Comment 1 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Matthew
Last Name: Jarmuz
Email Address: matt.jarmuz@odyne.com
Affiliation: Odyne Systems LLC

Subject: Technology and Fuels Assessment Overview
Comment:

Figure 17 states that the Odyne plug-in hybrid system has pure electric range of up to 40 miles. The Odyne plug-in hybrid system does not provide full electric range but has up to 10 miles of equivalent all electric range.

Odyne recommends that retrofit technology to existing vehicles should be included in the Technology Overview. Retrofitting the existing vehicles in California will allow the state to reach its emissions goals more quickly.

Odyne recommends that Equivalent All Electric Range should be included with All Electric Range.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-04-14 11:49:01

No Duplicates.

Comment 2 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: David
Last Name: Cox
Email Address: David@rngcoalition.com
Affiliation: Coalition for Renewable Natural Gas

Subject: RNG Coalition: Comments on Technology and Fuels Assessment Overview
Comment:

```
Please find comments attached from the Coalition for Renewable
Natural Gas.

Yours In Service,

David Cox
Director of Operations
Coalition for Renewable Natural Gas
```

Attachment: www.arb.ca.gov/lists/com-attach/2-techfuel-report-ws-VyVSOgdhBwsLbgBv.pdf

Original File Name: RNG Coalition Comments on Heavy Duty Technology and Fuels Assessment Overview and Status Update.pdf

Date and Time Comment Was Submitted: 2015-05-01 13:25:30

No Duplicates.

Comment 3 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Patrik
Last Name: Akerman
Email Address: patrik.akerman@siemens.com
Affiliation: Siemens AG

Subject: Comments to TechFuel draft: WTW analysis
Comment:

Ladies and gentlemen,

Concerned that the forecasted growth in road freight (i.e. heavy duty truck) emissions +64% (CARB Sustainable Freight, p13),

Recognizing the challenge of reducing California's GHG emissions (including power generation and transportation): -40% by 2030 and -80% by 2050 (compared with 1990 baseline),

Sharing the recognition of CARB that it is important to aim for solutions that satisfy all of the air quality goals in order to provide the certainty business need for long term planning. (CARB Sustainable Freight, p24),

Noting the concerns raised by CARB about insufficient supply of renewable bio-fuels. (CARB Technology and Fuels Assessment, p17),

Supporting the use of WTW analysis of how to make the most efficient use of the renewable energy sources available,

Siemens

submits the following considerations on the options for using renewable electricity in road freight. The options being:
1) Battery on-board storage
2) Transforming electrical energy into chemical form (e.g. electrolysis or methanation)
3) Direct supply to moving truck, i.e. Electric Road Systems (e.g. catenary hybrid)

1. Batteries. For long haul road freight, the energy demand is substantial, e.g. with current technology a 40ton truck going 600 miles would need 20tons of battery. This is not practical. Battery technology is progressing, and although a reduction in weight of a factor 5-20 would be a huge boon to energy users and society, it is not being forecast in the coming decades. It therefore seems imprudent to solely rely on improvements in battery technology to overcome the challenge caused by road freight GHG emissions.

2. Power-to-Gas. Converting zero- or low-carbon electricity into chemical energy is associated with significant energy losses. Studies in Europe have estimated well-to-wheel efficiency for hydrogen fuels cells at around 27%, while using methanation to make renewable natural gas for combustion engines has only around 19% efficiency. Given that the transport sector is a significant energy user such inefficiencies will require quite some power generation capacity. Furthermore, such inefficiencies will impact the cost of fuel and therefore the economics of operations.

3. Electric Road Systems. When supplying the electricity directly to the trucks the WTW efficiency is around 76%, which could translate into operating costs that are 1/3 or even ¼ that of

Power-to-Gas trucks. If the electricity is not fully renewable, but low-carbon, then that same differential also applies to the GHG emissions.

Electric Road Systems (ERS) is similar to rail electrification in that it is aimed at those routes where the high volume of traffic justifies the investment. Prime candidates for ERS are those roads that are intensely used by trucks, such as connections between ports and rail yards. Looking further into the future there are also larger trucking corridors that could benefit from ERS, such as the I-5 or Highway 99, identified by US DOT as the two largest road freight corridors in California with ADT above 10.000 in 2007 and significantly more in the coming decades.

The International Energy Agency (IEA) analyzed how catenary hybrid technology could impact road freight and found that in countries such as France a half of all truck transport (ton-km) occur on just 2.5% of the roads. IEA also found that including catenary hybrids in their scenario reduced both CO2 emissions (due to replacing diesel) and reduced energy demand (due to replacing hydrogen, which was previously the only consideration). California could also benefit from a similar scenario.

Best regards
Patrik Akerman
Siemens AG

Sources:
1. Zoerner, T. (25. 03 2013). Entwicklung der Netzverluste in Deutschland . Accessible online on May 05 2014 at https://www.proteus-solutions.de/~Unternehmen/News-PermaLink:tM.F04!sM.NI41!Article.955326.asp
2. BMUB. (2014). Erneuerbar mobil. Berlin: BMUB.
3. Hessisches Ministerium für Umwelt, Energie, Landwirtschaft und Verbraucherschutz.
(November 2013). H2BZ. Accessible online on May 3 2014 at http://www.h2bzhessen.
de/mm/Wind-Wasserstoff_geschuetzt.pdf
4. IVECO. (18. 01 2010). Stralis-CNG. Accessible online on May 3 2014 at
http://lehrerfortbildungbw.de/bs/berufsbezogen/fahrzeugtechnik/material/2009_02_sympnutzfzg/doc/iveco/STRALIS-CNG_ES_2010-01-18_deutsch.pdf
5. California Air Resources Board - Sustainable Freight, pathways to zero and near-zero emissions. April 2015
6. IEA (International Energy Agency) (2014): Energy Technology Perspectives 2014, OECD/IEA, Paris. ISBN 9789264208001.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-05-07 07:04:31

No Duplicates.

Comment 4 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Kent
Last Name: Leacock
Email Address: kleacock@proterra.com
Affiliation:

Subject: Proterra Comments
Comment:

```
Proterra appreciates the opportunity to provide comments on the
Heavy-Duty Technology and Fuels Assessment Overview. We strongly
support the initiatives of the California Air Resources Board to
meet California’s long-term air quality goals and help facilitate
the transition to zero-emission technologies in the heavy-duty
sector.Please see our comments attached.
```

Attachment: www.arb.ca.gov/lists/com-attach/5-techfuel-report-ws-UjpQMwdnWH1RLgVa.pdf

Original File Name: Heavy Duty Technology and Fuels Assessment Overview_Proterra Comments_5-26.pdf

Date and Time Comment Was Submitted: 2015-05-26 10:08:24

No Duplicates.

Comment 5 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Michael
Last Name: Bachrach
Email Address: 2stepme@bellsouth.net
Affiliation:

Subject: Electric Car Acceptance
Comment:

In my opinion the roll out of the electric car has been problematic. While the drivetrain (in my opinion) is superior to the ICE, the battery has been a complete failure. I live in South Florida and I own and drive a Nissan Leaf. While the range of the car is less than desired, the real problem is the longevity of the battery. After 50,000 miles my range is down 30%. Nissan has made this impossible to verify but it is obvious in the miles I can travel combined with an OBD scanner. Between the range and the longevity issue the resale value of my car has fallen from a purchase price of 38,500 to maybe 10,000 dollars in a little over 3 years. I am not happy about this loss, but the real problem is the demand for a used electric car. The fact that the resale value is low and certain to continue down points to the idea that these cars will ultimately provide relatively few miles per unit car for the investment. The electric car should last much longer than an ICE. The investment is from the owner (me) and government subsidies. Society has paid a lot of money to put these cars on the road and they need to provide service to potential users. If the manufacturers would produce upgraded replacement batteries for these potentially useful vehicles the vehicles could provide continued service to society. Counting on the manufacturer to upgrade and replace the batteries is questionable for at least two reasons. 1) they have no competition because they control the computer code used within the car so any new batteries might be inferior and overpriced. 2) Their desire may be to simply sell a new car and send the slightly used car to the landfill. Competition is the answer and you may have the solution. The ZEV credit has been used to move electric cars into the market. I think you could use ZEV credits to keep these cars on the road. Offer one or more ZEV credits to any company that upgrades an existing "100 mile" electric car to a "200 mile" electric car. Offer one or more ZEV credits to any company, for each car that they built, that provides the information for another company to replace the battery in an electric car that they produced. As an example this would allow Tesla to build a 200 mile battery for the Leaf. If this has reach the wrong department please forward it the proper department. Thanks you ...

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-07-07 10:15:53

No Duplicates.

Comment 6 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Mark
Last Name: Siddall
Email Address: mark.siddall@daimler.com
Affiliation:

Subject: Draft Technology Assessment: Engine/Drivetrain Optimization and Vehicle Efficiency
Comment:

Please see comment attached.

Attachment: www.arb.ca.gov/lists/com-attach/9-techfuel-report-ws-VTEFd1wzVmQCW1Q3.pdf

Original File Name: DTNA comments on ARB tech assessment for Phase 2 - Final 09Jul15.pdf

Date and Time Comment Was Submitted: 2015-07-09 10:00:43

No Duplicates.

Comment 7 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Graham
Last Name: Noyes
Email Address: gnoyes@kfwlaw.com
Affiliation: Keyes, Fox & Wiedman LLP

Subject: Comments of Sierra Energy RE: Technology and Fuels Assessment Overview
Comment:

Attached please find the comments of Sierra Energy regarding the Technology and Fuels Assessment Overview. Please contact me if you have any questions regarding these comments or if a scheduled discussion would be helpful.

Best Regards,

Graham

Graham Noyes
Keyes, Fox & Wiedman LLP
980 Ninth Street, 16th Floor
Sacramento, CA 95814
(916)668-4636 Direct
(206)856-8784 Cell

Licensed to Practice in California, Washington and the District of Columbia

gnoyes@kfwlaw.com
kfwlaw.com

Attachment: www.arb.ca.gov/lists/com-attach/10-techfuel-report-ws-BnUAbwdjVXQHcwdm.pdf

Original File Name: Sierra Energy RE Technology and Fuels 13 July 2015_SE.pdf

Date and Time Comment Was Submitted: 2015-07-13 10:20:21

No Duplicates.

Comment 8 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Chuck
Last Name: Brush
Email Address: ChuckBrush@aol.com
Affiliation:

Subject: Gasoline reformulation
Comment:

Please make an attempt to standardize the Califoria blend with the other states that use reformulated gas. This is to encourage some orderliness to the fuel market.

Thanks,

Chuck Brush

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-07-13 11:06:08

No Duplicates.

Comment 9 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Michael
Last Name: Coates
Email Address: mcoates@mightycomm.com
Affiliation: Volvo Group North America

Subject: Comments on Technology & Fuels Assessment Overview
Comment:

```
Renee,

Here are Volvo's comments on the Overview. We'll also be submitting
comments on the sections relevant to our business as they are
released. I think you'll find this consistent with all of our
discussions with CARB staff.

If there are any questions, we have technical staff that would
welcome the opportunity to discuss further.

Michael Coates
Mightycomm for Volvo Group North America
408.399.9081
mcoates@mightycomm.com
```

Attachment: www.arb.ca.gov/lists/com-attach/12-techfuel-report-ws-AHYCa1wxBSBQOQRb.pdf

Original File Name: Volvo Comments on April 2015 Tech Assessment Overview vfinal.pdf

Date and Time Comment Was Submitted: 2015-07-24 12:15:36

No Duplicates.

Comment 10 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Matthias
Last Name: Woll
Email Address: mwoll@testo.de
Affiliation:

Subject: PM Measurement
Comment:

Is there a certain reason why you measure the PM emission in Particlemass instead of Particlenumber?

As far as I know: the smaller the Particles, the more dangerous they are. And few bigger Particles cover a huge amount of small Particles if you measure in Particlemass.

At the moment portable Particle Counter for diesel exhausts are developed for a new Swiss Regulation. If you take this into account, this could also offer opportunities to California to implement target-oriented regulations and field tests for less pollution and healthier air.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-08-04 02:33:53

No Duplicates.

Comment 11 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Etienne
Last Name: Teyssandier
Email Address: etienne.teyssandier@dearman.co.uk
Affiliation:

Subject: Dearman's comments on "Technology Assessment: transport refrigerators"
Comment:

```
Dear Rodney,

Please find attached Dearman's comments on the technology
assessment.

If there are any questions or points of interest, we have
commercial and technical staff that would welcome the opportunity
to discuss further.

Etienne Teyssandier
Lead Analyst for Dearman
+44(0)20 3829 0035
etienne.teyssandier@dearman.co.uk
```

Attachment: www.arb.ca.gov/lists/com-attach/14-techfuel-report-ws-AjAHMVNjVDJVDFBg.pdf

Original File Name: 2015 08 20 TRs Technology assessment Dearman comments VF.pdf

Date and Time Comment Was Submitted: 2015-08-20 12:41:34

No Duplicates.

Comment 12 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Lee
Last Name: Kindberg
Email Address: lee.kindberg@maersk.com
Affiliation: Maersk Line

Subject: Technology Assessment: Transport Refrigerators
Comment:

```
Thank you for the opportunity to review and provide comments on the
Technology Assessment: Transport Refrigerators, published July 31,
2015. Please see attached letter.
```

Attachment: www.arb.ca.gov/lists/com-attach/16-techfuel-report-ws-UD0GYVczUHEKf1c8.pdf

Original File Name: Maersk Line Comments on TRU Technology Assessment Aug2015.pdf

Date and Time Comment Was Submitted: 2015-08-28 14:30:14

No Duplicates.

Comment 13 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Yolla
Last Name: Hager
Email Address: Yolla@heatrsd.com
Affiliation: HEAT

Subject: Technology Assessment: Commercial Harbor Craft”
Comment:

Hager Environmental & Atmospheric Technologies (H.E.A.T.) greatly appreciates the opportunity to comment on “Technology Assessment: Commercial Harbor Craft, August 2015.” We are supportive and appreciative of California Air Resources Board (CARB) and South Coast Air Quality Management District’s (SCAQMD) efforts to reduce NOx, GHG, and PM in the ports of California. With California being “a global gateway for goods,” it sets a precedence for ports around the world for emissions reduction. Meeting goals of lowering the unhealthy levels of pollutants found around the ports from harbor crafts effecting highly populated areas surrounding epicenters of commerce is a commendable but challenging goal. H.E.A.T. recognizes the challenges that CARB and SCAQMD face, and we are prepared to contribute to the major goal of identifying and quantifying critical pollutants released in the ports in efforts to find solutions to reduce them.

Attachment: www.arb.ca.gov/lists/com-attach/17-techfuel-report-ws-USFTOlUmWX5VIFN+.pdf

Original File Name: Ports-ARB.pdf

Date and Time Comment Was Submitted: 2015-09-01 06:53:24

No Duplicates.

Comment 14 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Kevin
Last Name: Moran
Email Address: kevin_moran@americanchemistry.com
Affiliation: American Chemistry Council

Subject: Comments on the Draft Technology Assessment
Comment:

See attached comment

Attachment: www.arb.ca.gov/lists/com-attach/18-techfuel-report-ws-VDVVMFAyV1sDbFI8.pdf

Original File Name: ACC Industrial Gases Panel Comments on Cryogenic Refrigeration.pdf

Date and Time Comment Was Submitted: 2015-09-03 09:56:47

No Duplicates.

Comment 15 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jim
Last Name: Swathell
Email Address: jswathell@me.com
Affiliation:

Subject: VW Diesel Fix
Comment:

My household has 2 2015 VW diesels. My Touareg is ok because it has a Selective Catalytic Reduction (SCR), a known as urea after-treatment system. My friend with a Golf diesel is on recall. I would ask the ARB to require VW to retrofit their 2 liter diesel with a Selective Catalytic Reduction system and not do the cheaper software reprogram. With the potential fine of 37,500 per offense I would be very disappointed if the ARB and EPA would not negotiate a lesser fine if VW would spend however thousands of dollars the retrofit would cost. Innocent citizens will be hurt by a cheap fix, the big fines will not help us.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-09-21 19:28:14

No Duplicates.

Comment 16 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: John
Last Name: Yandell
Email Address: john@yandelltruckaway.com
Affiliation:

Subject: NOx emissions
Comment:

```
I was reading an article that to attain a goal of .02 g/bhp-hr
would cost only $500.00 per truck. None of the costs to date since
inception had been close to estimates. We are seeing the cost and
repair of these items to be exhorbitant to date.
I think this is a false assumption.
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-10-01 09:19:48

No Duplicates.

Comment 17 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: jim
Last Name: keeler
Email Address: jim404b@gmail.com
Affiliation:

Subject: Cleaner AIR
Comment:

```
This electric propulsion is a definate improvement HOWEVER there is
an AIR Powered automobile that has been manufactured in the country
of INDIA for probably the past 10 years..... May we ask where is
this in the once great country of our USA ? ? Compress and drive,
pretty good idea with the exception that uncle sam would be losing
his 50 percent portion in fuel tax ? ? ?
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-10-14 16:21:37

No Duplicates.

Comment 18 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Ryan
Last Name: Kenny
Email Address: ryan.kenny@cleanenergyfuels.com
Affiliation:

Subject: Comment Letter Draft Technology Assessment 9-2015
Comment:

```
Please find attached a comment letter on the Draft Technology
Assessment: Lower Emission Natural Gas and Other Alternative Fuel
Heavy-Duty Engines – September 29, 2015. Thank you for considering
our views.
```

Attachment: www.arb.ca.gov/lists/com-attach/23-techfuel-report-ws-UTJVP1wzV2EHXgdk.pdf

Original File Name: CLNE Comments Draft Technology Assessment HD Engines.pdf

Date and Time Comment Was Submitted: 2015-11-02 14:49:53

No Duplicates.

Comment 19 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Dawn
Last Name: Fenton
Email Address: dawn.fenton@volvo.com
Affiliation:

Subject: Volvo Comments on Tech Assessment: Lower NOx Heavy-Duty Diesel Engines
Comment:

Attached please find the comments from Volvo Group on the Tech Assessment: Lower NOx Heavy-Duty Diesel Engines.

If there are any questions on these submissions, please contact Dawn Fenton at the email submitted or Volvo's California representatives: Mightycomm, 15466 Los Gatos Blvd., No. 109-380, Los Gatos, CA 95030, 408.399.9081.

Attachment: www.arb.ca.gov/lists/com-attach/24-techfuel-report-ws-UzUAb1M8BDYAalUj.docx

Original File Name: FINALVolvo Comments on Tech Assessment Lower NOx 11.10.15.docx

Date and Time Comment Was Submitted: 2015-11-10 23:08:18

No Duplicates.

Comment 20 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Vincent
Last Name: Wiraatmadja
Email Address: vincent@weidemangroup.com
Affiliation: BYD Motors, Inc.

Subject: Comments on the Draft Technology Assessment: Medium- and Heavy-Duty Battery Electric Truck
Comment:

```
Please find attached BYD's comments on the Draft Technology
Assessment.
Thank you.
```

Attachment: www.arb.ca.gov/lists/com-attach/25-techfuel-report-ws-UTNWKVI3A31XDgNu.pdf

Original File Name: BYD- MHD Technology Assessment Comment Letter Final..pdf

Date and Time Comment Was Submitted: 2015-11-13 14:33:54

No Duplicates.

Comment 21 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: tim
Last Name: fortier
Email Address: tfortier@ctibulk.com
Affiliation: cti

Subject: observation
Comment:

```
It seems all you have done is promote the use of electric and
alternative fuel as the remedy to replace the use of diesel. The
issue to be leery is the tech to retrofit is dubious. Todays new
diesel engines are rampant with breakdowns. I fear you are
clamoring for things that are not invented and or not reliable or
durable. Tim Fortier
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-11-18 11:11:29

No Duplicates.

Comment 22 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Deborah
Last Name: Gordon
Email Address: debbie.gordon@allisontransmission.com
Affiliation: Allison Transmission Inc.

Subject: Comments on MD/HD Battery Electric Truck & Bus Report
Comment:

Please see attached document.

Attachment: www.arb.ca.gov/lists/com-attach/29-techfuel-report-ws-AGFcNgFsADoFcARr.pdf

Original File Name: Allison Comments on BEV Technology Assessment Nov 2015.pdf

Date and Time Comment Was Submitted: 2015-11-19 07:57:05

No Duplicates.

Comment 23 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jerilyn Lopez
Last Name: Mendoza
Email Address: jmendoza5@semprautilities.com
Affiliation: SoCalGas

Subject: Comments on Natural Gas Vehicle Technology Assessment
Comment:

Attached please find our comments to the Draft Technology Assessment: Lower Emission Natural Gas and Other Alternative Fuel Heavy-Duty Engines, released for comment on September 29, 2015. Also forthcoming are three additional zip documents with documents referenced in our appendix.

Please contact me with questions and thank you for your time and consideration.

Jerilyn López Mendoza
SoCalGas
Environmental Affairs Program Manager - CARB
Energy and Environmental Affairs
555 W 5th St., GCT 17E5
Los Angeles, CA 90013
Jmendoza5@semprautilities.com
(desk) 213-244-5235
(cell) 213-700-0095
(fax) 213-244-8257

Attachment: www.arb.ca.gov/lists/com-attach/30-techfuel-report-ws-UCNcNQdlBDYGbAVi.pdf

Original File Name: SoCalGas NG Tech Assess FINAL Comments 11-25-15.pdf

Date and Time Comment Was Submitted: 2015-11-25 15:27:32

No Duplicates.

Comment 24 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jerilyn Lopez
Last Name: Mendoza
Email Address: jmendoza5@semprautilities.com
Affiliation: SoCalGas

Subject: Attachment 1 of 3 to SoCalGas NG Tech Assessment Comments
Comment:

```
This is attachment one of three to our Draft Technology Assessment:
Lower Emission Natural Gas and Other Alternative Fuel Heavy-Duty
Engines.  Please contact me with questions and thank you for your
time and consideration.


Jerilyn López Mendoza
SoCalGas
Environmental Affairs Program Manager - CARB Energy and
Environmental Affairs
555 W 5th St., GCT 17E5
Los Angeles, CA 90013
Jmendoza5@semprautilities.com
(desk) 213-244-5235
(cell) 213-700-0095
(fax) 213-244-8257
```

Attachment: www.arb.ca.gov/lists/com-attach/31-techfuel-report-ws-VjcHdVwpVmQCZ1Q8.zip

Original File Name: Attachment Doc 1 SCG comment letter 11-25-15 UWV_FinalReport_April_Final_July.zip

Date and Time Comment Was Submitted: 2015-11-25 15:32:29

No Duplicates.

Comment 25 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jerilyn Lopez
Last Name: Mendoza
Email Address: jmendoza5@semprautilities.com
Affiliation: SoCalGas

Subject: Attachment 3 of 3 to SoCalGas NG Tech Assessment Comments
Comment:

```
This is attachment three of three to our Draft Technology
Assessment: Lower Emission Natural Gas and Other Alternative Fuel
Heavy-Duty Engines.  Please contact me with questions and thank you
for your time and consideration.


Jerilyn López Mendoza
SoCalGas
Environmental Affairs Program Manager - CARB
Energy and Environmental Affairs
555 W 5th St., GCT 17E5
Los Angeles, CA 90013
Jmendoza5@semprautilities.com
(desk) 213-244-5235
(cell) 213-700-0095
(fax) 213-244-8257
```

Attachment: www.arb.ca.gov/lists/com-attach/33-techfuel-report-ws-WjtdL1QhAjADZghg.zip

Original File Name: Attachment Doc 9 SCG comment letter 11-25-15 CalHEAT NGV Roadmap-Final Report_July 2014.zip

Date and Time Comment Was Submitted: 2015-11-25 15:38:02

No Duplicates.

Comment 26 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jerilyn Lopez
Last Name: Mendoza
Email Address: jmendoza5@semprautilities.com
Affiliation: SoCalGas

Subject: SoCalGas Tech Comments - In-Use Emissions Testing and Demonstration of Retrofit Technology
Comment:

Attached please find University of California, Riverside, and Bourns College of Engineering-Center for Environmental Research and Technology (CE-CERT) Report July 29, 2014: In-Use Emissions Testing and Demonstration of Retrofit Technology for Control of On-Road Heavy-Duty Engines, referenced as item #2 in our November 25, 2015, written comments on ARB's Draft Technology Assessment: Lower Emission Natural Gas and Other Alternative Fuel Heavy-Duty Engines issued September 29, 2015. Please contact me with any comments or questions. Thank you.

Jerilyn López Mendoza
SoCalGas
Environmental Affairs Program Manager - CARB
Energy and Environmental Affairs
555 W 5th St., GCT 17E5
Los Angeles, CA 90013
Jmendoza5@semprautilities.com
(desk) 213-244-5235
(cell) 213-700-0095
(fax) 213-244-8257

Attachment: www.arb.ca.gov/lists/com-attach/35-techfuel-report-ws-BmdcLlciAjAHYlM7.pdf

Original File Name: Attachment Doc 2 SCG comment letter 11-18-15 UCR_FinalReport_July2014.pdf

Date and Time Comment Was Submitted: 2015-12-01 10:45:09

No Duplicates.

Comment 27 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jerilyn Lopez
Last Name: Mendoza
Email Address: jmendoza5@semprautilities.com
Affiliation: SoCalGas

Subject: Final Attachment To SoCalGas Tech Assessment Comments 11-25-15
Comment:

Attached please find the SoCalGas final attachment our comments on the Draft Technology Assessment: Lower Emission Natural Gas and Other Alternative Fuel Heavy-Duty Engines. This contains the documents referenced as Documents 3 through 8 on page 12 of our Comments. We had technical difficulties transmitting this information electronically when we submitted other attachments to our Comments. Please contact me with any questions or concerns and thank you for your patience and understanding.

Jerilyn López Mendoza
SoCalGas
Environmental Affairs Program Manager - CARB
Energy and Environmental Affairs
555 W 5th St., GCT 17E5
Los Angeles, CA 90013
Jmendoza5@semprautilities.com
(desk) 213-244-5235
(cell) 213-700-0095
(fax) 213-244-8257

Attachment: www.arb.ca.gov/lists/com-attach/36-techfuel-report-ws-VCdSO1IwBTcAalUy.pdf

Original File Name: SoCalGas Tech Assessment Attachments Docs 3 thru 8.pdf

Date and Time Comment Was Submitted: 2015-12-04 15:02:40

No Duplicates.

Comment 28 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: George
Last Name: Boswell
Email Address: stic@frontier.com
Affiliation: stic fuel systems

Subject: Improvement in combustion efficeny; increased powe,r lower emissions
Comment:

George A. Boswell from STIC Fuel Research here. Have verifiable results [November 2015] from major manufacture of chainsaws that my new patent pending concepts [2012/2015 and continuing into 2016/2017] will have a substantial impact in improving the combustion efficiency by a substantial amount and providing substantial decrease in emissions for the ICE [Internal Combustion Engine] for the four and two stroke engines ranging from the hand held to automotive/truck. Recent testing [two-stroke hand-held] reveals 30% to 40% increase in power through the operating range and areas of zero carbon monoxide without having modified the engine in any manner with no timing changes and no structural changes; with a substantial reduction in engine vibration as well as reducing the sound emissions. See the attached proposed SAE paper being presented. Respectfully George A. Boswell [STIC Combustion Efficiency Research]

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-12-12 14:43:38

No Duplicates.

Comment 29 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Eileen
Last Name: Wenger Tutt
Email Address: eileen@caletc.com
Affiliation:

Subject: CalETC Comments Re Support for the Draft Technology Assessment: Mobile Cargo Handling Equi
Comment:

```
Attached please find CalETC Comments Re Support for the Draft
Technology Assessment: Mobile Cargo Handling Equipment.
```

Attachment: www.arb.ca.gov/lists/com-attach/38-techfuel-report-ws-BmUFYgFsBTMBc1Ix.pdf

Original File Name: CalETC Comments Re ARB Mobile Cargo Handling Technology Assessment final (12-17-2015).pdf

Date and Time Comment Was Submitted: 2015-12-18 08:59:42

No Duplicates.

Comment 30 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jonathan
Last Name: Nelson
Email Address: jonathan@weidemangroup.com
Affiliation: BYD Motors

Subject: Draft Mobile Cargo Handling Equipment Technology Assessment -- Comments Letter
Comment:

```
On behalf of BYD Motors, please find attached a comments letter on
the Draft Mobile Cargo Handling Equipment Technology Assessment.
Please do not hesitate to let me know if there are any questions,
or should you like to meet to discuss this further.

Jonathan Nelson
```

Attachment: www.arb.ca.gov/lists/com-attach/39-techfuel-report-ws-AmBVKlA1UFwKIVV4.pdf

Original File Name: BYD -- Mobile Cargo Handling Equipment Technology Assessment Comments Letter.pdf

Date and Time Comment Was Submitted: 2015-12-18 09:03:50

No Duplicates.

Comment 31 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Brad
Last Name: Balzer
Email Address: bradbalzer@gmail.com
Affiliation:

Subject: Make VW Accelerate EVs
Comment:

```
Don't make them fix their diesels, make them move more quickly
towards zero emissions vehicles.  I'm with Elon Musk here, it just
makes sense
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2015-12-18 20:26:20

No Duplicates.

Comment 32 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: TL
Last Name: Garrett
Email Address: tgarrett@pmsaship.com
Affiliation: Pacific Merchant Shipping Association

Subject: Re: Draft Technology Assessment: Mobile Cargo Handling Equipment
Comment:

```
Attached are the comments of the Pacific Merchant Shipping
Association.  We will also send separately, a Technical Report done
by Moffat & Nichol on issues specific to container terminal
operations at California public ports.
```

Attachment: www.arb.ca.gov/lists/com-attach/41-techfuel-report-ws-UiIFbgNxU2FVDAl7.pdf

Original File Name: PMSA re Technology Assessment for Cargo Handling Equipment.pdf

Date and Time Comment Was Submitted: 2015-12-21 15:10:22

No Duplicates.

Comment 33 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: TL
Last Name: Garrett
Email Address: tgarrett@pmsaship.com
Affiliation: Pacific Merchant Shipping Association

Subject: Re: Draft Technology Assessment: Mobile Cargo Handling Equipment
Comment:

Attachment to PMSA Comment Letter

Attachment: www.arb.ca.gov/lists/com-attach/42-techfuel-report-ws-UCACaQR2BzUAWVMg.pdf

Original File Name: PMSA Sustainable Freight Strategy Impact Study Tech Memo 8918 Final.pdf

Date and Time Comment Was Submitted: 2015-12-21 15:19:18

No Duplicates.

Comment 34 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Joyce
Last Name: Dillard
Email Address: dillardjoyce@yahoo.com
Affiliation:

Subject: Comments ARB Technology and Fuels Assessment Overview due 12.30.2015
Comment:

Attached.

Attachment: www.arb.ca.gov/lists/com-attach/43-techfuel-report-ws-AGNUPQdrWGZRMgBu.pdf

Original File Name: Comments ARB Technology and Fuels Assessment Overview due 12.30.2015.pdf

Date and Time Comment Was Submitted: 2015-12-30 11:34:22

No Duplicates.

Comment 35 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Mike
Last Name: Britt
Email Address: mbritt@ups.com
Affiliation:

Subject: UPS Tech Fuels Assessment Overview or Sector Reports
Comment:

```
UPS Tech Fuels Assessment Overview or Sector Reports
```

Attachment: www.arb.ca.gov/lists/com-attach/44-techfuel-report-ws-ViMGcFYkUC0BfVA5.zip

Original File Name: UPS.zip

Date and Time Comment Was Submitted: 2016-01-08 13:00:58

No Duplicates.

Comment 36 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Mike
Last Name: Tunnell
Email Address: mtunnell@trucking.org
Affiliation: CTA/ATA

Subject: CTA/ATA Comments on Technology Assessments
Comment:

See Attachments

Attachment: www.arb.ca.gov/lists/com-attach/45-techfuel-report-ws-VDdVMlIhVmcHXgVx.zip

Original File Name: CARB Tech Assessments.zip

Date and Time Comment Was Submitted: 2016-01-13 14:27:53

No Duplicates.

Comment 37 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Nico
Last Name: Bouwkamp
Email Address: nbouwkamp@cafcp.org
Affiliation:

Subject: Comments on the Draft Technology Assessment: Medium- and Heavy-Duty FCEVs
Comment:

Please, see attached document.

Attachment: www.arb.ca.gov/lists/com-attach/48-techfuel-report-ws-UjECZQZhBzcKfAN3.pdf

Original File Name: CaFCPTechProgramsLetter_Comments_Nov2015DraftMD_HD H2 Vehicle Tech Assessment.pdf

Date and Time Comment Was Submitted: 2016-02-05 15:15:24

No Duplicates.

Comment 38 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: scott
Last Name: marshall
Email Address: gopoing@gmail.com
Affiliation:

Subject: Your ridiculous efforts
Comment:

We all breath the same air ,...it doesn't stay in one place ,...I don't know who you think you are helping by putting all of these regulations on us californians ,...its absolute discrimination to restrict the emissions on people of a chosen area while others a short distance away have no restrictions at all ,...this applies to vehicles , tools,...etc. ...I have no idea how you think this is fair or if you care ....or how you think you are doing anyone any good ,....the only thing you do is make life more difficult for a lot of people and cost them more money while serving no actual purpose ,....just another useless government program wasting tax dollars .....are all of the people that work for the air resources board that oblivious that they really believe they are making any difference by restricting how a small percent of people are allowed to live while so many are allowed to do as they please and do you really think this is at all fair or equal ????

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-02-26 02:44:05

No Duplicates.

Comment 39 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: barry
Last Name: cohen
Email Address: info@nationalalgaeassociation.com
Affiliation:

Subject: Comment on Technology and Fuels Assessment
Comment:

```
Burning algae biofuel is carbon-neutral.

We suggest algae farming and indoor algae biomanufacturing for
biofuels and co-products.

Making algae (biocrude) oil for fuels (jet, renewable diesel) on
non-arable land, recycle 75-80% of water used and sequester CO2 at
the same time. A potential win-win-win.

Building algae biorefineries would benefit California in becoming
self-sustainable using carbon neutral fuels.

Note:  This comment was originally submitted on 2014-12-12 14:36:37
for Technology and Fuels Assessment Board Meeting (Non-Reg).
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-02-29 09:07:24

No Duplicates.

Comment 40 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jesse
Last Name: Marquez
Email Address: ombcomm@arb.ca.gov
Affiliation: Coalition for a Safe Environment

Subject: Advanced Maritime Emissions Control System
Comment:

Please see attached comment.

Original File Name: Jesse Marquez - 14-10-5 Written Submission 12-18-2014.pdf

Note: This is non-web submitted comment and was originally submitted on 2014-12-22 12:04:02 for Technology and Fuels Assessment Board Meeting (Non-Reg).

Attachment: www.arb.ca.gov/lists/com-attach/54-techfuel-report-ws-BzRRelYjVWMFYAZu.pdf

Original File Name: 3-techfuels2014-UzkGZVYkAiIHZARb.pdf

Date and Time Comment Was Submitted: 2016-02-29 09:50:34

No Duplicates.

Comment 41 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Don
Last Name: Anair
Email Address: ombcomm@arb.ca.gov
Affiliation: Union of Concerned Scientist, et al

Subject: Petition to Support a Clean Freight System and Healthy Air for all Californians
Comment:

```
Please see attached comment.

Original File Name: Don Anair - 14-10-5 Written Submission
12-18-2014.pdf

Note:  This is a non-web submitted comment and was originally
submitted on 2014-12-22 12:04:02 for Technology and Fuels
Assessment Board Meeting (Non-Reg).
```

Attachment: www.arb.ca.gov/lists/com-attach/55-techfuel-report-ws-VmJXfFEkBDIAZQJq.pdf

Original File Name: 4-techfuels2014-VzMGb1E+Ag4FYlI8.pdf

Date and Time Comment Was Submitted: 2016-02-29 10:02:27

No Duplicates.

Comment 42 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Dawn
Last Name: Fenton
Email Address: dawn.fenton@volvo.com
Affiliation: Volvo Group North America

Subject: Draft Technology Assessment: Medium- and Heavy-Duty Battery Electric Trucks and Buses
Comment:

```
We are pleased to submit the attached comments and photo in
response to the draft technology assessment named above.

Thank you,
Dawn Fenton
```

Attachment: www.arb.ca.gov/lists/com-attach/58-techfuel-report-ws-B3EHblU4BCECawhX.zip

Original File Name: Volvo BEV Comments.zip

Date and Time Comment Was Submitted: 2016-04-05 09:08:47

No Duplicates.

Comment 43 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Dave
Last Name: Cook
Email Address: dave.cook@railpropulsion.com
Affiliation: Rail Propulsion Sytems

Subject: Comments on Draft Heavy-Duty Technology and Fuels Assessment Overview
Comment:

Figure 14 on page 13 of the draft report discusses locomotive battery tenders. Locomotives are good candidates for hybridization as they have built in electric powertrains and the low rolling friction of steel wheels minimizes the impact of the extra weight of the large battery system. But it will be challenging to find a freight application that performs enough start and stop motions to get a benefit from recovering the braking energy because efficiently operated freight trains rarely stop, this is why they can achieve 450+ revenue ton miles per diesel gallon.

On the other-hand, regional passenger and commuter locomotives stop and accelerate frequently, in contrast to freight rail, passenger trains typically consume 3 gallons per mile.

Attached is a while paper discussing the hybridization of regional passenger rail service with a simple system that would pay for itself in fuel savings. Additionally it offers the rail agencies additional power when accelerating so that they can operate longer trains on less fuel in the same schedule or they could operate these trains faster getting more trains in the same schedule.

This system also allows electrifying a rail corridor where it makes sense without restricting newly electrified trains to a limited electrified corridor. Picture Caltrain electrification that ends at San Jose. A passenger will now need to disembark and get on a diesel hauled train in order to continue from San Jose to Gilroy.

This hybridization also allows the implementation of wireless power transfer to implement partial charging of the train batteries at each stop; this further increases zero emissions miles and reduces diesel fuel consumption.

The hybridization can be done one train at a time, and wireless power transfer can be added where its practical one station at a time with minimal interruption of rail service.

Attachment: www.arb.ca.gov/lists/com-attach/60-techfuel-report-ws-B2hWPgBeUmNWPwFg.pdf

Original File Name: On Board Electrification and Near Zero Emissions for Regional Rail.pdf

Date and Time Comment Was Submitted: 2016-04-19 15:36:15

No Duplicates.

Comment 44 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Dawn
Last Name: Fenton
Email Address: Dawn.fenton@volvo.com
Affiliation: Volvo Group North America

Subject: Comments on Heavy-Duty Hybrid Technology Assessment
Comment:

```
I am pleased to submit the attached comments for Volvo Group North
America.
```

Attachment: www.arb.ca.gov/lists/com-attach/62-techfuel-report-ws-WjxVOlc4BTcBa1MM.doc

Original File Name: FINAL Volvo Comments on HD Hybrid Tech Assessment.5.6.16.doc

Date and Time Comment Was Submitted: 2016-05-06 12:43:11

No Duplicates.

Comment 45 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Katherine
Last Name: Wurtz
Email Address: KWURTZ@KEWCONSULTANTS.COM
Affiliation: KEW Grant Services LLC

Subject: Freight Locomotive Technology Assessment
Comment:

The technology assessment defines engine efficiency as the relationship between the total energy contained in the fuel and the amount of energy available to perform useful work. One way to accurately measure this would be to establish a measurement of a locomotive engine's fuel efficiency using a measure for brake specific fuel consumption. KEW Grant Services LLC out of Knoxville, TN has come up with a draft formula to measure brake specific fuel consumption using the following algorithm and welcomes discussion and feedback from the ARB.

Gdc=(Σ(gij)(Fij))/(Σ(BHPij)(Fij))

Where Gdc = duty cycle weighted, brake specific fuel consumption in gal/bhp-hr
Where gij = gallons per hour i per test mode j
Where Fij = the applicable weighting factor i for mode j
Where BHPij = brake horsepower or pulling power i for mode j using the formula BHPij = (Torqueij)(RPMij)/5252
Where Torqueij = the measured torque i for mode j And
Where RPMij = the measured RPM i for mode j

Additionally, the technology assessment provides a solution to achieving lower emissions by using on-board battery tenders in addition to a compact SCR/DOC system. KEW Grant Services LLC would like to offer an off-board battery tender solution that may provide pulling power at zero emissions. Increasing pulling power through the utilization of an existing piece of switching equipment as the housing for battery tenders can enhance energy efficiency and the amount of tractive effort of a switch locomotive. Using a locomotive and slug combination improves switching operation's tractive effort with no increases in emissions. A slug is a tender car that is hooked up to the locomotive, usually a frame with two trucks and traction motors. Using the slug as housing for the battery tenders increases tractive effort or pulling capacity at zero-emissions levels and can increase the amount of space available for battery power.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-06-01 10:03:15

No Duplicates.

Comment 46 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Tom
Last Name: Mack
Email Address: tmack@VeRail.com
Affiliation: VeRail Technologies, Inc.

Subject: Freight Locomotive Technology Assessment - Additional Technologies Overview
Comment:

VeRail Technologies, Inc. appreciates the opportunity to provide information for the ARB Freight Locomotive Technology Assessment regarding an additional locomotive technology not address in the Technology Assessment. This technology will be demonstrating at the Ports of Los Angeles and Long Beach starting in mid to late-2017. We strongly support ARB's goals to reduce locomotive emissions substantially from current EPA Tier 4 levels to Tier 4+ (at least 70% below Tier 4), near-zero, and zero-emission track-miles levels. Please see our attached information on these upcoming locomotives and technologies.

Attachment: www.arb.ca.gov/lists/com-attach/64-techfuel-report-ws-VCIHZAZ1VGYAbwll.pdf

Original File Name: VeRail Locomotive Information and Analysis for ARB Draft Technical Assessment on Freight Locomotives (06-14-16 v8).pdf

Date and Time Comment Was Submitted: 2016-06-14 11:37:43

No Duplicates.

Comment 47 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Tom
Last Name: Mack
Email Address: tmack@VeRail.com
Affiliation: VeRail Technologies, Inc.

Subject: Comments on Freight Locomotive Technology Assessment
Comment:

```
I am pleased to submit the attached comments for VeRail
Technologies, Inc.
```

Attachment: www.arb.ca.gov/lists/com-attach/65-techfuel-report-ws-AGddPgFuBDIFcQVk.pdf

Original File Name: General Comments and Observations on Draft Freight Locomotive Technology Assessment (06-14-16 v1).pdf

Date and Time Comment Was Submitted: 2016-06-14 12:05:37

No Duplicates.

Comment 48 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Evelyn
Last Name: Nackman
Email Address: enackman@aar.org
Affiliation:

Subject: Association of American Railroads Comments
Comment:

Evelyn R. Nackman
Associate General Counsel
ASSOCIATION OF AMERICAN RAILROADS
425 3rd Street, SW, Suite 1000
Washington, D.C. 20024
June 15, 2016

Elizabeth Yura, Chief
Emissions Assessment Branch
California Air Resources Board
Transportation and Toxic Division
P.O. Box 2815
Sacramento, CA 95812
(916) 322-8277

SUBMITTED VIA
http://www.arb.ca.gov/msprog/tech/techreport/comments.htm

RE: CARB's Draft Technology Assessment--Freight Locomotives

Dear Ms. Yura:

The Association of American Railroads (AAR) and its member companies appreciate the opportunity to comment on the California Air Resources Board's (CARB) Draft Technology Assessment: Freight Locomotives, released on April 26, 2016 ("Draft Assessment"). AAR has several members that operate in California; however, all AAR members have an interest in discussions that involve technological advances to locomotives.

AAR and its members remain committed to working with regulators to reach meaningful and carefully considered resolutions to environmental concerns in California and nationally. As you are aware, over the last two decades, AAR and its members made significant investments in California and voluntarily agreed to enforceable measures that were effective in significantly reducing diesel particulate matter and NOx emissions from locomotives and other rail operations in the state. With that context in mind, AAR provides the input below on the Draft Assessment.

The Association of American Railroads ("AAR") is a national, non-profit trade association that represents the Nation's major freight railroads. AAR's membership includes freight railroads that operate 83 percent of the line-haul mileage, employ 95 percent of the workers, and account for 97 percent of the freight revenues of all railroads in the United States. AAR's membership also includes passenger railroads that operate intercity passenger trains and provide commuter rail service. AAR is the Nation's leading railroad policy, research, standard setting, and technology organization. AAR and its members are committed to operating the safest, most efficient, cost-effective, and environmentally sound rail transportation system in the world.

First, AAR agrees with CARB that any discussion about changes to the emission limits for the next generation of new and retrofit locomotive emissions standards should be, if at all, convened by the U.S. Environmental Protection Agency (EPA). Changing locomotive technology in one state does not simply impact one state. Railroads operate across state lines. Any changes to the technology will require a uniform approach by regulators. As such, all stakeholders should be given the opportunity to be involved and provide input.

Second, any consideration of future standards must be predicated on a detailed analysis of cost effectiveness as well as energy efficiency. In addition, CARB's discussion of the challenges that EPA and other stakeholders may need to consider in developing new locomotive standards is helpful, but the discussion should also be framed by the safety implications of any proposed solutions as well as the environmental benefits.

In conclusion, emission standards should encourage the most environmentally beneficial form of transportation, rather than unreasonably burdening it. Creating costly, technologically infeasible, or unsafe mandates will not benefit the environment, protect the public, and could potentially harm the U.S. economy. Every effort should be made in future discussions to clearly acknowledge significant technological obstacles and to devise practical, cost effective, and safe environmental solutions.

Sincerely,

Evelyn R. Nackman

Attachment: www.arb.ca.gov/lists/com-attach/66-techfuel-report-ws-BWZVMgZ1UGEGXwhk.pdf

Original File Name: CARB Loco Tech Assessment Comment Letter --AAR (filed).pdf

Date and Time Comment Was Submitted: 2016-06-15 07:25:20

No Duplicates.

Comment 49 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Rolf
Last Name: Neuhaus
Email Address: neuhaus.rolf@siemens.com
Affiliation:

Subject: Comments
Comment:

Dear Elizabeth, Dear Air Resources Board,
Thank you for the opportunity to comment on this draft version of the Technology Assessment: Freight Locomotives (April 2016) [http://www.arb.ca.gov/msprog/tech/techreport/freight_locomotives_tech_report.pdf]. We hope that our comments will be valuable for the development and completion of this report. We identified a number of items that may require document changes, additional research and/ or data validation. Please see our suggestions below.

The Siemens Mobility Division provides answers with its comprehensive portfolio; because modern, interconnected and IT-based mobility is the core competency of its five business units: Mobility Management, Turnkey Projects & Electrification, Mainline Transport, Urban Transport and Customer Services. They have the know-how to make road traffic in the US flow more smoothly and quickly, make trains more environmentally friendly and efficient, make train schedules and freight shipments more reliable. We work with our customers to develop optimal solutions to help overcome their challenges. Siemens manufactures light rail vehicles, Tier 4 passenger locomotives and passenger coaches for various customers throughout the US in Sacramento, CA.

1) Page ES-10: 11. Last bullet point: Fully electric locomotives are powered by an electric overhead line, not "charged" as mentioned in the report.
2) Page ES-10: Bottom of the page, last sentence as well as V-11: Please specify what CARB is referring to with providing a "supply network" for the urea required by SCR systems. Based on our experience in the Tier 4 passenger locomotive market, suppliers exist and are ready to supply urea. Supply likely will leverage the current diesel supply chain to railroads.
3) Page I-6: Last sentence: Figure I-6 shows one example of a Tier 4 passenger locomotive, not "the new generation of Tier 4 passenger locomotives" as stated in the document.
We suggest to update the sentence to include information on the Siemens Charger locomotives which are currently being built in Sacramento, CA.
https://w3.usa.siemens.com/mobility/us/en/interurban-mobility/rail-solutions/high-speed-and-intercity-trains/Documents/Multi-State_Charger%20DE%20Locomotive_DataSheet_LR.pdf

http://www.railwaygazette.com/news/traction-rolling-stock/single-view/view/siemens-shows-first-complete-charger-locomotive.html

4) Page VIII-3: Last sentence of first paragraph: "Therefore, all-electric freight locomotives have significantly less pulling power (i.e., up to two-thirds less – though they are typically higher horsepower for speed) than U.S. diesel-electric freight interstate line haul locomotives." --> This statement is not correct and should be removed.
5) Page VIII-5: The 1999 paper from Bharat Bhargava appears outdated and does not include any of the more recent achievements, e.g. in China. This section should be updated or removed. E.g. the

Siemens HXD1 9,600kW electric freight locomotive in Datong, China operates at 25 kV/ 50 Hz AC.
6) Page VIII-8: Entire section D. Capital Costs: Locomotives and Infrastructure should be updated or removed. As stated in the document, CARB has limited access to relevant capital cost information. To our mind, publishing a capital cost estimate based entirely on staff opinion and without a meaningful calculation does not appear useful. The available data seems unreasonably high which cannot be validated without a transparent data baseline. It is also not clear from the document, why an increase to a 75kV or a 100kV system may be required. If more information should be available, we recommend to include it.
("Staff has no capital cost information for freight rail electrification in the U.S. We have looked at prior studies that attempted to estimate costs for freight rail electrification in the South Coast Air Basin. Staff has also looked at passenger electrification costs in the U.S. to gain some insights on the order of magnitude of potential costs for freight rail electrification. Finally, staff does not have access to detailed operational and maintenance costs for U.S. diesel-electric or other countries all-electric freight locomotives. Similarly, we do not have access to that information for all-electric rail infrastructure.")

Thank you very much for your consideration. Please feel free to contact us with any questions regarding these comments.

With best regards,
Rolf Neuhaus
Siemens Industry, Inc.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-06-15 10:08:05

No Duplicates.

Comment 50 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Bruce
Last Name: Wolff
Email Address: Bruce.Wolff@mtu-online.com
Affiliation: MTU America Inc.

Subject: Comments: Draft Technology Assessment - Freight Locomotives
Comment:

1. Examining different technologies as in this Draft Assessment is an important step in setting new regulations or funding criteria. However, those regulations and criteria should always regulate only the desired end result (emission levels), rather than specifying a required technology to achieve those results. In this way, creative enterprises may develop unforeseen solutions that meet the desired end results, while avoiding or reducing harmful side-effects such as costs or operational impacts.

2. Table II-2's comparison (page II-2, PDF page 40) of existing standards for line haul locomotives with those of 750 hp off-road engines is not the most accurate comparison. A more relevant comparison would be between locomotives and off-road engines above 750 hp, including engines by builders such as MTU, Cummins and Caterpillar that are used in both locomotives and in off-road (e.g. surface mining) equipment. The relevant emission standards for these off-road engines are:

- NOx: 3.5 g/kW-hr, or 2.6 g/bhp-hr
- PM: 0.04 g/kW-hr, or 0.03 g/bhp-hr
- HC: 0.19 g/kW-hr, or 0.14 g/bhp-hr

3. The metrics on page III-1 (PDF page 45), to evaluate and guide development of advanced technologies, also need to include reliability and maintainability under all anticipated operating conditions. Even the cleanest locomotive does little to improve air quality, if it is so unreliable or difficult to maintain and repair that a railroad can't use it.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-06-17 06:48:48

No Duplicates.

Comment 51 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Andreas
Last Name: Hoffrichter
Email Address: Andreash@msu.edu
Affiliation:

Subject: Hydrogen and Fuel Cells
Comment:

The report considers alternative fuels for railway propulsion but only briefly mentions hydrogen as an option without any detailed investigations.

Currently, there are several hydrogen railway projects ongoing world-wide, primarily in the passenger rail multiple unit and streetcar sector, often with the objective to reduce emissions. But there are also studies ongoing for higher power rail applications (~3300kW, 4400hp), for example, at the University of California at Davis. Hydrogen fuel cell technology could significantly contribute in the reduction of local as well as overall GHG emissions. A document for some further information is the PhD dissertation with the title 'Hydrogen as an energy carrier for railway traction' by Hoffrichter, which is publicly available at http://etheses.bham.ac.uk/4345/ .

The authors of the report are correct that there are, currently, now line-haul freight locomotives that utilize hydrogen but the technology is applicable to that market and such locomotives could be produced in the near-mid term future.

It would probably be useful to consider hydrogen fuel cell technology further as an option to reduce emissions in California.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-07-11 12:16:01

No Duplicates.

Comment 52 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Jennifer
Last Name: Shea
Email Address: jennifer.shea@ge.com
Affiliation: GE

Subject: GE Transportation's Comments on ARB Tech Assessment for Freight Locomotives
Comment:

GE Transportation respectfully submits the attached comments on the ARB Draft Technology Assessment for Freight Locomotives.

Attachment: www.arb.ca.gov/lists/com-attach/71-techfuel-report-ws-BmFUN1EPVzRWZlVk.pdf

Original File Name: GE 06152016.pdf

Date and Time Comment Was Submitted: 2016-07-13 16:15:46

No Duplicates.

Comment 53 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Bill
Last Name: McGuire
Email Address: bill.mcguire@twinriversusd.org
Affiliation:

Subject: Sacramento Regional Zero-Emission School Bus Deployment Project
Comment:

```
Attached please find letter from Twin Rivers Unified School
District indicating that the District is ready and committed to
efficiently and effectively implement a zero-emission school bus
pilot commercial deployment program.  Our school district board has
approved the project and the necessary CEQA documents have been
filed with the State.

Sincerely

Bill McGuire
Deputy Superintendent
Twin Rivers Unified School District
```

Attachment: www.arb.ca.gov/lists/com-attach/72-techfuel-report-ws-WzpVIVAzUC0DZwVq.pdf

Original File Name: ARB.board.letter.zero.emission.school.bus.deployment.pdf

Date and Time Comment Was Submitted: 2016-10-17 10:43:35

No Duplicates.

Comment 54 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Christopher
Last Name: Calder
Email Address: calderconnection@gmail.com
Affiliation: none

Subject: Biofuels are a crime, not a solution. Climate change is a religion, not science.
Comment:

As a scientific theory, man made climate change due to atmospheric carbon dioxide levels has as many loopholes as a rodeo, and is about as accurate as astrology. It has succeeded in the marketplace of ideas only because it makes such a compelling story, a new age replacement for Christianity with Mother Nature on the cross instead of Jesus. Can you imagine Albert Einstein branding anyone who does not believe in his theories "traitors," "heretics," and "deniers"? If we don't do what the high priests of climate change say, we will all burn in the hell of global warming. Green scams are now an enormous business worldwide, thriving on an idea that is contradicted by the provable facts, including the ancient ice core records.

Here is a three step cure for climate change hysteria and the irrational love of worthless, energy inefficient renewable energy scams.

1) Please watch Nobel laureate Ivar Giaever's speech that destroys the myths of climate change in such a sweet, logical, and simple way that it touches your heart. It's on YouTube.

https://www.youtube.com/watch?v=TCy_UOjEir0

2) Then watch *Climate Hysteria* on YouTube for lots of technical details and how the IPCC engages in "bullying" and "sausage making" to fake a consensus on man made climate change.

https://www.youtube.com/watch?v=eO1ukCq9vlw

3) Then Google *The Renewable Energy Disaster* website to see why we need to change course on food and energy policy. We make food with energy, so costly and inefficient energy policy equals costly and inefficient agricultural policy. Malnutrition and related illness are the world's leading cause of avoidable premature death, not war and terrorism. Malnutrition is also the world's leading cause of avoidable mental retardation in children. The renewable energy fad causes food cost inflation, unemployment, budget deficits, social instability, increased ecological damage, and starvation for the poorest people on earth. The site also contains information on research into cost effective, reliable energy schemes that we should pursue to replace fossil fuels. The deadly earth-starving biofuel scam must be effectively banned outright. Making cars and trucks our competitors for food in an overpopulated world with limited agricultural resources is a symptom of heartless insanity, not a positive policy derived from science.

http : / / renewable DOT 50webs DOT com
/

Christopher Calder - 100% nonprofit food security advocate

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-12-15 21:48:31

No Duplicates.

Comment 55 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Richard and Chihoko
Last Name: Solomon
Email Address: risolom@gmail.com
Affiliation:

Subject: Scope 2030 plan
Comment:

We are writing today to express our support for the efforts being made to develop this plan because we want to see California continue to make progress in its goals of reducing carbon emissions to levels that are 50% below 1990 by the year 2030. We make the following general suggestions:
Develop emissions and electric vehicle standards that are consistent with the level of deployment needed to meet the 2030 emissions target

Develop goals for heavy-duty and off-road electrification that are ambitious to ensure carbon reductions and clean air improvements in communities that need it most.

Develop low Carbon Fuel Program targets for 2030 that continue to drive clean fuels innovation and production and

Develop proactive policies to promote climate benefits from self-driving cars and protect against possible increases in emissions.

Promote and support the development of wide spread and accessible infrastructure for alternative fuels like hydrogen and fast charging EV stations.

Thank you for your attention to these suggestions.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2017-01-22 01:30:29

No Duplicates.

Comment 56 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Richard
Last Name: Wright
Email Address: engprof44@gmail.com
Affiliation: solano community college

Subject: Fuel efficiency and global warming
Comment:

I follow the debate about fuel efficiency and clean air standards with interest. I recommend that you folks at the ARB look into a technological creation of an inventor near Portland, Oregon. Look up the citation on the web under the heading gasoline/hydraulic automobile. Imagine the possibilities of making an automobile that (a) can travel at highway speeds, (b) achieves 74 miles per gallon, and (c) uses only 16 horsepower. The original article was publish in The Mother Earth News. This invention might just well be a planet saver. In additional, there are some folks in the midwest who have been able to use this initial design and improve upon it and achieve over 100 miles per gallon. Will this invention ever be embraced by the auto companies? Probably not. Let's consider the long-range consequences. We could very well return to a condition that prevailed upon the earth over 20,000 years ago when what is not Manhattan Island and most of Europe were covered by ice over 1000's of feet thick. Look up the chart under the heading The temperature of the earth. Write to be for specific details, please, sincerely, Richard Wright, English Professor, Solano community college, Fairfield, CA

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2017-03-24 14:29:05

No Duplicates.

Comment 57 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Dean
Last Name: Campbell
Email Address: orca871@yahoo.com
Affiliation:

Subject: POLLUTION
Comment:

These proposals are consistent with contemporary values of the America People .... Value and Honor our Home/Earth by reducing the millions of tons of Pollution we dump into our air and water every day. We must plan for our future, Inc udine clean air and clean water.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2017-04-14 14:53:57

No Duplicates.

Comment 58 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Paul
Last Name: Francis
Email Address: Pdfflyer@Roadrunner.com
Affiliation: Next Tier Emissions and Performance, LLC

Subject: Tier V Locomotive Emissions Proposed
Comment:

Since 2009, our startup, Next Tier Emissions and Performance, LLC (NTEP) has received a US Patent 8,752,512 for this very same Emissions Reduction using on-board Hydrogen Electrolyzers and fueled by Brackish Seawater. This proposed patent uses Green Energy and provides Carbon Tax Credits to the manufacturer. This patent is applicable to all domestic locomotives produced since 2005.
Please take a moment to review a current US Patent 8,752,512 which we have authored. As a Hydrogen Locomotive Special Projects Engineer, we offer the electrolysis of Hydrogen on-board current locomotive platforms. The Green power used for the electrolysis is recycled from the locomotive power grid itself when the locomotive uses Dynamic Braking. Instead of releasing the Excess Electrical Amperage to the atmosphere via Dynamic Braking Grids in the form of Heat, we capture the excess energy via ultra-capacitors and batteries. This method is Green, uses Brackish seawater. In order to save millions of Gallons of fuel annually, we add only Brackish Seawater, ultra-capacitors, and several batteries. Small Quantities of Hydrogen are constantly replenished in on-board tanks nestled within the main diesel fuel tank itself. We also reduce Carbon Emissions by 25% using this methodology. The Carbon Tax $Credits generated partially reduce the $cost of equipment which we add to the current platform. We are deliberately drawing Dynamic Braking Grids to your attention. The Patent cited above obsoletes the use of Dynamic Braking Grids from Locomotives in favor of ultra-capacitors. These same Energy losing Grids were the probable cause cited in the Bakersfield, CA fires more than 10 years ago which caused millions of $dollars in damages. This US Patent deserves to see the light of day in view of the US Technology which it brings forth. This Patent discloses long held knowledge to reduce US Transportation costs. The Locomotive Community is not excited over Tier IV Locomotives and needs to see a Tier V Proposal in order to rejuvenate stagnant production and re-manufacture of older excess inventory.
We, US Citizens, are in political trouble over the present stance on Climate Control. Through the Republican District Director, Brad Moore, Brad.Moore@Mail.House.Gov who reports into the organization through Rep. Mike Kelly, and Glenn T Thompson, I attempt to contact yourself in order to provide the Best Available Technology (BAT) in order to further your Future Policy on Climate Change and Climate Control. What a breath of fresh air.
What I am proposing to you is a short read of a Googled patent. If you would Google “Brackish Seawater used in a Diesel PowerPlant”, US Patent 8,752,512 you will find the efforts of three MBA, Graduate Engineering types originating from Erie, PA who have been unsuccessful thus far, cannot get this idea implemented by GE Transportation, Caterpillar, RailPower, and/ or Siemen’s Manufacturer’s. GE Transportation is seemingly interested in a Compressed Natural Gas Locomotive which can be fueled by CNG although an infrastructure does not exist. We all know NASA, yes, NASA has pioneered in the conversion of Diesel Locomotives to run on Hydrogen in the mid 1970’s. These documented facts have been forwarded to Ms. Elaine Chao, newly appointed and highly qualified

Secretary of Transportation, also forwarded to the White House, and forwarded to Arnold Schwarzenegger, former Governor of California. Awaiting their response.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2017-04-20 06:05:03

No Duplicates.

Comment 59 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Webb
Last Name: Deneys
Email Address: wbdpublic@mac.com
Affiliation: None

Subject: Gas car ban alternative
Comment:

The HOV stickers are effective as an incentive to buy low emission vehicles. To further reduce pollution I would suggest a negative incentive rather than a ban on gas cars. My suggestion is to restrict vehicles with poor gas mileage (say starting at 15mpg, higher over time) to the two right lanes. That will avoid negative impacts on rural or commercial users that may have a legitimate use for an F350-style truck but will reduce pollution from weekend warriors doing 80 on the freeway. A commercial user with a full truck is already driving in the slow lanes.

It also seems like a rational and fair approach unlikely to draw federal action.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2017-10-19 19:55:47

No Duplicates.

Comment 60 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Joseph
Last Name: Henson
Email Address: filterhousinggroupllc@aol.com
Affiliation: LLC with a US Patent for a device(s) tha

Subject: Going to the Sea
Comment:

We believe that in undertaking ships to see to look at FUELS you and and the US Government are looking at one of the major problems but are missing one of the Major problems that our seas contain, PLASTIC AND RELATED POLLUTION. There are continuing articles, research on the rising levels of plastic related pollution in our seas...in some areas that are MILES OF PLAstic. And in a recent report it was stated that some of the Fish we are eating contains small particles of plastic. Yes it is that BAD

California as one if not the most polluted state should start along with other states and the Federal Government to develop "fishing," ships that collect Plastic. The model(s) already exists. We have fishing ships that (1) have long nets that bring in hundreds of Fish (2) these fish are sorted out(as the plastic would be sorted out by types)by individuals (3) the plastic would be heated and melted by type (4) sold to respective Plastic companies...little or nothing is being done NOW.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2018-05-11 17:51:06

No Duplicates.

Comment 61 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: ANDY
Last Name: APPAN
Email Address: ANDY_APPAN42@YAHOO.COM.SG
Affiliation: amarappan

Subject: low carbon, no carbon shipping 330 knot
Comment:

```
ANDY  TRANSPORT  TECHNOLOGY  DESIGN  COMPARISION
TECHNOLOGY : NO ENGINE, NO CARBON, NO CO2E, NO HEAT.
ANDY BEARING, JET : REDUCES ROLLING FRICTION AT WHEELS TO GET
HIGHER SPEED FOR SAME TON-HP. DOUBLE FOR AUTO;TRIPLE FOR RAIL,
SHIP.
NOCARBONTRANSPORT NOW DESIGN ANDY DESIGN
VEHICLE  TON  HP VOLUME SPEED KMPL SPEED
 CBM/H TANK.M PR.KG THK.MM
BIKE  0.3 8 100 60 60 120 2 2/1/1 120 12
CAR  2 100 1800 100 10 200 25 5/5/1 120 30
TRUCK  15 240 4800 100 5 200 60 6/5/2 120 36
RAIL  1000 6250 210L 100 0.12 600 300 25/6/2 600 750
SHIP  1000 800 30L 11KN 0.167 660KN 40 5/4/2 600 150
SHIP  50,000 40,000 1500L 11KN 0.0034 330KN 2000 20/20/5 600 600
MUTHUKAL ANDY APPAN, M E , 50 YRS EXPERT, CHENNAI. INDIA
```

Attachment: www.arb.ca.gov/lists/com-attach/88-techfuel-report-ws-Uz9UPVUjUV0AZVQ1.png

Original File Name: LOW CARBON, NO CARBON TRANSPORT, POWER PLANT 120 PPM.png

Date and Time Comment Was Submitted: 2018-05-11 19:21:57

No Duplicates.

Comment 62 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: ANDY
Last Name: APPAN
Email Address: ANDY_APPAN42@YAHOO.COM.SG
Affiliation: amarappan

Subject: no carbon tranport
Comment:

```
ANDY  TRANSPORT  TECHNOLOGY  DESIGN  COMPARISION
TECHNOLOGY : NO ENGINE, NO CARBON, NO CO2E, NO HEAT.
ANDY BEARING, JET : REDUCES ROLLING FRICTION AT WHEELS TO GET
HIGHER SPEED FOR SAME TON-HP. DOUBLE FOR AUTO; TRIPLE FOR RAIL,
SHIP.
NOCARBONTRANSPORT NOW DESIGN ANDY DESIGN
VEHICLE  TON  HP VOLUME SPEED KMPL SPEED
 CBM/H TANK.M PR.KG THK.MM
BIKE  0.3 8 100 60 60 120 2 2/1/1 120 12
CAR  2 100 1800 100 10 200 25 5/5/1 120 30
TRUCK  15 240 4800 100 5 200 60 6/5/2 120 36
RAIL  1000 6250 210L 100 0.12 600 300 25/6/2 600 750
SHIP  1000 800 30L 11KN 0.167 660KN 40 5/4/2 600 150
SHIP  50,000 40,000 1500L 11KN 0.0034 330KN 2000 20/20/5 600 600
MUTHUKAL ANDY APPAN, M E , 50 YRS EXPERT, CHENNAI. INDIA
```

Attachment: www.arb.ca.gov/lists/com-attach/89-techfuel-report-ws-VzYGbgFkV31SCwNc.pdf

Original File Name: Andy Transport no GHGe.pdf

Date and Time Comment Was Submitted: 2018-05-11 19:52:48

No Duplicates.

Comment 63 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: David
Last Name: Atwater
Email Address: pctman@sbcglobal.net
Affiliation: Citizen of Stockton, CA

Subject: New Regulations on ocean going cargo ships
Comment:

CARB and State regulators constantly endeavor to achieve their own goals for "air quality" without regards for our economy in the State. As a resident of Stockton, I am very concerned that as a deep water port, your organization will put the Port of Stockton out of business. The Port brings hundreds of millions of dollars of economic activity to our City, the County and, in fact, the entire area. Please keep in mind that, with the improvements of the Panama Canal, shipping companies have options other than the great economic engines that are the shipping ports of our State. They now have access to the Gulf Coast and even the East Coast. I know some at CARB will say; "GREAT, take those ships and there cargo elsewhere!" But, killing all those jobs will be yet another nail in the California economy's life.

THIS IS SERIOUS. Without an economy you and your organization workers could be the only ones left with jobs in the State. No, I am not joking here....it's easy for you to kill jobs, but impossible to kill a government program gone wrong.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2018-05-14 08:40:24

No Duplicates.

Comment 64 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Lou
Last Name: Browning
Email Address: Louis.Browning@icf.com
Affiliation: ICF

Subject: OGV Tech Report Comments
Comment:

See attached for comments

Attachment: www.arb.ca.gov/lists/com-attach/91-techfuel-report-ws-BXUBYlYyUnNRCAV3.docx

Original File Name: Peer Review of TECHNOLOGY ASSESSMENT.docx

Date and Time Comment Was Submitted: 2018-05-23 12:44:26

No Duplicates.

Comment 65 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Emanuel
Last Name: Wagner
Email Address: ewagner@californiahydrogen.org
Affiliation: California Hydrogen Business Council

Subject: CHBC Comments on ARB Technology Assessment: Ocean-Going Vessels
Comment:

See attached.

Attachment: www.arb.ca.gov/lists/com-attach/92-techfuel-report-ws-BWZXOQFiWGhXDlQ3.pdf

Original File Name: CHBC comments_California Air Resources Board Ocean Going Vessel_final.pdf

Date and Time Comment Was Submitted: 2018-06-15 11:11:52

No Duplicates.

Comment 66 for Technology and Fuels Assessment Report comments (techfuel-report-ws) - 1st Workshop.

First Name: Brian
Last Name: Choe
Email Address: bchoe@aqmd.gov
Affiliation: SCAQMD

Subject: SCAQMD's comment on OGV Technology Assessment
Comment:

See attached.

Attachment: www.arb.ca.gov/lists/com-attach/93-techfuel-report-ws-VSYAZVAwWXsHbANn.docx

Original File Name: SCAQMD Comment.docx

Date and Time Comment Was Submitted: 2018-06-19 08:45:55

No Duplicates.

There are no comments posted to Technology and Fuels Assessment Report comments (techfuel-report-ws) that were presented during the Workshop at this time.