EPA's Preferred Plan for Minnesota:

	Interim Goal 2020-2029 Average CO2 lb/MWh (Net)	Year 2030 Target CO2 lb/MWh (Net)
Minnesota	911	873

Existing Position:

	2012 CO2 Emissions (Tons)	2012 Net Generation (MWh)	2012 CO2 Intensity (lb/MWh)
Minnesota	28,000,000	38,130,000 (includes coal, NGCC, existing non-hydro renewable energy generation, and approximately 6% of "at-risk" nuclear generation)	1,470 41% reduction needed to meet Year 2030 target

2012 Baseline Data:

	Coal CO2 lb/MWh (A)	Coal Net Gen. MWh (B)
Minnesota	2,318	22,000,000

NGCC CO2 lb/MWh (C)	NGCC Net Gen. MWh (D)	NGCC Capacity MW (E)	NGCC Capacity Factor
863	5,715,000	2,768	24%

Building Block 1: Universal 6% Coal Plant Heat Rate Improvement

	Adjusted Coal CO2 lb/MWh (F)
Minnesota	2,179

Column F = Column (A) x 0.94

Building Block 2: Re-Dispatch NGCC to a 70% Capacity Factor, then Re-Dispatch Coal

	NGCC Re-Dispatched MWh (G)	Coal Re-Dispatched MWh (H)	Reduction in Coal Generation from 2012 MWh (%)
Minnesota	17,021,000	10,700,000	11,300,000 (51%)

Column (G) = Column (E)*8784*.7
Column (H) = Column (B) - (G) + (D)
Reduction in Coal Generation = Column (B) - (H)

Building Block 3: Determine Renewable Energy Targets

	2012 Total State Generation (I)	Renewable Target % (J)	Renewable Target MWh (K)
Minnesota	52,194,000	15%	7,888,544

Renewable Target is the average of binding renewable portfolio standards in the North Central region, which is: IL(16%), MI(10%), MN(30%), MO(10%), WI(10%)

Column (K) = Column (I)*Column (J)

Building Block 4: Determine avoided MWh available through demand-side energy efficiency measures. Best practice assumption is 1.5% annual savings.

Step 5a: EPA determined demand side savings goals (cumulative) as a percentage of retail sales:

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	State Generation % of Sales (L)	2012 Total MWh's (sales x 1.0751) (M)
MN	4.80%	5.92%	6.95%	7.89%	8.73%	9.49%	10.17%	10.76%	11.28%	11.72%	82.84%	73,100,000

Column M represents 2012 retail sales multiplied by 7.51% scaling factor to convert retail sales into total net generation accounting for transmission and distribution losses

Step 5B: Calculate demand side EE goals (cumulative):

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
MN	2,906,860	3,587,136	4,209,459	4,775,778	5,287,950	5,747,747	6,156,859	6,516,898	6,829,400	7,095,830

$$Yearly\ Goal = Annaul\ EE\%\ x\ Column\ L\ x\ Column\ M$$

Step 6: Calculate State Goals

$$Yearly\ Goal = \frac{\left(Coal\ CO2\ \frac{lb}{MWh}\ x\ \ Redispatched\ Coal\ MWh\right) + \left(NGCC\ CO2\ \frac{lb}{MWh}\ x\ Redispatched\ NGCC\ MWh\right) + Oil\&Gas\ CO2\ lb + "Other"\ CO2\ lb}{Redispatched\ Coal\ MWh + Redispatched\ NGCC\ MWh + OG\ MWh + Other\ MWh + Nuclear\ At\ Risk\ \&\ New\ MWh + \ Renewable\ Goal\ MWh + EE\ goal\ MWh}$$

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Interim Goal 2020 – 2029 Average CO2 lb/MWh	Final 2030 Goal CO2 lb/MWh
MN	965	949	935	922	910	901	892	884	878	873	911	873