



State of Oregon Department of Environmental Quality

Written Comments on Methodology November 2016, Clean Fuels Program 2017 Rulemaking Advisory Committee Meeting

Commenters

Renewable Products Marketing Group (RPMG)

Clean Energy

Oregon Fuels Association, Jubitz Corporation, Carson Oil Company, Coleman Oil Company

Western States Petroleum Association

- Attachment: Oregon Clean Fuels Program Update, Nov. 2016, The Boston Consulting Group



November 11, 2016

Ms. Cory-Ann Wind
Oregon Department of Environmental Quality
Clean Fuels Program
811 SW Sixth Avenue
Portland, OR 97204-1390

RE: RPMG Comments on Oregon's Clean Fuels Program - November 2, 2016 Advisory Committee Meeting Agenda Item C, Implementing the Forecasted Fuel Supply Deferral

Dear Cory,

We would like to thank you for giving Renewable Products Marketing Group (RPMG) the opportunity to serve on the Oregon Clean Fuels Program (CFP) Advisory Committee as part of this rulemaking process. We are supportive of DEQ's efforts to develop a scientifically robust and sustainable program to reduce the carbon intensity of Oregon's transportation fuels. This first Advisory Committee meeting was an introduction to the important topic of Cost-Containment, and RPMG will prepare additional specific comments on that issue in a subsequent letter. Per your request, we have focused this letter on the issues surrounding Agenda Item C – Implementing the Forecasted Fuel Supply Deferral and the method as outlined in the ICF Memorandum "Task 1: Proposed Methodology for Fuel Supply Forecast."

In order to conduct any potential program deferral as part of the existing CFP regulation, DEQ will need to look ahead and annually monitor Oregon's fuel supply to assess whether there is an adequate supply of lower carbon fuels to meet a particular year's standards. This is an exercise that has great ramifications to the program, fuel suppliers and obligated parties. We note that having a consistent regulatory regime surrounding the fuel supply itself is a cost-containment mechanism.

As proposed by DEQ there would be a four step process outlined for comment:

1. Conducting a forecast;
2. Evaluating if a deferral is warranted;
3. Crafting the deferral; and
4. Implementing the deferral.

The four steps laid out in the Attachments are reasonable, logically ordered and repeatable in a consistent manner. RPMG would like to provide a few comments on each stage individually.

Conducting a Forecast

RPMG appreciates that the methodology, its assumptions and the data used will be publicly available. RPMG additionally recommends that prior to this first actual forecast being completed that the initial methodology, assumptions and actual data sets used, be provided to the Advisory Committee since it is currently assembled and tasked with assisting DEQ. Having stakeholders be able to understand what is being looked at can add value to the process. Likewise the associated

“tool” being developed for future DEQ forecasts should be available to the public such that independent analysis can be performed.

Deferral Evaluation

Per DEQ Agenda Item C document, if DEQ forecasts a shortfall in clean fuel credits, and the shortfall is greater than 5 percent of the credits needed to comply, DEQ shall determine whether a forecasted deferral is needed by considering the following:

- a) Timing of fuel availability;
- b) Timing, duration and magnitude of the estimated shortfall; and
- c) Any other information DEQ may need in the analysis.

These considerations are appropriate for determining whether to issue a forecasted fuel supply deferral. DEQ should not conclude that additional supplies are not available without an associated market sensitivity analysis. The same logic holds for an estimated duration of shortfall. The point is that fuel markets are relatively dynamic, and only when there is a systemic shortfall should a lengthy deferral be issued. Likewise, any analysis of fueling and distribution infrastructure or carbon intensities should have a forecasting element, and should not just be a static snapshot.

Issuing a Deferral

If a shortfall of greater than 5% is forecasted, the timing of such a deferral notice is important. If DEQ were to issue a deferral, there should be sufficient lead time to allow producers and importers to be able to adjust their supply chains accordingly. A short, or relatively short notice would be an additional market disruptor.

Deferrals should only be prospective and should clearly articulate the standard(s) that may be deferred. RPMG supports the concept that a forecasted deferral would only be issued for an entire class of fuels, i.e. gasoline, diesel or both. Granting a deferral to an individual regulated party or an individual fuel would provide an unlevel marketplace.

Deferral Implementation

Agenda Item C notes that rulemaking actions would need to occur to institute a deferral. RPMG understands the need for process. RPMG believes that a fuel standard deferral by its nature is a temporary action. Without the promise of the regulation getting back on track, DEQ risks that a single deferral may cause an annual ripple impact to the market. Such an effect could cause supplies of lower carbon fuels to not catch up as investments could also be deferred.

RPMG recommends that an annual schedule of deadlines and process details be developed such that the market can be certain if a deferral is to be issued, it would be by a set date annually and would include a pre-determined end date. This regularity would provide additional certainty to the market.

ICF Memorandum “Task 1: Proposed Methodology for Fuel Supply Forecast”

This methodology is understood to be applicable to the annual Fuel Forecasted Fuel Supply Deferral. Although the forecast is conducted for an abbreviated timeframe (one year), the tool itself is being developed for the duration of the program and repeated use. For this reason, the underlying assumptions of the forecast and the functionality of the tool must accommodate a broader frame of reference. One such area not listed in the outline of the methodology are future modifications to state fuel mandates and blend ratios of liquid biofuels. The tool must accommodate changes to state-wide fueling infrastructure for increases to blending ratios, example E15, B10 and beyond.

A full consideration of all other questions raised in the November 2nd meeting should be thoroughly addressed. Such as:

- “How does fuel that currently goes to California get incorporated into the forecast?”

- The deferral should be designed in a way that can still provide market certainty so that credits can still be monetized and the program maintains a price signal.
- The analysis and deferral mechanism should consider both short term fluctuations and the long term compliance needs of the program.
- How will banked credits be dealt with in the forecast? Don't automatically assume that banked credits will be available.
- How should co-processing of biological feedstocks at petroleum refineries be incorporated?
- How could the City of Portland's new policy on fossil fuel infrastructure be addressed?
- How often will the tool be updated?
- It would be nice to design the forecast for use in other studies, programs.
- Can electricity use be analyzed at a finer resolution than statewide? i.e. utility districts."

RPMG stands ready to assist DEQ, in any way we can, and will continue to engage in this important rulemaking effort.

Sincerely,



Jessica Hoffmann
Regulatory and Compliance Manager

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Ryan Kenny
Senior Public Policy and Regulatory Affairs Advisor



November 11, 2016

Ms. Cory-Ann Wind
Rule Coordinator, Oregon Clean Fuels Program
Department of Environmental Quality
811 SW 6th Avenue
Portland, OR 97204

RE: COMMENTS CONCERNING CLEAN FUELS PROGRAM

Dear Ms. Wind:

As a member of the Oregon Clean Fuels Program Advisory Committee, we were pleased to participate in the recent first meeting mostly focused on outlining the systematic approach for the Forecasted Fuel Supply Deferral and cost containment mechanisms. Clean Energy would appreciate having our comments below considered as this process moves forward.

As North America's largest provider of natural gas and renewable natural gas (RNG) transportation fuel, we have a deep understanding of the growing marketplace for renewable natural gas vehicle fuel, and our portfolio includes 589 stations nationwide. RNG is a popular and environmentally beneficial alternative to gasoline and diesel fuels. We source RNG from over 15 production facilities in North America - the majority of which is sold under the brand name "Redeem" and classified as a cellulosic biofuel under the federal Renewable Fuel Standard. Our notable Redeem customers include UPS, Kroger and Ryder.

RNG is often sourced from the decomposition of organic materials from agriculture, food waste, landfills and wastewater treatment plants. After it is treated to remove CO₂ and other contaminants, it meets gas pipeline quality standards and can be injected into the gas grid and sold through the pipeline for power generation, heat, industrial use or transportation fuel.

Please consider:

- There was considerable pushback at this meeting from the obligated parties when a discussion ensued for a proposal to allow early adopters of alternative fuels to generate credits under the Clean Fuels Program. **We want to emphasize in no uncertain terms our strong position that early adopters SHOULD be able to generate credits.** We believe it is counterproductive and backward for DEQ and any stakeholder to take a position that early adopters don't count.

The argument from obligated parties was that electricity, CNG, LNG, propane and other opt-in fuels were not included in the baseline calculation, a similar approach they pointed out taken in California. As such the obligated parties argued that the fuel associated with those early adopters before the California program was implemented does not represent a decrease in carbon intensity relative to

the baseline. They believe that these opt-in fuels should not be able to generate credits unless they invest in an even lower carbon alternative. We disagree and believe early adopters should be rewarded for switching from diesel to a lower carbon option in the first place, and be allowed to generate blue gas credits. This gets fleets introduced to the Program and further incentivizes them to achieve more reductions (and revenue) through the switch, in our case, to RNG.

- We were pleased ICF presented methodology behind the tool that would be used to forecast the total available supply of alternative fuel relative to the available infrastructure in Oregon. We agree that ICF's methodology should utilize a fuel supply component, a fuel demand component, and a carbon intensity component. However, this tool in its current form lacks an economic impact analysis or even a narrow definition of "available fuel supply." In other words, this tool does not take into account the amount of fuel that is already committed to California under the California Low Carbon Fuel Standard, and instead lumps this fuel into a broad available fuel supply category.

We understand why the obligated parties at this meeting expressed much concern over this approach because it overstates alternative fuels available for consumption in Oregon by including fuel that is already committed to customers in California. The obligated parties worry that this overstatement will prevent DEQ from issuing a deferral and the result would be insufficient volume of credits available for compliance. We do not disagree.

- Many different opinions were expressed concerning cost containment and the true purpose and goal of any future mechanisms. We support the consensus view expressed to promote market stability with the establishment of floor and ceiling prices, respectively, for Clean Fuels Program credits. Establishing a price floor (and ceiling to a lesser extent) would be critical in financing future renewable natural gas and other alternative fuel projects to help meet the growing compliance demand in the programs of Clean Fuels Program.
- We believe it is obvious that the aggressive compliance curve will require significant credit generation from opt-in fuels such as RNG. It is important for DEQ to support the expansion of alternative fuels like RNG and help support a network to all available Oregon infrastructure.

We appreciate your consideration of our views, and look forward to continued participation in the process. Please feel free to let me know if we can address any immediate question.

Sincerely,



Ryan Kenny
Senior Public Policy & Regulatory Affairs Advisor
Clean Energy



To: Cory-Ann Wind & Bill Peters, Air Quality Program, Oregon Department of Environmental Quality (ODEQ)

Re: Comments to the ODEQ on the forecasted fuel supply under the Oregon Low Carbon Fuel Standard (LCFS)

November 11, 2016

Dear Cory-Ann and Bill,

Thank you for allowing us to comment on the implementation of the forecasted fuel supply deferral under Oregon's Low Carbon Fuel Standard (LCFS) program. Below please find points of significance to our members.

DEFINITION OF AVAILABILITY

The ODEQ should focus on refining the meaning of what fuels are truly "available" in the State of Oregon to be used towards LCFS compliance. Fuel that is technically produced, yet used in another state like California (likely to comply under their LCFS standard), is not actually available to Oregonians seeking to comply under Oregon's LCFS. If a lower carbon fuel is not being shipped to the State of Oregon, it cannot be bought to lower the carbon number of our fuel mix. It is as if the fuel does not even exist.

Similarly, fuel may be technically "available" somewhere else in the country (like California), but Oregon's LCFS program should consider whether it is cost prohibitive to bring it to Oregon.

NEW PROJECTS

The forecasting model looks at planned projects in and near Oregon. The completion time of these projects should be taken into consideration. If a project is completed at the end of the year it should not have the same weight as a project completed in the first month of the year.

BANKED FUEL CREDITS

Careful consideration should be given to the weight banked fuel credits have in the early years of the program. These credits are banked to help companies comply in later years. Assuming these credits could be used to cover any shortfalls in the coming year will lead to less credits available for compliance in later years.

USE OF ODOT DATA

The model looks at Oregon fuel consumption based on ODOT data as well as trends for Oregon and nationally. This data does not take into account an increased rate of tourism in the state that drives up the demand for fuel.

Thank you in advance for your consideration of our comments.

Sincerely,

Paul Romain, Danelle Romain & David Rocker, Representing the Oregon Fuels Association

Mark Gram, Jubitz Corporation

Jeff Rouse, Carson Oil Company

Annie Stuart, Coleman Oil Company

Oregon Fuels Association

www.oregonfuels.org



Credible Solutions • Responsive Service • Since 1907

Catherine H. Reheis-Boyd

President

Sent Via Email: OregonCleanFuels@deq.state.or.us

November 11, 2015

Cory-Ann Wind

Oregon Department of Environmental Quality

Clean Fuels Program

E Submission: OregonCleanFuels@deq.state.or.us; wind.cory@deq.state.or.us

Re: Oregon Department of Environmental Quality (DEQ)
Fuel Forecasting and Oregon Clean Fuels Program Advisory Committee

Dear Ms. Wind,

The Western States Petroleum Association (WSPA) is a non-profit trade group representing 25 companies that explore for, develop, transport, refine, and market petroleum products in Washington, Oregon, California, Nevada and Arizona. Member operations will be affected by the proposed Oregon Clean Fuels Program 2017 rulemaking.

WSPA appreciates the opportunity to provide comment on the fuel forecasting methodology for the Oregon Clean Fuels Program Advisory workgroup. The WSPA members continue to be concerned regarding the speed of rulemaking activities; it takes time to evaluate the current state of fuel availability for next and subsequent years.

WSPA is also concerned with the infeasibility and unsustainable targets set for the program reductions. While we have the data for only two quarters in 2016, there is already an indication that the market is not on-track to generate the level of banked credits that was estimated in the 2014 ICF compliance scenarios. This places even more significance on the 1-year fuel availability look ahead that is the subject of this comment letter. Based on program data provided by DEQ to date, WSPA had BCG compare the actual credit and deficit results to what was projected in the 2014 compliance scenarios. These observations and suggestions are offered in the attached analysis – and should inform

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both the 2017 fuel availability analysis and the updates to the compliance scenarios that DEQ will undertake.

Cost containment is intended to take into account the effect of this program on consumers, and the fuel forecasting analysis needs to be viewed through that lens. Because the fuel forecasting needs to be a part of cost-containment and consumer protection, it should utilize more realistic scenarios.

The following comments are directed to the Fuel Forecast Methodology and Tool to be developed by ICF for 2017 and annually thereafter.

WSPA Members are concerned that Oregon DEQ, and it's consultant, ICF, will continue to use overly optimistic analysis of future fuel availability to Oregon as was presented in the initial 2014 study. During our advisory committee meeting, when we discussed the methodology of fuel forecasted for the Oregon markets, it was clear there was a focus on general availability of alternative fuels, and little effort planned that would account for factors that dictate how much is likely to be used in Oregon. There are competing markets, transportation and logistics constraints, vehicle technology constraints, regulatory impediments and consumer choice factors that must be evaluated in determining what contribution to credit generation potential that a particular fuel will make in Oregon. The following items are only some examples of what should be included in the forecasting analysis:

1. Competition for available alternative fuels:
 - a. Domestic:
 - i. As WSPA members noted, the lowest carbon intensity (CI) fuels will also be needed in California to meet other program obligations. Therefore, it is less likely that lower CI fuels needed to build a large bank of credits will go to Oregon early in the program. With credit banking being a critical aspect of this program for compliance in later years and a stated flexibility that DEQ intends to provide, not taking into account the competition for these credits could be disastrous for the sustainability of this program as discussed in bullet #4, below.
 - ii. The geographic location of Oregon is likely to be disadvantaged for many domestic sources of alternative fuels due to the transportation or gas pipeline distance to Oregon versus California, for similar fuel pathways.
 - b. International:
 - i. Biofuel availability from imports into the United States competes globally, with many factors outside the control of the Clean Fuels Program (CFP) influencing the final destination. Examples of such factors may include flat price, RIN

value, ForEX, Blenders tax credit (Biomass Diesel) etc. The supply of the lowest CI fuels encourages a more complex analysis process, for example:

1. Following on from above, whether specific biofuels are imported to the U.S. West Coast is largely a function of the difference in RIN price for sugarcane ethanol and corn-based ethanol (the RIN spread), and other factors independent of the LCFS credit price. In order to make imports of sugarcane ethanol economic, the RIN spread must be sufficient to overcome the significant freight costs of transporting the cargo from South America. These economics are subject to many factors, including sugarcane harvest issues, currency fluctuations, and other changing factors. The same dynamics hold true for imported renewable diesel and biodiesel.
 2. Another example is the recent history of availability of Brazilian ethanol. There were 0 MB imports of Brazilian ethanol shipped to the United States from January – May 2016. Much of the volume was finding its way into the Asian market. Additionally, sugar cane ethanol availability is seasonal ~ April to October.
 3. Sugar cane and sorghum are also used in the food market. The 2014 ICF paper assumes 100 MGY of sorghum ethanol, which has no reference to source.
 4. Finally, with many countries imposing stricter emissions standards which will be competing for the same fuel, this competition for supply will be higher.
2. Jurisdictional Constraints by the City of Portland
- a. The City of Portland will be issuing new amendments on the land use requirements for fossil fuel infrastructure shortly; so far the language does not take into account the potential for new infrastructure to accommodate other fuels needed to comply with the OR CFP (i.e. tankage limitations). As a result, these limitations should be included in the evaluation of a forward looking aspect of the program
 - i. One example of added complexity is the explicit requirement for biodiesel blending. This means that existing biodiesel tanks cannot be repurposed for renewable diesel. While this biodiesel mandate co-exists with OR CFP it may require additional tanks in order to handle renewable diesel, which will be difficult given the land use restrictions highlighted above.
 - b. Additionally, Portland requires biodiesel to be purchased from specific sources that may not be the lowest CI and may lack the desired properties required in order to

comply with the OR CFP. This conflict should also be considered in the forecast analysis if there is an expectation that it will not be resolved.

3. Current infrastructure:
 - a. There are other state regulations governing fuel quality (Department of Weights and Measures) which states “gasoline must contain 10 percent ethanol by volume” and that gasoline blended with ethanol must meet federal specifications. There are limited stations equipped to sell E10+ in Oregon.
 - b. Legacy terminal infrastructure in Oregon is predominantly designed to receive truck / barge / rail delivery of biofuels. If international shipping of sugar cane ethanol / renewable diesel is required to comply, obligated parties will have to double the maximum cargo size of traditional transportation modes. This means there may be a need for investment in order for terminals to handle these deliveries. Capability upgrades will require significant planning and be under the new permitting requirements expected to be enacted by the City of Portland before the end of this year, and possibly as early as next week
 - c. As discussed in many iterations of the Oregon CFP program rulemaking, vehicle availability in the state that can use the alternative fuels is limited and fleet turnover is measured in decades.
4. Banked Credits. As discussed above in bullet #1, credit banking is a critical aspect of this program for compliance in later years and a stated flexibility that DEQ intends to provide. It is therefore important to tread carefully on how banked credits are evaluated in these 1-year look ahead fuel availability analyses.
 - a. The ICF 2014 scenarios reflect building credits until 2021 under the 1-B5 scenario then starting to draw in 2022. By 2025 the banked credits are exhausted. Thus, they assume adequate supply of credits are available early on in the program to cover later years when the CFP is significantly reduced. DEQ should not include the availability of banked credits in the determination of whether there are adequate credits to offset the deficits in the 1-year look ahead analysis within 95% unless the level of banked credits exceed what was expected in the compliance scenario.
 - b. Credits generated by electricity are an unknown in terms of participation by individual households, utilities, the growth of EV’s and correlated infrastructure. The technical hurdles to the feasibility of this kind of ecosystem should not be discounted. California’s more established program is struggling to meet its EV targets.

- c. Overall the credits are harder to achieve in Oregon versus the already established California program, and there is a shorter duration for which the more widely used alternative fuels are eligible to generate credits due to the aggressive program structure. This highlights the differences in the Oregon and California programs; it is not a one-size fits all application of the CA program to Oregon.

Thank you for your consideration of WSPA's comments. We welcome any questions or comments you might have. Please contact me at this office or my staff, Jessica Spiegel at Jessica@wspa.org or 360-352-4512.

Sincerely,



Attachment:

Oregon Clean Fuels Program Update, Nov 2016. The Boston Consulting Group.



Oregon Clean Fuels Program Update

November 2016

THE BOSTON CONSULTING GROUP

Oregon Clean Fuels Program still infeasible

During infancy, low reduction levels give appearance of feasibility; but program unsustainable

Based on ODEQ's second quarterly data summary (through 2Q 2016), ethanol and biodiesel blending accounts for 99% of credits generated in OR Clean Fuels Program to date

- While currently the primary source of credits, many E10 and B5 blends are expected to be non-compliant¹ by 2018
- Many of the alternatives shown as compliant on paper (including lower-CI ethanol such as cane and molasses ethanol) are unlikely to be available to Oregon in the near-term
- California will compete for the lowest-CI fuels available to the West Coast

Other fuels such as renewable diesel and alternative fuels (electricity and natural gas) have fallen short of forecasts and face infrastructure challenges

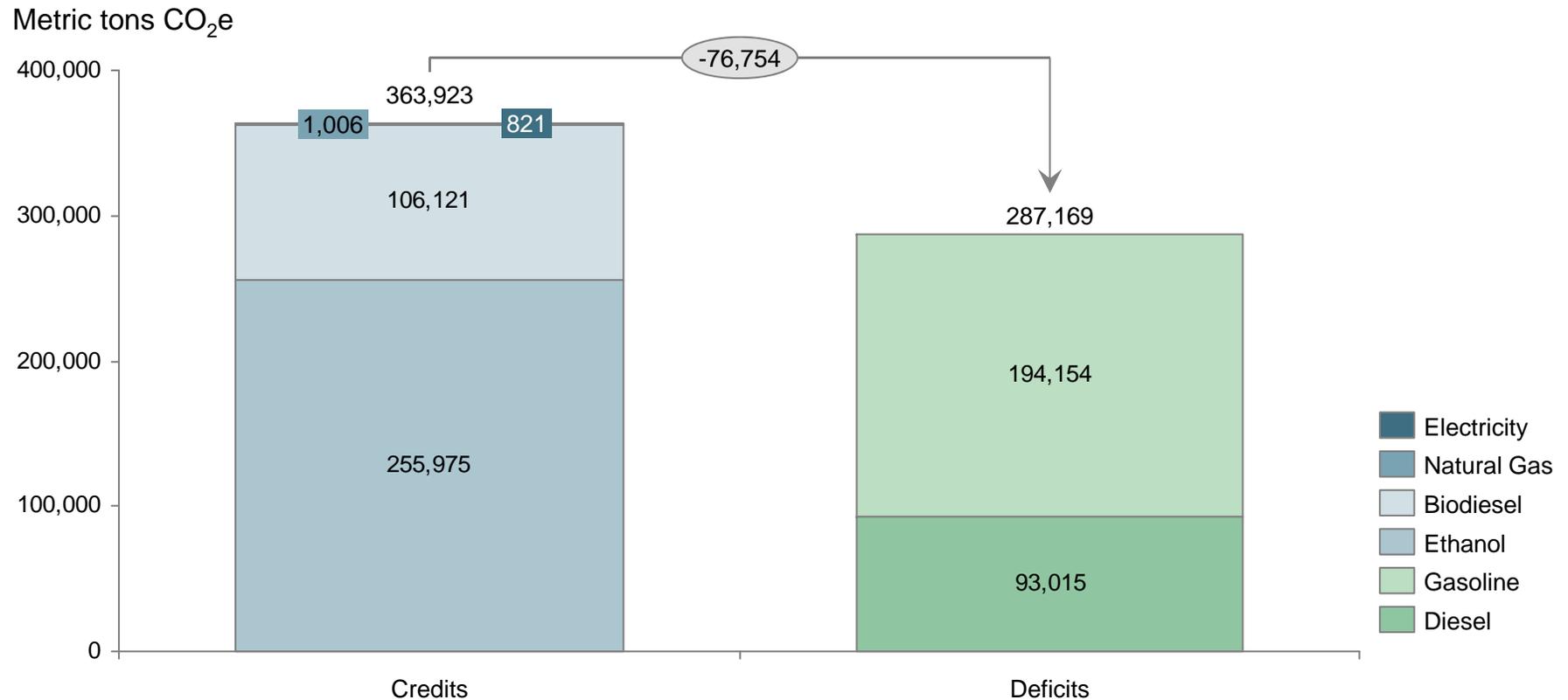
- Renewable diesel capacity in the US has been delayed and any imported renewable diesel will likely supply California
- Alternative fuels such as natural gas and electricity depend on adoption and availability of vehicles and refueling infrastructure will continue to be slow to materialize

The Clean Fuels Program does not build in enough time and resources needed for the innovation required to meet the program's goals.

- Since feasibility of this program relies heavily on banked credits that will be drawn down sooner than expected, it is projected to fail.

1. Generating more deficits than credits

Ethanol and biodiesel blending accounts for 99% of credits generated in OR Clean Fuels Program to date



Drop-in and alternative fuels yet to make an impact in the Clean Fuels Program

Note: Credits through 2Q 2016 from ODEQ second quarter 2016 data summary. Shows net balance for products that have generated both deficits and credits (ethanol, gasoline, diesel, biodiesel)
 Source: ODEQ, BCG analysis

While currently the primary source of credits, many gasoline blends will be noncompliant after 2018

Example:

- In 2016, standard CI is 98.37
- Clear gasoline is 100.77
- A blend of 90% clear gasoline and 10% ethanol would require an ethanol CI of 67.61 to be credit neutral (same number of deficits and credits)

		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
		<i>Required EtOH CI for blend to be compliant</i>									
<i>Blendstock CI²</i>		67.61	64.29	57.38	50.61	36.93	23.39	2.94	(17.51)	(37.96)	(65.19)
MW Corn¹ (ETHC247L)	62.95	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red
OR Corn (Pacific) (ETHCOR003)	53.81	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red
Sorghum, Corn (ETHGW007)	50.76	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red
Molasses (ETHMOR001)	52.83	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red
Sugarcane (ETHSOR001)	51.04	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red
Cellulosic (ETHB003)	23.36	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red

Unlikely to be available

Will lower-CI ethanol or non-blended fuels be available when the current options are non-compliant?

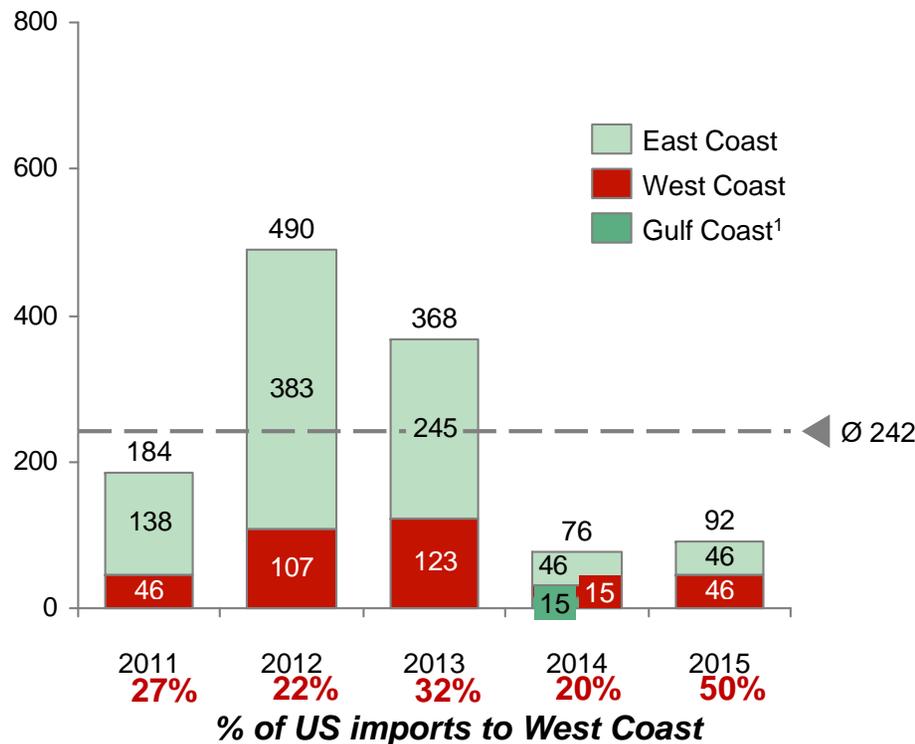
1. 2A application (specific conditions apply): Midwest; Dry Mill; Dry DGS and Modified DGS; NG. Chosen as a representative example of approved MW corn pathways.
 2. CIs taken from the Oregon Carbon Intensity Lookup Table for Gasoline and Gasoline Substitutes – temporary rulemaking April 2016 and Oregon Approved CI Values, July 2016

Note: Baseline value for gasoline is E10 with 90% clear gasoline and 10% corn ethanol based on the weighted average of corn ethanol supplied to Oregon in 2013
 Source: ODEQ, BCG analysis

Meanwhile, Oregon also unlikely to be able to lean on cane ethanol gasoline blends

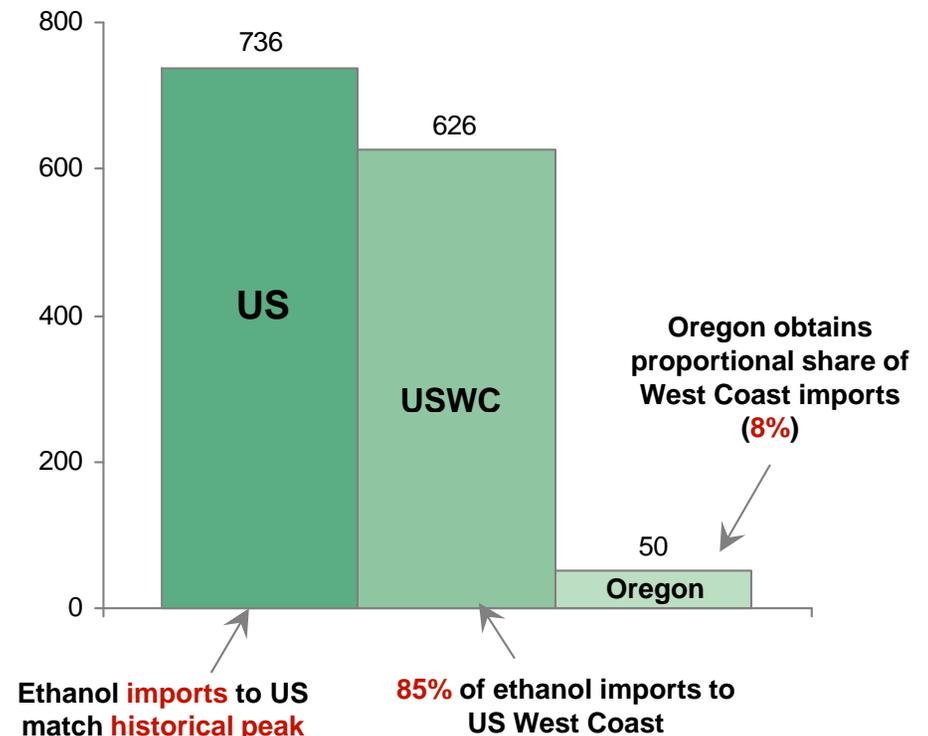
West Coast not pulling larger share of ethanol

Fuel ethanol imports (millions of gallons)



What you have to believe to get to 50 MGPY in Oregon

MGPY cane ethanol imports

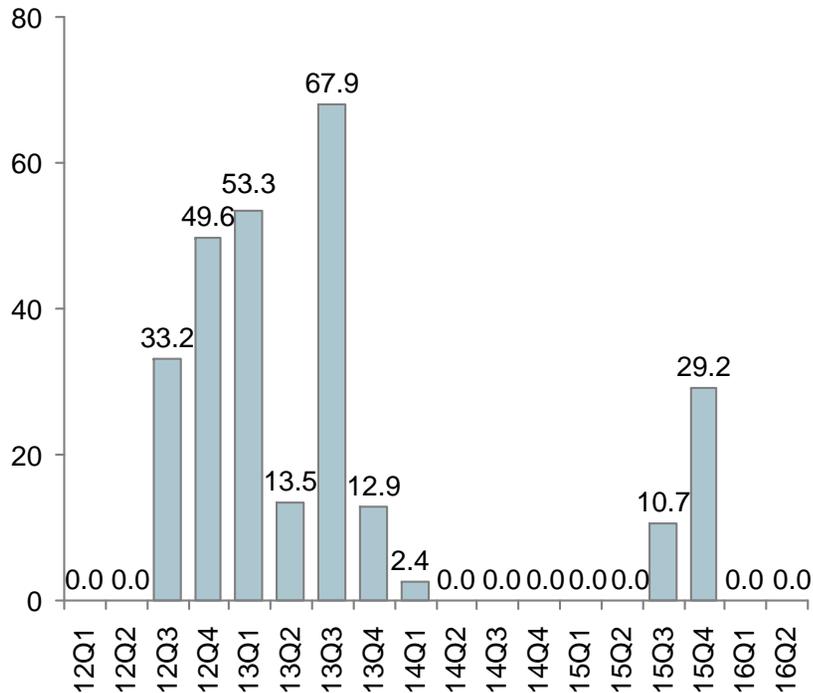


All compliance scenarios assume 50 MGPY of cane ethanol

If California can't draw cane ethanol with a larger market and LCFS in place, Oregon also unlikely to see imports

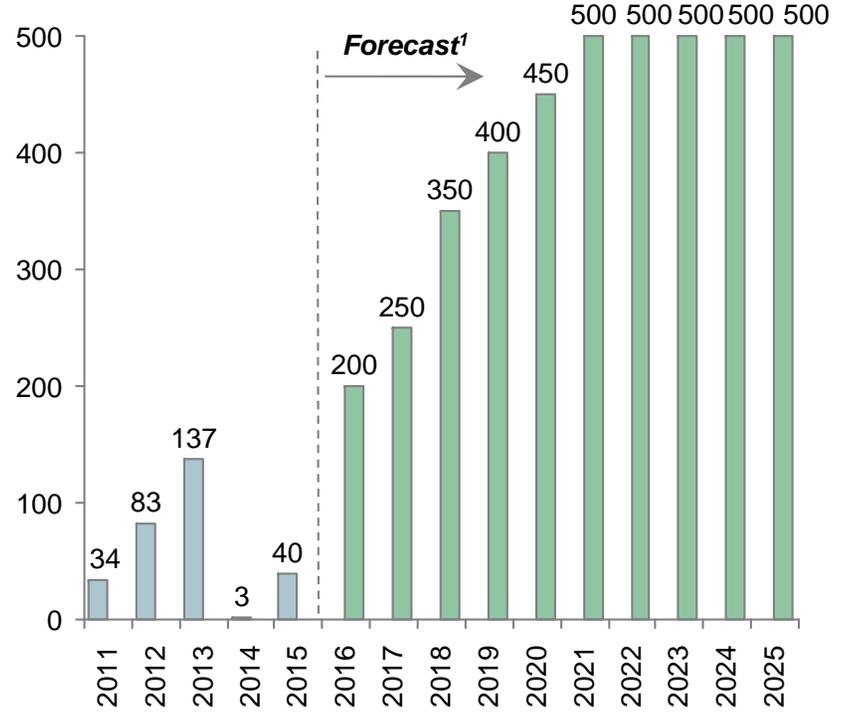
Even with LCFS in place, California not drawing imports of cane ethanol

Cane ethanol from Brazil to CA (Million gal)



California well below expectations for 2016

Cane ethanol from Brazil to CA (Million gal)

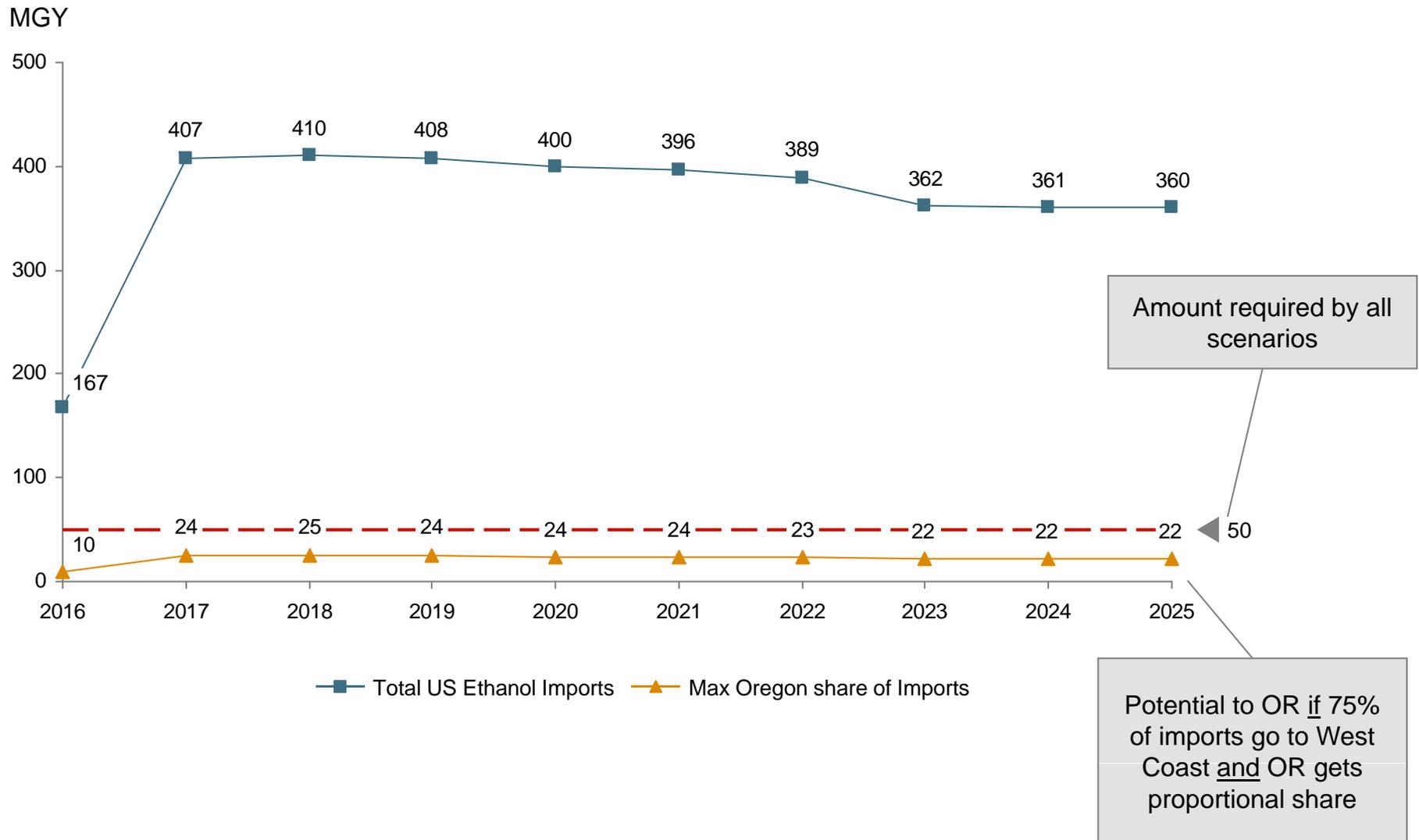


Actual CARB forecast

1. Forecasted 2015 volume is twice the YTD volume through June 2015

Source: CARB April 2015 Compliance Scenario, CARB quarterly LCFS data (as published September 22, 2015), BCG analysis

Even if West Coast imports return, Oregon is unlikely to hit forecasted cane ethanol volumes



Source: FAPRI 2016 U.S. Baseline Briefing Book, BCG analysis

Similar to gasoline blends, many 5% blends of renewable and biodiesel are expected to be non-compliant after 2018

Example:

- In 2016, standard CI is 99.39
- ULSD is 101.65
- A blend of 95% ULSD and 5% BD or RD would require an BD/RD CI of 52.88 to be credit neutral (same number of deficits and credits)

		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
		<i>Required blendstock CI for blend to be compliant</i>									
<i>Blendstock CI</i>		52.88	47.48	36.69	26.12	4.54	(17.04)	(49.19)	(81.56)	(100+)	(100+)
Soybean BD (BIODOR001)	58.25	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
UCO BD (BIODOR002)	18.12	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red
Tallow BD (BIODOR003)	37.93	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red
Canola Oil BD (BIODOR004)	57.84	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Corn Oil BD (BIODOR005)	36.89	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red
Soybean RD (RNWDOR001)	52.25	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red
UCO RD (RNWDOR002)	19.25	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red
Tallow RD (RNWDOR003)	29.96	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red
Canola Oil RD (RNWDOR004)	49.98	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red
Corn Oil RD (RNWDOR005)	33.64	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red

1. CIs taken from the Oregon Carbon Intensity Lookup Table for Diesel and Diesel Substitutes
 Note: Baseline value for gasoline is B5 with 95% clear diesel and 5% soybean diesel
 Source: ODEQ, BCG analysis

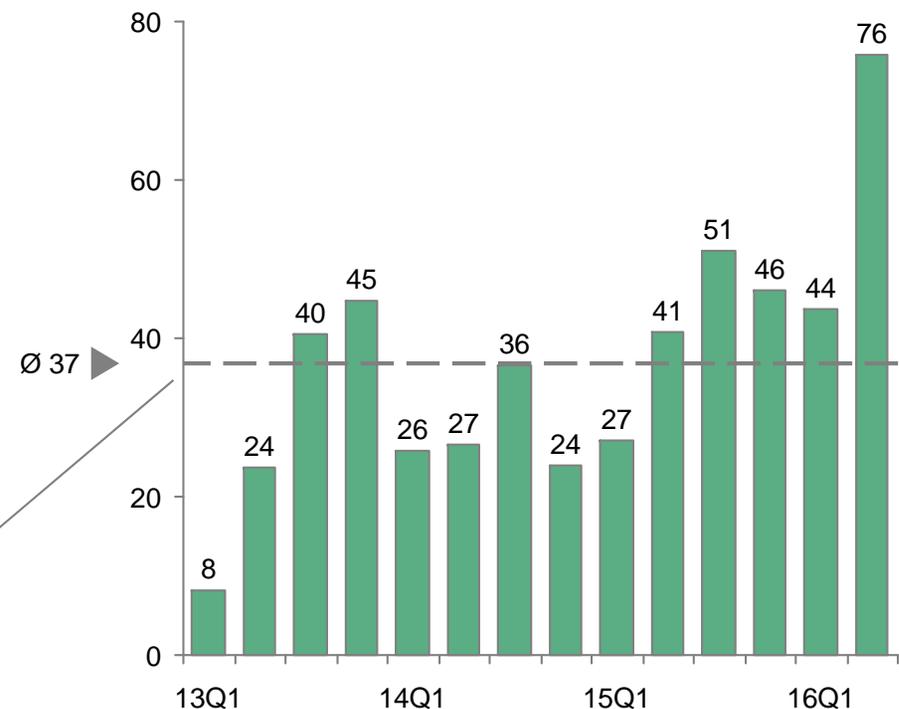
Renewable diesel volumes in Oregon, thus far unseen, are unlikely to reach forecasted levels

Compliance requires 14-15 MGPY of RD by 2016 – largely based on the availability of Neste Oil's Singapore production facility

- California already taking all available Singapore production available to the US
- Washington's compliance scenarios assumed no RD due to California absorbing volumes

California's steady supply of RD will make it difficult for other West Coast states to obtain significant volumes unless new sources of RD are expected

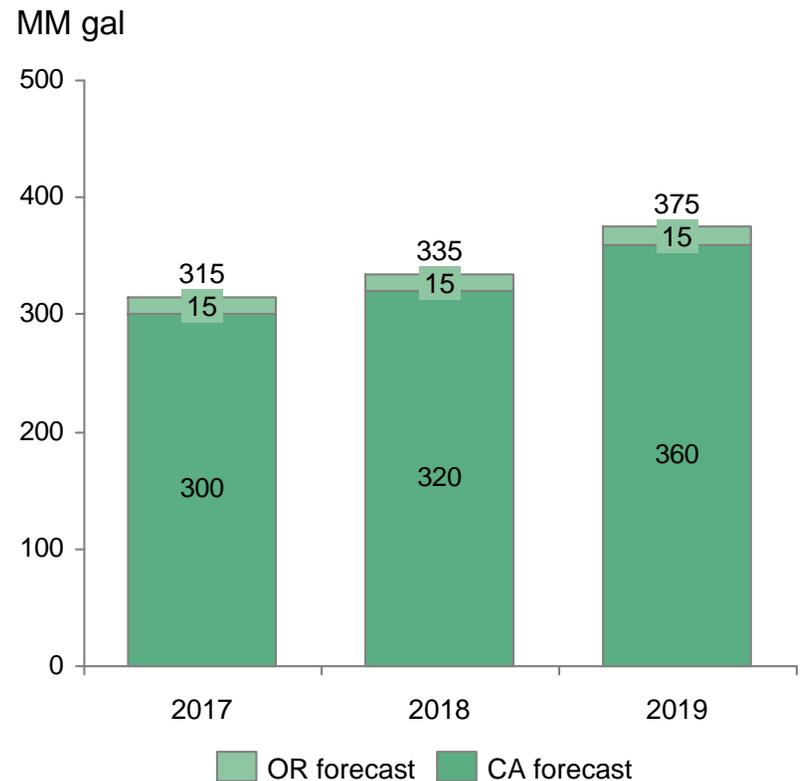
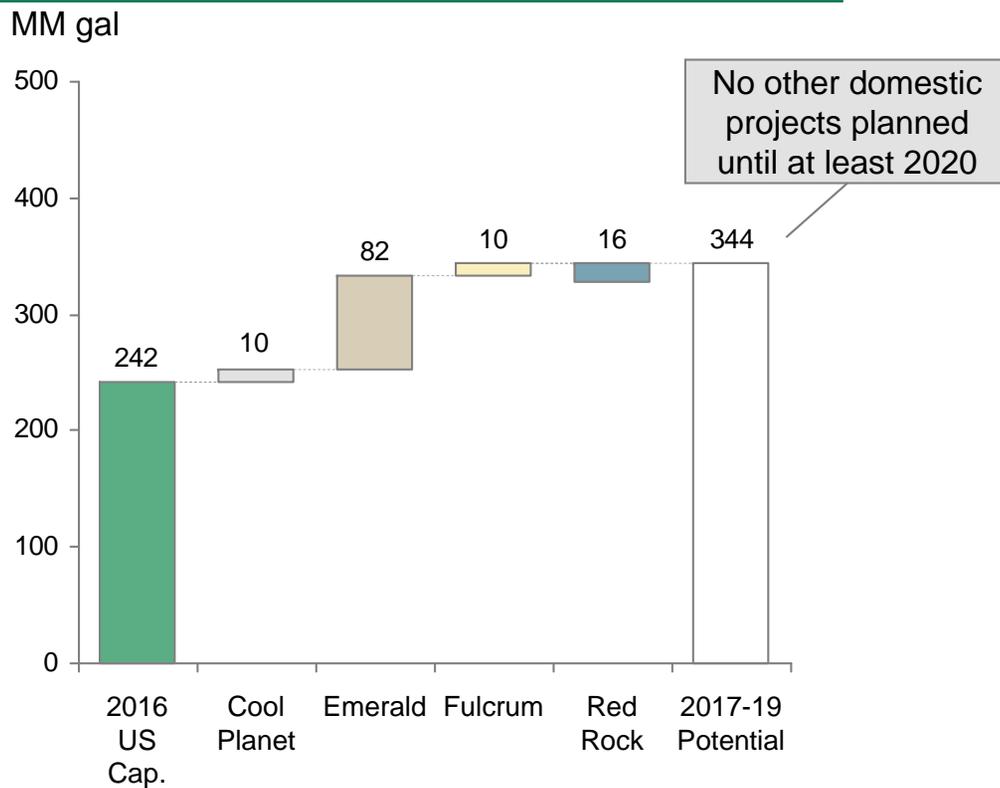
Renewable diesel in CA LCFS (million gallons)



In the short run, there is not enough RD capacity to achieve projected availability to West Coast

Even if all announced projects were built by 2017 in the US...

...the West Coast would need to ramp up imports significantly to get expected volumes

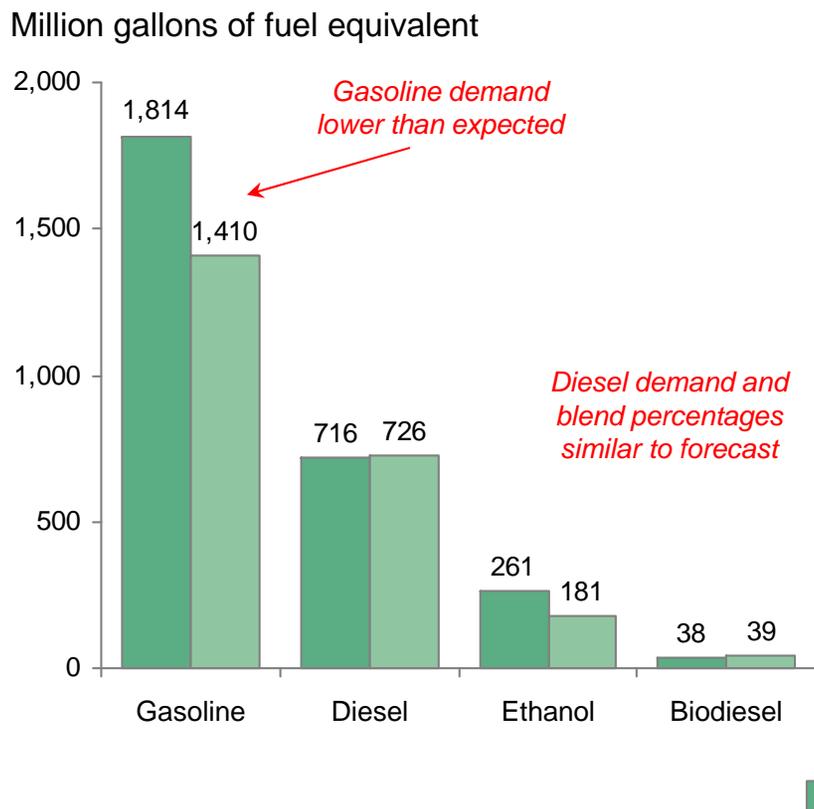


Has Oregon identified available RD capacity abroad that will be sufficient to meet CA and OR's needs?

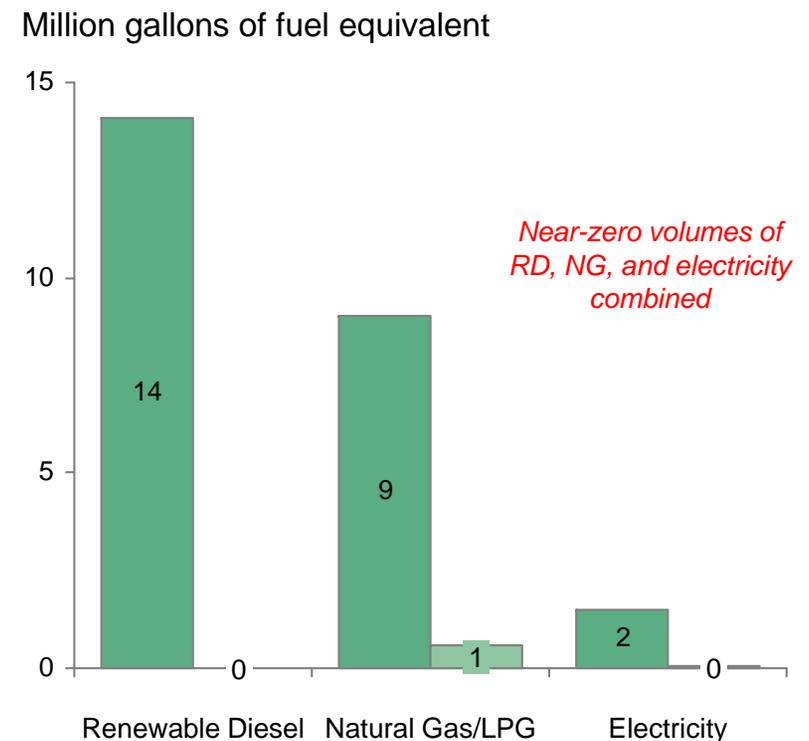
Source: CARB Sept workshop, E2 2013 Advanced Biofuel Market Report, CARB compliance curves spreadsheet

Early in the program, volumes of drop-in and alternative fuels are already falling significantly short of expectations

Ethanol and biodiesel blended fuels mostly in line with expectations



However, "non traditional" blends have fallen short



Note: Assumed volumes of all fuels and blendstocks would be twice what was seen in the first two quarters of 2016
 Source: IFC (Task 3 Report), ODEQ

Non-blended fuels (electricity and natural gas) depend on more than just fuel availability

In the case of "non-blended fuel pathways", (i.e. electricity and natural gas), the forecasted volumes of fuels are not the primary risk

Instead, the key issues for these pathways to be able to generate credits is the presence of fueling infrastructure and vehicle availability such that consumers can use these fuels in Oregon

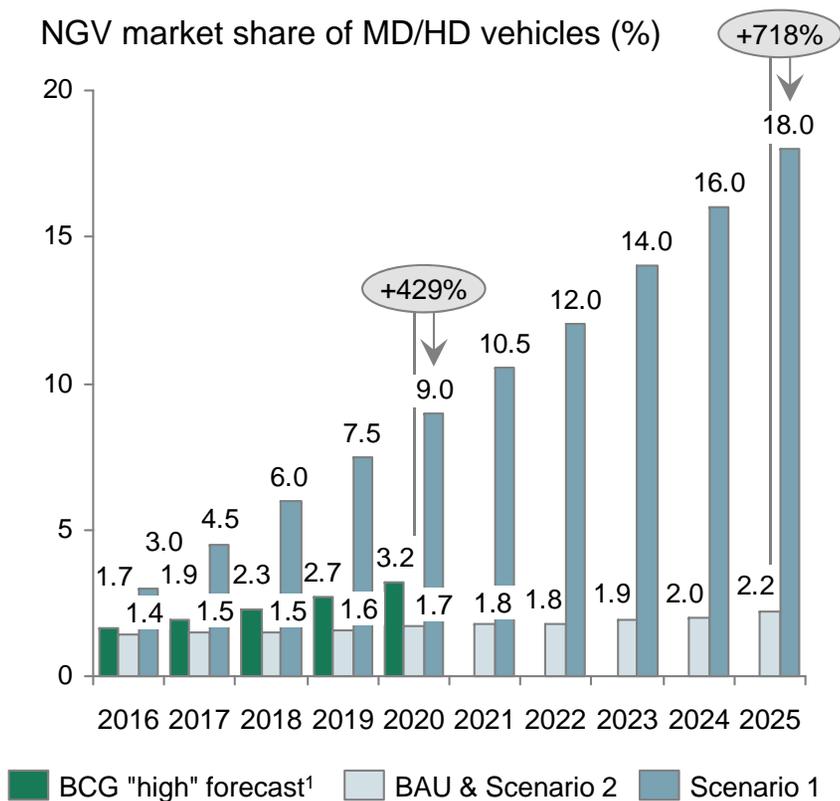
- Both infrastructure and vehicle availability are still based on optimistic growth assumptions
- Even in California with the most aggressive plans and funding for EVs in the country, there are projected shortfalls in EVs and infrastructure. Oregon will face even greater challenges in this area.

There are a few different types of alternative vehicles that the Oregon compliance scenarios forecast as having an impact on industry compliance, including:

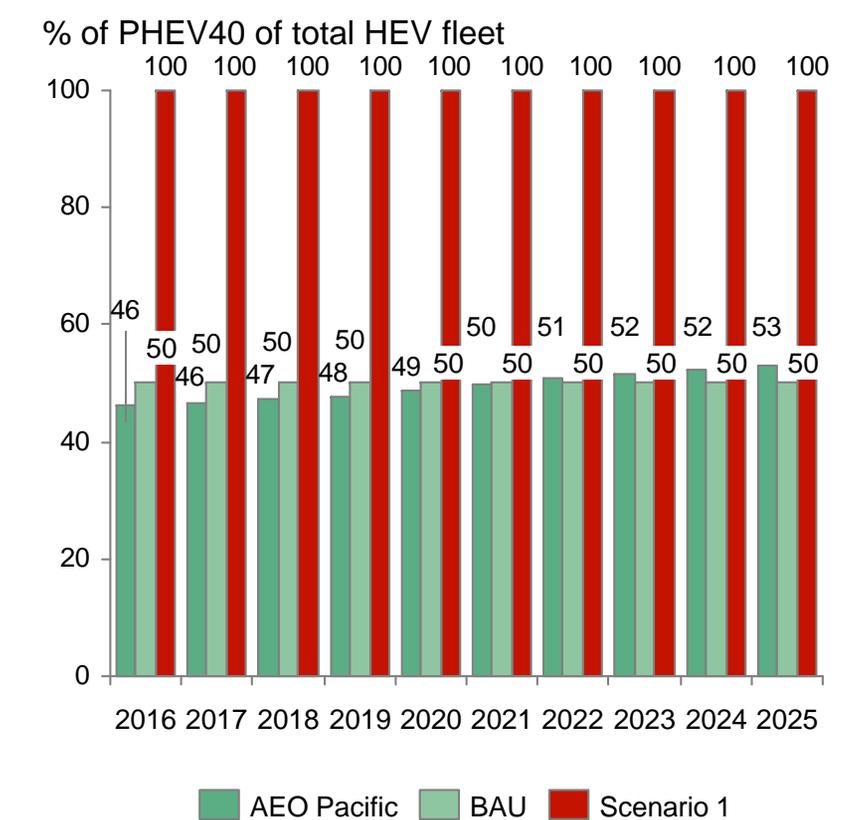
- Electricity-based vehicles
 - Battery electric vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs)
- Natural gas based vehicles (NGVs)

Compliance scenario includes optimistic vehicle availability targets

Scenario 1 requires MD/HD NGV market share to be 4x BAU by 2020

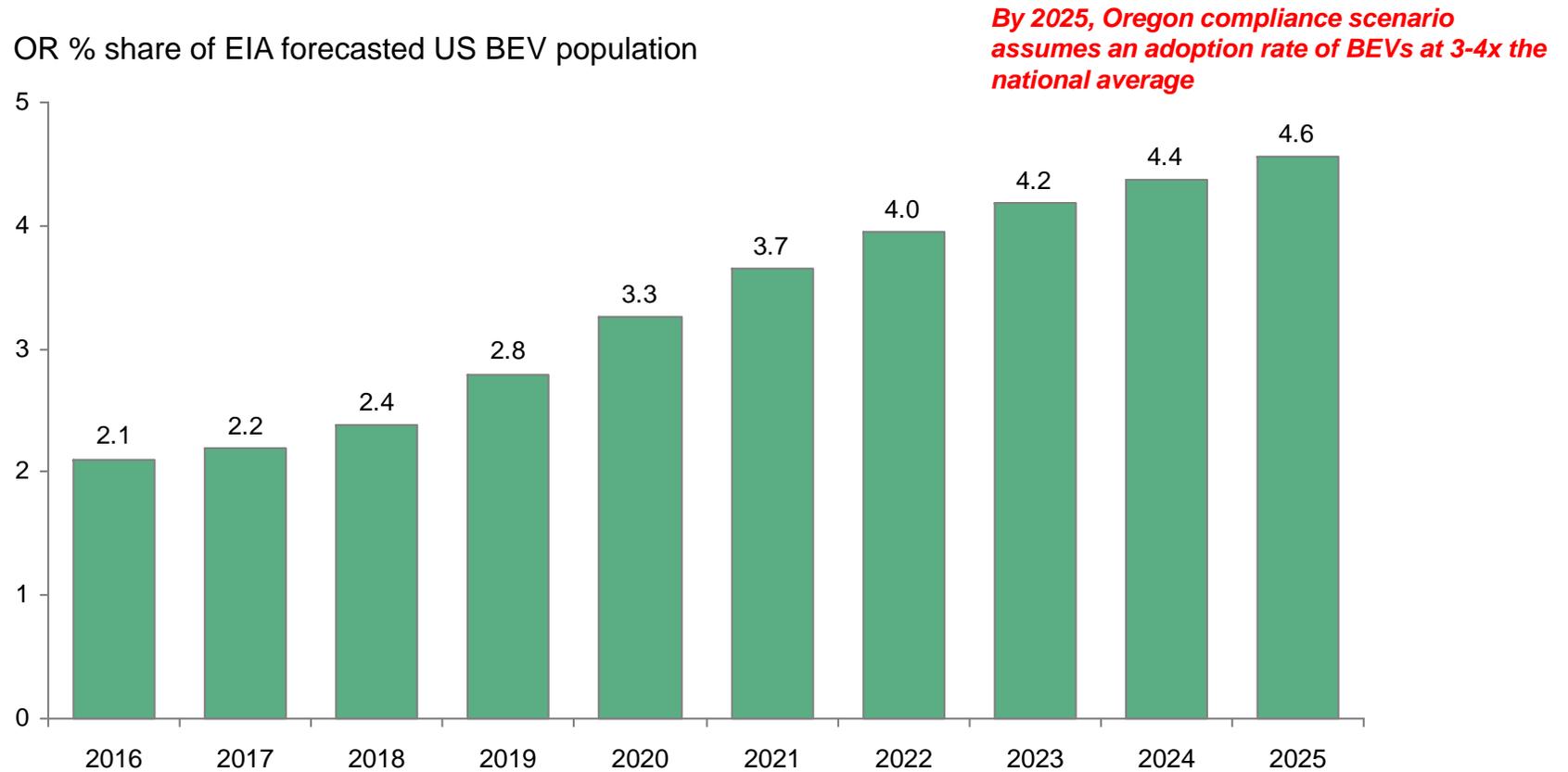


PHEV fleet composition 100% PHEV40, currently ~50%



1. Recent BCG study estimates that the fleet of natural gas vehicles in the US would increase 12-18% per year through 2020. This series shows 18% growth per year and assumes the BAU expectation for market share in 2015 is equal to 2016.
Source: ICF Compliance Scenario Fuel Consumption, EIA 2016 Annual Energy Outlook, BCG analysis

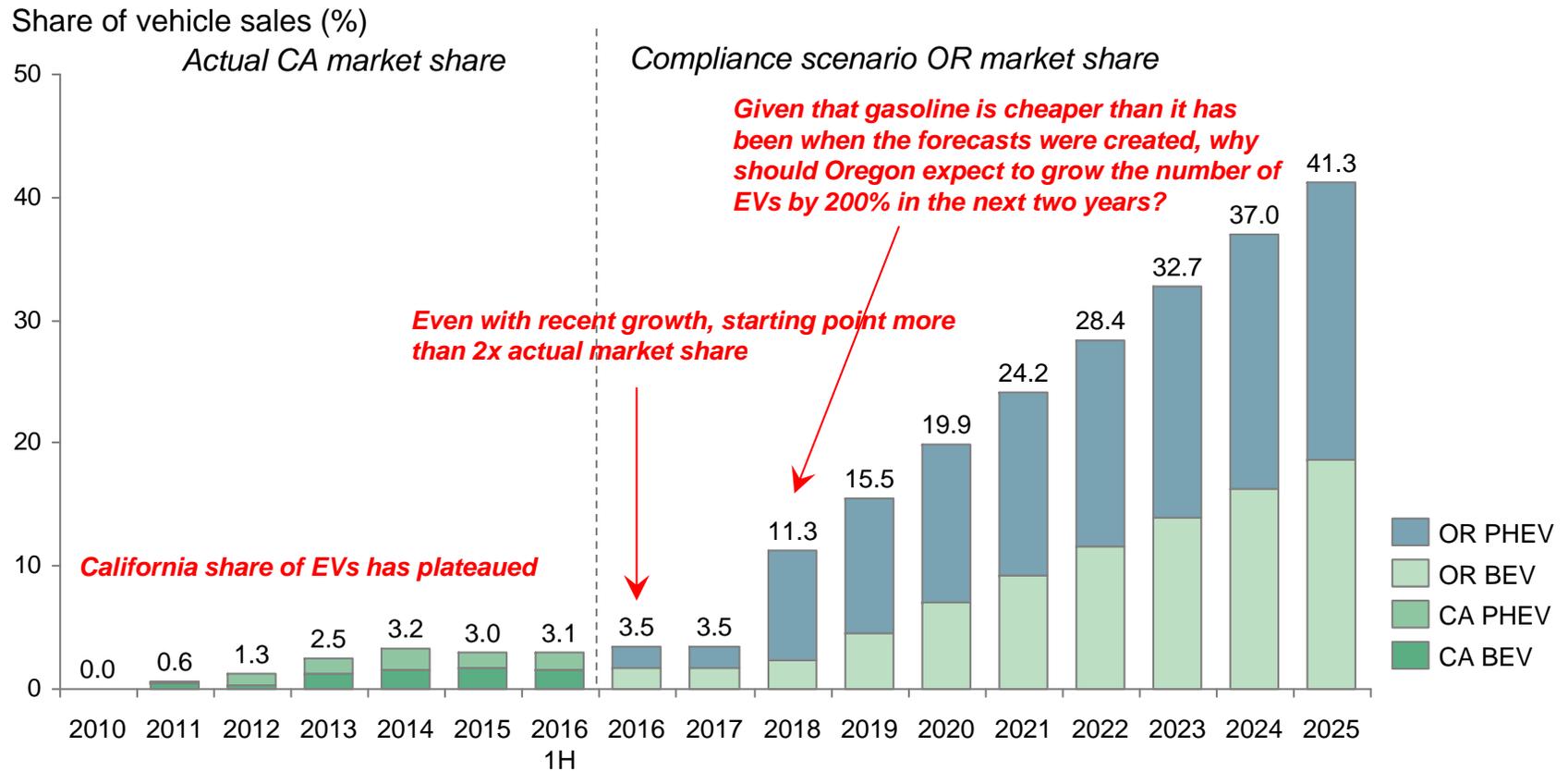
Oregon will need to have a disproportionate share of US BEVs to meet forecast



Currently Oregon represents ~1.3% of US vehicle registrations

1. Battery electric vehicle, includes 100 mile and 200 mile electric vehicles in EIA AEO
Source: ICF Compliance Scenario Fuel Consumption and Vehicle Populations, EIA Annual Energy Outlook 2016

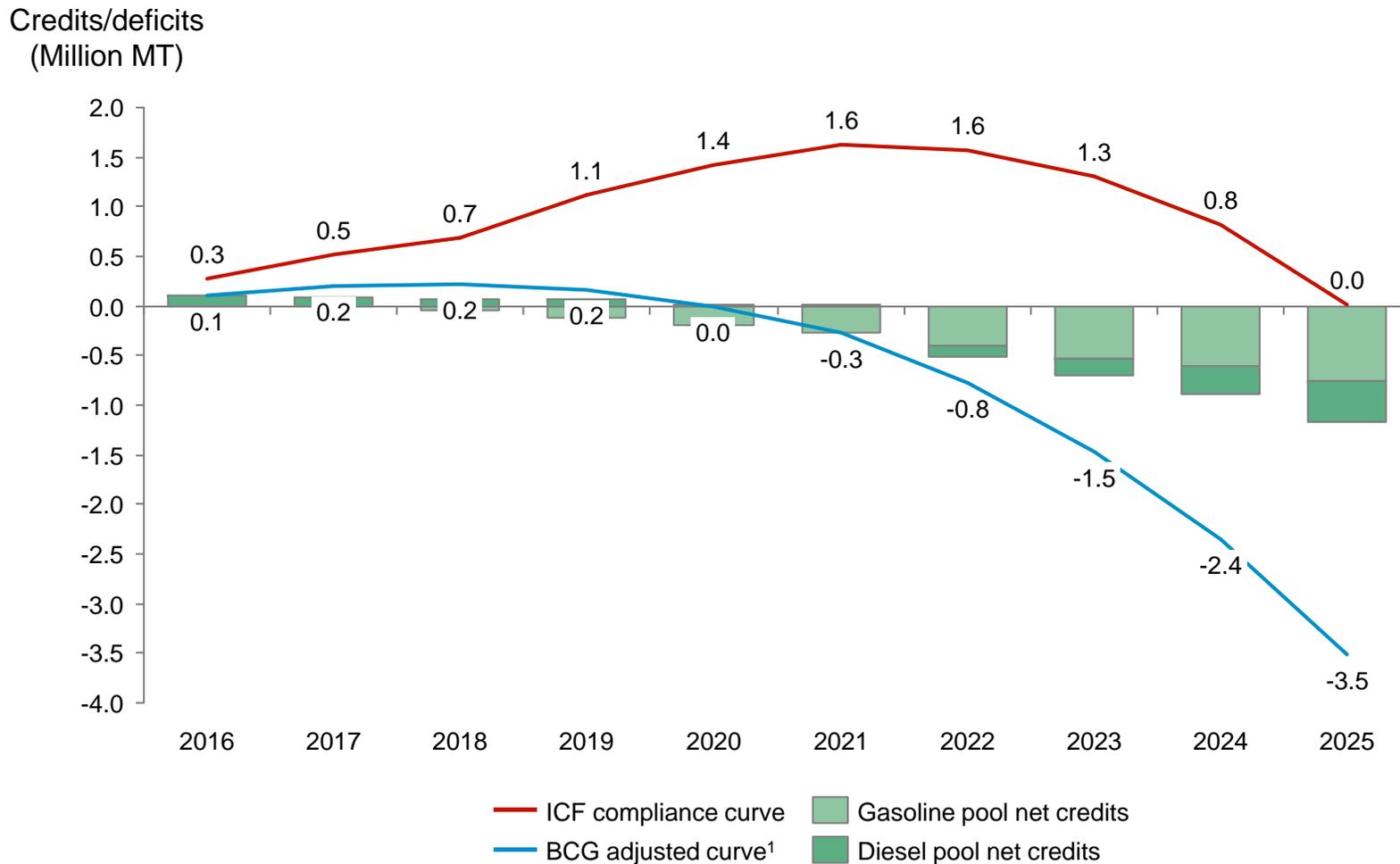
Recent California EV sales plateau indicates that Oregon should also expect sales below forecast



How will EV sales meet targets in a lower oil price environment?

Notes: Scenario 1-B5, exact market share for Oregon unavailable, but fleet composition is currently estimated between 0.5-1.0% EV
 Source: California New Car Dealers Association, ICF, Drive Oregon, BCG analysis

Oregon unlikely to build up credit bank as blended fuels become noncompliant and other substitutes are lagging



Note: Scenario 1-B5 shown here, Scenario 2-B5 has nearly identical result

1. BCG curve adjusts gasoline demand downward for entire period, adjusts CI values to April 2016 rulemaking, and decreases expected volumes of certain fuels/fuel substitutes (electricity, tallow renewable diesel, cane ethanol). The BCG curve does not represent an independent model of the Oregon Clean Fuels Program.

Source: ICF Task 3 Report, ODEQ Public Notice Packet, BCG analysis

Path forward

The ODEQ should continue with its existing plan to produce a report forecasting volumes for both 2017 and for the following years (at least through 2020). For this effort to truly inform cost containment, it should focus on the following:

- In addition to estimating available volumes, the forecast should inform:
 - Which pathway volumes have the most potential variation?
 - What are the specific linkages (economic incentives and infrastructure) between existing and planned production facilities and fuels coming into the LCFS region?
 - Will consumers own vehicles in sufficient quantities to be able to use the fuels?
- Instead of models being compliance driven (options and volumes of credits fit into a predefined compliance curve), they should be driven by ranges of fuel availability
- Previous compliance scenarios help review possible outcomes and the potential impact of regulation. However, they are not a replacement for measuring the likely availability of fuels

The Oregon Clean Fuels Program faces unique issues

- Oregon is later in its implementation cycle than California and British Columbia
- Fuel suppliers in those states should be willing to outbid Oregon for lower-CI fuels
- Oregon has a significant volume disadvantage versus California