Statewide Greenhouse Gas Emission Forecast

The 2020 forecast of greenhouse gas (GHG) emissions is important for tracking California’s progress towards the goal of reducing statewide (or aggregated) emissions to 1990 levels by 2020. Annual emission forecasts for each year to the year 2020 provide a reference for assessing the effect of greenhouse gas reduction measures. Forecasts developed by Air Resources Board (ARB) staff are used to evaluate the impact of emission reduction measures included in the greenhouse gas emissions reduction scoping plan and for other planning purposes.

Electricity Sector GHG Emission Forecast

The forecast of electricity sector emissions within the statewide greenhouse gas inventory begins with actual emission data and then projects future emission data points based on projected electricity demand and fuel consumption data through 2020. The forecast of in-state and imported electricity generation emissions through 2020 rely on data from several sources, including the California Energy Commission (CEC) and other state agencies, the U.S. Department of Energy, and data reported directly to the ARB pursuant to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. For the electricity sector in particular, the forecast relies on the CEC’s 2009 statewide electricity demand forecast. Data from interagency collaborative workgroups, such as those formed under the Western Climate Initiative, were also used.

Monitoring Electricity Sector Emissions

The requirements and standards included in the Mandatory Reporting Regulation serve as a primary vehicle for monitoring power generating facility emissions over time. Data reported to the ARB by in-state power generators under the Mandatory Reporting Regulation include greenhouse gas emissions by amount and type of fuel used to generate electric power.

For imported electricity, information on power transactions is reported, including megawatt hours (MWh) imported from specified and unspecified power generating sources. Reported data, as well as and methods used to compile those, are rigorously reviewed by independent third-party verifiers prior to ARB finalizing the emissions levels. Emissions from power generators below the reporting threshold in Mandatory Reporting are determined from data ARB staff receives from other state and federal agencies.

The following graphs illustrate actual, business-as-usual, and forecasted GHG emission variables for the State’s electricity sector through the year 2020. The business-as-usual emissions reflect the most recent demand forecasts and implementation of the adopted market- and regulatory-based measures for the electricity sector as of October 2011.

Below are four figures that illustrate anticipated electricity-sector GHG emissions from various perspectives. All of the forecasted emission data assume a linear decrease from currently available actual emission information through 2020, when we are expected to meet the State’s emission reduction goal. Figure 1 shows the Statewide, aggregated emission reduction goal (427 MMTCO2E by 2020) along with expected electricity sector GHG emissions over time, expressed in million metric tons of carbon dioxide equivalent (MMTCO2E) emissions. Figure 2
illustrates the GHG emission intensity for the electricity sector over time, expressed in metric tons of carbon dioxide equivalent (MTCO2E) emissions per MWh hour of electricity generated. Finally, Figures 3 and 4 show the change in GHG emissions for the electricity sector over time, relative to population and economic production, respectively.

Figure 1: Statewide and electricity sector GHG emissions

![Statewide and electricity sector GHG emissions graph]

Figure 2: Electricity sector GHG emission rate

![Electricity sector GHG emission rate graph]

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1 Emission rate data were derived from the CEC’s 2009 statewide electricity demand forecast.
Figure 3: Electricity sector GHG emission per capita \(^2\)

Population data were derived from the California Department of Finance.

Figure 4: Electricity sector GHG emissions / Gross State Product \(^3\)

Gross State Product data were derived from the U.S. Department of Commerce.