

## High Efficiency, Zero Emission, Hydrogen Fuel Cell Electric Vehicles Northeast Deployment to Begin 2015

Automakers are now making plans to comply with a Zero-Emission Vehicle (ZEV) Mandate program in effect for California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont. The program requires large-volume automakers that sell more than 10,000 vehicles in California annually to sell approximately 1.413 million ZEVs between 2018 and 2025.<sup>1</sup> Automakers are mandated to sell over 500,000 ZEVs by 2025.<sup>2</sup> Ten percent of state departments’ light-duty fleet purchases must be ZEVs by 2015, increased to 25 percent by 2020. Automakers have indicated that they plan to introduce hydrogen FCEVs, some as soon as 2015.<sup>3,4</sup>

ZEVs include hydrogen fuel cell electric vehicles (FCEVs) and plug-in electric vehicles (PEVs), including both pure battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). Plug-in hybrids like the Chevy Volt are not fully counted as ZEVs and only get partial credits on their all-electric range because they incorporate an onboard internal combustion engine.<sup>5</sup> Since there is very little infrastructure for these vehicles it is still questionable which technology will take the lead in meeting the ZEV requirements.

A 2012 Preliminary Study conducted by the National Renewable Energy Laboratory (NREL) projects deployment of approximately 117,000 to 205,000 FCEVs in the Northeast region by 2025.<sup>6</sup>

### Zero-Emission Vehicle (ZEV) Sales, as Mandated by the 2012 Amendment<sup>7</sup>

Year	Transitional ZEVs (Plug-In Hybrids)	ZEVs (Electric and/or Hydrogen Fuel Cells)	Total ZEV Sales Requirements <sup>8</sup>
2018	61,000	17,000	78,000
2019	75,000	33,000	108,000
2020	89,000	49,000	138,000
2021	102,000	61,000	163,000
2022	116,000	75,000	191,000
2023	131,000	87,000	218,000
2024	147,000	99,000	246,000
2025	162,000	109,000	271,000
	<b>883,000</b>	<b>530,000</b>	<b>1,413,000</b>

The expected result of this deployment will be high efficiency vehicles that require less fuel and produce very low or zero tailpipe emission. Economic activity to produce and maintain the vehicles and refueling stations is also expected.<sup>9</sup>

<sup>1</sup> Only the largest automakers are subject to the mandate: BMW, Daimler AG, Ford, General Motors, Honda, Hyundai, Kia, Mazda, Nissan, Toyota, and Volkswagen.

<sup>2</sup> Based on a 14.5 million unit U.S. light-duty vehicle market according to the U.S. Department of Energy (DoE) Energy Efficiency and Renewable Energy (EERE).

<sup>3</sup> Cars.com; “Hyundai Plans Tucson Fuel-Cell for 2015;” <http://blogs.cars.com/kickingtires/2013/05/hyundai-plans-tucson-fuel-cell-for-2015.html>; May 20, 2013

<sup>4</sup> Auto blog green; “2015 Toyota hydrogen fuel cell car will have 300-mile range;” <http://gas2.org/2013/07/02/toyotas-2015-fuel-cell-car-aims-for-300-mile-range/>; July 2, 2013

<sup>5</sup> Car and Driver; “Zero-Emission Vehicle Regulations Get Tougher for 2012;” <http://www.caranddriver.com/features/zero-emission-vehicle-regulations-get-tougher-for-2012>; January 2011

<sup>6</sup> Northeast Region: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, and New York

<sup>7</sup> U.S. Department of Energy Efficiency & Renewable Energy; “Fact #77: California Zero-Emission Vehicle Mandate is Now in Effect;” [http://www1.eere.energy.gov/vehiclesandfuels/facts/2013\\_fotw771.html](http://www1.eere.energy.gov/vehiclesandfuels/facts/2013_fotw771.html); March 18, 2013

<sup>8</sup> Equals Transitional ZEVs (Plug-In Hybrids) plus ZEVs (Electric and/or Hydrogen Fuel Cells)

<sup>9</sup> The existing hydrogen and fuel cell industry in the Northeast is comprised of almost 1,200 supply chain companies, \$1.1 billion in revenue and investment, and over 5,600 full- and part-time jobs. This data does not include full contribution from the hydrogen and fuel cell transportation industry which would increase with market deployment of FCEVs.