

# Chapter 9 - Appendix A

## Alternative Resource Plans

**Table 9A.1 Unconstrained RES Compliance Model with RAP DSM**

TERM 1												
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
MW's Installed New Solar	30.0	20.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	0.0	619.0	744.0
MW's Installed New Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Revenue Requirement-1% Rate Cap limit	\$2,990	\$2,981	\$2,963	\$2,952	\$2,947	\$2,936	\$2,925	\$2,915	\$2,905	-\$202	\$26,311	
% Increase												-0.6%

TERM 2												
	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040		
MW's Installed New Solar	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	242.4	317.4	
MW's Installed New Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Revenue Requirement-1% Rate Cap limit	\$2,990	\$2,986	\$2,979	\$2,973	\$2,968	\$2,962	\$2,956	\$2,952	\$2,947	\$54	\$26,767	
% Increase												0.1%

**Table 9A.2 Type, Size, Timing of Resource Addition/Retirement<sup>1</sup>**

Plan A - RAP DSM - RES Compliance																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	136	135	171	169	168	167	165	165	201	200	200	199	198	197	196	195	195
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699	1,740
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536	556
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,412	1,567	1,633	1,503	1,566	1,648	1,722	1,752	1,824	1,871	933	954	975	-226	-213	-209	-185
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,412	-1,567	-1,633	-1,503	-1,566	-1,648	-1,722	-1,752	-1,824	-1,871	-933	-954	-975	226	213	209	185

Plan B - Renewable Expansion																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699	1,740
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536	556
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,459	1,739	1,767	1,836	1,944	2,175	2,448	2,521	2,704	2,793	2,004	2,066	2,234	1,073	1,285	1,313	1,335
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,459	-1,739	-1,767	-1,836	-1,944	-2,175	-2,448	-2,521	-2,704	-2,793	-2,004	-2,066	-2,234	-1,073	-1,285	-1,313	-1,335

Plan C - No New DSM - CC																						
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715	
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Demand Response	0	0	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	824	824	824	824
New Secondary Supply Side	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 Adjustment	1,294	1,515	1,587	793	841	955	827	729	724	833	979	967	1,041	1,024	130	99	168	-214	-71	-98	-137	
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-841	-955	-827	-729	-724	-833	-979	-967	-1,041	-1,024	-130	-99	-168	214	71	98	137	

Plan D - No New DSM - All Solar																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand Response	0	0	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	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	0	0
Capacity Position after Adjustment	1,294	1,515	1,587	793	841	955	827	729	724	833	979	967	1,041	1,024	330	499	768	-238	-95	-122	239
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-841	-955	-827	-729	-724	-833	-979	-967	-1,041	-1,024	-330	-499	-768	238	95	122	-239

Plan E - No New DSM - Pumped Hydro																						
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715	
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Demand Response	0	0	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	600	600	600	600
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	824	824	824	824
Capacity Position after Adjustment	1,294	1,515	1,587	793	841	955	827	729	724	833	979	967	1,041	1,024	130	99	168	386	529	502	463	
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-841	-955	-827	-729	-724	-833	-979	-967	-1,041	-1,024	-130	-99	-168	-386	-529	-502	-463	

<sup>1</sup> 20 CSR 4240-22.060(4)(B)9

Plan F - No New DSM - AP1000																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand Response	0	0	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	1,100	1,100	1,100
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,587	793	841	955	827	729	724	833	979	967	1,041	1,024	130	99	168	62	205	178	139
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-841	-955	-827	-729	-724	-833	-979	-967	-1,041	-1,024	-130	-99	-168	-62	-205	-178	-139

Plan G - No New DSM - Simple Cycles																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand Response	0	0	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	690	690
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	824	824
Capacity Position after Adjustment	1,294	1,515	1,587	793	841	955	827	729	724	833	979	967	1,041	1,024	130	99	168	476	619	592	553
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-841	-955	-827	-729	-724	-833	-979	-967	-1,041	-1,024	-130	-99	-168	-476	-619	-592	-553

Plan H - MAP DSM - Renewable Expansion																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	141	276	424	585	759	954	1,099	1,249	1,405	1,559	1,696	1,828	1,953	2,074	2,189	2,273	2,351	2,420	2,482
Demand Response	0	0	225	315	408	499	564	623	669	718	764	799	841	879	912	934	958	986	1,005	1,015	1,029
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,953	1,384	1,672	2,039	2,150	2,306	2,492	2,800	3,148	3,325	3,578	3,730	2,995	3,107	3,315	2,221	2,461	2,513	2,550
Purchases (+) or sales (-)	-1,294	-1,515	-1,953	-1,384	-1,672	-2,039	-2,150	-2,306	-2,492	-2,800	-3,148	-3,325	-3,578	-3,730	-2,995	-3,107	-3,315	-2,221	-2,461	-2,513	-2,550

Plan I - MAP DSM - RES Compliance																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	136	135	158	157	156	154	153	152	151	150	150	149	148	147	146	145	145
Energy Efficiency & DER	0	0	141	276	424	585	759	954	1,099	1,249	1,405	1,559	1,696	1,828	1,953	2,074	2,189	2,273	2,351	2,420	2,482
Demand Response	0	0	225	315	408	499	564	623	669	718	764	799	841	879	912	934	958	986	1,005	1,015	1,029
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,953	1,384	1,625	1,867	2,004	1,960	2,102	2,260	2,410	2,544	2,648	2,758	1,874	1,945	2,006	871	914	941	980
Purchases (+) or sales (-)	-1,294	-1,515	-1,953	-1,384	-1,625	-1,867	-2,004	-1,960	-2,102	-2,260	-2,410	-2,544	-2,648	-2,758	-1,874	-1,945	-2,006	-871	-914	-941	-980

Plan J - DOPE1 DSM																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	15	25	36	48	62	79	132	218	336	454	577	703	826	950	1,042	1,134	1,221	1,301	1,375
Demand Response	0	0	0	0	0	0	0	0	86	129	171	207	248	285	323	353	379	404	387	410	432
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,602	818	876	1,003	932	894	985	1,221	1,522	1,670	1,904	2,049	1,309	1,427	1,614	483	736	810	868
Purchases (+) or sales (-)	-1,294	-1,515	-1,602	-818	-876	-1,003	-932	-894	-985	-1,221	-1,522	-1,670	-1,904	-2,049	-1,309	-1,427	-1,614	-483	-736	-810	-868

Plan K - DOPE2 DSM																					
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	9,118	9,118	9,118	9,118	9,118	8,146	8,146	8,146	6,960	6,960	6,960	6,960
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	63	125	191	260	334	414	487	562	641	718	784	850	912	973	1,032	1,067	1,099	1,128	1,155
Demand Response	0	0	0	0	0	0	42	85	127	146	156	174	195								

Plan O - Rush Early Retirement																				
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	7,940	7,940	7,940	7,940	6,968	6,968	6,968	5,782	5,782	5,782	5,782
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536
New Primary Supply Side	0	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	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,459	1,739	1,767	1,836	1,944	997	1,270	1,343	1,526	1,615	826	888	1,056	-105	107	135
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,459	-1,739	-1,767	-1,836	-1,944	-997	-1,270	-1,343	-1,526	-1,615	-826	-888	-1,056	105	-107	-135

Plan P - Sioux-Rush Island Early Retirement																				
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536
New Primary Supply Side	0	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	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,459	1,739	1,767	1,836	1,944	1,203	1,476	1,549	1,732	1,821	2,004	2,066	2,234	1,073	1,285	1,313
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,459	-1,739	-1,767	-1,836	-1,944	-1,203	-1,476	-1,549	-1,732	-1,821	-2,004	-2,066	-2,234	-1,073	-1,285	-1,313

Plan Q - Sioux-Rush Island Retirement - No CGS																				
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536
New Primary Supply Side	0	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	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,394	1,612	1,955	2,045	2,112	2,234	1,542	1,814	1,943	2,276	2,493	2,825	3,015	3,382	2,398	2,758	2,977
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,394	-1,612	-1,955	-2,045	-2,112	-2,234	-1,542	-1,814	-1,943	-2,276	-2,493	-2,825	-3,015	-3,382	-2,398	-2,758	-2,977

**\*\*\*These tables are HIGHLY CONFIDENTIAL in their entirety\*\*\***

Plan V - Sioux-Rush Island Early Retirement - Renewable Subscription																				
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536
New Primary Supply Side	0	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	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,725	2,005	2,033	2,101	2,209	1,418	1,641	1,699	1,832	1,921	2,054	2,116	2,234	1,073	1,285	1,313
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,725	-2,005	-2,033	-2,101	-2,209	-1,418	-1,641	-1,699	-1,832	-1,921	-2,054	-2,116	-2,234	-1,073	-1,285	-1,313

Plan W - Sioux-Rush Island Early Retirement - No DSM - Renewable Subscription																				
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,435	-9,494	-9,548	-9,600
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718
Energy Efficiency & DER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Demand Response	0	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	824	824	824
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,587	793	1,107	1,221	1,092	994	989	76	172	145	169	152	180	149	168	-214	-71	-98
Purchases (+) or sales (-)	-1,294	-1,515	-1,587	-793	-1,107	-1,221	-1,092	-994	-989	-76	-172	-145	-169	-152	-180	-149	-168	214	71	98

Plan X - Sioux-Rush Island Early Retirement - Renewables when needed																					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	136	135	171	169	168	167	165	165	201	200	200	199	198	197	196	195	1,715
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699	1,740
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536	556
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,412	1,567	1,633	1,503	1,566	676	750	780	852	899	933	954	975	-226	-213	-209	157
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,412	-1,567	-1,633	-1,503	-1,566	-676	-750	-780	-852	-899	-933	-954	-975	226	213	209	-157

Plan Y - Sioux-Rush Island Early Retirement - Grain Belt Express																					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	294	416	610	606	753	950	948	1,096	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715	
Energy Efficiency & DER	0	0	126	240	358	481	609	749	844	942	1,044	1,145	1,232	1,317	1,398	1,478	1,555	1,606	1,655	1,699	1,740
Demand Response	0	0	183	224	261	304	331	358	375	399	425	409	431	453	475	489	511	505	525	536	556
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,896	1,257	1,570	1,849	1,875	1,943	2,004	1,262	1,535	1,564	1,747	1,821	2,004	2,066	2,234	1,073	1,285	1,313	157
Purchases (+) or sales (-)	-1,294	-1,515	-1,896	-1,257	-1,570	-1,849	-1,875	-1,943	-2,004	-1,262	-1,535	-1,564	-1,747	-1,821	-2,004	-2,066	-2,234	-1,073	-1,285	-1,313	-157

Plan Z - Sioux-Rush Island Early Retirement - DPOE2 DSM																					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	15	25	36	48	62	79	132	218	336	454	577	703	826	950	1,042	1,134	1,221	1,301	1,375
Demand Response	0	0	0	0	0	0	43	86	129	171	207	248	285	323	353	379	404	387	410	432	454
New Primary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	824
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,602	818	876	1,003	932	894	985	249	550	698	932	1,077	1,309	1,427	1,614	483	736	810	514
Purchases (+) or sales (-)	-1,294	-1,515	-1,602	-818	-876	-1,003	-932	-894	-985	-249	-550	-698	-932	-1,077	-1,309	-1,427	-1,614	-483	-736	-810	-514

Plan AA - Sioux-Rush Island Early Retirement - DPOE2 DSM																					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	63	125	191	260	334	414	487	562	641	718	784	850	912	973	1,032	1,067	1,099	1,128	1,155
Demand Response	0	0	0	0	0	0	42	85	127	146	156	174	195	216	228	247	265	242	257	273	288
New Primary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	824
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,650	918	1,031	1,215	1,203	1,228	1,338	569	804	888	1,049	1,117	1,270	1,319	1,466	271	462	479	128
Purchases (+) or sales (-)	-1,294	-1,515	-1,650	-918	-1,031	-1,215	-1,203	-1,228	-1,338	-569	-804	-888	-1,049	-1,117	-1,270	-1,319	-1,466	-271	-462	-479	-128

Plan BB - Sioux-Rush Island Early Retirement - MAP																					
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Existing Resources	10,146	10,146	10,150	9,338	9,338	9,338	9,338	9,118	9,118	8,146	8,146	8,146	8,146	8,146	8,146	8,146	6,960	6,960	6,960	5,782	
Existing Sales and Load	-8,851	-8,745	-8,691	-8,682	-8,680	-8,689	-8,815	-8,891	-8,939	-8,978	-9,029	-9,083	-9,157	-9,216	-9,285	-9,357	-9,494	-9,548	-9,600	-9,635	
Renewables	0	115	129	137	183	307	305	503	546	694	891	933	1,081	1,122	1,270	1,310	1,458	1,497	1,694	1,718	1,715
Energy Efficiency & DER	0	0	141	276	424	585	759	954	1,099	1,249	1,405	1,559	1,696	1,828	1,953	2,074	2,189	2,273	2,351	2,420	2,482
Demand Response	0	0	225	315	408	499	564	623	669	718	764	799	841	879	912	934	958	986	1,005	1,015	1,029
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
New Secondary Supply Side	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capacity Position after Adjustment	1,294	1,515	1,953	1,384	1,672	2,039	2,150	2,306	2,492	1,828	2,176	2,353	2,606	2,758	2,995	3,107	3,315	2,221	2,461	2,513	1,372
Purchases (+) or sales (-)	-1,294	-1,515	-1,953	-1,384	-1,672	-2,039	-2,150	-2,306	-2,492	-1,828	-2,176	-2,353	-2,606	-2,758	-2,995	-3,107	-3,315	-2,221	-2,461	-2,513	-1,372

**Table 9A.3 Deviation and Probability: Project Cost Grid, Project Cost, FOM, OM, Project Schedule, EFOR, Environmental CapEx, and Transmission<sup>2</sup>**

**Project Cost Uncertainty Grid<sup>3</sup>**

Estimate Class	Degree of Project Definition (Expressed as % of complete definition)	Established Standard	Maturing	Evolving	Emerging
Class 5	0% to 2%	Low: -20%, High: +30%	Low: -25%, High: +45%	Low: -30%, High: +75%	Low: -35%, High: +120%
Class 4	1% to 15%	Low: -15%, High: +20%	Low: -20%, High: +35%	Low: -25%, High: +55%	Low: -30%, High: +90%
Class 3	10% to 40%	Low: -10%, High: +10%	Low: -15%, High: +25%	Low: -20%, High: +45%	Low: -25%, High: +70%
Class 2	30% to 75%	Low: -5%, High: +5%	Low: -10%, High: +15%	Low: -15%, High: +35%	Low: -20%, High: +55%
Class 1	65% to 100%	Low: -3%, High: +3%	Low: -5%, High: +8%	Low: -10%, High: +17%	Low: -15%, High: +40%

Ameren Missouri used the project cost uncertainty grid above to help guide the subject matter experts in their project cost deviation and probability assignments. Columns (Established Standard, Maturing, etc.) show the degree of technological maturity for a supply side type, whereas the rows, Estimate Classes, show the degree of project definition. Subject matter experts first determined which maturity and class level each supply side option falls under, and then, using that information, made assessments on

<sup>2</sup> 20 CSR 4240-22.060(7)(C)1A; 20 CSR 4240-22.060(7)(C)1B

<sup>3</sup> 20 CSR 4240-22.060(5)(E)

how much project costs might deviate and the probabilities associated with that. This approach was an attempt to standardize and add more objectivity to a subjective step and also was consistent with Ameren's project approval and project management practices.

### Project Cost Uncertainty Distribution

Technology	Estimate Class	Item	Low Project Cost	Low Mid Point Cost	Expected Value Project Cost	High Mid Point Cost	High Project Cost
Combined Cycle	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	10%	20%	50%	15%	5%
Simple Cycle	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	10%	20%	50%	15%	5%
Nuclear	Class 5	Deviation	-20%	-10%	0%	60%	120%
		Probability	5%	15%	40%	25%	15%
Pumped Storage	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	5%	15%	40%	25%	5%
Hydro	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	5%	15%	40%	25%	5%
Li-Ion 4hr - Battery	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	5%	15%	40%	25%	15%
Wind	Class 5	Deviation	-20%	-10%	0%	15%	30%
		Probability	5%	20%	50%	20%	5%
Solar PV	Class 5	Deviation	-10%	-5%	0%	5%	10%
		Probability	5%	20%	50%	20%	5%

**FOM Uncertainty Distribution <sup>4</sup>**

Technology	Item	Low Cost	Low Mid Point Cost	Expected Value	High Mid Point Cost	High Cost
Combined Cycle	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Simple Cycle	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Nuclear	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	20%	35%	30%	10%
Pumped Storage	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Hydro	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Li-Ion 4hr - Battery	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Wind	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%
Solar PV	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	25%	40%	25%	5%

**VOM Uncertainty Distribution**

Technology	Item	Low Cost	Low Mid Point Cost	Expected Value	Mid High Point Cost	High Mid Point Cost	High Cost
Combined Cycle	Deviation		-50%	0%	33%	38%	
	Probability		25%	45%	25%	5%	
Simple Cycle	Deviation		-50%	0%	50%		
	Probability		25%	50%	25%		
Nuclear	Deviation	-25%	-10%	0%	10%	25%	40%
	Probability	5%	20%	40%	20%	10%	5%
Pumped Storage	Deviation	-25%	-10%	0%	10%	25%	40%
	Probability	5%	20%	40%	20%	10%	5%
Hydro	Deviation	-25%	-10%	0%	10%	25%	40%
	Probability	5%	20%	40%	20%	10%	5%
Li-Ion 4hr - Battery	Deviation	Assumed all O&M costs are fixed					
	Probability	Assumed all O&M costs are fixed					
Wind	Deviation	Assumed all O&M costs are fixed					
	Probability	Assumed all O&M costs are fixed					
Solar PV	Deviation	Assumed all O&M costs are fixed					
	Probability	Assumed all O&M costs are fixed					

<sup>4</sup> 20 CSR 4240-22.060(5)(I)

**Project Schedule Uncertainty Distribution <sup>5</sup>**

Technology	Item	Low	Low Mid Point	Expected Value	High Mid Point	High
Combined Cycle	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	50%	15%	5%
Simple Cycle	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	50%	15%	5%
Nuclear	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Pumped Storage	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Hydro	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Li-Ion 4hr - Battery	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Wind	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Solar PV	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%

**EFOR Uncertainty Distribution <sup>6</sup>**

Technology	Item	Low	Low Mid Point	Expected Value	High Mid Point	High
Combined Cycle	Deviation		-1%	0%	2%	
	Probability		25%	50%	25%	
Simple Cycle	Deviation		-4%	0%	4%	
	Probability		25%	50%	25%	
Nuclear	Deviation		-1%	0%	1%	
	Probability		20%	50%	30%	
Pumped Storage	Deviation		-4%	0%	4%	
	Probability		25%	50%	25%	
Hydro	Deviation	-30%	-15%	0%	20%	40%
	Probability	5%	25%	40%	25%	5%
Li-Ion 4hr - Battery	Deviation	Included as part of capacity factor				
	Probability	Included as part of capacity factor				
Wind	Deviation	Included as part of capacity factor				
	Probability	Included as part of capacity factor				
Solar PV	Deviation	Included as part of capacity factor				
	Probability	Included as part of capacity factor				

<sup>5</sup> 20 CSR 4240-22.060(5)(F)<sup>6</sup> 20 CSR 4240-22.060(5)(J)

\*\*\* *Environmental CapEx Uncertainty Distribution*

Technology	Item	Low Project Cost	Low Mid Point Cost	Expected Value Project Cost	High Mid Point Cost	High Project Cost
Labadie - Ash Landfill	Deviation	-20%	-10%	0%	15%	30%
	Probability	5%	10%	55%	20%	10%

\*\*\*

*Retirement Transmission CapEx Uncertainty Distribution <sup>7</sup>*

Technology	Item	Low Project Cost	Low Mid Point Cost	Expected Value Project Cost	High Mid Point Cost	High Project Cost
Sioux	Deviation	-40%	-20%	0%	35%	70%
	Probability	5%	15%	40%	30%	10%
Labadie	Deviation	-40%	-20%	0%	35%	70%
	Probability	5%	15%	40%	30%	10%
Rush Island	Deviation	-40%	-20%	0%	35%	70%
	Probability	5%	15%	40%	30%	10%

<sup>7</sup> 20 CSR 4240-22.060(5)(E)

\*\*\* Table 9A.4 Sensitivity Analysis: *Change in PVRR Ranking*<sup>8</sup>

**\*\*\*THIS TABLE IS  
HIGHLY CONFIDENTIAL  
IN ITS ENTIRETY\*\*\***

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<sup>8</sup> 20 CSR 4240-22.060(6)

\*\*\* Table 9A.5 Sensitivity Analysis: *Change in PVRR*<sup>9</sup>

Plan	Integration Ranking	DSM Load Impact & Cost			DSM Cost Only			ROE-Interest Rate			Project Cost			Project Schedule			Fixed and Variable O&M			Coal Price			EFOR		
		PWA	Low	High	PWA	Low	High	PWA	Low	High	PWA	Low	High	PWA	Low	High	PWA	Low	High	PWA	Low	High	PWA	Low	High
A-RAP DSM - RES Compliance	65,981	(26)	36	(293)	19	(260)	447	(128)	(1,715)	436	37	(782)	1,149	1	(14)	19	(1)	(99)	91	53	(258)	792	2	6	15
B-Renewable Expansion	65,921	(26)	36	(293)	19	(260)	447	(140)	(1,885)	480	36	(1,041)	1,403	9	(27)	117	5	(136)	186	53	(258)	792	0	1	3
C-No New DSM - CCs	67,880	-	-	-	-	-	-	(148)	(1,991)	508	38	(1,256)	1,632	10	(45)	143	4	(291)	331	53	(258)	792	4	12	29
D-No New DSM - All Solar	66,709	-	-	-	-	-	-	(150)	(2,018)	515	34	(1,166)	1,506	10	(37)	133	6	(127)	187	53	(258)	792	-	-	-
E-No New DSM - Bumped Hydro	68,384	-	-	-	-	-	-	(151)	(2,028)	518	37	(1,314)	1,687	11	(67)	174	4	(246)	286	53	(258)	792	3	15	18
F-No New DSM - AP1000	75,700	-	-	-	-	-	-	(203)	(2,736)	706	268	(5,352)	8,034	13	(505)	640	9	(370)	461	53	(258)	792	1	(9)	23
G-No New DSM - Simple Cycles	67,877	-	-	-	-	-	-	(148)	(1,988)	507	38	(1,252)	1,627	10	(45)	143	4	(261)	306	53	(258)	792	3	10	24
H-MAP DSM - Renewable Expansion	66,687	(17)	(51)	(121)	71	(498)	1,210	(139)	(1,860)	474	36	(1,005)	1,365	9	(24)	113	5	(113)	168	53	(258)	792	-	-	-
I-MAP DSM - RES Compliance	66,540	(17)	(51)	(121)	71	(498)	1,210	(124)	(1,669)	425	36	(697)	1,060	0	(6)	9	(1)	(46)	39	53	(258)	792	1	3	6
J-DOPE1 DSM	66,636	-	-	-	43	(161)	587	(143)	(1,915)	488	37	(1,098)	1,464	9	(32)	124	5	(174)	221	53	(258)	792	1	4	9
K-DOPE2 DSM	66,563	-	-	-	35	(137)	486	(143)	(1,916)	488	37	(1,098)	1,464	9	(32)	124	5	(174)	221	53	(258)	792	1	4	9
L-Labadie Early Retirement - 1 units	66,378	(26)	36	(293)	19	(260)	447	(139)	(1,862)	474	26	(971)	1,233	9	(34)	128	5	(218)	268	30	(174)	476	3	8	20
M-Labadie Early Retirement - 2 units	66,137	(26)	36	(293)	19	(260)	447	(138)	(1,857)	473	30	(944)	1,240	9	(27)	117	5	(136)	186	38	(204)	589	0	1	3
N-Sioux Early Retirement	65,954	(26)	36	(293)	19	(260)	447	(140)	(1,877)	478	36	(1,060)	1,424	9	(27)	117	5	(136)	186	50	(245)	746	0	1	3
O-Rush Early Retirement	66,016	(26)	36	(293)	19	(260)	447	(139)	(1,861)	474	31	(990)	1,299	9	(29)	120	5	(151)	203	38	(195)	578	1	2	6
P-Sioux-Rush Early Retirement	65,958	(26)	36	(293)	19	(260)	447	(140)	(1,873)	477	34	(1,042)	1,380	9	(29)	120	5	(151)	203	46	(225)	685	1	2	6
Q-Sioux-Rush Early Retirement - No CCs	66,583	(26)	36	(293)	19	(260)	447	(149)	(1,996)	509	34	(1,297)	1,634	14	(38)	180	9	(180)	266	46	(225)	685	-	-	-

\*\*\*

<sup>9</sup> 20 CSR 4240-22.060(6)

Table 9A.6 DSM Participant Costs (\$Million)<sup>10</sup>

DSM Program	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
RAP	56	58	60	62	64	71	48	50	52	55	68	74	79	80	80	85	76	73	73
MAP	2	3	4	3	2	2	2	2	2	2	2	4	5	6	5	4	4	4	4
DOPE1	1	1	1	2	2	3	21	40	58	61	62	64	66	72	49	51	53	57	69
DOPE2	23	24	25	26	27	29	25	26	27	28	28	29	30	30	30	36	36	36	37

<sup>10</sup> 20 CSR 4240-22.060(2)(A)3

Figure 9A.1 Combined Impact of DSM on Summer Peak Demand<sup>11</sup>

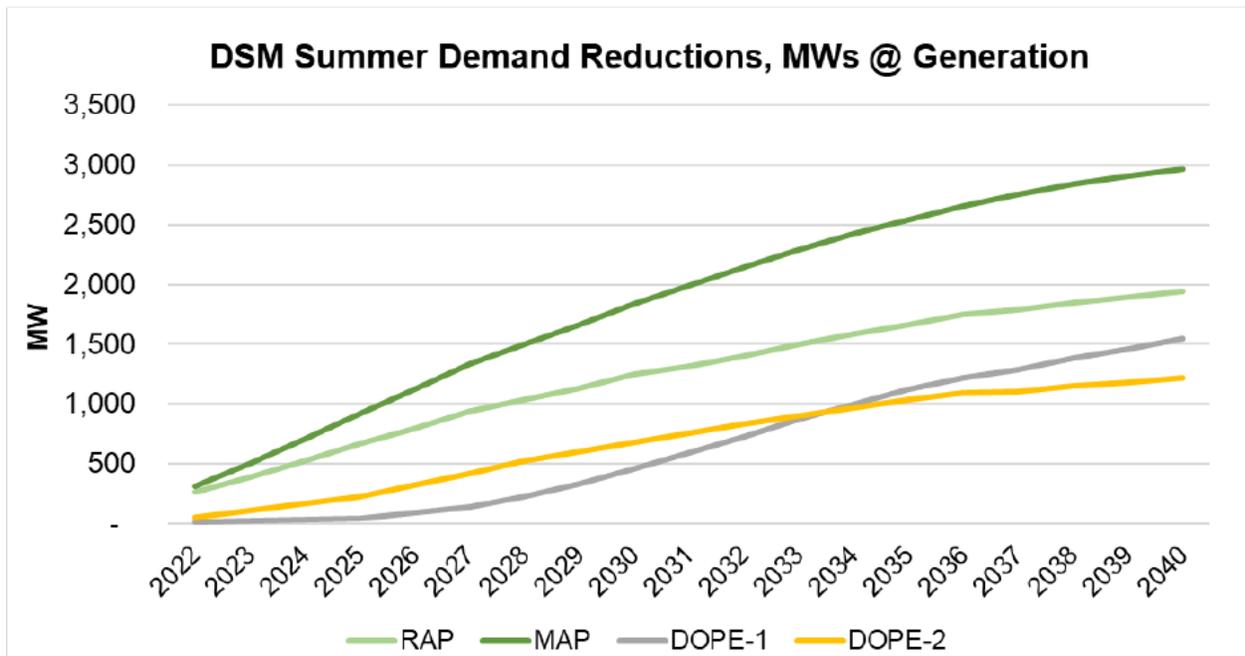
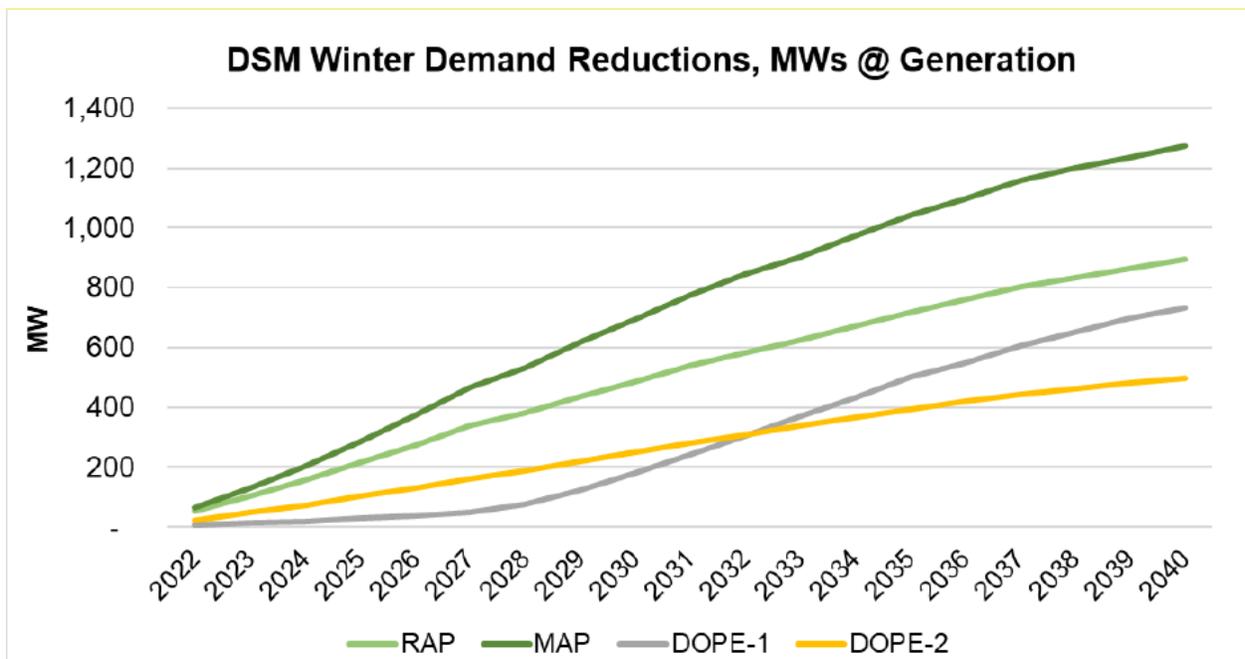


Figure 9A.2 Combined Impact of DSM on Winter Peak Demand<sup>12</sup>



<sup>11</sup> 20 CSR 4240-22.060(4)(B)1

<sup>12</sup> 20 CSR 4240-22.060(4)(B)1



Figure 9A.5 Stacked Programs for DOPE 1 DSM Capacity<sup>15</sup>

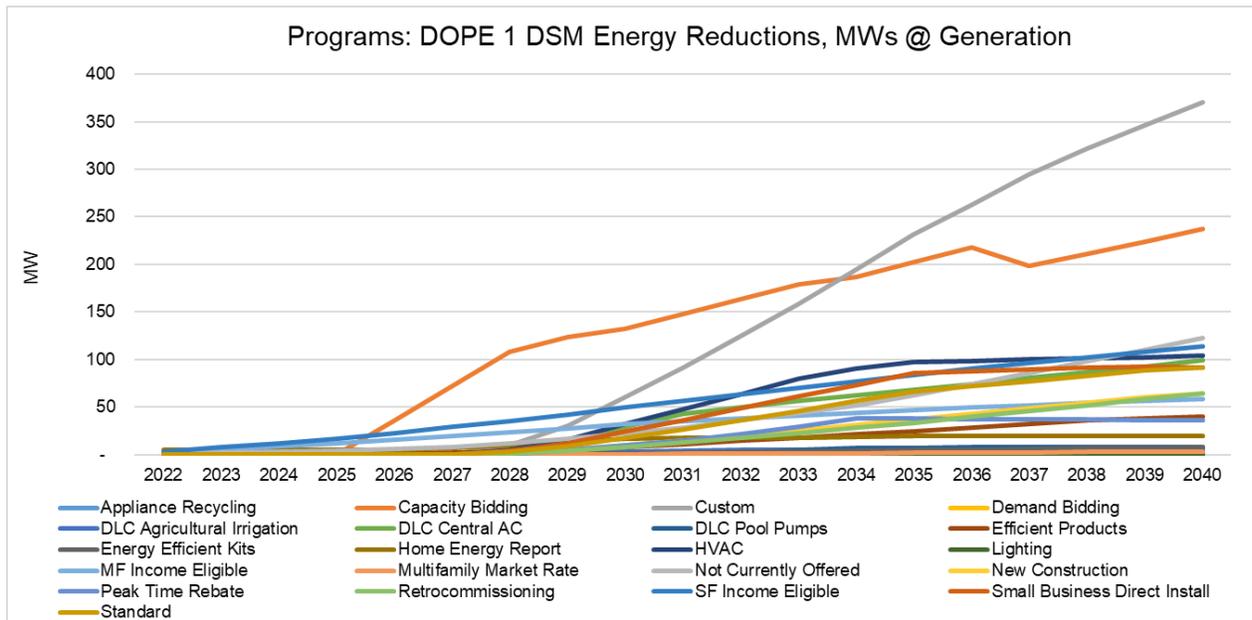
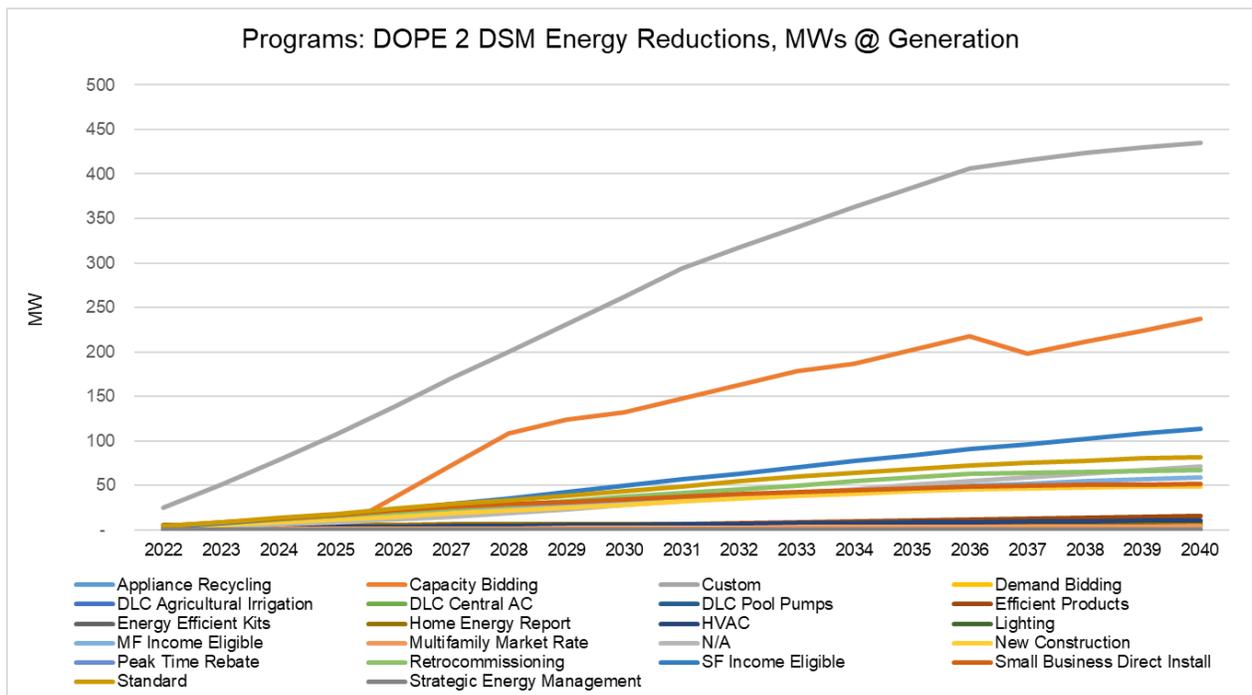


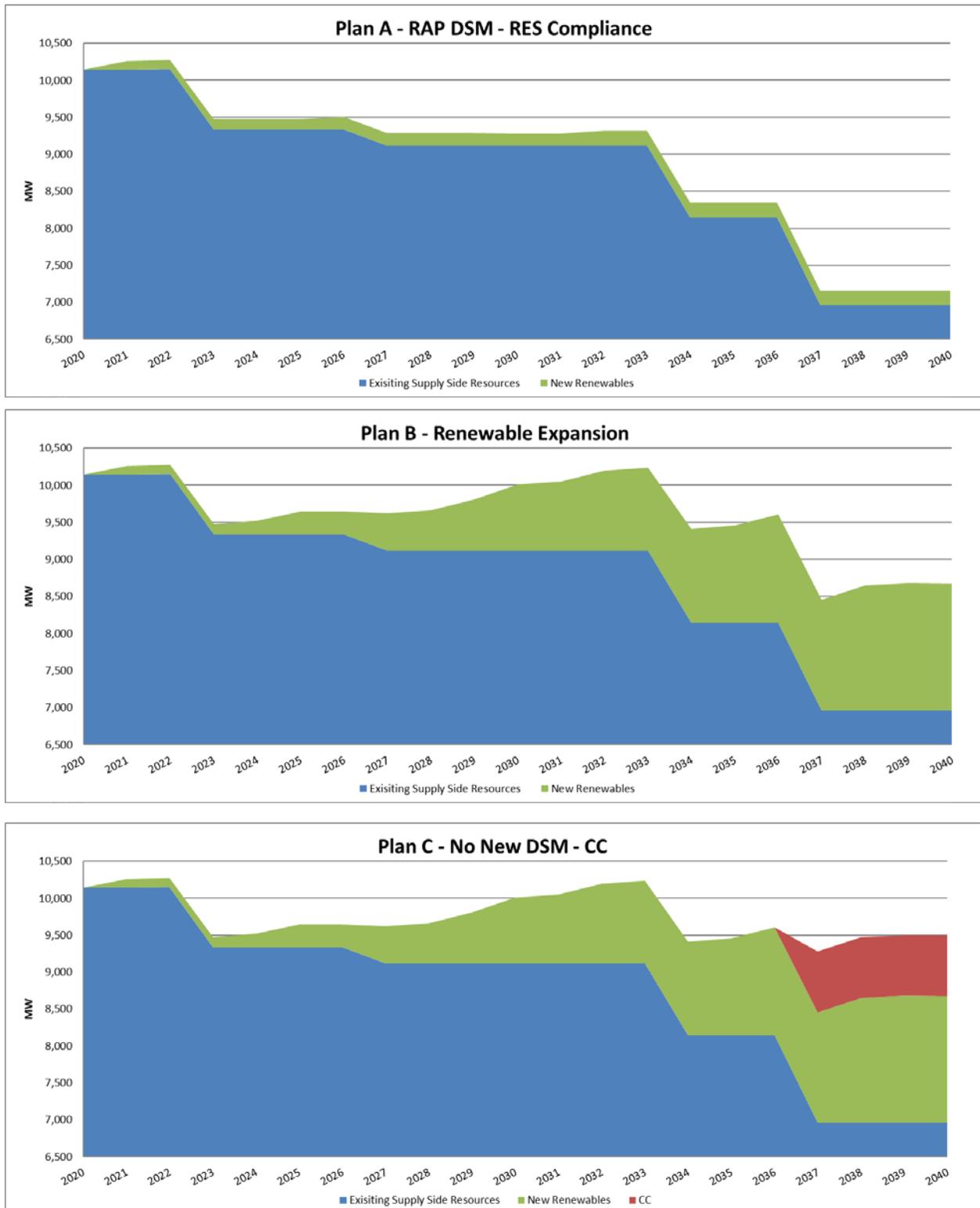
Figure 9A.6 Stacked Programs for DOPE 2 DSM Capacity<sup>16</sup>



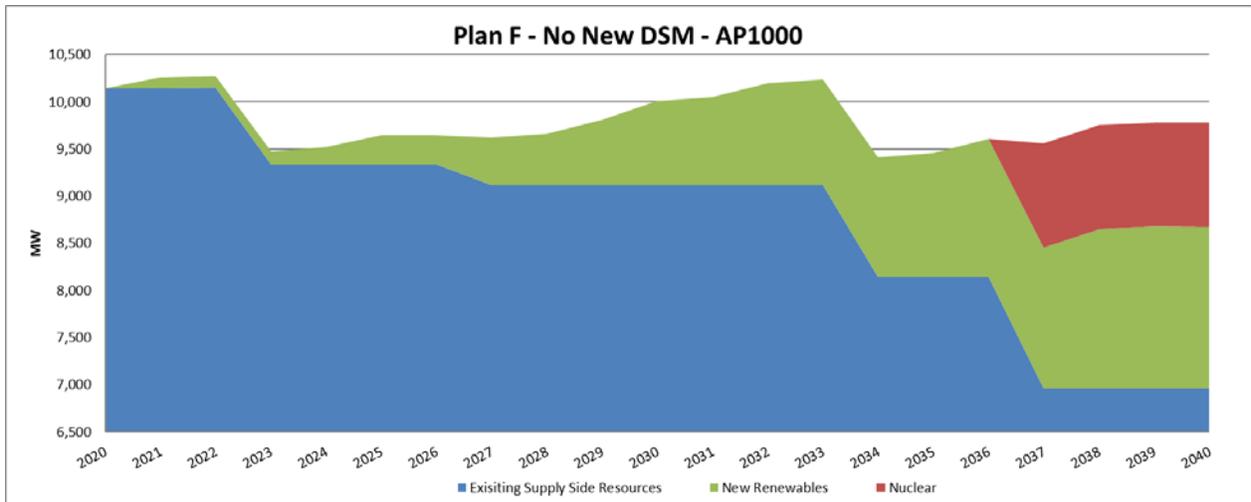
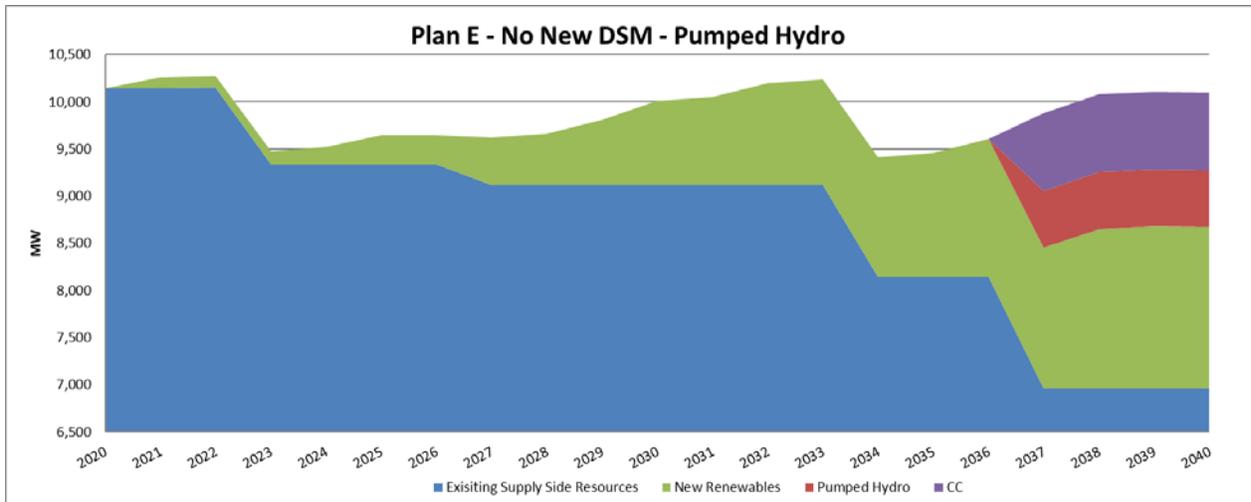
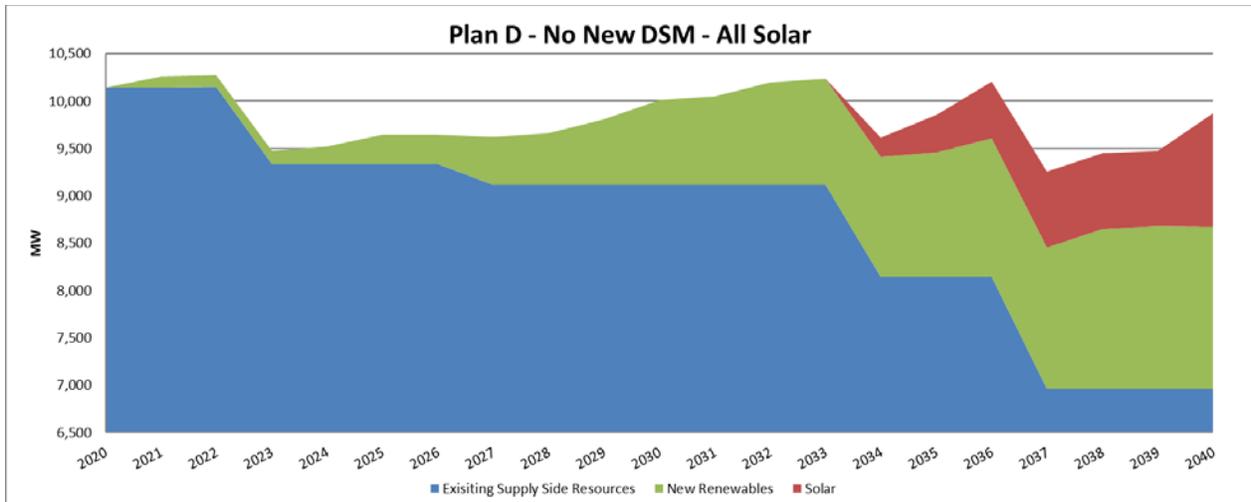
<sup>15</sup> 20 CSR 4240-22.060(4)(B)2

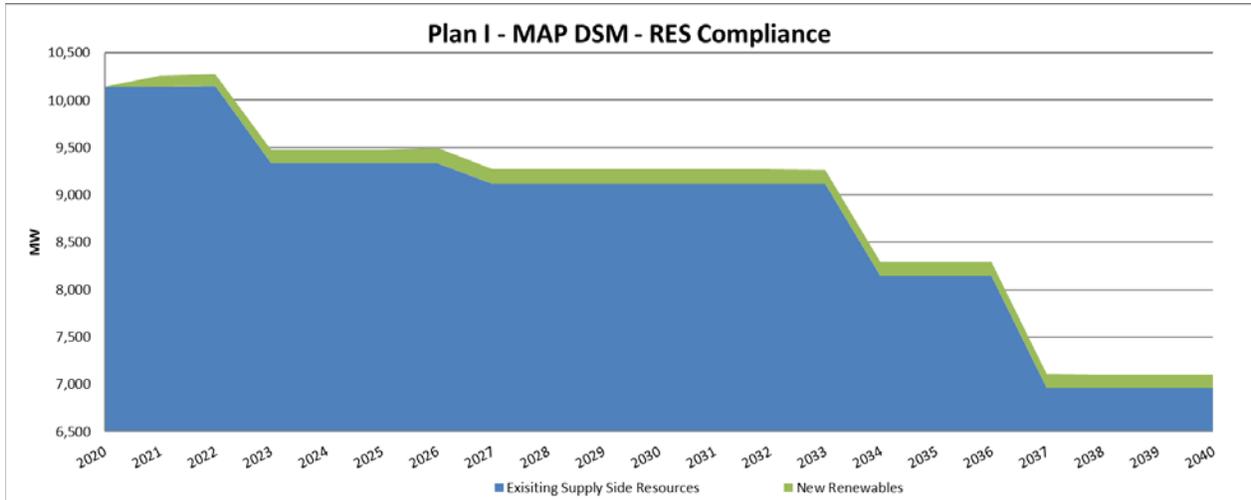
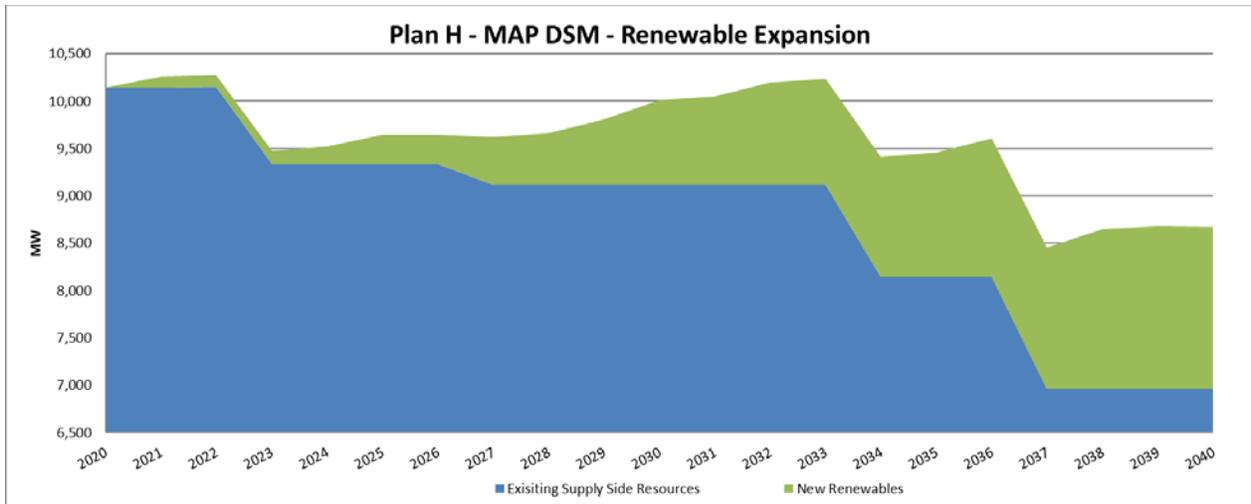
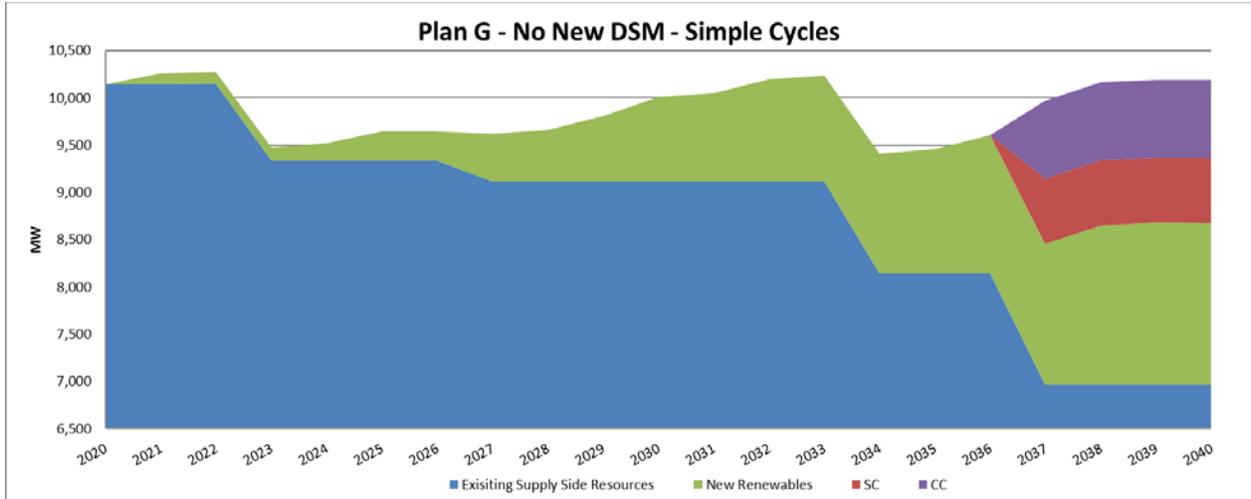
<sup>16</sup> 20 CSR 4240-22.060(4)(B)2

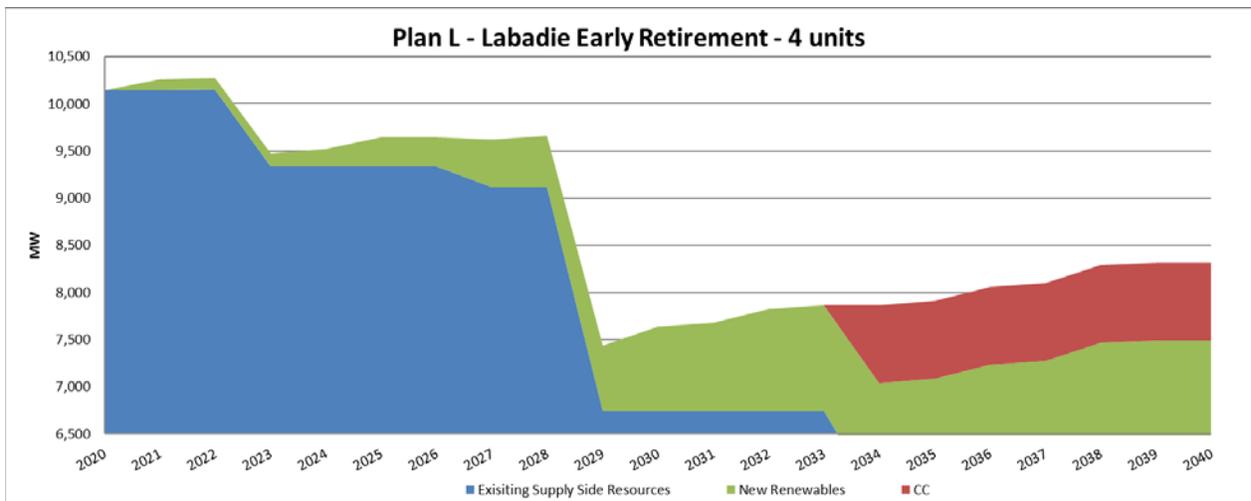
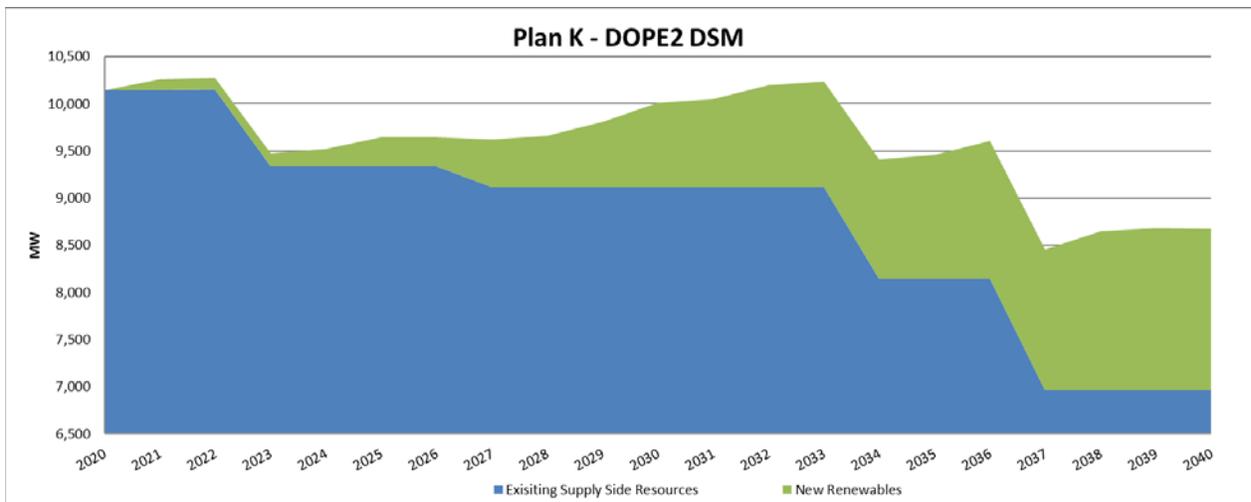
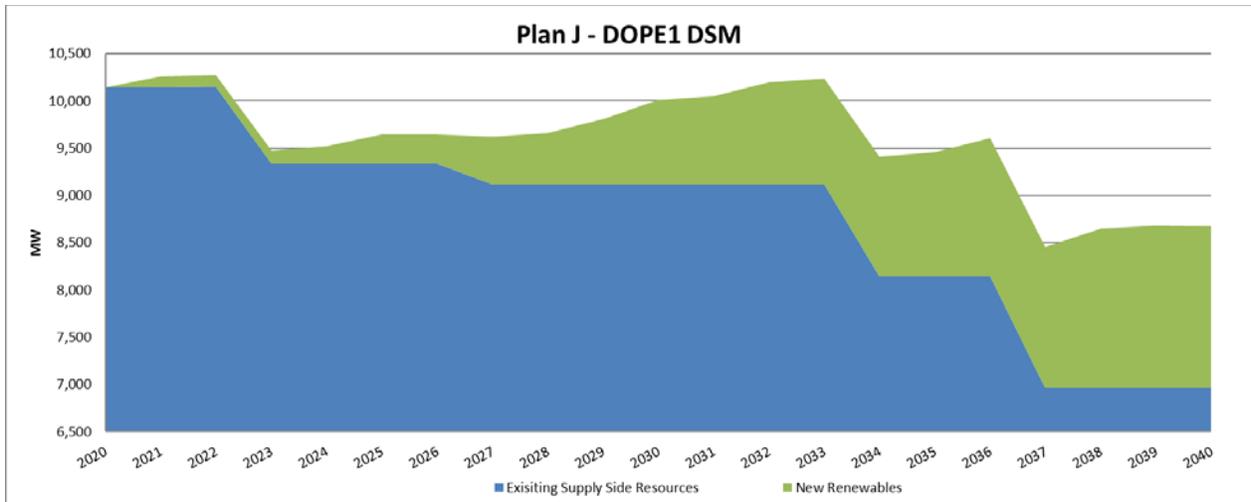
Figure 9A.7 Composition of Capacity<sup>17</sup>

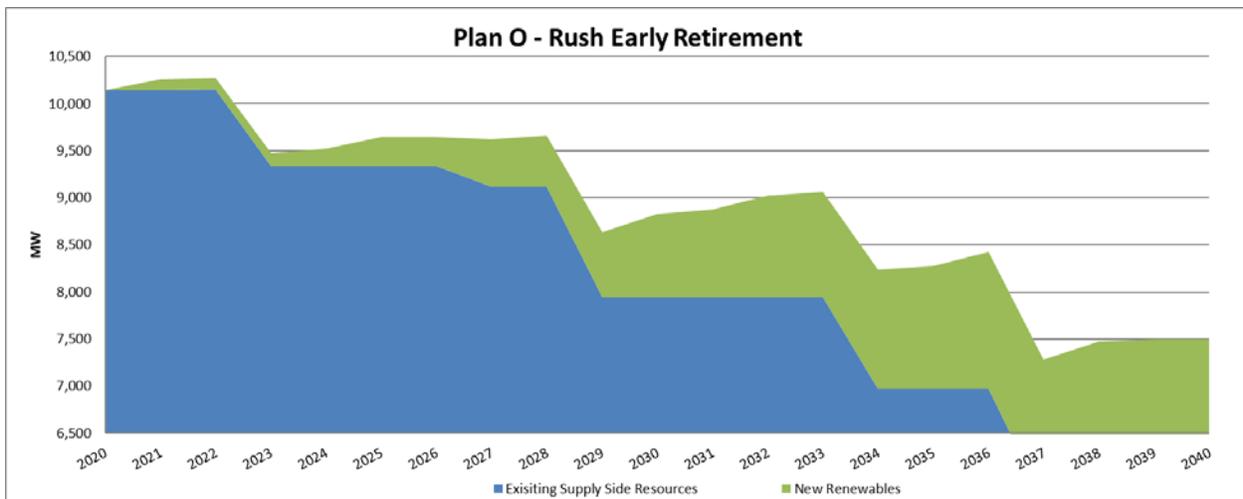
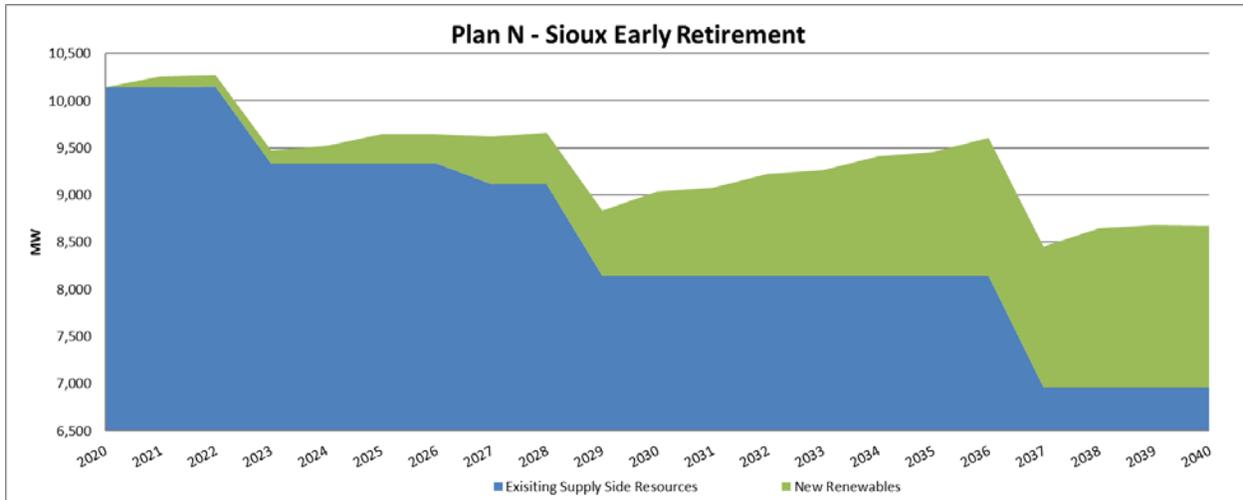
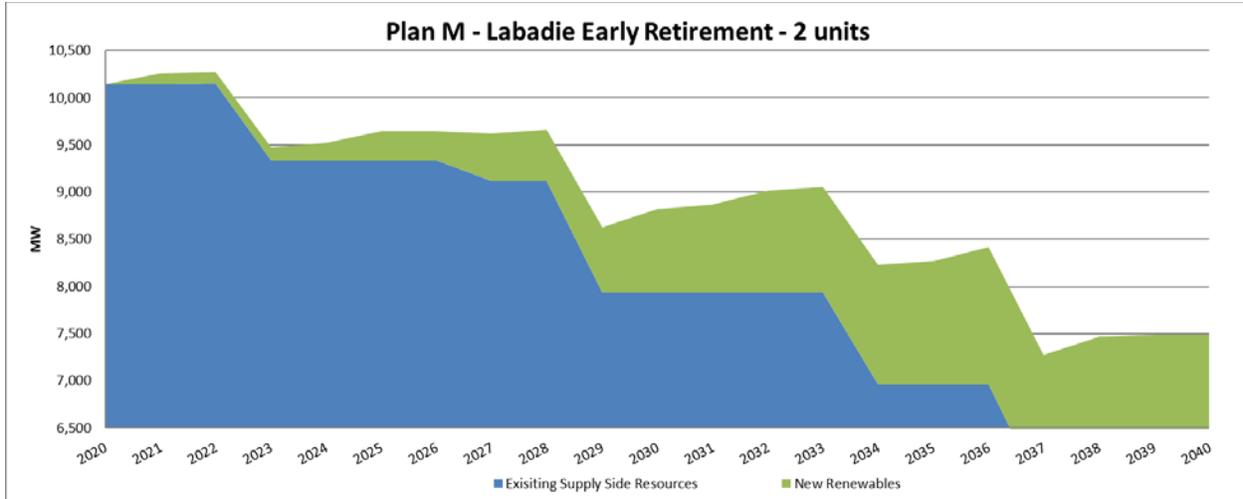


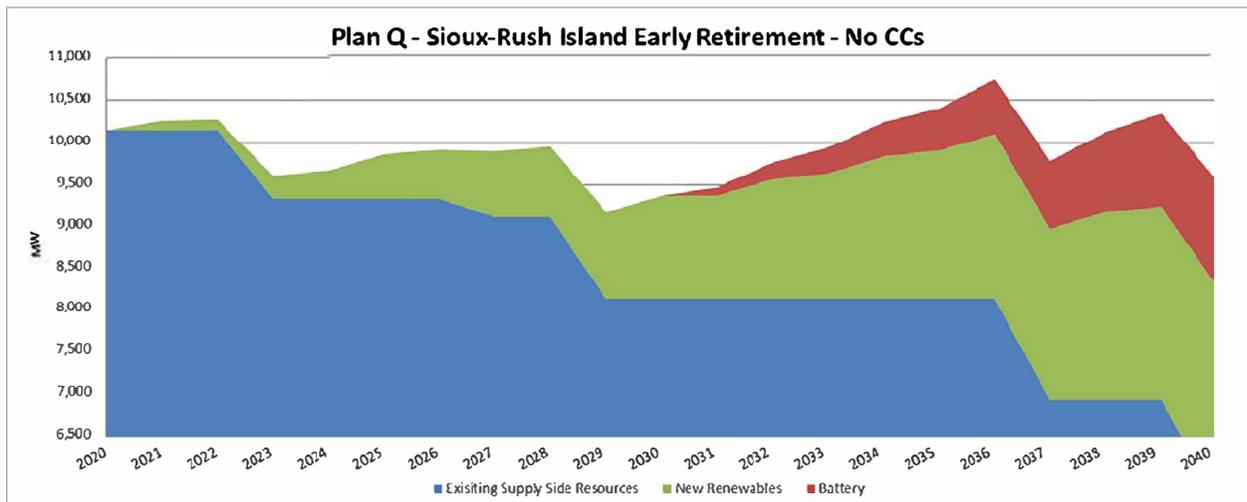
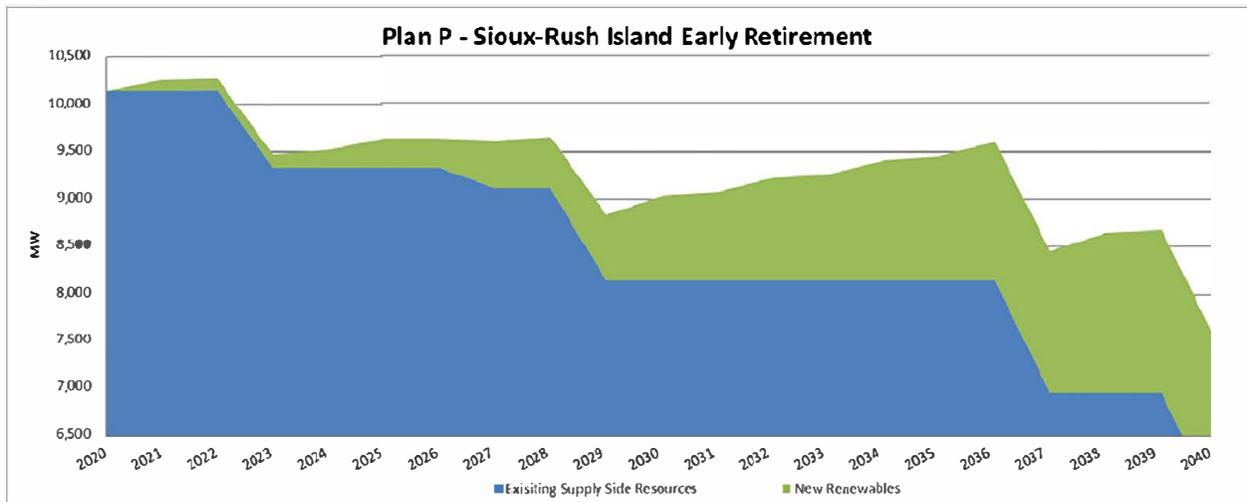
<sup>17</sup> 20 CSR 4240-22.060(4)(B)3





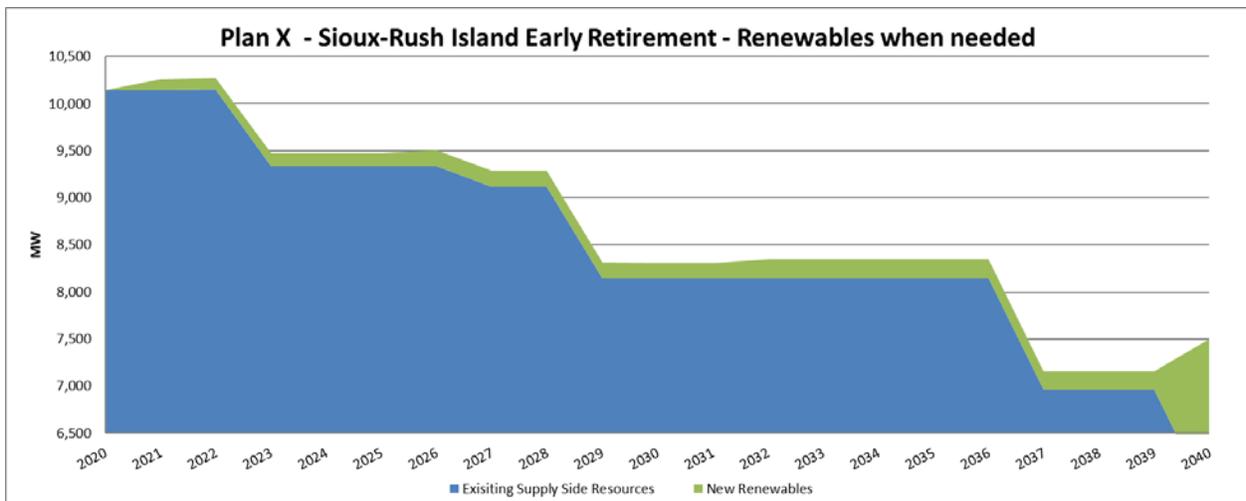
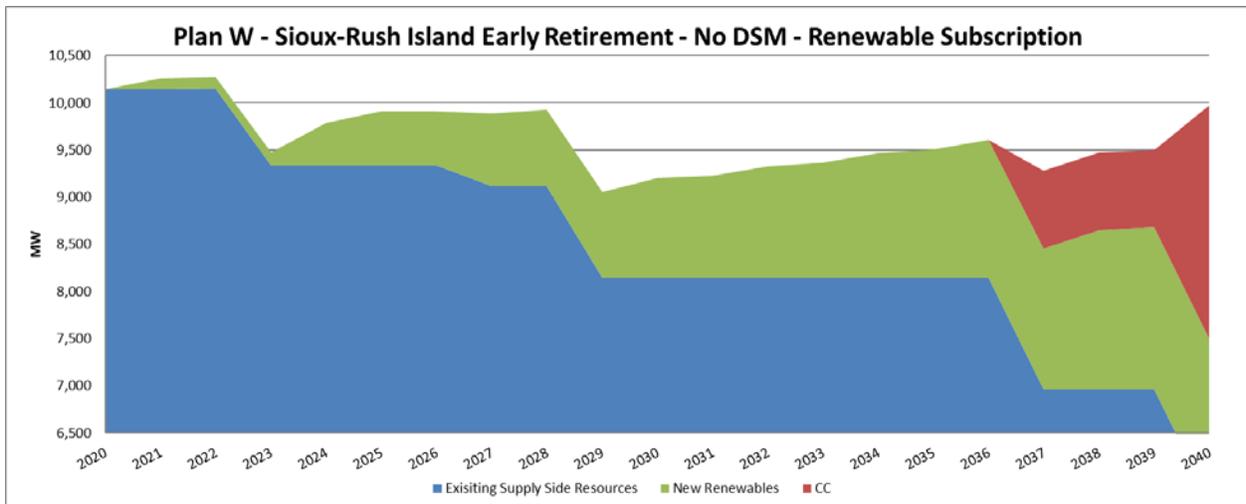
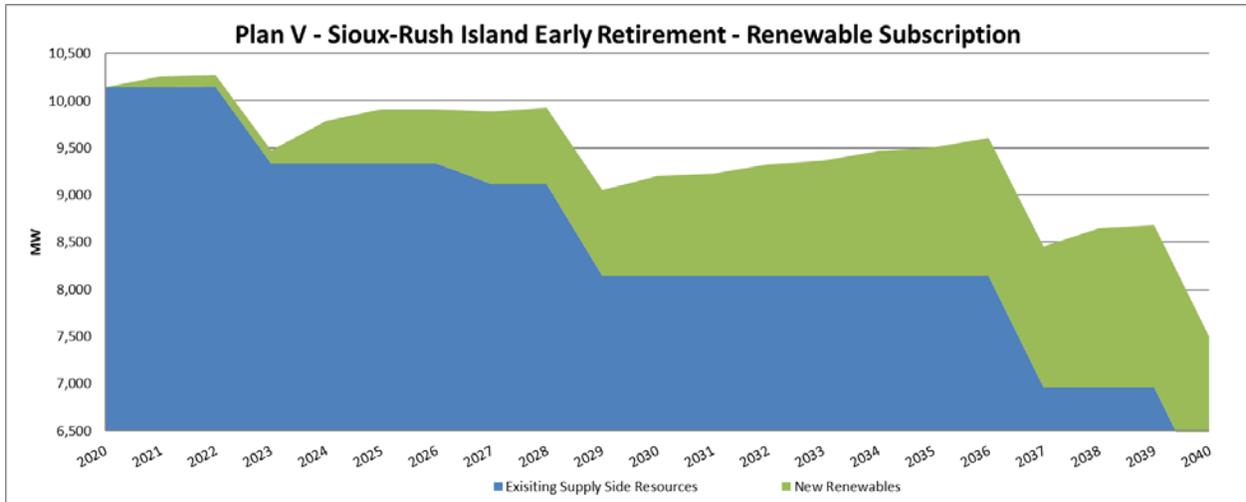


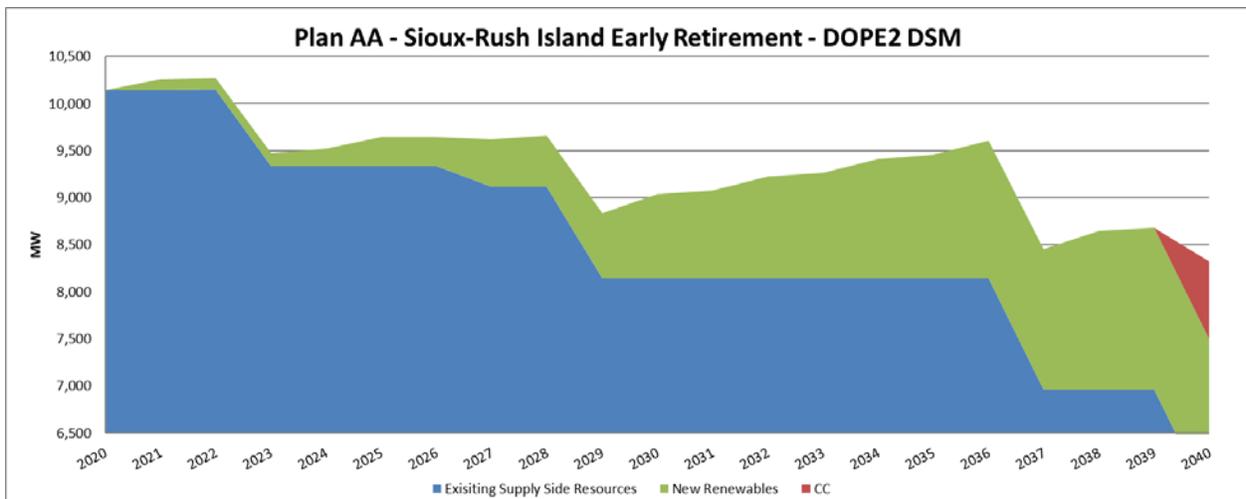
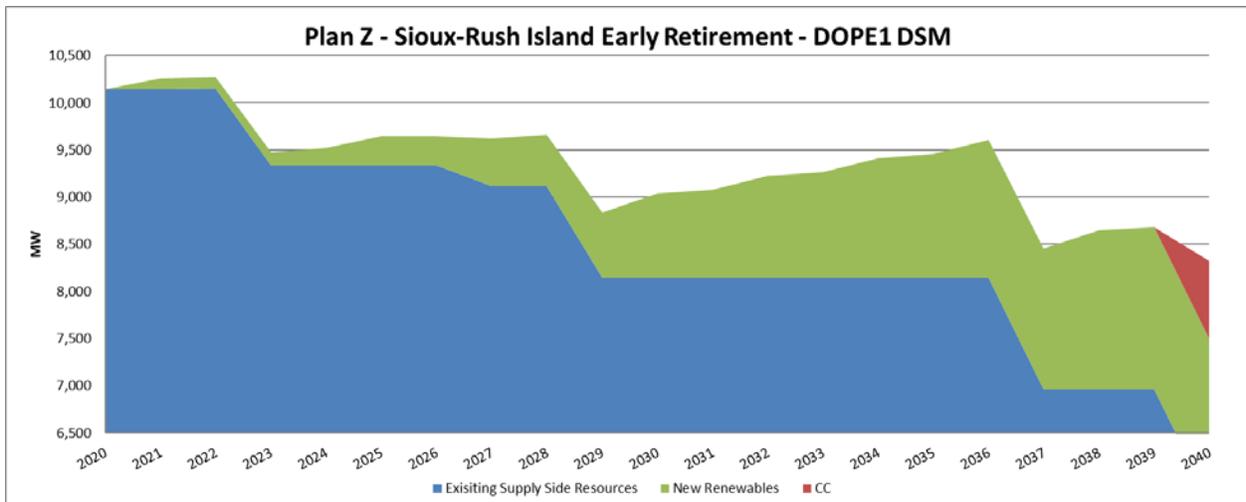
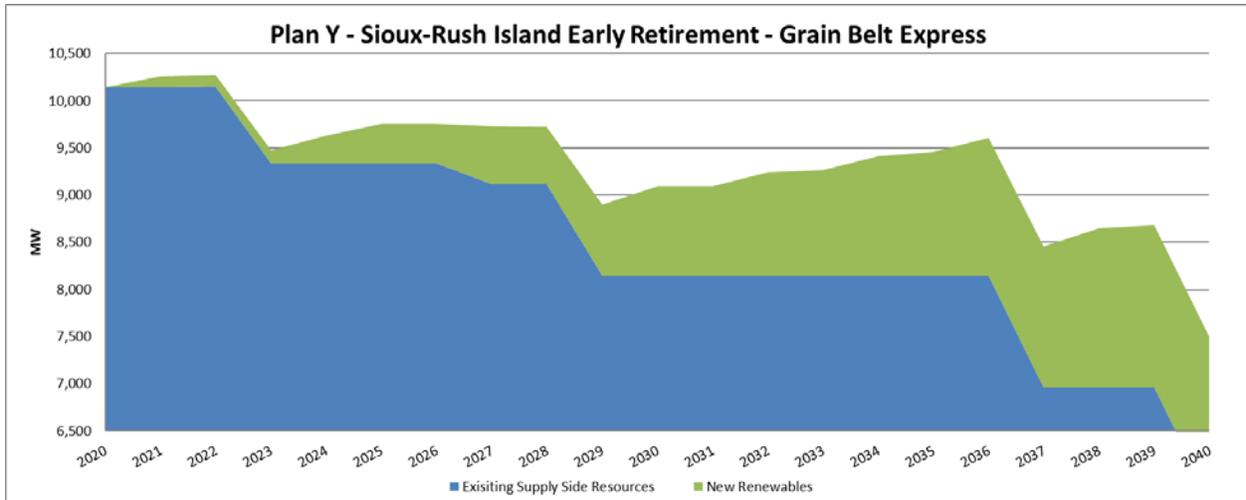




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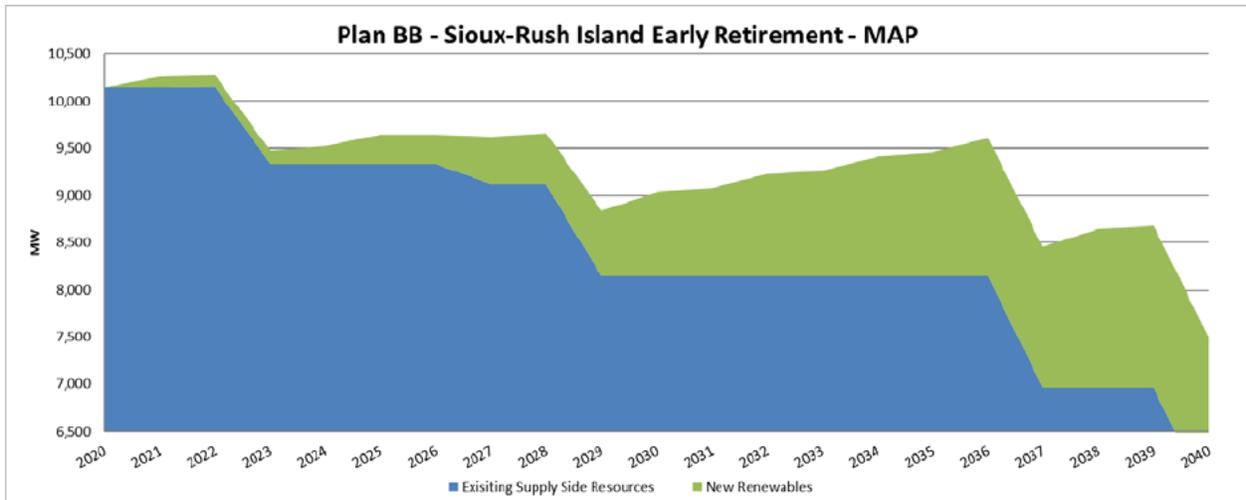
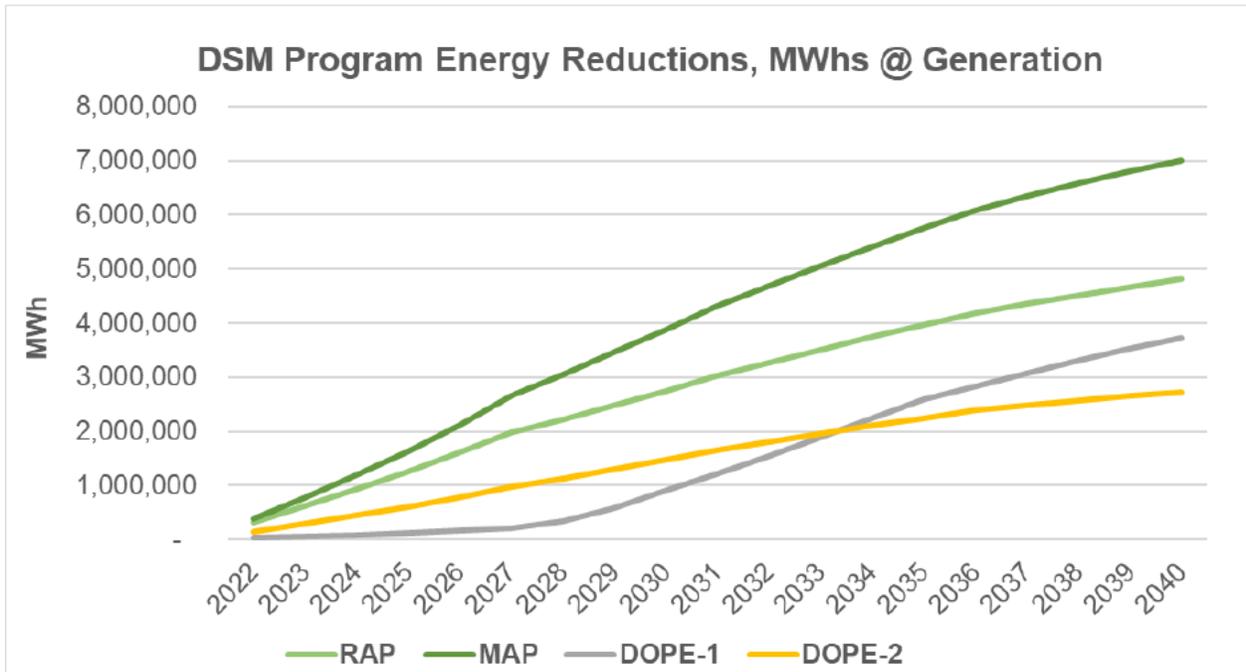


Figure 9A.8 Combined Impact of DSM Resources on Energy<sup>18</sup>



<sup>18</sup> 20 CSR 4240-22.060(4)(B)4

Figure 9A.9 Programs for RAP DSM Energy<sup>19</sup>

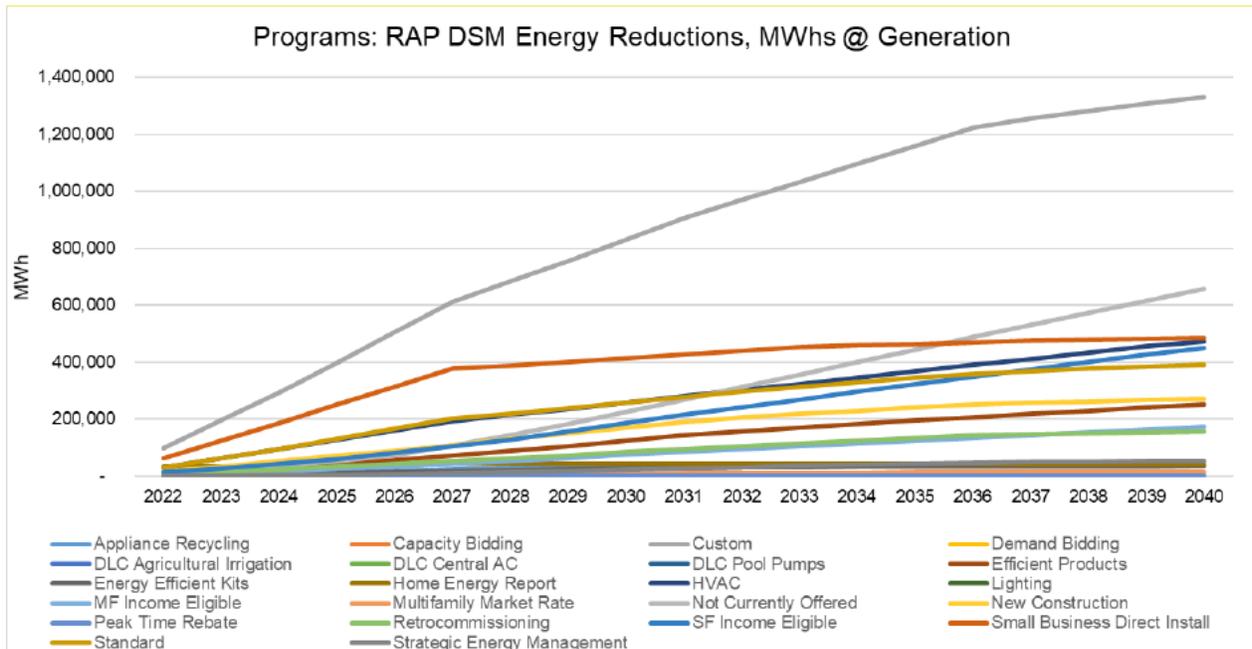
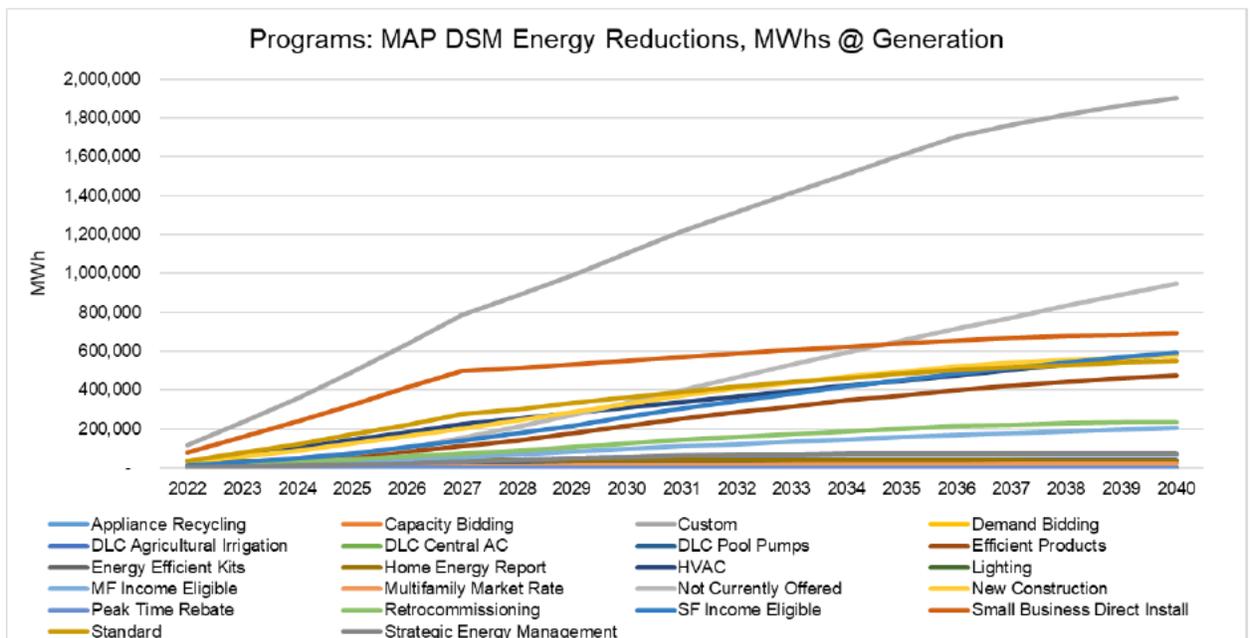


Figure 9A.10 Programs for MAP DSM Energy<sup>20</sup>



<sup>19</sup> 20 CSR 4240-22.060(4)(B)5

<sup>20</sup> 20 CSR 4240-22.060(4)(B)5

Figure 9A.11 Programs for DOPE 1 Energy<sup>21</sup>

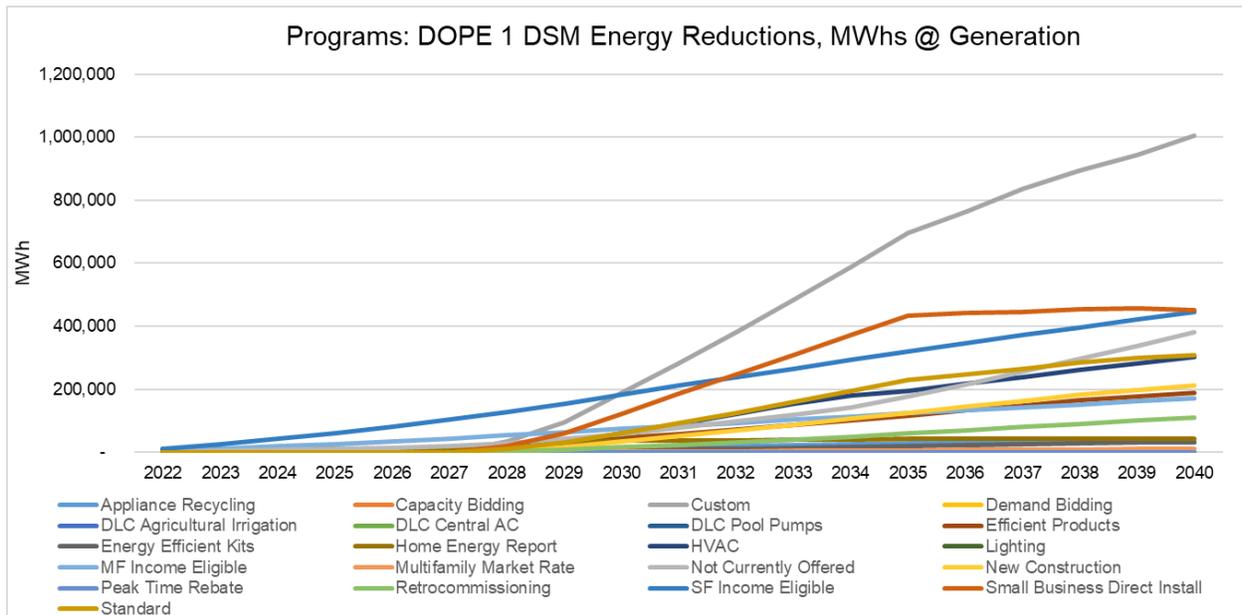
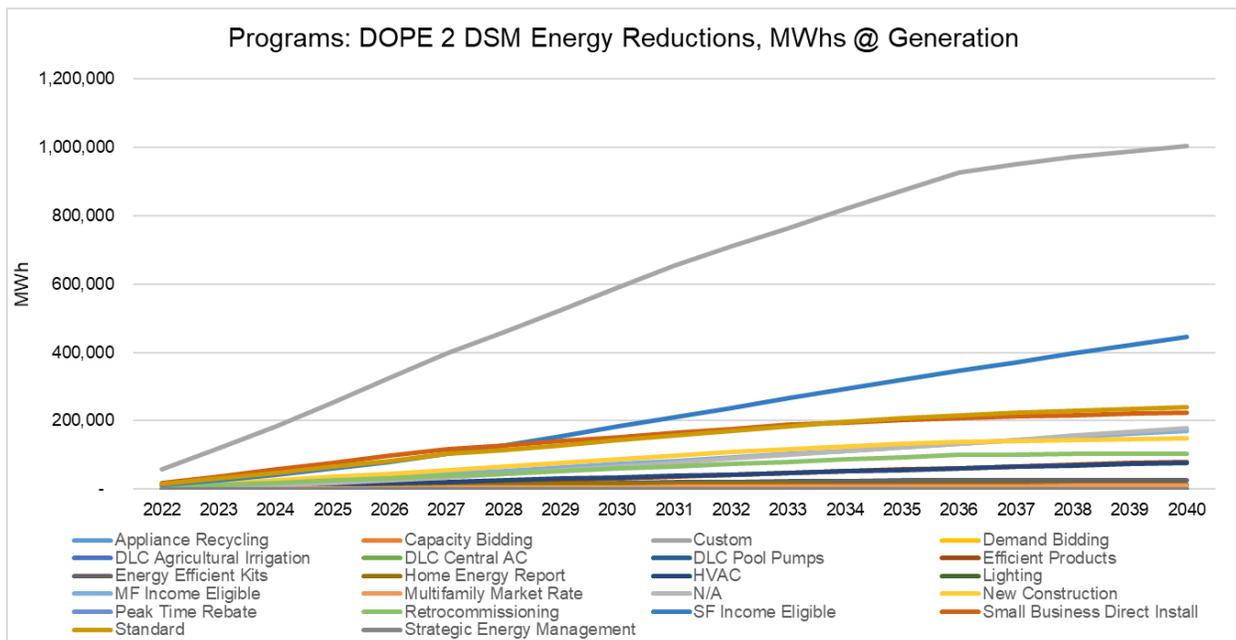


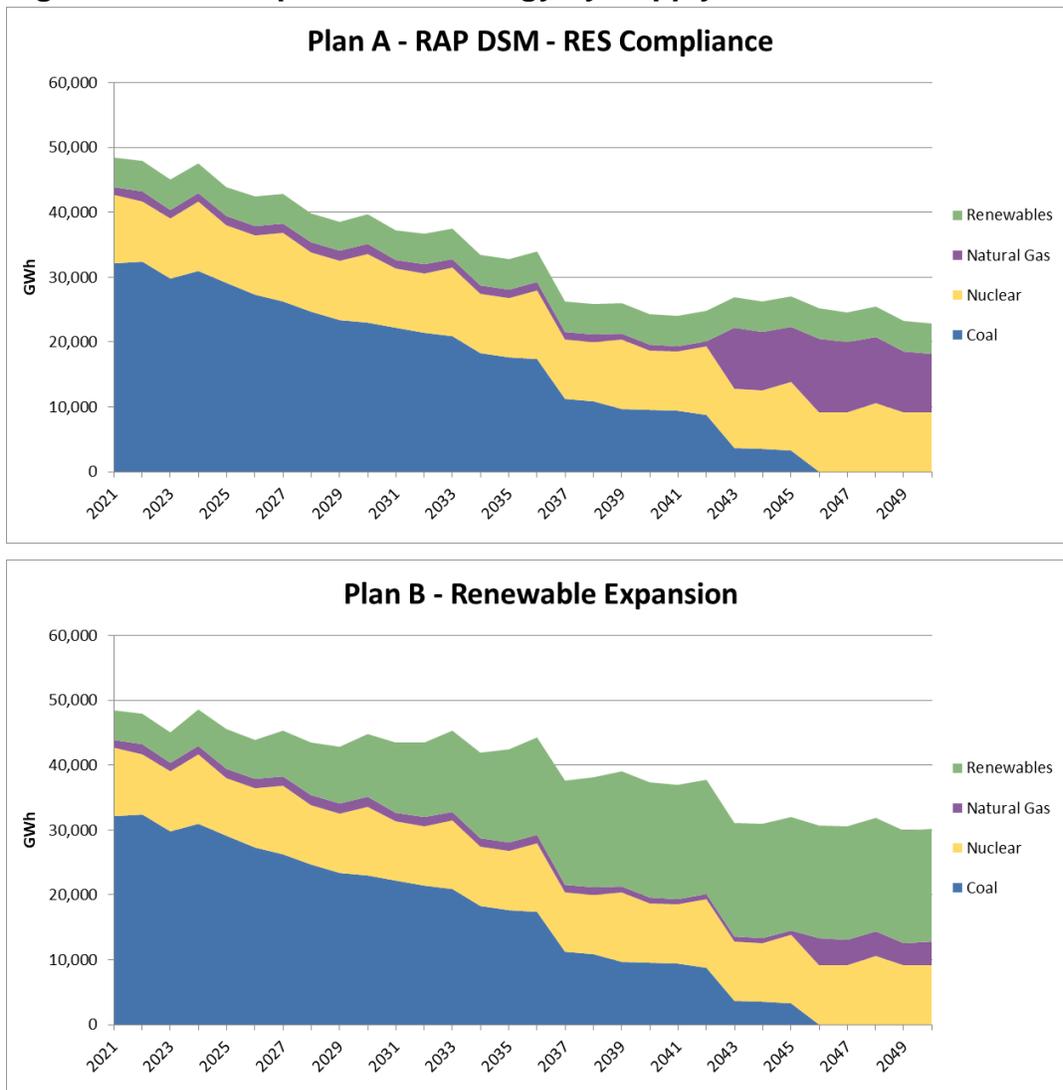
Figure 9A.12 Programs for DOPE 2 Energy<sup>22</sup>



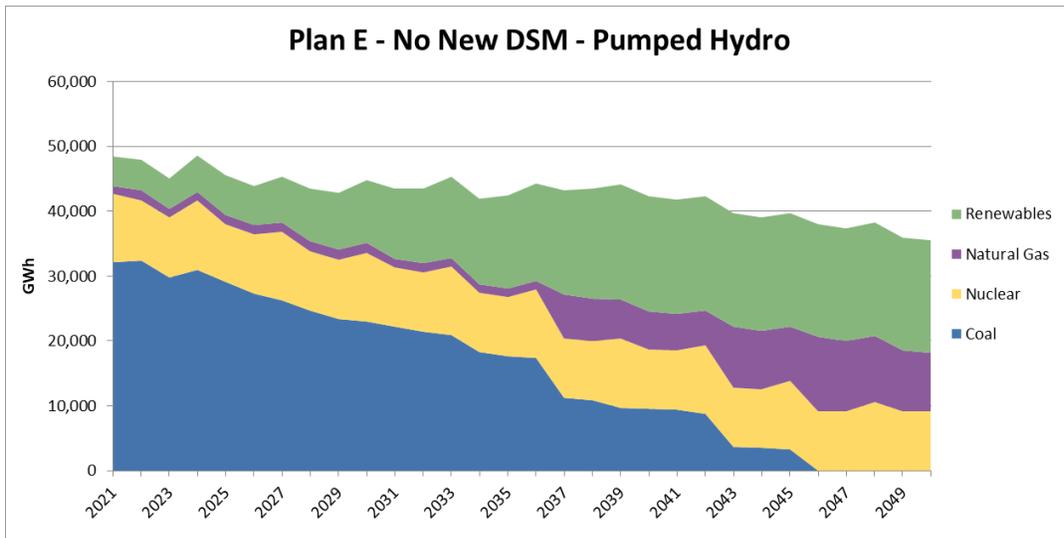
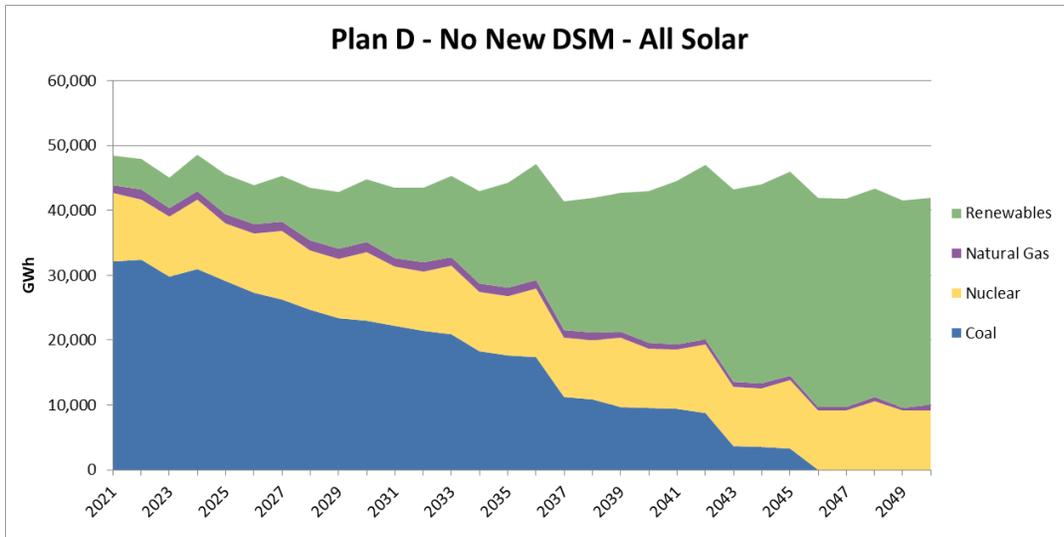
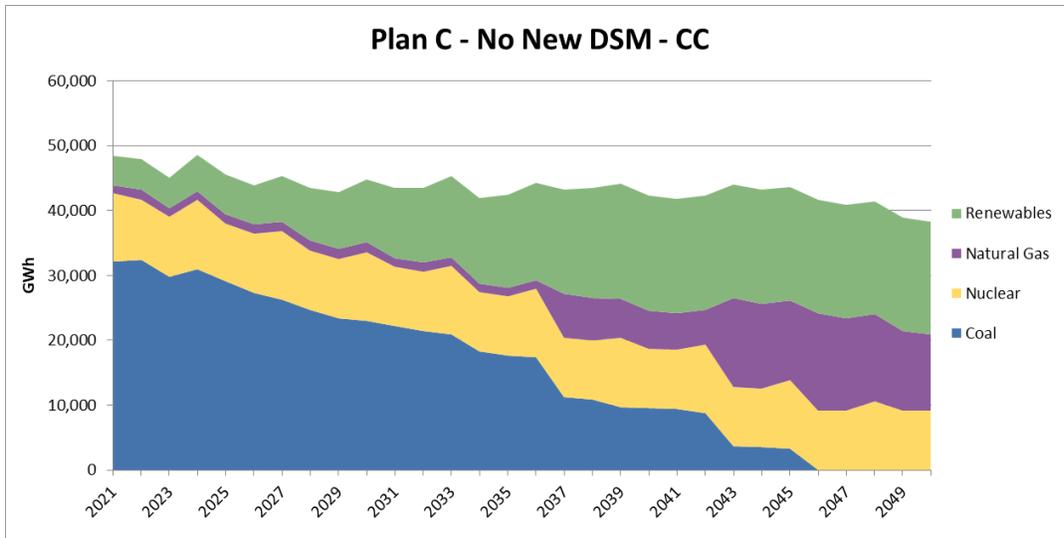
<sup>21</sup> 20 CSR 4240-22.060(4)(B)5

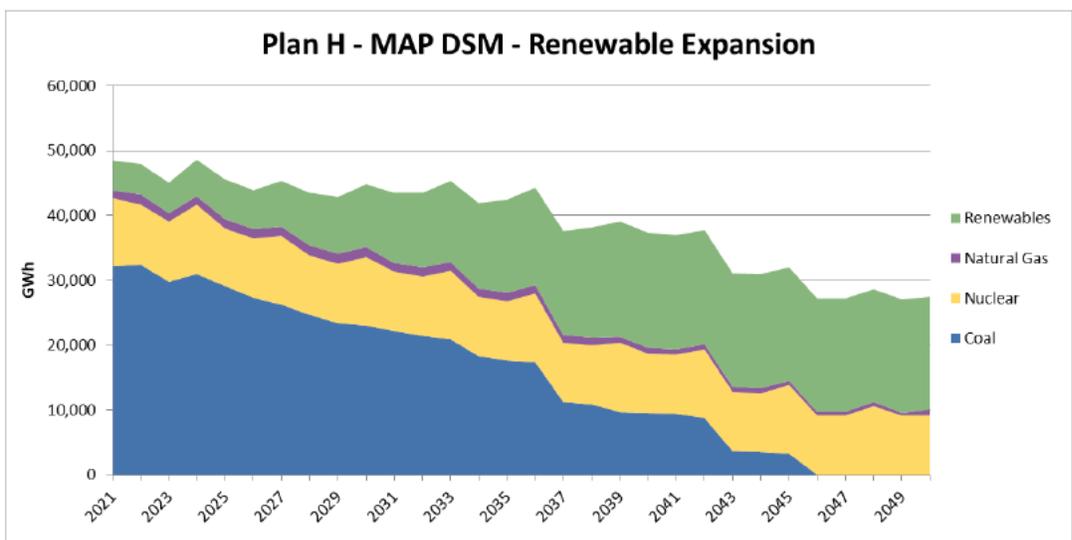
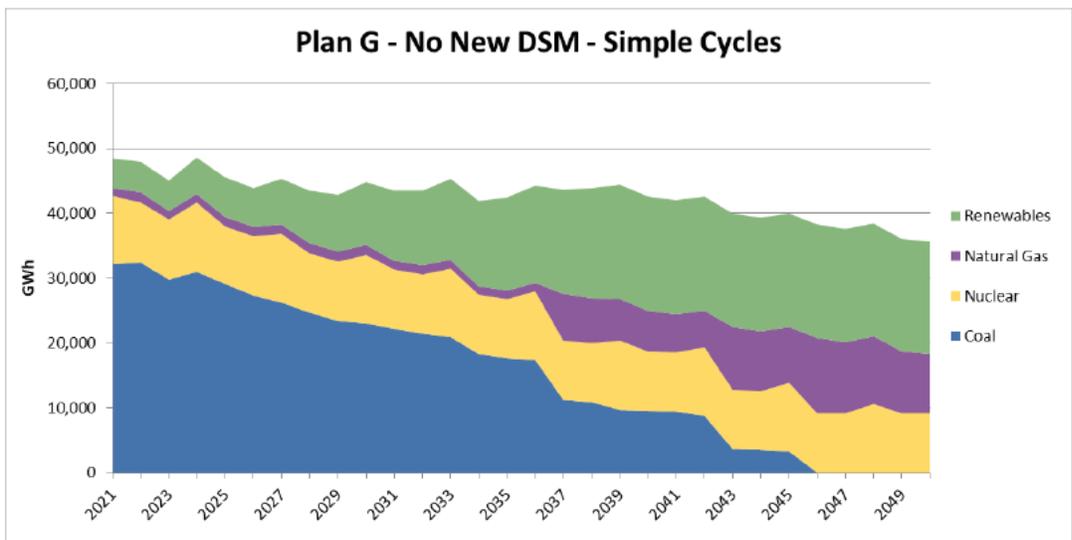
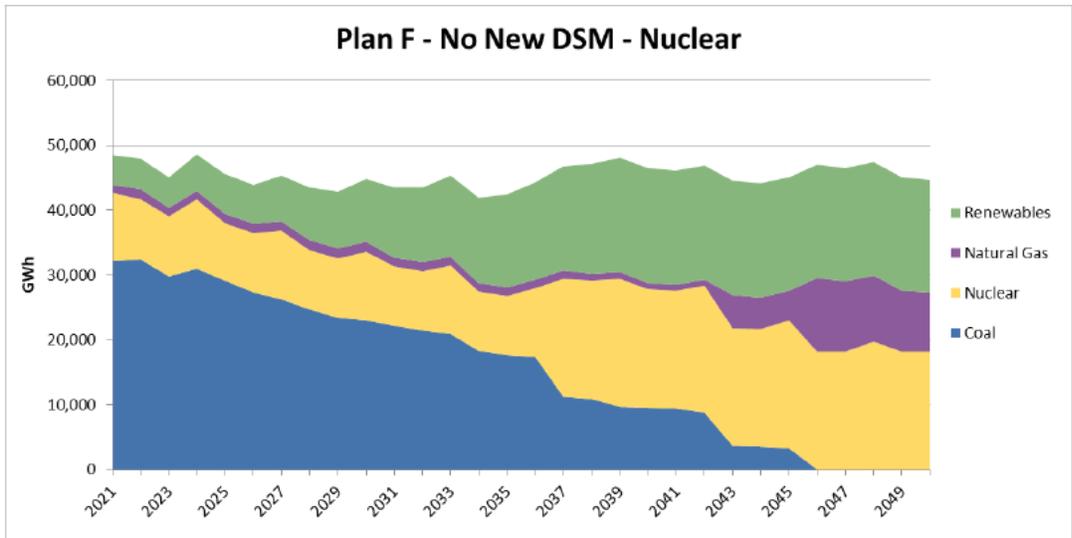
<sup>22</sup> 20 CSR 4240-22.060(4)(B)5

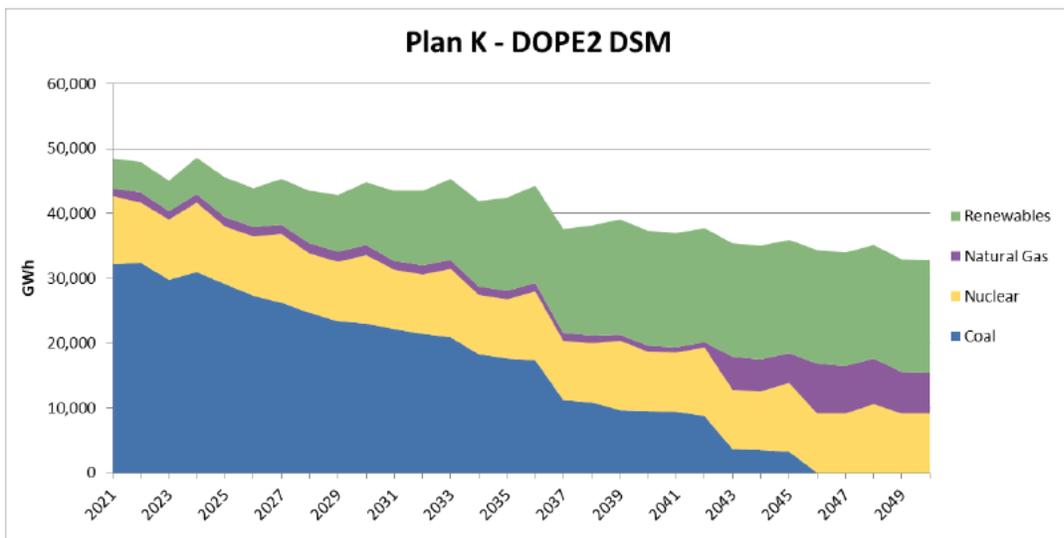
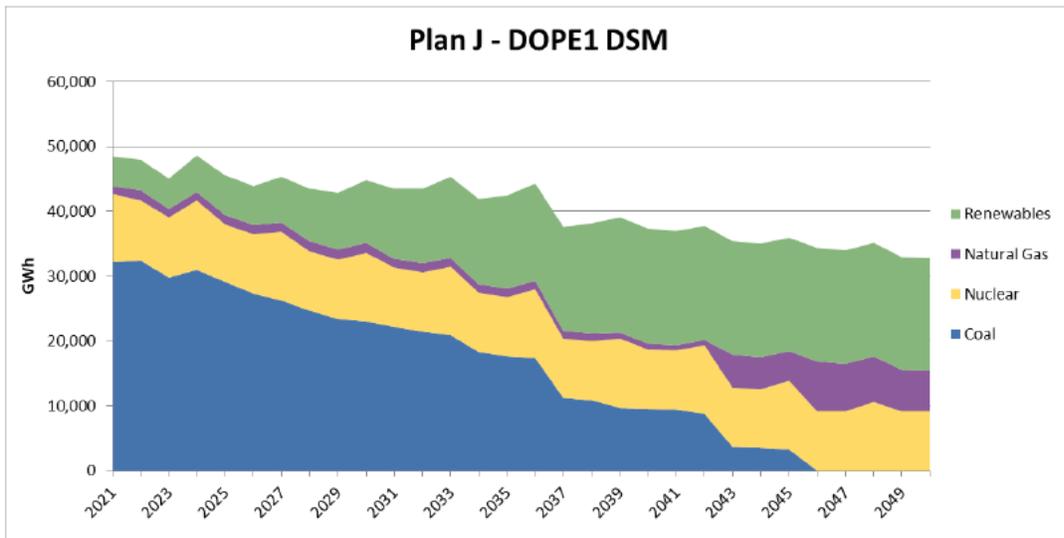
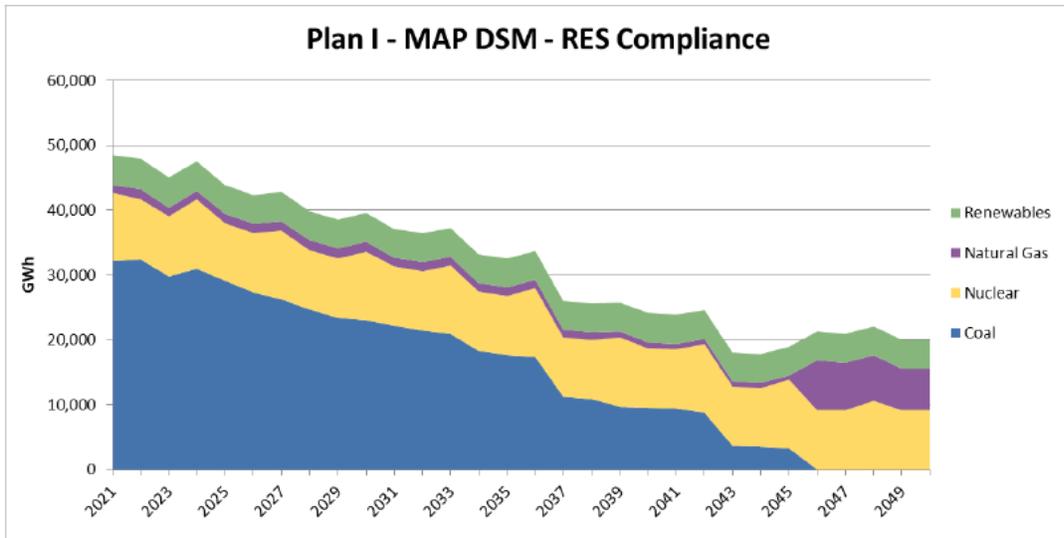
Figure 9A.13 Composition of Energy by Supply-Side Resource<sup>23</sup>

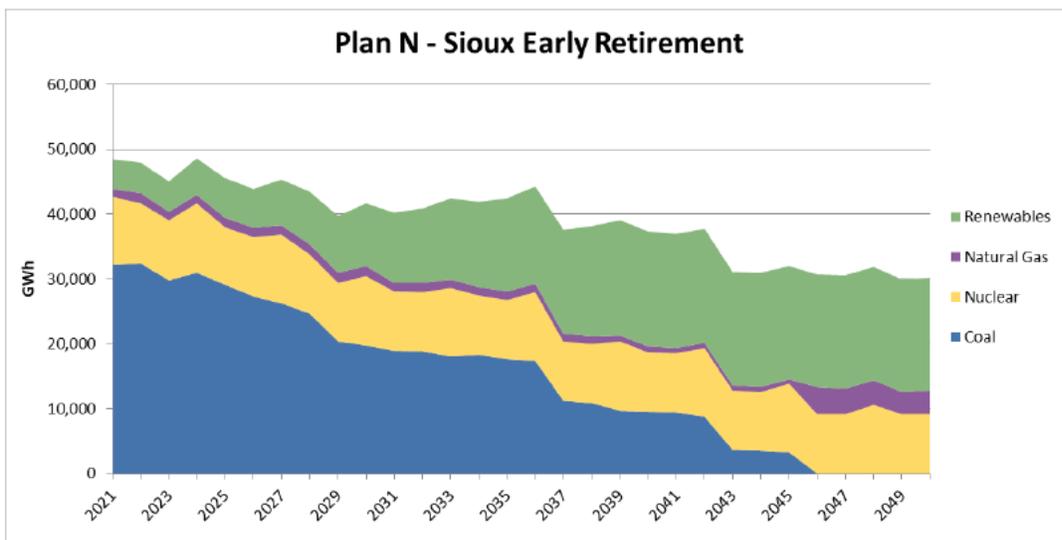
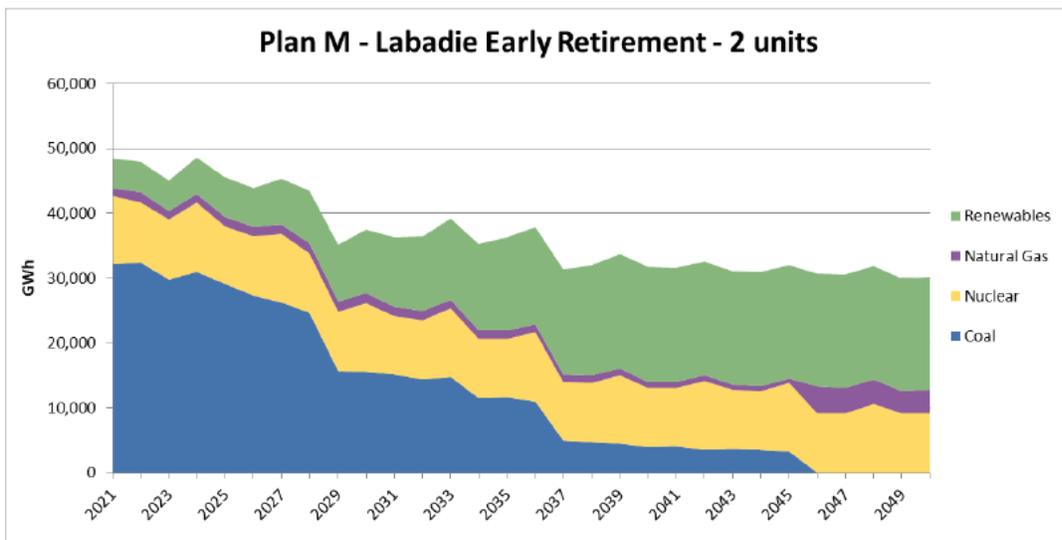
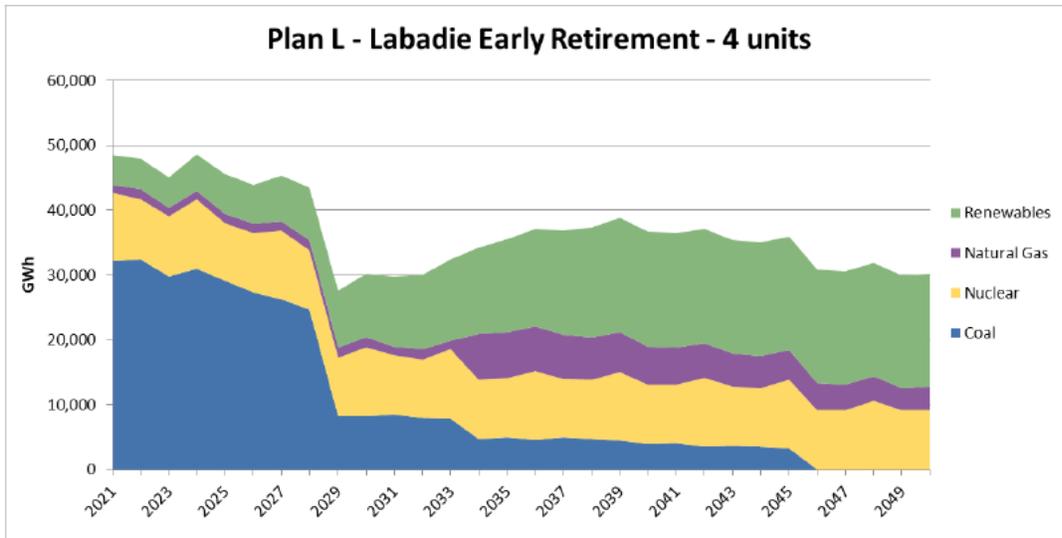


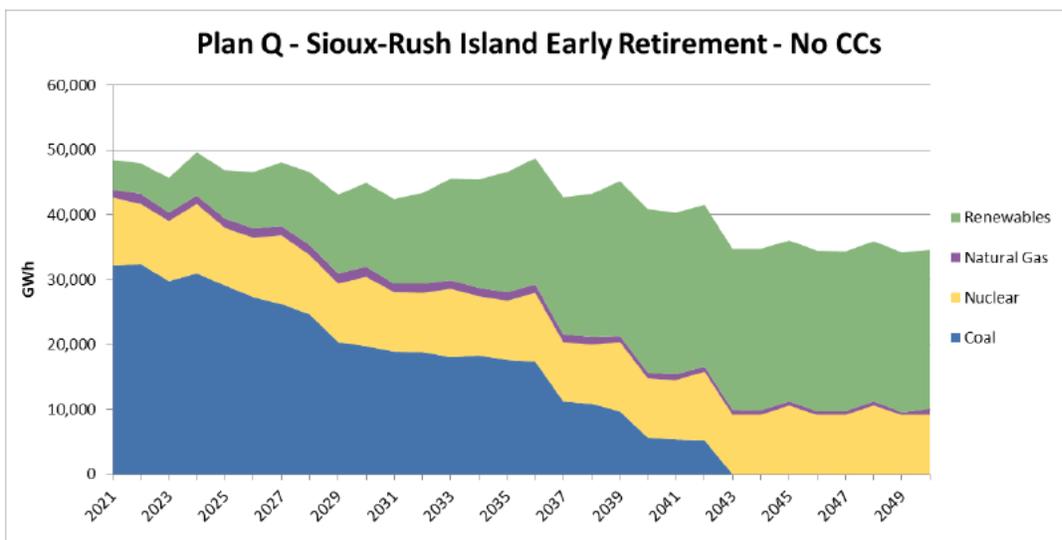
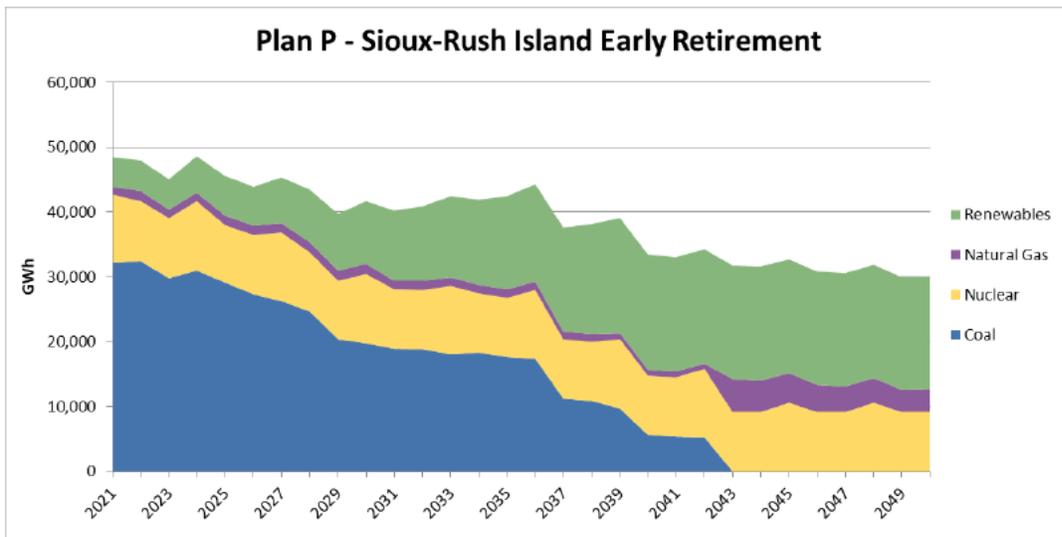
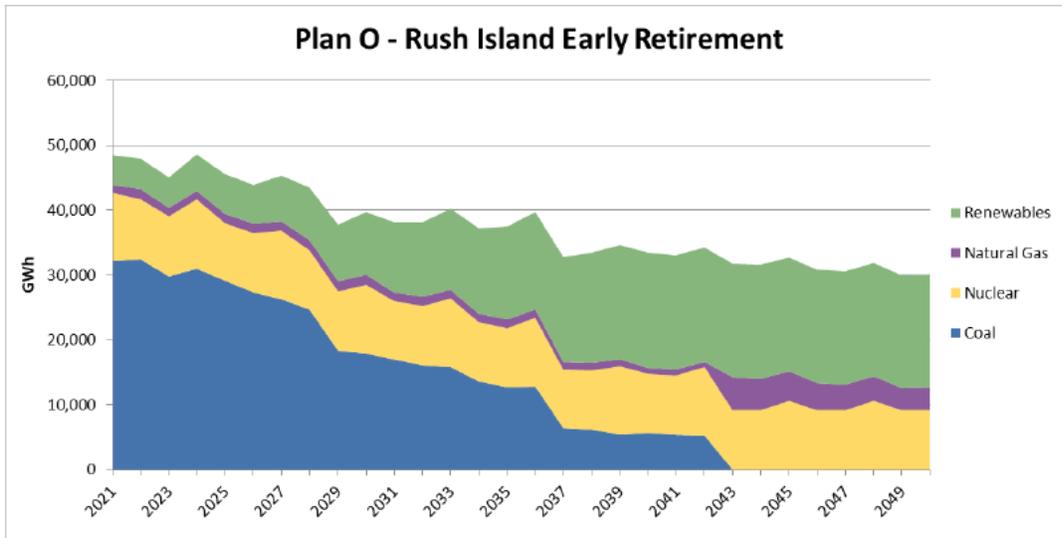
<sup>23</sup> 20 CSR 4240-22.060(4)(B)6; Energy from storage resources not shown since pump/charge energy is higher than produced energy.





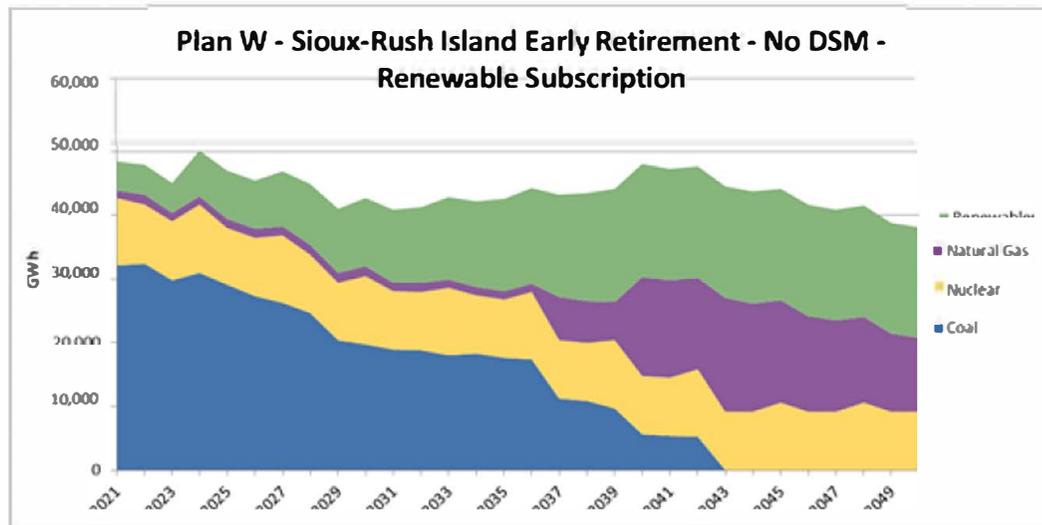
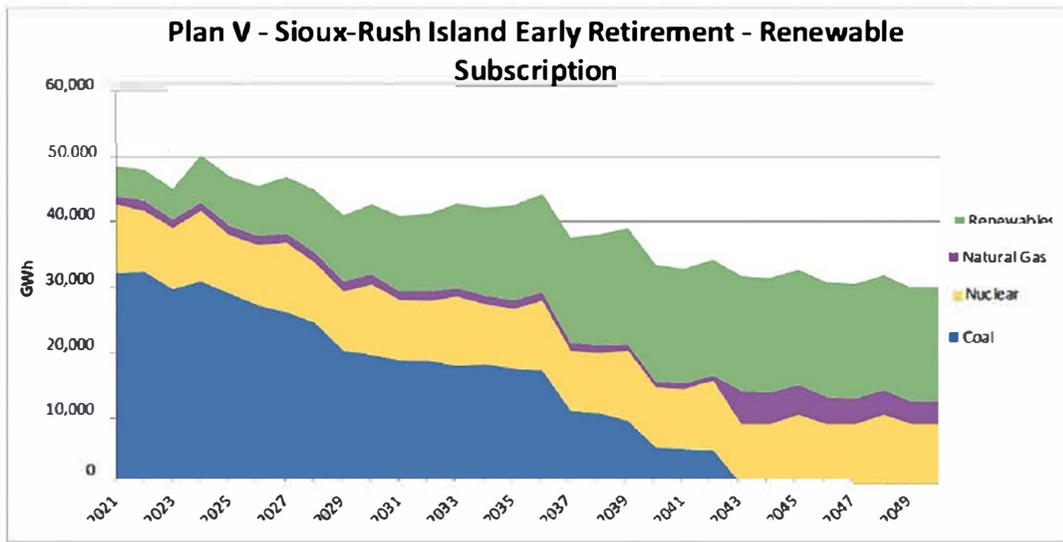


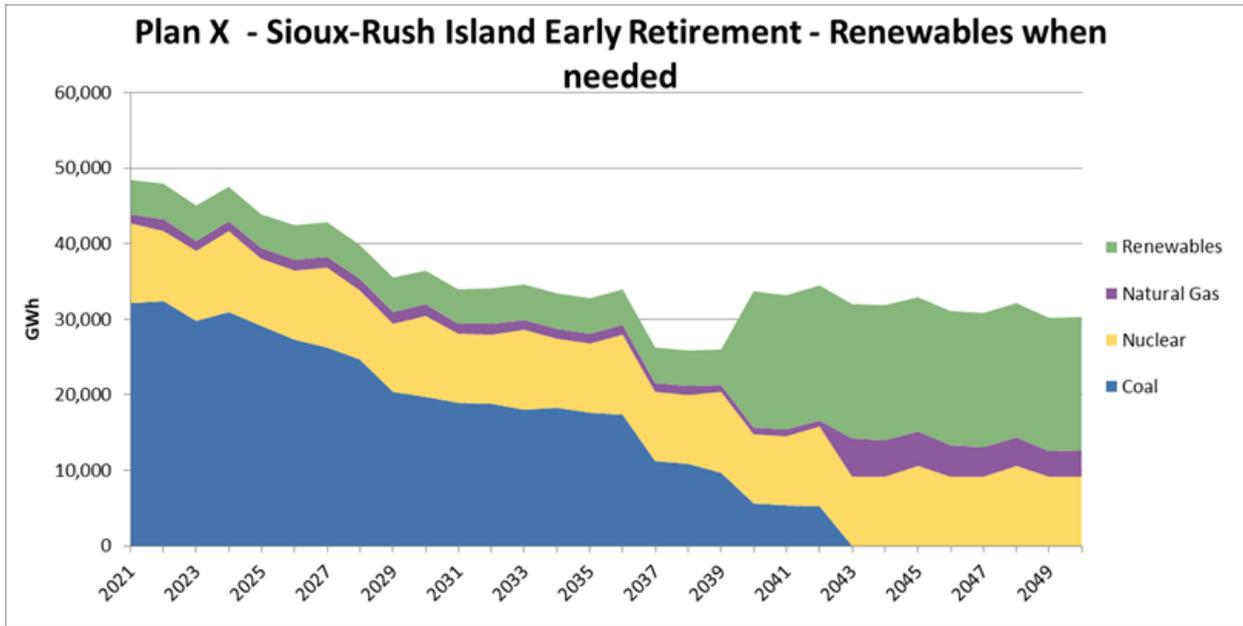


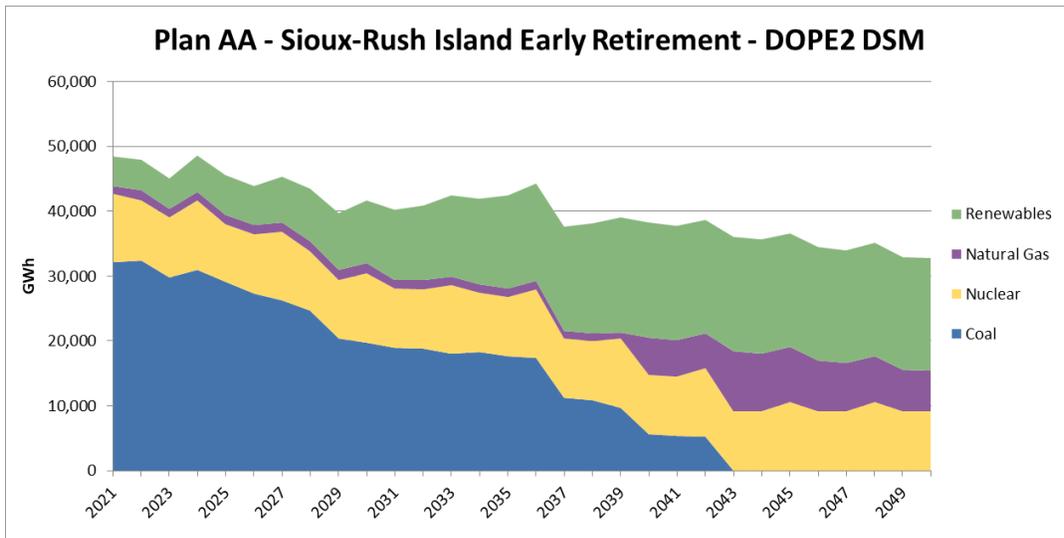
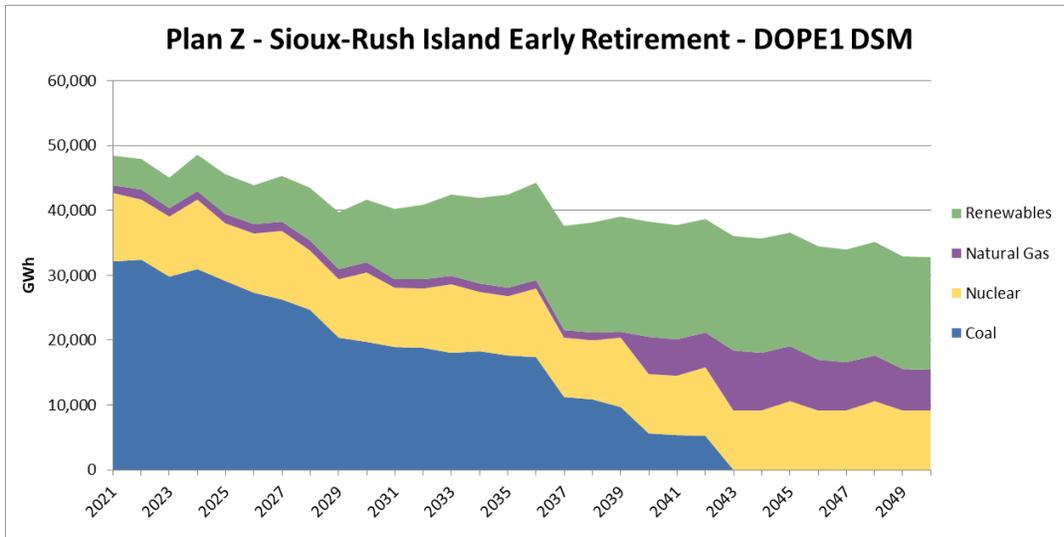
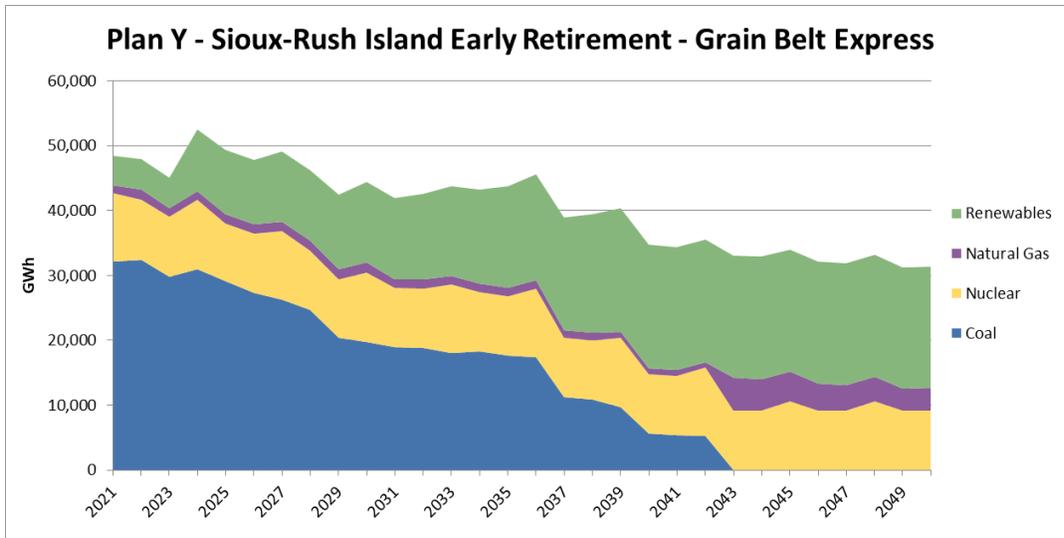


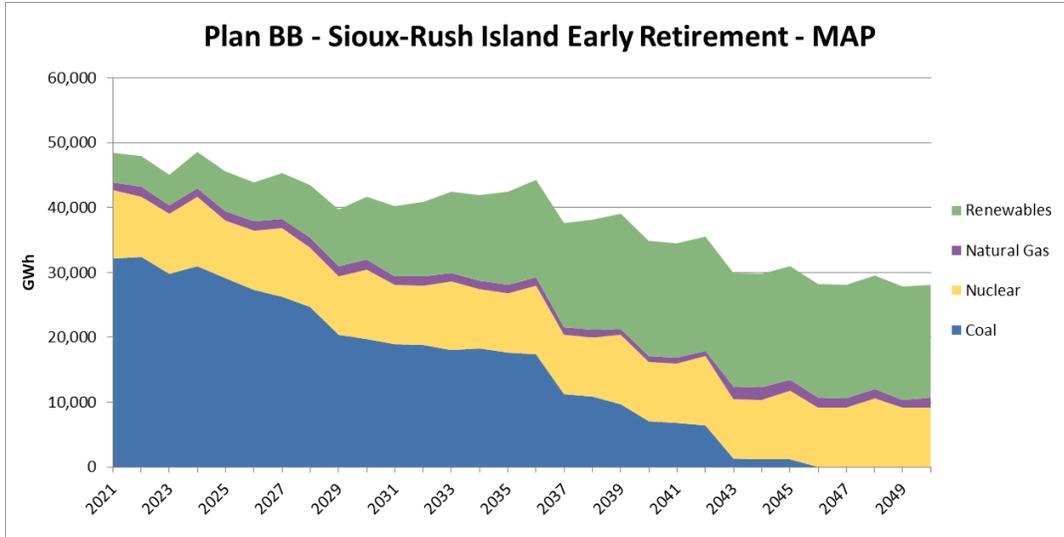
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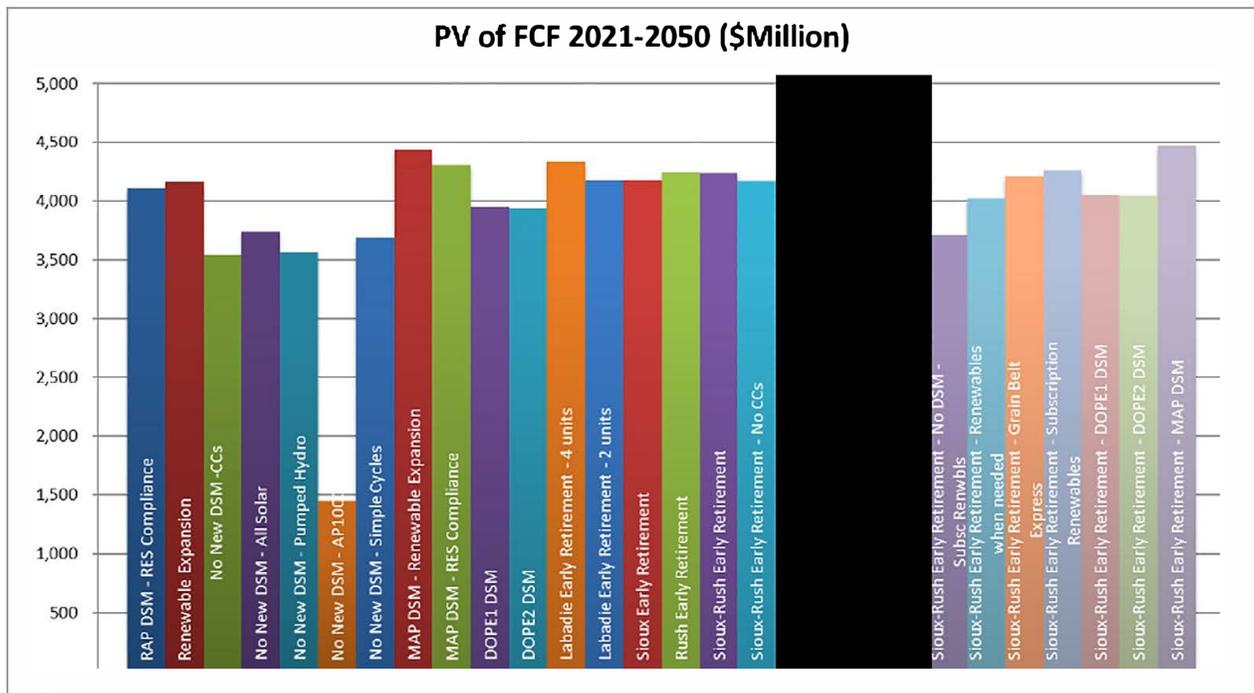


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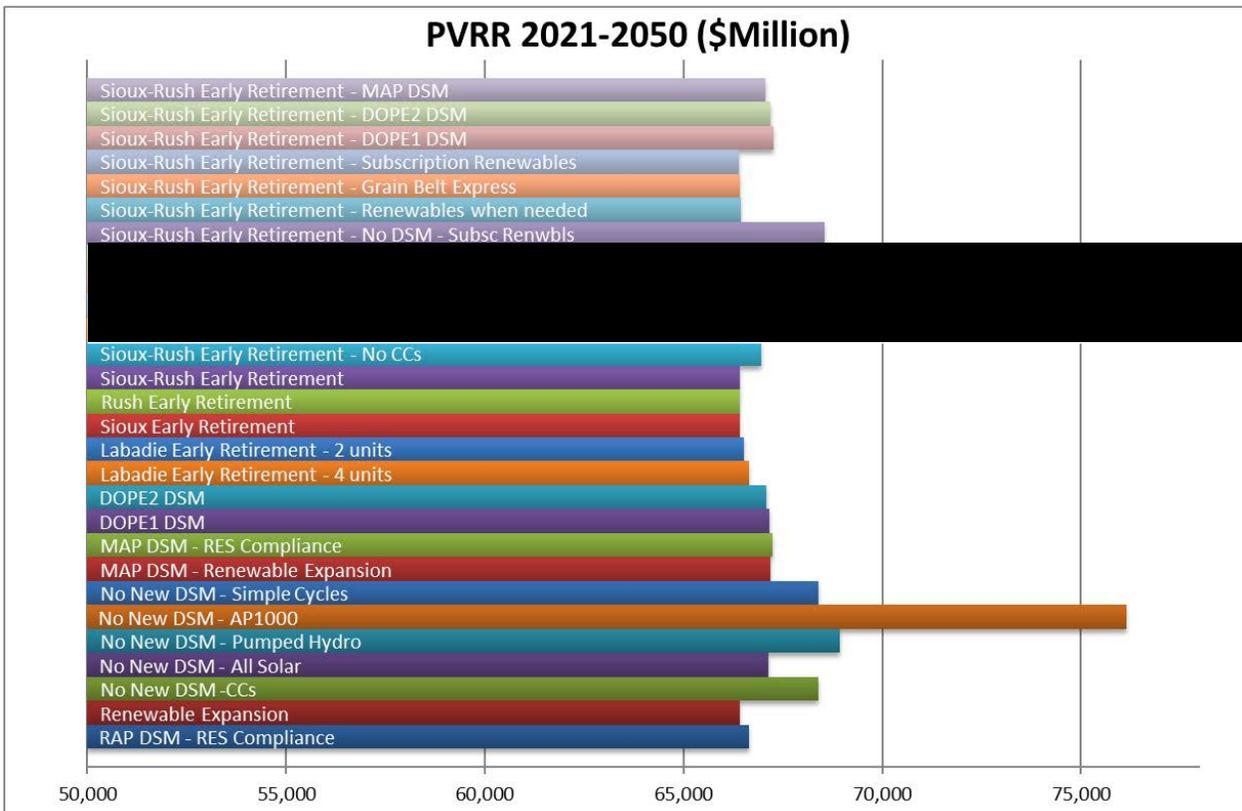
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<sup>25</sup> 20 CSR 4240-22.060(2)(A)4; 20 CSR 4240-22.060(2)(A)5

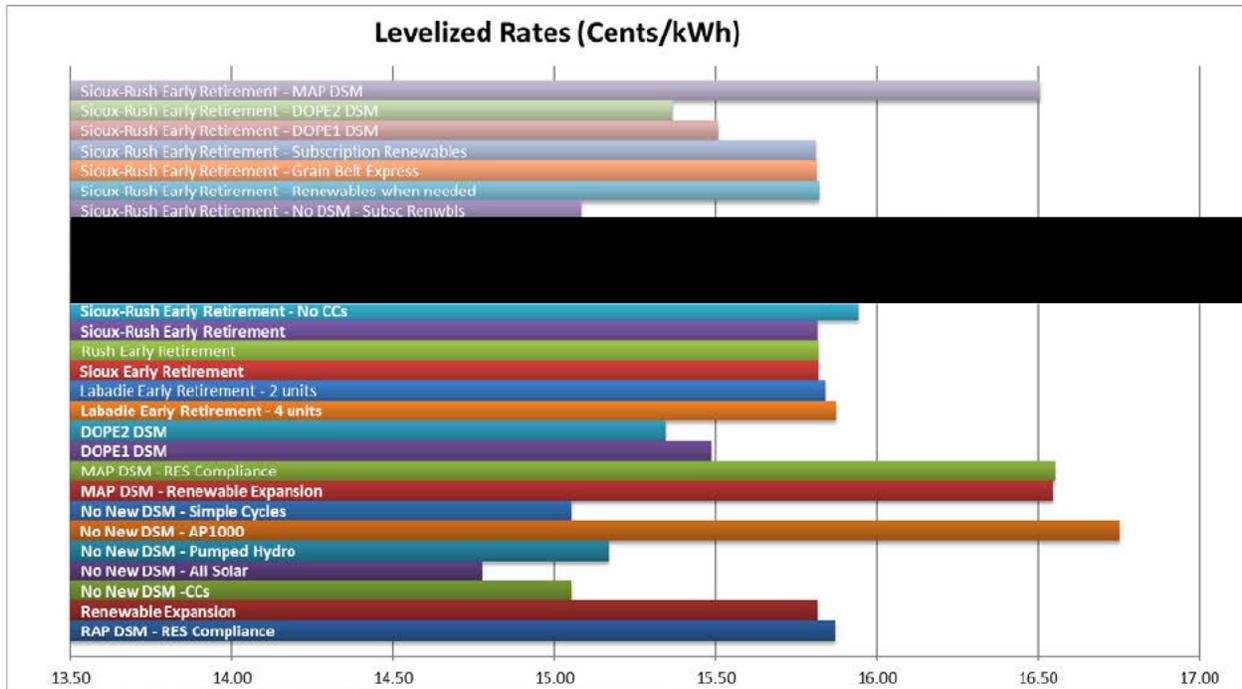
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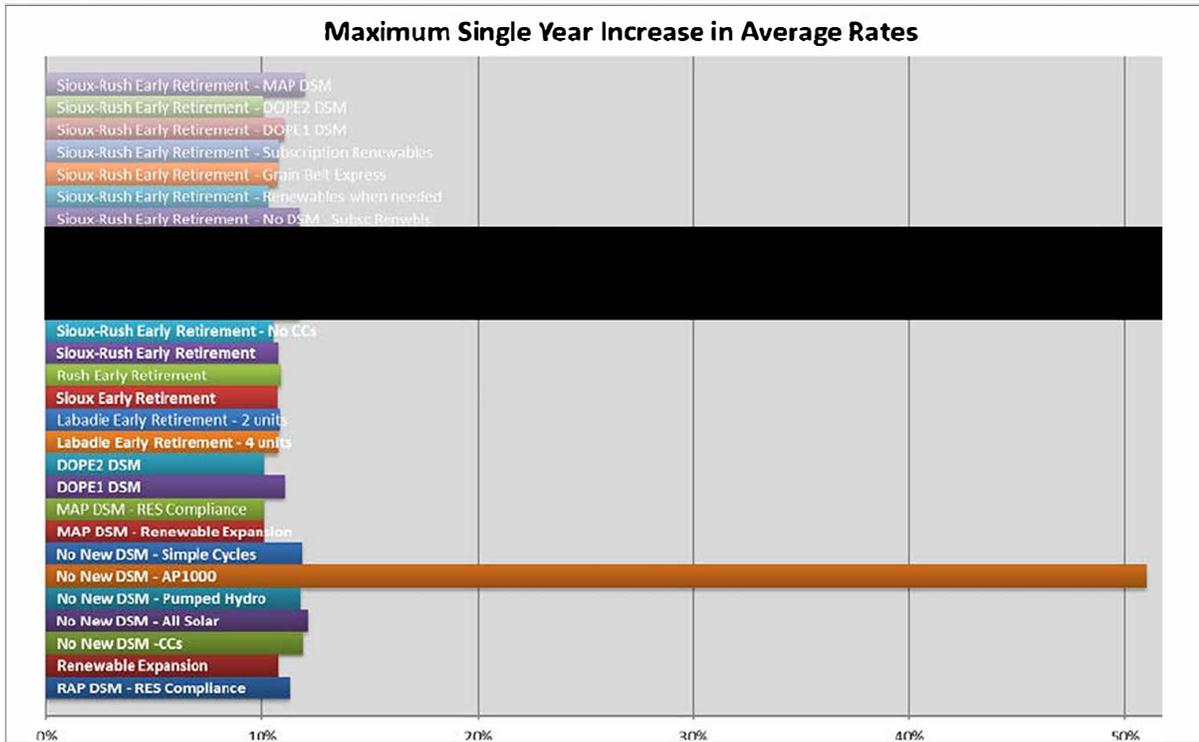


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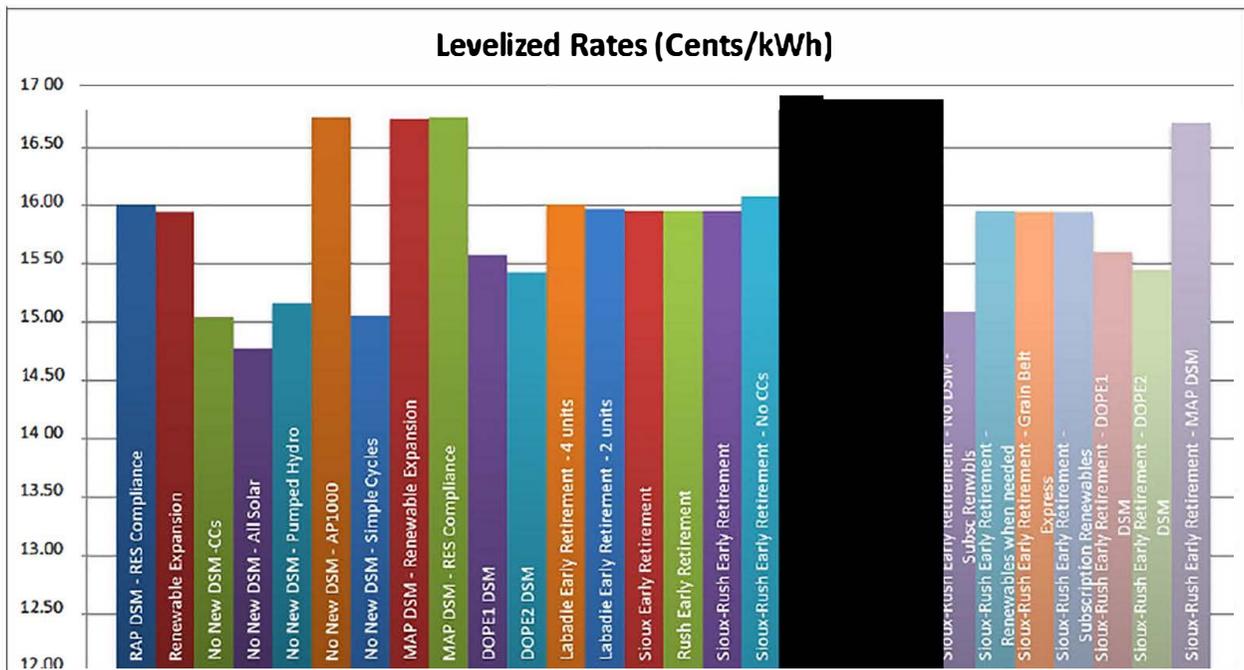


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<sup>26</sup> 20 CSR 4240-22.060(4)(C)  
<sup>27</sup> 20 CSR 4240-22.060(4)(C)1A

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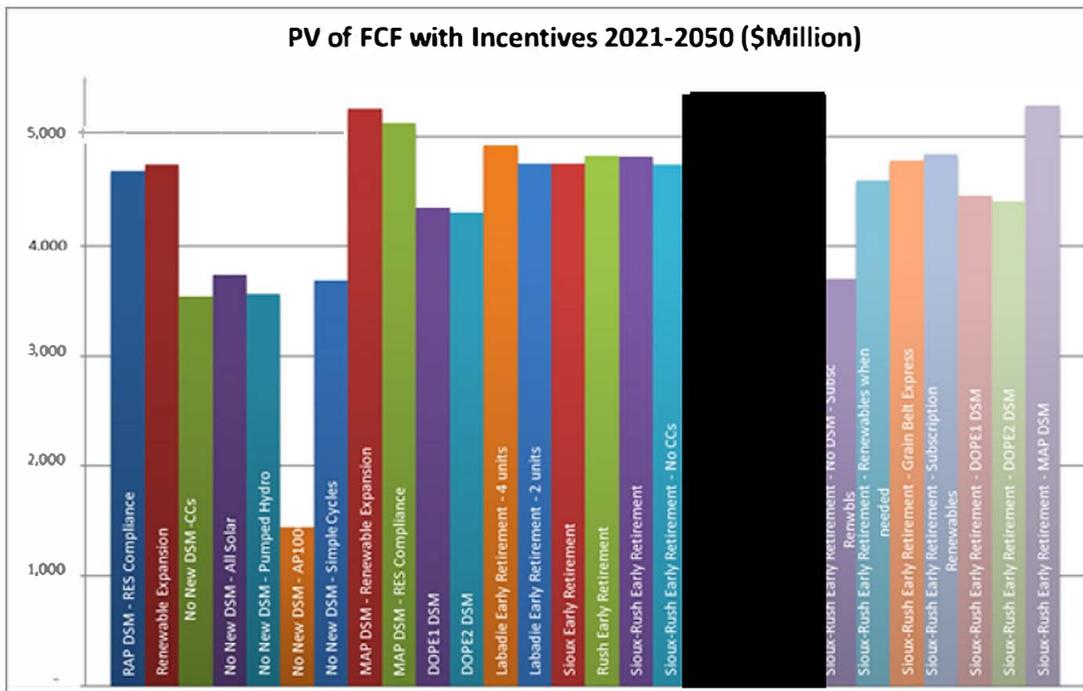
<sup>28</sup> 20 CSR 4240-22.060(4)(C)1B; 20 CSR 4240-22.060(4)(C)1C

Tabulation for annual % increases in rates with and without financial incentives is provided in the workpapers.

Free Cash Flows

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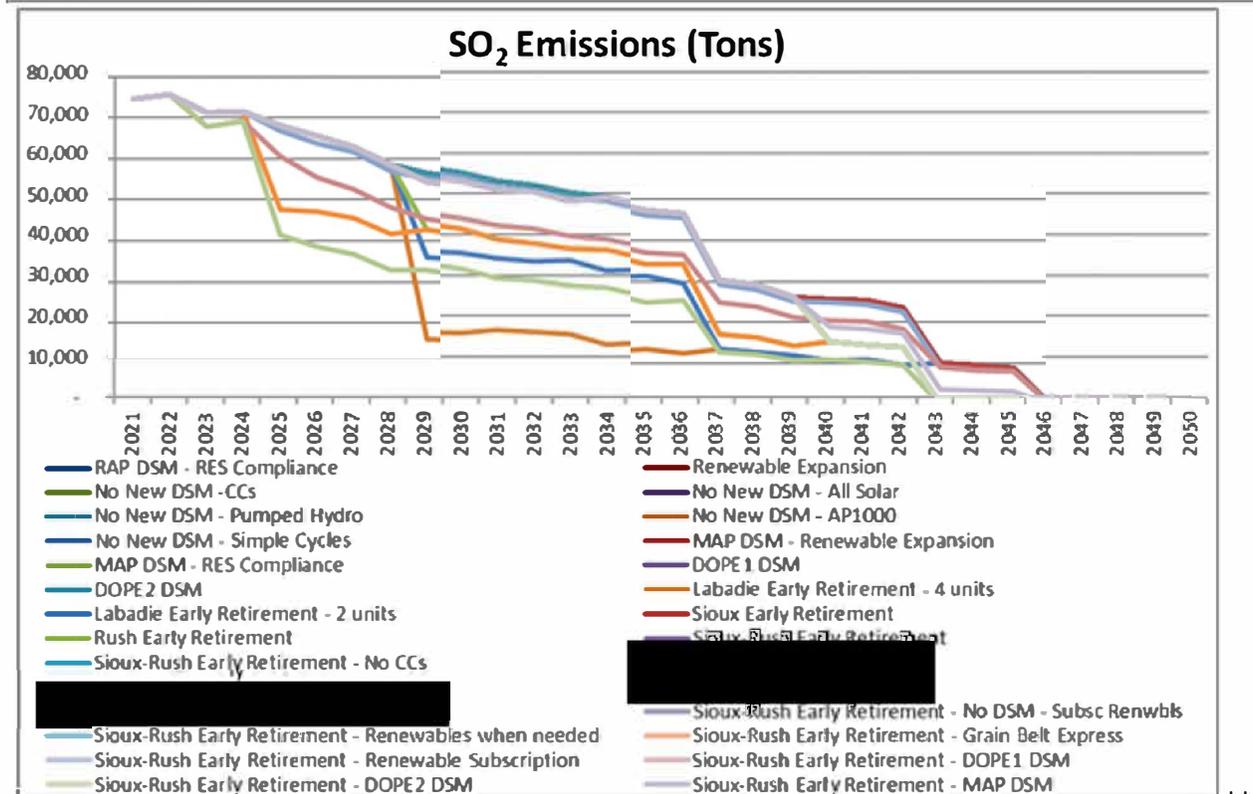
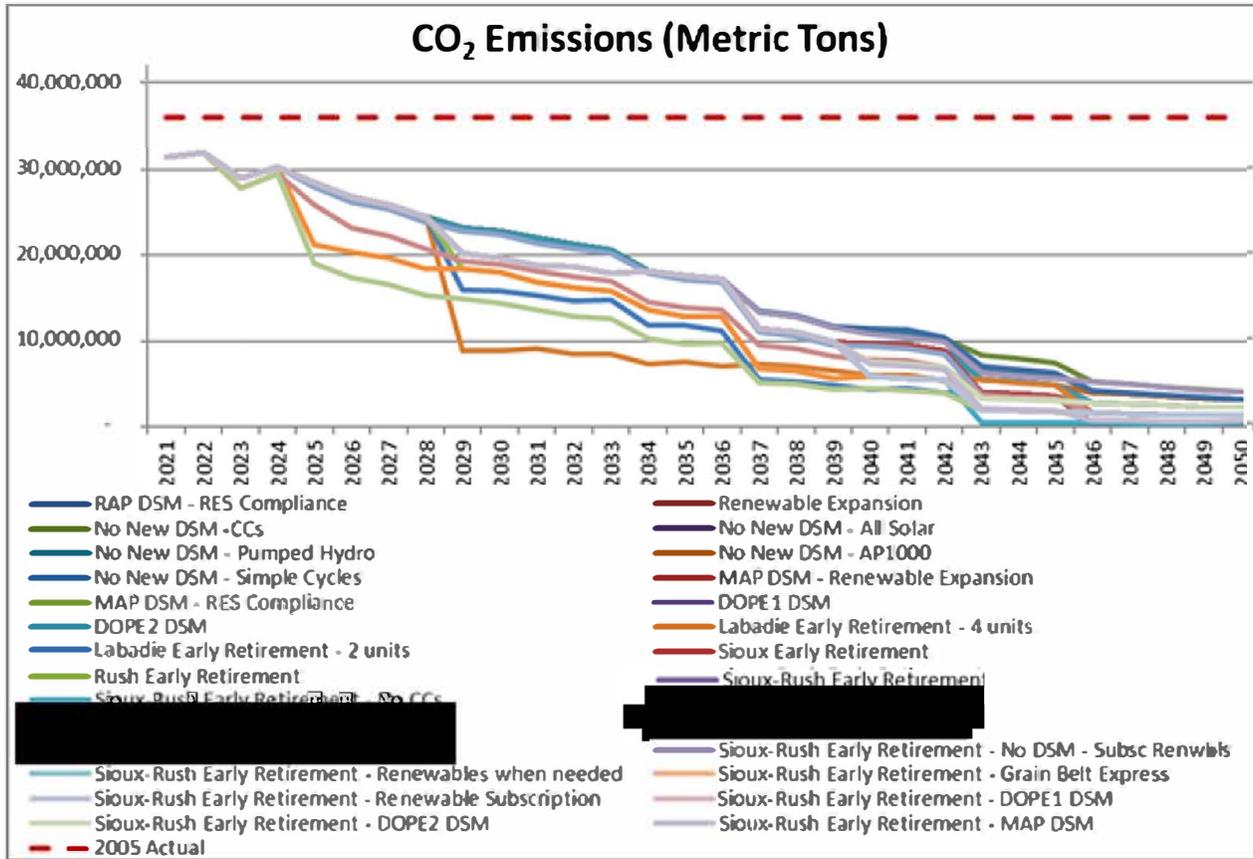
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Figure 9A.17 Annual Emissions

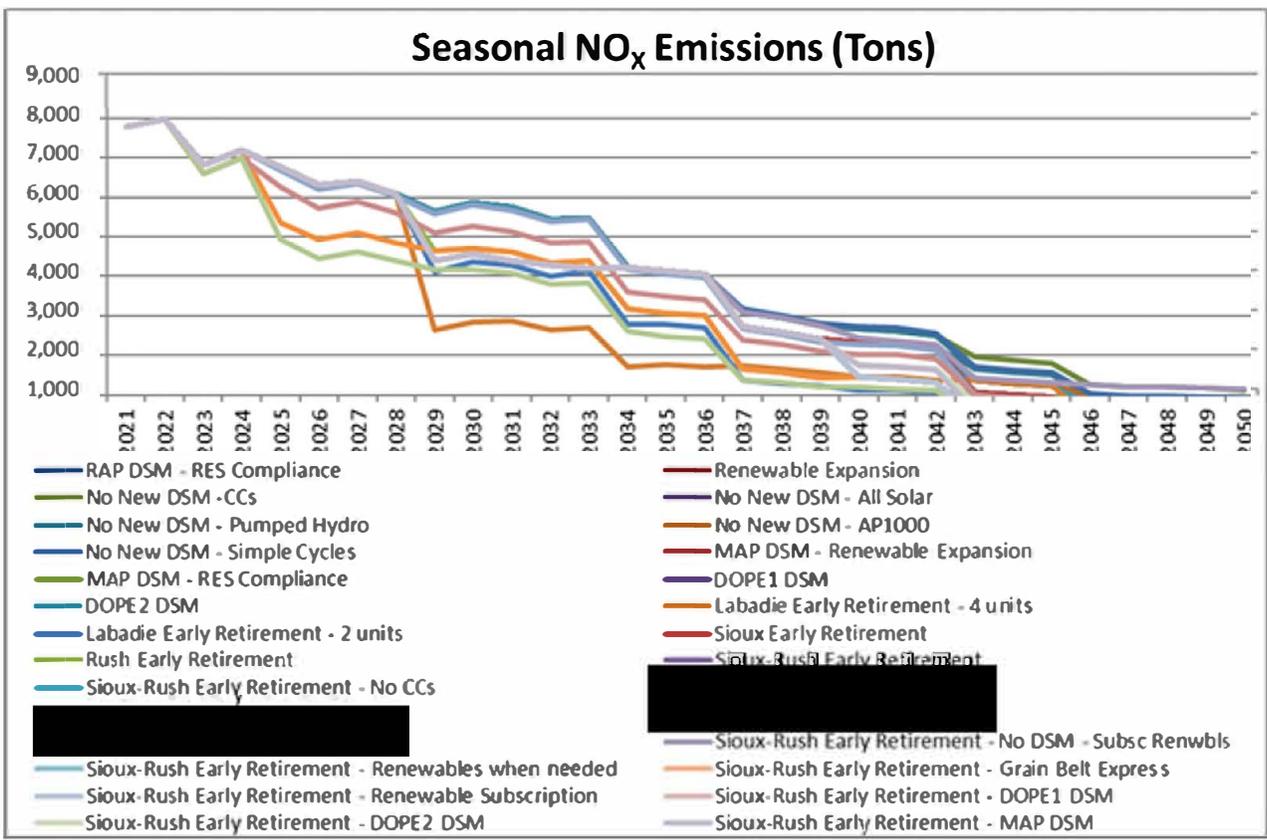
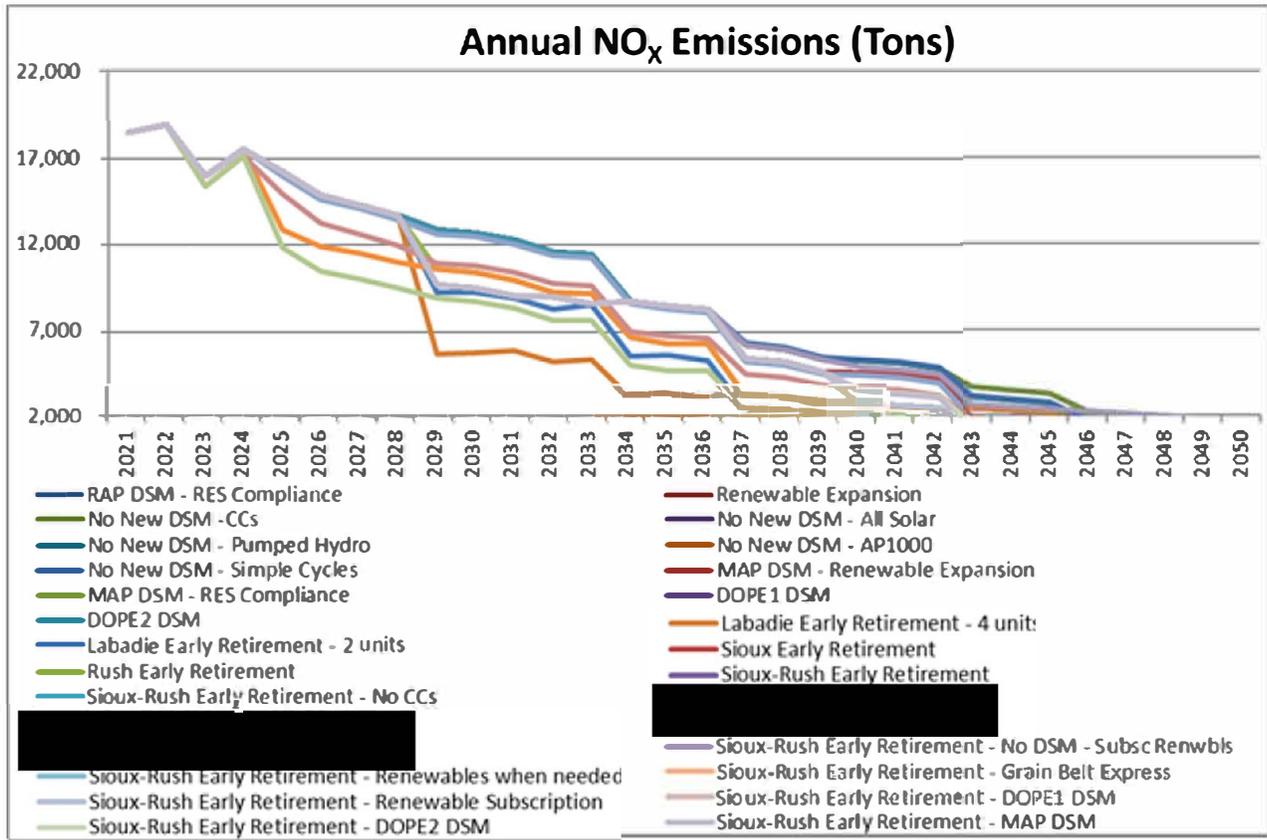
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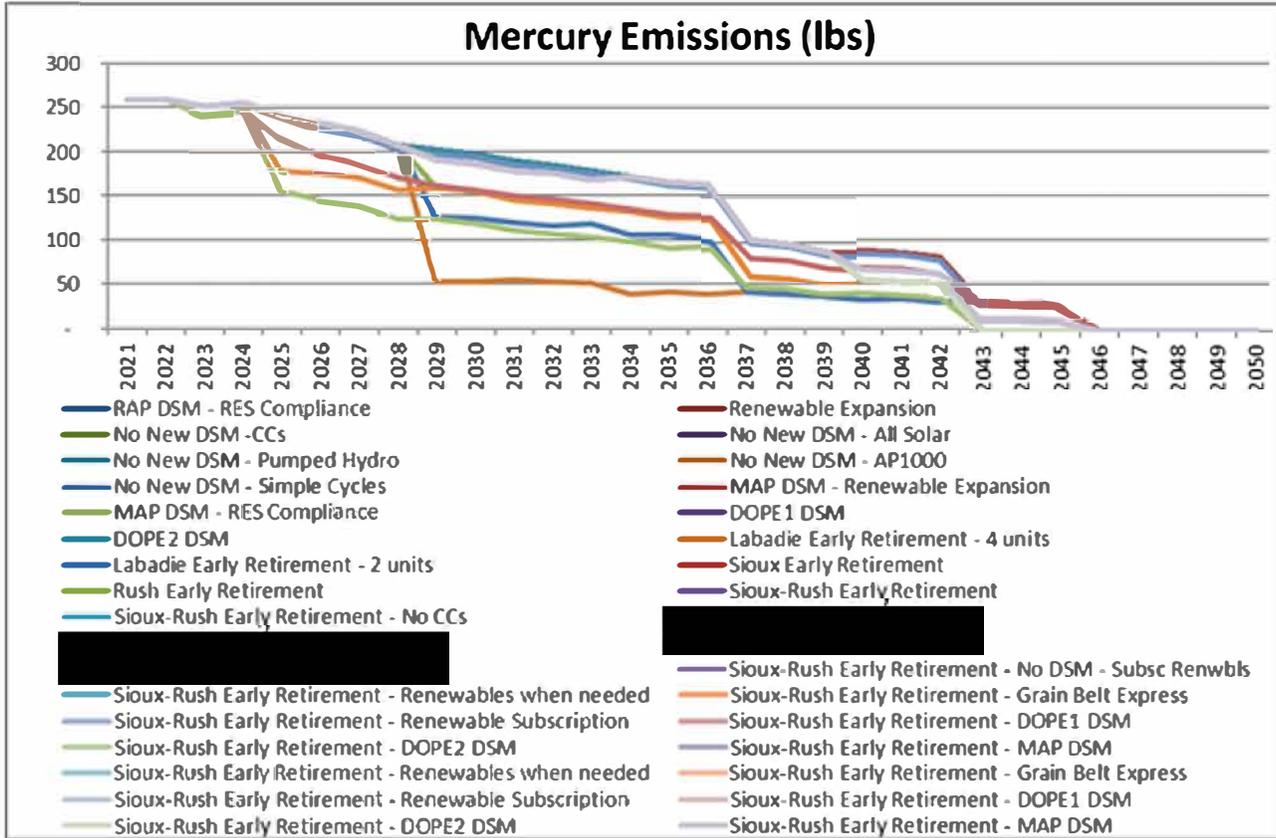
<sup>29</sup> 20 CSR 4240-22.060(4)(B)7

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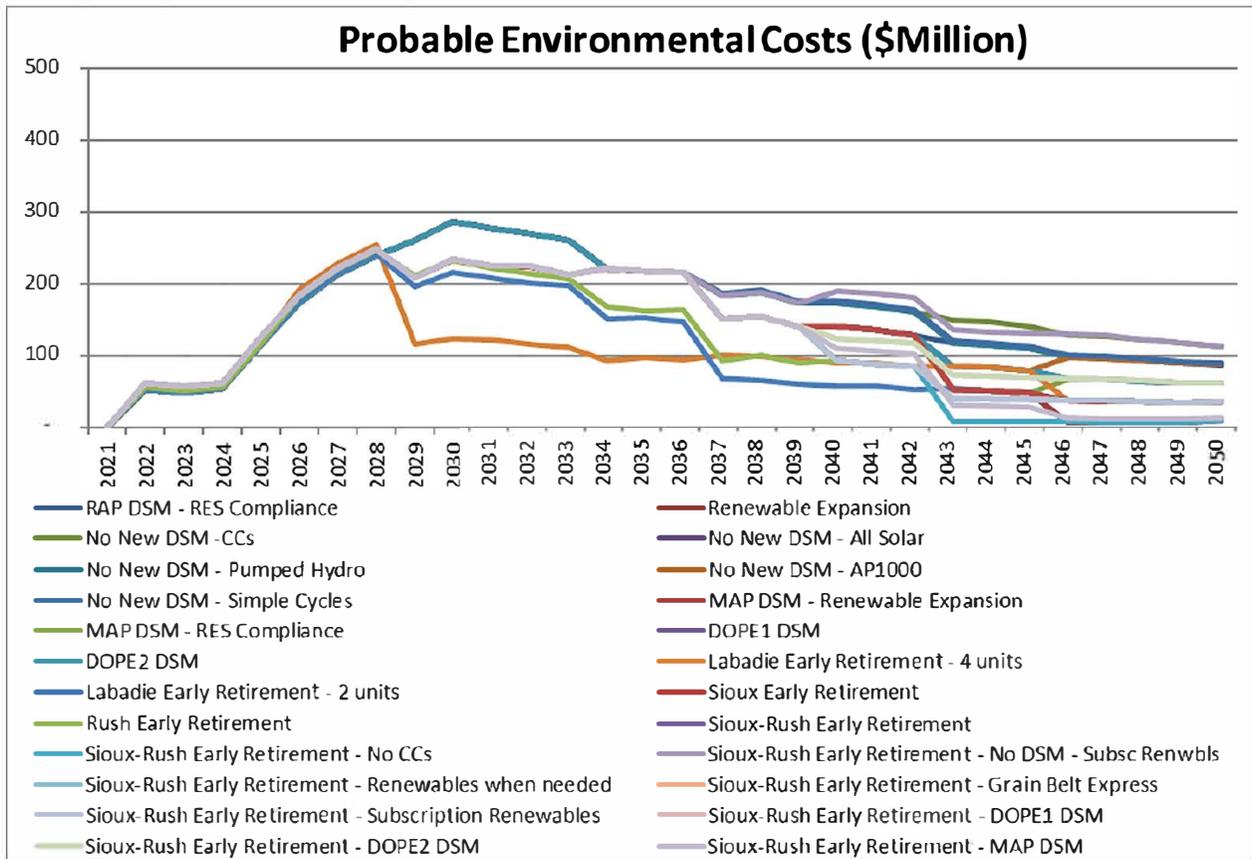
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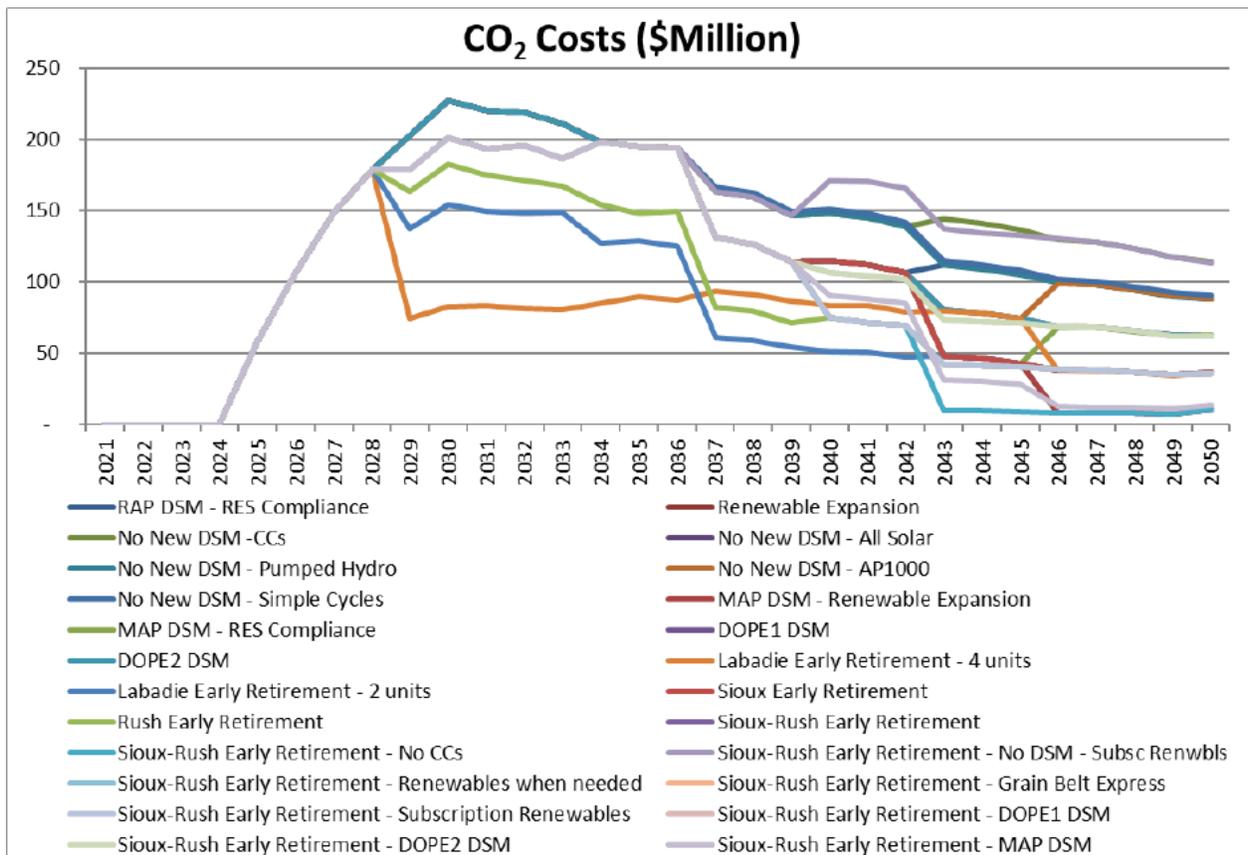
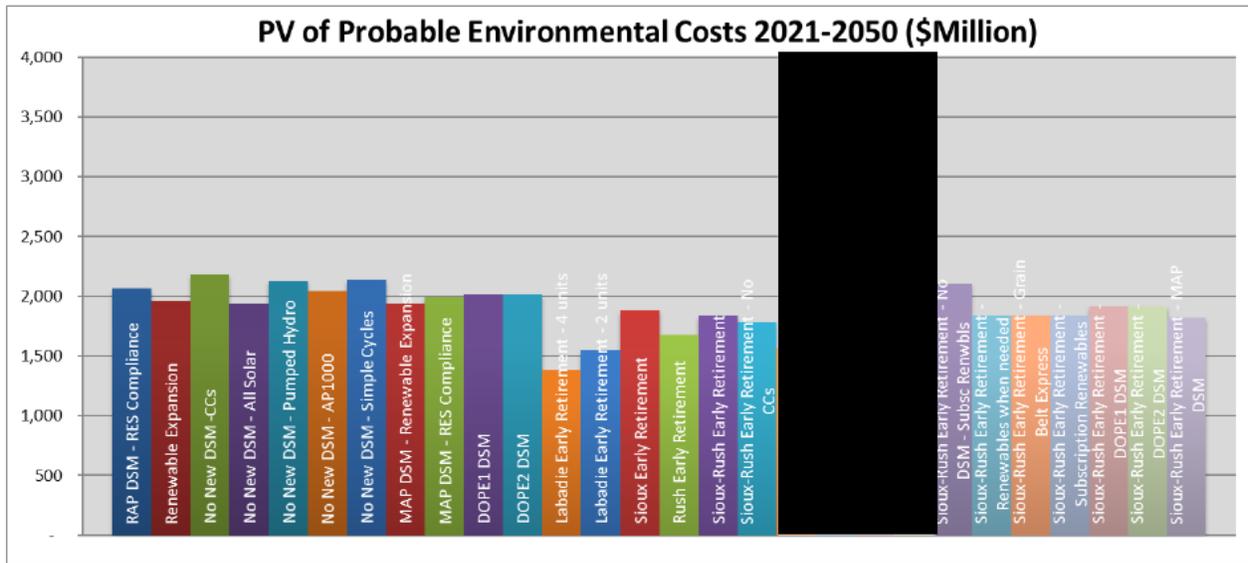
Figure 9A.18 Probable Environmental Costs<sup>30</sup>



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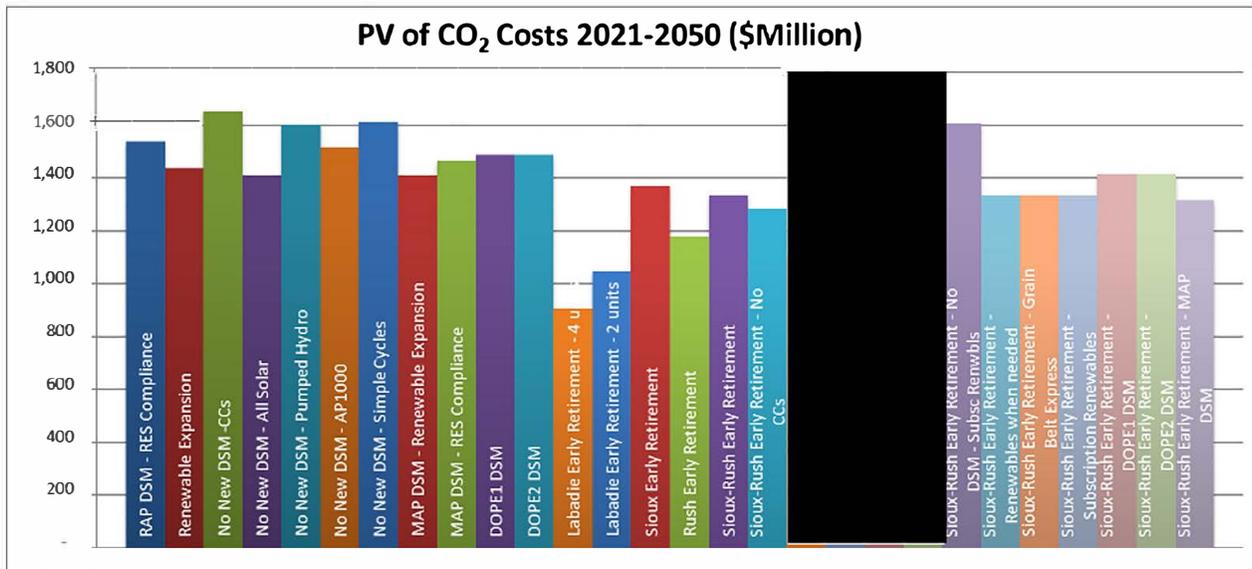
<sup>30</sup> 20 CSR 4240-22.060(2)(A)2; 20 CSR 4240-22.060(4)(B)8

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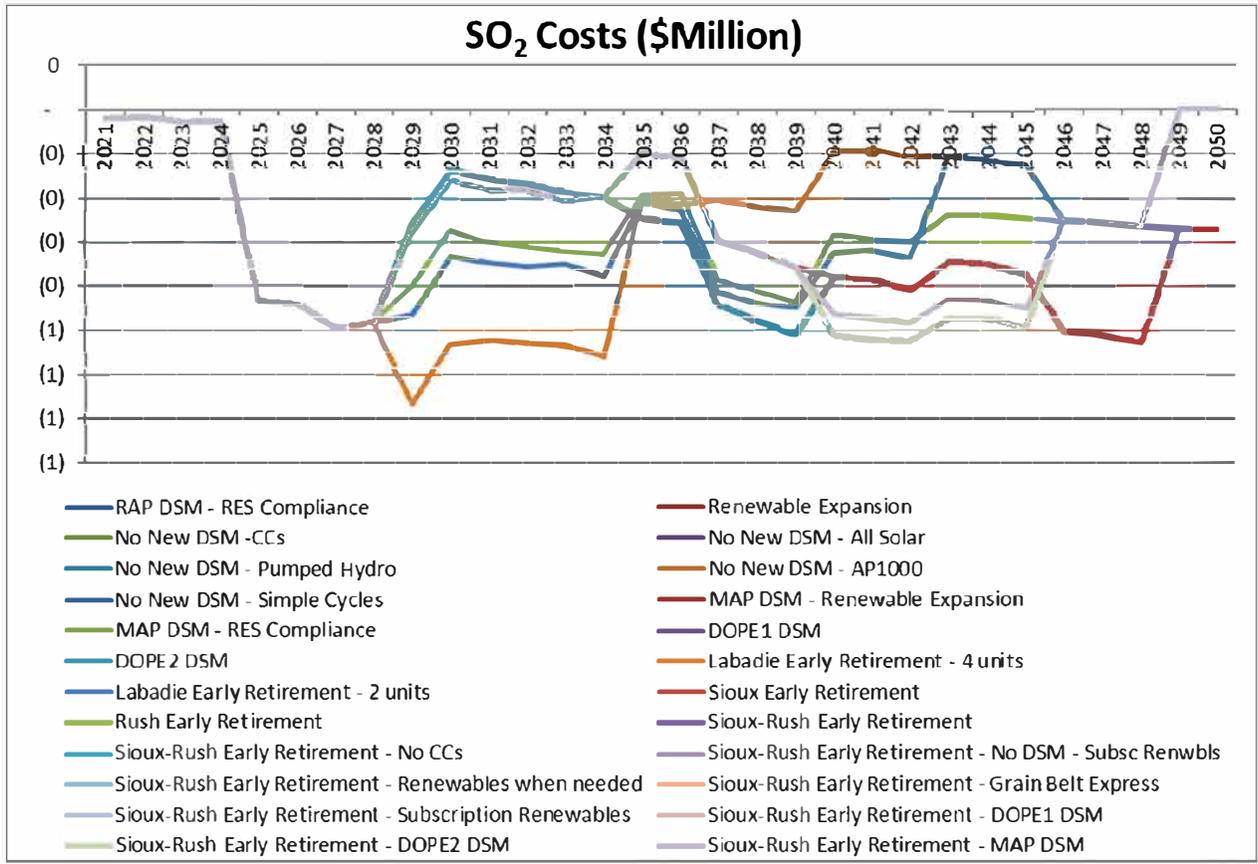


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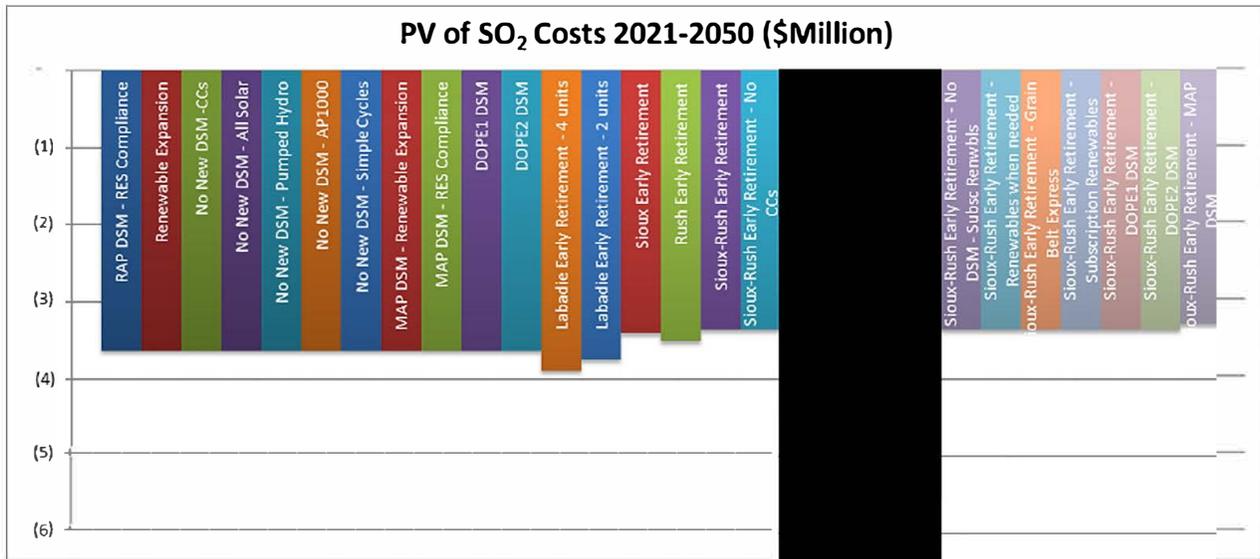


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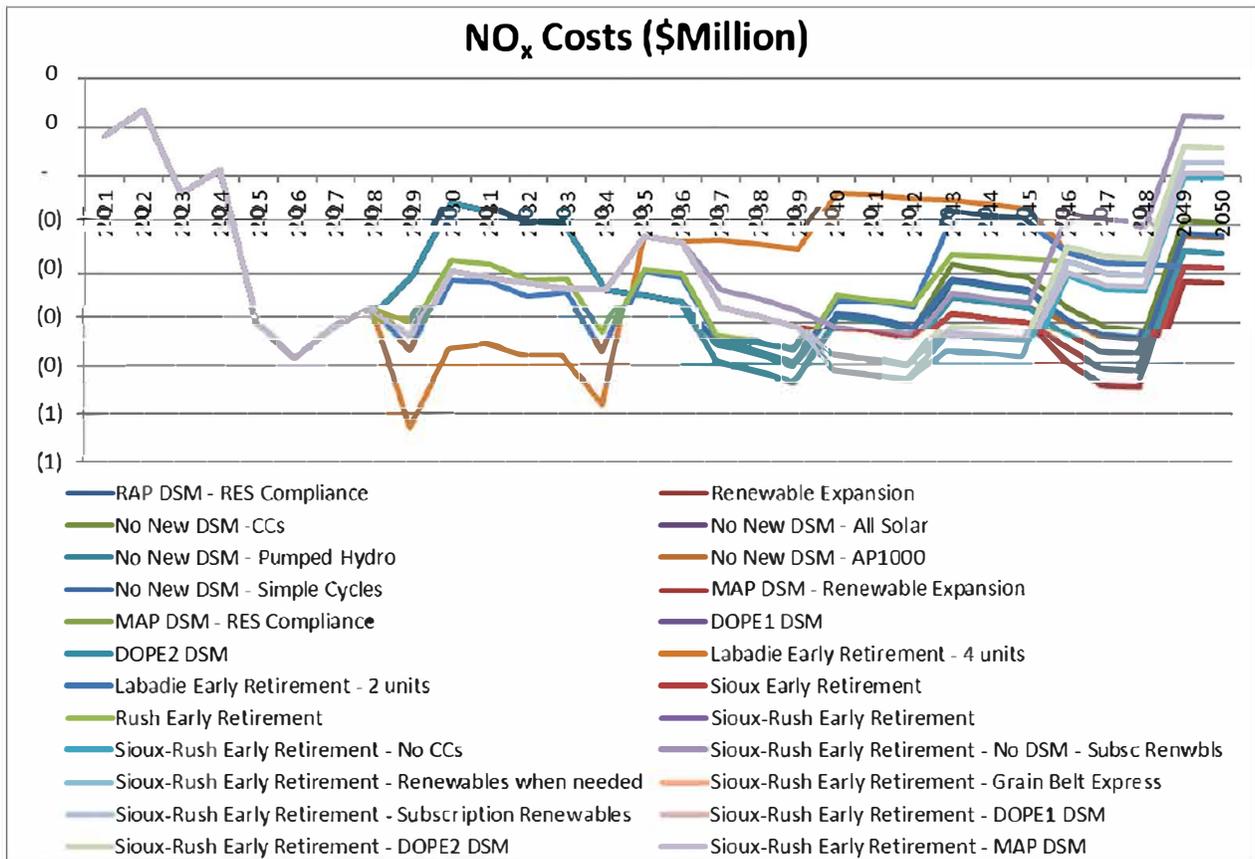
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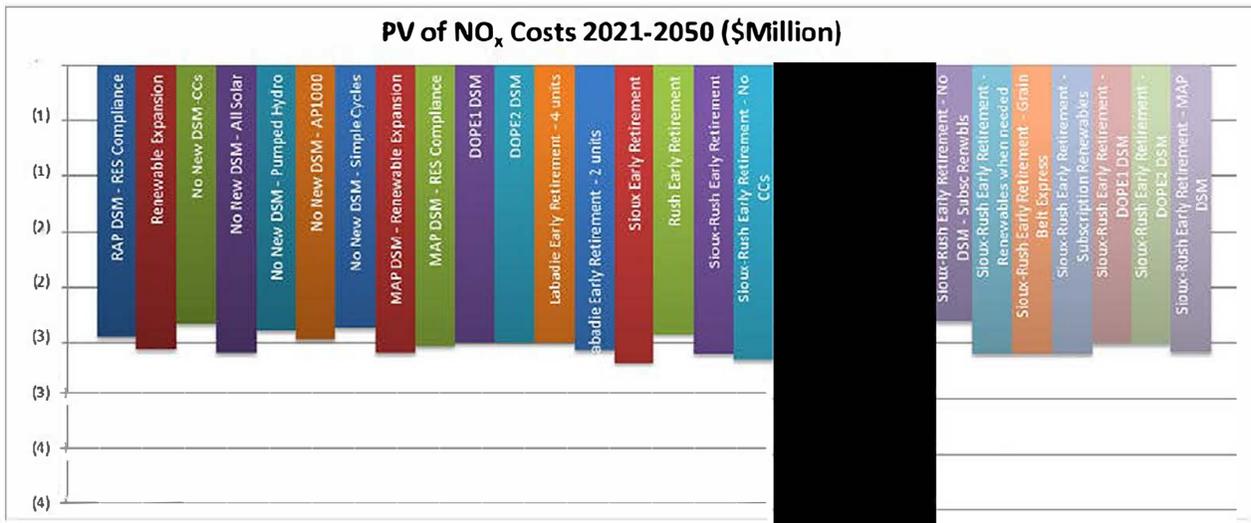


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### Expected Values, Rankings and Cumulative Probability Distributions for Selected Performance Measures<sup>31</sup>

Ameren Missouri first examined the ranks of the alternative resource plans using the probability-weighted averages or the expected values for the selected performance measures. The electronic workpapers also provide data for the alternative resource plans and the performance of each plan by each selected performance measure: PVRR, PVRR with utility financial incentives, PVRR with PV of out-of-pocket costs to participants in DSM programs, PV of probable environmental costs, emissions, levelized annual average rates, annual and maximum single-year increase in average rates, pre-tax interest coverage, FFO/interest coverage, FFO/debt, debt/capitalization, ROE, PV of FCF, EPS and FTE jobs.<sup>32</sup>

The expected value data for the measures and their ranks on each measure are shown in Table 9A.7 and Table 9A.8, respectively.

Since Ameren Missouri is a market participant in MISO, the modeling used in integration analysis assumes electric energy can be bought and sold within MISO market. Any energy unable to be served with Ameren Missouri resources is served with other MISO market resources; therefore, the unserved hours will always be zero.<sup>33</sup>

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<sup>31</sup> 20 CSR 4240-22.060(7)

<sup>32</sup> 20 CSR 4240-22.060(2)

<sup>33</sup> 20 CSR 4240-22.060(7)(C)4

Table 9A.7 Expected Values for Selected Performance Measures<sup>34</sup> \*\*\*HC\*\*\*

Plan	EXPECTED VALUE														
	PVRR \$MM	PVRR w/ Incentives \$MM	Levelized Rates Cents/kWh	Max Single Yr Rate Increase	PV of Participant Cost \$MM	PV of Probable Environmental Cost \$MM	Avg CO2 Emissions (MM Tons)	PreTax Interest Coverage	FFO-Interest Coverage	FFO/Debt	Debt/Capitalization	ROE	FCF \$MM	EPS	Jobs
A-RAP DSM - RES Compliance	66,647	67,222	15.87	11%	673	2,067	16	4.18	7.10	25%	46%	10%	4,109	3.52	23,091
B-Renewable Expansion	66,410	66,984	15.82	11%	673	1,964	16	4.16	7.22	25%	45%	10%	4,166	3.79	36,750
C-No New DSM -CCs	68,395	68,395	15.05	12%	0	2,180	17	4.18	7.16	25%	45%	10%	3,546	4.10	28,174
D-No New DSM - All Solar	67,143	67,143	14.78	12%	0	1,936	15	4.15	7.30	25%	45%	10%	3,740	4.15	28,173
E-No New DSM - Pumped Hydro	68,922	68,922	15.17	12%	0	2,129	17	4.18	7.14	25%	45%	10%	3,565	4.18	30,494
F-No New DSM - AP1000	76,139	76,139	16.76	51%	0	2,043	16	4.25	6.96	24%	45%	11%	1,446	6.09	45,879
G-No New DSM - Simple Cycles	68,402	68,402	15.05	12%	0	2,140	17	4.18	7.18	25%	45%	10%	3,688	4.07	32,201
H-MAP DSM - Renewable Expansion	67,197	68,010	16.54	10%	32	1,936	15	4.16	7.23	25%	45%	10%	4,437	3.71	53,155
I-MAP DSM - RES Compliance	67,238	68,051	16.55	10%	32	1,992	16	4.17	7.11	25%	46%	10%	4,306	3.39	38,562
J-DOPE1 DSM	67,167	67,574	15.49	11%	324	2,015	16	4.17	7.20	25%	45%	10%	3,946	3.88	36,083
K-DOPE2 DSM	67,094	67,459	15.35	10%	293	2,015	16	4.17	7.20	25%	45%	10%	3,938	3.89	34,654
L-Labadie Early Retirement - 4 units	66,657	67,231	15.87	11%	673	1,383	12	4.15	7.26	25%	45%	10%	4,340	3.77	35,369
M-Labadie Early Retirement - 2 units	66,507	67,081	15.84	11%	673	1,552	13	4.15	7.23	25%	45%	10%	4,177	3.75	35,131
N-Sioux Early Retirement	66,425	66,999	15.82	11%	673	1,880	15	4.16	7.23	25%	45%	10%	4,178	3.78	35,995
O-Rush Early Retirement	66,425	67,000	15.82	11%	673	1,675	13	4.15	7.24	25%	45%	10%	4,246	3.76	34,630
P-Sioux-Rush Early Retirement	66,412	66,986	15.82	11%	673	1,836	15	4.16	7.24	25%	45%	10%	4,237	3.78	35,470
Q-Sioux-Rush Early Retirement - No CCs	66,942	67,517	15.94	11%	673	1,785	14	4.16	7.34	26%	45%	10%	4,169	3.99	47,861
R-S-T-U															
V-Sioux-Rush Early Retirement - Renewable Subscription	66,391	66,965	15.81	11%	673	1,836	15	4.15	7.25	25%	45%	10%	4,259	3.78	35,890
W-Sioux-Rush Early Retirement - No DSM - Renewable Subscripti	68,549	68,549	15.82	12%	0	2,108	15	4.17	7.20	25%	45%	10%	3,707	4.12	37,530
X-Sioux-Rush Early Retirement - Renewables when needed	66,431	67,222	15.81	10%	673	1,836	15	4.17	7.18	25%	45%	10%	4,026	3.69	37,716
Y-Sioux-Rush Early Retirement - Grain Belt Express	66,408	66,982	15.08	11%	673	1,836	16	4.09	7.20	25%	45%	10%	4,206	3.90	34,236
Z-Sioux-Rush Early Retirement - DOPE1 DSM	67,255	67,662	15.51	11%	324	1,915	15	4.16	7.22	25%	45%	10%	4,051	3.88	31,621
AA-Sioux-Rush Early Retirement - DOPE2 DSM	67,183	67,548	15.37	10%	293	1,915	15	4.16	7.22	25%	45%	10%	4,043	3.89	27,010
BB-Sioux-Rush Early Retirement - MAP	67,048	67,861	16.51	12%	32	1,820	15	4.15	7.26	25%	45%	10%	4,469	3.68	51,530

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<sup>34</sup> 20 CSR 4240-22.060(4)(A); 20 CSR 4240-22.060(7)(A); 20 CSR 4240-22.060(7)(C)3

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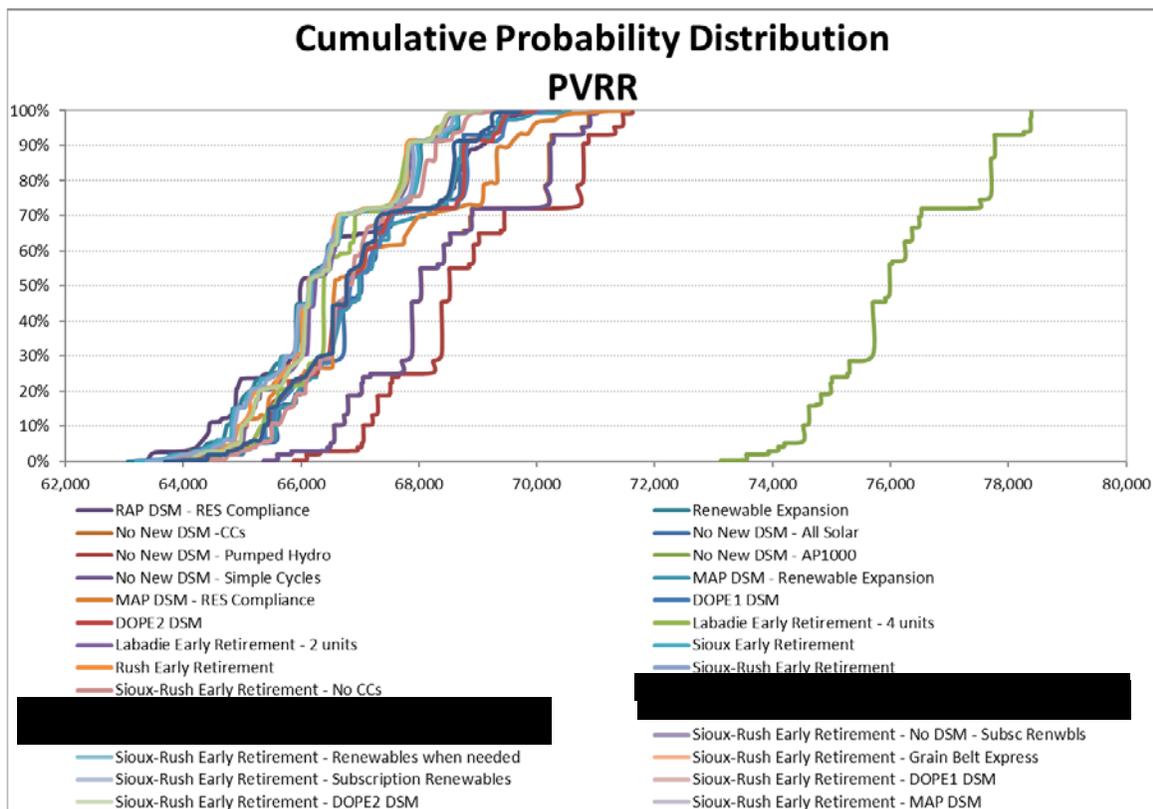
<sup>35</sup> 20 CSR 4240-22.060(4)(A); 20 CSR 4240-22.060(7)(A); 20 CSR 4240-22.060(7)(C)3

Since the two uncertain factors (project cost and ROE& interest rates) that would cause variability in financial measures within the end points of each plan were not found to be critical in the sensitivity analysis, and hence, were not included in the final probability tree in the risk analysis, CDFs for these measures are not very meaningful; therefore, the CDFs for financial measures are not included in this report, but can be found in the workpapers. CDFs for the remaining performance measures are shown in Figures 9A.17 – 21.<sup>35</sup>

To create the CDFs, Ameren Missouri looked at the unique outcomes for the performance measures for each of the 81 branches on the full probability tree for each alternative resource plan and their associated joint probabilities. To create the CDF for PVRR for each plan, for example, the 81 PVRR values were sorted from lowest to highest, and the associated probabilities were accumulated. The lowest PVRR would then be assigned the probability of its same branch, the second lowest PVRR would be assigned its own branch summed with the probability of the lowest PVRR, the third lowest PVRR would have a cumulative probability of its own and of the lower two, and so on. This process essentially shows the PVRR values (or the values for the other selected performance measures) and the percentiles for a plan.<sup>36</sup>

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**Figure 9A.17 Cumulative Probability Distribution of PVRR**

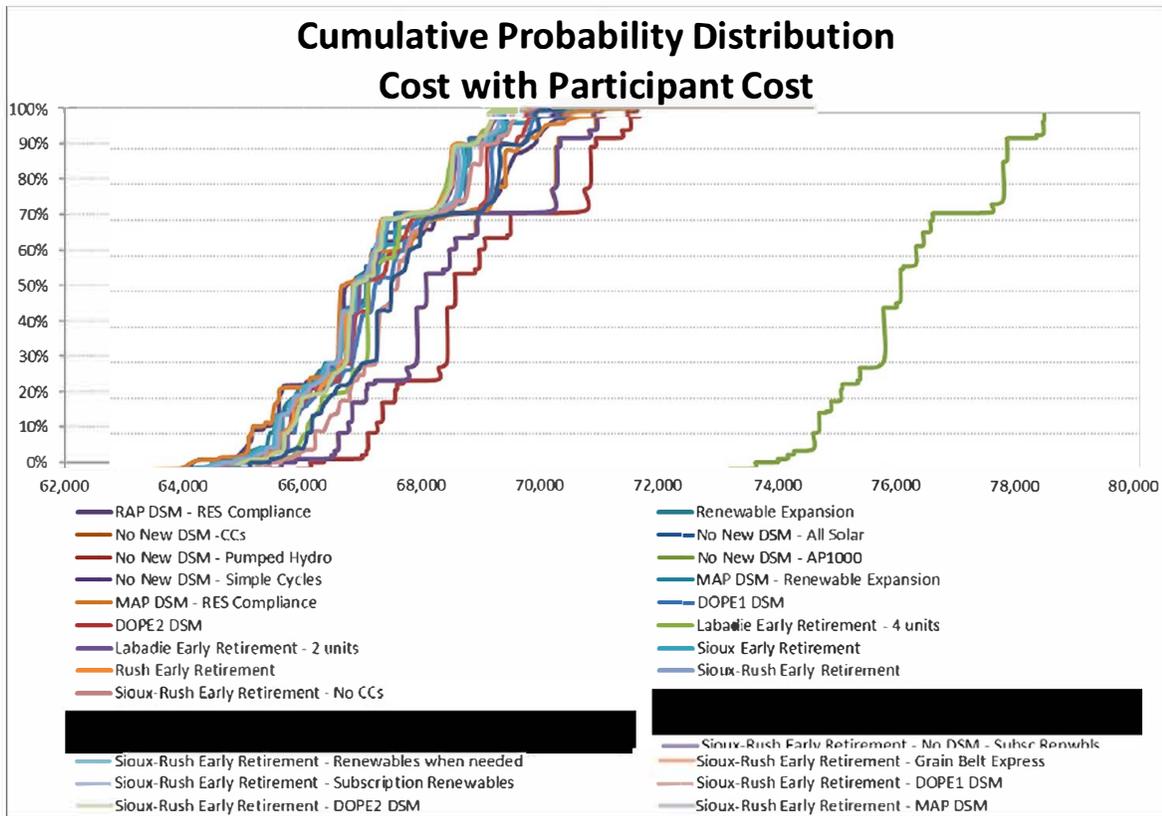
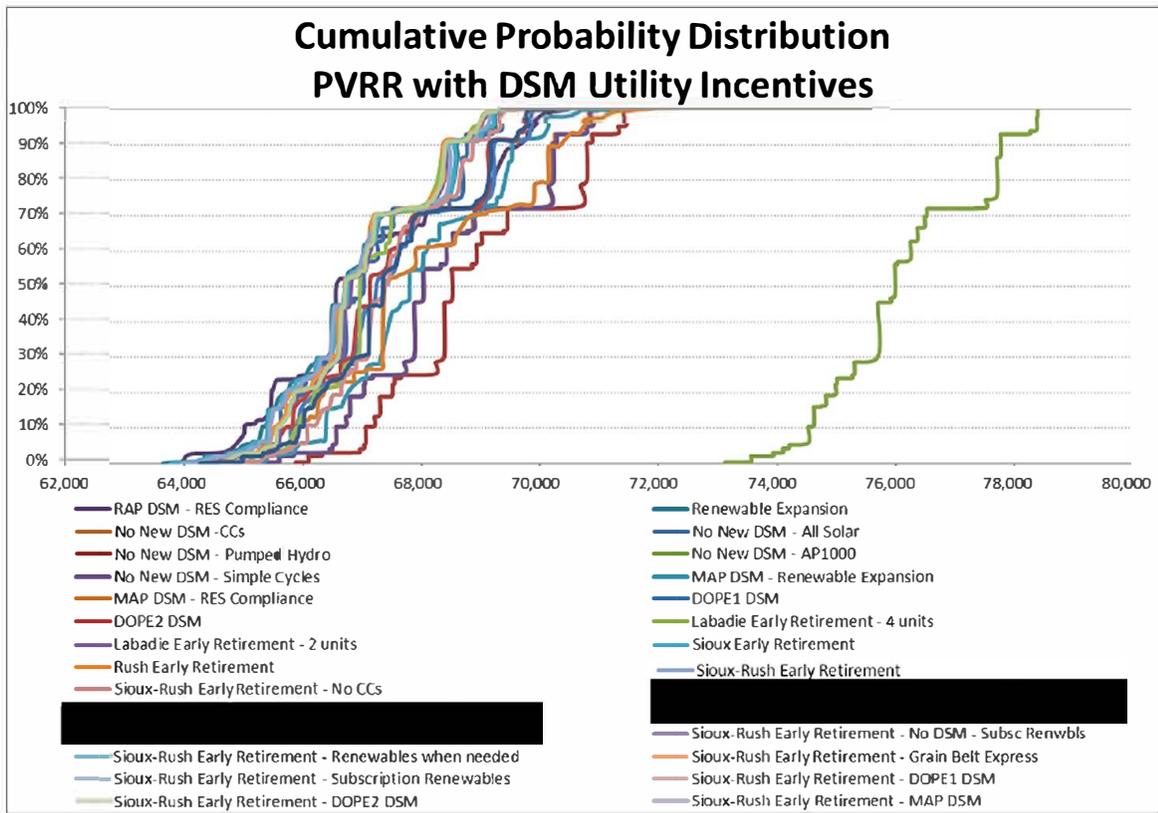


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<sup>35</sup> 20 CSR 4240-22.060(7)(C)2

<sup>36</sup> 20 CSR 4240-22.060(7)(C)1

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Figure 9A.18 Cumulative Probability Distribution of PV of Environmental Costs\*\*\*

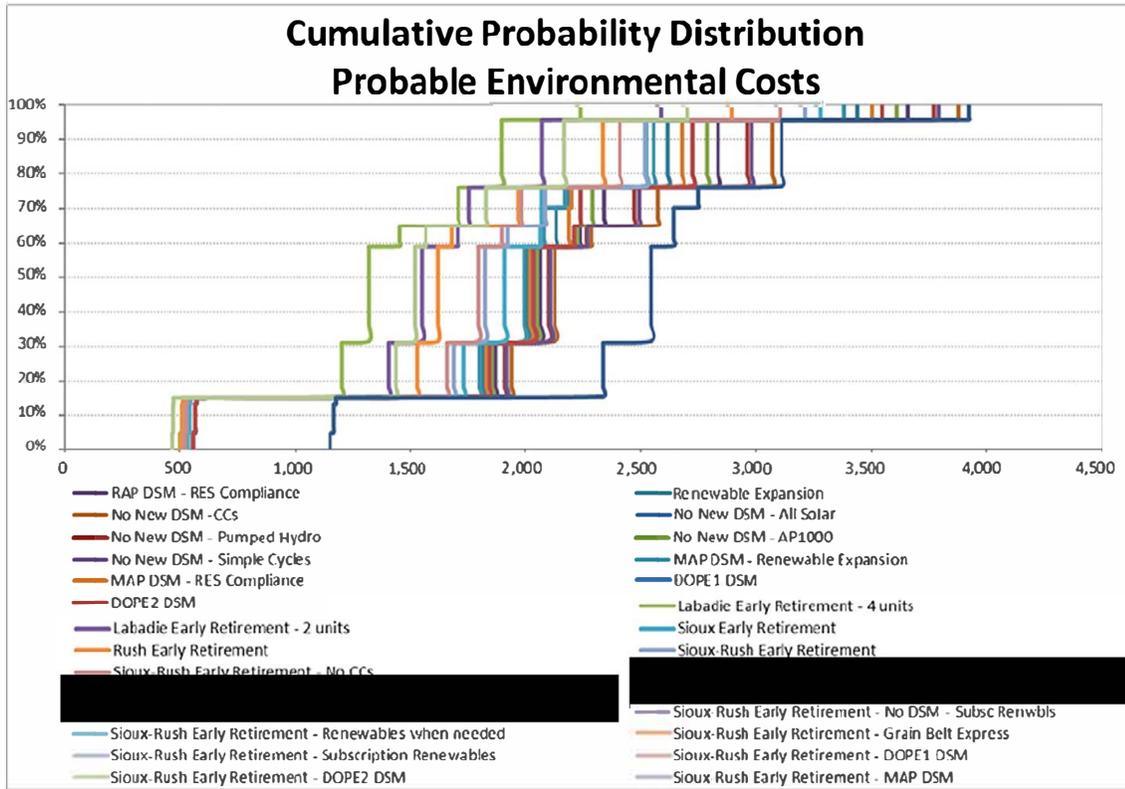
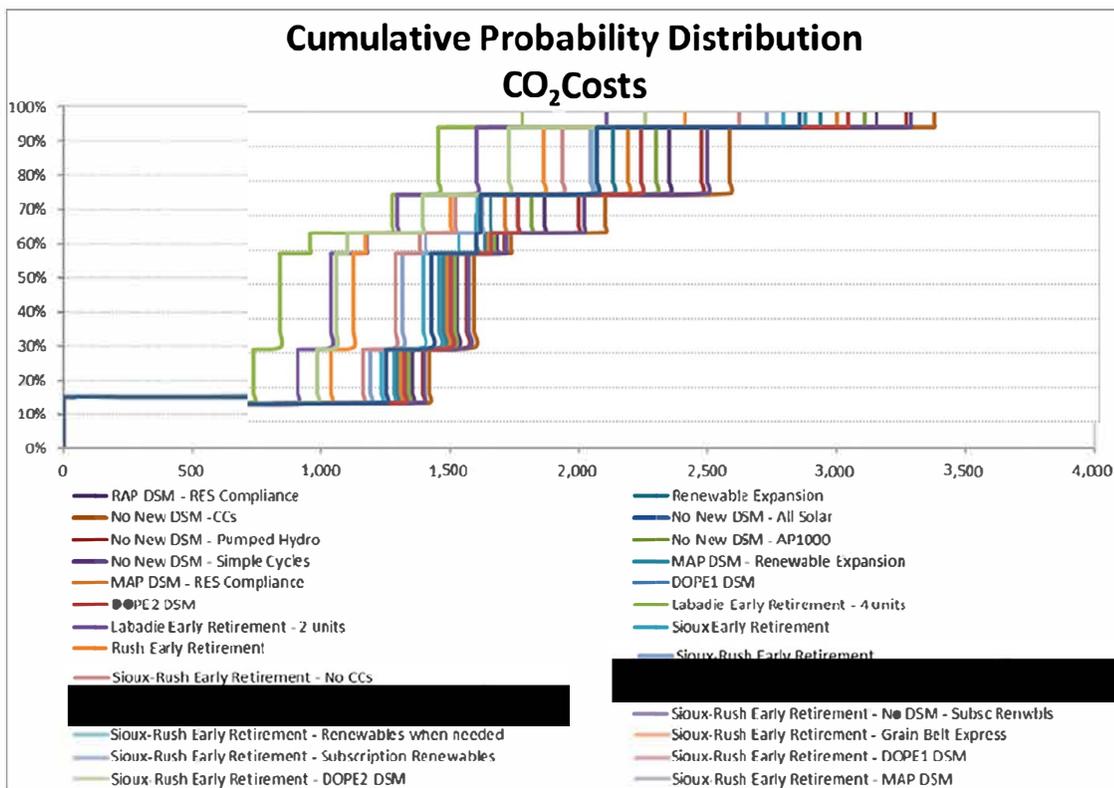


Figure 9A.19 Cumulative Probability Distribution of PV of CO<sub>2</sub> Costs \*\*



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\*\*\* Figure 9A.20 Cumulative Probability Distribution of Levelized Rates \*\*\*

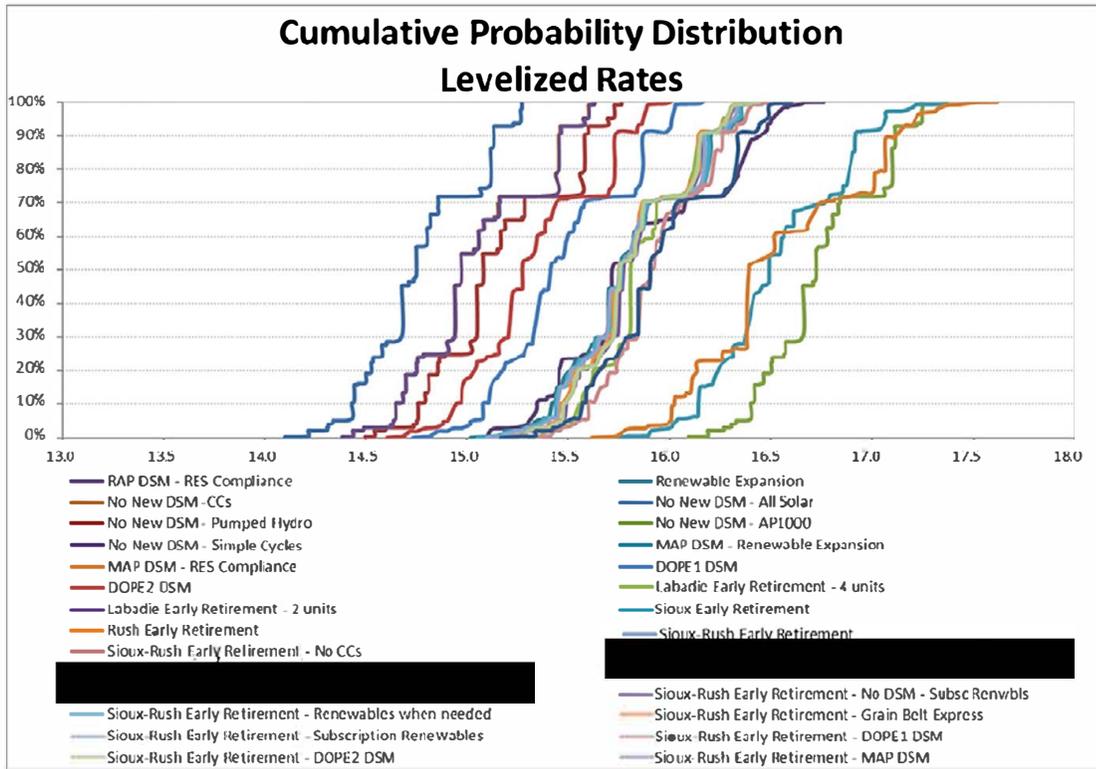
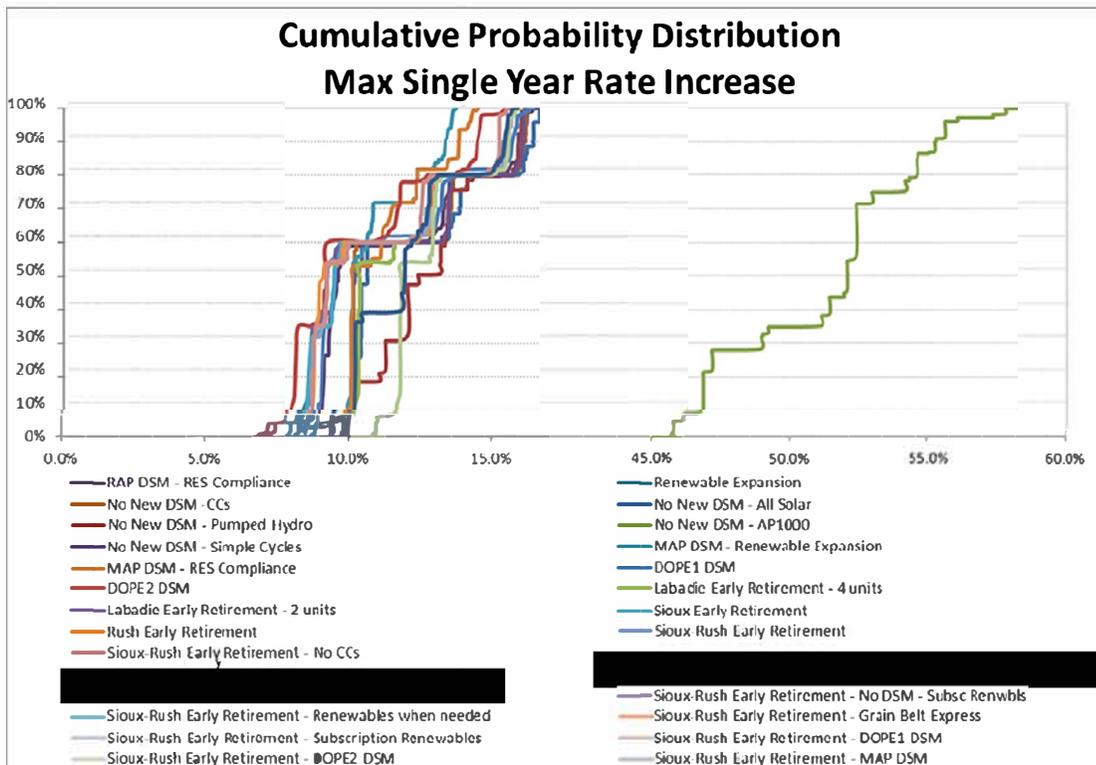


Figure 9A.21 Cumulative Probability Distribution of Max Single Year Rate Increase

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Measures of Dispersion

Ameren Missouri also estimated the standard deviation of the performance measures shown as in Table 9A.9.

\*\*\* Table 9A.9 Standard Deviation for Selected Performance Measures<sup>37</sup> \*\*\*

Plan	STANDARD DEVIATION														
	PVRR	PVRR w/	Levelized	Max Single	PVof	PVof Probable	Avg CO2	PreTax	FFO-	Debt/			FCF		
	\$MM	Incentives	Rates	Yr Rate	Participant	Environmental	Emissions	Interest	Interest	FFO/Deb	Capitalizatio	ROE	\$MM	EPS	Jobs
A-RAP DSM - RES Compliance	1,992	1,992	0.47	3%	0	1,041	3.97	0.00	0.00	0%	0%	0%	0	0.00	N/A
B-Renewable Expansion	1,568	1,568	0.37	3%	0	962	4.01	0.00	0.00	0%	0%	0%	0	0.00	N/A
C-No New DSM -CCs	1,652	1,652	0.36	2%	N/A	1,126	3.92	0.00	0.00	0%	0%	0%	0	0.00	N/A
D-No New DSM - All Solar	1,481	1,481	0.33	2%	N/A	941	4.03	0.00	0.00	0%	0%	0%	0	0.00	N/A
E-No New DSM - Pumped Hydro	1,689	1,689	0.37	2%	N/A	1,085	3.94	0.00	0.00	0%	0%	0%	0	0.00	N/A
F-No New DSM - AP1000	1,495	1,495	0.33	4%	N/A	1,023	3.98	0.00	0.00	0%	0%	0%	0	0.00	N/A
G-No New DSM - Simple Cycles	1,663	1,663	0.37	2%	N/A	1,093	3.94	0.00	0.00	0%	0%	0%	0	0.00	N/A
H-MAP DSM - Renewable Expansion	1,642	1,642	0.40	1%	0	941	4.03	0.00	0.00	0%	0%	0%	0	0.00	N/A
I-MAP DSM - RES Compliance	2,046	2,046	0.50	1%	0	984	4.00	0.00	0.00	0%	0%	0%	0	0.00	N/A
J-DOPE1 DSM	1,621	1,621	0.37	3%	0	1,001	3.99	0.00	0.00	0%	0%	0%	0	0.00	N/A
K-DOPE2 DSM	1,624	1,624	0.37	3%	0	1,001	3.99	0.00	0.00	0%	0%	0%	0	0.00	N/A
L-Labadie Early Retirement - 4 units	1,194	1,194	0.28	2%	0	609	2.24	0.00	0.00	0%	0%	0%	0	0.00	N/A
M-Labadie Early Retirement - 2 units	1,349	1,349	0.32	3%	0	698	2.85	0.00	0.00	0%	0%	0%	0	0.00	N/A
N-Sioux Early Retirement	1,523	1,523	0.36	3%	0	920	3.73	0.00	0.00	0%	0%	0%	0	0.00	N/A
O-Rush Early Retirement	1,345	1,345	0.32	3%	0	810	2.39	0.00	0.00	0%	0%	0%	0	0.00	N/A
P-Sioux-Rush Early Retirement	1,452	1,452	0.35	3%	0	904	3.11	0.00	0.00	0%	0%	0%	0	0.00	N/A
Q-Sioux-Rush Early Retirement - No CCs	1,271	1,271	0.30	2%	0	864	3.13	0.00	0.00	0%	0%	0%	0	0.00	N/A
V-Sioux-Rush Early Retirement - Renewable Subscription	1,435	1,435	0.34	3%	0	904	3.11	0.00	0.00	0%	0%	0%	0	0.00	N/A
W-Sioux-Rush Early Retirement - No DSM - Renewable Subscript	1,500	1,500	0.33	2%	N/A	1,116	3.00	0.00	0.00	0%	0%	0%	0	0.00	N/A
X-Sioux-Rush Early Retirement - Renewables when needed	1,663	1,663	0.40	2%	0	904	3.11	0.00	0.00	0%	0%	0%	0	0.00	N/A
Y-Sioux-Rush Early Retirement - Grain Belt Express	1,382	1,382	0.33	3%	0	904	3.11	0.00	0.00	0%	0%	0%	0	0.00	N/A
Z-Sioux-Rush Early Retirement - DOPE1 DSM	1,497	1,497	0.35	3%	0	965	3.08	0.00	0.00	0%	0%	0%	0	0.00	N/A
AA-Sioux-Rush Early Retirement - DOPE2 DSM	1,499	1,499	0.34	3%	0	965	3.08	0.00	0.00	0%	0%	0%	0	0.00	N/A
BB-Sioux-Rush Early Retirement - MAP	1,546	1,546	0.38	1%	0	869	3.23	0.00	0.00	0%	0%	0%	0	0.00	N/A

Standard deviation for “Jobs” has not been estimated since there was only one estimate per plan, it would be 0.

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<sup>37</sup> 20 CSR 4240-22.060(7)(C)3

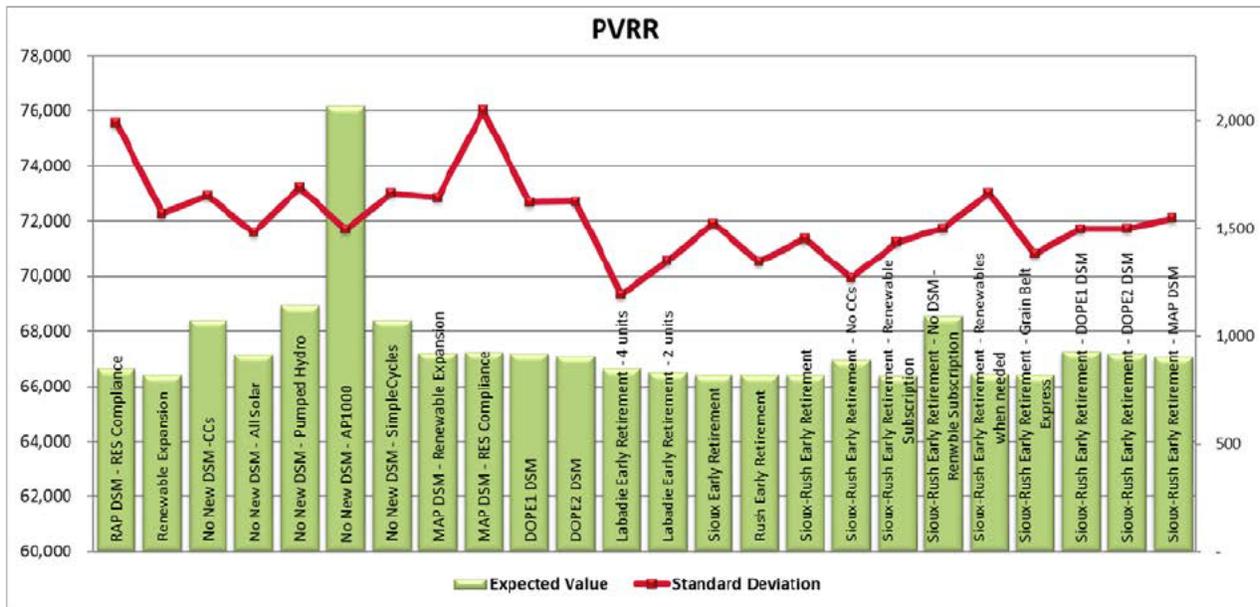
Charts 9A.22 displays the expected value and standard deviation for each plan’s PVRR. Also, in chart 9A.23, the 5<sup>th</sup> and 95<sup>th</sup> percentiles along with the expected PVRR are shown.<sup>38</sup>

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**CHART IS  
HIGHLY CONFIDENTIAL  
IN ITS ENTIRETY**

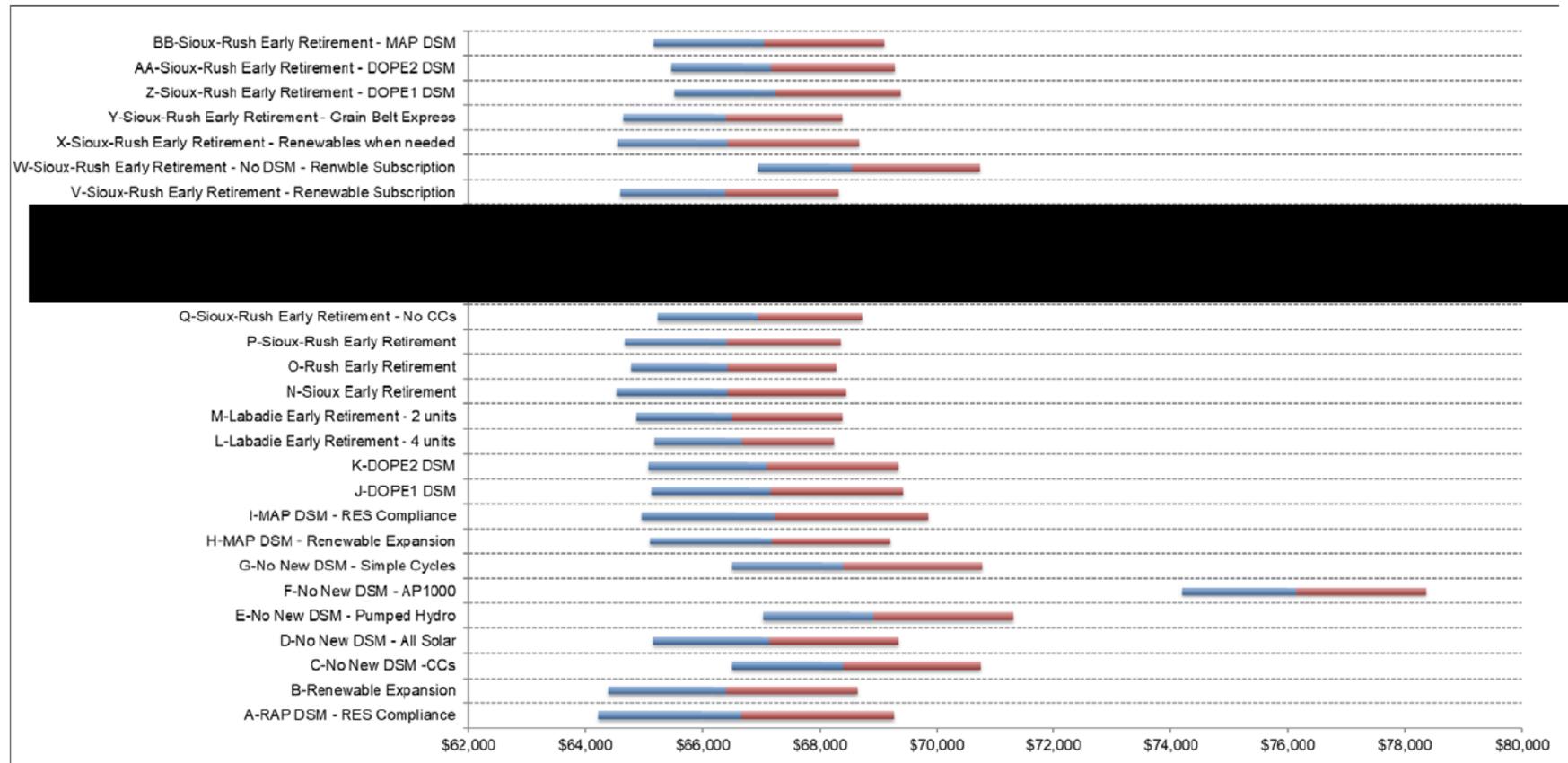
**PVRR – Expected Value and Standard Deviation (without Plans R-U)**

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<sup>38</sup> 20 CSR 4240-22.060(7)(B)

\*\*\* Figure 9A.23 PVRR – Expected Value, 5<sup>th</sup> and 95<sup>th</sup> Percentiles



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## Compliance References

20 CSR 4240-22.060(2) .....	58
20 CSR 4240-22.060(2)(A)2 .....	52
20 CSR 4240-22.060(2)(A)3 .....	11
20 CSR 4240-22.060(2)(A)4 .....	43
20 CSR 4240-22.060(2)(A)5 .....	43
20 CSR 4240-22.060(2)(A)6 .....	38
20 CSR 4240-22.060(4)(A) .....	59
20 CSR 4240-22.060(4)(B)1 .....	12
20 CSR 4240-22.060(4)(B)2 .....	13, 14
20 CSR 4240-22.060(4)(B)3 .....	15
20 CSR 4240-22.060(4)(B)4 .....	24
20 CSR 4240-22.060(4)(B)5 .....	25, 26
20 CSR 4240-22.060(4)(B)6 .....	27
20 CSR 4240-22.060(4)(B)7 .....	49
20 CSR 4240-22.060(4)(B)8 .....	52
20 CSR 4240-22.060(4)(B)9 .....	1
20 CSR 4240-22.060(4)(C) .....	46
20 CSR 4240-22.060(4)(C)1A .....	46
20 CSR 4240-22.060(4)(C)1B .....	47
20 CSR 4240-22.060(4)(C)1C .....	47
20 CSR 4240-22.060(5)(E) .....	4, 8
20 CSR 4240-22.060(5)(F) .....	7
20 CSR 4240-22.060(5)(I) .....	6
20 CSR 4240-22.060(5)(J) .....	7
20 CSR 4240-22.060(6) .....	9, 10
20 CSR 4240-22.060(7) .....	58
20 CSR 4240-22.060(7)(A) .....	59
20 CSR 4240-22.060(7)(B) .....	66
20 CSR 4240-22.060(7)(C)1 .....	61
20 CSR 4240-22.060(7)(C)1A .....	4
20 CSR 4240-22.060(7)(C)1B .....	4
20 CSR 4240-22.060(7)(C)2 .....	61
20 CSR 4240-22.060(7)(C)3 .....	59, 65
20 CSR 4240-22.060(7)(C)4 .....	58