Bob Gaffney
17-7-4

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Fresno firm looks to find its element in hydrogen

SOURCE: ADVANCED EMISSION CONTROL SOLUTIONS, L.P. | An artist's rendition of a hydrogen fueling station for cars as well as for larger vehicles.

David Castellon - STAFF WRITER

The clock is ticking for California semi truck owners.

After years of having to replace or retrofit engines and emission systems to meet increasingly stringent state clean-air standards, a new regulation will take effect on Jan. 1, 2023 requiring all large trucks and busses on California roads to be 2010 models or newer.

That means some owners of trucks and busses operating in the state will have to make some tough decisions, not the least of which includes whether to continue running diesel-powered vehicles or go with alternative-power options that include rechargeable batteries, compressed or liquid natural gas, methane, hydrogen and propane.

Bob Gaffney believes those truck owners should pick hydrogen — particularly here in the Valley.

In fact, he and his partners at Advanced Emission Control Solutions (AECS), L.P., in Fresno believe so strongly in this that they're working with a local gas station owner to obtain a $2.5 million California Energy Commission grant to fund the installation of the first hydrogen fueling stations for a Fresno gas station.

"Eventually, we want to have a half dozen or so," along the Highway 99 corridor, so gas stations in Tulare and Madera counties could become involved, Gaffney said.

He and his partners plan to pursue grants to build hydrogen-production facilities here as well.

At least for now, AECS isn't looking to own any of these pumps or be financial partners with the fuel station owners, though they do have an interest in partnering on the hydrogen-production side.

AECS started in 2008 retrofitting diesel trucks with particulate filters to comply with new state emission rules, and once trucks largely had these retrofits done or, in newer trucks, had them installed at the factories, the business turned to maintaining and cleaning the filters.

"Any business has to be ahead of the curve," said Gaffney, adding that he and his partners began looking for a new business niche, figuring the future lay in determining how the next generation of trucks will be powered and becoming the local business specializing in that repair.

They looked at compressed and liquid natural gas, as well as hydrogen.

"We chose the pathway of hydrogen after going to the Air Resources Board — to the upper level — and talked to the people about what they felt about hydrogen, and they definitely are interested in hydrogen as being a part of what they are trying to accomplish, which is lower emissions here in the San Joaquin Valley and across California," Gaffney recounted, noting that vehicles with hydrogen fuel cells are emission-free.

One problem is that California doesn't have much of a hydrogen fuel infrastructure.

Currently, a handful of car manufacturers — Honda, Toyota and Hyundai among them — make cars running on hydrogen that chemically generates electricity in their motors, unlike the more-common lithium batteries that recharge through home electrical sockets and recharging stations.

Most hydrogen cars are in Southern California and the Bay Area, because that's where most of the 29 public hydrogen-fueling stations in the state are located — along with 31 under construction — with few in between, said Stephen Davis, head of business development for AECS.

Among those in-between places are hydrogen fuel pumps at Harris Ranch's Fast Track Shell station off Highway 198 and Interstate 5, on the far western end of the Valley, and additional hydrogen pumps are being planned in Santa Nella, northwest of Los Banos, he said.

But without any hydrogen fuel pumps on this end of the Valley, it doesn't make sense for people to buy hydrogen cars here.

As for trucks and other large vehicles, Utah-base Nikola Motor Company — reportedly the leader in hydrogen-fueled truck development — is testing prototypes and expects to begin sales in 2021.

Gaffney said he would like to break ground on the first Fresno hydrogen pump next year, but that will depend on the grant award. He said he's optimistic because previous grant awards focused on developing hydrogen use in the southern and northern parts of the state, and this round is focused on the Valley.

If a station is built here, the customer base likely would include people who buy hydrogen-powered cars here and people with such cars in Northern and Southern California who might route their trips across the state along the 99 instead of the 5, because they would have places to refuel, as might trucking companies that buy hydrogen-powered trucks once they're available, Davis said.

It would open another option for fleet managers in picking the types of trucks to invest in, as it will for local governments replacing busses, garbage trucks and other heavy-duty vehicles.

"Toyota has spent billions of dollars to move hydrogen. They're spending it on trucks, they're spending it on automobiles, because they believe hydrogen is the future," said Gaffney, whose business would look to maintain and repair hydrogen-powered semis and other large hydrogen vehicles, as well as cars.

He added that Mercedes Benz and Chevrolet are developing hydrogen cars.

But the interest in hydrogen may not be so strong in the trucking industry, said Michael Clark of Clovis, who, through the San Diego-based business he works for, Velocity Truck Centers, sells trucks to clients across the U.S.

He said that besides Nikola, he knows of only one other business developing hydrogen-powered trucks, while several large manufacturers, including Freightliner, are focused on developing electric- and natural gas-powered trucks.

Tesla Motors has announced plans to have its electric trucks in production next year, reportedly with a range of 500 miles on a full charge. In comparison, Nikola claims on its website to have ranges of 500-1,000 miles on a single fill-up for two of the trucks it's developing

A big part of the reason the larger manufacturers aren't going with hydrogen is there's already infrastructure along the West Coast and some other parts of the country for charging or fueling these vehicles, and — just as important — the manufacturers would have to have dealerships and mechanic shops lined up to fix these trucks if they break down, while no such system exists yet for hydrogen trucks, Clark said.

Still, Davis said he has a dozen local trucking businesses interested in going to hydrogen if some fueling pumps are installed here, though he and Gaffney declined to name any.

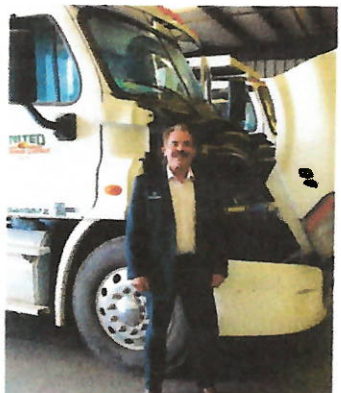

PHOTO BY DAVID CASTELLON | Bob Goffney, a partner in Advanced Emission Control Solutions, L.P., stands in his repair bay where workers maintain and clean particulate filters for diesel truck exhaust systems.

"My main thing is we have to get things started here in Fresno and the San Joaquin Valley. We're lagging," Gaffney said, adding that the City of Fresno and the Fresno County Economic Development Corp. are helping AECS' efforts.

"Southern California is on its way, Northern California is on its way and we need to do it here in our area."

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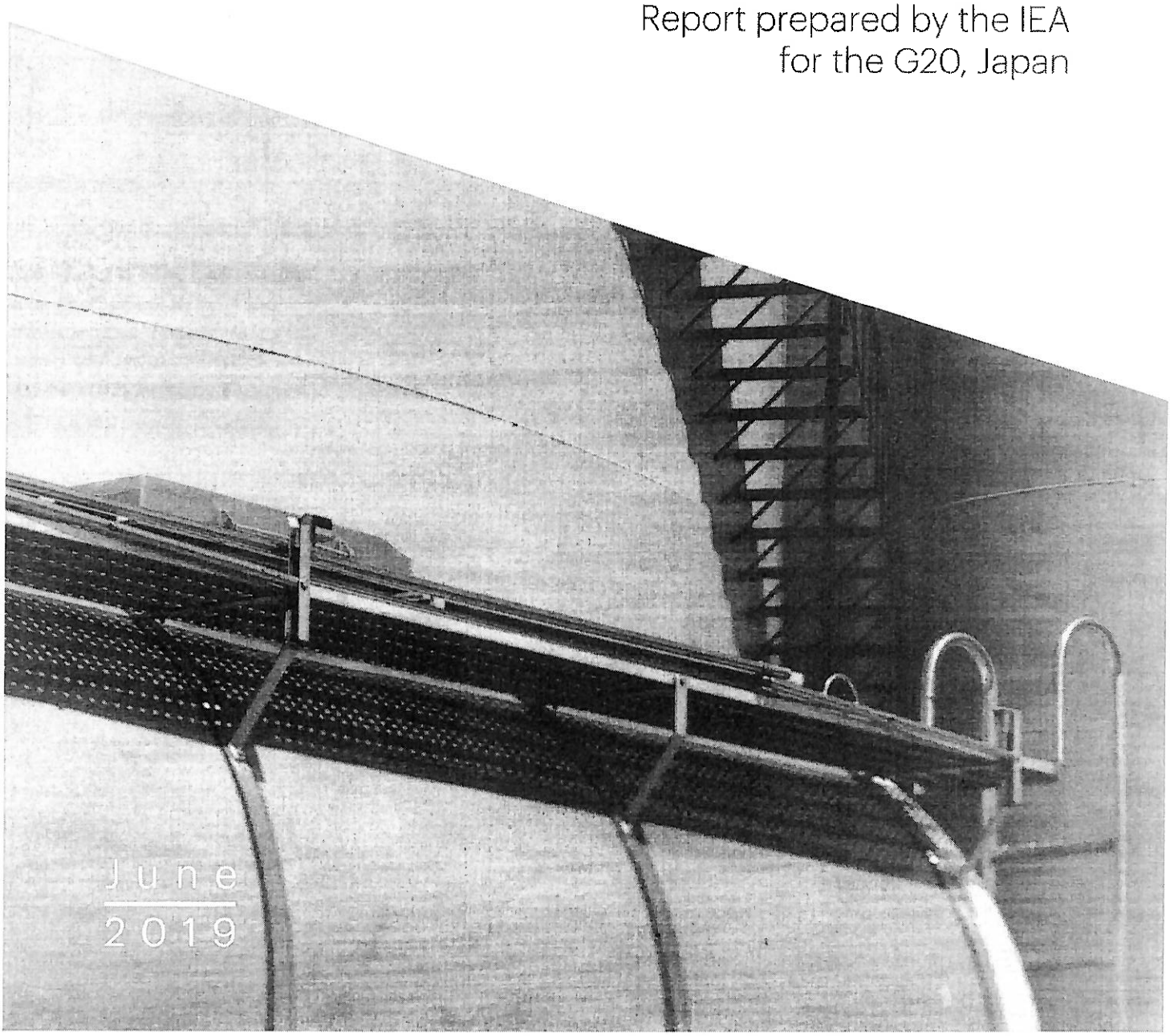
The Future of Hydrogen

Seizing today's opportunities

Executive summary and recommendations

Report prepared by the IEA for the G20, Japan



June 2019

Foreword

This is a critical year for hydrogen. It is enjoying unprecedented momentum around the world and could finally be set on a path to fulfil its longstanding potential as a clean energy solution.

To seize this opportunity, governments and companies need to be taking ambitious and real-world actions now. We are very grateful to the government of Japan for its request under its presidency of the G20 that the International Energy Agency (IEA) prepare this important and timely report.

Our study provides an extensive and independent assessment of hydrogen that lays out where things stand now; the ways in which hydrogen can help to achieve a clean, secure and affordable energy future; and how we can go about realising its potential. To help to get things moving, we have identified the most promising immediate opportunities to provide a springboard for the future.

As the world's leading energy authority covering all fuels and all technologies, the IEA is ideally placed to help to shape global policy on hydrogen. The rigorous analysis in this report was conducted in close collaboration with governments, industry and academia.

This study on hydrogen is part of a comprehensive approach the IEA is taking to the global energy system. Last month, we published a report on the role of nuclear power in a clean energy system. We are also holding various high-level meetings to underscore the critical elements needed for a sustainable energy future – including a ministerial conference in Dublin this month on energy efficiency and another ministerial on systems integration of renewables in Berlin in October 2019.

I very much hope our report on hydrogen will inform discussions and decisions among G20 countries, as well as those among other governments and companies across the world. I hope it will help to translate hydrogen's current momentum into real-world action that sets hydrogen firmly on the path to becoming a significant enabler of a clean, secure and affordable energy future.

Beyond this report, the IEA will remain focused on hydrogen, further expanding our expertise in order to monitor progress and provide guidance on technologies, policies and market design.

We will continue to work closely with governments and all other stakeholders to support your efforts to make the most out of hydrogen's huge potential.

The IEA looks forward to continuing this journey together.

Dr. Fatih Birol
Executive Director
International Energy Agency

Executive summary

The time is right to tap into hydrogen's potential to play a key role in a clean, secure and affordable energy future. At the request of the government of Japan under its G20 presidency, the International Energy Agency (IEA) has produced this landmark report to analyse the current state of play for hydrogen and to offer guidance on its future development. The report finds that clean hydrogen is currently enjoying unprecedented political and business momentum, with the number of policies and projects around the world expanding rapidly. It concludes that now is the time to scale up technologies and bring down costs to allow hydrogen to become widely used. The pragmatic and actionable recommendations to governments and industry that are provided will make it possible to take full advantage of this increasing momentum.

Hydrogen can help tackle various critical energy challenges. It offers ways to decarbonise a range of sectors – including long-haul transport, chemicals, and iron and steel – where it is proving difficult to meaningfully reduce emissions. It can also help improve air quality and strengthen energy security. Despite very ambitious international climate goals, global energy-related CO_2 emissions reached an all time high in 2018. Outdoor air pollution also remains a pressing problem, with around 3 million people dying prematurely each year.

Hydrogen is versatile. Technologies already available today enable hydrogen to produce, store, move and use energy in different ways. A wide variety of fuels are able to produce hydrogen, including renewables, nuclear, natural gas, coal and oil. It can be transported as a gas by pipelines or in liquid form by ships, much like liquefied natural gas (LNG). It can be transformed into electricity and methane to power homes and feed industry, and into fuels for cars, trucks, ships and planes.

Hydrogen can enable renewables to provide an even greater contribution. It has the potential to help with variable output from renewables, like solar photovoltaics (PV) and wind, whose availability is not always well matched with demand. Hydrogen is one of the leading options for storing energy from renewables and looks promising to be a lowest-cost option for storing electricity over days, weeks or even months. Hydrogen and hydrogen-based fuels can transport energy from renewables over long distances – from regions with abundant solar and wind resources, such as Australia or Latin America, to energy-hungry cities thousands of kilometres away.

There have been false starts for hydrogen in the past; this time could be different. The recent successes of solar PV, wind, batteries and electric vehicles have shown that policy and technology innovation have the power to build global clean energy industries. With a global energy sector in flux, the versatility of hydrogen is attracting stronger interest from a diverse group of governments and companies. Support is coming from governments that both

import and export energy as well as renewable electricity suppliers, industrial gas producers, electricity and gas utilities, automakers, oil and gas companies, major engineering firms, and cities. Investments in hydrogen can help foster new technological and industrial development in economies around the world, creating skilled jobs.

Hydrogen can be used much more widely. Today, hydrogen is used mostly in oil refining and for the production of fertilisers. For it to make a significant contribution to clean energy transitions, it also needs to be adopted in sectors where it is almost completely absent at the moment, such as transport, buildings and power generation.

However, clean, widespread use of hydrogen in global energy transitions faces several challenges:

- **Producing hydrogen from low-carbon energy is costly at the moment.** IEA analysis finds that the cost of producing hydrogen from renewable electricity could fall 30% by 2030 as a result of declining costs of renewables and the scaling up of hydrogen production. Fuel cells, refuelling equipment and electrolysers (which produce hydrogen from electricity and water) can all benefit from mass manufacturing.

- **The development of hydrogen infrastructure is slow and holding back widespread adoption.** Hydrogen prices for consumers are highly dependent on how many refuelling stations there are, how often they are used and how much hydrogen is delivered per day. Tackling this is likely to require planning and coordination that brings together national and local governments, industry and investors.

- **Hydrogen is almost entirely supplied from natural gas and coal today.** Hydrogen is already with us at industrial scale all around the world, but its production is responsible for annual CO_2 emissions equivalent to those of Indonesia and United Kingdom combined. Harnessing this existing scale on the way to a clean energy future requires both the capture of CO_2 from hydrogen production from fossil fuels and greater supplies of hydrogen from clean electricity.

- **Regulations currently limit the development of a clean hydrogen industry.** Government and industry must work together to ensure existing regulations are not an unnecessary barrier to investment. Trade will benefit from common international standards for the safety of transporting and storing large volumes of hydrogen and for tracing the environmental impacts of different hydrogen supplies.

The IEA has identified four near-term opportunities to boost hydrogen on the path towards its clean, widespread use. Focusing on these real-world springboards could help hydrogen achieve the necessary scale to bring down costs and reduce risks for governments and the private sector. While each opportunity has a distinct purpose, all four also mutually reinforce one another.

1. **Make industrial ports the nerve centres for scaling up the use of clean hydrogen.** Today, much of the refining and chemicals production that uses hydrogen based on fossil fuels is already concentrated in coastal industrial zones around the world, such as the North Sea in Europe, the Gulf Coast in North America and southeastern China. Encouraging these plants to shift to cleaner hydrogen production would drive down overall costs. These large sources of hydrogen supply can also fuel ships and trucks serving the ports and power other nearby industrial facilities like steel plants.

2. **Build on existing infrastructure, such as millions of kilometres of natural gas pipelines.** Introducing clean hydrogen to replace just 5% of the volume of countries' natural gas supplies would significantly boost demand for hydrogen and drive down costs.

3. **Expand hydrogen in transport through fleets, freight and corridors.** Powering high-mileage cars, trucks and buses to carry passengers and goods along popular routes can make fuel-cell vehicles more competitive.

4. **Launch the hydrogen trade's first international shipping routes.** Lessons from the successful growth of the global LNG market can be leveraged. International hydrogen trade needs to start soon if it is to make an impact on the global energy system.

International co-operation is vital to accelerate the growth of versatile, clean hydrogen around the world. If governments work to scale up hydrogen in a co-ordinated way, it can help to spur investments in factories and infrastructure that will bring down costs and enable the sharing of knowledge and best practices. Trade in hydrogen will benefit from common international standards. As the global energy organisation that covers all fuels and all technologies, the IEA will continue to provide rigorous analysis and policy advice to support international co-operation and to conduct effective tracking of progress in the years ahead.

As a roadmap for the future, we are offering seven key recommendations to help governments, companies and others to seize this chance to enable clean hydrogen to fulfil its long-term potential.

The IEA's 7 key recommendations to scale up hydrogen

1. **Establish a role for hydrogen in long-term energy strategies.** National, regional and city governments can guide future expectations. Companies should also have clear long-term goals. Key sectors include refining, chemicals, iron and steel, freight and long-distance transport, buildings, and power generation and storage.

2. **Stimulate commercial demand for clean hydrogen.** Clean hydrogen technogies are available but costs remain challenging. Policies that create sustainable markets for clean hydrogen, especially to reduce emissions from fossil fuel-based hydrogen, are needed to underpin investments by suppliers, distributors and users. By scaling up supply chains, these investments can drive cost reductions, whether from low-carbon electricity or fossil fuels with carbon capture, utilisation and storage.

3. **Address investment risks of first-movers.** New applications for hydrogen, as well as clean hydrogen supply and infrastructure projects, stand at the riskiest point of the deployment curve. Targeted and time-limited loans, guarantees and other tools can help the private sector to invest, learn and share risks and rewards.

4. **Support R&D to bring down costs.** Alongside cost reductions from economies of scale, R&D is crucial to lower costs and improve performance, including for fuel cells, hydrogen-based fuels and electrolysers (the technology that produces hydrogen from water). Government actions, including use of public funds, are critical in setting the research agenda, taking risks and attracting private capital for innovation.

5. **Eliminate unnecessary regulatory barriers and harmonise standards.** Project developers face hurdles where regulations and permit requirements are unclear, unfit for new purposes, or inconsistent across sectors and countries. Sharing knowledge and harmonising standards is key, including for equipment, safety and certifying emissions from different sources. Hydrogen's complex supply chains mean governments, companies, communities and civil society need to consult regularly.

6. **Engage internationally and track progress.** Enhanced international co-operation is needed across the board but especially on standards, sharing of good practices and cross-border infrastructure. Hydrogen production and use need to be monitored and reported on a regular basis to keep track of progress towards long-term goals.

7. **Focus on four key opportunities to further increase momentum over the next decade.** By building on current policies, infrastructure and skills, these mutually supportive opportunities can help to scale up infrastructure development, enhance investor confidence and lower costs:

    - Make the most of existing industrial ports to turn them into hubs for lower-cost, lower-carbon hydrogen.
    - Use existing gas infrastructure to spur new clean hydrogen supplies.
    - Support transport fleets, freight and corridors to make fuel-cell vehicles more competitive.
    - Establish the first shipping routes to kick-start the international hydrogen trade.

INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 30 member countries, 8 association countries and beyond.

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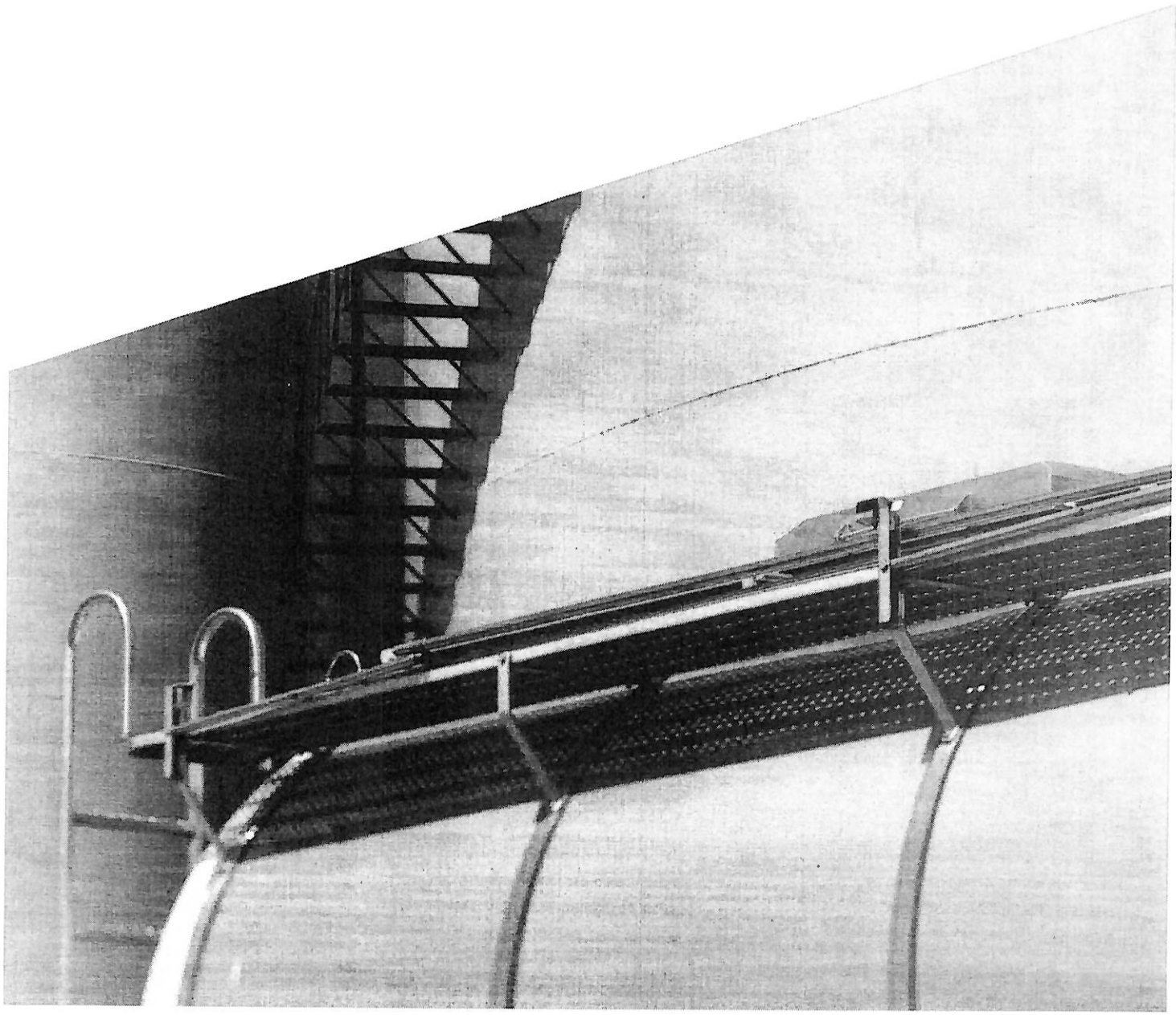

Executive Summary

The U.S. Department of Energy (DOE) funds research and development that reduces U.S. dependence on imported petroleum and promotes better air quality. The work described in this report was supported through DOE's National Renewable Energy Laboratory (NREL).

NREL has contracted with Gladstein, Neandross & Associates (GNA) to survey opportunities to integrate hydrogen into the natural gas vehicles and fueling stations of the Interstate Clean Transportation Corridor (ICTC). The ICTC is an existing network of over 600 heavy-duty trucks and 20 fueling stations in California and Nevada that are fueled by liquefied natural gas (LNG). This project is intended to lay the groundwork for natural gas-hydrogen fueling infrastructure along the existing ICTC to facilitate the introduction and commercialization of hydrogen vehicles along this route.

The objective of this study is to evaluate whether the existing vehicle stock and fueling infrastructure of the ICTC can help form the foundation for the development of the "hydrogen highway" that many policy makers and stakeholders are interested in creating. This paper evaluates the potential for "piggy-backing" early hydrogen production, dispensing, and consumption onto the already successfully deployed natural gas vehicle projects pioneered by the ICTC. In addition, the authors have made recommendations for five specific demonstration projects (four primary and one alternate) that use existing ICTC fleets and infrastructure for hydrogen technology development. If successful, these demonstration projects could help smooth the way for the integration of hydrogen into the transportation sector by helping to reduce its cost, establish initial consumers, and provide early demand for hydrogen production. In addition, this project could provide the benefit of stimulating the development of technologies that could aid in accelerating the introduction of hydrogen-capable heavy-duty vehicles, and will help fill gaps in projected future hydrogen fueling infrastructure.

The authors have surveyed the infrastructure and deployment activities in the ICTC project and have determined that several of these sites will make excellent platforms for future hydrogen demonstration projects. These platform sites are all located in California, and include Harris Ranch near Coalinga, the City of Tulare, the City of Barstow, and USA Waste in Fresno. An alternate site has also been identified at the UPS facility in Ontario. Each of these sites enjoys substantial advantages for potential future hydrogen technology demonstration and deployment, including the strategic importance of the location, the willingness of the fleet operator to participate in a demonstration project, and the potential ease with which hydrogen dispensing or on-board fueling technology can be integrated into existing assets.

2017 Traffic Volumes : Route 99

Jump to Route: 1 | 2-4 | 5-6 | 7-10 | 11-15 | 16-20 | 22-33 | 34-43 | 44-50 | 51-59 | 60-70 | 71-80 | 82-86 | 87-91 | 92-98 | 99 | 101 | 103-116 | 118-133 | 134-161 | 162-163 | 164-178 | 180-197 | 198-220 | 221-275 | 280-405 | 505-980

Dist	Rte	Rte Suffix	CO	Post Mile Prefix	Post Mile	Post Mile Suffix	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month
06	099		KER	L	0.748		JCT. RTE. 5				5100	53000
06	099		KER		2.732		METTLER, JCT. RTE. 166 WEST	5100	53000	48500	5100	53000
06	099		KER		5.343		DAVID ROAD	5100	53000	51000	5400	61000
06	099		KER		7.295		SANDRINI ROAD OC	5400	61000	54000	5400	61000
06	099		KER		9.299		HERRING ROAD OC	5400	61000	54000	5500	62000
06	099		KER		10.930		OLD U. S. 99	5500	62000	55000	5300	60000
06	099		KER		13.411		JCT. RTE. 223 EAST	5300	59000	53000	5600	64000
06	099		KER		15.432		HOUGHTON ROAD	5600	64000	59000	5700	65000
06	099		KER		17.500		JCT. RTE. 119 WEST	5700	65000	61000	6200	76000
06	099		KER		19.541		PANAMA LANE	6200	76000	71000	8300	113000
06	099		KER		21.082		BAKERSFIELD, WHITE LANE	8400	113000	102000	10800	137000
06	099		KER		22.604		BAKERSFIELD, MING AVENUE	10800	137000	131000	12400	158000
06	099		KER		23.514		JCT. RTE. 58 EAST	12400	158000	153000	14200	165000
06	099		KER		24.599		BAKERSFIELD, CALIFORNIA AVENUE	14200	165000	154000	12300	160000
06	099		KER		25.654		JCT. RTE. 58 WEST, JCT. RTE. 178 EAST	12400	160000	154000	10100	134000
06	099		KER		26.776		BUCK OWENS BOULEVARD	10100	134000	124000	10100	134000

06	099	TUL	18.429	TIPTON, JCT. RTE. 190 EAST	4400	55000	50000	4500	57000
06	099	TUL	19.463	TIPTON, AVENUE 152	4500	57000	52000	4700	60000
06	099	TUL	23.489	AVENUE 184	4650	58000	54000	4700	58000
06	099	TUL	25.433	AVENUE 200	5000	65000	58000	5000	65000
06	099	TUL	26.053	AIRPORT					
06	099	TUL	27.600	PAIGE ROAD (AVENUE 216)	5000	68000	58000	5000	61000
06	099	TUL	28.605	TULARE, BARDSLEY AVENUE	5000	61000	58000	5400	66000
06	099	TUL	29.568	TULARE, JCT. RTE. 137	5400	66000	62000	5500	68000
06	099	TUL	30.578	PROSPERITY AVENUE	5500	68000	64000	5100	63000
06	099	TUL	31.849	CARTMILL ROAD OC	5100	63000	59000	5100	63000
06	099	TUL	33.222	SOUTH TAGUS	5100	63000	59000	5100	63000
06	099	TUL	33.942	TAGUS (AVENUE 264)	5500	68000	64000	5800	71000
06	099	TUL	36.411	CALDWELL AVENUE (AVENUE 280)	5800	71000	67000	5900	71000
06	099	TUL R	38.714	VISALIA, JCT. RTE. 198	5900	71000	68000	5800	70000
06	099	TUL	40.790	GOSHEN	5700	68000	64000	5600	66000
06	099	TUL	48.710	TRAVER	5500	66000	63000	5600	67000
06	099	TUL	51.806	DODGE AVENUE	5600	67000	63000	5800	70000
06	099	TUL R	53.822	MENDOCINO AVENUE	5800	70000	66000	5500	66000
06	099	TUL R	53.939	TULARE/FRESNO COUNTY LINE	5500	66000	63000		
06	099	FRE R	0.000	TULARE/FRESNO COUNTY LINE				5500	66000
06	099	FRE R	0.951	KINGSBURG, JCT. RTE. 201 EAST	5500	66000	63000	5800	70000
06	099	FRE R	2.058	BETHEL AVENUE	5800	70000	67000	6000	73000
06	099	FRE R	3.742	MOUNTAIN VIEW AVENUE	6000	73000	69000	6600	81000
06	099	FRE R	5.321	SELMA, SECOND STREET	6600	81000	76000	6900	85000
06	099	FRE	6.431	JCT. RTE. 43 SOUTH	6900	85000	78000	8000	95000
06	099	FRE	9.164	MANNING AVENUE	8000	95000	91000	87000	107000

06	099	FRE	11.098	FOWLER, MERCED STREET	8700	107000	101000	9200	109000
06	099	FRE	11.836	ADAMS AVENUE	9100	109000	103000	9400	111000
06	099	FRE	12.404	CLOVIS AVENUE	9400	111000	105000	8500	101000
06	099	FRE	14.512	AMERICAN AVENUE	8500	101000	96000	8900	105000
06	099	FRE	15.491	CHESTNUT AVENUE	8900	105000	100000	8200	96000
06	099	FRE	15.864	CENTRAL AVENUE	8200	96000	92000	9200	109000
06	099	FRE	16.925	CEDAR AVENUE	9200	109000	104000	8800	104000
06	099	FRE	17.255	FRESNO, NORTH AVENUE	8800	104000	99000	9600	113000
06	099	FRE	18.544	FRESNO, JENSEN AVENUE	9600	113000	107000	10400	122000
06	099	FRE	19.290	FRESNO, NORTH JCT. RTE. 41	10400	122000	117000	6300	75000
06	099	FRE	20.190	FRESNO, VENTURA STREET	6300	75000	72000	7700	93000
06	099	FRE	20.737	FRESNO, FRESNO STREET	7700	93000	89000	7600	91000
06	099	FRE	21.012	FRESNO, STANISLAUS STREET	7600	91000	87000	8900	104000
06	099	FRE	22.160	JCT. RTE. 180S	8900	104000	99000	12800	148000
06	099	FRE	22.735	FRESNO, BELMONT AVENUE	12800	148000	139000	12300	143000
06	099	FRE	23.304	FRESNO, OLIVE AVENUE	12300	143000	133000	11600	138000
06	099	FRE	23.852	MC KINLEY AVENUE	11600	138000	129000	10800	128000
06	099	FRE	24.416	FRESNO, CLINTON AVENUE	10800	128000	120000	9300	113000
06	099	FRE	25.000	FRESNO, SHIELDS AVENUE	9300	113000	107000	8400	110000
06	099	FRE	26.224	DAKOTA AVENUE	8400	110000	104000	8600	111000
06	099	FRE	26.554	ASHLAN AVENUE	7000	91000	86000	6400	83000
06	099	FRE	28.102	SHAW AVENUE	6400	83000	79000	6300	81000
06	099	FRE	30.988	HERNDON AVENUE	6300	81000	77000	6600	85000
06	099	FRE	31.609	FRESNO/MADERA COUNTY LINE	6600	85000	81000		
06	099	MAD	0.000	FRESNO/MADERA COUNTY LINE				6600	85000

I-5 FRESNO COUNTY

06	005	FRE	0.228	JCT. RTE. 269, LASSEN AVENUE	5000	47000	42000	5200	48000
06	005	FRE	5.501	JAYNE AVENUE	5200	48000	43000	5200	47500
06	005	FRE	14.873	JCT. RTE. 198	5200	47500	43000	5100	48000
06	005	FRE	17.964	JCT. RTE. 33 SOUTH, JCT. RTE. 145 NORTH	5100	48000	43000	5100	48500
06	005	FRE	29.955	JCT. RTE. 33 NORTH	5100	48500	43000	5200	46000
06	005	FRE	38.359	KAMM AVENUE	5200	46000	41000	5300	45500
06	005	FRE	45.798	MANNING AVENUE	5300	45500	41500	5400	47000
06	005	FRE	48.990	PANOCHE ROAD	5400	47000	42500	5000	51000
06	005	FRE	52.746	RUSSELL AVENUE	5000	51000	41500	4950	50000
06	005	FRE	60.077	SHIELDS AVENUE	4950	50000	41000	5000	49500
06	005	FRE	65.782	NEES AVENUE	5000	49500	41500	5100	53000
06	005	FRE	66.159	FRESNO/MERCED COUNTY LINE	5100	53000	43000		
10	005	MER	0.000	FRESNO/MERCED COUNTY LINE				5600	45500
10	005	MER	6.280	JCT. RTE. 165 NORTH	3900	35500	30000	4750	40500
10	005	MER	17.578	JCT. RTE. 152	5300	35000	32000	4000	41500
10	005	MER	21.839	JCT. RTE. 33	3900	41000	34500	3100	33000
10	005	MER	23.600	NORTH OF ROUTE 33 @ SANTA NELLA TRUCK SCALES	4000	37000	32500	4300	44000
10	005	MER	32.391	JCT. RTE. 140 EAST	4550	46500	42900	4050	42500
10	005	MER	32.477	MERCED/STANISLAUS COUNTY LINE	4050	42500	41500		
10	005	STA	0.000	MERCED/STANISLAUS COUNTY LINE				3700	42500
10	005	STA	5.505	STUHR ROAD	3700	41000	40000	3700	41000
10	005	STA	10.719	FINK ROAD	3700	41000	40000	3700	41000
10	005	STA	15.855	DEL PUERTO CANYON ROAD/SPERRY AVENUE	4050	42000	41000	4700	53300
10	005	STA	22.992	INGRAM CREEK (HOWARD ROAD)	4950	56000	50300	4750	43000
10	005	STA	28.055	STANISLAUS/SAN JOAQUIN COUNTY LINE	4750	58000	42500		

Doctor to Fresno officials: If people cannot breathe, nothing else matters

BY DR. PRAVEEN BUDDIGA

As a physician, I see many patients every day. Whether it is asthma, COPD, or other chronic respiratory diseases, it is evident that poor air quality is having an impact on our community's health. Unfortunately, I see these impacts far too often in Fresno.

The Fresno region, and much of the Valley, ranks among the worst air quality in the nation. In the most recent State of the Air report from the American Lung Association, Fresno ranked third worst for ozone, or smog pollution, and particle pollution, largely caused by vehicle traffic and freight.

California has some of the strongest policies in the country to reduce vehicle emissions through both zero-emission vehicles and clean fuels. Those policies are an important tool to decrease vehicle emissions, but we need more tools to solve the problem. We must address the fundamental changes that need to happen in our state's land use planning and transportation system decisions.

To clean the air and improve health we must change the way we have designed our neighborhoods for decades.

We have placed the focus on sprawl that leads to increased traffic and air pollution while reducing the ability for residents to walk, bike or share a ride for even the simplest of errands. It is time we make regional planning decisions based on public health and reduced air pollution.

Last week the California Air Resources Board started the process to update regional climate targets for 2020 and 2035, focused on reducing emissions through land-use and transportation decisions.

These targets, originally established by state legislation in 2008, will guide community-planning decisions in Fresno and beyond to limit air pollution from vehicles. For public health, it is critical the Air Board pass the strongest targets to continue efforts to reduce air pollution.

Breathing unhealthy air can affect everything from birth weight to school performance, and it can lead to an increased risk for a lifetime of lung disease. Air pollution is connected to increased asthma rates, emergency room visits and hospitalizations, and even premature death.

The San Joaquin Valley is one giant basin, which naturally traps air pollution. We can't change our geography, but we can urge regional planners to consider public health when designing neighborhoods and transportation systems for easy access to schools, work, entertainment and shopping.

The regional climate targets set by Senate Bill 375 in 2008 are already working to better align community planning with state goals to reduce greenhouse-gas emissions. Our state and local leaders must now accelerate the progress to achieve California's bold vision for climate action and healthier communities.

Local governments especially should take advantage of state financial resources now available to them to build healthier communities. California's Climate Investment Program, funded through cap and trade funds, combined with other state funding, is available to support sustainable, healthy community planning, transit, active transportation and more.

One key example of this is the Transformative Climate Communities grant program that will invest $70 million into Fresno communities in the next year, with pending proposals for energy efficiency, solar and urban greening projects in Southwest Fresno worthy of state funding. We can build on the success of our community voices and build a healthier Fresno for everyone.

I join with physicians from around the state to urge the California Air Resources Board to make health improvement the top priority and adopt the strongest possible regional climate targets together with other strategies to reduce vehicle dependence.

I call on our local government officials to take advantage of those climate funds now available to make our communities healthier and reduce air pollution. We must continue to do everything we can to fight for clean air in our region. Because if we can't breathe, nothing else matters.

Dr. Praveen Buddiga is a specialist at Family Allergy Asthma Clinic in Fresno and a volunteer with the American Lung Association in California.

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