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COMMITTEE HEARING

BEFORE THE

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT

COMMISSION OF THE STATE OF CALIFORNIA

In the matter of,)
) Docket No. 14-IEP-1
)
Integrated Energy Policy)
Report (IEPR))

WORKSHOP ON

**MEASURING THE SUCCESS OF THE
ALTERNATIVE AND RENEWABLE FUEL
AND VEHICLE TECHNOLOGY PROGRAM**

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

THURSDAY, JUNE 12, 2014

10:00 A.M.

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Amy Zimpfer, U.S. EPA, Region 9

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INDEX

	Page
Introduction	
Heather Raitt, IEPR Lead	6
Opening Remarks	
Commissioner Janea Scott	8
Incorporating GHG Benefit-Cost Criteria in ARFVTP	
Charles Smith, Energy Commission	11
ARFVTP Benefits Reporting and Program Status Report	
Jim McKinney, Energy Commission Staff	25
Presentation of 2014 NREL Benefits Report	
Marc Melaina, US DOE - National Renewable Energy Laboratory	38
Jobs and Workforce Training Benefits	
Peter Cooper, California Employment Training Panel	79
Lunch	
Metrics Presentation Overview	
Anthony Eggert, UC Davis Policy Institute for Energy, Environment and the Economy	93
Lightning Round Presentations - What Metrics do other Agencies use? How do Other agencies measure benefits?	104
Amy Zimpfer, U.S. EPA, Region 9	105
Erik White, ARB	113
Matt Miyasato, South Coast AQMD	119
Dean Taylor, SCE	126
Jeff Rosenfeld, ICF	127
V. John White, CEERT	134
Tom Cackette, Tom Cackette Consulting	140
Facilitated Conversation with Lightening Round Presenters	146

INDEX

	Page
Public Comment	193
Concluding Remarks	204
Adjournment	204
Reporter's Certificate	205
Transcriber's Certificate	206

1

1 P R O C E E D I N G S

2 JUNE 12, 2014

10:00 A.M.

3 MS. RAITT: All right good morning. Good
4 morning and welcome to today's IEPR workshop on
5 Measuring the Success of Alternative and Renewable Fuel
6 and Vehicle Technology Program. This workshop is part
7 of the 2014 IEPR update.

8 I'm Heather Raitt. I manage the IEPR unit.

9 I'll begin by going over the usual housekeeping
10 items. Restrooms are in the atrium. A snack room is on
11 the second floor at the top of the atrium stairs, under
12 the white awning.

13 In the event of an emergency and we need to
14 evacuate the building, please follow staff to Roosevelt
15 Park which is across the street, diagonal to the
16 building, and wait there until we're told it's safe to
17 return.

18 Today's workshop is being broadcast through our
19 WebEx conferencing system and parties should be aware
20 that you're being recorded.

21 We'll place the audio recording on the Energy
22 Commission's website in about -- well, in a few days.
23 And a written transcript will be posted in about three
24 weeks.

25 I'll briefly go over the agenda. This morning

1 we have opening comments from Commissioner Scott and
2 then a series of presentations before breaking for lunch
3 at about noon, for one hour.

4 We'll return after the lunch break for more
5 presentations and discussion. And at the end of the
6 discussion there will be an opportunity for public
7 comments and questions.

8 We're asking parties to limit their comments to
9 three minutes during the public comment period. We'll
10 take comments first from people in the room, then WebEx,
11 and then phone-in-only participants.

12 For those in the room who would like to make
13 comments, please fill out a blue card and give it to me.
14 When it's your turn to speak, please come to the center
15 podium and speak into the microphone. And it's helpful
16 if you give a business card to our court reporter.

17 For WebEx participants, you can use the chat
18 function to tell our WebEx coordinator that you'd like
19 to ask a question or make a comment during the public
20 comment period. And we'll let you relay your question
21 or open your line at the appropriate time.

22 Phone-in-only participants, we'll open all lines
23 after we've taken the WebEx comments.

24 Materials for this meeting are available on the
25 website and hard copies are on the table at the entrance

1 to this meeting room.

2 We do encourage written comments and they are
3 due by the close of business on June 26th.

4 The process for submitting comments is posted on
5 the notice which, again, is on the website.

6 And with that, I'll turn it over to Commissioner
7 Scott. Thank you.

8 COMMISSIONER SCOTT: Thank you very much,
9 Heather.

10 Good morning everyone and welcome. This is our
11 Integrated Energy Policy Report Workshop on Measuring
12 the Success of the Alternative and Renewable Fuel and
13 Vehicle Technology Program.

14 There are many metrics that we already use to
15 measure the benefits of the program and I think that
16 there are many more that we could potentially use to
17 measure the benefits of this program. And today's
18 workshops will highlight and discuss both.

19 The Legislature has given us a set of measures
20 in both AB 118 and AB 8, and you will hear a little bit
21 more about those today.

22 The Legislature has also called upon the Energy
23 Commission to use a portfolio approach in our
24 investments. For example, not putting all of our eggs
25 in one basket.

1 And at the first IEPR workshop back in March we
2 heard from Professor Joan Ogden of UC Davis and Dr.
3 Barry Wallerstein of the South Coast Air Quality
4 Management District, and others, and they emphasized for
5 us the value of a portfolio approach.

6 Another criteria is the benefit cost analysis
7 which measures the number of greenhouse gas pollution
8 reduced per dollar spent.

9 Charles Smith and Jim McKinney will spend some
10 time discussing that with you today.

11 Additionally, the Legislature has also
12 encouraged us to invest in projects that have the
13 potential to be transformative.

14 And Dr. Mark Melaina from the National Renewable
15 Energy Lab will dedicate a portion of his presentation
16 in explaining one way to measure the market
17 transformation.

18 And let us not forget about the important
19 workforce training component of the Alternative and
20 Renewable Fuel and Vehicle Technology Program.

21 This helps ensure that the dedicated folks who
22 are working on today's transportation technologies will
23 also be able to take the courses that will allow them to
24 work on the advanced, cleaner technologies that the
25 Alternative and Renewable Fuel and Vehicle Technology

1 Program also helps to fund.

2 Peter Cooper from the California Employment
3 Training Panel will tell us more about exactly how that
4 works.

5 We will then spend the afternoon hearing about
6 some of the metrics and measures that other agencies
7 use, and engage in a robust discussion facilitated by
8 Anthony Eggert, the Executive Director of UC Davis's
9 Policy Institute for Energy, Environment and the
10 Economy.

11 Before we turn to Jim McKinney and Charles Smith
12 to get us going, I wanted to share with you some of the
13 numbers that we released in our latest investment plan
14 because, to me, this is a measure right here of some of
15 the success of the program.

16 We have -- and some of these numbers are
17 slightly out of date because this is from April and we
18 have done additional projects since April.

19 But we've got almost 7,800 electric vehicle
20 charging points. We've done ten plug-in vehicle
21 readiness planning grants. And that helps regions all
22 around the State be ready for the battery-electric
23 vehicles.

24 We have done 21 new or upgraded hydrogen fueling
25 stations. And again, this was before our notice of

1 proposed awards on the latest hydrogen.

2 We have done 35 projects to expand the
3 production of low-carbon biofuels within the State.

4 We've issued more than 1,000 incentives for
5 natural gas vehicles.

6 And 62 fueling stations for compressed or
7 liquefied natural gas.

8 We have funded 30 projects to demonstrate
9 advanced technologies in medium and heavy duty trucks,
10 18 manufacturing projects and last, but certainly not
11 least, 39 workforce training agreements.

12 So, I just wanted to give you some of the
13 numbers of what the program has done to date.

14 I know that some of you have been asking the
15 Energy Commission to convene a conversation like this
16 for some time now, and I hope you are looking forward to
17 today's workshop just as much as I am.

18 So, I'd like to turn it over to Jim McKinney and
19 Charles Smith and they'll get us going.

20 Oh, I'm sorry I also wanted to acknowledge that
21 I have with me here, on the dais, my terrific advisors,
22 Lezlie Kimura-Zeto and Jim Bartridge.

23 MR. SMITH: Thank you, Commissioner Scott and
24 good morning everyone. I'm Charles Smith with the
25 California Energy Commission's Emerging Fuels and

1 Technologies Office, in the Fuels and Transportation
2 Division.

3 Today I'll be giving a quick overview of
4 Assembly Bill 8's new benefit cost provision for the
5 Alternative and Renewable Fuel and Vehicle Technology
6 Program, and how we utilize and assess benefit costs.

7 Assembly Bill 8, or AB 8, passed by the
8 Legislature and signed by Governor Brown in September
9 2013, made several important contributions to our
10 program.

11 Among others, it extended our program's funding
12 to January 1st, 2024. It maintained the primary purpose
13 of our program, as described here, and it also added a
14 benefit-cost score provision to our statutes.

15 So, AB 8 defined benefit-cost score as a
16 project's expected or potential greenhouse gas emissions
17 reduction per dollar awarded by the Commission to the
18 project.

19 The benefit-cost score gets implemented in two
20 other sections of statute. Section 44271 already
21 required us to establish a competitive process for the
22 allocation of funds for projects. And AB 8 requires us
23 to consider benefit-cost scores among other factors in
24 this process.

25 In the next section of statute, AB 8 specifies

1 that in addition to previously established preferences,
2 we give additional preference to funding projects with
3 higher benefit-cost scores.

4 This slide lists all of the preferences in
5 selecting a project that are established in our
6 program's statutes.

7 I won't recite all of them, but I would point
8 out some of the more prominent ones, maybe including
9 consistency with State climate change policies,
10 lifecycle greenhouse gas emission reductions, reducing
11 criteria air pollutants, match funds, economic benefits,
12 technology advancement.

13 And so, to these existing criteria AB 8 added a
14 project's benefit-cost score.

15 So, where in our program's implementation do we
16 apply these preferences? Well, this slide shows our
17 general process for implementing the program.

18 From the top we start by developing funding
19 allocations in the annual investment plan update. Based
20 on those funding allocations we develop competitive
21 solicitations in which we receive and score applications
22 for funding within specific project types.

23 And so, this is where our project preference
24 criteria come into play, including the ABH GHG benefit-
25 cost score criteria.

1 Based on "WRENCH" (phonetic) scores we develop
2 and executive agreements with successful applicants
3 until we run out of available funding in that area.

4 We also have interagency agreements, off to the
5 right there, with sister agencies, such as our workforce
6 training agreements with the State's Employment Training
7 Panel and Employment Development Division, as well as
8 our fuels and standards development agreement with the
9 Division of Measurement Standards.

10 All of these agreements get managed by Energy
11 Commission staff and we periodically collect data from
12 funding recipients.

13 Based on information from all parts of this
14 process, we subsequently develop our biennial benefits
15 report for the program.

16 And Jim McKinney and Marc Melaina will be
17 talking about the benefits report in the next
18 presentations.

19 The table that's split over the next two slides
20 shows we are incorporating benefit-cost scores and cost
21 efficiency into our scoring criteria.

22 These five solicitations were all released after
23 the passage of Assembly Bill 8 last September. Each one
24 included scoring elements relevant to a project's
25 benefit cost and cost efficiency, which were part of one

1 or more scoring criteria.

2 The table also shows the weight assigned to
3 those criteria in the right most column.

4 For example, our Federal cost-sharing
5 solicitation included two relevant scoring elements.
6 The first scores an applicant based on their cost-
7 effective and efficient use of State match share funds.

8 And the second scores them on the degree to
9 which the project reduces GHG emission for each dollar
10 the Energy Commission funds or for each dollar of Energy
11 Commission funds requested.

12 Both of these elements are included as part of
13 the cost-effectiveness match share criteria which
14 represented 25 out of 100 total possible points.

15 Similar scoring elements were used in our recent
16 hydrogen fueling infrastructure solicitation as well.
17 In this case, the two elements were part of two
18 different scoring criteria which respectively
19 represented 40 and 20 out of 380 total possible points.

20 Incidentally, in this solicitation we noticed a
21 renewed effort by our applicants to seek less program
22 funding. And so we originally expected to fund the
23 development of 21 to 23 new stations, but we were
24 ultimately able to offer funding for 28 new stations,
25 plus a mobile refueling system, so good news on that

1 front.

2 Our recent solicitations for charging
3 infrastructure and biofuel production also included GHG
4 emission reductions for program dollar as key scoring
5 elements in the project budget criteria.

6 Those criteria represented about 10 percent and
7 13 percent, respectively, of the total possible points.

8 Most applications from the biofuel production
9 solicitation are still under review.

10 Within the charging infrastructure solicitation
11 we provided funding for more than 800 new charging
12 stations -- or new charging points, I should say,
13 including 53 fast chargers in support of the State's ZEV
14 action plan.

15 And finally, for natural gas vehicle incentives
16 we had to approach this issue a little bit differently.
17 Since these incentives are issued on a first come/first
18 served basis there are no scoring criteria.

19 But when preparing the solicitation we adjusted
20 the incentive amounts for each weight class to aim for a
21 more consistent benefit cost ratio.

22 Based on the successful applications we've
23 received during these and previous solicitations, as
24 well as information from other sources, we can develop
25 estimates of benefit-cost ratios for multiple project

1 types.

2 The benefits in terms of direct GHG emission
3 reductions are calculated using the volume of
4 conventional fuel displaced and the carbon intensity of
5 the new alternative fuel.

6 For simplicity, each project type in this
7 exercise was assumed to produce a consistent level of
8 benefits over a span of ten years. We then divide the
9 total GHG emission reductions by the amount of program
10 funding provided to the project in millions of program
11 dollars. And this gives us a benefit-cost ratio.

12 Using data from applicants and other sources, we
13 constructed a low case and high case for each project
14 type for this exercise.

15 The low case represents a lower benefit/higher
16 cost project, while the high case represents a higher
17 benefit/lower cost project.

18 And in the next few slides I have four examples
19 of our method for estimating this range of benefit
20 costs.

21 We start with the simplest examples which are
22 commercial-scale, diesel substitute production projects.
23 Notice the cells in yellow. These are the key input
24 cells which generate the values in the white and green
25 cells.

1 The second row in this table, ARFVTP share, is
2 the amount of funding our program provided to the
3 project. You'll notice the difference between low case
4 and high case, \$5 million versus \$2.6 million. Again,
5 this refers to the difference between lower
6 benefit/higher cost projects in the low case, and higher
7 benefit/lower cost projects in the high case.

8 The next row represents the amount of fuel
9 produced in diesel gallon equivalent, or DGE per year.

10 In the fourth row, since we are already
11 estimating fuel production in DGE, we can assume that
12 each diesel substitute, DGE, displaces one gallon of
13 conventional diesel fuel.

14 The next row is the carbon intensity of the
15 alternative fuel. We used an approximate value of 30
16 grams carbon dioxide equivalent per megajoule in the low
17 case versus 15 grams per megajoule in the high case.

18 These estimates are based on stated applicant
19 pathways in combinations with established low carbon
20 fuel standard or LCFS carbon intensity data.

21 Using the amount of alternative fuel and the
22 carbon intensity of that alternative fuel we can
23 calculate the amount of GHG emissions reduced per year
24 in metric tons by the project.

25 Multiplying that by 10 gives you the expected

1 emission reductions over a ten-year period. Divide that
2 by the amount of millions provided by our program
3 funding and you get the end result in the green cells, a
4 range of tons of GHG emissions reduced per million
5 program dollars.

6 The next example looks at workplace, electric
7 vehicle supply equipment or EVSE, also known as charging
8 infrastructure

9 Again, we start off with our program costs,
10 ranging from \$8,000 per level two charging point in the
11 low case to \$3,000 in the high case.

12 To determine the amount of conventional fuel
13 displaced we estimate the amount of electricity charged
14 per workday and the number of workdays per year.

15 This all translates into about 1,750 kilowatt
16 hours per year in the low case or about 178 gasoline
17 gallons equivalent displaced per year in the low case.

18 For the high case it's about 509 GGE per year.

19 The carbon intensity of electricity, based on
20 the LCFS data, might be 36.5 grams per megajoule to 30.8
21 grams per megajoule depending on the particular pathway
22 you use.

23 Using the amount of alternative fuel per year
24 and the carbon intensity of that fuel relative to
25 gasoline, we can again estimate GHG emissions reduced

1 per year.

2 Multiplying this over a ten-year span and
3 dividing this by the cost of the project in millions to
4 us gives our benefit-cost ratio in terms of direct GHG
5 emissions reduced per million program dollars.

6 The third example is for our heavy-duty truck
7 incentives. Here, since we've prescribed the incentive
8 amounts there's no difference in program cost between
9 the low case and the high case.

10 But what does change are the assumptions about
11 the displaced vehicle.

12 In the low case we assume a displaced truck that
13 would consume about 2,100 diesel gallons equivalent per
14 year.

15 In the high case we assume a displaced truck
16 that would consume about 12 and a half thousand DGE.

17 After accounting for a small average reduction
18 in natural gas engine efficiency and the approximate
19 carbon intensity of California CNG, it's pretty easy to
20 calculate the GHG emissions reduced over a ten-year span
21 and the resulting benefit-cost ratio for this project
22 type.

23 The last example, hydrogen fueling
24 infrastructure, is probably the most complex though it
25 still relies on the same basic approach as the three

1 previous ones.

2 We calculate the amount of conventional fuel
3 displaced by hydrogen per year using the station's daily
4 fueling capacity in kilograms, the approximate miles per
5 gallon of fuel cell vehicles, and the approximate miles
6 per gallon of a displaced conventional vehicle.

7 This gives us the annual DGE displaced estimates
8 in the seventh row.

9 From there we approximate a range of hydrogen
10 carbon intensities based on the pathways submitted by
11 our applicants and the establish low-carbon fuel
12 standard carbon intensity numbers.

13 Once we have the amount of conventional fuel
14 displaced per year and the carbon intensity of the
15 alternative fuel we can once again estimate the amount
16 of direct GHG emissions reduced over a ten-year span per
17 million of program dollars.

18 So, in developing these benefit-cost ranges we
19 noticed a few key points worth mentioning.

20 First and foremost there is a very large range
21 of potential GHG emission reductions per program dollar
22 for each project.

23 Even within each project type not all projects
24 have an identical scope.

25 We also found that this direct approach toward

1 GHG emission reductions per program dollar left a few
2 very important issues unaddressed. Calculating direct
3 GHG emissions from the hardware we've funded doesn't get
4 to these projects' contribution toward market
5 transformation goals.

6 Our support, for example, for an initial network
7 of hydrogen stations is critical to enabling the broader
8 market introduction of fuel cell vehicles and has value
9 beyond the immediate throughput of those stations.

10 Our early investment into multi-unit dwelling
11 charging infrastructure can help improve the business
12 case and technological feasibility of this activity for
13 future private investment.

14 Similarly, our advanced technology truck
15 demonstration projects and pre-commercial biofuel
16 production projects will help advance vehicle and fuel
17 production technologies even if the amount of direct GHG
18 emission reductions by those particular projects is
19 initially small.

20 We also noticed that the project types with the
21 highest benefit-cost ratios tended to represent
22 commercially and technologically mature fuel pathways.

23 This was expected as they need to invest fewer
24 resources into technological development, demonstration
25 and scaling.

1 And while these technologies are likely to make
2 key contributions to the State's imminent 2020 climate
3 goals, we don't expect them to be sufficient on their
4 own to meeting the much more ambitious goal of 80
5 percent GHG emission reduction.

6 It's also worth pointing out the significant
7 potential for changes to these benefit cost ratios, even
8 with just minor adjustments to the assumptions, the
9 things that were in the yellow cells, this approach also
10 doesn't address the bigger question of attribution.
11 Namely, what share of a project's benefits can be,
12 quote/unquote, claimed by our program.

13 And, finally, an emphasis on direct GHG emission
14 reductions has a risk of under-valuing other project
15 types, including regional PEV readiness agreements, fuel
16 standards agreements, workforce training agreements and
17 other activities that don't directly lead to GHG
18 emission reductions.

19 So what does it all mean? First and foremost we
20 continue to use benefit-cost scores as an element of our
21 scoring criteria when reviewing proposals.

22 Based on the benefit-cost ranges that we can
23 observe, we can possibly use these ranges as benchmarks
24 when developing solicitations and/or considering
25 proposals in the future.

1 Third, we learn that benefit-cost ratios are
2 most useful and most applicable when comparing similar
3 project types and when a fuel or technology is both
4 commercially and technologically mature.

5 And, finally, part of why we're grateful for all
6 of your participation here today, we're interested in
7 your perspectives on how we can improve both the
8 calculation and use of benefit-cost scores, as well as
9 any other measurements of program success.

10 So, thank you.

11 COMMISSIONER SCOTT: Thank you very much,
12 Charles. That was an excellent presentation and a
13 terrific way, I think, to set the stage for today's
14 discussion.

15 I appreciate that you spent a few minutes
16 talking about how the Energy Commission already is
17 incorporating some of the different criteria throughout
18 our program. And so the examples, I thought, that you
19 had on slide six and seven were really terrific.

20 And I also wanted to just say how much I
21 appreciate sort of the thought and care that you've put
22 into in thinking about how it is that we might calculate
23 the potential greenhouse gas emissions reductions per
24 dollar awarded.

25 So this was, I just think, a terrific frame for

1 today's discussion. Thanks for putting that together.

2 I think Jim McKinney's next up.

3 MR. MC KINNEY: So good morning everybody and
4 welcome to our workshop today.

5 So, I think I know most of the people in the
6 room here. So, I'm the Program Manager for ARFVTP.

7 And my task this morning is to start to
8 introduce the benefits reporting work that we do here
9 with the Commission and with the National Renewable
10 Energy Laboratory, and also give you the most current
11 numbers on our program status.

12 So I think you've all seen this language before.
13 These are the key parts of the statute, AB 118 back in
14 2007, and most recently with the AB 8 reauthorization
15 from last year.

16 And I've highlighted a key word here, a key
17 verb. So, to transform California's transportation
18 market into a diverse collection of all fuels and
19 technologies, and that's repeated below.

20 And I really want to start to draw your
21 attention this morning to the market transformation part
22 of the work that Dr. Melaina and his team at NREL have
23 calculated.

24 In my mind, that's really kind of the ultimate
25 mission for this program.

1 Calculating expected benefits is relatively
2 straight forward. Charles did a nice job of walking us
3 through that.

4 But I think, as we're learning from ARB's kind
5 of over-success with the Clean Vehicle Rebate Project,
6 we can't buy our way to these really steep reductions
7 and climate change emissions from the transportation
8 sector.

9 So we're seeing that, again as I said, with the
10 light-duty electric vehicle sector. That's a tremendous
11 success story. But that also means they're going to
12 have to recalibrate how they administer some of these
13 funds.

14 So as I think about it, again with the purpose
15 of our program, really the Legislature asked us to step
16 in and hedge risk.

17 And what does that mean? That means offering up
18 government capital as an incentive until the private
19 capital markets are ready to start making the
20 substantial investments that we need to transform the
21 transportation sector in California and start to really
22 chip away at these just tremendous goals; 30 percent
23 reduction in GHGs by 2020, and the 80 percent reduction
24 target in 2050.

25 So, again, there's a broad range of policy

1 drivers that help drive our program investments. And,
2 really, the core one for us is GHG reductions, stemming
3 from AB 32 and then picked up in the original AB 118
4 statute.

5 And again, as a reminder, this is a shared
6 program with our colleagues at the Air Resources Board.
7 Our primary goal is carbon emission reductions and
8 theirs is air quality improvement. And that plays out
9 in some important different ways as we go through here.

10 Petroleum reduction, biofuels production, low-
11 carbon fuel standard, again, we're pretty familiar with
12 these.

13 The one metric that I saw at the workshop that
14 Mike Waugh was helping to host with the LCFC Advisory
15 Board meeting several weeks ago was the first time I'd
16 seen this 10 percent figure quantified.

17 So, the figure I remember and, correct me if I'm
18 wrong, Mike, 15 million metric tons by 2020.

19 So, that's really helpful and I think that helps
20 create a context, again, for the work that Dr. Melaina
21 will present.

22 So these are the current numbers, so I'm going
23 to expand a bit on Commissioner Scott's introduction.
24 And the numbers are going up.

25 So, we are nearly at the half-billion dollar

1 mark in program investment. So, what these figures
2 represent is the current state of our NOPAs, or Notice
3 of Proposed Awards.

4 So as you can see, some of the percentages for
5 our investments are starting to change pretty
6 significantly from the last few years.

7 So, biofuel has got kind of a lesser amount of
8 the total project funding these days.

9 Electric drive has always been about at one-
10 third and that's staying the course. And we're now at
11 \$150 million. So, that includes all of our EVSE
12 investments and then our substantial investments in the
13 ZEV truck technologies, which are quite expensive.

14 Natural gas and propane, we had a very important
15 series of awards on the truck side, and I'll talk more
16 about that a little later.

17 And then hydrogen has really -- that's been
18 about 9, 10 percent, historically, now it's at 20
19 percent. And that reflects the \$46 million Notice of
20 Proposed Award that we did in April.

21 Market and program development, and workforce
22 development continue to grow at kind of lesser levels
23 and they're at about five percent each, respectively so
24 again, coming up on a half-a-billion dollars in total
25 investments with our program.

1 What else did I want to say here? Yeah, one
2 other thing to look at is our ZEV technology
3 investments. So, if you combine electric drive and
4 hydrogen that's 50 percent of our program investments
5 are now in zero emission vehicle technology categories,
6 so I think that's an interesting stat.

7 One thing to note here, too, again these are the
8 most recent figures, so these numbers are going to be
9 higher than what Dr. Melaina is going to present. So,
10 don't get too concerned if you see different sets of
11 numbers.

12 So, Dr. Melaina's team analyzed what was
13 available through March 31st, 2014, plus the hydrogen
14 award. We felt that was very important to get into the
15 analysis.

16 But some of the other things, where we've had
17 big awards, aren't going to be reflected in the NREL
18 numbers.

19 So here's another way of looking at it, so you
20 can see biofuels was about \$90 million cumulatively.

21 Fueling infrastructure has gone up quite a bit
22 and you can see, again, that kind of relative proportion
23 between EVSE, which is the green part of the second bar,
24 and blue which is hydrogen, and the purple there are
25 natural gas investments.

1 On the vehicle side, as well, electric vehicles
2 are about half our total investments there.

3 And then the natural gas truck program, again,
4 is really starting to accelerate so that represents
5 about half of those.

6 Manufacturing, that's all in or nearly all in
7 the zero emission vehicle category, primarily with
8 trucks, although we did -- there was the grant with
9 Tesla, as well.

10 And then workforce development and program
11 support you can see in the other category.

12 So, just to dig a little deeper and I've just
13 got a couple of slides here. So, electric vehicle
14 support, so on the charger side, so we're now at \$38
15 million in total investments, and we're up to 8,600
16 charges.

17 So, about 3,900 in the commercial sphere, 3,800
18 in the residential sphere, 756 in the workplace area,
19 and DC fast charging we're now at about 107.

20 Our total support to CVRP is approaching \$50
21 million and that -- I know those numbers ramp up really
22 quickly so I may be a little out of date. But not too
23 long ago 21,000 vouchers was about one-third of the
24 vouchers they've disseminated there.

25 And again, that's just a tremendously important

1 part of the government's efforts to promote this market.

2 Our regional readiness planning grants, Leslie
3 Baroody, our team lead for electric vehicles did a nice
4 job of walking through that with our workshop last week,
5 where Dr. Melaina presented the other big task he's had
6 for us over the past few years.

7 So, hydrogen fueling stations, total funding is
8 \$90 million, so we're coming up close on \$100 million
9 for this.

10 So, for new stations about \$72 million in
11 investments, three station upgrades for that -- did I
12 say that correctly? It's 45 new stations I'm sorry, \$72
13 million, three station upgrades.

14 And our new Operations and Maintenance and Grant
15 Program, which I think is going to be really important
16 as we get these stations built and as we wait for the
17 vehicles to come in.

18 And I slipped in a slide of the Hyundai Tucson
19 fuel cell vehicle. And Commissioner Scott, I think,
20 went down and helped welcome the first kind of family
21 owner of a commercially available fuel cell vehicle in
22 California. So, that was a really nice event, and good
23 photographs, and it was really nice to see that happy
24 family with a car key to a car like this.

25 We're going to get a mobile re-fueler. And then

1 you can see our other hydrogen support activities, as
2 well.

3 On the truck side, this continues to represent
4 about one-third of our total investments.

5 So, the natural gas truck side, so these numbers
6 are quite a bit higher than what you reported,
7 Commissioner.

8 So, Andre Freeman, who runs this part of our
9 program, was kind enough to get us the current numbers.
10 So, we're now approaching \$50 million in our natural gas
11 truck vouchers, about 2,300 trucks. If you add in the
12 propane, that's about 3,000 trucks we've been able to
13 put on the road here in California.

14 You know, it's a somewhat modest reduction on
15 the carbon side, but it is full petroleum reduction.

16 And this is one of those things that I want you
17 to pay attention to when Mark Melaina goes through his
18 numbers. The natural gas numbers were a bit of a
19 surprise to me when I first saw them.

20 And then, also, advanced technology truck
21 demonstration and manufacturing, so we're up \$70 million
22 there, 36 projects and, again, I want to flag that for
23 you as Dr. Melaina goes through his presentation.
24 Because the results from these investments really
25 figure -- they predominate in kind of the long-term

1 benefits from our program.

2 And in the biofuels side, so we're at \$91
3 million total, about 33 projects so far.

4 And on the renewable diesel, the biodiesel side
5 this represents two of our more recent awards. One is
6 to Crimson Renewable Fuels. The other is to Community
7 Fuels in Stockton.

8 So, this is good, we're starting to see some big
9 numbers in the millions of gallons per year in
10 commercial production capacity. And we're very pleased
11 with these investments because they're very low carbon.
12 And I know the renewable fuels operation is all waste-
13 based feedstocks with that.

14 So, turning now to the statutory direction under
15 AB 109 to do our benefits reporting work. So each two
16 years in the normal IEPR cycle we're to report on
17 several things, so one is a list of the funded projects.
18 That's kind of a detailed accounting exercise and any
19 expected benefits so again, petroleum reduction, GHG
20 reduction and then criteria emissions reductions.

21 In some ways this is really a big part of my
22 work here at the Energy Commission and this is the part
23 that's the most fun to me, and I think these long-term
24 projections for carbon reduction in one way may be the
25 ultimate metric of our program because that's really the

1 policy basis for it.

2 What else did I want to say here? There are a
3 couple of other things that we've added, so public
4 health benefits and then job creation and workforce, and
5 Peter Cooper will speak to those later.

6 So, just so you know where we are, so in the
7 2013 Integrated Energy Policy Report we did report on
8 those figures.

9 So, this was the first time EPA Region 9 had
10 kind of run their public health calculator and we
11 identified 380 tons per year of NOx emissions from our
12 program investments. And that tied out to about \$3
13 million per year in annual public health benefit.

14 So that's improved -- I'm not good at this
15 stuff -- reduced incidences of asthma and other
16 respiratory diseases. So again, that kind of tallied up
17 to \$3 million.

18 And on the job side, so we calculated this in
19 2013, but we haven't done it yet for 2014, so the
20 numbers we have are about 6,300 jobs created. And we
21 will tally those up later in 2014 for the IEPR cycle.

22 So, in 2011 we did the first benefits report, so
23 that was Charles Smith, Andre Freeman and myself, and
24 some other staff that helped pull together the numbers.

25 And the really challenging part with this, and

1 Charles alluded to this in his introduction, is
2 attribution.

3 So, for example we've got some really important
4 grants out on battery chemistry with some battery
5 development companies. And at some point -- and we know
6 this is a critical factor, you know, power density cost
7 is a critical factor for making EVs more affordable.

8 But if we look out, you know, in 10 years or 15
9 years, and perhaps there have been some important
10 breakthroughs and some good payoffs, but that's really,
11 really hard to measure back, you know, from this initial
12 investment to some level of deployment, some incremental
13 difference in the cost for those units.

14 So, we kind of did the best we could, but Dr.
15 Melaina and his team have really formalized that quite a
16 bit more with the analytic capacity that they brought in
17 with the 2013 report.

18 So, more formal methods for expected benefits
19 and, again, market growth.

20 And we also extended our analysis period to
21 2025. And you can see how kind of the number of
22 projects we analyze each cycle goes up. So in 2011 it
23 was 86 projects, in 2013 147, and in this one I forgot
24 to write that number down, but I think Marc will catch
25 it for the number of projects we're analyzing here.

1 So, kind of going back to the theme of the
2 workshop that Commissioner Scott laid out, you know, how
3 do we measure and communicate these market
4 transformation benefits from our investments?

5 And again, expected benefits are really pretty
6 easy to calculate, but that's always going to be kind of
7 a short-term payoff for this and it's not going to get
8 into the longer-term market transformation.

9 That's the challenging work. And again, we
10 really appreciate the advanced analytics that Dr.
11 Melaina's team brings to bear on this.

12 But just to go back to some of the points I was
13 making initially, the goal of this program is to
14 transform markets. And again, we can't buy our way to
15 compliance.

16 And when I think of market transformation and
17 all those synergies, a big part of that is attracting
18 private capital, making it more likely that end-users
19 are going to buy these fleets and private capital is
20 going to invest in these technologies.

21 So, some of the examples that always stick in my
22 mind, so Electric Vehicles International, down in
23 Stockton, they talk many times of how our initial grants
24 were really seed money. They kind of put a little stamp
25 of approval on their technologies and their plants which

1 in turn helped attract private capital. And that's both
2 on the investment side and then private orders for
3 additional trucks than we had originally funded.

4 The same with Mike Simon at Transpower who's,
5 you know, developing Class A, all-electric tractors for
6 drayage operations down in the ports. The same kind of
7 thing, the initial grant money was seed money, a little
8 stamp of approval, demonstrated the viability of his
9 engineering team and technology. And that's kind of
10 escalated over the years and he's now attracting more
11 private capital and, hopefully, will get some orders for
12 commercial trucks.

13 And I think the first element award for the
14 hydrogen sector, that Charles alluded to, is also a
15 really good example of that.

16 The first element was able to be so successful
17 because they brought in private money. So, for the very
18 first time an OEM in North America is investing in
19 hydrogen infrastructure. So, that reduced the unit
20 costs for their station, so they were able to under-bid
21 their competitors quite a bit.

22 We got more stations out of this. We got a
23 better kind of cost-effective score.

24 But again, kind of through these seed
25 investments that we're doing private capital is starting

1 to flow into the hydrogen fueling infrastructure side.

2 So with that, I would like to introduce Dr.

3 Melaina.

4 So, Dr. Melaina is a Senior Engineer at the U.S.

5 Department of Energy's National Renewable Energy

6 Laboratory.

7 And his research addresses early market

8 transitions for alternative fuels, with a focus on

9 scenario development, market barriers, and hydrogen
10 infrastructure.

11 Before joining NREL in 2007, Dr. Melaina was

12 Research Track Director at the Institute for

13 Transportation Studies at the University of California

14 at Davis.

15 Dr. Melaina received his doctorate from the

16 School of Natural Resources and Environment and an MSC

17 in civil engineering from the University of Michigan.

18 And he has a BA in physics from the University of Utah.

19 So, welcome Marc.

20 MR. MELAINA: All right, thank you, Jim. I'm

21 going to go through these slides. They're fairly high

22 level and, hopefully, we'll have time for questions to

23 follow up.

24 So, again, my name is Marc Melaina. I work at

25 the National Renewable Energy Laboratory.

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1 I have a couple of just introductory slides. If
2 people are not familiar with NREL, we are owned by U.S.
3 Department of Energy. We're operated by the Alliance
4 for Sustainable Energy based in Golden, Colorado.

5 And of the U.S. energy labs, we are one of the
6 labs -- we are the lab that focuses on energy
7 efficiency, renewable energy.

8 Other laboratories work in that space, as well,
9 but we focus in that area.

10 Within the energy efficiency/renewable energy we
11 look across all the different sectors, buildings,
12 electricity, transportation, and we look -- including
13 R&D, bench, laboratory scale, we do work through to
14 systems integration and market deployment.

15 So, I'm going to go through, pretty well, the
16 categories that we have in the document, the report in
17 terms of the types of benefits that we've estimated and
18 really touch on the results, and some of the conceptual
19 framework of how we've set up these calculations.

20 So, these are some of the numbers that Jim was
21 getting into. At the top here, we already talked about
22 the different metrics. Greenhouse gas emissions,
23 petroleum use reductions are a major focus, as well as
24 criteria emissions, tailpipe emissions in particular.

25 For the analysis that I'm presenting, we have

1 estimated benefits for 207 projects, with total funding
2 of \$426.1 million, and this is since 2009.

3 So, this is a subset of the total projects
4 funded, which is 274, out of \$487.8 million. And again,
5 that's through the end of March this year.

6 So, this is the layout we have for talking about
7 four different types of benefits in the report.

8 Baseline benefits are benefits that we would expect to
9 have occur from these different technologies if there
10 was no intervention by a government agency in the
11 market. The technologies would compete on their own in
12 the market, which some of them are already doing, and we
13 would -- benefits would accrue without any intervention.

14 Expected benefits we've already talked about.
15 This is -- I liked the term Charles used about hardware
16 on the ground. We know what we're putting in the
17 ground, we know how it's supposed to work, we know how
18 to estimate the effectiveness of that hardware.

19 Market transformation benefits, as we just
20 heard, are trickier and so I'm going to talk through
21 some of the particular market transformation influences
22 and benefits that we tried to tackle in this report.
23 It's a subset of the total possible market
24 transformation benefits.

25 But as Jim said, it's a really key one in terms

1 of understanding how program funds are going to be
2 leveraged as markets take off over time.

3 And the fourth one here is really to put us in
4 perspective and this is the required carbon reduction
5 benefits if we stay in compliance with our long-term
6 goals out to 2050.

7 So, we have a trajectory there to place these
8 other three in perspective.

9 So, just a visual on that, along the bottom here
10 we have baseline benefits. This is a cartoon. These
11 are not based on real numbers.

12 Expected benefits, putting hardware in the
13 ground over time, the vehicles get driven a little bit
14 less, eventually some of the hardware gets shut down,
15 and these expected benefits would trail off, but the
16 program provides the impetus to put this equipment in
17 the ground, initially.

18 At the same time there's an influence on the
19 market. And here, this is shown as an influence, not a
20 benefit.

21 We want this market transformation influence to
22 happen early on as we put this equipment in and also as
23 we support policy development, consumer awareness.
24 Those are other types of influences that over time will
25 accrue with benefits closing the gap between these

1 declining expected benefits and the required reductions
2 that we need over time to meet long-term goals.

3 So, this market transformation influence would
4 result in accrued benefits that would close the gap
5 between these two.

6 So, those are the same four I just talked about
7 on the previous slide.

8 So, let me talk about the expected benefits. We
9 already talked about this a little bit, but just to say
10 a little bit more about where the numbers came from and
11 how we crunched the numbers on the different projects.

12 These are all based upon information about
13 successful completion of all the funded projects. If a
14 vehicle is funded and deployed, it is fully utilized,
15 the same with production facilities.

16 And we assume that a mid-size car that is
17 deployed displaces another mid-size car that was going
18 to be in the market, so one-to-one displacement. So,
19 that's an important assumption.

20 This is really based upon project-level,
21 proposal-level information that Energy Commission staff
22 has collected, and we've vetted, and tried to place into
23 consistent sort of harmonized, you might say, framework
24 to calculate these different benefits.

25 So, this is really bottom-up data collection and

1 analysis.

2 So, as we heard earlier, these are fairly
3 straight forward. We understand the different numbers
4 that need to go into these calculations very well.

5 Vehicle miles traveled, again this ties us back
6 to that one-to-one replacement of the service provided
7 by the technology.

8 The same vehicle miles traveled that would have
9 happened with that conventional car. Those vehicle
10 miles are now occurring because we have a new technology
11 that's been deployed.

12 Average fuel economy, fuel production capacity,
13 these are basic numbers that you would put in for an
14 energy balance calculation, and then fuel carbon
15 intensity values are based upon the Low Carbon Fuel
16 Standard look-up tables.

17 In some cases we have a little bit better
18 information than that for some of the projects. Or not
19 better, I should say new information.

20 This is one of the key tables in the report and
21 this walks through the different project categories.
22 There's two slides here.

23 It goes to the categories of fuel class, or
24 subclass, the total awards in these two columns here.

25 And then of those which ones were evaluated for the

1 benefits analysis.

2 And then in the far right, these two columns
3 show whether we have included these under the expected
4 benefits category and if we have included them in the
5 market transformation category.

6 Some are in both, some are only in one or the
7 other.

8 So, this is a high level summary of how we
9 calculated benefits for each of these different project
10 categories and subclasses.

11 So, along the top here we have fuel delivery
12 infrastructure, then we have the different vehicle
13 awards.

14 And then on the next slide we have fuel
15 production. And then several of the awards that Jim
16 mentioned we don't really have metrics that we can build
17 upon to try and estimate benefits because these are
18 pretty far removed from direct hardware in the ground.

19 So, this is a high level graphic of the results
20 of the expected benefits calculations for greenhouse gas
21 reductions based upon that previous slide.

22 So, let me just go back and make sure people are
23 connecting the dots here. This is the expected column
24 here. If we summed these all up by each of these
25 categories, fuel delivery, vehicles and fuel production,

1 for each category that has a checkbox there we get this
2 annual reduction in greenhouse gases over time, out to
3 2025, the analysis period.

4 You can see they're color-coded. So, green is
5 vehicles, blue is fuel infrastructure, red is fuel
6 production.

7 You see these ramping up over time as projects
8 are put in place and the hardware or vehicles are
9 deployed.

10 And then at this point, when they've ramped up
11 over the analysis period, we have a pie chart here that
12 shows what fraction of this wedge goes to which
13 category.

14 So, you can see here on the vehicle side the
15 manufacturing category is really the dominant category
16 for this wedge of reductions.

17 On blue here we have a similar pie chart, where
18 we have the natural renewable gas category being the
19 largest contributor, the other ones being important but
20 smaller in overall magnitude.

21 And then for the bottom one, here we see diesel
22 substitutes providing the majority of the greenhouse gas
23 reductions.

24 If you wanted to make this more complicated, you
25 could show all of these as trends over time, but that

1 would be hard to discern all those different patterns.

2 This really captures the major results here on
3 the right.

4 This is slightly different than the petroleum
5 fuel reductions because there are different carbon
6 intensities and efficiencies associated with these
7 different projects.

8 So, the next slide is the same set of analysis,
9 but looking at the petroleum fuel reductions.

10 So, a little bit different. Some changes, I
11 think especially in fuel reduction between the two. And
12 again, this is based upon the carbon intensities versus
13 the fuel use calculations.

14 So, these are two key rollup slides that
15 summarize the overall results of our expected benefits
16 calculations.

17 The next slide just shows a table that draws
18 some numbers for people who prefer to look at numbers,
19 rather than graphs, that represent those same figures.

20 These three categories here were the three
21 colors on the previous two slides. This is greenhouse
22 gas reductions. This is petroleum fuel reductions. And
23 then we have the total for all expected benefits here.

24 The next few slides I'm going to talk about the
25 market transformation benefits.

1 An important distinction here is that for the
2 expected benefits we've really taken what we think is a
3 central value, best estimate of those benefits.

4 Where in market transformation we know that the
5 influences that we're trying to estimate are much more
6 uncertain so we have a high and low range of what that
7 influence might translate into in terms of greenhouse
8 gas, petroleum reductions.

9 So, this is a range here. We discuss these as
10 being additive or you would have your expected and then
11 you would have additional benefits for market
12 transformation.

13 But in a lot of ways they are qualitatively
14 different because they're different types of influences,
15 different types of benefits in a qualitative way.

16 And then for reference, and I have a graph on
17 this towards the end, require carbon market reductions.
18 This is the trajectory we would need to be on to move
19 towards the 2050 greenhouse gas reduction goal.

20 And this is really based upon the Air Resources
21 Board Vision Study from a couple of years ago and one of
22 their scenarios of compliance for carbon reductions.

23 So let me move into the market transformation
24 methods and results.

25 This slide summarizes the major -- well, the key

1 influences that we felt we could estimate with a
2 reasonable degree of certainty and theoretical
3 cohesiveness.

4 There are other market transformation influences
5 that we know exist, people have written about them, but
6 they're very hard to quantify.

7 So, the one that comes to mind for me is
8 information barriers between consumers and understanding
9 the product. We know that's a real barrier for market
10 transformation but it's very difficult to quantify.

11 So there's a little bit of that in here, but we
12 didn't try and tackle that type of transformation
13 barrier.

14 What we did try and tackle are these first two
15 bullets here under vehicle price reductions. So,
16 vehicle price means when a consumer is considering
17 purchasing a vehicle they look at the price of the
18 vehicle, and they evaluate their value of the vehicle
19 versus the price, and try to determine whether or not
20 they want to buy the vehicle.

21 If there are a greater number of electric
22 charging stations, public stations, or there are, say,
23 rebates for home chargers, workplace charging stations a
24 consumer will see that vehicle as being more valuable
25 and it changes how they interpret that price signal.

1 So, that's what we're talking about for that category.

2 Similarly, for fuel cell electric vehicle and
3 hydrogen stations, if there are no hydrogen stations out
4 there, the sticker price of the vehicle doesn't really
5 matter because the consumer cannot possibly value that
6 vehicle.

7 As more and more stations are deployed, they
8 interpret that price of the vehicle a little bit
9 differently because the value of the vehicle's increased
10 by greater fueling availability being available.

11 So, both of those are similar. We tried to
12 estimate them a little bit differently, but it's a
13 similar type influence of vehicle price on consumer
14 decisions.

15 Another influence is a more direct rebate being
16 applied that also influences vehicle price. This is not
17 quite as complicated, conceptually, as the first two,
18 but there are some interesting things there about how a
19 rebate might not be quite the same as a direct change
20 from the automaker of the MSRP of a vehicle.

21 Okay, let me just check, am I moving through
22 these quickly enough?

23 So, these vehicle price reduction influences on
24 the market, on consumers in particular, are distinct
25 from what we've categorized as vehicle cost reductions.

1 So, this is an influence on the manufacturer or
2 the producer of the vehicle and making their production
3 process more efficient, more cost-effective, moving down
4 the learning curve effectively so that they can produce
5 vehicles at a lower cost which we then assume would
6 translate into a lower price for the consumer. But we
7 do -- we call it vehicle cost because that's really what
8 we're trying to influence.

9 So, direct investments in production processes.
10 The way we've analyzed it is through increased
11 experience by moving manufacturers down the learning
12 curve.

13 This is a pretty standard analytic framework,
14 but what we're trying to do is match sort of this high-
15 level view of accumulative experience curve with this
16 bottom-up information we have on specific projects.

17 Thirdly, we have a category of what we call next
18 generation technologies. If a particular project is
19 deployed and we know it's one of the first generations,
20 it's not quite commercially mature if it's deployed
21 successfully the project is successfully displayed to
22 the market. Investors see the results. Other companies
23 see what happens. Successful completion of that project
24 makes it more likely that the next generation of the
25 same technology will be scaled up and deployed at

1 commercial scale or near commercial scale.

2 So, that's what this category does. And we do
3 this both for biofuel production and for the medium and
4 heavy duty truck next generation category for those
5 truck projects.

6 So, that slide really summarizes the different
7 types of market transformation influences we've tried to
8 incorporate.

9 Just a couple visuals on things I just talked
10 about. This is what I was referring to in terms of a
11 learning curve.

12 These curves have been developed based upon
13 retrospective observations of prices, production prices,
14 and cumulative experience.

15 Just because that happened historically does not
16 mean it's going to happen in the future. But we refer
17 to some of the cost curves from National Academy's study
18 that came out early last year, and we used that as a
19 reference for the electric drive vehicles in terms of
20 their -- the progress ratios, the key number there.

21 So, if you have a project that pushes the
22 manufacturers down the learning curve, they can then
23 sell their next set of vehicles at a lower price.

24 Down here we just have a responsiveness, sort of
25 demand elasticity function for consumers, how they

1 interpret that vehicle price. It does depend on the
2 consumer and the vehicle, the type of vehicle.

3 And so we've tried to set up those calculations
4 consistently across the different vehicle types to show
5 how consumers might respond to those price changes.

6 Okay, so this is a little bit more detailed than
7 the previous chart that I showed where we're indicating
8 the fuel technology categories and which of those three
9 market transformation influences we're trying to
10 estimate for each one.

11 So you can see the fuel price reduction, what
12 that applies to, the vehicle cost reduction in
13 manufacturing, and then the next generation calculations
14 for electric commercial trucks and for the fuel
15 production projects.

16 So, this is a table. I have a graph next, but
17 this is a table that just summarizes the high and low
18 results.

19 What we've tried to do here is to have the high
20 results be more optimistic about what that influence
21 might be on the market, future markets and future
22 deployments.

23 And then the low is to say that the influence is
24 not going to be as effective. There's a fairly broad
25 range here. It's really tough to say that we've set up

1 that range consistently across all the different
2 projects. We've done it on a technology project basis
3 for each one to try and estimate that range.

4 ZEV industry experiences the production,
5 function, and then the next generation trucks and next
6 generation fuels are broken out here.

7 Let me just give an example here. Say the
8 uncertainty in our calculations around the influence of
9 hydrogen stations resulted in a broader high and low
10 range than electric charging infrastructure. Just
11 because of the way we tried to estimate that influence,
12 we know less about it, and the numbers suggest that
13 there's a greater uncertainty about what that influence
14 might be.

15 So, the high and low ranges shown here are
16 aggregates of the various different projects in each
17 category.

18 So what that looks like, if you take my previous
19 slides, just to remind people these here, if you take
20 this total for the expected benefits, adding these three
21 up, and you stack the market transformation benefits as
22 being additive on top of those expected benefits, you
23 would move from this expected benefits total.

24 If you took all those categories and their low
25 ranges, you would move up to this dotted line. So, all

1 of these low rows here, if you added those up to this
2 bottom sum you would move up to this dotted line.

3 If you took all the high values, you would move
4 up here. And here, this is the greenhouse gas
5 reductions million metric tons moving in expected to,
6 say, I think it's 1.7, 1.6, you would move up to this
7 range closer to 2.6, 4.2. The numbers are on the next
8 graph.

9 So, hopefully, visually people can see how
10 that's a high and low range if you did stack these,
11 which is how we present them.

12 Building on that, we have tried to show, for a
13 sake of reference, what the trajectory is to get on
14 track to meet the long-term greenhouse gas reduction
15 goal, and that is the market growth benefits category.

16 Ramping up over time each of these results in a
17 higher level of benefits and this is the range that you
18 would need to be if you wanted to be on that long-term
19 trajectory to meet the 2050 greenhouse gas reduction
20 goal, which is a major de-carbonization of the whole
21 sector.

22 You could say that you could wait longer. This
23 is a delayed result. But you can't really justify
24 saying you can wait this much longer and still bring
25 about the same change. It's possible, but much less

1 likely.

2 These are rough numbers that we took from the
3 Air Resources Board Vision Study.

4 So, let me talk about those a little bit more.
5 There is some debate about when is the right time to
6 tackle carbon reductions. There's some economic views
7 that we should wait until the technology is more mature
8 and then try and force the technology.

9 Some views say that we need to support the
10 technology development early on and then the benefits
11 will be easier to achieve later on.

12 We've tried to capture that range here but,
13 really, there is some uncertainty about how that's
14 actually going to play out and what's the best way to do
15 it.

16 Overall, when you go out to 2050, and I have a
17 figure to show this, the total emission reductions you
18 need to meet that goal are much larger than what we've
19 achieved so far under the program, or under any of the
20 programs in California to move the market.

21 So, I think that's an important perspective.

22 And as Jim mentioned, it really emphasizes this
23 idea that government programs, alone, cannot move us all
24 the way through to that 2050 goal. We really have to
25 rely on market forces taking over and influencing the

1 market in smart ways, effective ways so that there's a
2 snowball effect, rather than saying we're going to push
3 this all the way to the end.

4 It's just not possible from a funding
5 perspective.

6 So, this is the figure that I showed earlier
7 about stacking our expected market transformation
8 benefits. And then that was out to the 2025 time frame.
9 And we already had the market growth benefits going off
10 the scale here.

11 So, if we wanted to increase that scale from 7
12 million metric tons up to 100, and we wanted to extend
13 the time frame out to 2050, the green trajectory here is
14 basically de-carbonizing the whole transportation
15 sector. Those are the emission reductions you would
16 have to achieve.

17 And this is where we're at in terms of the half-
18 a-billion dollars and our estimate of their both
19 expected and market transformation benefits.

20 So, I think that's an important perspective in
21 terms of what we've achieved so far and the degree to
22 which we have to rely on market forces in the future to
23 push a lot of this change.

24 So, this is my last slide, a few recommendations
25 on how to improve the estimate methodology. Better

1 collection and integration of data on the technology-
2 specific effectiveness metrics.

3 I think this is a little bit different than some
4 of the benefit metrics discussion we're going to have
5 later today.

6 This is about how effective is it to install
7 more public charging, more hydrogen stations. This is
8 an intermediary number or influence that you need to
9 understand before you can then calculate the ultimate
10 benefits of that investment.

11 So, I think understanding that influence is
12 really important.

13 Evaluation metrics for projects, which I think
14 we are going to talk about today, we want to incorporate
15 those into this framework so that we have a lot of
16 transparency and fidelity to the best data available.

17 And then at some point, what we believe we're
18 moving towards is explicit modeling of competitive
19 dynamics between both the incumbent technologies, these
20 new technologies, and the new technologies as they work
21 out in the marketplace in different sectors.

22 And then the important benefits from electric
23 charging, hydrogen stations really should be
24 incorporated into a larger vehicle choice modeling
25 framework that takes into account all the different

1 attributes of the vehicle, and the consumers in terms of
2 the market adoption rates for the different vehicles.

3 And that's all I have. I'm not sure if I have
4 time for questions or not.

5 COMMISSIONER SCOTT: I think that you do,
6 actually, and I had a few for you.

7 And then what I might ask our audience to do, is
8 we've got about 15 or 20 minutes, we might not have that
9 many questions, but then we need to turn over to give
10 time to Peter Cooper to talk about workforce training.

11 But if you do have questions, I'd ask that you
12 limit it to clarifications related to this presentation.

13 For the public comment, we should hold the
14 public comment piece until the end, during the public
15 comment portion.

16 But to the extent that you have questions about
17 this study, I think we could take some of those.

18 But I have a couple, so I'm going to start. And
19 I can't decide if I should work kind of where you left
20 off or start back at the beginning.

21 And maybe what I'll do is start back at the
22 beginning. So, back on slide three you mentioned that
23 these -- the benefits that you're calculating are based
24 on 207 awards of about \$426 million since 2009.

25 So, the calculation is limited to -- not limited

1 to but, you know, it just captures a set of kind of
2 where we are today, so it's a snapshot in time.

3 And so I think, like my executive summary
4 version of what you said, and I'll state it, and then
5 you can tell me if I stated it right, would be, you
6 know, based on 207 projects awarded to date.

7 And then if you jump up to slide 10, it would be
8 that have the checkmark in the expected benefits
9 category, right, so you have a subset of the projects,
10 where you can actually calculate the expected benefits.

11 And what you see on pages 12 and 13 are up to
12 almost 1.75 million metric tons of greenhouse gas
13 reductions from those investments.

14 And we also see on page 13 about, what do you
15 think that is, 230, 240 petroleum fuel reduction
16 measured in millions of gallons.

17 So, you can actually take the numbers we've
18 invested in that subset of projects and say these are
19 the benefits from that. Is that right?

20 MR. MELAINA: That's right, that's the right
21 interpretation. And I think for us it was a decision to
22 just look at the retrospective awards that have been put
23 in place, and not try and do any extrapolation further
24 about other infrastructure, future awards, any other
25 sort of build-on or add-on effects that would happen

1 from those. It's really just a retrospective on what's
2 been funded today.

3 COMMISSIONER SCOTT: Yep. No, and I think
4 that's an important number. That's a great number to be
5 able to articulate about the program.

6 And I like, then skipping -- jumping up to page
7 14, the chart where you see the expected -- oh, so it's
8 got exactly the right numbers on there, so it's 236 for
9 petroleum fuel reductions in 2025 and 1.7/45.7 of
10 greenhouse gas reductions.

11 I mean I think that's a really interesting
12 number. And that's just in kind of a subset of the
13 projects that we've invested in to date.

14 So, if we looked at this next year, that number
15 will be a little bigger because we will have additional
16 projects.

17 And if we look at this, you know, continue to do
18 this out through the end of 2023, which is when AB 8
19 sunsets, that these numbers continue to get bigger.

20 Then let me see here, and I just wanted to
21 restate that because it kind of put a whole bunch of
22 slides together in like two sentences. Maybe not very
23 articulate sentences, but I just wanted to make sure I
24 was stated that back to you right.

25 And then I was thinking here, on page 22, well,

1 I had a few thoughts on there, really. I think that the
2 Legislature has asked us to invest in projects that have
3 the power to be transformative.

4 And so, I really appreciate the work that you
5 have done in how do we estimate market transformation.
6 And I think that it's really neat and it's cool to kind
7 of see it added on top of the expected benefits that you
8 have in the slide right before this one.

9 And then, you know, one thing I was thinking
10 about in terms of the market growth of carbon benefits,
11 which is your next slide, is that a restatement of your
12 bullet -- you've got, "Moreover, it's not anticipated
13 that government programs alone would be capable of
14 funding the entire transition to the 2050 goal".

15 And I think that's something probably all of us
16 have recognized. And with a program like ours, where we
17 only -- well, we're lucky to have a terrific program,
18 like ours, where we have \$100 million, which is a lot of
19 money to invest. But in a state as big as California,
20 it's also not that much money.

21 And I was just thinking it would be interesting
22 to see, I think one restatement of that might be that
23 it's -- the government programs really can help us make
24 progress towards the goals that we're trying to meet.

25 And that it would be kind of interesting to see

1 if you layer on the Air Resources Board AQIP program,
2 and you layer on the Cap and Trade money, and you layer
3 on what South Coast Air Quality Management District, and
4 other management districts, and then you layer on what
5 the Fed look like, how does that -- how does that, you
6 know, expand that portion?

7 And then if you layer on how much private
8 investment we know is already out there, how much closer
9 does that bring kind of that bottom chunk of benefits up
10 to where we need to be.

11 And I just think that -- not that I'm asking you
12 to take on that part of the study, but I think that
13 would be something really interesting to see what that
14 ends up looking like.

15 MR. MELAINA: Yes, to me, that is the next step
16 in terms of analysis. And to build towards that I think
17 we do need more data on what I called the effectiveness
18 of the different influences.

19 And so you would also, then, need to know the
20 relative effectiveness of the different programs as
21 they're interacting on the same market.

22 So that is, I think, where we want to move
23 towards, but it does make it -- it makes it more
24 complicated.

25 COMMISSIONER SCOTT: Yeah, for sure.

1 Advisers, do you have any questions?

2 Do we have any --

3 MR. BARTRIDGE: So, Commissioner I'd just add --
4 I mean I think that's a great point. With Marc's it's
5 \$526 million. Jim's presentation talked about almost a
6 half-billion to date. And with ten more years of this
7 program there's another billion dollars that we can put
8 towards benefits that really can change that graph on
9 slide 25, or more towards. So, I just want to reiterate
10 that point.

11 COMMISSIONER SCOTT: Yeah. No, I agree. I
12 think it's important to recognize that it's a snapshot
13 in time so it's not like, oh, then the benefits all
14 taper off because, of course, we haven't added all of
15 the benefits in from the projects we haven't funded,
16 yet.

17 Great, so let's go here and then over to John.

18 MR. CHUCK WHITE: Thank you very much, Chuck
19 White with Waste Management.

20 This is really an interesting study. I'm
21 looking forward to diving into it in more detail.

22 Just one question I have, a point of
23 clarification. It's on slides 10 and 11 and you show
24 that under -- and by the way, welcome to Sacramento, to
25 a fellow Wolverine.

1 MR. MELAINA: Oh, thank you.

2 MR. CHUCK WHITE: The natural gas fueling
3 infrastructure is not checked in the market
4 transformation column and the natural gas vehicle
5 deployment incentives is also not checked in the market
6 transformation program.

7 But on the next slide, 11, biomethane is both
8 in -- is a market transformation.

9 And I guess the question I had is we need to
10 have -- if we're going to use the market transformation
11 aspects of biomethane we need to have the fueling
12 infrastructure and the vehicles in order to be able to
13 make that leap.

14 So, I guess I would ask for your reconsideration
15 that perhaps the natural gas transition to biomethane is
16 part of a continuum, all of which is market
17 transformative.

18 If you look through the low carbon fuel pathways
19 that CARB has developed so far, the absolute lowest
20 carbon fuels are biomethane-derived fuels into the
21 negative territory.

22 And, in fact, Waste Management, the company I
23 work for, will likely have the majority of its 3,000
24 heavy-duty vehicle fleet running on renewable natural
25 gas by the year 2020.

1 So, it is a transformative process but we can't
2 use that fuel unless we have the natural gas fueling
3 infrastructure, unless we have the natural gas vehicles
4 in order to be able to make that transition.

5 So, I guess my question is why were those boxes
6 not checked under the transformative and why don't you
7 think that natural gas is part of a continuum to getting
8 to the very lowest carbon fuels that CARB has identified
9 to date?

10 MR. MELAINA: All right, so that's a good
11 question. Thanks for bringing that up.

12 So, let me just reiterate that there are a lot
13 more market transformation influences that we know are
14 real, that we know are happening, but we don't feel
15 completely confident trying to tackle them analytically.

16 So, I think you're right that there are market
17 transformation influences here.

18 The distinction that to me makes sense is really
19 that we have a bit better understanding of how household
20 consumers respond to public infrastructure than how
21 fleets respond.

22 So, fleets have a little bit different decision
23 criteria. It's sort of a different market influence
24 when you're really putting in infrastructure that's
25 focused on fleets.

1 Also, for biofuel vehicles, say plug-in hybrids,
2 but also natural gas vehicles that can go on both
3 gasoline or natural gas, the criticality of public
4 infrastructure as it is for, say, hydrogen or battery-
5 electric vehicles is a little bit more murky. So, it's
6 harder to see how consumers would really respond to that
7 if they had the option of using gasoline in their
8 biofuel vehicle.

9 So, I wouldn't say that we're saying that the
10 influence isn't there, we just didn't have an analytic
11 framework to try and tackle it with the same level of
12 rigor that we've tried to do the other ones.

13 So, we're not trying to suggest that the
14 influence isn't there.

15 COMMISSIONER SCOTT: We'll go to John Shears and
16 then Jim McKinney or do you want to --

17 MR. MC KINNEY: Actually, if I could --
18 Commissioner, if I could comment on this category as
19 well? Sorry, John.

20 To me, this was one of kind of the unexpected
21 results. And it's really fun to play around with the
22 investment category and the dollar amounts there, and
23 then kind of look at the results, whether it's expected
24 or market transformation.

25 So, natural gas fueling infrastructure was one

1 that really jumped out at me because that's a very
2 modest investment from our program, but the numbers are
3 quite large.

4 And to me, that's a good example of our
5 portfolio approach where, you know, we identified some
6 early commercial market opportunities. Natural gas was
7 one. E85 was another, some of the other biofuels.

8 And this is one where I think we're really
9 getting a good return on our investment in this near-
10 term category.

11 And as Chuck mentioned, there are longer-term
12 opportunity as you integrate more biogas and grow the
13 fleets there.

14 COMMISSIONER SCOTT: Great, John.

15 MR. SHEARS: Good morning, John Shears, a member
16 of the AB 118 Advisory Committee. I guess now it's the
17 AB 8 Advisory Committee, ARFVTP Advisory Committee, the
18 Center for Energy Efficiency and Renewable Technologies.

19 And I want to thank Dr. Melaina for a great
20 draft and I want to remind everyone right now what we're
21 looking at in terms of the presentation and the document
22 that's available for review is it's still a draft.

23 I just had a couple of clarifying questions and
24 observations. One thing I think is in the draft, you
25 know, when you start talking about market requirements

1 and market benefits -- and then it switches to market
2 benefits. I think when you're presenting those slides
3 that shows the magnitude of the remaining challenge, I
4 would recommend sticking with market requirements
5 because it gets -- it's very confusing when you
6 initially look at it.

7 And given that a lot of people who aren't going
8 to have time to dig into anything beyond the executive
9 summary of the final report, I think that could confuse
10 a lot of people as to exactly what these visuals are
11 relaying to people.

12 That would also reinforce the message from the
13 Vision, CARB Vision and Air District's Clean Air Vision,
14 which is also discussed thoroughly in your draft.

15 I had some clarifying questions. With regards
16 to fuel cells, well, I guess before I even go there, so
17 right now, as far as this report goes, it's looking at
18 all of the investments through March 2014, or a little
19 bit earlier than March, depending upon the projects, and
20 projecting out through 2015 what those current projects'
21 benefits could look like.

22 So, we still have many more investments from the
23 program that will be additive, you know, whether linear,
24 or geometric, or exponential, what have you.

25 So, there's still a lot of stuff the program

1 could be doing, so I just want to sort of clarify that.

2 Then when it comes to the discussion of the ZEV
3 technologies, I just wanted to clarify with you. It's a
4 big report to try and read through carefully in a short
5 amount of time, so I may have missed it.

6 When you talk about fuel cell vehicles, you show
7 greenhouse gas reductions essentially plateauing. But
8 then there's a little short discussion about criteria
9 pollutant emissions and they taper off.

10 And I'm not quite sure why the greenhouse gases
11 would plateau but the criteria pollutant emissions would
12 taper off.

13 I couldn't quite get what was being done in the
14 modeling there that, you know, would basically lead to
15 those results. That's my first clarifying question.

16 MR. MELAINA: Right, so the tapering off effect
17 is generally when we have, basically, the impulse of
18 vehicles that would be deployed, and then the impulse
19 ends, and then the vehicles are driven a little bit less
20 and eventually retired over time. So, that would be the
21 tapering off.

22 But that should be consistent with both the
23 criteria emissions and the greenhouse gases. So, I
24 think what's happened with greenhouse gas is there's
25 some countervailing, additional things going on there

1 that are distinct from the criteria emissions. I'd have
2 to look into it.

3 MR. SHEARS: Yeah, okay. You know, again, I
4 know there's a lot of stuff that's underneath what you
5 could try and articulate in a report, and I just want
6 to --

7 MR. MELAINA: Yeah.

8 MR. SHEARS: The other thing was when you get to
9 the plug-in hybrids and the -- well, actually, it's
10 figure 22. Again, apologies for folks, it's not on the
11 presentation, it's actually in the report.

12 When you switch from CVRP, you know, sales data,
13 empirical data, to switch over to using the actual
14 projected sales, and not using elasticities, there's
15 like a reset that happens where you drop -- for example,
16 for FEV sales it drops from, you know, roughly 17,500,
17 18,000 vehicles all the way down to below somewhere in
18 the order of like 3,000 vehicles and then the model
19 takes over.

20 MR. MELAINA: Right.

21 MR. SHEARS: Could you comment on that? I mean
22 recognizing there's a discussion about early adopters
23 then moving to middle and later adopter communities, and
24 the differences in the elasticities of those consumer
25 groups and I can understand that.

1 But it seems like there's a little bit of an
2 artifact that's manifesting in this and if you could
3 speak a little bit to that?

4 MR. MELAINA: Right. Yeah, I remember which
5 figure you're talking about. So, it's not an artifact,
6 it's really what was mentioned earlier is that we're
7 evaluating these programs, projects retrospectively.
8 We're not assuming that they continue into the future.

9 So, for the CVRP, we assumed that those rebates
10 stop at some point. And so when they stop, that's the
11 drop.

12 What's bundled inside of there that continues is
13 the CVRP influence on moving manufacturers down the
14 learning curve, which results in a price reduction. So,
15 that continued market adoption there is just from the
16 manufacturers having shifted down the experience curve
17 and so the vehicles now cost a little bit less than if
18 those CRVP investments hadn't been made.

19 So, compared to the baseline, the new electric
20 drive vehicles being produced after that CVRP program,
21 even if it's stopped, they're a little bit cheaper. So,
22 we'd see some market uptake that wouldn't have existed
23 otherwise.

24 MR. SHEARS: Okay, yeah, so that's helpful
25 because then that leads to a follow-on discussion that

1 we don't -- so my question is how can we follow up with
2 Dr. Melaina and the Energy Commission staff on -- some
3 of this is a little difficult to try and just relate
4 through e-mail and texts, but how can we have follow-up
5 discussions on some of this?

6 Because some of this I think affects the final
7 projections that show up. Still, I think we still have
8 the magnitude of the problem remaining but it does --
9 and this is important for the Energy Commission, you
10 know, being able to be accountable back to the
11 Legislature for the investments. And so anything that
12 can be helpful in that direction --

13 COMMISSIONER SCOTT: Yeah, that's a terrific
14 suggestion. And I think what we could do is probably
15 set up a meeting between -- with Dr. Malaina, and
16 Charles, and Jim, and John, you, and maybe a few others
17 who are interested, and kind of just sit and talk
18 through some of the different pieces.

19 That's something I think we will be doing,
20 anyway, as we try to finalize the report.

21 I would also suggest -- I would highlight what
22 you mentioned, which is that this is a draft report.
23 So, any comments that you all have that you can write
24 down and send to us, please be sure to do that as well
25 because we will be looking for additional information

1 and the comments from folks.

2 And then I think as we finalize this report and
3 as we think about how to write about this report in the
4 IEPR, again there will be follow up, and conversations,
5 and ways for us to kind of, you know, tweak it. Here's
6 what we have, here's where we think we are, how does
7 that play and work together there.

8 So, thanks for that suggestion.

9 MR. SHEARS: Great, and thanks again. I mean
10 it's a great draft and it also gives everyone a great
11 introduction into the whole academic research space
12 around innovation and moving, transforming markets and
13 all that, so thanks for that.

14 COMMISSIONER SCOTT: It does. Thank you, John.

15 And then we'll do one last question from Paul.
16 And Chuck, and John, and Paul, if you would give your
17 card to the reporter so he knows your name, gets your
18 name right on the transcript, that would be great.

19 MR. GRUBER: Thanks Commissioner Scott. Thanks
20 Marc. I'm Paul Gruber, Executive Director of the Next
21 Steps Program at ITS Davis.

22 Two very quick things, I hope. On slides 12 and
23 13, when you break out the expected benefits in the pie
24 charts, I understand the benefits for vehicles and
25 fuels.

1 I just wondered if you could add some
2 clarification to what was included in the manufacturing
3 category, which is the lion's share of the vehicle
4 expected benefits.

5 MR. MELAINA: Sure, so there's a few projects in
6 that category. And not only is it the large fraction of
7 that green wedge, but it's also the part that's making
8 it continuous, an upwards slope.

9 So, that is really -- so, this is a tricky
10 question. So, I'll try to kick this down the line until
11 later today.

12 But this is an investment in not manufacturing
13 of fuel, but manufacturing a device that's going to
14 consume fuel and manufacturing more and more of them
15 each year.

16 So, as they're deployed, these vehicles are
17 going to be on the road consuming more and more fuel as
18 that manufacturing plant produces more vehicles.

19 Does that answer your question?

20 MR. GRUBER: Yeah and I'll dive into deeper into
21 the actual report. Is it sort of a gray area, then,
22 between expected benefits for investments today and
23 market transformation benefits that you're expecting to
24 see later?

25 MR. MELAINA: I wouldn't say it's a gray area.

1 I think what it is, is we have tried to resolve all the
2 best available data that we have and all the different
3 projects.

4 So, the projects are not all consistent with
5 each other. So, what I was just describing is the
6 vehicle production process is distinct from CVRP. Those
7 two investments are doing different things.

8 So, production process, you put that
9 manufacturing plant in place and it's going to keep
10 making cars over time.

11 So, we had information on what was going to
12 happen with those and so that was information we were
13 able to use.

14 For the other market transformation influences,
15 they're different qualitatively and we had different
16 types of data to back them up.

17 MR. GRUBER: Okay, thank you. And then --

18 MR. MC KINNEY: I'm sorry, Jim McKinney here.

19 MR. GRUBER: Go ahead.

20 MR. MC KINNEY: If I can kind of build on Dr.
21 Melaina's response?

22 So, within the manufacturing category many of
23 those are kind of medium-duty truck operations. So
24 Boulder Electric, Electric Vehicles International,
25 Motive, TransPower we're funding either kind of the full

1 plant or different assembly lines.

2 And as Dr. Melaina said, the capacity for those
3 to expand, and especially in the face of the market
4 demand that we anticipate, and a lot of that is driven
5 by regulations from South Coast and the Air Resources
6 Board, but we see strong market growth potential in the
7 ZEV truck sector.

8 And again, I think as ARB may state later on
9 today, the whole set of issues around clean freight and
10 clean transportation strategies is a big part of it.

11 MR. GRUBER: Yeah, okay, and then final
12 question. On slide 23, I wonder if there's an
13 opportunity, because you show this very steep market
14 growth curve, is there an opportunity to show a curve
15 that it would take longer if CEC didn't invest in
16 alternative fuels and vehicles?

17 Essentially, would that bump out the market
18 growth curve?

19 You've got the baseline effects in there, of
20 course, which would stay, but would there be a
21 significant difference? And that would be worth
22 showing, for sure, if there were.

23 MR. MELAINA: Yeah, I think that's what this
24 implies. We're not claiming that we calculated that,
25 but that is what the figure implies.

1 MR. GRUBER: Okay, thanks.

2 COMMISSIONER SCOTT: I think what Paul might be
3 asking is if there were no Alternative and Renewable
4 Fuel and Vehicle Technology Program, what would that
5 green curve look like versus what does that green curve
6 look like with the program?

7 MR. MELAINA: Right. So, the way we have it
8 there it's independent of the program.

9 COMMISSIONER SCOTT: Oh.

10 MR. MELAINA: So, yeah, it hasn't been
11 influenced by the program. We're superimposing it on
12 top of the program benefits.

13 COMMISSIONER SCOTT: Okay.

14 MR. GRUBER: Okay, thanks.

15 COMMISSIONER SCOTT: Great. Well, thank you
16 very much, Dr. Melaina. I think this was a terrific
17 presentation and you gave us a lot of really detailed
18 information, I think, based on some complex modeling,
19 especially when you get into the market transformation
20 benefits.

21 But I think you did a terrific job kind of
22 walking us through, some of the nitty-gritty, but
23 without getting too into the weeds.

24 So, I thought this was fantastic. I appreciate
25 the great work that you have done on this, and on the

1 statewide assessment, and your great presentation.

2 Thank you for being here today.

3 MR. MELAINA: Great, thanks.

4 MR. MC KINNEY: And Commissioner Scott, if I can
5 just add on behalf of staff, this is really hard work
6 and there's a lot of detail that goes into this. And we
7 need to recognize others on our staff who have
8 contributed.

9 So, Jennifer Masterson really stepped up for the
10 first time, really good work on the spread sheets and
11 really making sure the details are correct.

12 Andre Freeman and Charles Smith, as always you
13 contribute to this.

14 But I'd just like to give Dr. Melaina and his
15 team a round of applause. I think it's a stellar work
16 and we're really glad to have it.

17 COMMISSIONER SCOTT: Thanks to them and our
18 team.

19 (Applause)

20 COMMISSIONER SCOTT: Thank you very much. So,
21 we are now on to Peter Cooper from the California
22 Employment Training Panel. And he's going to talk with
23 us a little bit about the jobs and workforce training
24 benefits. Welcome Peter, thanks for joining us today.

25 MR. MC KINNEY: Yeah, and as Peter's walking up

1 there I'll kind of read his biography.

2 So, we're really going to switch away from
3 hardware to the human factors side of our investments
4 and all the benefits accrued around workforce training,
5 a little bit on job creation.

6 So, Peter Cooper is now the Assistant Director
7 of the Employment Training Panel with the State of
8 California.

9 Governor Brown appointed Mr. Cooper as Assistant
10 Director in May 2012, where he's focused on external
11 affairs and apprenticeship policy.

12 He served as a Senior Program Manager and
13 Legislative Advocate for the California Labor Federation
14 from 2000 to 2012, working primarily on low-wage worker
15 issues, environmental policy and workforce development.

16 From 1997 to 2000 he was the Research
17 Coordinator for the Service Employees International
18 Union Local 250, in Oakland, California.

19 And from 1992 to 1997 he conducted research for
20 the AFL-CIO and for Public Citizens Global Trade Watch,
21 in Washington.

22 And he's also a long-term advisory committee
23 member for our investment plan process.

24 So, Peter.

25 MR. COOPER: Yes, thank you, Jim. Commissioner

1 Scott, thank you for giving me the time to speak today.

2 And, you know, this program is really important
3 for ATP. I think it and our agreement, and interagency
4 agreement with the Energy Commission really epitomizes
5 the whole notion of a triple bottom line because helping
6 the environment, providing job training, and helping
7 employers, as well as being very measurable and
8 accountable.

9 And so, today I'd like to kind of dig in a
10 little bit into our program and talk to you about our
11 funding model, as well as how we measure job training
12 and job placement.

13 So, here you have a bit of an overview of the
14 workforce component of the strategic plan. And you'll
15 see that my agency, the Employment Training Panel, does
16 receive quite a bit of funds through the program over
17 the years.

18 I would point out the \$10.3 million match. So,
19 as you'll see later, our program does require in-kind
20 contributions from employers for training.

21 So, a little bit more about the Employment
22 Training Panel. Many of you may already know about our
23 program or may not.

24 We are a State agency under the umbrella of the
25 California Labor and Employment Workforce Agency.

1 We receive funding from employers that pay into
2 the UI training tax. And so when they're paying their
3 UI, they also pay a small sliver, which is about \$7 per
4 employee per year into this training fund, which comes
5 to roughly about \$65 million in the State of California.

6 The model that we have is very unique in the
7 United States. We haven't seen it replicated anywhere
8 else, really. And it's a pay-for-performance contract.

9 So, unlike other workforce programs that are
10 often grants, we require the employers to enter into
11 contracts and they'll only get paid after they've shown
12 that training has occurred and the employee has been
13 placed or retained in a job.

14 We write contracts that address the employer
15 training needs and reimburse the training.

16 We don't mandate whether it's -- the training
17 topics. We don't provide training. We let the employer
18 select the training providers.

19 Although, we are monitoring all of that and
20 especially in the case of the funding that's available
21 for THRIVI (phonetic), AB 118, we make sure that the
22 training topics are in sync with the investment plan.

23 So, let me move on to a little bit more details
24 about our program. Here's our basic contract structure.

25 So, we kind of have two different contract

1 structures. One is for single employers and the other
2 is for multiple employer contracts. And this could be a
3 training agency. It could be like a local Workforce
4 Investment Board, perhaps a community college, or an
5 employer association that brings together employers,
6 often smaller employers that need the assistance through
7 that NEC model.

8 But this is kind of our basic single -- our
9 basic contract structure. And so, we pay the contractor
10 and review their training records, review the
11 eligibility of the participating employers, and the
12 individual training eligibility information.

13 So, one of the things that we do is we look at
14 the Social Security, make sure that the trainee has a
15 Social Security number, at the beginning of the
16 contract.

17 And this benefits the employer, as well, because
18 they won't get paid at the end until they've shown that
19 they've placed or retained the worker in a job.

20 And so our staff actually goes and checks with
21 the EDD's base wage file to make sure they're in a job.

22 Move to the next slide. So, here we can see
23 kind of the timeline. Our contracts are generally for a
24 two-year period of time.

25 After a proposal has been developed, it's

1 brought to our monthly Panel meeting. It's approved.

2 Training starts, as you can see on the left side of the
3 slide.

4 They may have a number of different topics that
5 they're being trained in.

6 And they enter into a post-training retention
7 period. So, they have to get in their 90 days of
8 retention on the job before the funds are earned. And
9 at that point, when the funds are earned, they've shown
10 their retention they get paid on the tail end.

11 So, when you see from our Panel that -- for
12 example, if we enter into a contract with a large
13 company, let's say PepsiCo, or a small company, whatever
14 company, and you see that number that's really the
15 amount of funds that has been set aside for them, the
16 contract amount.

17 They're not given that money on the frontend.
18 That's a pool of money for them to draw from as they
19 show success in the program.

20 So, as I mentioned before, with the 118
21 partnership, as we're developing contract proposals with
22 the employer and looking at this training that they want
23 to occur, and the job skills development that they need,
24 we make sure that it fits within the context of the
25 investment plan.

1 Let's see, what else? So, one of the
2 opportunities and one of the benefits of having a model
3 that's already in place that the 118 funds have been
4 using, is that with this structure already in place we
5 do have consistent metrics and performance indicators.

6 And we report back to the Legislature on an
7 annual basis regarding our success in these programs.

8 Generally, employers are successful at about 70
9 percent, as far as drawing down the funds available that
10 have been set aside in their contract.

11 So, we serve both the employed and unemployed.
12 The goal is post-training full time employment earnings,
13 earnings at a high wage.

14 So, we also have a metric of a wage that's
15 required upon retention. The wages are set by the Panel
16 and they are on a regional basis. So, we have that wage
17 requirement, as well.

18 The most successful programs have really been
19 the skill upgrade training for incumbent workers. But
20 we do have some new-hire and job creation programs, as
21 well.

22 One other thing that I wanted to mention is we
23 do have situations where employers will come to the
24 Panel and at first they may appear to be eligible for AB
25 118 funding, and that funding stream, but the employer

1 may wish to only train -- have a portion of their
2 training be on AB 118-approved skills and training
3 topics. And the employer wants to do a lot more
4 training, more generalized training.

5 And so, they may come in under our core funding
6 and be funded that way.

7 So, evaluation, because ETP programs are
8 exclusively performance based, we stress throughout the
9 development process that the training should be a good
10 fit under AB 188 and addressing their needs, as well.

11 We seek out certifications and training that
12 leads to certifications when at all possible.

13 And as the marketplace is beginning to mature,
14 the workforce training needs are becoming more clearly
15 articulated to training providers.

16 Let's see, and we also make sure that there is
17 in-kind contribution. So, if you were to go on our
18 website and look at the contracts that have been funded
19 by the Panel, you'll always see a kind of a side-by-side
20 analysis of the in-kind contribution that's taking
21 place.

22 So, one kind of exciting area that we have
23 that's being developed at ETP is that we're in the
24 process of moving over to a web-based computer tracking
25 system.

1 And this will allow us to track and research the
2 outcomes of the training in a more efficient way.

3 One area that we are also considering is whether
4 we want to track the hours and the placement of the ETP
5 trainees for a period of time that's longer than the 90
6 days.

7 So, that's something that would have to happen
8 through statutory changes. But that's an area where we
9 could have metrics in the future that are more robust
10 and longer in duration into the career of the trainee.

11 As I mentioned, we verify the reported wages of
12 the trainee, using the Employment Development
13 Department's base wage file, during the retention period
14 to make sure they meet our requirements.

15 So, here's one of the programs that has been
16 very successful. This is a multi-employer contract that
17 was done by the California Labor Federation working with
18 the three public transit agencies for large fleet
19 conversion efforts.

20 And they were able to earn 100 percent of their
21 committed -- of their funds. And it was so successful,
22 in fact, that they are entering into a second contract
23 with ETP and we're expecting that to be successful, as
24 well.

25 And we funded, in past years, Tesla and this has

1 also been very successful.

2 And we funded expansion at the NUMMI factory in
3 Fremont. And as you can see, they've earned \$647,000
4 under this contract, which recently terminated. And
5 they earned nearly 86 percent of their initially awarded
6 funds.

7 So, here's my contact information. Robert
8 Meyer, who is really our specialist in this area, can be
9 contacted as well, and his information is up there for
10 you.

11 And so, I just wanted to leave you, lastly, with
12 two areas where I think ETP has worked and is a good
13 model to build upon.

14 The employers are encouraged to assume a greater
15 responsibility for training. Under our program they get
16 a flat rate, so they get anywhere from \$18 to \$26 per
17 hour, per trainee.

18 And the reimbursement that they get does not --
19 not only is it matched by the employer, but it doesn't
20 offset their entire funding needs.

21 So, the flat rate encourages them to assume a
22 greater responsibility and really be involved.

23 With our multiple-employer contracts, we also
24 require them to have the employers that are going to be
25 participating, their list of employers, where they're

1 planning on doing the placement of new hires, in that
2 case, all lined up before they get to our Panel. So,
3 they make sure that they have a very high probability of
4 success.

5 Because ETP is performance-based, it's a
6 structure that helps to ensure for success of the
7 program. And we've seen that time and time again.

8 The funds that are not used, they revert back to
9 our program.

10 So, it is a constant balancing act, both with
11 figuring out how much funding is available through our
12 program, whether it's the core funding or our funding
13 through the AB 118 process.

14 Because after two years, we'll have an employer
15 that maybe has only earned 80 percent of their funds.
16 The extra 20 percent goes back into our pot.

17 And so it's a constant, you know, calculating
18 and balancing act.

19 As well as an area that is really a challenge
20 for us, and I think for this program as well, is on the
21 one hand we want to be as accountable as possible with
22 the funds and be able to document that they've led to
23 job placement, and careers and training.

24 But on the other hand, we want to make the funds
25 accessible to the employers, especially the -- well, the

1 employers that have paid into our program.

2 And often those two are at odds with one
3 another. And so, trying to figure out the right balance
4 between those two priorities is a real challenge.

5 So, I'll leave it with that and if you have any
6 questions for me, I'd be happy to answer them at this
7 point.

8 COMMISSIONER SCOTT: Thank you very much, Peter,
9 for this presentation.

10 I would note, you mentioned the Santa Clara
11 Valley Transportation Authority, and I had the
12 opportunity a little while ago to go and visit, and see
13 the different parts of transportation that they're
14 working on, and the workers that had been trained with
15 some of the funding.

16 And it was just a really neat thing to see. And
17 they do all kinds of stuff. I mean it's light rail,
18 it's the buses, it's how to work on different types of
19 buses, whether it's a hybrid bus, or electric bus, and
20 things like that.

21 And it was just really neat to see how, exactly
22 how the money is getting spent and get to meet some of
23 the folks who've had a chance to take advantage of those
24 courses.

25 And, you know, while we were there one of the

1 things that they were mentioning is that even if you
2 were a person who didn't get to take advantage of the
3 training, a lot of times they can then go back and share
4 a lot of that information with the other folks that they
5 work with.

6 And that what they had found is it was kind of
7 bringing up the skill levels of everybody there, and I
8 thought that was a really cool thing.

9 I would just go back to your slide two. And the
10 only reason I do that is because I think it's -- these
11 are really cool numbers, right. It's \$11.5 million with
12 a \$10.3 million match through the Employment Training
13 Panel.

14 And it's, you know, almost 11,500 people have
15 been trained.

16 Sorry, I'll let you catch up. I mean, yeah, I
17 mean those are really cool numbers, 88 businesses across
18 the State, 14 municipalities across the State.

19 And I think that, you know, I just wanted to
20 underscore that.

21 And then you look at the EDD numbers and the
22 community college numbers and it's pretty exciting.

23 To me, this is another way to ensure that people
24 all across California can be involved in a program like
25 this and also feel the benefits of a program like

1 Alternative and Renewable Fuel and Vehicle Technology
2 Program, plus the program you have.

3 And so, it's been great to collaborate and work
4 together with you all on that.

5 MR. COOPER: Yeah, well thanks. I'm really glad
6 you were able to go down to that program because I think
7 it's important to collect the numbers, but it's also
8 important to recognize kind of the intangible benefits
9 of a program that provides support for communities and
10 workers.

11 COMMISSIONER SCOTT: Absolutely. Absolutely and
12 I liked what you mentioned, also, about earning a high
13 wage. That's what this is all about so --

14 MR. COOPER: Yeah, so we look forward to working
15 with the Energy Commission in the coming years.

16 And our program is going to be having more
17 funding as the economy strengthens because more
18 employers will be paying their UI training tax.

19 But that being said, we want to build on this
20 program as well because it really not only diversifies
21 our program but I think, you know, it's good for the
22 Energy Commission and it's a good model to replicate.

23 COMMISSIONER SCOTT: Agreed. Thank you.

24 MR. COOPER: Thank you.

25 COMMISSIONER SCOTT: I'll turn it back over to

1 Heather.

2 MS. RAITT: Okay, so just a reminder, I had some
3 blue cards, but if people do want to make some comments
4 after the afternoon session, please give me your blue
5 cards.

6 And otherwise, we'll break for lunch and return
7 at 1:00. Thanks.

8 (Off the record at 12:00 p.m.)

9 COMMISSIONER SCOTT: So, welcome back everybody
10 to the afternoon portion of our Measuring the Success of
11 the Alternative and Renewable Fuel and Vehicle
12 Technology Program.

13 We are going to start with a presentation by
14 Anthony Eggert, who is the Executive Director of UC
15 Davis's Policy Institute for Energy, Environment and the
16 Economy.

17 And after that we will go into sort of a
18 lightening round of presentations where people just put
19 their different metrics and ideas for how to measure
20 different parts of a program, whether it's greenhouse
21 gas reductions, criteria pollutant reductions, public
22 health benefits all on the table.

23 And then we'll have a discussion facilitated by
24 Anthony Eggert to talk through some of those ideas.

25 So, I will turn it over to Anthony. Welcome,

1 thank you so much for coming, and take it away.

2 MR. EGGERT: Thank you, Commissioner. It's
3 great to be here.

4 And so, what I'm hoping to do over the next,
5 say, 10 to 15 minutes is to provide, perhaps, a little
6 bit of a structure for the coming panel discussion.

7 But I'm going to go through these fairly quickly
8 because I am interesting in getting to that discussion.

9 Sort of in thinking about, you know, the ways in
10 which this program is structured and the various
11 criteria and metrics that are used, both to guide the
12 investment decisions as well as measure their potential
13 impact, I thought it would be helpful to give a little
14 bit of a -- almost like a hierarchy and a diagrammatical
15 representation of that.

16 And I'll just say up front that this is my own
17 interpretation of the program, not necessarily that of
18 the Commission.

19 But even before I do that I want to just cover a
20 couple of topics that I think are going to be familiar
21 with those of you who were here for this morning's
22 session.

23 And that is just to really kind of emphasize the
24 magnitude of the challenge and the opportunity for the
25 transportation sector within California, especially when

1 thinking about our goals for climate change, petroleum
2 reduction, et cetera.

3 So, as many people here I'm sure are aware, the
4 transportation sector is the largest component of
5 California's climate footprint.

6 I think some people aren't aware of the fact
7 that this diagram that's frequently shown for
8 transportation is only the downstream.

9 If you incorporate some of the upstream
10 emissions associated with refining, et cetera, it gets
11 closer to the half of the total State total.

12 And then, of course, on the financial side this
13 is a, you know, many, many billion dollars of
14 expenditure on an annual basis.

15 These are numbers from 2010. They're actually
16 larger, now, \$72 billion expended annual, about two-
17 thirds in the transportation sector, across all of the
18 energy expenditures, well over \$300 million a day in the
19 State.

20 And, of course, we are talking about a program
21 here of \$100 million a year that we're using to try to
22 influence that future system.

23 And so I think that says a couple of things.
24 One is that we really do have to think about how do we
25 set the stage for a large-scale transition that's going

1 to be in the many, many, many billions of dollars of
2 annual investment.

3 And also I think, just in terms of thinking
4 about the way in which we measure the impacts, we do
5 really have to be thinking about projecting into the
6 future.

7 And so, this is sort of my interpretation of a
8 slide that's already been presented on, the major policy
9 goals of the State for greenhouse gas emission,
10 petroleum production, biofuel production, low carbon
11 fuel standard, air quality, and the recent zero emission
12 executive order.

13 And so I think what's great about these policies
14 is that they do provide us some guideposts, goals and
15 milestones both in terms of the quantification of the
16 goals and the time frames that are associated with
17 different touch points, like 2020, 2023, and 2050.

18 And, of course, the policy itself, as has been
19 described earlier, has its own language on this very
20 clearly emphasizing the mission of the program to help
21 achieve and attain the State's climate change policies.

22 And then, also, as has been mentioned, not
23 necessarily to rely upon any singular preferred fuel or
24 technology.

25 And then there's a whole list of other project

1 criteria and metrics. And when looking at these I
2 realized that some of these, all of these could be
3 interpreted as project metrics and I think many of them
4 appropriately should be.

5 But also they are what I would also characterize
6 as sort of guiding criteria for choosing different types
7 of major investment categories.

8 So, I'll talk about what that means. So, this
9 is the schematic, the cartoon version here that I put
10 together.

11 And really, what this is intended to emphasize
12 is that there really is, I believe, sort of two sets of
13 criteria and metrics. Those that are -- can be sort of
14 thought of as guiding these major investment categories.

15 And then if you go all the way down to the lower
16 left-hand of the schematic, those criteria and metrics
17 that guide both the selection of projects and the
18 measurement of their impacts.

19 So, I'm going to walk through this very quick.
20 You can obviously convert these major policy goals into
21 criteria, including looking at sort of the potential of
22 different types of technologies and strategies to
23 contribute to greenhouse gas reductions, petroleum
24 reductions, et cetera.

25 And then you can use that to sort of map against

1 a number of different technology pathways and
2 strategies.

3 And, of course, because these are policy goals
4 that are in the future, it does help to have sort of
5 analytical framework for how to do that.

6 So, certainly, we've done a lot of work on this,
7 others have as well, looking at which ones have the
8 potential to sort of materially contribute to those
9 goals.

10 This is just specifically calling out for the
11 greenhouse gas reduction goals in 2050.

12 And I think Professor Ogden presented sort of a
13 version of this in one of the earlier IEPR meetings.

14 And it kind of shows a couple of things. One is
15 that there are options, like advanced biofuels, electric
16 vehicles, hydrogen fuel cell vehicles, and even greater
17 levels of vehicle efficiency that do have the potential
18 to contribute very, very large greenhouse reductions in
19 the time frames as needed.

20 But none of those, of course, alone can actually
21 achieve the goal and you really do need to look at
22 portfolios or combinations of those.

23 And, of course, we've run many, many different
24 scenarios looking at how you might go and do that.

25 But, importantly, they do materially contribute

1 to the goal.

2 And so, you can kind of look at these different
3 types of investments across the different policy goals.

4 And at one point I was thinking of trying to put
5 some sort of a quantification or magnitude here, but I
6 realized there's enough of both diversity in the
7 different scenarios and uncertainty that that's a
8 worthwhile exercise, but I didn't do it here.

9 And then, of course, all of that information
10 feeds into the investment planning process. But just
11 because a particular technology or strategy can
12 contribute to the goal, doesn't yet necessarily mean
13 that it's something that the program should make an
14 investment in.

15 And I think for that to be true, you really do
16 want to kind of walk through a number of key questions.

17 The first one I think we can answer with the
18 analysis. The rest of them I think take even kind of a
19 further level of both quantitative and qualitative
20 assessment.

21 So, for example, are there specific barriers
22 that can be identified that are preventing these
23 technologies from become commercialization in a material
24 way -- commercialize in a material way?

25 Three, you know, can public investment make a

1 contribution to overcoming those barriers?

2 And then four, again given sort of the magnitude
3 of this challenge, once those barriers are overcome is
4 there actually a business case for private investment to
5 sort of carry these technologies into large-scale
6 deployment?

7 And then, finally, even after all of that I
8 think you still have to answer this question about
9 whether or not the public benefits of overcoming the
10 barriers exceed the costs.

11 And then, even if the answer is yes to all of
12 those, it's still helpful to understand kind of what the
13 role of what government investment is in terms of
14 facilitating new technology, innovation and diffusion.

15 Of course, you know, sometimes this is
16 represented as a linear process. But for anybody that's
17 studied it, you realize that this is sort of a very
18 dynamic process in terms of as you innovate and
19 technologies you learn new things, you identify further
20 opportunities or gaps.

21 You know, when you think about it, we're still
22 working on both basic and applied R&D for combustion
23 engines, well over 100 years after they were
24 commercialized.

25 And so, the tools that the government has, or

1 public entities have, such as CEC, include
2 demonstrations, the development of codes and standards,
3 obviously regulations.

4 And we have a fairly substantial number of those
5 here in California that are very germane to the
6 strategies that are being pursued, like low-carbon fuel
7 standard, like the Zero Emission Vehicle Program.

8 I think probably the majority of what we're
9 talking about here is really kind of in this incentives
10 category, but certainly also involved in some of the
11 educational and even, to some extent, some of the codes
12 and standards efforts.

13 And then I think, you know, the other thing that
14 we have as the opportunity for input into determining
15 sort of what types of specific investments might be
16 helpful towards achieving the goals of commercialization
17 of these different technologies are what I would call
18 are either the action plans, or roadmaps that have been
19 developed around these different technologies.

20 And so in California we have things like the ZEV
21 Action Plan, the Bioenergy Action Plan. Certainly, the
22 U.S. Department of Energy and other agencies have
23 developed very detailed plans on how you sort of bring
24 these new technologies, like hydrogen fuel cells,
25 understanding what are some of those specific barriers

1 and what are opportunities to overcome them.

2 And some of those get quite detailed, you know,
3 looking at the very precise barrier and what the
4 specific role of what an investment might mean, a public
5 investment might mean.

6 And then, of course, we have both the
7 prospective and retrospective benefits assessment. We
8 heard from Dr. Marc Melaina this morning about that.
9 And I do think that that actually is a good framework
10 particularly, you know, trying to understand what the
11 potential future benefits of these investments can bring
12 to the State.

13 And then we have, you know, other tools that
14 allow us to look even beyond the time horizon that Dr.
15 Melaina presented on. This results from a study that
16 was conducted looking just at the deployment of zero
17 emission vehicles in California and the other U.S.
18 states that have adopted the California ZEV Program.

19 And what they find is that with a successful
20 deployment of these technologies they could accrue very,
21 very large, both public and private benefits, that are
22 well in excess of the transition costs.

23 Again, here just showing GHG benefits that are
24 consistent with the goals of the State, as well as
25 financial benefits that represent net present values

1 well in excess of \$100 billion.

2 Okay, so now coming all the way around here to
3 the specific project level investment criteria and
4 metrics, and I think that's going to be the majority of
5 what we'll hear from the panel.

6 But this is one thing I would request is that to
7 the extent there is a distinction between what you're
8 presenting, either sort of as the major category
9 investment criteria versus the specific project level
10 investment criteria that you make that distinction,
11 where appropriate.

12 And again, here this is again just that list
13 that we talked about.

14 But I think, you know, really here, once you're
15 at this level you really do want to know exactly what it
16 is you're trying to accomplish.

17 So, for example, if you've found that
18 infrastructure is one of the specific barriers for the
19 deployment of a particular vehicle technology, the
20 metrics that are -- that you use for understanding
21 whether or not your investment is achieving that goal
22 should be very specific to whether it's the number of
23 stations, whether it's the number of vehicles served,
24 which can both be an issue of the infrastructure
25 coverage, as well as the capacity, the amount that it

1 can actually dispense in a particular time period.

2 Similarly, for these other categories for
3 vehicles, fuels production, manufacturing and workforce
4 training, the project level metrics that you might use
5 should be very, very carefully tailored to what it is
6 you're trying to accomplish.

7 And then, finally, I just want to make a real
8 strong plug for the value of doing data collection and
9 review as a means of both providing further insights,
10 refining investment strategy and building a greater
11 confidence in the value of the program.

12 And that can not only help inform future
13 investment strategies and plans, but can also help us
14 really start to better understand, you know, what the
15 true gaps are.

16 You know, we sort of -- we think we know when we
17 conduct these analyses, we do the modeling. And then
18 when you actually get around to actually trying to build
19 one of these on the ground, in the real world, you
20 realize occasionally it's easier, but most often it's
21 even a bit more difficult than you had anticipated.

22 And making sure that we have a mechanism by
23 which to collect that information, analyze it, and then
24 incorporate it into future program efforts.

25 And again, here I think there is a very strong

1 case to be made where it's appropriate and efficient to
2 engage third party, expert, non-conflicted reviewers --
3 I think it's this week or next week is the big annual
4 merit review that the DOE is putting on, which I think
5 is a great example of that, where they invite many, many
6 different parties from academia, from business, from
7 others to basically take a look at both the programs and
8 the specific projects to understand whether or not
9 they're actually contributing to the goals of the
10 overall effort.

11 So, that's kind of where I wanted to leave this
12 and very much looking forward to the lightening round
13 and the discussion that follows. Thank you.

14 COMMISSIONER SCOTT: Terrific, thank you very
15 much, Anthony. I think that is a fantastic way to sort
16 of set up the conversation that we would like to have
17 with all of our wonderful panelists, who I'd like to say
18 thank you as well for coming.

19 And I also look very much forward to the
20 discussion.

21 So, I think what we should do is I'd like to --
22 well, we'll start with Amy Zimpfer here, from EPA. And
23 maybe what we'll do is just have you say a word or two
24 about yourself and then tell us -- give us your
25 lightening round presentation.

1 And then we'll just work our way around the
2 table and have each person say a few words about
3 themselves, and then give us the metrics, and then we'll
4 jump in the conversation.

5 MS. ZIMPFER: Would you like us to stay here?

6 COMMISSIONER SCOTT: Well, you can stay there or
7 you're welcome to go up to the --

8 MS. ZIMPFER: It doesn't make any difference, I
9 don't care.

10 COMMISSIONER SCOTT: Either way. What would you
11 prefer? Wherever you're most comfortable, I'm happy,
12 too.

13 MS. ZIMPFER: I'm happy to stay here.

14 COMMISSIONER SCOTT: Okay, that works great.

15 MS. ZIMPFER: I think that's good, too.

16 Okay. Well, I'm very honored to be here today.
17 My name is Amy Zimpfer. I'm an Associate Director in
18 the Air Division at USEPA. And among my portfolio, it
19 includes leading our clean energy and climate change
20 work in the regional office.

21 So, today what I -- the next slide, please.
22 What I'd like to just briefly do in this lightening
23 round is give kind of a broad perspective on EPA
24 regulation and the use of public health metrics in
25 pretty much everything that we do.

1 And then give you all two examples of how we've
2 recently used the social cost of carbon in fuel
3 rulemakings, and then go into the diesel emission
4 quantifier which we use when we go through and evaluate
5 projects for Diesel Emission Reduction Act funding.

6 So, the next slide -- in general, EPA has
7 conducted credible science-based regulatory impact
8 analysis for all of our major rulemakings. And we've
9 been doing this for many, many years.

10 And just from my perspective, being at EPA for
11 many years, it's really been over the last decades, a
12 couple of decades that we've gotten a lot smarter and
13 have really used science better to estimate the public
14 health benefits associated with our rules.

15 It's been easier to estimate the costs
16 associated with our rules to a particular industry, et
17 cetera.

18 But we've gotten a lot smarter about how we
19 estimate the benefits. And what we've found is that the
20 modified benefits typically far outweigh the costs.

21 And we had a study done in looking at the decade
22 2002 to 2012. EPA's rulemakings yielded between 112 to
23 623 billion dollars in annualized benefits compared to
24 30 to 37 billion dollars in annualized costs.

25 And, primarily, these human health benefits have

1 come from the reduction in premature mortality risk and
2 a number of reduced morbidity impacts. And also, such
3 things as reduced hospital visits, lost workdays, et
4 cetera.

5 So, indeed, we've found that our rules far
6 outweigh the costs. The benefits far outweigh the cost.

7 Another estimate is that benefits from EPA's
8 National Clean Diesel rulemakings, and these include
9 everything from light to heavy duty vehicles,
10 locomotives, marine engines, and oceangoing vessels that
11 we've estimated that over the life of those rules that
12 the benefits are expected to outweigh the cost by 18 to
13 1 by 2030.

14 So, let me give you a couple of examples. The
15 social cost of carbon; this is an estimate of the
16 economic damages or the damages avoided associated with
17 a small change in CO2 emissions, a small change being
18 perhaps one metric ton in any given year.

19 And we've used this quite a bit recently. We
20 used it to estimate the global climate benefits of the
21 series of adopted rulemakings that EPA has done on GHG
22 standards for light duty vehicles and for the first
23 round of heavy duty standards.

24 And the Department of Transportation used it,
25 also, in their Fuel Economy Standards for light duty

1 vehicles.

2 We also used the social carbon -- the social
3 cost of carbon in our recently proposed clean power
4 plant. It was proposed a week ago Monday. And this is
5 to -- we're proposing the various ways to reduce CO2
6 from a power production from fossil fuels.

7 So, what's the methodology? Well, first we do
8 an estimate of the damages and we take a look at future
9 global climate change damages, including changes in net
10 agricultural production, human health and property
11 damages from increased floods and a whole host of other
12 global damages.

13 So, this is one interesting aspect of the social
14 cost of carbon.

15 We take a look at the timing of the emissions.
16 We take a look at the year that CO2 is released and the
17 reductions. This is key to getting an estimate of the
18 impacts and benefits.

19 We have a number of discount rates that we look
20 at. And I'm going to provide a chart for you to just
21 give you a sense.

22 And then we have one that's based on the 95th
23 percentile from all the social cost of carbon models at
24 a three percent rate.

25 I do want to note that there are some

1 limitations, as with any metric and any model, that
2 there is a strong chance that we're likely under-
3 estimating the damages due to incomplete capture of
4 catastrophic and non-catastrophic impacts.

5 This is very difficult to do on a global scale
6 and so, likely, all our values are conservative. So,
7 we're under-estimating the damages.

8 It's hard to treat adaptation and technological
9 changes. There are assumptions that we use regarding
10 risk aversion. So, there are some limitations, as there
11 is with any number. But it's the best that we have
12 right now to estimate the social cost of carbon.

13 And the next slide shows -- I won't go over this
14 in great detail, but it does show the different discount
15 rates and this fourth 95th percentile, and it goes out
16 over a temporal time period.

17 So, let's go on to the next example in this
18 lightening round, and that is our Diesel PM2.5 Emission
19 Quantifier, the monetary health benefits associated with
20 it. So, we call it the DEQ, the Diesel Emission
21 Quantifier.

22 And this health benefits model uses a benefit
23 per ton, or BPT value, to estimate the monetized health
24 benefits of diesel PM2.5 emission reduction options.

25 And we look at things like exhaust treatment,

1 engine replacement, fuel switching, and other things.

2 And as I mentioned, we do use this as one of our
3 criteria when we evaluate projects and whether we should
4 be funding them using the Diesel Emission Reduction Act
5 grants, or DERA grants.

6 So, if you want to go to the next slide, here's
7 the types of inputs or the methodology that goes into
8 the DEQ.

9 So, we have three data sources, primarily, that
10 we use to come up with the benefit per ton, and that's
11 the National Emissions Inventory. That's updated
12 annually.

13 The National Air Toxics Assessment, NATA, we're
14 going to be coming out with an update on NATA fairly
15 soon.

16 And then BenMap, which is the Environmental
17 Benefits Mapping and Analysis Program.

18 These are the three primary data sources.

19 For valuing benefit, similar to the social cost
20 of carbon there are specific avoided incidences of
21 various things that go into the benefit calculation.

22 So, I've listed a number of them here, including
23 premature mortality, asthma exacerbation, non-fatal
24 heart attacks, work loss days, restricted activity days,
25 et cetera. So, that all goes into valuing the benefit.

1 And as with the social cost of carbon there are
2 limitations. While the numbers -- we have numbers
3 nationally, we do have the ability to bring them down to
4 a localized basis. But based on the input, we believe
5 the benefits can only be distributed in up to five
6 counties per project.

7 So, if a project is statewide, there has to be
8 some modification on how the numbers are used.

9 This is not important in California, but for
10 those of us that do work in the islands, and in Hawaii,
11 we cannot use this methodology for, in a verified way,
12 determining the project's benefits out in Hawaii.
13 That's true in Alaska, as well.

14 And then because of some of the uncertainties on
15 the numbers, we do not use this DEQ, the benefits for
16 ton, when we're doing an evaluation of our State
17 Implementation Plans, and what kind of reductions you
18 can get there. There are other methodologies.

19 So, the last slide that I have here is just an
20 example. I'm not going to go through this in great
21 detail.

22 But it looks at six counties in California. It
23 looks at the 2000 population and then gives you an
24 example of, if there were projects in those areas, what
25 the benefit dollar-per-ton value would be.

1 As you can see, in general higher population
2 results in a higher benefit per ton, but it's not
3 unequivocal.

4 So, for example, if you look at the San
5 Francisco project there, the population there is just
6 about three-quarters of a million, but you've got a
7 benefit per ton of this particular project at \$2.5
8 million per ton.

9 Whereas Orange County, which has a population of
10 almost three million, on a particular project that we
11 looked at there, it's \$2.9 million

12 So, it's not across the board. And we also have
13 to take care when we use this metric because there may
14 be places where you have disadvantaged communities and
15 it may not pencil out because they may be in Inyo
16 County, or maybe in counties that have smaller
17 population, but there may be a very strong need.

18 One example that comes to mind, I work a lot
19 with the State of Nevada, and we do provide Diesel Grant
20 funds to every state. If we did it just on a population
21 basis, places like California would get all the money.

22 But we need to ensure that all of our states get
23 some benefit of the Federal dollars.

24 So in Nevada, where they've put their funding,
25 and it does pencil out is for converting buses in some

1 of the rural areas. And for those children that ride
2 those diesel buses, that is an extremely big benefit for
3 them and for their health.

4 So, I'm going to close there. And just the last
5 slide has a number of individuals in our office that I
6 want to make sure that you have contact information.
7 They're the economists. I'm not an economist. They're
8 the specialists and can really provide some very
9 specific help if you need that with your staff.

10 Thank you.

11 COMMISSIONER SCOTT: Thank you so much, Amy.

12 Let's turn to Erik.

13 MR. ERIK WHITE: Thank you, Commissioner Scott.

14 It's a pleasure to be here today. My name is Erik
15 White. I'm Chief of the Mobile Source Control Division
16 at the Air Resources Board.

17 Part of the programs that I oversee, among many,
18 are the implementation of most of our incentive
19 programs, and those are incentive programs that are
20 focused on diesel emission reductions, as well as those
21 that are intended to target greenhouse gases and move
22 the advanced technology needle forward.

23 The next slide -- so, ARB, we're actually quite
24 fortunate to have, and have had for many, many years,
25 strong support through investments in incentive programs

1 that we really began about 16 years ago with the Carl
2 Moyer Program.

3 That program, along with the Goods Movement
4 Emission Reduction program, and the Lower Emission
5 School Bus Program have been very successful in
6 addressing diesel emissions throughout the State.

7 More recently we've been fortunate, as with the
8 CEC, to have investments through the AB 118 program,
9 where we can look at advanced technologies, both
10 development and deployments.

11 As well as some new funding that we expect in
12 this upcoming fiscal year from the cap and trade
13 auctions proceeds, which should allow us to build on the
14 118 investments that we've made so far.

15 One of the things you will see, though, in all
16 of these programs is they have different goals,
17 different priorities, and they use different metrics.

18 And so, a lot of that is reflective of both what
19 they're intended to achieve, but also when they came
20 into inception.

21 And so for some of these, for instance, we are
22 going back and looking at whether or not there are
23 opportunities to consider new metrics in some of our
24 older programs to recognize, you know, some of the new
25 priorities, both for GHGs and criteria pollutants, that

1 the State now has.

2 The next slide -- so, let me start with the Carl
3 Moyer Program. And I think, similar to how Amy
4 described their programs, this is one that's very
5 quantitative in terms of looking at what are the
6 absolute benefits for the dollars invested.

7 It is a focus on reducing diesel emissions, but
8 cost effectiveness really is the driving metric. And in
9 fact, the Carl Moyer Program has in statute minimum cost
10 effectiveness thresholds that projects have to meet.

11 These are projects that are done or this is an
12 assessment and metrics that are applied at the project
13 level.

14 So, as local air districts implement this
15 program, they really do look at what are the individual
16 cost effectiveness of each of the projects that they
17 fund.

18 Some districts look at that on a first come,
19 first served basis in terms of as long as a project is
20 cost effective, it's eligible.

21 Others go through and they rank their projects,
22 and fund only the most cost effective on an annual
23 basis.

24 That latter model is how ARB works with the
25 local districts on the Prop. 1B program where applicants

1 can apply to a local air district for funding, the
2 projects are ranked on their individual cost
3 effectiveness, and only the most cost-effective projects
4 are funded until the funding is exhausted.

5 So, it's a very straight forward program, but it
6 is very limited in terms of cost effectiveness, in terms
7 of dollars per ton is the only metric that's used.

8 The next slide -- when we look at our 118
9 Program, which is a much more recent program, what we
10 see is a broader set of goals that the program's
11 intended to achieve.

12 And with that come a broader set of metrics that
13 we use to look at the projects.

14 In this particular program we look at projects
15 not on the individual level. We don't look at each car
16 we fund through the Clean Vehicle Rebate Project. We
17 look at the project as a whole and make funding
18 allocations based on broad funding commitments that we
19 make to individual projects within the program.

20 But when we look at that, we have always
21 applied a number of different metrics in terms of
22 looking at both the quantitative assessment, the cost
23 effectiveness of the various projects we do, but also
24 things like, such as what are the greenhouse gas co-
25 benefits of the projects that we fund?

1 Are we moving the technology needle forward in
2 terms of the development and deployment of the vehicles?

3 So, these are things that we have historically
4 done since the program's inception.

5 With AB 8 last year, and the reauthorization of
6 these programs, the bill contains specific metrics for
7 us to begin to consider on an annual basis in our
8 funding plan.

9 They included as its primary determinate benefit
10 cost score, so very similar to what we've been doing in
11 the Carl Moyer Program, and what we've done in the AB 8
12 program.

13 But it also provided six additional criteria for
14 us to consider as we look at that. And that's
15 everything from what are the ability to achieve GHG
16 reductions, the ability to support market
17 transformation, the ability to help on regional air
18 quality improvements in areas that don't meet Federal
19 air quality standards. And how can we better leverage
20 private capital investments.

21 All of these we think are important metrics to
22 look at as we determine what are the best investments
23 for what is a very limited amount of money that we have
24 in the AB 118 Program, only about \$20 to \$22 million for
25 this upcoming fiscal year.

1 The next slide -- as we've begun to look at
2 implementing the Governor's proposed \$200 million
3 investment of low carbon transportation funding, we've
4 recognized that many of the same types of projects and
5 many of the same metrics that we've used historically in
6 our implementation of the AB 118 Program fit very
7 nicely, fit very well with this investment as well.

8 And that's really been the model for us to map
9 out and identify how best to invest those dollars.

10 While to date there are no specific metrics that
11 we need to follow in that, we believe it's prudent and
12 appropriate to look at, like I said, the same
13 determining factors we've used in the AQIP investment
14 projects.

15 One thing to keep in mind, though, as we look at
16 these and recognizing moving forward there is an
17 important need to consider benefits in disadvantaged
18 communities, benefits for low-income consumers, and
19 continue to implement and to recognize that.

20 As we've looked at how best to achieve our air
21 quality and climate goals over the last several years,
22 we've recognized today that investments today in the
23 cleanest technologies are necessary, both from an air
24 quality and from a climate perspective to meet those
25 goals.

1 So, as we look at how best to do that, we want
2 to make sure that we're prioritizing investments that
3 will deliver both criteria and greenhouse gas benefits,
4 and put us on that path to having zero and near zero
5 technologies widely available and deployed in the
6 transportation sector.

7 So, I'll stop right there as I quickly
8 lightening through ARB's programs.

9 COMMISSIONER SCOTT: That's great, thank you
10 very much, Erik.

11 Let's turn to Matt, welcome.

12 MR. MIYASATO: Thank you, Commissioner. The
13 South Coast is very happy to be participating with you
14 here at your IEPR workshop. So, I appreciate the
15 opportunity once again to present before you.

16 And I do want to thank staff for kind of the
17 batting order because that was a nice lead-in from both
18 Amy and Erik on how the South Coast presents our
19 incentive programs.

20 And I do want to touch, and I heard -- I think I
21 heard all of the Energy Commission staff this morning,
22 as well as Dr. Melaina from NREL, mention the difference
23 between commercial technologies and emerging
24 technologies. And I do want to highlight that.

25 So, as Erik mentioned, in terms of the

1 commercially available technologies, they have really
2 well-established cost-effectiveness criteria and formula
3 for which there are, you know, voluminous guidelines
4 that have been developed through legislation, and now
5 through the ARB, and how you apply those formulas.

6 But I want to really more direct my comments
7 toward emerging technologies because I think that's
8 where there is a quite a bit of discussion on how you
9 would -- on how the Energy Commission can develop these
10 markets, but also quantify in some fashion the benefits.

11 And so we, at the South Coast AQMD, we
12 prioritize our investments based on many different
13 factors; factors that were discussed at length this
14 morning by Mr. Melaina and by your staff.

15 But the ones in particular that we have to focus
16 on are the ones that are core to our mission as a
17 regulatory body for air quality. And that is reduction
18 of NOx emissions, toxics, and those which can give us
19 the best shot at attaining the Federal standards.

20 This is a graphic that we've put into our
21 research development demonstration, or Early Deployment
22 Program, for many, many years. It is an embodiment of
23 different strategies for getting along the technology
24 evolution curve. So, we start from basic research,
25 proof of concept, proof of technology, et cetera, as you

1 march down there.

2 And I think as Anthony Eggert mentioned, these
3 aren't linear. They overlap quite a bit. In fact, you
4 could be starting over in different phases depending on
5 where you are on the technology curve.

6 But we show this because there are -- there's a
7 timing issue and timing is critical in some cases for
8 providing an influx of incentives or of support for that
9 technology. And I think it's critical that the Energy
10 Commission does that and continues to do that.

11 I also highlight this because I think it is
12 important to note that we, at the South Coast, our
13 programs align fairly well with what you're trying to do
14 in AB 118 through your AFVRTP "XYZ" Program, where there
15 are many co-benefits to be had by reducing not only
16 criteria pollutants, but GHGs and petroleum
17 displacement.

18 So, the big question, I think, that has been
19 asked by the Commission is really, how do we, as a local
20 agency, and how does everyone else at the table here,
21 how do we prioritize?

22 And I've put it into kind of three distinct
23 blocks. The first one is we have to prioritize based on
24 the mission of our agency. So, we're a local air
25 quality and regulatory agency, and our mission is to

1 bring our region, which is the largest air quality
2 district in the nation, into compliance with the Federal
3 Clean Air Act.

4 And so, we have to support technologies which
5 give us the lowest possible criteria pollutant
6 reductions.

7 We also support policies. And that's in terms
8 of our Air Quality Management Plan, for the State
9 Implementation Plan, but also we have local regulations.
10 For example, our fleet rules, and so our priorities have
11 to go along those lines.

12 But then the last two -- or the third and fourth
13 bullet in that block is we also support energy diversity
14 and co-benefits. So, looking at petroleum displacement
15 is also one of the missions that we have at our agency.
16 It's not the top priority, but it is certainly one of
17 the things that we look at while we support projects, as
18 well as low greenhouse gas emissions.

19 And then as we look further down this list, we
20 look at the ability to enable the technology. So, for
21 example infrastructure; if we put out more
22 infrastructure will that help enable more consumers or
23 more end-users to use that technology?

24 And we believe that is the case, especially for
25 natural gas. We've seen the funding of natural gas

1 infrastructure and there's now been a proliferation of
2 those technologies on the roads.

3 And we also look at highly leveraging our
4 limited funds.

5 So, you guys have \$100 million. Erik just
6 mentioned about \$20 million for AQIP, and they're going
7 to get a big infusion for GHG in the cap and trade
8 revenues.

9 We only have about \$10 to \$12 million a year.
10 So, one of the hallmarks of our program is we really try
11 to work with our sister agencies at the state and
12 federal level, so the Energy Commission, ARB, EPA, as
13 well as Department of Energy.

14 And then the final one I think is things that
15 Marc had talked about for NREL's market transformation.
16 What effect will our funding have and with the largest
17 possible population of vehicles and technology?

18 So, is there a large inventory that we can then
19 affect by having this technology take place?

20 In the last few years it's become crystal in the
21 things that we should prioritize. And I've shown this
22 plot many times throughout the Commission.

23 This is in 2023 the top NOx sources in our
24 region. It's the inventory of different, typically
25 goods movement-related sources. And in order to meet

1 those dash lines at 2023 and 2032, that's the Federal
2 standards that we have to come in compliance with.

3 So, it's about a 60 to 70 percent reduction in
4 NOx emissions if we have any hope of meeting the Federal
5 standards.

6 And so by looking at this chart, I think it's
7 pretty clear from our perspective what are the
8 technology and sectors that we have to concentrate on?

9 And it's heavy-duty diesel trucks, off-road
10 equipment, marine vessels, and you can just march on
11 down the line.

12 Now, we don't anticipate getting 60 to 70
13 percent in every sector, so we've got to go for the
14 largest emission reduction possible in every sector that
15 we can possibly attack.

16 And that's why we have been focusing on near-
17 zero and zero emission technologies in particular in the
18 medium- and heavy-duty sector. And those duty cycles
19 and rotations are related to goods movement.

20 And then my final slide in the lightening round
21 is really just to highlight what our governing board has
22 approved past March in terms of our research plan moving
23 forward in the 2014-2015 time frame.

24 And you can see, based on the large portions of
25 that pie chart, in investment, we're really looking at

1 investing in technologies that can give us this, again,
2 near-zero and zero emission technologies. So, electric
3 and hybrid technologies with infrastructure, hydrogen
4 fuel cell technologies, and then near-zero engine
5 systems. And that's like the ultra-low natural gas
6 engine systems that we're working with the Energy
7 Commission.

8 And I would just leave you with perhaps three
9 points. In order to perhaps make the most use of the
10 funding that you do have, and Commissioner Scott you
11 mentioned that even though it is \$100 billion dollars,
12 it is for the entire State, essentially a drop in the
13 bucket if we're going to get to the clean air that we so
14 desperately need -- is having this portfolio approach is
15 important.

16 I think Dr. Wallenstein mentioned that when he
17 was at the IEPR workshop, previously.

18 We embody this in our Clean Fuels Program, which
19 is our Research, Development and Demonstration Program,
20 so having that portfolio.

21 But also leveraging collaboration, so
22 maintaining collaboration not with just the local air
23 districts, but also with your sister agencies at the
24 State, and also reaching out to the Federal government
25 such as EPA and Department of Energy.

1 And then the final point is that, and I think
2 Jim mentioned it, it's been pretty evident, you need
3 some kind of market pull at the end of the day in order
4 to ensure that these technologies take root.

5 And we have often been pushing for not only an
6 incentive or funding mechanism, but there's got to be a
7 regulatory or policy backstop with sufficient lead time
8 to show that the market is heading that way and early
9 investment, early transition to that technology is going
10 to be, at the end of the day, payoff for the end user.

11 And so, I know you're talking about investment
12 and research plan here, but there's got to be some kind
13 of regulatory backstop, we believe, and those have to go
14 hand in hand.

15 So with that, I'm going to close, and then I
16 look forward to Anthony's questions later.

17 COMMISSIONER SCOTT: Thank you so much, Matt.

18 Let's go on to Dean Taylor, welcome.

19 MR. TAYLOR: Hi, thank you very much for
20 inviting me. I appreciate it very much.

21 My name is Dean Taylor. I'm a Principal Adviser
22 in the Electric Transportation Department at Southern
23 California Edison for the last 23 years, working
24 primarily in the space of regulations and policy for
25 both electric vehicles, as well as electric goods

1 movement and people movement.

2 I'm going to actually go just for the
3 facilitated round and loan or give my time to my good
4 friend, Jeff Rosenfeld. So, he may go a tiny bit over
5 on his five minutes.

6 COMMISSIONER SCOTT: Excellent. Welcome Jeff.

7 MR. ROSENFELD: Great, thank you very much. My
8 name's Jeff Rosenfeld, Manager of Transportation Fuels
9 at ICF International and I've done significant work
10 looking at alternative fuels, vehicles and technologies.
11 And then I have done some work with a few clients
12 looking at benefit costs, understanding all the
13 different benefits that can happen or that can occur
14 with individual technologies and different ways to rank
15 and prioritize technologies.

16 Some key messages from my presentation is that
17 the metric formula and what benefits you include are
18 extremely important and that when benefits and costs are
19 kept constant, when all the values are kept constant --
20 when you change the formula, you change the ranking of
21 technologies, you change the prioritization.

22 And through the presentation, we'll come to
23 that, you know, all benefits, including greenhouse gas
24 emissions, criteria pollutants, petroleum displacement
25 should all be taken into account when ranking and

1 prioritizing technologies.

2 And then also the idea that private benefits,
3 including fuel cost savings, should also be something
4 that's considered.

5 Existing metrics usually take into account one
6 type of reduction, whether it's dollars per ton of NOx,
7 PM, greenhouse gas emissions, or per-gallon of petroleum
8 displacement. Do note here that Moyer does take into
9 account two different pollutants.

10 The metrics above don't account for the
11 aggregate. And many times it is a disadvantage to
12 technologies that displace all of them because many
13 times those technologies don't displace one category
14 extremely well, or displace a large amount in one
15 category. They displace some in all categories.

16 And then the metrics don't account for
17 technologies that have associated lifecycle cost
18 savings, including reduced fueling and operating and
19 maintenance costs.

20 And this is important because these
21 technologies, hopefully in the future, as they receive
22 funding and gain acceptance in the market, will
23 potentially not need funding in the future because they
24 do have operational savings for clients or for, you
25 know, end-users.

1 Where technologies that don't have any
2 operational savings most likely need to keep some sort
3 of funding because it's hard for them to eventually move
4 into the market and take shape because they don't offer
5 a benefit to the end-users.

6 The benefit cost ratio, you know, it's a term
7 that we've used a lot today. So, the benefit cost ratio
8 that I'll be discussing in the next few slides takes
9 into account the comprehensive societal benefits and
10 private operational benefits, with the numerator being
11 those benefits, and then the denominator being the
12 incremental cost of the vehicle and infrastructure.

13 The societal benefits are monetized based upon
14 literature values. Some of those are values developed
15 by EPA, looking at diesel and NOx, in addition to the
16 societal costs of carbon and petroleum reduction
17 benefits.

18 And the way we've aggregated, you know, put them
19 together is through monetization. Otherwise, it's very
20 difficult to add what is the combined benefit of
21 reducing a gallon of fuel, plus reducing a ton of NOx,
22 plus reducing a ton of PM. And with monetizing them,
23 you're able to combine them into a single value.

24 And then a value of greater than one in the
25 ratio would mean that there's a greater monetized

1 societal benefit per incremental cost.

2 So, a private benefit cost ratio, if it is
3 greater than one means that it has greater lifecycle
4 life savings than what the incremental cost would be.

5 And there is a limitation in the benefit cost
6 metric that we're discussing, as there is with any
7 metric, is that there isn't a magnitude included in it.

8 So, there also would need to be some sort of
9 magnitude of potential reductions that would need to be
10 included with the benefit cost metric as you're
11 determining, and ranking, and deciding on funding
12 technologies.

13 So, here's a quick quantitative comparison
14 between metrics. When -- I think in a few days I'll be
15 able to compile all the spread sheets, and everything,
16 and send it in with a letter that will accompany it, and
17 be part of the record that will go over the
18 quantification of these values.

19 But I did highlight certain values that were of
20 importance.

21 If we look at a diesel particulate filter for a
22 Class 8 truck, it does have the lowest value in terms of
23 dollars per ton of PM.

24 And in the Moyer metric where PM is valued at 20
25 times higher than a ton of NOx, it does have the lowest

1 value. But there are no NOx reductions, there are no
2 GHG reductions. It does have a societal benefit cost
3 ratio greater than one, but it has no benefit to the
4 actual consumer because it doesn't give them any
5 operational cost savings.

6 If you look at SCR, it's a very similar way
7 where it's low in terms of NOx, low in terms of PM. And
8 it does actually provide some societal benefit costs.

9 But I guess conversely, if you look at an
10 electric forklift, it has a very high societal benefit
11 cost ratio because you are adding in all the societal
12 benefits, petroleum displacement, NOx, PM, greenhouse
13 gas emissions.

14 But on each of those individual metrics it
15 wouldn't do very well.

16 And then that's very similar to the P-10 and
17 even the CNG bus. We see actually as the highest
18 societal cost ratio in this analysis, but wouldn't
19 receive funding if you're looking at NOx, PM, or even a
20 Carl Moyer metric.

21 And then in the next slide I do have in the
22 appendix the values for all of these different
23 technologies, but this is meant to go expansive.

24 Now, we're looking at potentially 16 different
25 technologies and actually ranking them.

1 And so, I'm just going to highlight a few of
2 them to show -- let's say if you look at the diesel
3 particulate filter. This gets back to one of the key
4 points is depending on the formulas you use,
5 technologies rank extremely differently.

6 So, dollars per ton of NOx and GHG, DPF would
7 not receive any funding. PM, it would receive funding.
8 And, potentially, in a Moyer context it would receive
9 funding.

10 But once you start looking at the full societal
11 benefits or any type of private benefits, it moves to
12 the middle to the bottom of the list.

13 CNG bus, in terms of individual metrics is
14 around the middle of the pack. But then once you start
15 taking into account all benefits, it starts moving
16 higher up because it actually does have petroleum
17 displacement, in addition to all the different pollution
18 reductions.

19 And then the last one is looking at an electric
20 forklift. And so, this one is highlighting a 19,000-
21 pound forklift, which is a very large forklift which
22 would displace a large diesel forklift, more like ones
23 you'd see not quite at the ports, but of that size. Not
24 a smaller forklift that would be more for internal
25 warehouses.

1 And so, it is the same thing as kind of the CNG
2 bus we're looking at, middle of the pack in terms of all
3 individual pollutants, but then it starts moving higher
4 up with a total societal benefit cost.

5 And then when you consider that it actually has
6 a pretty high private benefit cost ratio, then that
7 starts leading to maybe it's a technology potentially
8 for funding because if you start at the beginning,
9 investing in some of these technologies, then they can
10 catch on into the market because they do have a private
11 benefit cost. There is a reason for consumers to
12 continue acceptance.

13 And so that is actually the end of my
14 presentation. But the same thing, three, right, the
15 same points is that even more than just the specific
16 values here that were presented, the metric itself and
17 the decision of the formula is very important because
18 that dramatically determines which technologies are the
19 ones that receive funding.

20 And then including all benefits of technologies
21 from criteria pollutants, greenhouse gas, petroleum
22 reduction is very important.

23 COMMISSIONER SCOTT: Thank you very much, Jeff.

24 I must note that it was music to my ears when
25 you told me you were going to put a letter together and

1 send in the study. That's something I'd love to
2 encourage all of our panelists.

3 And anybody, really, who has comments or
4 thoughts on this, if you could write -- you know, get
5 the details down, whether it's a letter, whether it's a
6 study, or data that you just want to send us to make
7 sure that we've got it in our docket and on the record,
8 I would very much appreciate that.

9 And I know that we've done the lightening round
10 and that there's lots of additional information that
11 sort of underpins the things that we're talking about.
12 So, that's another place we could hope to get some of
13 those additional details.

14 I will now turn to V. John White, welcome.

15 MR. V. JOHN WHITE: Thank you, Madam Chair. I
16 apologize for being late, but I had another engagement
17 that ran over.

18 I'm not sure why I'm on this panel, other than
19 because I have some experience with the history of these
20 programs and also maybe a more qualitative judgment than
21 some of the others.

22 But I had the honor of working with my friend,
23 Tom Cackette and Carl Moyer on the original design of
24 the Moyer program, and also on -- with Allan Lloyd and
25 Paul Wuebben on the original legislation that created

1 the Office of Technology Advancement at South Coast.

2 And so, I'm familiar with the origins of these
3 programs and some of the thinking.

4 And I guess a couple things that I would observe
5 and opinions to offer is that we really need to keep our
6 eye on the prize, which is we're going to need very,
7 very deep reductions in GHG emissions by 2050, 80 to 90
8 percent.

9 And we have, even sooner than that, a need for
10 very deep reductions in criteria pollutants.

11 The Vision Document prepared by CARB, and the
12 San Joaquin Valley, and South Coast suggests we need 80
13 percent reductions by 2023, and 95 percent maybe by
14 2032.

15 So, the air quality challenge is very important
16 to keep in mind because, while the greenhouse gas is
17 important, the health benefits and the environmental
18 justice benefits are disproportionately focused on the
19 criteria air pollutants.

20 And so, I'm very glad just to have the pleasure
21 of sitting here, listening to the fine work being done
22 by all the agencies. And just looking at these programs
23 together as a whole, as well as in their individual
24 parts so that we can see what's -- where the overlap is,
25 where the duplication might be, and so forth.

1 Second, with regard to storage, I just want to
2 mention that I think a metric that the PUC needs to
3 rethink and get right is that we need to be looking at
4 greenhouse gas emission reductions per gigawatt hour,
5 not just the power output.

6 Okay, because for storage it matters,
7 particularly how much storage and how much discharge
8 we're getting.

9 If we're going to minimize the use of fossil
10 fuels, which is one of the reasons to do the storage.

11 I think, also, we need to keep in mind the
12 potential reductions of the criteria pollutants and
13 their community health benefits in terms of avoided sick
14 days, hospitalizations, worker productivity and so
15 forth.

16 We need to be transformative across all aspects
17 of the economy, but we need to keep the under-served
18 communities firmly in mind, particularly as we develop
19 the portfolio of projects.

20 One of the things about the Moyer Program that
21 Carl inspired in us was there was a lot of interest at
22 the time in the support the program would give for
23 relatively expensive emission reductions, mostly from
24 natural gas.

25 But what Carl emphasized was that there were

1 some very significant reductions available from
2 retrofits, which we hadn't even seen the technology for,
3 yet.

4 But if we made that part of the program, we
5 could end up having some very expensive tons associated
6 with natural gas and electric technologies, and some
7 very inexpensive tons associated with retrofits that
8 would have near-term benefits.

9 And so, that kind of came to mind when we're
10 thinking about this that we need to think about a
11 portfolio, and then we need to think about some of the
12 non-quantifiable variables, such as social equity and
13 environmental justice.

14 I do think that it is a little passing strange
15 that the folks from Tesla think they're entitled to the
16 full amount of incentives no matter what their car
17 costs, when we have a lot of -- you know, one of the
18 things that concerns me about the EV program is we are
19 building in these incentives as what is going to be
20 there.

21 And if we're going to reach our goals, that's a
22 lot of money. That's a lot of money.

23 And while AB 8 had a very good coalition of
24 people working on it, it's a lot of money to start
25 building in.

1 So, I think we need to think about, as we
2 develop these incentives, how do we make them go down in
3 time so that the money goes farther.

4 This is an example from our solar experience
5 where we had 3,000 megawatts, \$3 billion. And they're
6 theory was you increase the volume then the unit of
7 subsidy can go down.

8 And that's something that we ought to be looking
9 for here and not give people a sense of entitlement that
10 we're going to be there with the same amount of money,
11 no matter what, because we expect this to lead to cost
12 reduction.

13 So, the other thing that I think I would include
14 in your vision of this -- of all these programs, and
15 having Dr. Eggert here, and my friend, Tom Cackette,
16 you've got some very important talent to advise you.

17 And it is we need to think about transparency of
18 these metrics. We need to think about emission
19 reductions, costs, I agree and, you know, societal
20 benefits, and so forth.

21 But then, we need review and evaluation to see
22 what we got with the money we spent, and then what might
23 we learn from that, and then recalibrate and adjust in
24 response to those evaluations.

25 Okay, but if you don't have the criteria and the

1 transparency built in, then the valuation is harder to
2 do and then it becomes arbitrary.

3 I think, also, one thing we haven't talked about
4 too much, but I think given the lack of progress we're
5 making on reducing carbon emissions, I'm happy that
6 everybody's happy about the President's plan.

7 But there's an article today that said, you
8 know, it's not nearly close to getting us to the 2030
9 goals that we agreed in Copenhagen to try to pursue.

10 So, we're going to need additional reductions.
11 And the utilization of CO2 in the creation of
12 technologies, there's -- my friend, Paul Wuebben's
13 working on renewable methanol in Iceland, where they're
14 actually using CO2 to create the fuel. We may need to
15 think about that as an additional --

16 So this is why even though people's dreams
17 sometimes have a way of becoming entitlements in this
18 world of incentives.

19 And so, I think we need to keep everybody
20 understanding that these are programs that are not
21 locked in. These are not guaranteed incentives.
22 Although, we want certainty, we want to build in a
23 valuation, an adjustment and recalibration so that we
24 can optimize as we go forward.

25 And also have a story to tell when it comes time

1 to try and reauthorize this money.

2 And the Legislature, most of whom won't have
3 been here when the program was original developed, have
4 a basis for judging the progress that has been made and
5 the adjustments that need to be made.

6 Thank you.

7 COMMISSIONER SCOTT: Terrific, thank you so
8 much.

9 And last, but certainly not least, Tom Cackette,
10 welcome.

11 MR. CACKETTE: Well, thank you, Commissioner
12 Scott and staff for inviting me today.

13 Given the lightening round format here, I'm
14 going to focus on a very narrow, but I think important
15 part of this overall metric and evaluation process.

16 And that's going to be looking at mainly the
17 greenhouse gas aspects of it, and the proposed projects,
18 sort of the up-front part as opposed to the valuation
19 after the fact.

20 So, the next slide -- so just to check
21 against -- my ideas against some of the statute, you can
22 see here that AB 8 says that, "The Commission shall
23 provide preferences to those projects that maximize the
24 goals based on the following criteria", and Anthony
25 showed the long list.

1 And I picked out the ones, since I'm talking
2 about GHG, that says, "consistency with climate policy".

3 And, of course, we all know that Governor Brown
4 and Governor Schwarzenegger have adopted the 80 percent
5 GHG reduction by 2050. So, that's clearly one of the
6 climate policies that we need to be consistent with as
7 we go forward with these projects under AB 8.

8 And so what I'm going to suggest is that we sort
9 of spin this a little bit more away from hard analytical
10 numbers. I know the statute says you got to do dollars
11 per ton, and tons, and things like that, but it also
12 suggests a lot of other things, and there are other
13 policies that aren't very amenable to this idea of
14 coming up with an exact dollar-per-ton type number.

15 And it's really hard to quantify and then
16 combine those. Like it's very hard for ARB, I think, to
17 even come up with the idea that they could combine cost
18 effectiveness of PM versus NOx. They had to come up
19 with a formula that, you know, people may not agree
20 with.

21 And it's certainly true in other areas. When
22 you try to do energy with climate change, you know, they
23 don't always match up in an analytical way.

24 So, I'm going to suggest that we need to have a
25 more of a qualitative ranking of the proposed projects

1 and that -- against the various goals and in this case,
2 my example against the GHG goal.

3 And that these should be clearly stated and the
4 investment plan should provide, I think, some more
5 elucidation into what these policies are, and more
6 transparent, and how they might be done in this
7 qualitative manner.

8 So, I just have one slide, the next one, which
9 gives an incomplete, but maybe sheds some light on how
10 such a qualitative evaluation can occur.

11 And I think this should come first, before we
12 get into the tons, and the dollars-per-ton type thing.

13 So, for example, you'd have to ask the question
14 of will the project contribute to achieving the goal?

15 So, one of the first things is does it appear to
16 be necessary technology, fuel or infrastructure to meet
17 the GHG goal?

18 Sometimes we have lots of different ones and
19 maybe some of them are really great on the short term,
20 but they don't necessarily benefit us towards the long
21 term.

22 And then another one is can it have a big
23 impact? And do we really want to spend our money on
24 something that could reduce the total sector emissions,
25 GHG emissions by five percent, when there might be

1 another one that, if it's potentially successful, could
2 maybe do 50 percent.

3 So, that's a factor that you could qualitatively
4 take into consideration.

5 Even if it's successful, even if there's a fuel,
6 for example, out there that could completely take over
7 the transportation sector, light duty for example, does
8 its performance fall short of the goal?

9 And we could eliminate petroleum and go to
10 something else, but if it had a 20 percent GHG
11 reduction, and that's the only potential, it obviously
12 falls very far short of the goals that have been set on
13 greenhouse gases.

14 You know, is it the best option or are there
15 other approaches that are more likely to be successful?

16 You know, we might have multiple ones to look at
17 and sometimes they have a lot of merits and a lot of
18 supporters, but maybe certain ones are just better to
19 follow from a qualitative stand point, than other
20 approaches.

21 And then, is it realistic? You know, we can
22 invest in something that might have some short-term
23 benefit, but is there really a business plan that would
24 allow it to be sustainable.

25 And so, I think you can combine these things

1 into sort of a -- well, even before that, I think we
2 have to rate the risk of success. And that should be
3 done transparently in the program.

4 And I say that because of a principle that I
5 believe, and I know not everyone does, but it is that
6 there should be a balance in these funds between things
7 that are low risk that we know are going to pay off
8 with, you know, high probability, and things that are
9 high risk that have a good chance of failing, but could
10 have enormous benefits in the long term.

11 So, some balance by assessing this risk in your
12 overall portfolio, I think, would be a very good thing.

13 Now, you can assess the specific benefits of the
14 projects, like has been done, the tons to be reduced.

15 And I want to point out that doing it only in dollars
16 per ton isn't too helpful if a very, very cost effective
17 project only has the potential to get a one percent
18 reduction. And it is really the tons that count, as
19 well, so you have to balance those two factors.

20 But this more analytical metric is really better
21 for comparing similar projects, you know, maybe a couple
22 of different infrastructure projects, or a couple of
23 vehicle subsidy projects. Compare them together based
24 on some cost effectiveness.

25 But then only include that as just one other

1 factor compared to the ones at the top. It's sort of
2 like when we do some competitive bidding that's very
3 technical, we don't say we're going to pick the cheapest
4 project. We take the cost benefit as one factor out of
5 five or six other rankings that you do to determine
6 whether that contract is better than another one.

7 And so, I think that kind of a process would be
8 far superior to just relying on the hard metrics that we
9 have now. But the key to it is making it transparent so
10 that everyone can see how the decision making's being
11 made.

12 And to have the investment plan be a good setup
13 and a real good analytical discussion of these policies
14 and how the Commission wants to go forward with applying
15 them to the projects.

16 So, that's it, thank you.

17 COMMISSIONER SCOTT: Excellent, thank you so
18 much.

19 So, we have just an amazing set of metrics, and
20 ideas, and thoughts on the table here, so I'm going to
21 turn it to Anthony, now, to help us facilitate a good
22 conversation to think about how -- how some of this can
23 be applied to the Alternative and Renewable Fuel and
24 Vehicle Technology Program as we go on .

25 And I'd like to invite Dr. Melaina, if he

1 wishes, and Jim McKinney, yes, and Charles, if you'd
2 like to come and join the conversation, I think that
3 would be terrific. Anthony.

4 MR. EGGERT: Excellent, thank you very much,
5 Commissioner. And that was a very informative set of
6 lightening presentations.

7 And I do have questions. I have a number of
8 questions here, but I would also invite yourself, if
9 anything -- you want to sort of chime in with any
10 additional questions or comments.

11 I'm going to maybe go right to the most
12 provocative here to get things moving. And I think V.
13 John sort of raised the point, which is -- oh, sorry.

14 COMMISSIONER SCOTT: Just a quick interruption
15 before he does that question. There will be a
16 transcript of this, so that's kind of the best way that
17 this will be captured. But the rest of us will be kind
18 of taking notes and everything as we go along. So, I
19 just wanted to make sure folks knew that.

20 And for the people who are on the WebEx, if you
21 can say your name before you answer the question that
22 would be really helpful for them as they're trying to
23 follow the conversation. Thanks.

24 MR. EGGERT: Excellent. I thought maybe you
25 were forewarning there was a transcript from the

1 provocativeness of my questioning. So, maybe it's not
2 that provocative.

3 (Laughter)

4 MR. EGGERT: So, V. John, you know, mentioned
5 this idea about the need to avoid entitlement. And so,
6 I guess this is sort of a question open to the full
7 panel which is how do we know when to stop? You know,
8 how do we know when the public investment either has
9 been so successful that the private sector, you know,
10 can carry the load under whatever sort of market or
11 policy conditions might exist at that point?

12 Or, sort of the flip side of that is how would
13 we know when to stop when something maybe isn't panning
14 out in the way that we might have anticipated or hoped
15 for.

16 So, if anybody's given -- had any thoughts on
17 that or --

18 MR. ERIK WHITE: Well, I'll say a few.

19 MR. EGGERT: Erik.

20 MR. ERIK WHITE: Because, you know, I think we
21 wholeheartedly agree with that comment. And it's a
22 question that we've struggled with in our AQIP program,
23 for the CVRP, in particular.

24 So, we look at light duty rebates. When is the
25 right time to start ramping those down? When is it time

1 to start looking at whether or not we've invested
2 sufficiently in one technology and can begin to look at
3 other technologies that are emerging in the marketplace,
4 or shifting to a completely different sector of the
5 marketplace?

6 And so, the plan that we've developed this year
7 really strives to start to lay out -- I don't think we
8 have the answers, yet, but start to lay out the
9 questions and the discussion about how to start to do
10 that.

11 Is it looking at market penetration,
12 manufacturers in the marketplace, technology costs,
13 consumer uptake and acceptance?

14 How do you start to quantify some of those so
15 that you can look at many of them, because I don't think
16 any one of them, individually, is ever going to give you
17 the answer you need as to whether or not the market is
18 self-sufficient and those investment dollars could be
19 shifted someplace else.

20 But I do agree that if we don't start looking at
21 that and having the conversation, there is going to be a
22 belief that those incentive dollars are going to be
23 there in perpetuity. And they become part of both the
24 pricing of the technology in the marketplace and,
25 ultimately, could lead to a slowing of development and

1 reduction of costs because those government dollars are
2 always there to prop things up.

3 So, I think it's very much something that the
4 Energy Commission should take a hard look at. It's
5 something that ARB is looking very closely at.

6 And I would expect and hope for the next couple
7 of years we'll have better information to start to make
8 those, to lay out that case and look at multiple years
9 ahead and start planning for transitions in our
10 incentive programs.

11 But, certainly, I agree, the project that is the
12 one that comes to mind is the one that is really getting
13 to that point where we need to have a serious dialogue
14 on that.

15 MR. CACKETTE: Well, one thing I think to keep
16 in mind is this classic valley of death problem. I mean
17 that's what we're dealing with is we've got technologies
18 here that are either still in development, like some of
19 the fuel projects, or the technologies are here but the
20 market's still in development.

21 And so, you can look at sort of the valley of
22 death. If you think they're getting through the valley
23 of death, and assuming you still have money -- or
24 don't -- if they're still in the valley of death and
25 assuming you still have money, then they still deserve

1 some incentives because we're trying to get them to the
2 early commercialization stage before stopping.

3 Of course, if you don't have enough money, you
4 then have to do a little bit more of a projection and
5 decide whether or not this technology might have enough
6 legs to do it on itself, to actually get into the
7 commercial market.

8 But I don't think anybody expects that we're
9 going to have incentives forever. I mean that's one of
10 the principles I had is does this thing have a business
11 case for the long-term future?

12 If it's going to be, you know, a \$20 fuel that
13 might come down to \$15, and we don't project the
14 gasoline or diesel, or any of the other ones are ever
15 going to get above \$5, that sort of tells you what the
16 problem is, and that that's probably not something you
17 should be pushing towards.

18 But yet other ones, like on the vehicle side, we
19 do know that the electric vehicles and the fuel cell
20 vehicles, from looking at the latest National Academy
21 Report, can become cost effective with internal
22 combustion engines, the same price or even cheaper over
23 time. So that helps you also look at the threshold of
24 when these incentives clearly should end.

25 MR. EGGERT: Dean and then Marc.

1 MR. TAYLOR: Just two quick thoughts. No alt
2 fuel has ever made it to a million vehicles in the
3 United States and I think all of us have been trying for
4 decades, out of a vehicle stock of 250 million. So,
5 it's a really daunting, you know, number to achieve.

6 The Federal government, I thought on tax
7 credits, instead of picking a year did it by
8 manufacturer so that the tax credits start phasing out
9 once an individual manufacturer reaches 200,000 units.

10 So that's, I thought, a very creative way and it
11 also gives you a sense of scale, too, I think, of the
12 problem given that there's probably 20 or 30
13 manufacturers.

14 MR. EGGERT: Right. Marc Melaina.

15 MR. MELAINA: So, I think I'll try and
16 complicate the answer further. I think another thing
17 that was mentioned in the National Academy Study was
18 that if California, the U.S. and other countries start
19 being successful in displacing petroleum, global
20 petroleum prices will drop.

21 And then our reference for what is competitive
22 in the market is going to change based on what we're
23 thinking now, if the price of oil goes up.

24 And so that's -- it's not just a moving target,
25 we should expect that to happen with success.

1 MR. EGGERT: Great. Sure, go ahead, yeah.

2 COMMISSIONER SCOTT: Okay, so the question that
3 I had was based on something that -- or I have lots of
4 questions, actually -- but that Amy mentioned in her
5 presentation.

6 And that was about if you just look at
7 population, all the Federal dollars would end up going
8 towards California.

9 And so they -- you took into account how to get
10 money to other places, for example Nevada, with the
11 rural school buses.

12 And we have actually a very similar issue, I
13 think in California, in terms of wanting to be sure that
14 we've spread the benefits of the program to all regions
15 of the State. And there are, as you can imagine,
16 certain regions of the State that are much more
17 populated than other regions.

18 So do you or others at the table have advice for
19 the best way to kind of make sure you're capturing a
20 good geographic diversity as you're making investments?

21 MS. ZIMPFER: I don't know if it's the best
22 advice, but I can tell you how we do it with the Diesel
23 Emission Reduction Act Funds, the DERA fund.

24 So, we recognize, and it's not unlike other
25 national decisions that are made, that there are state

1 differences.

2 So, when we allocate the dollars, we provide
3 some into the competitive pot and that's where we use
4 the calculation that I described.

5 And then each state gets a certain percentage
6 based on a formula that we have. So, every state has a
7 certain amount of money that they can use for diesel
8 projects.

9 And then we have a category, if there is a
10 certain sector that we feel needs some additional
11 emphasis, for us this year it's the ports throughout the
12 country, recognizing that there are disadvantaged
13 populations, very often, that may have a combined impact
14 from pollution in and around ports.

15 So, that's how we've done it. And we could
16 provide some exact numbers, and so forth, and the way we
17 went about coming up with those figures.

18 But that's the way that we felt. It spread
19 about the benefits. We addressed some of the facts that
20 there's difference in terms of there's risk numbers from
21 state to state to state.

22 And also that, you know, it is a program that
23 has national acceptance and I think has consistently had
24 almost unequivocal support from almost all members of
25 Congress, and that's been important to keep the funding

1 going.

2 MR. CACKETTE: Well, I want to comment a little
3 bit on that in that that makes a lot of sense to me when
4 you're dealing with local impacts. But from a global
5 stand point, you know, if you spend some money, wherever
6 it is, and it benefits in a GHG reduction it, arguably,
7 benefits everyone everywhere in the world.

8 And so I could see a pathway in which if you
9 have too strong of a factor in these rankings that says
10 everybody should get a little bit or we should spread
11 it, you know, rural versus urban, or something like
12 that, that isn't necessarily the most efficient way to
13 achieve the greenhouse gas goals.

14 And I guess we do have one in the new bill that
15 talks about disadvantaged areas, so there's some need to
16 respond to that.

17 But I wasn't aware that actually, you know, a
18 spreading out so much for each county, or something like
19 that was not in the bill as I remember reading it.

20 MR. ERIK WHITE: The only thing I would add to
21 that is as you look at trying to, you know, make
22 investments throughout the State, and I agree with Tom,
23 you know, GHG reductions wherever they are achieved are
24 working towards meeting the State's goals.

25 Recognizing, though, that not all technologies

1 will have applicability in all parts of the State, and
2 so recognizing infrastructure limitations, how vehicles
3 are used, where things are produced is very important in
4 deciding where certain programs might have applicability
5 and where -- and be successful, and where others just
6 simply don't have a strong opportunity for success. So,
7 I think that's important to consider.

8 MR. MC KINNEY: This is Jim McKinney. And I
9 think one of the topics that several of the agencies are
10 kind of responding to the recent legislation is the San
11 Joaquin Valley.

12 So, we know from our program statistics that,
13 you know, not a lot of our program dollars go there.

14 But then I look at the slide that Matt Miyasato
15 presented and I think the inventory is somewhat similar
16 to the San Joaquin Valley.

17 And if you're really looking at the off-road
18 sector and then long-haul trucks as kind of major
19 contributors, what's the potential effectiveness of our
20 program dollars because those are not things that we
21 focus on, per se.

22 And I think some of the medium-duty trucks, or
23 the light-duty vehicle investments where we do have a
24 much bigger impact, you know, how great a role might
25 that play in the San Joaquin Valley for starting to

1 transform some of the preferences there for vehicles and
2 fuels.

3 So, I think that's challenging. But one thing
4 we have experimented with is our geographic, say,
5 preferences or set-asides, and we did that for our
6 centers' solicitation, recently, and perhaps that's
7 something we could apply for other parts of our program.

8 MR. EGGERT: Excellent. Yeah, that just sort
9 of -- one specific example that could apply here is
10 those investments that are trying to simultaneously
11 reduce emissions of greenhouse gas emissions and NOx,
12 specifically, given the challenges that we know we're
13 going to have in those specific areas around the State.

14 So, I guess the next question here goes to kind
15 of an issue that Matt Miyasato brought up with respect
16 to the regulatory backstop.

17 And I guess that's a question about -- certainly
18 relevant here in the State, where we do have a policy
19 landscape which includes programs that are very germane
20 to AB 8, AB 188, like the Low-Carbon Fuel Standard, like
21 the Zero Emission Vehicle Program.

22 And I guess I'm curious, maybe Matt, you could
23 start expanding on what you meant by that regulatory
24 backstop and thinking about public investment in the
25 context of other regulatory programs?

1 MR. MIYASATO: Well, thank you, Anthony.

2 I think that the ones you mentioned are good
3 examples, right. So, knowing that there is a regulation
4 in place that will, in some respects, drive the market
5 toward the zero tailpipe emission technologies, or
6 cleaner technologies, that certainly helps, at least at
7 the local level us to do a plus-up, and say, hey, this
8 is coming down on the pipe. We need to ensure that
9 you're prepared and we're prepared to offer, and send
10 this for either further infrastructure or further buy-
11 down.

12 So, that's helped us with medium-duty trucks,
13 for example, where it's been the EPA, the Energy
14 Commission where we've helped fund these medium-duty UPS
15 trucks.

16 And much to Jim's point, those are manufactured
17 in Stockton. So, some of those trucks also got a plus-
18 up from the San Joaquin Valley.

19 So, you know, in areas where we can collaborate
20 and provide further incentive funding for these
21 typically small, entrepreneurial companies to get over
22 the hump, I think that's important.

23 But having the end-users know that there's a
24 date certain at which they will have to move to a
25 cleaner technology gets them thinking about how do they

1 then plan on a five-year, ten-year timeline, rather than
2 just this next year.

3 So, a good example was the truck and bus world,
4 where the truckers knew or they purportedly knew that
5 they were going to have to go to a cleaner technology,
6 and then incentive funding was provided by Prop. 1B.

7 So, you know, that was a perfect example of how
8 to transform that market. Now, we've got all post-2007
9 model year trucks running around the ports.

10 And by the way, we agree that population density
11 should be one of the primary candidates for incentive
12 funding.

13 But also, from the broader perspective, from
14 EPA, and ARB, and CEC you have to look at where can your
15 funding be provided that it has the greatest impact.

16 You know, that's why we always push for looking
17 at that kind of broad spectrum, but ensuring that the
18 places with the greatest need are the ones that should
19 be prioritized first. So, that's just a pitch for the
20 South Coast.

21 But I think we're seeing a lot of regulatory
22 activity that is pushing toward cleaner technology. A
23 good example is also our port is going through a process
24 now where it's an indirect source. But the intent is
25 really to say if you're not going to meet your targets,

1 we need to have an opportunity to come in and work with
2 you to help you establish or meet those targets, maybe
3 not by the plan that you had originally required.

4 But knowing that there is going to be some stick
5 with the carrot, I mean it's an important hand-in-hand,
6 push-pull mechanism that we've seen work time and again.

7 MR. V. JOHN WHITE: Yeah, this is actually a
8 point that I wanted to make, to emphasize that Matt made
9 earlier, and that there needs to be a synergy between
10 the regulatory strategy and the incentive programs.

11 And we need to be careful that we don't back
12 ourselves into a situation where the availability of the
13 incentive money becomes a requirement for regulations to
14 be adopted.

15 I think in the Moyer program we were successful.
16 And the origin of the Moyer program was the case that we
17 had a Federal implementation plan coming down on us to
18 get tons from the diesel sector that we didn't feel like
19 we could directly regulate without a street fight and
20 potential litigation.

21 And so the idea was, well, let's just buy some
22 of these tons and get going on it. But also, use the
23 money to drive down the cost of compliance so there's a
24 relationship between -- and I think South Coast has been
25 successful in this regard, also, with the Office of

1 Technology Advancement -- is you use the money to prove
2 out the reductions being feasible, and to help reduce
3 the costs. But also, use the prospect of direct
4 regulation as an incentive to drive participation in the
5 program.

6 Because the money may not be there forever, so
7 you value the early adopters and reward them, but you
8 also use the program to drive the market so that you can
9 regulate it.

10 Because again, the depth of the reductions that
11 we need, both on criteria pollutants and GHG, are such
12 that we can't imagine doing this entirely with incentive
13 programs.

14 And so we need to think about the strategic --
15 and this is where I also agree with Tom that the
16 qualitative judgment, rather than some pseudo-
17 quantified, you know, thing that in the end is as
18 arbitrary as a quantitative judgment -- a qualitative
19 judgment, should figure out what's the strategic value
20 of what we're doing here.

21 And, you know, a rigorous cost-of-benefit
22 analysis is fine, particularly on stuff like comparing
23 costs, well-to-wheel, those kind of things where we
24 really see what the value proposition is for the
25 technologies.

1 But at the same time we should look at how the
2 incentive programs help us make the regulatory programs
3 more successful.

4 MR. MIYASATO: Can I just add to that?

5 MR. EGGERT: Yeah.

6 MR. MIYASATO: John, thank you for reminding me.
7 So, the very specific example I want to bring up is our
8 fleet rule. So, we have limited mobile-sourced
9 authority over a public fleet. So, if a fleet is
10 greater than 15 vehicles, when they purchase the next
11 vehicle greater than that 15, they have to have the
12 cleanest available technology.

13 So, having that in place for our transit fleets
14 within our region really drove LAMTA, Los Angeles
15 Metropolitan Transit Authority, the sixth largest
16 transit authority in the nation, to go to all natural
17 gas. And I think they completed that conversion two
18 years ago.

19 But that was a combination of not only having a
20 fleet rule in place but also, on the other side of the
21 coin we were offering incentive funding for the purchase
22 of vehicles for buses, as well as infrastructure.

23 We saw that also with the waste-hauler fleets,
24 so Waste Management. They have a huge fleet of natural
25 gas vehicles and we were able to incentivize them with

1 infrastructure, as well as assistance with the vehicles,
2 themselves.

3 So, having both of those in tandem, we believe,
4 is able to achieve this turnover that John was talking
5 about.

6 COMMISSIONER SCOTT: Well, I would add, too,
7 when I think about sort of a specific metric, maybe
8 based on what you said, Matt, when you were first
9 speaking, is that one measure of success might be how
10 the percentage of trucks that were transitioned from,
11 you know, the older trucks to the 2007 or post-2007
12 trucks. You know, that's kind of a specific metric that
13 goes along with what you said earlier.

14 So, I think my next question here would be based
15 on Jeff's excellent slide that he did on number five.
16 And I don't know if Heather or Lynette could help me
17 pull that up from Jeff Rosenfeld's presentation, and it
18 was slide number five.

19 And, basically, this is the one, though, that
20 showed the ranking comparison between the metrics. And
21 I think it's a really important point and it just
22 captured it really well, all on one slide, with the
23 different yellow highlights that you had.

24 And Tom mentioned a great way for how we might
25 want to think through, and John echoed it as well, an

1 idea for how to think through how do you sort of sort
2 through all of this and decide what is the right metric
3 as you're ranking -- I don't know if it's a charging
4 station, or ranking a hydrogen fueling infrastructure,
5 or ranking the value of a medium- and heavy-duty truck
6 versus some other things.

7 And so, I would love to know if other folks
8 have, or Tom, you could reiterate your last slide, too,
9 if you like, suggestions for how we might take some of
10 this -- because this, I think, illustrates really nicely
11 how complex it is to just pick one thing.

12 But it also shows if you pick a couple of things
13 you'll probably get to the right answer in terms of
14 picking some of the top technologies that you want to
15 focus on.

16 So, my question is how would you take something
17 like what Tom suggested as sort of a how to rank your
18 way through this and apply it to the Alternative and
19 Renewable Fuel and Vehicle Technology Program.

20 MR. ERIK WHITE: Well, I'll say a few words on
21 that because -- well, ours didn't look quite that
22 complicated, but we went through a similar assessment as
23 it related to implementing AB 8 and the metric
24 requirements in that.

25 And to Tom's point, the importance of

1 qualitative considerations as you look at what to fund,
2 we ultimately determined that we somehow needed to
3 quantify those qualitative considerations in a way that
4 would allow us to come up with a ranking or a score
5 amongst the various projects that we wanted to.

6 Recognizing that on a purely benefit cost score
7 perspective certain projects, you know, may not look
8 very attractive on a dollar-per-ton or ton-per-dollar
9 basis because they are in that valley of death. They
10 are early in their development process and the potential
11 future benefits are significant, the potentially
12 expected near-term benefits are small.

13 And so, how do you start to try and bring those
14 in? And so some of the ways we looked at that was
15 accounting for both expected current and future benefits
16 as it related to price reductions in the marketplace for
17 the dollars we were investing today, expected,
18 deployment rates of the technology in the future and the
19 benefits that those would provide.

20 But also looking at I think just some of the
21 things that Matt showed on his bar chart, you know, for
22 instance how does it contribute to regional air quality
23 issues?

24 And if it's an important contributor, providing
25 greater weight to that because it was going to get at a

1 bigger piece of that pie, so to speak, for certain
2 regions as they needed to identify emission reductions.

3 But at the end of the day we ultimately decided
4 that trying to quantify and come up with a score to rank
5 our projects on an equal footing was the best way we
6 could go because some of them were so different and so
7 diverse.

8 How do you compare light duty with heavy duty?
9 The investment needs and the benefits are so different
10 and, yet, we need to move both forward.

11 And so we didn't want to -- as that chart would
12 show, if you only went on a dollar-per-ton basis, we
13 would be funding diesel-to-diesel replacements as long
14 as there were diesel trucks to take off on the road.

15 That does not put us in the position to meet our
16 long-term air quality or climate goals. So, we need to
17 find other ways in which to incorporate those metrics
18 into what we did.

19 So, you might look at that. We thought that was
20 a reasonable and prudent way to try and take various
21 metrics and put them together into a meaningful
22 comparative document.

23 MS. ZIMPFER: Yeah, I would like to just give a
24 little more of a depth of the types of criteria that we
25 use in our DERA program, or Diesel Emission Reduction

1 Act program.

2 The public health benefits and the monetized
3 benefits is just one of many. We have about 10
4 different aspects that we score each project on.

5 Some of them, they're things like location and,
6 again, we want to try to have some geographic diversity
7 of the project.

8 We look at the regional significance. How
9 significant is this project in terms of our Region 9 EPA
10 requirements?

11 Things like how does it fit with other types of
12 programmatic priorities?

13 And this can be or some of it is public health-
14 based, but some of them may be more intangible.

15 So, we could provide this to the Commission and
16 you can take a look at it, that there are ten total.
17 So, it does try to get at some of the societal benefits
18 that are here.

19 This is pretty complicated. I'd need a lot of
20 more time to kind of understand it. But it does seem
21 like you've done a really interesting -- taken a really
22 interesting approach to try to quantify even the private
23 benefits. So, this is interesting and it would take a
24 while to kind of work through it.

25 MR. TAYLOR: Hi, Dean Taylor, Southern

1 California Edison.

2 I think what this slide is, in a sense, trying
3 to say is people talk about being fuel neutral,
4 everybody agrees on that. That performance standards
5 are important and everybody seems to agree on that.

6 But this is kind of saying which performance
7 standard?

8 This is just showing -- basically, I think the
9 punchline on this slide is over on the far right is that
10 is a better solution. The broader your metric, you
11 know, the better. You know, you're being fair.

12 If you just pick a narrow metric, like dollars
13 per ton of PM, you're going to end up with PM traps.
14 And that won't do any -- it will have become very
15 frustrating, I think, to both the public sector and the
16 private sector.

17 I think what the private sector is looking for
18 is, you know, stability and consistency over time so
19 that we don't, you know, move from one fuel to another,
20 and then ten years' later to another, and then to
21 another.

22 So, obviously, that leads to stranded
23 investments and probably a lot of frustration overall.

24 Maybe you could go to the prior slide, slide
25 four is a simplified version of this, a little easier to

1 digest.

2 And that kind of illustrates how this -- if you
3 just see that the ones in yellow are kind of the best
4 ones. And so, the ones that -- you know, you tend to
5 find that the cleanest technologies are, in the case of
6 the plug-in hybrids, BEVs, forklifts.

7 We don't have hydrogen on here, but I would
8 suspect hydrogen, biofuels, all of them would do very
9 well on the technologies on the far right, where you
10 have a benefit cost.

11 And in a sense I think the AB 118, ARFVTP, I
12 don't know what you call your program is -- it has that.
13 I mean if you look in the section, it says you have to
14 do climate change, you have to do alternative fuels, and
15 then it lists 11 preference criteria, everything from
16 jobs, to multi-media impacts, and water quality, and on
17 and on.

18 So, in many ways it reminds us what we all
19 learned in school about an environmental impact report.
20 You really need to look at the broader picture and that
21 becomes a better, you know, metric.

22 So, one of the key conclusions of all of this is
23 that metrics really matter, and it sounds like many of
24 us are all doing that.

25 But maybe to answer your question about the

1 qualitative side that Tom was raising is that certain
2 things that you do in the alternative fuel
3 commercialization area are not very prone to metrics.

4 I think most agencies love hardware. It's
5 really -- you know, and I'm sure the Legislature is
6 probably saying we want metrics, we want proof, you
7 know.

8 But there are certain categories that are not
9 very prone to that and maybe that's more of what Tom is
10 talking about especially is useful.

11 So, you know, I just note in the ARFVTP part of
12 AB 118 there's some of these things that aren't about
13 the hardware like infrastructure or vehicles, like
14 market education and outreach.

15 I think Southern California Edison was saying
16 dramatically increase that, in our prior testimony to
17 you, from like \$1 million a year to like \$10 million a
18 year.

19 I saw some of the other slides saying how
20 important that was throughout the whole process. You
21 know, it's just amazing how hard it is to get people to
22 think about alternative fuels.

23 Stakeholder engagement, I was at a CEC-funded
24 thing just last week on the PEV dealer ecosystem. I
25 mean the whole dealership thing is really a crucial area

1 where you need users groups and a lot of deep thinking
2 on how to solve that.

3 Another, you know, I think CEC funded a used
4 battery, the first time every that the used battery
5 community came together down at UCLA, about a month ago.

6 And those are all very, very useful things in
7 the ecosystem.

8 The broader analytics are another example of
9 something that is, you know, crucially important to do
10 both in planning ahead to ask these kind of questions
11 that Tom is asking, as well as the post-review data
12 collection. All of that kind of analytics is very
13 necessary.

14 Manufacturing, how do you -- you know, that's a
15 whole different -- how do you rank those proposals?
16 That's a whole different process.

17 Fuel production, jobs training, yeah, I'm glad
18 you mentioned on one of the slides codes and standards.
19 There's a whole bunch of other, you know, removing of
20 barriers.

21 I mean I think that's why alt fuels
22 commercialization tends to fail sometimes is we don't
23 pay attention to some of these other little details or
24 give enough money to them.

25 And again, I would encourage you not to go crazy

1 on the metrics on this because it's going to be really,
2 really hard. So, I don't know what the answer is, maybe
3 it's the proverbial 80/20 rule where you kind of protect
4 some of these hard-to-do programs and just don't do such
5 rigorous metrics.

6 Save the more rigorous metrics like this maybe
7 for the infrastructure, for the vehicle rebates, and for
8 those things.

9 And I like how, Anthony, you mentioned the two
10 things of policy versus projects. So, one of the key --
11 I think I'm mostly talking about the front end, the
12 policy stuff, how do you figure out what to do in the
13 beginning stages? How do you correctly bucket the
14 monies?

15 COMMISSIONER SCOTT: Let me just add, before Tom
16 starts, the AB 8 criteria, and thanks for raising those
17 again, I think are a really good lens by which to view
18 these through, and we certainly do that as we are
19 putting together our solicitations. A lot of the
20 scoring criteria are based directly on some of those
21 criteria, as well.

22 And even though public health benefits aren't --
23 or I think that's something that we should also really
24 capture. I think, you know, I used to work at
25 Environmental Defense Fund and that was oftentimes very

1 much the lens by which I looked through to see whether
2 we thought rules were good, whether the projects were
3 good and things like that.

4 And I think to the extent that we could at least
5 take some of the benefits, and Jim did this in his
6 presentation, and you can kind of add them up. Well, we
7 know because we have this many new all-electric trucks
8 versus this. You know, if they were the same types of
9 diesel trucks and you could actually see what, you know,
10 the pollution reductions are and then translate those
11 into health benefits.

12 And I think that's an important piece for us to
13 continue to do more, as well.

14 So, I'll go to Tom and then back to Amy.

15 MR. CACKETTE: Well, I was just going to give an
16 example of kind of the structure or the concept and
17 it's -- you know, I don't want people to laugh at this
18 because it's a car performance magazine concept. But it
19 sort of encompasses what I was trying to suggest.

20 If you look at comparison tests in *Car and*
21 *Driver*, for example, you'll see when they test a Mustang
22 versus a Camaro versus a Charger, or something, a
23 Challenger, what they do is they have various
24 categories.

25 For example, they give a possible 20 points to

1 zero to 60 time because that's what they're about, you
2 know, how fast can it go?

3 And then they might give only five points to
4 ride comfort and NDH for the vehicle.

5 And then they rank the vehicles together using
6 that kind of a concept.

7 Of course, the challenge is why does one get
8 20 -- on goal get 20 points at maximum and the other one
9 only get 5? And that's where it would really get huge
10 pressure on the CEC to try to evaluate that in some way,
11 and to put its judgment forward.

12 But I think that judgment is -- if you don't put
13 it forward, it's really buried in here anyway, it's just
14 that nobody understands what's really happening, what
15 you really value the most versus don't value the most.

16 So, that's just an example of how it could be
17 done on a number scale, like 1 to 10, or high, medium
18 and low rankings for some of these categories, but then
19 you have to weight the various goals and that is
20 judgmental, but I think it's necessary.

21 MS. ZIMPFER: Hi, Amy Zimpfer, again. I just
22 wanted to take the opportunity to build on what you were
23 saying about public health impacts and building that
24 into the decision criteria.

25 With your new requirement under AB 8 to look at

1 air quality, I want to really significantly emphasize
2 that potential for NOx reductions in 2023 and 2032.

3 Matt Miyasato put up the slide. The task before
4 us in California is profound to meet the national
5 ambient air quality standards.

6 And the potential that you have to really couple
7 your previous objectives on petroleum and greenhouse gas
8 reduction, coupling that with NOx reductions is going to
9 have great benefit for the State.

10 And I really do think that is one of your potent
11 criterias that you can bring in, public health
12 evaluation.

13 When assigning human health value for EPA to any
14 particular action, it's generally driven by PM2.5.

15 And the linkage between PM2.5 and NOx, NOx is a
16 precursor.

17 And so focusing on NOx in San Joaquin Valley and
18 in the South Coast, and its ability to reduce ultimate
19 public health exposure via PM2.5 is the key.

20 And we can provide some more examples to you and
21 your staff, but that diesel emission quantifier is one
22 methodology you can use to maybe really get at that
23 criteria you need to look at with respect to public
24 health under the air quality parameter.

25 COMMISSIONER SCOTT: I think it -- and it's

1 interested because AB 8, it says, "The ability to reduce
2 air quality pollutants, toxics, and avoid multi-media
3 impacts."

4 But it doesn't actually say public health
5 benefits, but I think that's an important -- most people
6 don't know, okay, if we've reduced 100 tons of NOx, most
7 people don't know what that means.

8 But if you translate it into public health
9 benefits, that helps explain what that means and why
10 it's so valuable.

11 MS. ZIMPFER: And then just it can be monetized
12 so easily and you can do a comparison of the public
13 health benefits that are monetized against the costs and
14 the dollars you're putting towards that modification.

15 MR. MIYASATO: So, Commissioner, Matt Miyasato,
16 South Coast AQMD. I just want to make a few comments
17 because you did want to -- you did put the slide up on
18 these different comparisons between -- or quantitative
19 comparison between metrics.

20 I just want to go back to Anthony's original
21 comment that you really need to know what your goal is
22 before you design or develop that metric.

23 And so, these were developed under different --
24 I think Erik mentioned, different conditions, and
25 different time frames, and different goals.

1 And so, I would just echo an earlier comment
2 that I made is you really -- I think it's fair to judge
3 technologies based on a metric for something that's
4 verified and commercial.

5 And so, when you're looking at these emerging
6 technologies, as I'd mentioned in my presentation, I
7 would have to agree with Tom and Dean is, you know,
8 don't go metric crazy. Look at these quantitative --
9 qualitative, rather, valuations for the program and its
10 ability to get to the end goal.

11 And echoing what Amy just mentioned is there's a
12 deep need in both the South Coast and the San Joaquin
13 Valley for these zero and near zero emission
14 technologies. And your program has helped tremendously
15 in us being able to develop those technologies and
16 continue to develop those.

17 The final comment is that this is a -- I really
18 like this chart and I'm anxious to dig into more of the
19 study.

20 But, you know, a lot of these technologies are
21 on different places on their cost reduction curve, or as
22 Tom was saying, different places in the valley of death.

23 And so, it's a bit unfair to judge them on the
24 same -- you know, it's apples and oranges and they're
25 not on the same playing field.

1 And that really gets back to that first question
2 you asked, Anthony, is how do you know when to stop?
3 And it's difficult to know when incentives don't -- no
4 longer play a role.

5 So, a good example is these single truck drivers
6 that still need an incentive to go to natural gas even
7 though over the course of a certain period of time it's
8 a positive payback, but they just can't afford the
9 initial capital. And so, the incentives in that case
10 still make sense, we believe.

11 So, it's a difficult question and I think you
12 need to take it on a case-by-case basis as these
13 conditions come up.

14 MR. V. JOHN WHITE: This is John White, from
15 CEERT. I would say, first of all, just recognize
16 there's no substitute for judgment, okay. And that in
17 the end that's what you're paid to do.

18 The metrics, and the data, and the
19 quantification are to inform your judgment, but they're
20 not to substitute for your judgment.

21 And we've seen this in modeling exercises of
22 various kinds. That's why the evaluation and feedback
23 loop is so important so you can see what you've done.
24 You see what it costs. You see what you didn't get to
25 do because you spend the money here.

1 And then just to emphasize the point about the
2 role of regulation, we have been blessed with an
3 abundance relative to other states and countries, of
4 these funds. And in some ways, I think, people are
5 giddy about how much money there is.

6 But if you look at the rest of the society's
7 needs, and areas like education, and water, things --
8 you know, we have a lot of needs on assistance.

9 So, it's incumbent upon us to spend this money
10 wisely and, as I said before, to use it as leverage with
11 our regulatory program.

12 And I'm grateful that the car companies have
13 abandoned their attacks on the ZEV mandate, in light of
14 all the incentive money that has been made available,
15 but the ZEV mandate is not going to -- and my hope is it
16 will exist and drive the technology, and the cost
17 reduction along with the incentives, and that we will
18 use the incentives to go further with the regulation,
19 rather than using the incentives as the ceiling on the
20 regulations.

21 Okay, I mean, you know, and I understand we live
22 in a time where direct regulation, and command and
23 control are not as appreciated as they should be, but
24 that's how we got here, as far as we have, is with a
25 direct regulation that was supplemented by incentives.

1 And I think it's a slippery slope to be on. My
2 earlier comments were designed to have us keep in mind
3 that these resources may be finite and so thinking
4 through how they help us get to the deeper reductions,
5 combined with other tools in the box, as opposed to
6 being the whole universe of what we're doing I think is
7 an important distinction.

8 MR. EGGERT: So, this is a follow up and I --
9 this is my last question, and I think it really builds
10 upon something you just said, V. John, now, and then
11 actually when you were making your comments earlier I
12 thought you might actually be reading off one of my
13 slides about this need for sort of do, learn, adapt.
14 Those are my words. I think you used a slightly
15 different version.

16 But this gets to the point of how do you know if
17 what you're doing is actually having a difference.

18 And how many people here have either read or
19 seen the movie *Money Ball*?

20 So, there's a -- I've mentioned this to the
21 Commissioner, there's an initiative underway right now
22 called "Money Ball for Government". And it's all about
23 how do we use data collection, analysis, statistical
24 assessment to understand sort of which government
25 programs are working well, versus which ones maybe

1 aren't working well and either need to be adjusted or
2 ended.

3 And so I guess, you know, I think there's a
4 huge, huge role, potential here for undertaking a fairly
5 extensive program evaluation through data collection and
6 analysis. They advocate within this initiative for at
7 least one percent of program funds.

8 So, I'm curious if anybody has any thoughts
9 about how this program might do that in a way that does
10 provide sort of that feedback loop, that ability to sort
11 of adjust and improve the program over time.

12 Dean?

13 MR. TAYLOR: That's one of our comments on a
14 prior workshop where the EV Infrastructure Plan was --
15 we were planning on saying just that is to form some
16 data collection, or almost like users' groups, or the
17 different stakeholders, be it universities, research
18 institutes, national labs can better compare and collect
19 all the data.

20 So, that's just one small example. You could
21 take that basic idea and apply it in a bunch of
22 different areas.

23 It's really easy for all of us to get very
24 siloed and, yet, data is what we really, really need. I
25 think most of the private sector is saying let's -- we

1 need much more data before there's more -- don't over-
2 regulate or don't over-legislate, let's get more
3 informed.

4 So, at least one percent, maybe more of the
5 money can be easily spend and just have a whole lot more
6 collaboration between all the different parties because
7 the data really is, seemingly, hard to find.

8 I'd also just chime in, maybe going off what
9 Matt said, is that we haven't talked a lot about RD&D,
10 but that is an important bucket within the program.

11 I mean, I think we've talked a lot about
12 infrastructure, or vehicle incentives, or some of the
13 other things.

14 But RD&D gets to the emerging thing and it
15 should be treated very differently.

16 So, if any of these up there are in the
17 beginning stages, and they're at the first 10,000 units
18 or something, by all means that's in a very different
19 category.

20 Because one of the struggles is how do you
21 quantify that? Do you look it over the first -- you
22 know, eventually, hopefully, they'll get into the
23 millions of units, so what is the cost for time?

24 You know, do you amortize all that RD&D money
25 over the first hundred vehicles or the first million

1 vehicles? You get very different dollar-per-tons
2 numbers.

3 So, it's very challenging to do RD&D metrics.

4 MR. MIYASATO: Yeah, I would -- Anthony, I
5 think, so Money Ball I keep thinking about statistics
6 and a lot of things that -- I can't remember, was it
7 learn, do, adapt?

8 MR. EGGERT: You start with do and then --

9 MR. MIYASATO: Okay, that's probably better.

10 MR. EGGERT: Yeah.

11 MR. MIYASATO: But that's very similar to, you
12 know, the sigma philosophy on -- you know, where you
13 design, measure, analyze, improve control, so it's a
14 similar process.

15 But I think it comes back to what John has
16 mentioned is all these statistics are no substitute for
17 judgment.

18 Right, so you need to -- you can apply that, I
19 think, on verified technologies, such as Dean was
20 mentioning, on things that are concrete, you can get a
21 dollar-per-ton value and a metric.

22 But for these other things, these more
23 quantitative, long-term planning that Tom was
24 mentioning, I think it would -- you can have these
25 qualitative discussions with the investment to give us,

1 you know, where are these priorities and how do they
2 mesh in the other needs in the local areas, as well as
3 the State?

4 MR. EGGERT: So, Erik, maybe just one, a couple
5 of examples. You know, we -- one of our partners within
6 the Plug-In Electric Vehicle Research Team, they do a
7 lot of work on infrastructure for plug-in vehicles, of
8 course.

9 And the need to understand how the existing
10 infrastructure is being used, you know, how often people
11 are using it, what types of vehicles is something that
12 is very, very difficult to come by.

13 And I think that does present a barrier even,
14 you know, for these emerging technologies where we're
15 just starting to learn about how that market evolves and
16 the customer behavior that aligns with it.

17 And another sort of really compelling point that
18 came up during the Governor's ZEV Action Summit was the
19 need to help guide some of the private investment,
20 particularly in the medium- and heavy-duty sector where
21 they don't have a tremendous amount of RD&D dollars,
22 themselves.

23 Where if these demonstration programs, funded
24 through the government, can provide compelling, credible
25 information about what's actually working they -- it's

1 much more easy for them to sort of pick up the ball and
2 guide their private investments towards the best
3 technologies.

4 So, Erik?

5 MR. ERIK WHITE: The only thing I would add is
6 that, you know, we have been blessed with having
7 substantial investments to make here in California to
8 support, you know, the various goals that we have,
9 whether it's the air districts at the local level, at
10 the State level, CEC, ARB, at the Federal level EPA,
11 DOE.

12 But we have to recognize that there are limited
13 budgets. While we have a tremendous amount of money, I
14 don't think there's anybody that believes we have
15 enough.

16 And so having data to help inform how to invest,
17 how much to invest in particular projects is absolutely
18 critical.

19 It doesn't substitute for judgment and an
20 ability to look at a technology or look at the
21 marketplace and provide insight that the data doesn't
22 necessarily reveal.

23 But at the same time it should be, I think, the
24 foundation for which funding decisions and investment
25 decisions should be made.

1 And so to the extent that as projects move
2 forward having mechanisms in those projects to collect
3 that data, to help inform future decisions is absolutely
4 critical.

5 MR. EGGERT: V. John, did you have -- you had
6 your marker up there.

7 MR. V. JOHN WHITE: Oh, that was from a previous
8 one.

9 MR. EGGERT: Okay.

10 COMMISSIONER SCOTT: I had one last question, I
11 think, for the panel and then I know -- I recognize
12 we're just a little bit over time, but I'm so excited to
13 have all of you experts here to get to ask these
14 questions to.

15 And one of the questions, and it was raised, I
16 think Marc Melaina mentioned it, I think Anthony
17 mentioned it, how do we attribute the project benefits,
18 right?

19 And I think it's something we talked about in
20 terms of if South Coast, and EPA, and Energy Commission
21 have all put some money together and it means that we've
22 got, you know, some new charging infrastructure and a
23 few new cars, you know, how do you kind of attribute
24 those benefits as we're working our way through them?

25 And I wondered if folks have some thoughts or

1 suggestions on that?

2 MR. MIYASATO: So, the clarifying question is
3 the concern is how do you attribute the dollar per
4 benefit from the Energy Commission?

5 COMMISSIONER SCOTT: Yes. So, do we get to take
6 credit for all of it?

7 MR. MIYASATO: Well, what we do at the South
8 Coast, we take full credit for everything.

9 COMMISSIONER SCOTT: There we go.

10 (Laughter)

11 COMMISSIONER SCOTT: Yeah, that was going to be
12 my answer.

13 MR. MIYASATO: But the reason for that is
14 because oftentimes a project would not go forward if all
15 the funding was not in place.

16 And so, if you're the last in that helps that
17 project go, you should be entitled to that full benefit.

18 COMMISSIONER SCOTT: There we go.

19 MS. ZIMPFER: This is Amy Zimpfer with EPA. We
20 also take full advantage of emphasizing how much we've
21 leveraged.

22 So, very often, our contribution is the smallest
23 amount. So, when we go forward and talk about what the
24 results are, we too will take -- will share information
25 about the results of the total project, then go into the

1 cost sharing and the dollars leverage.

2 So, for every Federal dollar how much was
3 leveraged. That's been very useful in our
4 communication.

5 COMMISSIONER SCOTT: Great. Go ahead, John.

6 MR. V. JOHN WHITE: I think one of the ideas
7 that you might have in mind in a broader sense is South
8 Coast, some years ago, at the instigation of one of
9 their most important and influential board members, who
10 laid the foundation for a lot of the work that we did
11 subsequently, who's Dr. Larry Berg, and he
12 commissioned -- he got South Coast -- there was a lot of
13 cost in those days about the cost of the air pollution
14 regulations.

15 And so he got the South Coast Board to
16 commission a study, by Dr. Jane Hall, then with the
17 California State University at Fullerton, which was
18 what's the cost of not cleaning up the air?

19 And that work proved very influential and very
20 important. It really pioneered the whole analytics of
21 the health cost, the lost employment.

22 Things that we now take for granted as being
23 part of the debate were not considered, it was just the
24 pure cost of doing the regs.

25 And I think in this case, because our

1 transportation sector is 40 percent of the greenhouse
2 gas target that we need to reduce, and in the case of
3 criteria air pollutant even greater, we have to examine
4 the cost of not doing these things, also.

5 And, particularly, the embedded costs we're
6 paying for the petroleum fuel cycle, including the fact
7 that despite the current boom in the Bakken shale, which
8 I was noticing this week all the talk about the trains
9 coming through Sacramento from -- without even knowing
10 what's inside the cars, and whether the cars have any
11 safe -- have enough safety equipment.

12 This is odd to me that we would not -- so, to
13 me, when this program was considered for its cost
14 effectiveness, the cost of not having it, and of not
15 making these changes, and particularly the cost of our
16 continuing dependence, and what might happen to us if
17 that dependence, both from a security stand point, as
18 well as from a GHG, not-getting-to-the-target stand
19 point that's an important overriding consideration in
20 terms of why we're doing this. And why, while the money
21 may add up to a lot, it may seem like a lot, it's
22 purpose it to avoid even greater costs than those which
23 we are expending.

24 COMMISSIONER SCOTT: Dean. Thank you.

25 MR. TAYLOR: On the attribution question, if at

1 all possible I would actually agree with them and
2 suggest avoiding it. In other words, it's a proverbial
3 rabbit hole because it's very similar to double counting
4 issue between -- and if you look on the regulation side,
5 there's a lot of potential double counting between
6 different -- let's say CARB programs like, you know,
7 LCFS, or SB 375, or ZEV programs, et cetera.

8 And I think the best way -- I think the best way
9 it's handled is you keep a whole separate ledger called
10 the CARB inventory and there is no double counting over
11 there.

12 But when you get into the programmatic areas of
13 either regulations or grants, I think double counting
14 and attribution are things that you just don't want to
15 do there.

16 Do what EPA and South Coast are doing is
17 probably the best.

18 COMMISSIONER SCOTT: I like the idea of
19 mentioning how the funds were leveraged, as well.

20 MR. TAYLOR: Right.

21 COMMISSIONER SCOTT: Okay, I will turn to
22 Anthony for some closing remarks, and then I'll make
23 some and we'll go from there.

24 MR. EGGERT: Great, thank you, Commissioner.
25 I'll be very brief.

1 So, again, just want to really, really thank the
2 panel. This has been an excellent discussion on these
3 topics.

4 I know it's something with our partners at Davis
5 we sometimes debate on an academics basis. But having
6 people that are actually, really involved in
7 implementing on-the-ground programs, you know,
8 struggling with these questions and coming up with, I
9 think, excellent suggestions, insights based on real-
10 world experience, I think this is -- I'm hoping you
11 found it to be as useful for your purposes.

12 And I think, I mean my observation is that I
13 think to a large extent a lot of what's been suggested
14 is -- has been part of the program.

15 Not everything, but a significant component of
16 it. It's not always been explicitly articulated in the
17 context of the program, but certainly a lot of the
18 different types of information that have been suggested
19 as being relevant to program decisions have been coming
20 into the program through program staff.

21 Certainly, you know, providing sort of an expert
22 judgment, again both at the staff and at the leadership
23 level, I think has been very much a part of that
24 program.

25 So, I think you're starting with, I think, an

1 excellent foundation.

2 At the same time, you know, I think always we
3 should be looking for ways in which to improve.

4 And so I think, again, there's been some great
5 suggestions on how to even further improve upon the ways
6 in which both the decisions are made about the major
7 investment program types, and then also the project
8 evaluation.

9 And, ultimately, I'm very hopeful that it --
10 there's an increased enhancement on some of the program
11 evaluation, as we've discussed.

12 So, I think probably my last point is just this
13 idea of really thinking about, you know, what it is
14 we're trying to achieve. Keep reminding ourselves, you
15 know, what the major goals for this in the context of
16 the overall policy landscape in California.

17 I think, again, some of the things that some of
18 the panelists have mentioned about putting this program
19 in the context of the ultimate goal allows us to both
20 see how critically important it is, but also the
21 challenge of making it -- leveraging it to really
22 contribute to those much broader and bigger goals for
23 greenhouse gases and the other criteria that we're
24 setting out to accomplish.

25 Thank you.

1 COMMISSIONER SCOTT: Thank you. I would just
2 add, and actually I have a lot of the same points as
3 Anthony did, that as we saw from our lightening round of
4 presentations, and also the presentations that we saw
5 earlier this morning, there are lots of good metrics out
6 there that we could be using.

7 You know, whether it's dollar per ton of NOx,
8 dollar per ton of PM, dollar per ton of greenhouse
9 gases, you know, petroleum reduced, number of jobs
10 created, there's a lot out there.

11 And as Anthony highlighted, many of those things
12 are things that we already employ at the Energy
13 Commission as we put together are solicitations is that
14 we do the scoring criteria.

15 I think one of the things that we've heard
16 pretty loud and clear is which metric or what metrics
17 you pick matter.

18 That we need to do, learn and then adapt, or
19 review and then evaluate to see what we've got, so that
20 we can continue to learn and grow, so that kind of --
21 that loops back in on itself.

22 It is important for us and me to use good
23 judgment, and to be qualitative, but to be transparent
24 about what it is that we're doing here at the
25 Commission, as well.

1 I've heard that we should not go metric crazy,
2 but to make sure that we have robust foundation so that
3 we have a good story to tell, so that when people are
4 looking at the program they do have something to judge
5 and evaluate it by.

6 And that we should remind ourselves of what
7 we're trying to achieve and what the ultimate goal is.

8 So, I'd like to say thank you so much to our
9 expert panelists for just a fascinating conversation. I
10 really have been looking forward to this all week and
11 you all certainly delivered.

12 And also to say thank you to Anthony for his
13 excellent framing of this and his thoughtful
14 facilitation, I think this has just been fantastic.

15 So, many thanks to all of you.

16 (Applause)

17 (Off the record.)

18 COMMISSIONER SCOTT: I want to thank you again
19 for joining us.

20 If you'd like to make a public comment, please
21 make sure that you get your blue cards over to Heather
22 or Lynette so that they can get those cards up to me. I
23 have a few here in my hand.

24 But I look forward to additional comments. So,
25 I will start with Chuck White from Waste Management.

1 MR. CHUCK WHITE: Thank you, Commissioner Scott,
2 Chuck White with Waste Management.

3 It's really been an interesting session for me
4 to get all these different perspectives. You have quite
5 a job ahead of you, as if you hadn't already, to balance
6 all these interests.

7 I would like to just briefly discuss, hopefully
8 briefly discuss two issues. One is tying in with the
9 Low Carbon Fuel Standard.

10 But first of all, I'd like to talk about the
11 greenhouse gas benefit cost. During one of the
12 presentations, I think it might have been Charles' or
13 perhaps Jim's, when you started doing the new rating
14 criteria for using the greenhouse gas cost analysis. I
15 thought it was about -- ranged between 5 and 13 percent
16 of the overall score.

17 And it seems to me later on Jim made the point
18 that the greenhouse gas reductions are really kind of
19 the core purpose of the entire program. So, it seemed
20 to be a little bit inconsistent that perhaps the
21 greenhouse gas cost effectiveness was only 5 to 13
22 percent.

23 And so, I would just ask you to reconsider, amid
24 all of the other cost benefit things you have to
25 evaluate, I guess I would ask you to consider that if,

1 in fact, greenhouse gas reductions are a key component,
2 finding cost-effective greenhouse gas reductions and
3 benefit cost ratios is pretty key.

4 And why do I say this? Well, I guess it's
5 probably a little bit self-serving for Waste Management
6 and our industry because we are sitting on a lot of
7 waste that actually can product the lowest carbon fuels
8 in California.

9 If you look at all of the low-carbon fuels that
10 CARB has evaluated, the waste-derived fuels are by far
11 and away the lowest carbon intensity fuels.

12 And we've recently discussed the potential to
13 produce low-carbon fuels with the University of
14 California at Davis, and they think that there's enough
15 biomass from urban, ag, and forest resources to produce
16 about 2.1 billion gallons of low-carbon, virtually zero
17 carbon fuel very cost effectively to existing
18 technologies.

19 And waste-derived biofuels have a number of
20 secondary benefits. In the case of agriculture it could
21 be reduced open burning of agricultural wastes.

22 In terms of forests, it can be reduced forest
23 fire dangers.

24 And in terms of urban waste sources, of course
25 reduce landfill disposal and methane reduction and

1 beneficial use of methane.

2 So, again, I just would ask you to keep in the
3 back of your mind that based on the fact that there's a
4 lot of information about the very low-carbon fuel nature
5 of waste-derived fuels, and the fact that it can be very
6 cost effective.

7 I'll go into this a little bit later because the
8 biofuels that we can produce, biomethane from landfill
9 gas, anaerobic digestion we can probably make work if we
10 have a revenue stream at about \$15 per MMBtu or,
11 hopefully, more.

12 But right now diesel at the refinery is about
13 \$25 per MMBtu.

14 So, I mean you can produce, really, a lot of
15 biofuels very cost-effectively, very competitively with
16 the existing fuel infrastructure.

17 The problem we have with biomethane, for
18 example, is the very, extremely low cost of natural gas,
19 which is even lower.

20 So, you've got to figure out a way to bridge the
21 gap between the low cost of natural gas, at \$5 MMBtu and
22 the cost of producing biomethane at \$15.

23 Even though it's still cheaper than diesel, it
24 is much more expensive than natural gas.

25 And that leads to me to the -- really, the LCFS

1 here, in California, that's -- and that really ties into
2 what Dr. Melaina from NREL said.

3 And he pointed out in his chart, with that big,
4 sweeping green curve that markets are really the most
5 important driver that are going to result in the
6 conversion to low-carbon fuels.

7 Not to say the CEC's AB 118 and AB 8 program
8 isn't very important, but it's really going to be the
9 markets. And either the markets for the fuel or the
10 markets for the credits, which are designed to
11 internalize the externalities, in this case the
12 greenhouse gas emissions.

13 So, it's really the issue of developing these
14 markets. And the market mechanisms are absolutely
15 necessary.

16 One of the sad things that Jim and I have talked
17 about a lot is that Waste Management had to turn down a
18 very large grant from the Energy Commission to do a
19 second landfill gas to LNG plant in Southern California.

20 And the problem was that the market wasn't there
21 for the resultant fuel. There was no certainty.

22 The only thing that was certain was we knew what
23 the revenue stream would be from the gas we could
24 produce, but we couldn't meet the \$15 per metric ton
25 cost it would take to produce the fuel in competition

1 with natural gas.

2 The LCFS and the Renewable Fuel Standard Credits
3 at the Federal level were so uncertain, and continue to
4 be uncertain to this day that it's very hard to make an
5 investment in these technologies to get a return on
6 investment.

7 So, I guess my point to you is while the AB 118
8 program, AB 8 program is so important and necessary,
9 there really has to be attention to the actual market of
10 these fuels and the market of their attributes going
11 down the road.

12 COMMISSIONER SCOTT: Thank you. Everyone gets
13 their time to make comments.

14 Do you have something in writing that you can
15 submit to us to make sure that we --

16 MR. CHUCK WHITE: I will submit comments,
17 absolutely. I work with the Natural Gas Vehicle
18 Coalition that we're a member of.

19 And I would urge you to clarify some of your
20 existing regulation, the 3103 that implies that perhaps
21 your grants are conditioned on not generating -- or you
22 can't use your full -- get your full credit amount under
23 LCFS if you get a grant from the Energy Commission which
24 is kind of, in our view, a contradiction between the
25 purpose of the program to transfer to the LCFS. Not

1 penalized for taking advantage of the LCFS.

2 COMMISSIONER SCOTT: Okay great.

3 MR. CHUCK WHITE: Thank you.

4 COMMISSIONER SCOTT: Thank you.

5 And thank you for having me up to visit the
6 site. It was a terrific day. We got a chance to go and
7 see how the methane is being captured from the landfill
8 in Altamont, and then a lot of that was being made into
9 liquefied natural gas, and also compressed natural gas
10 that was then going to fuel the waste haulers that were
11 bringing the waste back. And that was just a really
12 neat thing to see, so thanks for that.

13 MR. CHUCK WHITE: Yeah, and we'd like to do more
14 of those. And your grants are very helpful in getting
15 that to happen. But the problem is we need to have a
16 market for both the fuel and the credits that can be
17 produced from that in order to make it a financially
18 viable venture.

19 COMMISSIONER SCOTT: Yep.

20 MR. CHUCK WHITE: Thanks.

21 COMMISSIONER SCOTT: Thank you, Chuck.

22 Our next person is Joe Gershen. Hi Joe.

23 MR. GERSHEN: Hi. Thanks for letting me speak.
24 I'll try to be brief.

25 So, here on behalf of CVA, and also sit on the

1 advisory committee, and spoke with a couple of other
2 members.

3 As you guys all know, I've been talking about
4 metrics since I've been on the advisory committee, so
5 really happy to have had this workshop today.

6 So, we appreciate that the Commission staff is
7 addressing all of these topics of metrics.

8 While we're enthusiastically supportive of
9 metrics, as I just said, being used to determine funding
10 criteria, we also encourage the ARFVTP program team to
11 also use actual and real metrics to evaluate investment
12 priorities in current and future investment plans.

13 We believe the direction given in AB 109 to,
14 "Provide analytical rational for all proposed
15 expenditures" is clear and unambiguous, and it supports
16 the use of actual metrics and quantifiable benefits in
17 addition to the expected benefits that we've talked
18 about today.

19 Our concern in this workshop brief, and the
20 recent IEPR is that the intent seems to be shifting with
21 transformative benefits, in particular, from analytical
22 rationale, which are objective, to only estimates and
23 expectations which are a little bit more subjective.

24 Ultimately, we are investing hundreds of
25 millions of taxpayer dollars in this program, which I

1 support, and have an obligation to those investors to do
2 right by them.

3 Through the Legislature there's an expectation
4 of giving those taxpayers a return on their investment
5 in the form of real production of petroleum use, carbon
6 emissions and criteria emissions.

7 We want to make sure that we are objectively
8 assessing these metrics and doing so on a regular basis.

9 So, we're going to prepare some more comments
10 and some more detail with some of the other folks on the
11 advisory committee who have also been talking about
12 metrics, and we'll submit those in the docket, and look
13 forward to continuing to work with you guys.

14 Thanks very much.

15 COMMISSIONER SCOTT: Thank you. I look forward
16 to receiving that and continuing to work with you, as
17 well.

18 So, if you have blue cards, be sure to get them
19 to Heather and Lynette.

20 My next person is Tim Carmichael, who I don't
21 see here anymore

22 Go ahead, Joe.

23 MR. GERSHEN: Tim texted me and said he was
24 going to try and make it back, but he couldn't, but he
25 also supported -- he's read, you know, my comments

1 earlier and he supports them as well.

2 COMMISSIONER SCOTT: Great, thank you.

3 So, that's all the blue cards I have from folks
4 in the room.

5 Do we have comments from the WebEx or from the
6 phone?

7 MS. RAITT: We have one WebEx comment that I'll
8 read in just a moment here.

9 COMMISSIONER SCOTT: Okay.

10 MS. RAITT: This is from Eileen Tutt, and she
11 wrote, "I am surprised to hear Mr. White suggest that
12 incentives for clean technologies are taken for granted
13 and we need to start scaling down. Electric vehicles
14 have only been on the market for three years and we are
15 very grateful for the State's support of this
16 technology. The industry appreciates the State's, both
17 Legislature and Administration, support in this very
18 early market phase. The oil industry incentives far
19 exceed anything received by alternative fuels and have
20 been in place much longer, with no end in sight. We
21 cannot lose perspective so early in the introduction of
22 clean transportation technologies."

23 So, that was it.

24 COMMISSIONER SCOTT: Thank you. Any other
25 comments from the WebEx?

1 MS. RAITT: That's the only comment we had from
2 WebEx. So, we have folks on the line. If you are on
3 the phone and wanted to make a comment or ask a
4 question, now is the time, the lines are open. Go ahead
5 and ask your question.

6 I don't think -- it sounds like we don't have
7 anyone on the lines making comments.

8 COMMISSIONER SCOTT: Okay, well thank you for
9 the public comments. And thanks just again to everyone
10 who participated in today's workshop. I thought it was
11 a terrific workshop.

12 I want to say thank you to Jim McKinney, and to
13 Charles Smith, and to -- you mentioned Jennifer
14 Masterson, right, and Andre Freeman for their terrific
15 work helping put all of this together.

16 Thanks to my terrific advisors and to the IEPR
17 team, and all the other staff who's working to make sure
18 that we have terrific workshops and get good
19 information.

20 The comment deadline is up here on the board.
21 And I don't know if Heather has any closing remarks?

22 MS. RAITT: Just encourage folks to submit
23 written comments by June 26th.

24 COMMISSIONER SCOTT: Excellent. Thank you,
25 everybody, we are adjourned.

1 MS. RAITT: Thank you.

2 (Thereupon, the Workshop was adjourned at

3 3:24 p.m.)

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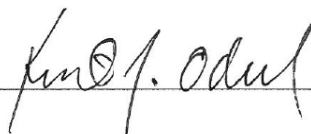
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