

## Sample Calculation

### Benefits of Plug-In Hybrid

#### General Methodology

- Compute the emissions associated with the electrical generation to charge batteries for a plug-in vehicle for a set number of miles.
- Compare to the emissions associated with driving a conventional vehicle the same number of miles.

#### Assumptions/Inputs

- A vehicle drives 12,500 miles annually.
- kWh demand for charging an electric vehicle to drive 12,500 miles is 3125 kWh, or 3.125 MWh. (Austin Energy)
- Average NOx emission rate for electricity generation in the region is 3.06 to 5.72 lbs/MWh. Assume 3.06. (1-hour SIP)
- Factor to account for line losses: 0.93. (Austin Energy)
- Average emission rate for conventional vehicle: 41 pounds NOx per 12,500 miles at 25 mpg. (EPA AP-42)

#### Emissions from Power Generation

- $(3.125 \text{ MWh} * 3.06 \text{ NOx/MWh}) / 0.93 \text{ line loss} = 10.3 \text{ lbs NOx per year}$

#### Emissions from Conventional Vehicle Operation

- 41 pounds NOx/year assuming 12,500 miles and 25 mpg.

#### Difference

- $41 - 10.3 = 30.7 \text{ lbs NOx/vehicle/year reduced}$

**Table 1. Sample Annual and Daily NOx Emission Reduction**

Number of Vehicles	Total lbs NOx Reduced	Total tpy NOx reduced	Total tpd NOx reduced
1,000	30,718	15	0.04
10,000	307,177	154	0.42
100,000	3,071,774	1,536	4
1,000,000	30,717,742	15,359	42