



West Coast Partnership to Promote Alternative Fuel Corridors

The Landscape & Opportunities for Medium- and Heavy-Duty Vehicles

Alternative Fuel Infrastructure Corridor Coalition (AFICC)

Oregon Workgroup

Webinar Session #1

Thursday, September 20, 2018

Overview

- AFICC Goals and Objectives
- Oregon Workgroup Roadmap
- Discussion Leader Presentations: Oregon Alternative Fuel Vehicle and Infrastructure Priorities, Needs and Opportunities
- Workgroup Discussion

Today's Discussion Leaders

Program Facilitators

- **John Mikulin**, Environmental Protection Specialist, EPA Region 9
- **Alycia Gilde**, Director, CALSTART

Presentations by:

- **Diane Turchetta**, Transportation Specialist, FHWA
- **Andrew Dick**, Policy Advisor, ODOT
- **Dan Avery**, Senior Policy Analyst, ODOE
- **Tim Collins**, Senior Transportation Planner, Freight Planning, Metro
- **Mike Montero**, Principal, Montero & Associates, LLC



MD/HD Alternative Fuel Infrastructure Corridor Coalition

1. Convene a stakeholder coalition focused on M/HD alternative fuel infrastructure deployment.
2. Conduct stakeholder workgroups & targeted outreach to identify desired/unfunded M/HD alternative fuel stations.
3. Synthesize stakeholder input into a plan document.
4. Use the plan to support project development, leverage existing funds, and seek joint applications to US DOT and other competitive funding programs.
5. Obtain federal funding assistance to help implement infrastructure in California, Oregon and Washington (i.e., natural gas, propane, electric vehicle charging and hydrogen for public and private M/HD fleets).



AFICC Project Overview



**Present
Outcomes to
Partners**

Needs

- Prioritize Hot Spots (Areas of Congestion, Communities, Intermodal Freight Hubs)
- ID Alt. Fuel Infrastructure Gaps
- ID Best Techs/Fuels for Vocational/Transportation Activities/Project Areas

Draft Implementation Plan

- Include Themes & Priorities
- Outline Strategy & Actions
- Provide Recommendations
- ID AFV Project Partnerships
- Estimate Project Costs & ID Funds

Develop AFV Stakeholder Synthesis

- Summarize Workgroup Feedback
- Respond to Questions
- Outline Critical Barriers & Challenges
- Evaluate Needs & Costs for AFV Infrastructure

**Facilitate
Workgroup Sessions
[CA, OR & WA]
Collect Feedback, Compile
Info, & Research Q's**

Establish Framework

- Define Workgroup Discussion Objectives
- ID Key Stakeholders
- ID Coalition-Supporting Resources
- ID Direct Outcomes

Opportunities

- ID partnerships with Freight Shippers, Carriers, BCOs, Ports, Railroads, Truck Associations (LMCs/IOOs) Truck Stops, Warehouses, EDCs, and Cities on Coordinated Alt. Fuel Corridor Projects

Alternative Fuel Infrastructure Corridor Coalition (AFICC) 2018 Oregon Workgroup Roadmap

Webinar Sessions

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M/HD Alternative Fuel
Landscape and Opportunities
Thursday, Sept. 20, 2018
1:00 – 2:30 p.m. PT

Partners provide an update on alternative fuel activities & opportunities to promote emission reductions, advance clean techs, & transportation sustainability through alternative fuel corridors.

Session #2
Natural Gas & Propane
Technologies
Thursday, Nov. 1, 2018
2:30 – 4:00 p.m. PT

Technology manufacturers and fueling infrastructure providers provide information on the latest emerging technologies, operational suitability, infrastructure considerations, & fleet best practices. These sessions are open to CA, OR and WA partners.

Session #3
Plug-In Electric & Hydrogen
Fuel Cell Technologies
Tuesday, Nov. 6, 2018
10:30 a.m. – 12:00 p.m. PT

Session #4
M/HD Alternative Fuel
Infrastructure Needs
Thursday, Dec. 13, 2018
1:00- 2:30 p.m. PT

Partners provide input on critical gaps & infrastructure needs along key corridors & evaluate actions and funding opportunities to support partnership, coordination & project implementation.

Champion Strategy Calls

Session # 1:
Thurs. 8/30/18
2:00 – 3:00 p.m.

Session # 2:
Thurs. 10/11/18
1:00 – 2:00 p.m.

Session # 3:
Fri. 11/30/18
10:00 – 11:00 a.m.



FHWA Alternative Fuels Corridor Program

WEST COAST COLLABORATIVE – ALTERNATIVE FUEL INFRASTRUCTURE
CORRIDOR COALITION WEBINAR

DIANE TURCHETTA | U.S. DEPARTMENT OF TRANSPORTATION



U.S. Department of Transportation
Federal Highway Administration

National Alternative Fuel Corridors



To improve the mobility of alternative fuel vehicles, the U.S. Department of Transportation (DOT) has designated national corridors in strategic locations along major highways for:

- ▶ Plug-in electric vehicle charging
- ▶ Hydrogen fueling
- ▶ Propane (LPG) fueling
- ▶ Natural gas (CNG, LNG) fueling

Combined Results

➤ Designations....

- ✓ 58 nominations
- ✓ Includes portions/segments of 84 Interstates, along with 43 US highways/state roads
- ✓ Comprise 44 states plus D.C.
- ✓ Covers over 100,000 miles of the National Highway System (all fuels combined)

FY 2018 Request for Nominations

- Anticipate issuing Round 3 request for nominations in September 2018
- Distributed through FHWA Division Offices
- Nominations due the end of January 2019
- Designations made in spring 2019
- No anticipated change in designation criteria
- Some changes in shapefile submissions

Regional Alternative Fuel Corridor Convening's

- The purpose is to help state and local agencies identify Interstate corridors that are potential candidates for designation or need additional facilities to change the designation from Corridor-Pending to Corridor-Ready.
- Representatives from states in the targeted region will be invited and multiple cross-state corridors will be discussed and analyzed for designation potential.



I-26 (South Carolina)

Regional Alternative Fuel Corridor Convening's

- Midwest – June 12 (St. Paul, MN)
- Southeast – Sept 25 (Charleston, SC)
- REV West States – Spring/Summer 2019
- NE/Mid-Atlantic – Fall 2019
- Texas and surrounding states - 2019

Future of AFC Program

ALTERNATIVE FUELS CORRIDOR

- Request for Nominations on an annual basis under life of FAST Act
- Possible inclusion in the next transportation reauthorization bill
- Enhanced coordination efforts with Clean Cities Program/NREL
- Enhanced collaboration with stakeholders including industry

For More Information

DOT Alternative Fuel Corridor Team Contact Information

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Resources

FHWA Alternative Fuels Corridor website:

http://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

MUTCD Memorandum – Signing for Designated Alternative Fuel Corridors

https://mutcd.fhwa.dot.gov/resources/policy/alt_fuel_corridors/index.htm

DOE/NREL Alternative Fueling Station Locator:

<https://www.afdc.energy.gov/locator/stations/>

Rounds 1 & 2 EV Map for HI - Corridor Ready and Pending



Legend

- 2010 Urbanized Area
- Alternative Fuel Corridors**
- EV - Corridor Ready
- EV - Corridor Pending

0 20 40 60
Miles

[Go to Layers to turn on Fuel Stations](#)

Rounds 1 & 2 CNG Map – Corridor Ready and Pending



Alternative Fuel Corridors

 CNG - Corridor Ready

 CNG - Corridor Pending

0 200 400 600

Miles

[Go to Layers to turn on Fuel Stations](#)

Rounds 1 & 2 LNG Map – Corridor Ready and Pending



Rounds 1 & 2 LPG Map – Corridor Ready and Pending



Alternative Fuel Corridors

 LPG - Corridor Ready

 LPG - Corridor Pending

0 200 400 600

Miles

[Go to Layers to turn on Fuel Stations](#)

Rounds 1 & 2 HYD Map – Corridor Ready and Pending



Alternative Fuel Corridors

- Hydrogen - Corridor Ready
- Hydrogen - Corridor Pending

0 200 400 600

Miles

[Go to Layers to turn on Fuel Stations](#)



ZEVs and Oregon

WIC – AFICC Webinar No. 1:
Alternative Fuel Landscape
and Opportunities
September 20, 2018

Andrew Dick

Oregon Department of Transportation



9/20/2018

West Coast Electric Highway

- Network of corridor DC fast chargers
- “BC to BC”:
British Columbia to
Baja California
- Built to expand EV charging access and enable distance travel



West Coast Electric Highway

- Funded via stimulus funds, TIGER grant
- First station in 2012
- 44 Stations in Oregon, Level 2, DCFC at each
- More than 100,000 charging events
- Nearly 1,000 MWh of charging
- 3 million miles of all-electric driving



M/HD ZEV Deployment Goals

- Identify opportunities to pilot alt-fuel M/HDVs in Oregon
- Identify early candidates for fueling stations and growing alt-fuels networks
- Find willing fleet partners to be early adopters of new technology



9/20/2018

Where is there a need for alt fuel infrastructure in Oregon?

What are the priority fuels, locations and opportunities?

- Population centers (Portland, Eugene) for back-to-base fueling operations
- If possible, corridors beginning with I-5 and expanding to I-84, US 101, etc.
- Areas with bad air quality, other complementary factors



What is ODOT hoping to get out of the effort?

- Align strategy with California and Washington
- Build relationships with local and regional government
- Develop list of priority deployment areas
- Create high-level plan to cite when/if funding is available





Questions?

Oregon Department of Energy

*Leading Oregon to a safe, clean,
and sustainable energy future*

Oregon Biogas / RNG
Inventory - SB 334 (2017)

Presented to: WCC
AFICC

September 20, 2018

Dan Avery



Fuel Production Pathways

Anaerobic Digestion

Agricultural Manure

Landfills

Municipal Wastewater

Waste Food

Thermal Gasification

Forest Harvest Residuals

Agricultural Harvest Residuals

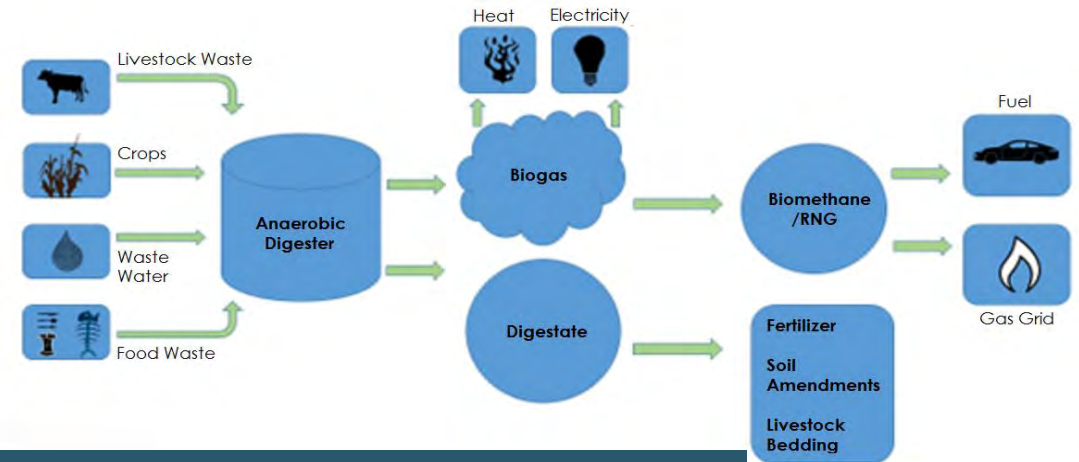
Other Near-Commercial Technologies

Power to Gas

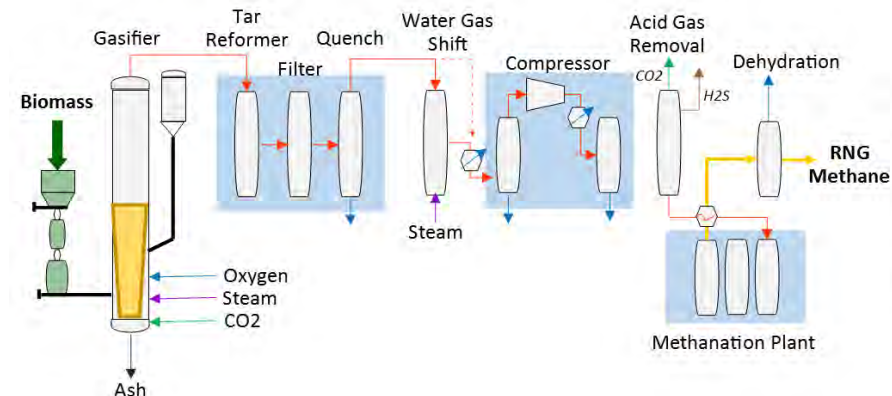
PyroCatalytic Hydrogenation

Hydrothermal Liquefaction

Anaerobic Digestion Pathway



Thermal Gasification Pathway



- ✓ Dry the biomass with waste heat
- ✓ Feed dry biomass to gasifier
- ✓ Remove tars and dust
- ✓ Shift to get H₂:CO ratio = 3:1
- ✓ Compress to pipeline pressure
- ✓ Remove acid gases including CO₂
- ✓ Convert syngas to methane
- ✓ Remove remaining moisture
- ✓ 65% conversion efficiency

Annual potential production of CH₄ - Summary

Source – Anaerobic Digestion	Annual CH ₄ production scf ³
Agricultural manure	4,639,626,825
Wastewater	1,225,228,606
Landfill	4,351,052,420
Waste food	138,571,656
Subtotal	10,354,479,507

71,936,081 DGE

Context: In 2016 Oregon consumed ~226,978,752,000 cf of methane

Estimated technical potential for RNG is 22% of Oregon's N.G. consumption (4.5% AD, 17.5 TG)

Source – Thermal Gasification	Annual CH ₄ production scf ³
Forest Harvest Residuals	16,998,108,771
Agricultural Harvest Residuals	22,686,775,137
subtotal	39,684,883,908

275,704,348 DGE

Total Potential Annual CH₄ = 50,039,363,416 scf

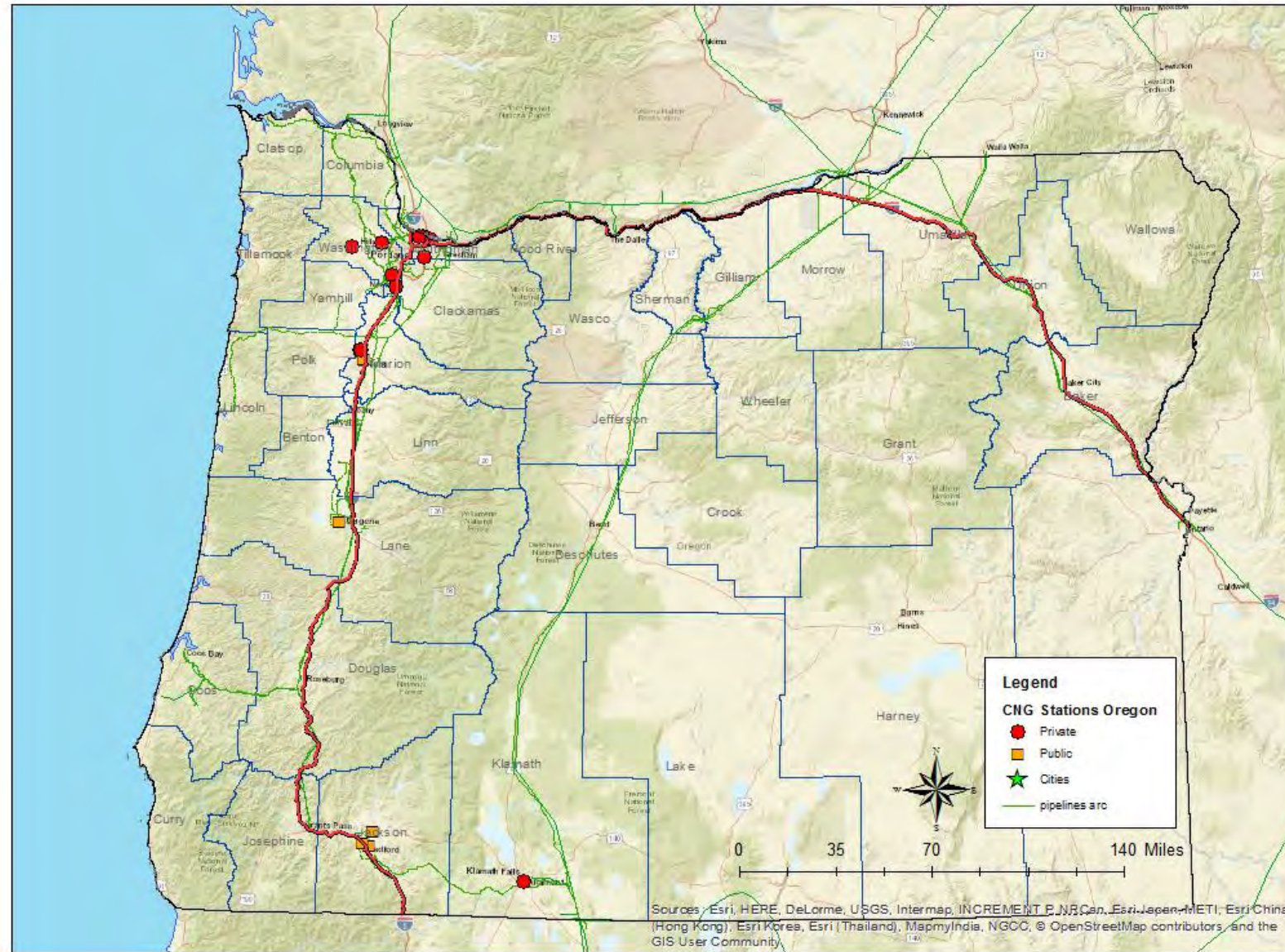
347,640,429 DGE



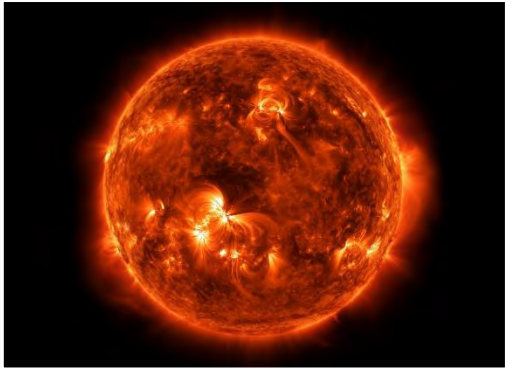
1. Allow the natural gas companies to buy and sell RNG to and for their customers.
2. Allow local gas distribution companies to recover pipeline interconnection costs through their rates.
3. Study how best to expand natural gas transportation fueling infrastructure.
4. Explore development of voluntary gas quality standards for injection of RNG into the natural gas pipeline.
5. Explore financial incentives to help drive the nascent industry forward.
6. Coordinate with RNG stakeholders and state agencies to develop a tracking and accounting protocol for production and use of RNG.

Existing Infrastructure

CNG Fueling Stations - 2018



Questions?



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Link to the ODOE Biogas/RNG Inventory :
<https://www.oregon.gov/energy/Data-and-Reports/Documents/2018-RNG-Inventory-Report.pdf>



Near and Zero-Emission Freight and Goods Movement Opportunities

Tim Collins, Senior Transportation Planner

Freight Planning

Metro

Regional Freight Policy & Action Plan

- AFICC supports Policy #4 of the Regional Freight Policy
 - “Pursue a sustainable, multi-modal freight transportation system that supports the health of the economy, communities and the environment through clean, green and smart technologies and practices”
- AFICC addresses 4.2 of the Freight Action Plan
 - “Pursue greenhouse gas and other pollutant reduction policies and strategies for freight that transitions the region to lower or zero emission freight vehicles and equipment”

Freight Action Plan States: *(continued...)*

- “Research into this action should identify strategies, projects or programs that best meet transportation, safety and air quality goals that are synonymous with efficient goods movements.
- Metro will work with DEQ and other regional partners to explore and define potential environmental benefits in the following area:
Programs, policies and projects for cost--effective net reduction of greenhouse gas and other pollutants, such as ... incentives for zero/low emission delivery vehicles and alternative fueling stations.”

Opportunities for Near- to Zero-Emission Freight

- Need for a Medium- and Heavy-Duty Alternative Fuel Vehicle Incentive Program for Goods Movement and Freight Activities
- Monitor state and three state (WA, OR and CA) corridor efforts for Medium- and Heavy-Duty Alternative Fuel Vehicles and required Infrastructure
- Seeks collaboration with DEQ and ODOT to determine funding and feasibility for alternative fuel infrastructure
- Interest in supporting AFICC effort by sharing information on related strategies, programs and projects

Alternative Fuel Initiative

Mike Montero

Montero & Associates, LLC

Consultants in Urban Development



Discussion Questions

- What alternative fuel technologies is your organization interested in?
- What infrastructure needs do you have for your business, community, or region?
- What funding resources are available to support implementation?
- What more would you like to learn about medium- and heavy-duty alternative fuel vehicles and infrastructure?



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