California’s Ultra Low Carbon Transportation Policy Landscape

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Council of State Governments
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The Imperative

Reductions from:
- Energy Efficiency
- Electricity Decarbonization
- Smart Growth
- PV Roofs
- Biofuels
- Non-Energy, Non-CO₂
- Electrification

Baseline Emissions

1990 Emissions Level

Remaining Emissions

80% below 1990 Level (90% below 2050 Baseline)

2007 2010 2015 2020 2025 2030 2035 2040 2045 2050

Mt CO₂e

The Promise of Dollar a Gallon Fuel

- Gasoline forecast (High)
- Gasoline forecast (Low)
- Electricity forecast (High)
- Electricity forecast (Low)

* an "eGallon" is the cost of fueling a vehicle with electricity compared to a similar vehicle that runs on gasoline.

Data source: Energy Information Administration
The ZEV Program

who killed the electric car?
The ZEV Program

REVENGE OF THE ELECTRIC CAR
Incentives
The Low Carbon Fuel Standard
The Death Duck Spiral

Energy Death Duck

Pounds of Duck Lo Mein/kWh

2017 2019 2021 2023 2025 2027 2029 2031

A Fine Spring Day

< Peak Duck Power

No Drain Plug Outcome

California Energy Markets, April 1, 2014
The Actual Duck

Figure 2: The duck curve shows steep ramping needs and overgeneration risk

Net load - March 31

Source: CalISO
Integrating Wind

Actual Wind Output as a Percentage of ERCOT Load

Time

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00

(Wind Output/Load)\%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Actual Integrated Wind Output  Actual Load
Integrating Wind

Dallas/Fort Worth

San Diego

Source: EV Project, Q2 2014 Report
Does San Diego Have the Smart Grid of Tomorrow?

Source: Electric Power Research Institute
Or the Smart Phone of Yesterday?

Images: General Motors – Volt Android App; Nissan Motors – Leaf Charging Timer
The Long-term Importance of Smart Charging

Smart Charging as a Grid Resource

Source: SDG&E
Reversing the Death Spiral

Senate Bill No. 626

CHAPTER 355

An act to add Section 740.2 to the Public Utilities Code, relating to electrical infrastructure.

[Approved by Governor October 11, 2009. Filed with Secretary of State October 11, 2009.]

LEGISLATIVE COUNSEL’S DIGEST

SB 626, Kehoe. Electrical infrastructure: plug-in hybrid and electric vehicles.

Under existing law, the Public Utilities Commission (PUC) has regulatory authority over public utilities, including electrical corporations and gas corporations, as defined. Existing law requires the PUC, in cooperation with the State Energy Resources Conservation and Development Commission (Energy Commission), the State Air Resources Board (state board), air quality management districts and air pollution control districts, electrical and gas corporations, and the motor vehicle industry, to evaluate and implement policies to promote the development of equipment and
Integrating Solar

Source: E3
A shift in rebate debate
Bill would cap income eligibility for green car subsidies

By Jerry Heiss

California wants 1.4 million pre-recession vehicles on the road by 2021 — more than 3 times the number now.

Nearly half of California residents who get rebates for Tesla’s electric Model S sedan earned at least $80,000, according to a state survey of buyers. Above, a Model S at Tesla’s Santa Monica showroom.

Zer-o-omission vehicle rebates

<table>
<thead>
<tr>
<th>Rebates</th>
<th>May 2011</th>
<th>May 2012</th>
<th>May 2013</th>
<th>May 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.9%</td>
<td>10.7%</td>
<td>10.3%</td>
<td>10.1%</td>
<td></td>
</tr>
<tr>
<td>$12,400</td>
<td>$12,600</td>
<td>$12,800</td>
<td>$13,000</td>
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<tr>
<td>$7,900</td>
<td>$8,100</td>
<td>$8,300</td>
<td>$8,500</td>
<td></td>
</tr>
<tr>
<td>$42,456</td>
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</tbody>
</table>

Nearly 60% of the state rebates went to households earning $50,000 or more, according to a state survey of buyers. Nearly half of those getting rebates for Tesla’s premium electric sedan earned at least $80,000.

With incentives and taxable rebates, the state is giving rebates to buy new vehicles — state laws require that the rebates go to people who are low-income.

Shaping, Zero-Emission Vehicle Project, <i>La Tapatia</i>

**Temporary VA fix could be permanent**

Plan for veterans’ care would cost taxpayers at least $9 billion a year if extended past the 3-year trial.

By Lisa Mascaro

WASHINGTON — When it passed legislation to fix the troubled veterans’ affairs department, Congress managed to do two things: It gave veterans what they wanted without creating a new budgetary program and it held off for a year. The $13 billion measure, which President Obama supports, is due to expire on Oct. 1. Democratic lawmakers, led by House Veterans’ Affairs Committee Chairman Rep. Bob Filner, D-San Diego, plan to push legislation before the end of the session, which is expected to be short. The law provides $13 billion for veterans’ care, including a $13 billion increase for the VA. The law, which was passed last year, included a provision that would make the funding permanent in Washington. The law also includes a provision that would allow veterans to use their own money to pay for care at the VA.

**Power struggle in Syria grows ever more convoluted**

As the war in Syria enters its third year, the U.S. and its allies are increasingly divided over how to respond to the crisis.

By Lisa Mascaro

The U.S. has been providing military equipment and training to Syrian rebels, but it is not clear how effective they are in the fight against the Islamic State group. The U.S. has also been providing military equipment to the Syrian government, but it is not clear how effective that is either.

The U.S. and its allies are increasingly divided over how to respond to the crisis.

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Greenhouse Gas Emissions for Electric and Plug-In Hybrid Electric Vehicles

The only greenhouse gas (GHG) emissions from electric vehicle are those associated with electricity production. Shown below are the grams of carbon dioxide (CO₂) per mile for your region of the country.

Try another vehicle:
Zip Code: 98101  Year: 2014  Vehicle: BMW i3 BEV

Your CO₂ Emissions Rates

Vehicle: BMW i3 BEV
Zip Code: 98101 (Seattle, WA)
Tailpipe: 0 g/mile
Total: 120 g/mile

See your results
Today’s Lifecycle

Greenhouse Gas Emissions, CO2eq/km

- Use
- Production

- Baptista 2010 - conventional
- Baptista 2010 - electric
- EPA 2013 - conventional
- EPA 2013 - electric
- Hawkins 2012 - conventional
- Hawkins 2012 - electric
- Ma 2012 - conventional
- Ma 2012 - electric
- Michalek 2011 - conventional
- Michalek 2011 - electric
- Notter 2010 - conventional
- Notter 2010 - electric
Charging Level Matters

Level 1 =
- 1.2 kW

Level 2 – Low =
- 3.3 kW

Level 2 – High =
- 6.6-7.2 kW
Sales

National Sales:
Cumulative 2014: 66,138
Cumulative 2011-2014: 234,502
July: 11,392

California Sales:
Cumulative 2011-2014: 97,423