

Renewables Ready Communities Program Technical Appendix

This technical appendix explains the methodology and assumptions used for developing the estimated greenhouse gas (GHG) emissions reduced for each measure of the RRC Program that will result in direct GHG emission reductions. The “GHG Emission Reduction Calculation Spreadsheet” included with this application provides the specific GHG emission reduction calculations for each measure, as well as the settings used to represent the Inflation Reduction Act (IRA) within RMI’s Energy Policy Simulator (EPS).

Measure 1: Renewables Ready Communities Awards (RRC Awards)

GHG Reduction Estimate Method

The web version of RMI’s Energy Policy Simulator ([EPS, version 3.4.3 specific to Michigan](#)) was used to create a business-as-usual (BAU) scenario as a basis for comparison for Measure 1 emissions reductions from 2025 to 2030 and 2025 to 2050. The EPS tool was also used to calculate emission reductions for reduction measures in the State of Michigan’s PCAP. The PCAP uses a goal of 50 percent renewable energy by 2030 and 60 percent renewable energy by 2035, consistent with Public Act 235. Measure 1 of the RRC Program aims to achieve the more ambitious goal of 60 percent renewable energy by 2030, consistent with the science-based targets presented in the MI Healthy Climate Plan, as explained in Section 1.a. of the Workplan under the sub-header “Michigan’s Priority Climate Action Plan”. Due to this measure intending to incentivize a significant deployment of renewable energy to the electric grid, requiring large capital investments and offsetting a significant amount of fossil fuel generation, the emissions reductions realized through this measure are anticipated to be permanent.

The BAU and proposed emission reduction scenarios produced by the EPS both take into account forecasted changes in electricity demand and consumption related to increased electrification of transportation and the built environment, independent of changing individual policy levers. However, no additional assumptions were made related to the implementation of increased electrification outside of the electricity sector. As a result, the effects in this analysis of increased electrification outside of the electricity sector may be minimal. Additionally, the impact of non-CPRG related federal incentives provided through programs or legislation, such as the Inflation Reduction Act (IRA), Bipartisan Infrastructure Law (BIL), and Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act were represented in this analysis, in both the BAU and proposed emissions reduction scenario (see the “EPS IRA BAU Settings” tab on the attached GHG Emission Reduction Calculation Spreadsheet). Similarly, non-federal incentives provided prior to the passage of the IRA are included. Additionally, no changes to default values such as emission factors or emission rates were changed or substituted, and global warming potentials from the Synthesis Report of the Intergovernmental Panel on Climate Change Fifth Assessment Report (AR5) were used. For more details on how the EPS is structured, models emissions across different sectors, and other assumptions used in the base tool, please visit the [posted online documentation](#). For further documentation of methodologies and data sources used for each U.S. state, please visit the [U.S. State Energy Policy Simulators \(EPS\) webpage](#).

To reach the MI Healthy Climate Plan goals by 2030, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) conservatively estimates that around 20 percent of the total MW needed will not require a financial incentive via the RRC Awards program and will be sited either through the state siting process at the Michigan Public Service Commission (MPSC) or through other means. This

assumption was made due to the framework of the RRC Awards incentivizing and encouraging local permitting processes and because the RRC Awards include a higher incentive amount per MW than the MPSC permitting process (\$5,000/MW and \$2,000/MW, respectively).

Since projects permitted through the MPSC are not eligible for RRC Awards, any renewable energy projects permitted in that manner or that fall below the capacity threshold for the RRC Awards are not included in the emission reductions calculations for Measure 1.

To create the BAU scenario through the EPS, changes were made to default settings as shown in the “EPS IRA BAU Settings” tab on the attached GHG Emission Reduction Calculation Spreadsheet, and via the [link to the EPS Scenario](#). To create the 60 percent renewable energy scenario, no changes were made to any of the following categories, outside of those made to incorporate the effects of the IRA: Transportation, Buildings and Appliances, and Industry. Within the Electricity Supply category, no changes were made to any of the following default sub-categories: Ban New Power Plants, Carbon Capture and Sequestration, Change Electricity Imports, Change Electricity Exports, Demand Response, Early Retirement of Power Plants, Grid-Scale Electricity Storage, Increase Transmission, Reduce Plant Downtime, Reduce Soft Costs, Reduce Transmission & Distribution Losses, Subsidy for Capacity Construction, and Subsidy for Electricity Production.

The Clean Electricity Standard sub-category within the Electricity Supply category was the only policy lever that was edited, other than edits made to incorporate the effects of the IRA, using the following data points as parameters and milestones:

- 2020: 0 percent Clean Energy
- 2021: 0 percent Clean Energy
- 2022: 0 percent Clean Energy
- 2023: 0 percent Clean Energy
- 2024: 0 percent Clean Energy
- 2030: 73 percent Clean Energy (60 percent Renewable Energy)
- 2040: 100 percent Clean Energy
- 2050: 100 percent Clean Energy

Within EPS, policy changes only take effect after 2023, hence the “0 percent Clean Energy” setting for years 2020-2023. It is assumed most projects incentivized through the RRC Awards will not be fully operational until late 2024, so a value of 0 percent Clean Energy was used as a conservative estimate. Additionally, EPS assumes an annual linear uptake of the policy between policy milestones. Once both scenarios were created, the projected annual emissions for each year between 2020 and 2050 for the electricity sector alone was downloaded. To determine the amount of emissions reduced and measure the anticipated impact of this Measure 1, the annual emissions calculated in the 60 percent renewable energy scenario was subtracted from the annual emissions calculated in the BAU scenario. The annual values between 2025-2030 and the annual values between 2030-2050 were then summed to create estimates of anticipated realized, cumulative emissions reductions resulting from CPRG funding for the RRC Awards, the one-time State budget allocation of \$30 million to the 2024 RRC Awards Pilot (referred to as “state budget allocation”), and the 20% of renewable energy achieved outside the RRC Awards program, as shown in Table 1 below.

Further analysis was performed to determine the approximate emissions reductions anticipated to result from each category from the broader calculations above. To begin, it was necessary to determine the total amount of megawatts (MW) of capacity needed to be generated by renewable energy sources in 2030 – namely, solar and wind. This value was generated by the EPS in the 60 percent renewable energy scenario. To determine how many MWs still need to be sited, accounting for existing renewable energy projects, the current distribution of renewable energy capacity was sourced from Form EIA-860M, and subtracted from the approximation of total need that was originally calculated by EPS.

It was previously estimated that the state budget allocation would spur development of approximately 5,000 MW of some combination wind, solar, and energy storage projects. In this analysis, energy storage was assumed to not result in any direct emissions reductions because it does not directly offset electricity produced from fossil fuels. Data from the Midcontinent Independent System Operator (MISO) includes the percentage of projects in its database that are wind, solar, storage, or a hybrid of the three. For hybrid projects, it was assumed that these projects generally adhered to the MISO distribution percentage of exclusively wind, solar, and storage projects, and were split among those three categories accordingly. It is important to note that the projects represented in MISO are representative of proposals between the years 2023-2027, prior to the passage of the 2023 clean energy legislation in Michigan, including PA 233 and PA 235 discussed in the Workplan. Both laws are anticipated to support greater development and implementation of renewable energy projects, therefore the distributions currently represented in MISO are expected to change as projects are proposed and developers begin to explore the feasibility of an increased number of sites. The MISO percentages were applied to the total capacity value expected from the state budget allotment of 5,000 MW.

Given the assumption explained earlier, the RRC Awards would conservatively incentivize 80 percent of the renewable energy needed to reach the 2030 goal. Therefore, to calculate the portion of MWs installed outside of the RRC Awards program, the remaining portion of needed renewable energy capacity (i.e., the total amount of needed capacity calculated by EPS minus existing renewable energy capacity and the capacity expected to result from the state budget allocation) was multiplied by 0.2. As mentioned previously, these MWs will likely be sited either through the MPSC siting process or by other means (referred to as “MPSC or Other” in the tables below).

The corresponding portfolio distribution (shown in Table 2) was then applied to the total amount of emissions reductions calculated by EPS in Table 1, resulting in the emissions reductions shown below in Tables 3-6. Due to the BAU scenario already taking incentives from the IRA into account, including federal tax credits, it can be assumed that the entirety of the emissions reductions shown in Table 4 can be fully attributed to the renewable energy incentivized by Measure 1, the RRC Awards. Estimated annual emissions reductions are shown in Table 7, and annual corresponding co-pollutant reductions also generated by the EPS are shown in Table 8.

Models/Tools Used

- The web version of RMI’s Energy Policy Simulator (EPS, version 3.4.3 specific to Michigan)

Measure Implementation Assumptions

- To reach the 60 percent renewable energy by 2030 goal, it is a conservative assumption that 80 percent of the needed capacity will be achieved through Measure 1, RRC Awards. The remaining

capacity is assumed to be met through a siting process that falls outside of the RRC Awards (such as through the MPSC or through projects that may not need the RRC Awards).

- Assumes any renewable energy projects that fall below the capacity threshold for the RRC Awards are considered to be additional to those realized through this measure.
- Assumes an annual linear uptake of the measure between policy milestones.
- Assumes that the CPRG funding will serve to fill the remaining gap in incentivizing MW necessary to reach the 60 percent renewable energy by 2030 goal, after incorporating current renewable energy capacity, the estimated capacity that the State of Michigan budget allocation will incentivize, and the estimated capacity resulting from a siting process that falls outside of the RRC Awards.
- Assumes that the distribution of projects in MISO are representative of the projects that will eventually be sited and operational due to the funding provided by the State of Michigan's budget allocation.
- Assumes that the "hybrid" project category in MISO follows the same distribution as exclusively wind, solar, and storage projects.
- Assumes that all emissions reductions realized through this measure can be attributed to the CPRG since the effects of the IRA are already integrated into both the BAU and the emissions reduction scenario.

GHG Reduction Estimate Assumptions

- Assumes all projects are operational by 2030.
- Assumes no emissions reductions from a CPRG award are realized in 2024.
- Forecasted changes in electricity demand and consumption related to increased electrification of transportation and the built environment are taken into account.
- No changes to default values such as emission factors or emission rates were changed or substituted, and global warming potentials from AR5 were used.
- To create a BAU scenario that incorporates the IRA, uses the settings as shown in the "EPS IRA BAU Settings" tab on the attached spreadsheet, or via the [link to the EPS Scenario](#).
- For more details on how the Energy Policy Simulator (EPS) is structured, models emissions across different sectors, and other assumptions used, please visit the [posted online Introduction to EPS](#).
- For further documentation of methodologies, data sources, and assumptions used for each U.S. State within the EPS, [please visit the U.S. State EPS Methodology](#).
- Assumes any renewable energy projects permitted via the MPSC or that fall below the capacity threshold for the RRC Awards are not considered to be part of the emissions reductions estimated to result from a CPRG award.
- Assumes that storage does not result in any direct emissions reductions.
- Assumes that all emissions reductions realized through this measure can be attributed to the CPRG since the effects of the IRA are already integrated into both the BAU and the emissions reduction scenario.

Reference Case Scenario (GHG Emissions or Activity Level)

- To create a BAU scenario that incorporates the IRA and corresponding incentives such as tax credits, the reference case uses the settings as shown in the "EPS IRA BAU Settings" tab on the attached spreadsheet, or via the [link to the EPS Scenario](#).

- For more details on how the Energy Policy Simulator (EPS) is structured, models emissions across different sectors, and other assumptions used, please visit the [posted online EPS Introduction](#).
- For further documentation of methodologies, data sources, and assumptions used for each U.S. State within the EPS, [please visit the U.S. State EPS Methodology](#).
- Forecasted changes in electricity demand and consumption related to increased electrification of transportation and the built environment are taken into account.

Measure-Specific Activity Data

In order to track the implementation and success of this measure, metrics such as annual renewable energy capacity (MW) installed and electrical output (MWh) will be regularly reported on as available, in addition to regular updates on related permitting, construction, and other related activities. See Section 3 of the Workplan for more information.

GHG Emissions Reduced

| Cumulative Emissions Reductions from Combined Funding (CPRG + State Budget + Existing Renewables + MPSC & Other) | |
|--|---|
| | Electricity Sector Only (MTCO ₂ e) |
| 2025-2030 | 133338240.00 |
| 2025-2050 | 787794870.00 |
| Annual Reductions | See “EPS Elec Sector Emission Output” Tab |

Table 1: Total cumulative emissions reductions expected to result from existing renewable energy projects, projects anticipated to be sited due to an allocation from the State Budget, projects anticipated to be sited outside the RRC Awards (such as the MPSC or other process), and projects anticipated to be sited due to an allocation from the EPA’s CPRG, as compared to BAU.

| | EPS Est. Total MW Needed by 2030 | Projects Currently Operational | | State Budget Allocation | | CPRG Allocation | | MPSC & Other Allocation | |
|---------------------|----------------------------------|--------------------------------|----------------------|-------------------------|----------------------|-----------------|----------------------|-------------------------|----------------------|
| | | MW | % of Total 2030 Need | MW | % of Total 2030 Need | MW | % of Total 2030 Need | MW | % of Total 2030 Need |
| Solar + Wind | 28490 | 4545.4 | 15.95 | 3351.34 | 11.76 | 16474.61 | 57.83 | 4,118.7 | 14.46 |
| Storage | 2500 | 0 | 0.00 | 1571.35 | 62.85 | 742.92 | 29.72 | 186 | 0.07 |

Table 2: The contribution of current renewable energy projects, projects anticipated to be sited from the State Budget, and projects anticipated to be sited from CPRG funding to the total capacity approximately needed to reach the MI Healthy Climate Plan goal of 60% renewable energy by 2030. Note: the 2,500 MW of energy storage needed by 2030 is sourced from the MI Healthy Climate Plan and PA 235.

| Cumulative Emissions Reductions from State Budget Only | |
|--|---|
| | Electricity Sector Only (MTCO ₂ e) |

| | |
|------------------|-------------|
| 2025-2030 | 15684871.55 |
| 2025-2050 | 92670049.85 |

Table 3: Emissions reductions expected to result from an allocation from the State of Michigan budget of \$30,000,000, as compared to BAU.

| Cumulative Emissions Reductions from Combined CPRG Only | |
|--|---|
| | Electricity Sector Only (Total MTCO2e) |
| 2025-2030 | 77104073.88 |
| 2025-2050 | 455549689.69 |

Table 4: Emissions reductions expected to result from Measure 1, RRC Awards, an allocation from the EPA's CPRG program of \$90,400,000, as compared to BAU.

| Cumulative Emissions Reductions from Existing Renewable Energy | |
|---|---|
| | Electricity Sector Only (MTCO2e) |
| 2025-2030 | 21273276.10 |
| 2025-2050 | 125687708.04 |

Table 5: Emissions reductions expected to result from renewable energy projects that are already in operation, as compared to BAU.

| Cumulative Emissions Reductions from MPSC & Other Siting Only | |
|--|---|
| | Electricity Sector Only (MTCO2e) |
| 2025-2030 | 19276018.47 |
| 2025-2050 | 113887422.42 |

Table 6: Emissions reductions expected to result outside the RRC Awards program, such as through the MPSC siting or other processes, as compared to BAU.

| Year | Electricity Sector CO2e Emissions, 60% RE by 2030 [metric tons/year] | Cumulative Emissions [metric tons] | Electricity Sector CO2e Emissions, BAU [metric tons / year] | Cumulative Emissions [metric tons] | Annual Difference Attributable to CPRG [metric tons / year] | Annual Cumulative Difference Attributable to CPRG [metric tons] |
|-------------|---|---|--|---|--|--|
| 2020 | 43511200 | N/A | 43511200 | N/A | N/A | N/A |
| 2021 | 48594600 | N/A | 48594600 | N/A | N/A | N/A |
| 2022 | 40930500 | N/A | 40930500 | N/A | N/A | N/A |
| 2023 | 38955200 | N/A | 38955200 | N/A | N/A | N/A |
| 2024 | 39020000 | N/A | 39020000 | N/A | N/A | N/A |
| 2025 | 30897500 | 30897500 | 37525200 | 37525200 | 3832529 | 3832529 |
| 2026 | 26244900 | 57142400 | 39538400 | 77063600 | 7687090 | 11519619 |
| 2027 | 20754200 | 77896600 | 40633000 | 117696600 | 11495100 | 23014719 |
| 2028 | 15355400 | 93252000 | 35472600 | 153169200 | 11632957 | 34647677 |

| | | | | | | |
|------|----------|-----------|----------|-----------|----------|-----------|
| 2029 | 10885400 | 104137400 | 35141700 | 188310900 | 14026430 | 48674107 |
| 2030 | 5313460 | 109450860 | 35175200 | 223486100 | 17267828 | 65941935 |
| 2031 | 4282350 | 113733210 | 34510900 | 257997000 | 17479939 | 83421874 |
| 2032 | 3364030 | 117097240 | 34817600 | 292814600 | 18188319 | 101610193 |
| 2033 | 3940690 | 121037930 | 35295200 | 328109800 | 18131036 | 119741229 |
| 2034 | 3268300 | 124306230 | 34793600 | 362903400 | 18229797 | 137971026 |
| 2035 | 3260040 | 127566270 | 34738200 | 397641600 | 18202538 | 156173564 |
| 2036 | 3254990 | 130821260 | 34569800 | 432211400 | 18108079 | 174281644 |
| 2037 | 3250460 | 134071720 | 34775000 | 466986400 | 18229358 | 192511001 |
| 2038 | 3246200 | 137317920 | 34749800 | 501736200 | 18217249 | 210728250 |
| 2039 | 3241080 | 140559000 | 34965500 | 536701700 | 18344940 | 229073190 |
| 2040 | 3202960 | 143761960 | 35261100 | 571962800 | 18537917 | 247611107 |
| 2041 | 3209370 | 146971330 | 35685300 | 607648100 | 18779508 | 266390615 |
| 2042 | 3208190 | 150179520 | 36041900 | 643690000 | 18986397 | 285377012 |
| 2043 | 3194030 | 153373550 | 36538200 | 680228200 | 19281576 | 304658587 |
| 2044 | 3183870 | 156557420 | 36811900 | 717040100 | 19445720 | 324104308 |
| 2045 | 3187500 | 159744920 | 37240300 | 754280400 | 19691347 | 343795655 |
| 2046 | 3152770 | 162897690 | 37507100 | 791787500 | 19865710 | 363661365 |
| 2047 | 3150760 | 166048450 | 37856300 | 829643800 | 20068800 | 383730165 |
| 2048 | 3146850 | 169195300 | 37618000 | 867261800 | 19933262 | 403663428 |
| 2049 | 3145600 | 172340900 | 37299500 | 904561300 | 19749809 | 423413237 |
| 2050 | 3143550 | 175484450 | 37167800 | 941729100 | 19674838 | 443088075 |

Table 7: Annual emissions reductions in the electricity sector expected to result from an allocation from the EPA's CPRG program only (Measure 1, RRC Awards), as compared to BAU.

| Cumulative Reduction of Pollutants from CPRG Only, Compared to BAU | | | | | |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | SOx (metric tons) | NOx (metric tons) | PM 2.5 (metric tons) | VOCs (metric tons) | CO (metric tons) |
| | Electricity Sector Only | Electricity Sector Only | Electricity Sector Only | Electricity Sector Only | Electricity Sector Only |
| 2025-2030 | 30422.60 | 30036.78 | 6709.02 | 2181.29 | 15119.62 |
| 2025-2050 | 157746.24 | 181637.20 | 28035.39 | 9318.67 | 92661.24 |

Table 8: Cumulative co-pollutant reductions expected to result from an allocation from the EPA's CPRG program (Measure 1, RRC Awards), as compared to BAU.

Measure 2: Brownfield Renewable Energy Pilot Program

GHG Reduction Estimate Method

The web version of the EPA's AVOIDed Emissions and geneRation Tool (AVERT, last updated on April 25, 2023) was used to calculate the emissions reductions expected to result from a \$10 million investment in grants to encourage brownfields in Michigan to host renewable energy projects. Due to limited knowledge of specific features of existing brownfields in Michigan, it was assumed that the data in the [EPA's RE-Powering America's Land Mapper](#) for Michigan was representative of brownfield renewable

energy potential in the state. As such, various features of brownfields used in this analysis were derived from this dataset, including projected renewable energy capacity per site.

An average of the Michigan RE-Powering America locations' estimated PV capacity (column Q on tab "Raw RE-Powering Data" in the attached reduction calculation spreadsheet) was used to determine an approximate value to represent the anticipated renewable energy capacity per brownfield site. Due to brownfields often being smaller in size, it was assumed that each of the developments to receive CPRG funds through Measure 2 would host a solar project rather than a wind project. Based on the RE-Powering data, the average capacity is approximately 1.18 MW per site.

The framework for this proposal budgets approximately \$1,000,000 per brownfield site redeveloped. As such, it's reasonable to assume that approximately 10 brownfield sites will be redeveloped into host sites for renewable energy developments, leading to a total solar capacity of 11.8 MW across all 10 sites using the average capacity previously derived. The Brownfield Renewable Energy Pilot Program is not included in Measure 1 estimates to achieve the 60 percent renewable energy by 2030 goal because it is a relatively small MW capacity compared to MWs incentivized through the RRC Awards.

The brownfield renewable energy projects are assumed to meet prevailing wage and apprenticeship requirements pursuant to Section 48 and 48E in the U.S. Tax Code, and therefore will likely qualify for the corresponding 30 percent federal tax credit for renewable energy projects. The emission reductions attributable to the CPRG funds through Measure 2 will therefore be 70 percent of the total since an estimated 30 percent of the project can be attributed to federal tax credits.

The emission reduction calculations for Measure 2 are based on the conservative assumption that 10 brownfield sites are redeveloped with renewable energy. However, it is highly likely that the Pilot Program will catalyze other brownfields to redevelop with renewable energy projects, and the emission reductions attributable to the CPRG funds for Measure 2 will be larger than the conservative calculations.

When providing inputs into AVERT, each of these projects were assumed to be utility projects rather than rooftop or distributed solar to account for distribution and transmission losses. Additionally, due to data and tool limitations, and in order to isolate the direct effects of this particular program and its impact on emissions reductions, none of the other available input options (i.e. energy efficiency, electric vehicles) were used in AVERT. Similarly, this means this analysis only estimates direct emissions reductions in the electricity sector, rather than a more comprehensive cross-sector analysis. None of the default information included in AVERT (i.e., emission factors and emission rates) was changed or substituted for other values.

Additionally, it is assumed that GHG emissions reductions from this proposal measure are realized linearly between 2025 and 2030, with remediated sites immediately ready for construction being prioritized, identified, and construction beginning post-award in late 2024 and early 2025. While this assumption was made for ease of calculations, it's likely that various issues and delays will arise in practice that result in a non-linear emissions realization. Regardless, all brownfield renewable developments from this pilot are anticipated to be operational by 2030. Similarly, these emissions reductions will be permanent due to the significant financial and time investment required when planning, permitting, and constructing a source of electricity generation.

In recent years, only one brownfield has been redeveloped to host a renewable energy project via the State of Michigan's Brownfield Redevelopment program, even with the existence of non-CPRG related federal incentives provided through programs or legislation such as the IRA, BIL, and CHIPS. Therefore, it is reasonable to assume the baseline of comparison to be a business-as-usual scenario of zero brownfield renewable energy developments in a given year.

Due to the direct emission reduction assumptions made through this analysis, as well as the narrative ones related to measure implementation, the below tables of AVERT-estimated GHG emission and co-pollutant reductions are a conservative estimate that will be realized through this measure of the proposal and are not anticipated to occur otherwise without CPRG funding.

Models/Tools Used

- The web version of the EPA's AVOIDed Emissions and geneRation Tool (AVERT, last updated on April 25, 2023).
- The EPA's RE-Powering America's Land Mapper, sites located within Michigan.

Measure Implementation Assumptions

- Assumes linear rate of project development, siting, and operation between 2025 and 2030, and 2025 and 2050.
- Assumes all projects are operational by 2030.
- Assumes that each award is \$1,000,000.
- Assumes that 10 brownfield sites become hosts for renewable energy projects.
- Assumes an average project capacity of 1.18 MW.
- Assumes each project meets prevailing wage and apprenticeship requirements pursuant to Section 48 and 48E.
- Assumes each project takes advantage of the 30 percent tax credits pursuant to Section 48 and 48E.

GHG Reduction Estimate Assumptions

- Assumes that the data included in the EPA's RE-Powering America's Land Mapper located within Michigan is representative of brownfields in Michigan.
- Assumes linear rate of GHG emission reductions as projects become operational.
- Assumes all projects are operational by 2030.
- Assumes all projects are solar developments rather than wind developments.
- Assumes all solar projects are utility rather than distributed to account for distribution and transmission losses.
- No emission factors, emission rates, or global warming potentials were changed from default AVERT values.
- No assumptions made related to EV uptake or energy efficiency gains.

Reference Case Scenario (GHG Emissions or Activity Level)

Within recent years, only one brownfield has been redeveloped to host a renewable energy project via the State of Michigan's Brownfield Redevelopment program, even with the existence of non-CPRG related federal incentives provided through programs or legislation such as the IRA, BIL, and CHIPS.

Therefore, it is reasonable to assume the baseline of comparison to be a business-as-usual scenario of zero brownfield renewable energy developments in a given year.

Measure-Specific Activity Data

In order to track the implementation and success of this measure, metrics such as project capacity (MW) installed and electrical output (MWh) will be regularly reported on as available, in addition to regular updates on related permitting, construction, and cleanup/redevelopment activities. For more information, refer to Section 3 of the Workplan.

GHG Emissions Reduced

| Emissions Reductions | | | |
|----------------------------------|--|---|---|
| | Electricity Sector Only (Total MTCO ₂ e) | Electricity Sector Only (CPRG MTCO ₂ e) | Electricity Sector Only (Tax Credit MTCO ₂ e) |
| 2025-2030 | 8708.97 | 6096.28 | 2612.69 |
| 2025-2050 | 43544.87 | 30481.41 | 13063.46 |
| Approx. Annual Reductions | 1741.79 | 1219.26 | 522.54 |

Table 9: Emissions reductions expected to result from an allocation from the EPA's CPRG program, by taking advantage of federal tax credits, and a corresponding total, as compared to BAU.

| Cumulative Reduction of Pollutants from CPRG Only, Compared to BAU | | | | | |
|--|-------------------------------|-------------------------------|---------------------------------|--------------------|-------------------------------|
| | SO ₂ (metric tons) | NO _x (metric tons) | PM _{2.5} (metric tons) | VOCs (metric tons) | NH ₃ (metric tons) |
| 2025-2030 | 2.524 | 3.096 | 0.683 | 0.254 | 0.159 |
| 2025-2050 | 12.621 | 15.479 | 3.413 | 1.270 | 0.794 |
| Approx. Annual Reductions | 0.505 | 0.619 | 0.137 | 0.051 | 0.032 |

Table 10: Cumulative co-pollutant reductions expected to result from an allocation from the EPA's CPRG program when combined with tax credits and other incentives, as compared to BAU.