	-59	11	11	11	41	41	41	41	41	41	41	41	41	41	-,,
Meramec retirement	0	-	0	0	0	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-854	-8
Renewables	0		8	8	8	12	12	16	16	20	21	24	26	29	31	34	37	39	41	-0
Noranda termination	0	-	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
	-48		-134	-210	-306	-407	-507	-603	-688	-758	-825		-927	-955	-977	-989	-1.000	-1.006	-1.009	-1.0
		-03	-134	-210	-300	-40/	-307	-003	-088									-		-
Energy efficiency		^				20	0.2	150	226	220								704	90.6	
Energy efficiency Demand response	0		0	0	0	-20	-83	-158	-236	-329	-399	-474	-549	-620	-679	-732	-765	-784	-805	-8
Energy efficiency Demand response New primary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-8
Energy efficiency Demand response New primary supply side New secondary supply side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Energy efficiency Demand response New primary supply side	0	0 0 302	0	0	0	0	0	0	0	0	0	0 0 355	0	0	0	0	0	0	0	-8

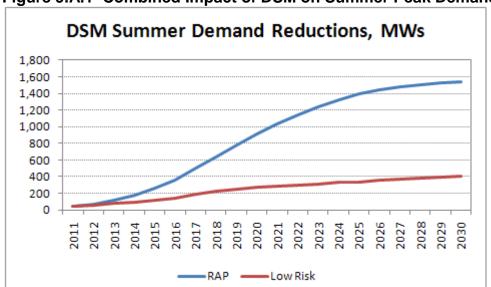
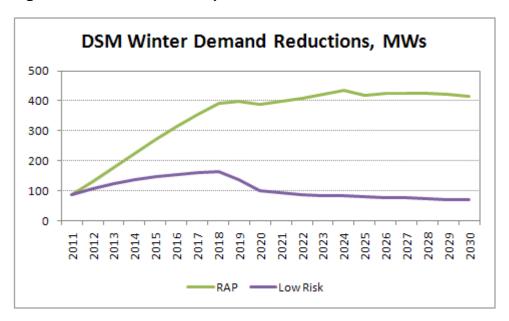


Figure 9.A.1 Combined Impact of DSM on Summer Peak Demand²

Figure 9.A.2 Combined Impact of DSM on Winter Peak Demand³



² 4 CSR 240-22.060(6)(C)1.

³ 4 CSR 240-22.060(6)(C)1.

¹⁴ candidate resource plans - 060(6)(C)(1,2,4,5).xlsx

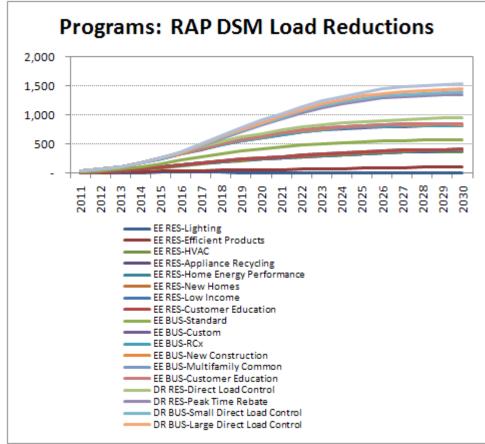


Figure 9.A.3 Stacked Programs for RAP DSM Capacity⁴

⁴ 4 CSR 240-22.060(6)(C)2.

¹⁴ candidate resource plans - 060(6)(C)(1,2,4,5).xlsx

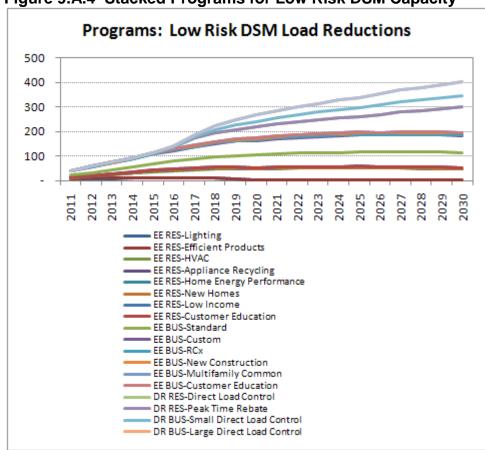
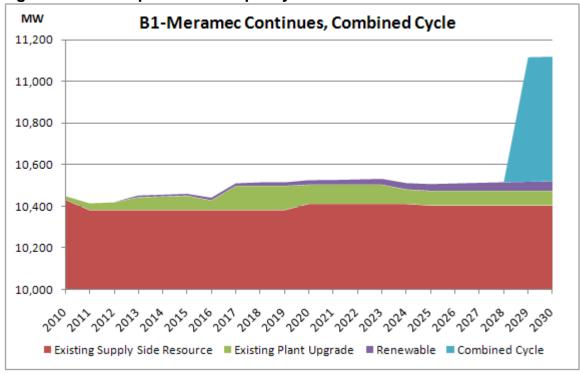


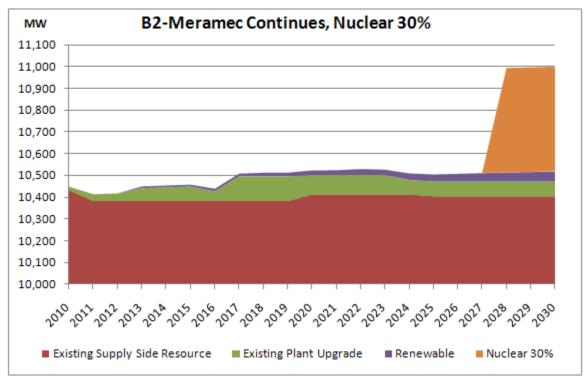
Figure 9.A.4 Stacked Programs for Low Risk DSM Capacity⁵

⁵ 4 CSR 240-22.060(6)(C)2.

¹⁴ candidate resource plans - 060(6)(C)(1,2,4,5).xlsx

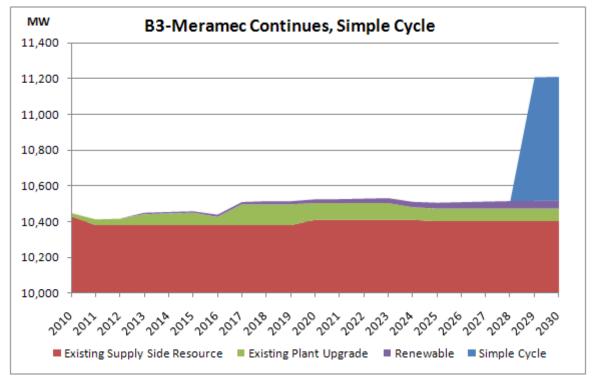
Figure 9.A.5 Composition of Capacity⁶

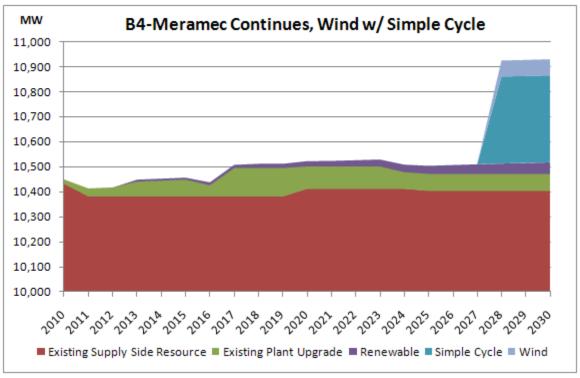


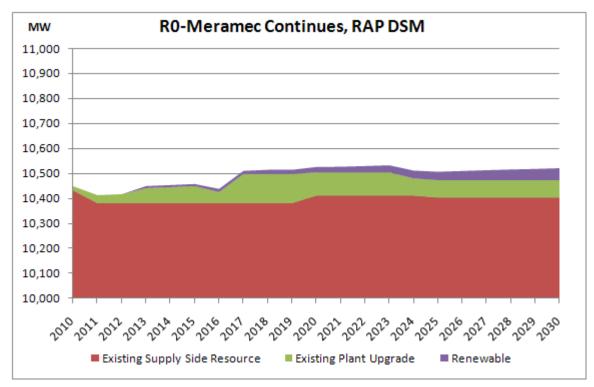


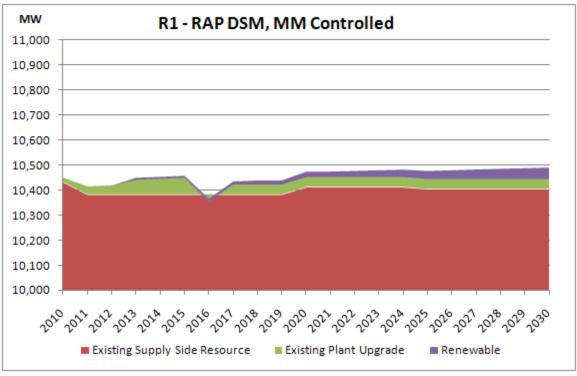
⁶ 4 CSR 240-22.060(6)(C)3.

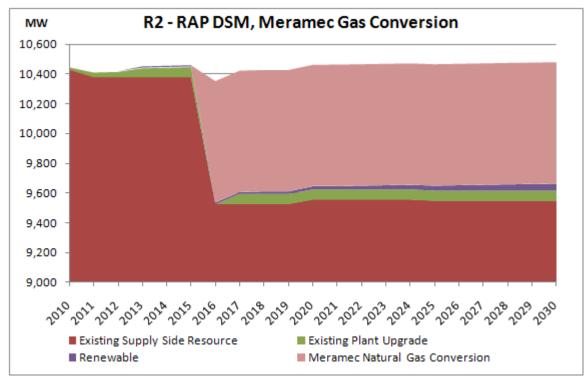
¹⁴ candidate resource plans - 060(6)(C)(3).xlsm

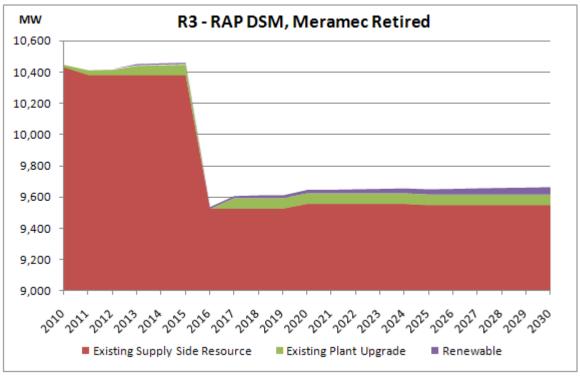


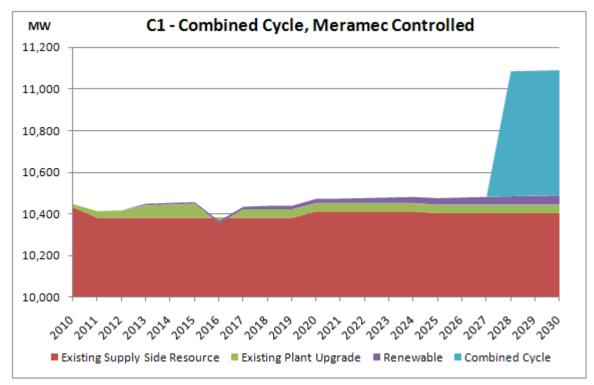


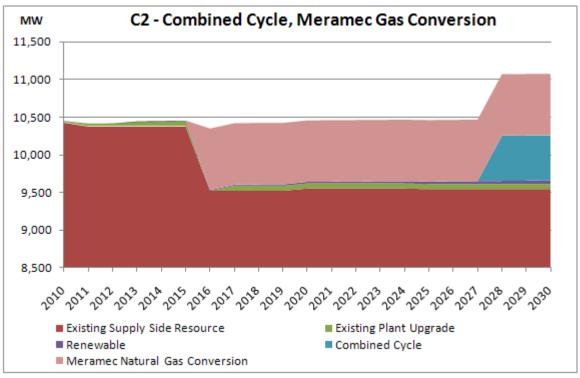


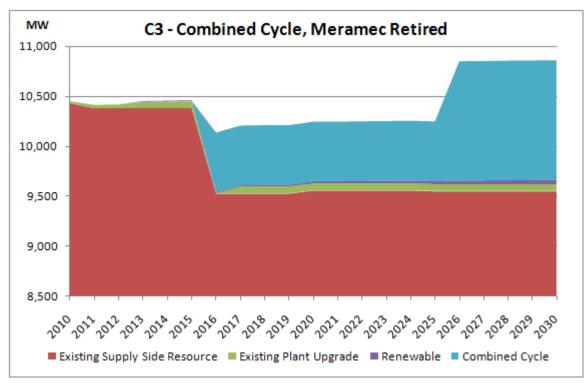


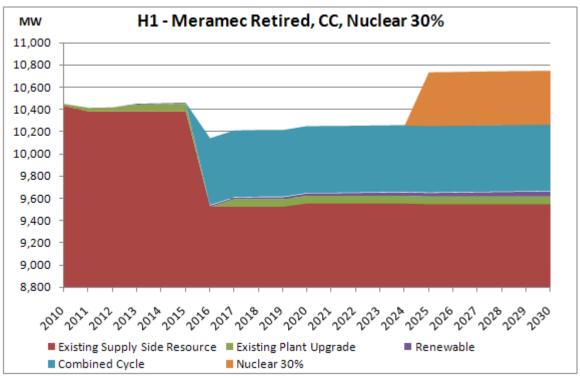


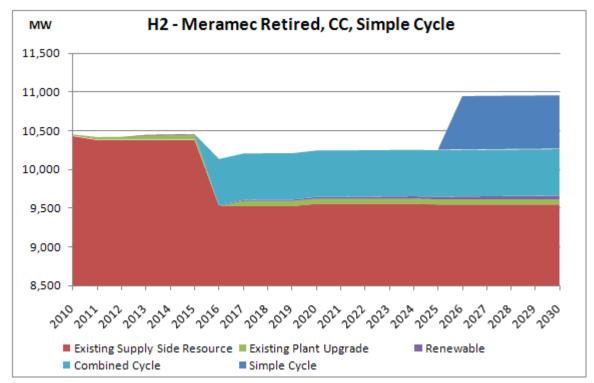


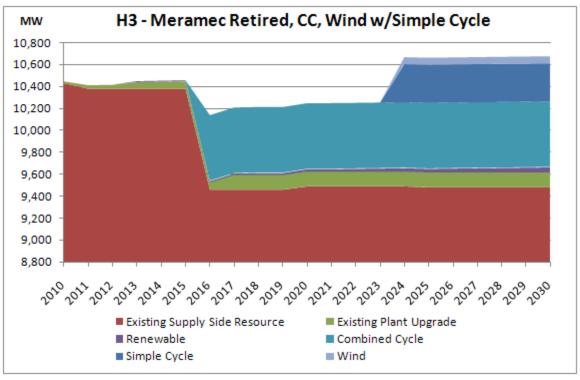












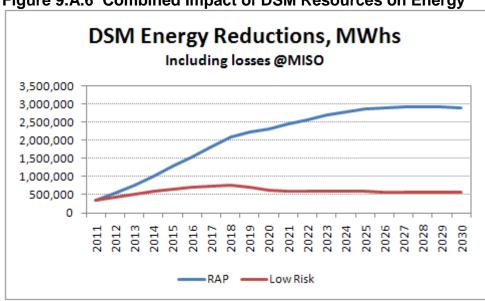
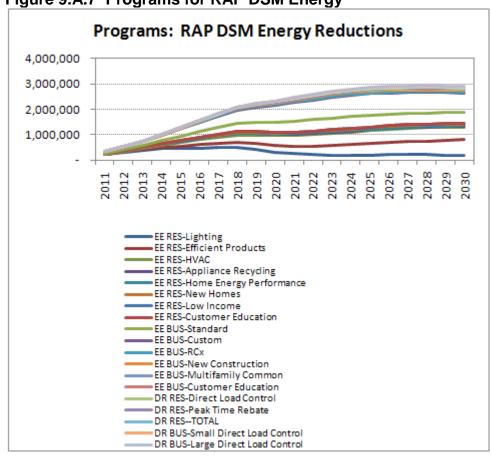


Figure 9.A.6 Combined Impact of DSM Resources on Energy⁷

Figure 9.A.7 Programs for RAP DSM Energy⁸



⁷ 4 CSR 240-22.060(6)(C)4.

^{8 4} CSR 240-22.060(6)(C)5.

¹⁴ candidate resource plans - 060(6)(C)(1,2,4,5).xlsx

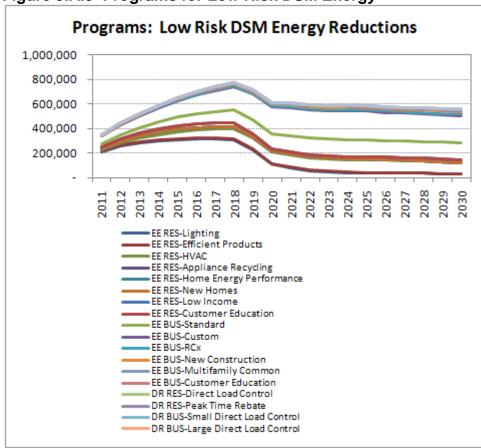
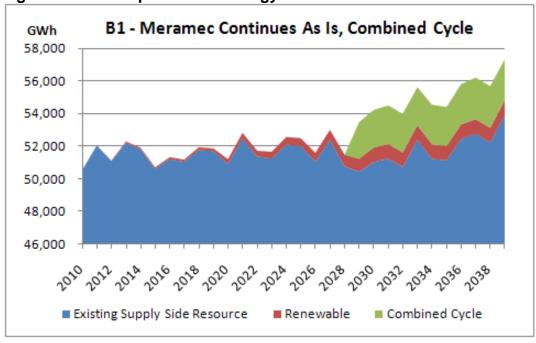


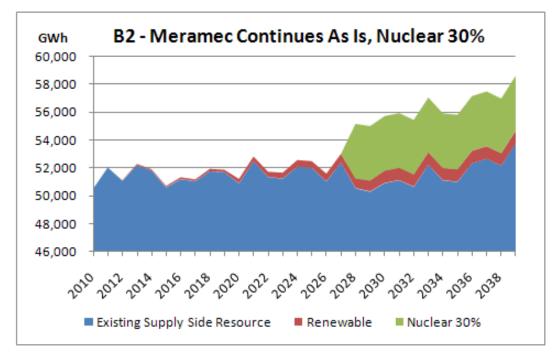
Figure 9.A.8 Programs for Low Risk DSM Energy⁹

⁹ 4 CSR 240-22.060(6)(C)5.

¹⁴ candidate resource plans - 060(6)(C)(1,2,4,5).xlsx

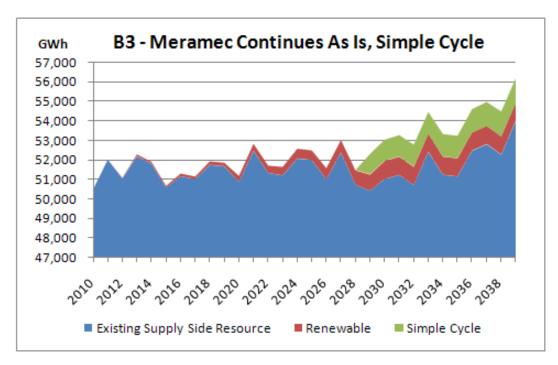


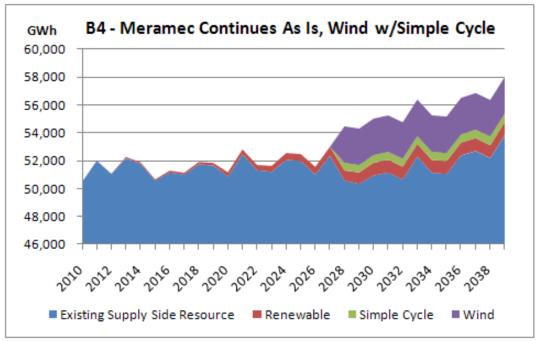


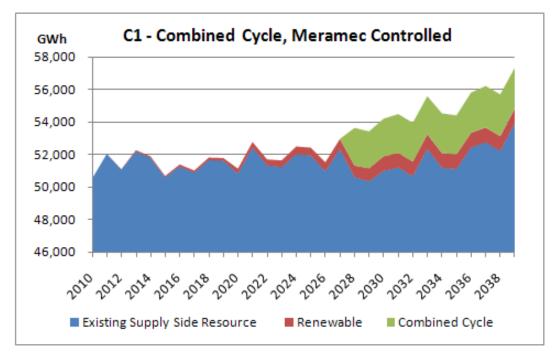


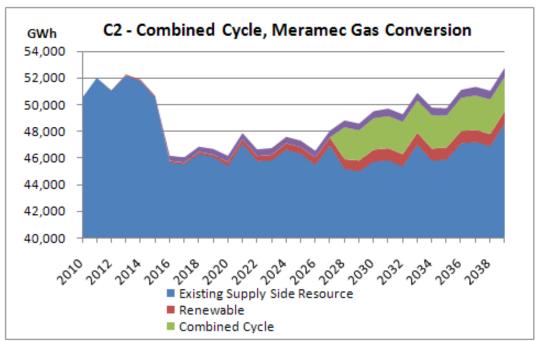
¹⁰ 4 CSR 240-22.060(6)(C)6.

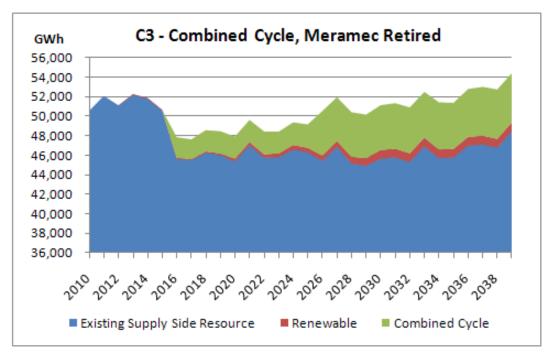
¹⁴ candidate resource plans - 060(6)(C)(6).xlsx

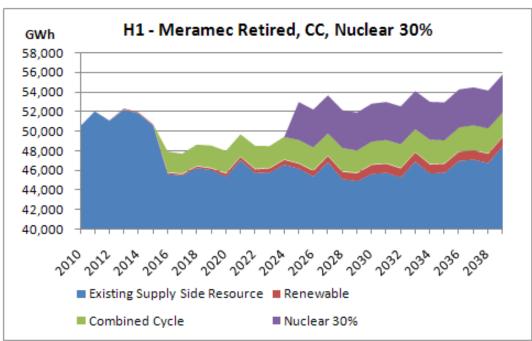


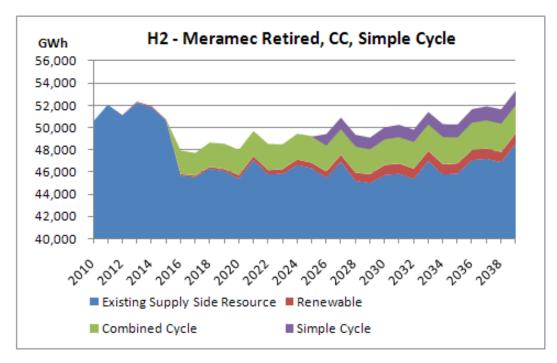


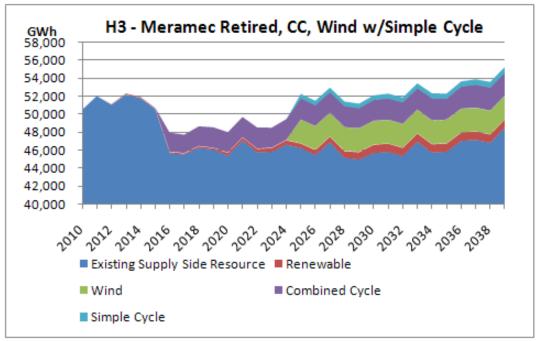


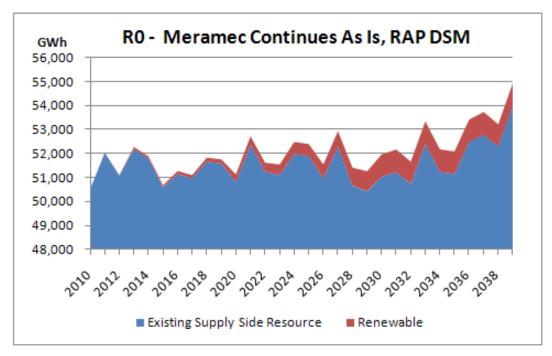


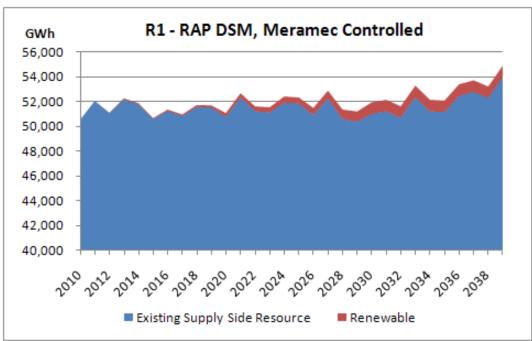


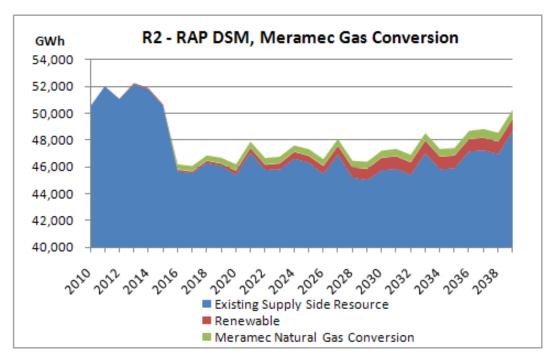












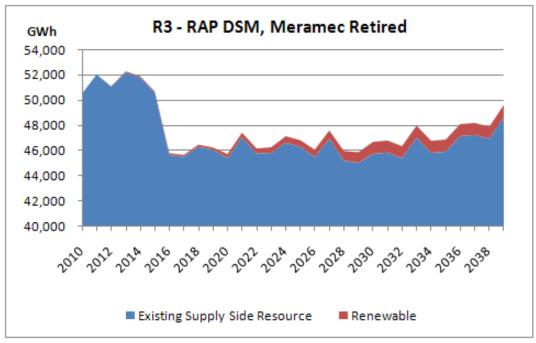
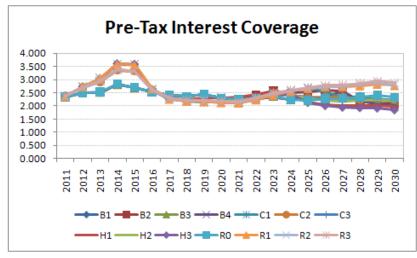
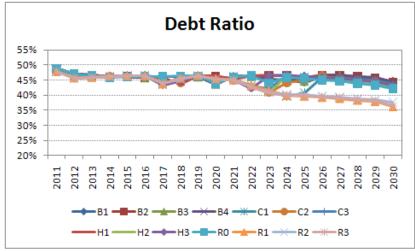
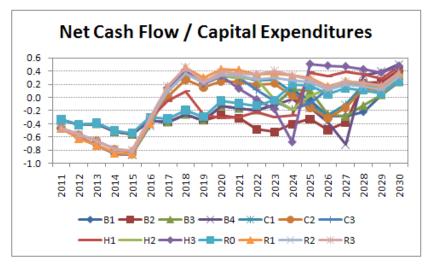


Figure 9.A.10 Financial Measures¹¹



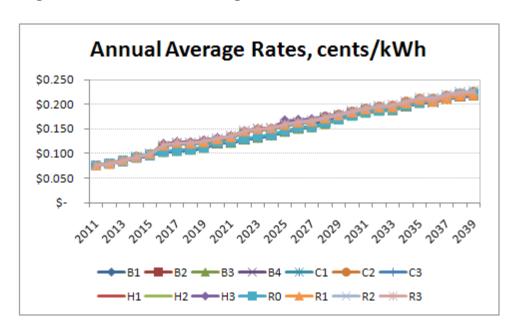




¹¹ 4 CSR 240-22.060(6)(C)7.

¹⁴ candidate resource plans - 060(6)(C)(7).xlsx

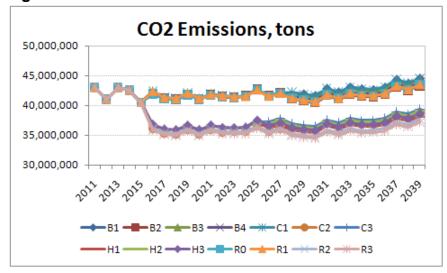
Figure 9.A.11 Annual Average Rates¹²

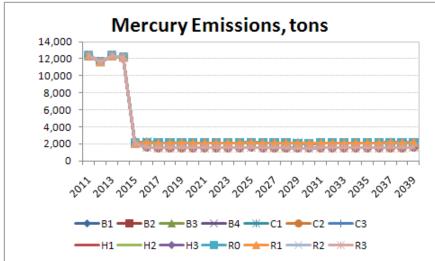


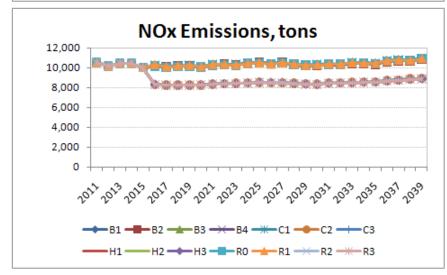
¹² 4 CSR 240-22.060(6)(C)8.

¹⁴ candidate resource plans - 060(6)(B), 060(6)(C)(8 thru 10), 070(5), 070(5)(A thru B).xlsx

Figure 9.A.12 Annual Emissions¹³







¹³ 4 CSR 240-22.060(6)(C)9.

¹⁴ candidate resource plans - 060(6)(B), 060(6)(C)(8 thru 10), 070(5), 070(5)(A thru B).xlsx

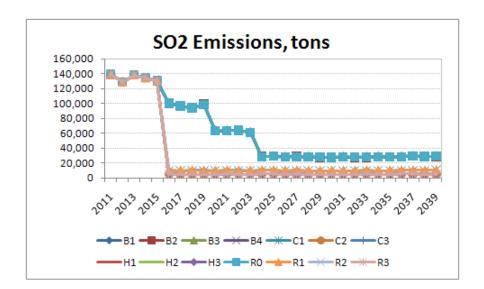
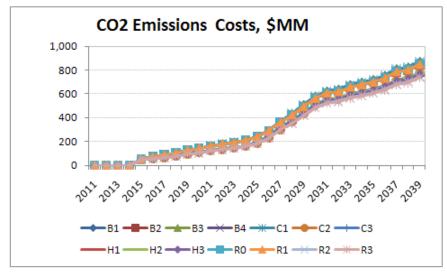
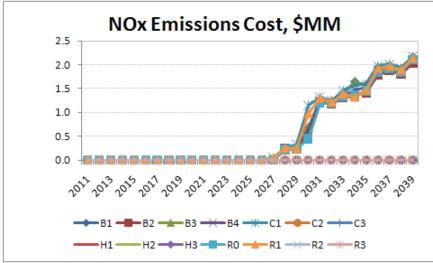
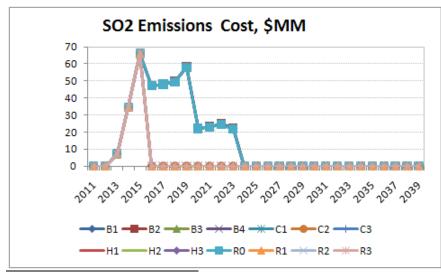


Figure 9.A.13 Probable Environmental Costs¹⁴







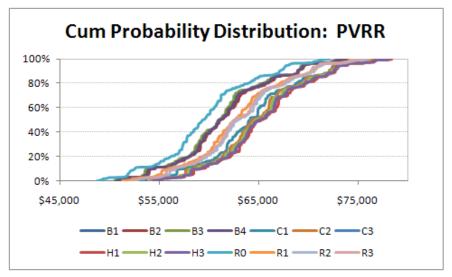
¹⁴ 4 CSR 240-22.060(6)(C)10.

¹⁴ candidate resource plans - 060(6)(B), 060(6)(C)(8 thru 10), 070(5), 070(5)(A thru B).xlsx

Selected Performance Measures¹⁵

The CDF for PVRR is shown in Figure 9.A.144 for the 14 final candidate resource plans, identified by their 2-digit plan codes, while a more summarized measure, the expected value for PVRR is shown in the table next to the chart, in rank order of PVRRs.

Figure 9.A.14 Cum Probability Distribution of PVRR & Probability Weighted PVRR



14 Final	Probability-
Candidate	Weighted
Plans	PVRR, \$MM
RO	\$59,661
B3	\$61,161
B1	\$61,259
B4	\$61,403
B2	\$61,568
R1	\$62,867
R3	\$63,101
R2	\$63,358
C1	\$64,403
C2	\$64,875
H2	\$65,198
C3	\$65,356
Н3	\$65,420
H1	\$65,596

Both the chart and the table provide the same ranking results, but it was more difficult to reach a conclusion using the CDF lines compared to using the single number for the expected values. This was because a conclusion using CDF lines required evaluating how all 270 points on each line compared the 270 points on each of the other CDF lines, how much of each line was to the left (better) of any other line, how each line started and ended compared to the start and end of other CDF lines, and the overall tendency of each CDF line. By comparison, the expected value for each line captured all of this information in a single number; essentially the CDF lines and the expected values were the same data in two different formats.

Since it was more difficult to make conclusions using CDFs than by using expected values, Ameren Missouri first examined the ranks of these plans using expected values for these 5 measures. The data for these 5 measures and their ranks on each measure are shown in Table 9.A.. This table is arranged in ascending rank order of PVRRs.

¹⁵ 4 CSR 240-22.070(5); 4 CSR 240-22.070(11)(B)

Rank on 14 Final Expected Expected Value of Expected Value of Expected Value Expected Value for Candidate Value of PV of Emissions Costs for DSM for Levelized Maximum Single PVRR, \$MM Costs, \$MM Participants, \$MM Annual Rates Year Rate Increase Plans PVRR Emissions DSM Costs Rates Rate Increase \$2,428 \$1,001 \$0.1249 22.1% R0 \$59,661 11 1 11 3 В3 \$61,161 \$2,458 \$162 \$0.1245 21.9% 13 1 1 6 B1 \$61,259 \$2,468 \$162 \$0.1247 22.0% 3 14 1 2 8 В4 \$61,403 \$2,443 \$162 \$0.1250 21.8% 4 12 1 4 4 B2 \$61.568 \$2,427 \$162 \$0.1253 21.8% 5 10 1 5 2 R1 \$62,867 \$2,281 \$1,001 \$0.1316 22.0% 6 8 11 7 7 R3 \$1.001 7 9 13 \$63,101 \$1.878 \$0.1321 22.6% 1 11 R2 \$63,358 \$1,899 \$1,001 \$0.1326 22.7% 11 q C1 \$64,403 \$2,323 \$162 \$0.1311 21.7% 9 1 6 1 C2 10 3 \$64.875 \$1,940 \$162 \$0.1320 22.5% 1 8 12 H2 \$65,198 \$1,981 \$162 \$0.1327 22.2% 11 11 10 C3 \$65,356 \$1,994 \$162 \$0.1330 22.2% 12 7 1 12 11 НЗ \$65,420 \$1.965 \$162 \$0.1331 21.9% 13 1 13 5 H1 \$65,596 \$1.947 \$162 \$0.1334 21.8% 14 3 Min \$59,661 \$1,878 \$162 \$0.1245 21.7% \$65,596 \$2,468 \$1,001 \$0.1334 22.7% Max \$5,935 \$590 \$839 \$0.0089 1.0% Range Avg \$63,230 \$2,174 \$402 \$0.1297 22.1% \$1,962 \$246 \$393 \$0.0038 0.3% StDev

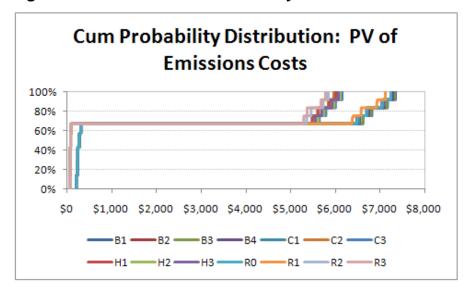
Table 9.A.2 Expected Values and Rank Order for Selected Performance Measures

PV items are dollars in millions

The expected values for 1 of the 4 measures besides PVRR, levelized annual average rates, had essentially the same rank order as the PVRR rank order, so no CDF was produced for this measure.

Two of the remaining 3 other measures had technical issues that made their rank meaningless or not useful. The technical issue for DSM costs was that there were only 2 possible values for this measure among the 14 plans, so a rank order for this measure would be not very useful. The technical issue for the maximum single-year rate increase was that there was very little variation among the 14 values (minimum of 21.7%, maximum 22.7%) so a ranking on this measure would also not be very useful.





The final remaining measure besides PVRR, the present of probable value environmental costs. had а substantially different rank order on expected values versus the rank order of PVRR.

Thus a CDF was developed for this

measure, which is shown in Figure 9.A.155.

Expected Value & Standard Deviations, Selected Performance Measures¹⁶

IRP rules also required expected values and some measure of the dispersion of the probability distribution of the 5 performance measures discussed in the prior section. These are provided in Table 9.A.3 and Table 9.A.4.

Table 9.A.3 Expected Values for Performance Measures

	4 Final	Expected Value of	Expected Value of PV of	Expected Value of 2011-2030	Expected Value for	Expected Value for Maximum	Expected Value of Avg Annual 2011-	Expected Value of 2011-	Expected Value for 2011-	Net Jobs 2011-	F 0 i
Ca	indidate	2011-2039	2011-2039 Emissions	Costs for DSM Participants,	2011-2039 Levelized	Single Year Rate Increase	2039 Carbon Emissions, MM	2039 PV of Free Cash	2039 Average Return on	2030 in FTE- Years	Energy Savings 2011-2030, GWH
	Plans	PVRR, \$MM	Costs, \$MM	\$MM	Annual Rates	2011-2039	tons	Flow, \$MM	Equity		
	R0	\$59,661	\$2,428	\$1,001	\$0.1249	22.1%	41.8	3,460	12.44%	11,991	41,092
	В3	\$61,161	\$2,458	\$162	\$0.1245	21.9%	42.1	2,796	12.37%	4,749	11,875
	B1	\$61,259	\$2,468	\$162	\$0.1247	22.0%	42.2	2,747	12.34%	5,095	11,875
	B4	\$61,403	\$2,443	\$162	\$0.1250	21.8%	41.9	2,661	11.74%	4,662	11,875
	B2	\$61,568	\$2,427	\$162	\$0.1253	21.8%	41.7	2,566	11.81%	28,403	11,875
	R1	\$62,867	\$2,281	\$1,001	\$0.1316	22.0%	41.8	3,775	11.56%	11,991	41,092
	R3	\$63,101	\$1,878	\$1,001	\$0.1321	22.6%	36.6	4,084	11.95%	8,496	41,092
	R2	\$63,358	\$1,899	\$1,001	\$0.1326	22.7%	36.9	3,740	12.03%	11,991	41,092
	C1	\$64,403	\$2,323	\$162	\$0.1311	21.7%	42.3	2,932	11.90%	5,125	11,875
	C2	\$64,875	\$1,940	\$162	\$0.1320	22.5%	37.4	2,881	12.15%	5,125	11,875
	H2	\$65,198	\$1,981	\$162	\$0.1327	22.2%	37.8	3,020	11.73%	3,321	11,875
	C3	\$65,356	\$1,994	\$162	\$0.1330	22.2%	38.0	2,995	11.80%	3,652	11,875
	H3	\$65,420	\$1,965	\$162	\$0.1331	21.9%	37.6	2,826	11.01%	3,345	11,875
	H1	\$65,596	\$1,947	\$162	\$0.1334	21.8%	37.4	2,725	11.15%	28,070	11,875

Table 9.A.4 Standard Deviations for Performance Measures

		•		–			• • • • • • • • • • • • • • • • • • • •				
14	Final	Standard	Standard Deviation of PV of 2011-	Standard Deviation of	Standard Deviation for	Standard Deviation for	Standard Deviation of Avg	Standard Deviation of	Standard Deviation for	Standard	Standard Deviation
Cand	didate	2011-2039	2039	2011-2030 Costs for DSM	2011-2039 Levelized	Maximum Single Year	Annual 2011-2039 Carbon Emissions.	2011-2039 PV of Free Cash	2011-2039 Average Return	Deviation of Net Jobs 2011-2030 in	of Energy Savings 2011-2030, GWH
		PVRR, \$MM	Emissions	Participants,	Annual Rates	Rate Increase	MM tons	Flow, \$MM	on Equity	FTE-Years	2011 2000, 47111
Pla	ans		Costs, \$MM	\$MM		2011-2039					
F	RO	\$5,075	\$18		\$0.0085	0.10%	0.205	16.9	0.15%		
E	B3	\$5,129	\$18	With only	\$0.0085	0.10%	0.207	13.8	0.15%	This item was	With only
E	B1	\$5,125	\$18	2 different	\$0.0084	0.10%	0.207	13.7	0.15%	not addressed	2 different
E	B4	\$5,104	\$18	values among	\$0.0084	0.10%	0.206	13.2	0.14%	by a probabilty	values among
E	B2	\$5,135	\$18	14 plans,	\$0.0084	0.10%	0.205	12.8	0.15%	tree, thus it	14 plans,
F	R1	\$5,245	\$18	this is not a	\$0.0090	0.10%	0.205	18.5	0.14%	only had 1	this is not a
F	R3	\$5,012	\$15	meaningful	\$0.0083	0.11%	0.180	20.2	0.15%	estimate per	meaningful
F	R2	\$5,046	\$15	calculation	\$0.0085	0.11%	0.181	18.5	0.15%	plan, and thus	calculation
(C 1	\$5,303	\$18		\$0.0090	0.10%	0.208	14.6	0.15%	insufficient data	
(C2	\$5,074	\$15		\$0.0084	0.11%	0.183	14.3	0.15%	to calculate	
H	12	\$5,094	\$16		\$0.0084	0.10%	0.185	14.9	0.14%	a standard	
(C3	\$5,100	\$16		\$0.0085	0.10%	0.186	14.8	0.15%	deviation for	
H	1 3	\$5,083	\$15		\$0.0084	0.10%	0.184	14.0	0.14%	each plan's	
H	H1	\$5,136	\$15		\$0.0085	0.10%	0.184	13.6	0.14%	estimate	

CDF of PVRR Differences from Endpoint Best PVRR

Ameren Missouri also used a variation of the cumulative probability distribution (CDF) for PVRR in its IRP analyses. Instead of estimating a CDF for PVRR, Ameren Missouri estimated a CDF of the PVRR differences from the endpoint best PVRR among all 14 candidate plans. This alternative calculation provided the same ranking as a ranking

¹⁶ 4 CSR 240-22.070(5)(A); 4 CSR 240-22.070(5)(B); 4 CSR 240-22.060(6)(B)

done simply on the PVRR itself or on the CDF of the PVRR. However, this alternative approach more clearly identified the differences among plans.

Each of the 14 plans had the same 270 endpoints, but each plan had different PVRR outcomes for its own set of those same 270 endpoints from the probability tree. An example of one of the 270 endpoints on the probability tree was: "High Load – High Gas Prices – Mandates Carbon Policy – Base DSM Cost together with Base DSM Load Impact – Low Project Cost – High Interest Rates together with High Return on Equity."

This particular endpoint existed for each of the 14 plans, but only one of the 14 plans had the best PVRR for this particular endpoint. All other plans had some positive difference (were worse) on this particular endpoint. Each of any plan's 270 endpoints' PVRRs was compared to the one best endpoint PVRR, and the difference versus the endpoint best PVRR was captured for each of the 270 endpoints of each plan. This data is shown

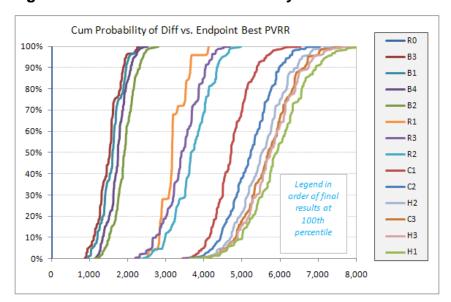


Figure 9.A.16 Cumulative Probability of Difference vs. Endpoint Best PVRR

In this chart, the vertical axis shows the range of each candidate plan's difference from the best PVRR for each of 270 endpoints, and the vertical axis shows the of probability the difference from the best PVRR in percentile terms.

For example, the value at the 40% level on the vertical axis shows the PVRR difference that has a 40% probability of occurring for each plan, while the value at the 80% level shows the PVRR difference that has an 80% chance of occurring for each plan. It is clear that plans to the left are more desirable plans, since any plan to the left of any other plan has a lower PVRR difference.

Compliance References

4 CSR 240-22.060(6)(A)	
4 CSR 240-22.060(6)(B)	30
4 CSR 240-22.060(6)(C)1	4
4 CSR 240-22.060(6)(C)10	
4 CSR 240-22.060(6)(C)2	
4 CSR 240-22.060(6)(C)3	
4 CSR 240-22.060(6)(C)4	14
4 CSR 240-22.060(6)(C)5	
4 CSR 240-22.060(6)(C)6	
4 CSR 240-22.060(6)(C)7	
4 CSR 240-22.060(6)(C)8	
4 CSR 240-22.060(6)(C)9	
4 CSR 240-22.070(11)(B)	
4 CSR 240-22.070(5) 4 CSR 240-22.070(5)(A)	30
4 CSR 240-22.070(5)(B)	