Comments of the Natural Resources Defense Council on the June 26, 2013 Workshop on Inputs and Methods for Transportation Energy Demand Forecasts

California Energy Commission
DOCKETED
13-IEP-1L
TN 71585
JUL 12 2013

Docket Number 13-IEP-1L

Submitted by:
Max Baumhefner

I. Introduction

The Natural Resources Defense Council ("NRDC") appreciates the opportunity to offer these comments on some of the issues discussed at the California Energy Commission's ("CEC" or "Energy Commission") 2013 Integrated Energy Policy Report ("IEPR") "Workshop on Inputs and Methods for Transportation Energy Demand Forecasts" held on June 26, 2013. NRDC is a nonprofit membership organization with a long-standing interest in minimizing the societal costs of the reliable energy services that Californians demand. We represent our nearly 100,000 California members' interests in receiving affordable energy services and reducing the environmental impact of California's energy consumption.

NRDC commends Energy Commission staff for their extensive efforts to conduct the transportation energy demand and fuels market assessment and forecasts. . The IEPR serves an extremely valuable purpose, informing California's critical long-term energy planning decisions with necessary information, with a goal of conserving resources and protecting the environment and public safety while also enhancing reliability and the economy.

II. NRDC Recommends the Commission Update Its Vehicle Technology Cost Inputs to Reflect the Latest, Best Available Data

We note that NRDC serves currently as a member of the National Academies of Science Committee (Phase 2) assessing technologies and costs for improving light duty-vehicle efficiency.[1] The work from this committee will be a new report, updating and building upon earlier committee reports that included or evaluated technology costs

---

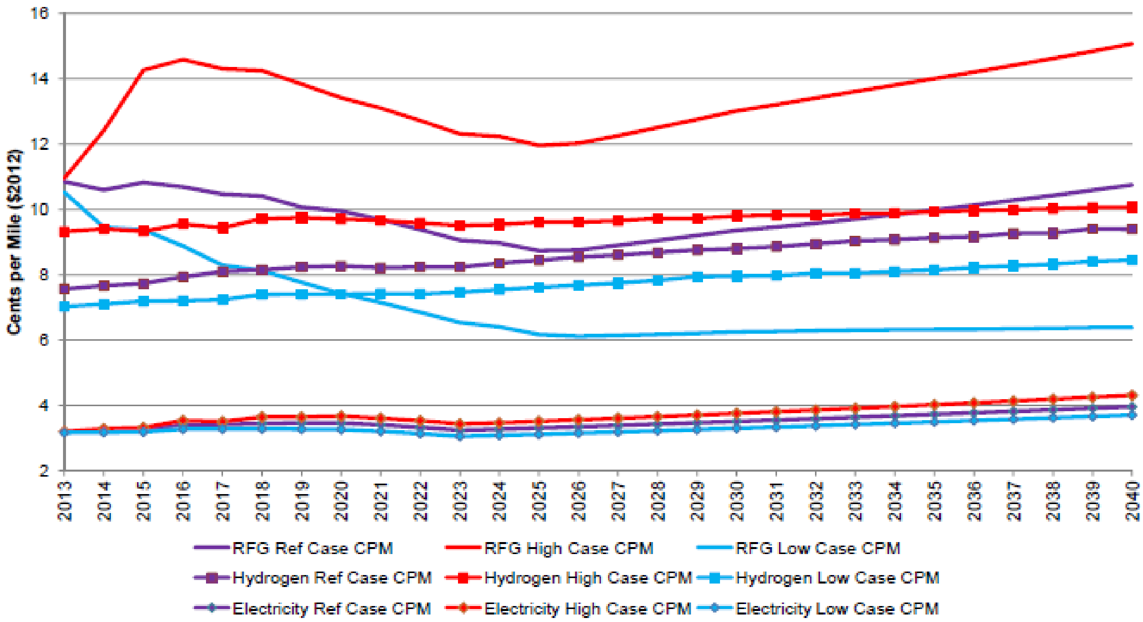
[1] http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=49432

(NAS 2009, 2011, 2013).[2] Much primary research however, has been conducted over the past several years of rulemakings to develop the National Program Greenhouse Gas Emissions and Fuel Economy Standards, harmonized together with California's Advanced Clean Cars Rulemaking on GHG emissions. Generally, this body of work built on many of the areas the NAS committee's identified as improvements to technology costing approaches. Through the joint technical analysis, the agencies have conducted numerous analyses to evaluate costs and technology potential, including computational vehicle simulation modeling and "tear-down" studies that evaluate the costs of each component of a technology. These cost estimates and studies are an improvement to the earlier NAS reports and should be among the primary sources for the CEC's Transportation IEPR technology cost inputs. We encourage CEC to work with the U.S. EPA and DOT, together with the Air Resources Board, to obtain the materials and spreadsheets utilized for the rulemakings.

III. NRDC Respectfully Suggests the Commission Convert Cost-Per-Mile Forecasts to Cost-Per-Gasoline-Gallon Equivalents

The chart on slide 17 of the presentation entitled, "Crude Oil and Transportation Fuel Price Cases for the 2013 IEPR Inputs and Methods for the Transportation Energy Demand Forecast," reproduced below, displays the price of various transportation fuels in "cents-per-mile," allowing for comparison between fuels.

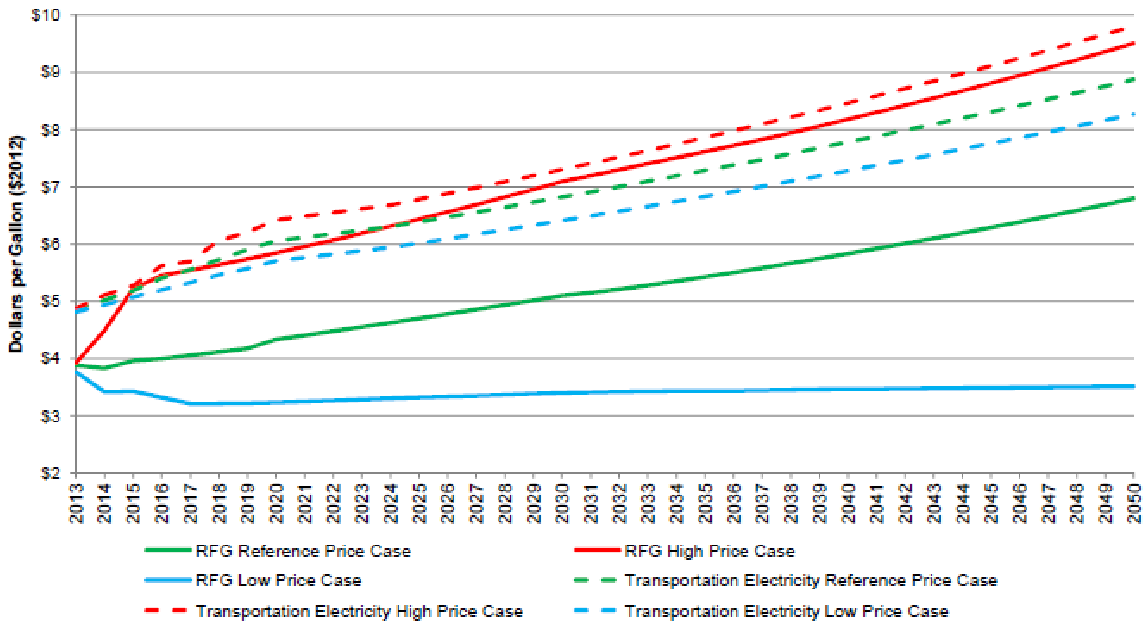
[2] NAS (2013), Transitions to Alternative Vehicles and Fuels, NAS (2011), *Assessment of Fuel Economy Technologies for Light Duty Vehicles*, NAS (2009), *America's Energy Future: Technology and Transformation*.



Unfortunately, no one buys transportation fuels by the mile; the most salient unit is "dollars-per-gallon" of gasoline. In light of this fact, the Department of Energy recently introduced the "eGallon," which displays the cost of driving on electricity in "dollars-per-gasoline-gallon equivalent."[3] This makes clear and comprehensible the significant savings available from driving on electricity; in California, an "eGallon" costs $1.51, compared to a gallon of gasoline at $3.98.[4] The Department of Energy's assumptions, included as "Attachment A," could be adapted by the Commission for use in the IEPR. Likewise, the "cents-per-mile" data displayed in the chart above could easily be converted into "dollars-per-gasoline-gallon equivalent" for all fuels. Comparing the cost of all transportation fuels in a unit that is readily understood and meaningful will help inform the decisions of California's policy makers, and improve the overall utility of the IEPR.

The same presentation contains slides that display the price of various fuels in "dollars-per-gallon," but does so based on energy content. Displaying the price of fuels based on energy content is appropriate for developing model inputs, but could easily confuse consumers of the final IEPR report. For example, slide 15 of the same presentation shows the current price of electricity in California at $5 per gallon, more than three times the Department of Energy's cost-of-driving-based "eGallon."

[3] http://energy.gov/maps/egallon
[4] *Ibid*.



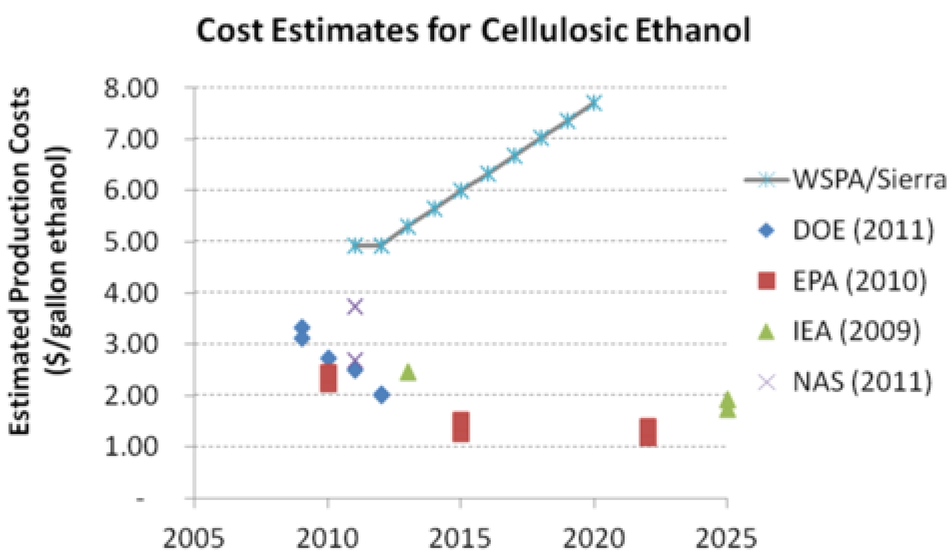
This could cause many readers to conclude that data provided by the California Energy Commission and the Department of Energy are contradictory. NRDC respectfully suggests the Commission omit energy-based units from the final IEPR report, and convert the cost-per-mile data it has already calculated to "dollars-per-gasoline-gallon equivalents" to prevent confusion and to allow for meaningful comparisons by policy-makers, stakeholders, and the public.

III. NRDC Requests that the CEC Work with a Broader Array of Stakeholders and Experts when Evaluating the Impacts of Carbon Prices and Other Fuel Requirements.

In the last CEC Transportation IEPR process, NRDC submitted over thirty pages of comments, much of which expressed concerns about the proposed methodology and the lack of data or study around the treatment on alternative fuel production costs and prices as well as the LCFS credit market.[5] We note that the preliminary analysis by CEC was ultimately not incorporated into the final IEPR, due to the number of questions it raised among stakeholders which included the alternative fuels industry itself. However,

[5] http://www.energy.ca.gov/2011_energypolicy/documents/2011-09-09_workshop/comments/NRDC_Comments_on_the_2011-2012_IEPR_Transportation_Energy_Forecasts_TN-62312.pdf; http://www.energy.ca.gov/2011_energypolicy/documents/2011-11-14_workshop/comments/Natural_Resources_Defense_Council_2011-11-24_TN-62987.pdf

the Western States Petroleum Industry proceeded to utilize and present this initial staff analysis - misleadingly – as the Energy Commission's report, formulating the basis for its subsequently flawed studies attacking the LCFS.[6] For example, the cost estimates for cellulosic ethanol are shown below and compared a number of other government agency reports.



Source:
http://switchboard.nrdc.org/blogs/smui/oil_industry_attacks_on_altern.html

Going forward, we respectfully urge CEC to ensure it receives balanced input from the respective alternative fuels industries, companies, expert stakeholders, and academics. The IEPR's cost or price forecasts for alternative fuels should be based on a range of available, peer-reviewed scientific literature and government studies which are readily available.

In CEC's presentation from June 26, 2013, entitled "Crude oil and transportation fuel price cases for the 2013 IEPR," staff provided initial assumptions that carbon policies are automatically price adders. In the case of the LCFS, the effects being born out in the marketplace are more complex, since for petroleum gasoline and diesel providers the LCFS serves as an additional cost on their higher-carbon products while for

[6] http://switchboard.nrdc.org/blogs/smui/oil_industry_attacks_on_altern.html

low carbon fuel providers, it serves as an incentive to produce more. Low carbon fuel providers would need to pass through some of the credit value in order to increase their alternative fuel sales. We also note that electric utilities are required by the program to pass through all LCFS credit value to electric transportation customers. Thus, in this case it is very clear that the LCFS is work as a fuel price adder but *decreases* electricity costs for those consumers. While the LCFS credit market is relatively new, it is likely with competition in this market some costs and some savings will both be passed through to consumers. The degree to which the industries pass through the LCFS credit cost or value, together with additional innovation spurred that tends to lower alternative fuel costs, should be accounted for if CEC attempts to model fuel price impacts. We believe it is too simplistic to simply consider a LCFS price adder across the board for all fuels.

We also urge CEC to consider overall fuel costs to Californians and not simply fuel prices, which are on a volume basis. This is particularly true since consumers will be purchasing less fuel volume overall as a result of AB32. The IEPR should reflect the overall benefits and costs when evaluating – presumably – the AB32 transportation sector carbon regulations. Much of this analysis has already been conducted during the regulatory development of each policy measure as well as through the peer review economic studies. Generally, we note that AB32 transportation policies, overall, will help shrink consumer fuel bills by approximately $50 billion over the next decade – roughly $1,000 per household by 2022 -- through improved efficiency of vehicles, better land use planning, and greater fuel diversity, as well as transportation reinvestments from auction proceeds longer term.[7]

Finally, CEC should also evaluate the economic effects from diversifying our transportation energy sources. Over 30 gasoline price spikes occurred in California since 2006, with most of this driven by volatility in world crude oil prices followed by refinery maintenance and unplanned refinery outages. Expanding the number of fuel providers and diversifying the energy sources can have positive economic spillover benefits due to reduced exposure to price volatility. CEC can also incorporate – as part of this evaluation - the U.S. Department of Energy's estimate that oil dependency cost our nation about

[7] These figures are based on the individual rulemaking documents from the Initial Statement of Reasons for the Advanced Clean Car Standard, LCFS, SB375, and allowance price forecasts estimated based on Resources For the Future (http://www.rff.org/RFF/Documents/RFF-DP-12-23.pdf)

$500 billion in 2011 alone, and approximately $2 trillion over the past five years due to reduced GDP growth, economic dislocation, and wealth transfer to oil producing countries.[8] Our state's carbon reduction policies will go a long way to helping reduce this dependency.

IV. NRDC Recommends CEC Consider the ICF Report Evaluating LCFS Compliance out to 2020 as an Important Input to Its IEPR Analysis. [9]

The recent June 2013 report conducted by ICF and commissioned by a number of alternative fuel industry and investor groups demonstrates several likely compliance scenarios. This report will be relevant for CEC to consider as input to its IEPR analysis and scenarios. We believe the information will be helpful as it draws upon updated market information and trends from companies currently contributing to LCFS compliance.

In contrast, we note our concerns regarding the flawed study by the Western States Petroleum Association report, conducted by Boston Consulting Group, that was reviewed by several organizations including NRDC. [10] This study on AB32 and the LCFS also recently underwent formal peer review by an independent panel of scientific experts, who ultimately rebuked the study and stated "we are concerned about some of its assumptions, methodologies and results."

---

[8] David L. Greene, Roderick Lee, and Janet L. Hopson, "OPEC and the Costs to the U.S. Economy of Oil Dependence: 1970-2010," and "Low Carbon Transportation: A Crucial Link to Economic and Energy Security."

[9] http://www.caletc.com/LCFSReport/

[10] http://switchboard.nrdc.org/blogs/smui/scientific_review_points_to_fa.html

IV. Conclusion

Thank you for the opportunity to comment on the "Workshop on Inputs and Methods for Transportation Energy Demand Forecasts" and for considering our recommendations.

Sincerely,

Max Baumhefner
Attorney, Clean Vehicles & Fuels

Simon Mui, Ph.D.
Director, California Vehicles & Fuels

eGallon

How much does it cost to drive an electric vehicle the same distance you could go on one gallon of gas?

The average American measures the day-to-day cost of driving by the price of a gallon of gasoline. In other words, as the price of gasoline rises and falls, it tells consumers how much it costs to drive. If you drive past a gas station, watch the evening news or read the newspaper, you'll see the price of a gallon of gas posted. But for electric vehicle (EV) owners -- who generally fuel at home -- it's hard to measure just how much it costs to drive. To help current and potential EV drivers better understand the cost of driving an EV, the Energy Department created a metric called the "electric gallon" -- or "eGallon." The eGallon represents the cost of driving an electric vehicle (EV) the same distance a gasoline-powered vehicle could travel on one (1) gallon of gasoline.

Why do we need an eGallon?

The cost of driving an EV depends on the cost of electricity. Generally, consumers think about the cost of electricity in the context of monthly electricity bills, not discrete units such as kilowatt hours. Because of this it is hard for most consumers to make the jump from the cost of electricity per kilowatt hour, to the "dollars-per-mile" cost of fueling an EV. The eGallon does this for them by providing a metric that is easily comparable to the traditional gallon of unleaded fuel -- the dominant fuel choice for vehicles in the U.S.

eGallon Methodology

The eGallon is measured as an "implicit" cost of a gallon of gasoline. It is calculated by multiplying the average U.S. residential electricity price (EP) by the average comparable passenger car adjusted combined fuel economy (FE) by the average fuel consumption of popular electric vehicles (EC), as follows:

$$eGallon\ (\$/gal) = FE * EC * EP$$

where

FE = the average comparable passenger car adjusted combined fuel economy, miles/gallon

EC = the average electricity consumption (kWh/mi) of the top 5 selling PEVs in the U.S.[1],

and

EP = the average U.S. electricity price, $/kWh.

For instance, if the average comparable[2] 2012 passenger car adjusted combined fuel economy, mi/gal[3] is 28.2 mi/gal and the average efficiency for the top selling U.S. EV brands in 2012[4] is .35kwh/mi, the price of an e-gallon would be:

*28.2 mi/gal * .35 kWh/mi * .1233 $/kWh =* ***$1.22/gal***

In other words, it costs about $1.22 to drive an EV the same distance that a vehicle powered by an internal combustion engine (ICE) can go on a gallon of gasoline.

As the EV market expands and fuel efficiency of ICE vehicles changes, eGallon numbers can be revised to provide consumers with more current information that will help them inform their purchasing and driving decisions.

Helping consumers make smart choices

The eGallon will allow consumers to make better choices regarding the vehicles they drive. It does this by succinctly informing drivers of the difference between gasoline and electric fuel costs. In this way, the eGallon is a valuable tool for communicating one important benefit of electrification: cheap, stable fuel prices.

---

[1] The top 5 EVs that can execute the UDCC drive cycle on pure electricity or the number of EV models that would be required to comprise 80 percent of said EV sales in the U.S. market for the previous year

[2] "Comparable" is defined as those vehicles in the size classes in which EVs are available. For model year 2012, the harmonic mean fuel economy of small (28.8 mpg, 25.1% of cars sold) and midsize (27.5 mpg, 21.7% of cars sold) cars is 28.2 mpg.

[3] EPA Fuel Economy Trends Report, March 2013

[4] This includes .35 kWh/mi (Volt), .34 (Leaf), .38 (Model S), .32 (Focus), and .33 (Active E). All fuel economy numbers are model year 2012 according to fueleconomy.gov, except Active E, for which fueleconomy.gov provides only 2011 fuel economy numbers.

Table 1. Plug Electric Vehicle (PEV) fuel economy.

PEV Model	kWh/100 Miles Combined[1]
Chevrolet Volt	35
Nissan Leaf	34
Tesla Model S	38
Ford Focus EV	32
BMW Active E (2011)[2]	33
Average[3]	35

1. Model Year 2012 Fuel Economy Guide. http://www.fueleconomy.gov/feg/pdfs/guides/FEG2012.pdf
2. 2012 BMW Active E data were not available in the Model Year 2012 Fuel Economy Guide. Instead, the 2011 data from the 2011 Guide was used.
3. Average (mean). (35 + 34 + 38 + 32 + 33) / 5 = 35 average kWh per 100 miles.

Table 2. Vehicle size class fuel economy.

EPA Size Class	Miles per Gallon Combined[1]	Sales %
Small Car	28.8	25.1%
Midsize Car	27.5	21.7%
Average[2]	28.2	n/a

1. EPA Fuel Economy Trends Report. http://www.epa.gov/oms/fetrends.htm#summary
2. Average (harmonic mean). (.251 + .217) / (.251/28.8 .217/27.5) = 28.2 average mpg.

Table 3. Weekly Retail Gasoline Price (12/10/12).

	Weekly Retail Gasoline (Dollars per Gallon, Including Taxes)[1]
Gasoline – All Grades	3.42

1. U.S. Energy Information Administration. Petroleum & Other Liquids. http://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_w.htm 12/10/12. Most recent retail price data available.

Table 4. Average residential retail price of electricity September 2012.

Sector	Average Retail Price of Electricity (cents per kilowatt-hour)[1]
Residential	12.33

1. U.S. Energy Information Administration. Electricity Data. http://www.eia.gov/electricity/data.cfm Sales, Revenue & Prices. Retail Price to Customers. Table 5.3. Average Retail Price of Electricity to Ultimate Customers: Total by End-Use Sector, 2003 – September 2012 (Cents per Kilowatt-hour). Most recent residential price data available.