

## STATUS OF SCOPING PLAN RECOMMENDED MEASURES

The estimated 2020 greenhouse gas (GHG) emission reductions for measures described in the 2008 Scoping Plan were based on the best available information as of December 2008. ARB staff has since revised the expected 2020 emission reductions in consideration of the economic recession and the availability of updated information from development of measure-specific regulations. For certain measures, ARB staff does not currently expect any anticipated changes to the 2020 reductions compared to the reductions developed for the 2008 Scoping Plan.

The revised emissions reduction estimates for measures included in the 2008 Scoping Plan recognize the following:

- Development of measure-specific regulations. Regulations adopted by the Board include estimates of reductions anticipated by 2020. These regulations, which reflect ARB's progress towards reducing statewide GHG emissions, include comprehensive documentation detailing the data sources and methods used to develop measures recommended in the Scoping Plan. Each regulation's Initial Statement of Reasons (ISOR) contains the information necessary to evaluate how the reduction was calculated. All ISOR documents are available on ARB's website.
- Severe and prolonged economic downturn. The revised measure-specific emission reductions consider the economic downturn through the use of an updated GHG emission forecast. The updated forecast was developed using average emissions over a three-year period (2006-2008) projected to 2020. For energy consuming sectors, the projection is based on future demand for electricity and transportation fuels described in the California Energy Commission's 2009 Integrated Energy Policy Report (IEPR). The IEPR accounts for the recession using economic and demographic data. The 2009 IEPR document is available on the California Energy Commission's website. [http://www.energy.ca.gov/2009\\_energypolicy/documents/](http://www.energy.ca.gov/2009_energypolicy/documents/)

### Attachment

#### 2020 Statewide Greenhouse Gas Emissions and the 2020 Target

The 2020 emissions baseline used in the 2008 Scoping Plan is 596 MMTCO<sub>2e</sub>. This estimate of statewide 2020 emissions was developed using pre-recession 2007 IEPR data and reflects GHG emissions expected to occur in the absence of any reduction measures in 2010. ARB staff re-evaluated the baseline in light of the economic downturn and updated the projected 2020 emissions to 545 MMTCO<sub>2e</sub>. Two reduction measures (Pavley I and the Renewables Portfolio Standard (12% - 20%)) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline, further reducing the 2020 statewide emissions projection to 507 MMTCO<sub>2e</sub>.

The updated forecast of 507 MMTCO<sub>2e</sub> is referred to as the AB 32 2020 baseline. Reduction of an estimated 80 MMTCO<sub>2e</sub> are necessary to reduce statewide emissions to the AB 32 Target of 427 MMTCO<sub>2e</sub> by 2020.

## **ESTIMATED REDUCTIONS FROM CAPPED SOURCES/SECTORS**

### **Pavley**

The Scoping Plan estimated Pavley 2020 reductions as 31.7 MMTCO<sub>2</sub>e, of which 27.7 was identified as Pavley and 4.0 as Advanced Clean Cars. The California Energy Commission (CEC) 2009 Integrated Energy Policy Report (IEPR) fuel forecast was referenced to estimate the potential reduction attributed to the Pavley portion (vehicles model-years 2009-2016) of this measure under post-economic downturn conditions, resulting in an estimated reduction of 26.1 MMTCO<sub>2</sub>e. Pavley has been incorporated into ARB baseline inventories.

<http://www.arb.ca.gov/cc/ccms/ccms.htm>

### **Advanced Clean Cars**

In the Scoping Plan this measure was estimated to reduce 4.0 MMTCO<sub>2</sub>e, which has been adjusted to reflect the economic downturn as described for the Pavley regulation (see above). The resulting estimated reduction is 3.8 MMTCO<sub>2</sub>e. The Advanced Clean Car measure is under development and focuses on vehicles model-years 2017-2025.

[http://www.arb.ca.gov/msprog/clean\\_cars/clean\\_cars.htm](http://www.arb.ca.gov/msprog/clean_cars/clean_cars.htm)

### **Renewables Portfolio Standard (RPS, 20% by 2020)**

In the 2008 Scoping Plan, renewables were estimated to achieve 21.3 MMTCO<sub>2</sub>e of GHG reductions in 2020, of which 7.9 MMTCO<sub>2</sub>e would be achieved by the RPS (12%-20%) and 13.4 MMTCO<sub>2</sub>e would be achieved by the Renewable Electricity Standard (RES, 20%-33%). Estimated RPS reductions in 2020 have been updated to reflect changed economic conditions based on the 2009 IEPR demand forecast and are 12.0 MMTCO<sub>2</sub>e. The updated RPS reduction has been incorporated into ARB baseline inventories. The RPS program is administered by the California Public Utilities Commission (CPUC).

<http://www.cpuc.ca.gov/PUC/energy/Renewables/>

### **Renewable Electricity Standard (RES, 33%)**

The RES measure was estimated to provide 13.4 MMTCO<sub>2</sub>e of reductions in the Scoping Plan (see above). Estimated emission reductions are presumed to be equivalent to those identified in a Staff Report (ISOR) prepared by ARB in 2010 which estimated reductions as 12.0 MMTCO<sub>2</sub>e. Reductions associated with unbundled Renewable Energy Credits (RECs) were subtracted from the ISOR value, yielding a value of 11.4 MMTCO<sub>2</sub>e. This measure is being implemented by the CEC and CPUC under SBX1-2, signed by Governor Brown in April 2011.

<http://www.energy.ca.gov/renewables/>

<http://www.arb.ca.gov/regact/2010/res2010/res10isor.pdf>

[http://leginfo.ca.gov/pub/11-12/bill/sen/sb\\_0001-0050/sbx1\\_2\\_bill\\_20110412\\_chaptered.pdf](http://leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_bill_20110412_chaptered.pdf)

## **Low Carbon Fuel Standard (LCFS)**

In the Scoping Plan, the LCFS was estimated to achieve 15.0 MMTCO<sub>2</sub>e reductions in 2020. Based on the proposed regulation, the reduction in the ISOR was calculated as 15.8 MMTCO<sub>2</sub>e. In order to reflect changed economic conditions, the estimated reduction from the regulation was recalculated using the same methodology as the Scoping Plan but with more recent data, resulting in an estimated reduction of 15.0 MMTCO<sub>2</sub>e.

<http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>

## **Energy Efficiency**

Energy efficiency consists of several measures that include building and appliance efficiency, increased combined heat and power (CHP) generation, and solar water heating (AB 1470 goal).

The energy efficiency and conservation measures have been adjusted to reflect changed economic conditions using the methodology in the Scoping Plan but with more current data from the 2009 IEPR. The estimated reduction is updated from 19.5 MMTCO<sub>2</sub>e to 11.9 MMTCO<sub>2</sub>e. Achievement of these emission reductions is dependent on continued funding and implementation of efficiency programs.

The CPUC recently approved a settlement designed to increase the amount of CHP operated by Independently Owned Utilities (IOUs) in the State. The settlement identifies a 4.8 MMTCO<sub>2</sub>e incremental GHG emission reduction goal by 2020. However, due to accounting differences between the Scoping Plan and the settlement, actual reductions in 2020 may differ from the 4.8 MMTCO<sub>2</sub>e.

The reduction attributed to Solar Water Heating in the Scoping Plan, 0.1 MMTCO<sub>2</sub>e, has been adjusted to reflect the changed economic conditions, but because the change is small, the resulting value (to one decimal place) is unchanged. The Solar Water Heating measure is being implemented and funded by the CPUC as a component of the California Solar Initiative, Thermal Development Program.

<http://www.cpuc.ca.gov/PUC/energy/Solar/thermhistory.htm>

## **Regional Transportation-Related GHG Targets**

The Scoping Plan identified 5.0 MMTCO<sub>2</sub>e as a placeholder for what could be achieved by the Sustainable Communities and Climate Protection Act of 2008 (SB 375) through sustainable regional transportation and local land use planning. The SB 375 Staff Report identifies 3.0 MMTCO<sub>2</sub>e, which is the aggregate from the regional passenger vehicle GHG reduction targets established for the 18 Metropolitan Planning Organizations approved in 2010.

[http://arb.ca.gov/cc/sb375/staffreport\\_sb375080910.pdf](http://arb.ca.gov/cc/sb375/staffreport_sb375080910.pdf)

## **Vehicle Efficiency Measures**

Vehicle efficiency measures in the Scoping Plan include Low Friction Oil, Tire Pressure Regulation, Tire Tread Program, and Solar Reflective Automotive Paint and Window Glazing. In the Scoping Plan, these measures were estimated to achieve a combined reduction of 4.5 MMTCO<sub>2</sub>e in 2020.

The Tire Pressure Regulation is approved and the estimated reduction identified in the ISOR is unchanged from the Scoping Plan estimate of 0.6 MMTCO<sub>2</sub>e. The Tire Tread Program (0.3 MMTCO<sub>2</sub>e in the Scoping Plan) is under evaluation and potential reductions are uncertain at this time. Low Friction Oil has been achieved in practice (2.8 MMTCO<sub>2</sub>e in the Scoping Plan). Potential reductions through cool car design are to be considered as part of the Advanced Clean Cars measure.

<http://www.arb.ca.gov/regact/2009/tirepres09/tireisor.pdf>

## **Goods Movement**

Goods Movement includes measures to reduce emissions from shipping and port operations including such actions as reducing vessel speed and electrifying port equipment. The Scoping Plan attributed 3.5 MMTCO<sub>2</sub>e to these system-wide measures. System-wide efficiency improvements are in progress but are not likely to provide significant GHG reductions by 2020.

<http://www.arb.ca.gov/planning/gmerp/gmerp.htm>

The Scoping Plan attributed 0.2 MMTCO<sub>2</sub>e of reductions to the Shore Power for Ocean-going Vessels measure. The ISOR for this regulation estimated potential reductions to range between 0.12 and 0.24 MMTCO<sub>2</sub>e. The estimated reduction of 0.2 MMTCO<sub>2</sub>e identified in the Scoping Plan is considered representative of this measure.

<http://www.arb.ca.gov/ports/shorepower/shorepower.htm>

## **Million Solar Roofs**

The Scoping Plan estimated the Million Solar Roofs measure could reduce 2.1 MMTCO<sub>2</sub>e emissions in 2020. The estimated reduction has been recalculated using the same methodology as that presented in the Scoping Plan with an updated grid emission factor, then proportionally adjusted to reflect the economic downturn, resulting in an estimated reduction of 1.1 MMTCO<sub>2</sub>e in 2020. The Million Solar Roofs measure is being implemented and funded by the CEC and CPUC as a component of the California Solar Initiative program.

[http://www.energy.ca.gov/ghg\\_emissions/index.html](http://www.energy.ca.gov/ghg_emissions/index.html)

<http://www.cpuc.ca.gov/PUC/energy/Solar/aboutsolar.htm>

## **Medium/Heavy Duty Vehicles**

The Scoping Plan identified potential reductions of 0.9 MMTCO<sub>2</sub>e from the Heavy Duty Aerodynamic Efficiency measure and 0.5 MMTCO<sub>2</sub>e from the Medium/Heavy Hybridization measure.

The Heavy Duty Aerodynamics measure is approved and the ISOR identifies 1.0 MMTCO<sub>2</sub>e of reductions, which has been adjusted proportional to the economic downturn resulting in an estimated reduction of 0.9 MMTCO<sub>2</sub>e in 2020. The hybridization measure is under evaluation and potential reductions are uncertain at this time.

<http://www.arb.ca.gov/regact/2008/ghghdv08/ghgisor.pdf>

## **High Speed Rail**

The 1.0 MMTCO<sub>2</sub>e estimated GHG reduction attributed to High Speed Rail is unchanged from that identified in the Scoping Plan. This measure is being implemented under an approved bond measure and Federal grant; GHG reductions in 2020 are dependent upon the implementation of High Speed Rail in 2020.

## **Industrial Measures (for sources covered under cap-and-trade program)**

Industrial measures include Refinery Measures and Energy Efficiency & Co-Benefits Audits. The Scoping Plan identified potential reductions of 0.3 MMTCO<sub>2</sub>e in 2020. These measures are under evaluation, so potential reductions are uncertain at this time.

<http://www.arb.ca.gov/cc/energyaudits/energyaudits.htm>

## **Cap-and-Trade**

The cap-and-trade regulation would establish a declining limit (cap) on 85-percent of statewide GHG emissions. The declining cap established in the regulation would ensure that all necessary reductions occur to meet the 2020 target, even if the estimated reductions from other measures fall short.

<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

## **ESTIMATED REDUCTIONS FROM UNCAPPED SOURCES/SECTORS**

### **High Global Warming Potential (GWP) Gas Measures**

The Scoping Plan identified seven high GWP measures with the potential to reduce an estimated 20.2 MMTCO<sub>2</sub>e.

H-1: Motor Vehicle Air/Conditioning was estimated to achieve 0.3 MMTCO<sub>2</sub>e in the Scoping Plan. This regulation is adopted. The Scoping Plan value has been adjusted

proportional to the economic downturn, resulting in an estimated reduction of 0.2 MMTCO<sub>2</sub>e.

H-2: The SF<sub>6</sub> Reductions Non-Utility and Non-Semiconductor Applications measure is adopted. However, SF<sub>6</sub> reductions are not in the ARB inventory and therefore cannot be tracked, so potential reductions are considered uncertain.

H-3: Semiconductor manufacturing was estimated to achieve 0.2 MMTCO<sub>2</sub>e in the Scoping Plan. This regulation is adopted. The Scoping Plan value has been adjusted proportional to the economic downturn, but the resulting change is so small that the reported value (to one decimal place) remains 0.2 MMTCO<sub>2</sub>e.

H-4: Consumer Products was estimated to achieve 0.3 MMTCO<sub>2</sub>e in the Scoping Plan. This regulation is adopted and the ISOR calculated 0.2 MMTCO<sub>2</sub>e.

H-5: High GWP reduction from mobile sources was estimated to achieve 3.3 MMTCO<sub>2</sub>e in the Scoping Plan. The mobile air conditioning component of this measure will be considered in the Advanced Clean Cars measure. The leak test, refrigerant recovery, and Federal ban components are under evaluation and potential reductions are uncertain at this time.

H-6: High GWP reduction from Stationary Sources includes refrigerant management, foam recovery and destruction, SF<sub>6</sub> leak reduction, the use of alternative suppressants in fire protection, and early retirement of residential refrigerators, which combined were estimated to achieve 10.9 MMTCO<sub>2</sub>e of reductions in the Scoping Plan. The estimated reduction identified in the Refrigerant Management Program ISOR is 7.2 which adjusted proportionally to the economic downturn results in an estimated reduction of 5.8 MMTCO<sub>2</sub>e. The ISOR for SF<sub>6</sub> leak reduction identifies a potential reduction of 0.1 MMTCO<sub>2</sub>e. The remaining components of H-6 are under evaluation and potential reductions are uncertain at this time.

H-7: Mitigation Fee on High GWP Gases was estimated to achieve 5.0 MMTCO<sub>2</sub>e in the Scoping Plan. Implementation of a mitigation fee on high GWP gases is not considered feasible at this time.

<http://www.arb.ca.gov/regact/2009/semi2009/semiisor.pdf>

<http://www.arb.ca.gov/regact/2008/cp2008/cpisor08.pdf>

<http://www.arb.ca.gov/regact/2009/gwprmp09/isorref.pdf>

## **Sustainable Forests**

The Scoping Plan estimated that sustainable forest practices could achieve 5.0 MMTCO<sub>2</sub>e of reduction through sequestration. The currently recognized reduction is unchanged from that identified in the Scoping Plan.

<http://www.arb.ca.gov/cc/forestry/forestry.htm>

### **Industrial Measures (sources not covered under cap-and-trade program)**

Industrial measures implemented by sources not covered under cap-and-trade program address emissions from oil and gas extraction and transmission operations. The Scoping Plan identifies a potential reduction of 1.1 MMTCO<sub>2</sub>e for these measures. These measures are under review and potential reductions are uncertain at this time.

<http://www.arb.ca.gov/cc/oil-gas/oil-gas.htm>

<http://www.arb.ca.gov/cc/gas-trans/gas-trans.htm>

### **Recycling and Waste (landfill methane capture)**

The Scoping Plan estimated the potential reduction from landfill methane capture as 1.0 MMTCO<sub>2</sub>e. The ISOR estimated the potential reduction to be 1.5 MMTCO<sub>2</sub>e.

<http://www.arb.ca.gov/regact/2009/landfills09/isor.pdf>

**Attachment**  
**2020 Statewide Greenhouse Gas Emissions and the 2020 Target**

	<b>Forecasted Statewide GHG Emissions (MMTCO<sub>2</sub>e)</b>
<b>2020 Baseline (2008 Scoping Plan)</b> Pre-economic downturn, Business-As-Usual	<b>596</b>
	Economic Downturn ↓
Recalculated 2020 Baseline from the Scoping Plan After economic downturn, Business-As-Usual	<b>545</b>
Measures newly incorporated into inventory (baseline)	
Pavley (vehicles model-years 2009-2016)      26 MMTCO <sub>2</sub> e	
<u>Renewables Portfolio Standard (12%-20%)</u> 12 MMTCO <sub>2</sub> e	Measures incorporated into baseline ↓
38 MMTCO <sub>2</sub> e	
<b>2020 AB 32 Baseline (adjusted in 2010)</b>	<b>507</b>
Reductions Necessary <u>to Achieve the 2020 Emissions Target</u> 80 MMTCO <sub>2</sub> e	Needed Reductions ↓
<b>2020 Emissions Target</b>	<b>427</b>