Response to
Sierra Club Data Requests Set Two:
Data Request No. 109

Amended Application for Certification
for
HYDROGEN ENERGY CALIFORNIA
(08-AFC-8A)
Kern County, California
DATA REQUEST

109. The AFC indicates that the VOC emitted with the CO₂ vent gas stream (concentration 40 ppm) is “MeOH”, which is the commonly used abbreviation for methanol (AFC, Appx. E-3, p. 10). Methanol is both a VOC and HAP. The AFC estimates VOC emissions from the CO₂ vent gas at 11 lb/hour and 2.8 ton/year (as CH₄, i.e., methane) (Ibid). However, the AFC fails to estimate emissions of methanol from the CO₂ vent for purposes of determining HAP emissions from the Project (see AFC, Appx. M, p. 1). Based on the AFC’s estimates for VOC emissions (as CH₄), HAP emissions from the CO₂ vent can be estimated at 5.6 ton/year (as MeOH).¹ This increases the estimate of total methanol emissions from the Project from 7.09 tons/year to 12.69 tons/year, which exceeds the 10 ton/year major source threshold for emissions of single HAPs pursuant to 40 CFR §63.41 (defining a major source as a facility that will emit 10 tons annually of any HAP or 25 tons annually of any combination of HAPs.)

a. Please revise estimates for HAP emissions from the Project to account for methanol contained in the CO₂ vent gas.

b. Please revise the health risk assessment for the Project to account for emissions of methanol contained in the CO₂ vent gas.

c. Please provide a case-by-case maximum achievable control technology (“MACT”) analysis pursuant to 40 CFR Part 63, Subpart B for the Project’s emissions of HAPs.

RESPONSE

a. Methanol is used by the Rectisol process to capture and remove carbon dioxide (CO₂) from synthetic gas to produce clean hydrogen-rich gas. Captured CO₂ is compressed and transported offsite for enhanced oil recovery and sequestration, and provisions are included for venting CO₂ for short periods of time in the event of unplanned equipment outages. A small amount of methanol remains in the CO₂ vent gas, and a wash system is in place to further reduce the potential for methanol emissions when venting occurs. The Rectisol process licensor, Linde, anticipates that the typical methanol content in the vented CO₂ stream will be 18 to 20 parts per million (ppm), as shown in Attachment 109-1. The annual emission estimate is based on the typical methanol content of 20 ppm and the expected annual quantity of CO₂ that would be vented, which will range from 70 to 100 percent of vent flow capacity. Emissions of methanol in the vented CO₂ gas are presented below in Attachment 109-2. This does not change the emissions of other pollutants from the CO₂ vent previously presented in the Amended Application for Certification (AFC).

Hydrogen Energy California (HECA) proposes a methanol emission limit from the CO₂ vent gas of 2.4 tons/year. HECA will manage annual CO₂ venting to meet the proposed emission limits for this source. HECA will measure the actual methanol concentration in the vent stream for each venting occurrence, along with flow rate. Based on the actual average annual methanol concentration and annual emission quantity to date, HECA will reduce the venting rate and/or duration as necessary to comply with annual emission limits. The CO₂ vent will be a highly instrumented and closely monitored system because venting affects the low greenhouse gas basis associated with all products produced.

¹ (2.8 tons VOC as CH₄/year) × (methanol = CH₃OH: 32 lb/lb-mol) / (methane = CH₄: 16 lb/lb-mol) = 5.6 tons VOC as CH₃OH/year.
The only other source of methanol emissions is the fugitives associated primarily with the Rectisol process, which are estimated to be 7.4 tons/year. Therefore, the total Project methanol emissions are 9.8 tons/year, which is less than the threshold for a single hazardous air pollutant (HAP), and HECA is not a major source of HAPs.

b. The health risk assessment will not be revised to reflect the methanol emissions from the CO₂ vent stream, because methanol has very high acute and chronic Risk Exposure Levels; therefore, this small increase in this pollutant is not expected to increase the health risks.

c. A maximum achievable control technology (MACT) analysis is not required based on the responses to Data Request 109 (a) and (b). Although not required, HECA believes that the HAP emission controls already provided and described in the Amended AFC are equivalent to MACT.
Attachment 109-1
Linde Expected Methanol Emissions
Dear Michael,

Herewith Linde confirms, that the expected methanol content in the vented CO2 stream downstream the water wash column is 18 to 20 ppmv.

Best Regards

Ulvi
Attachment 109-2
CO₂ Vent Emission Estimates
Operating Parameters

| Maximum Hours of Operation | 504  hr/yr |
| Max Hourly Flow            | 761,400 lb/hr |
| Max Hourly Flow            | 17,584 lbmol/hr |
| Average flow capacity for year | 85% of maximum (varies between 70% - 100%) |
| Annual Flow @ 85% capacity | 163,092 ton/yr |
|                         | = 7,533,112 lbmol/yr |

Methanol

<table>
<thead>
<tr>
<th>Compound</th>
<th>Short-term Emission Factor (ppm)</th>
<th>Long-term Emission Factor (ppm)</th>
<th>Hourly (lb/hr)</th>
<th>Annual (lb/yr)</th>
<th>Annual (ton/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>40</td>
<td>20</td>
<td>2.25E+01</td>
<td>4.83E+03</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Notes:
1) Vent gas methanol concentrations are based on process licensor data. The methanol concentration is expected to be 18-20 ppm, but could be as high as 40 ppm associated short-term operational conditions such as transient impacts on the wash column.
2) Annual emission rates are based on 504 hours per year of venting at 85% flow rate.
AMENDED APPLICATION FOR CERTIFICATION FOR THE
HYDROGEN ENERGY CALIFORNIA PROJECT

APPLICANT
SCS Energy, LLC
Marisa Mascaro
30 Monument Square, Suite 235
Concord, MA 01742
mmascaro@scsenergyllc.com

Tiffany Rau
2629 Manhattan Avenue, PMB# 187
Hermosa Beach, CA 90254
trau@heca.com

Hydrogen Energy California, LLC
George Landman
Director of Finance and Regulatory Affairs
500 Sansome Street, Suite 750
San Francisco, CA 94111
glandman@heca.com

CONSULTANT FOR APPLICANT
URS Corporation
Dale Shileikis, Vice President
Energy Services Manager
Major Environmental Programs
One Montgomery Street, Suite 900
San Francisco, CA 94104-4538
dale.shileikis@urscorp.com

COUNSEL FOR APPLICANT
Latham & Watkins, LLP
Michael J. Carroll
650 Town Center Drive, 20th Fl.
Costa Mesa, CA 92626-1925
michael.carroll@lw.com

INTERESTED AGENCIES
California ISO
e-recipient@caiso.com

Department of Conservation
Office of Governmental and Environmental Relations
(Department of Oil, Gas & Geothermal Resources)
Marni Weber
801 K Street, MS 2402
Sacramento, CA 95814-3530
marni.weber@conservation.ca.gov

INTERVENORS
California Unions for Reliable Energy
Thomas A. Enslow
Marc D. Joseph
Adams Broadwell Joseph & Cardozo
520 Capitol Mall, Suite 350
Sacramento, CA 95814
tenslow@adamsbroadwell.com

Association of Irritated Residents
Tom Frantz
30100 Orange Street
Shafter, CA 93263
tfrantz@bak.rr.com

Kern-Kaweah Chapter
of the Sierra Club
Andrea Issod
Matthew Vespa
85 Second Street, 2nd Floor
San Francisco, CA 94105
andrea.issod@sierraclub.org
matt.vespa@sierraclub.org

INTERVENORS (con’t.)
Environmental Defense Fund (EDF)
Timothy O’Connor, Esq.
123 Mission Street, 28th Floor
San Francisco, CA 94105
toconnor@edf.org

Natural Resources Defense Council
George Peridas
111 Sutter Street, 20th Fl.
San Francisco, CA 94104
gperidas@nrdc.org

Kern County Farm Bureau, Inc.
Benjamin McFarland
801 South Mt. Vernon Avenue
Bakersfield, CA 93307
bmcfarland@kerncfb.com

*HECA Neighbors
c/o Chris Romanini
P.O. Box 786
Buttonwillow, CA 93206
roman93311@aol.com
ENERGY COMMISSION – DECISIONMAKERS
KAREN DOUGLAS
Commissioner and Presiding Member
karen.douglas@energy.ca.gov

ANDREW McALLISTER
Commissioner and Associate Member
andrew.mcallister@energy.ca.gov

Raoul Renaud
Hearing Adviser
raoul.renaud@energy.ca.gov

Eileen Allen
Commissioners' Technical Advisor for Facility Siting
eileen.allen@energy.ca.gov

Galen Lemei
Advisor to Presiding Member
galen.lemei@energy.ca.gov

Jennifer Nelson
Advisor to Presiding Member
jennifer.nelson@energy.ca.gov

David Hungerford
Advisor to Associate Member
david.hungerford@energy.ca.gov

Patrick Saxton
Advisor to Associate Member
patrick.saxton@energy.ca.gov

ENERGY COMMISSION – STAFF
Robert Worl
Project Manager
robert.worl@energy.ca.gov

John Heiser
Associate Project Manager
john.heiser@energy.ca.gov

Lisa DeCarlo
Staff Counsel
lisa.decarlo@energy.ca.gov

ENERGY COMMISSION – PUBLIC ADVISER
Jennifer Jennings
Public Adviser’s Office
publicadviser@energy.ca.gov

*Indicates Change
DECLARATION OF SERVICE

I, Dale Shileikis, declare that on December 21, 2012, I served and filed a copy of the attached Response to Sierra Club Data Requests Set Two: Data Request No. 109, dated December, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: http://www.energy.ca.gov/sitingcases/hydrogen_energy/index.html

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission’s Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)

For service to all other parties:

X Served electronically to all e-mail addresses on the Proof of Service list;

___ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses marked “hard copy required” or where no e-mail address is provided.

AND

For filing with the Docket Unit at the Energy Commission:

X by sending one electronic copy to the e-mail address below (preferred method); OR

___ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 08-AFC-08A
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

___ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel1 at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
michael.levy@energy.ca.gov

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

________________________________________
Dale Shileikis

1 This Proof of Service form is not appropriate for the use when filing a document with the Chief Counsel under Title 20, sections 1231 (Complaint and Request for Investigation) or 2506 (Petition for Inspection or Copying of Confidential Records). The Public Advisor can answer any questions related to filing under these sections.