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California Hydrogen Car Owners Association (CHCOA) Proton Monthly – Combined Issue – March/April 2024

April 16, 2024

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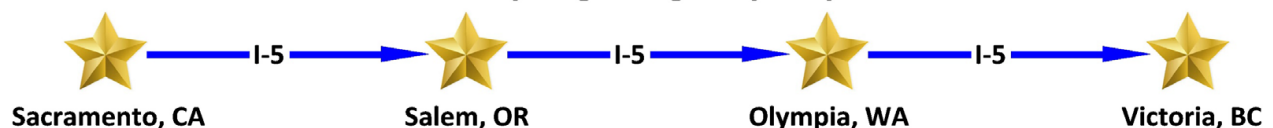
- We Do Not Do This Alone -

CHCOA is an all-volunteer, nonprofit organization. We never have, and never will, accept a donation from a business, or entity, which could impact our ability to be independent representatives of hydrogen fuel cell drivers in California.

Having said that, we can't succeed in our work to have hydrogen cars play a significant role in California's green energy future without the help of others. Business entities, large and small (many of which are noted above) have invested vast sums of money on the bet that hydrogen in transportation will succeed. We wish them the best of luck; for their success, and CHCOA's success converge on this mission.

If as we hope, they succeed, they will be doing right by their shareholders and at the same time doing right by the climate. They will be "Doing Well by Doing Good".

Join us on the Hydrogen Highway - September 2025



2023 Platinum Proton Award is Announced

Each year, the CHCOA Platinum Proton Award is given to:

The person, company, or nonprofit organization that has done the most to promote the use of hydrogen cars in California in the previous year.

After reviewing the nominations, the Executive Committee has made their decision and has announced that the Toyota Motor Company is the winner of the 2023 award. The sentiment that seems to summarize the Committee's decision was, "... Toyota has done the yeoman's work in moving hydrogen-fueled cars forward."

Congratulations Toyota!



From Left to Right: Greg and Bobbie Cane, Nils Hay

A Conversation with a Churchill Fellowship Recipient from Down Under

Last Sunday, we had the opportunity to talk for bit with Nils Hay, a [Churchill Fellowship recipient](#), and CEO of the Mid West Development Commission of Western Australia. Western Australia is a region of vast solar, wind and mineral resources and, in many ways, just beginning their journey toward switching to a green economy.

California is known around the world for its commitment to combating climate change including the role that hydrogen will play in a green energy future. Nils was interested in our thoughts on California's hydrogen economy, from the viewpoint of FCEV drivers.

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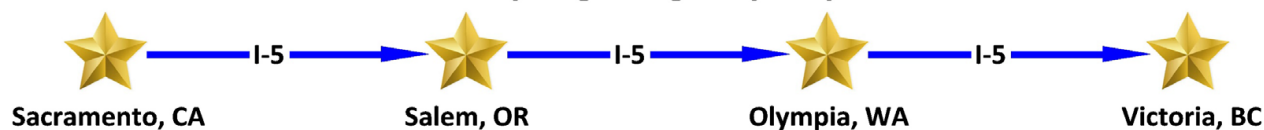


March and April were very busy months for CHCOA. There was more of everything; more events, more member participation; more tours and more interviews. As a result, we ended up with a combined March/April newsletter that was longer than usual. Still, we've got a number of great articles "on deck" for the May issue. There just wasn't time and space to fit them in here.

This newsletter reports on the ongoing dedicated work of our members without whose help it would not be possible. Our sincerest thanks to all of you.

- Greg and Bobbie Cane greg@h2tonps.org
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HYDROGEN VILLAGE



**Overview of the Day –
By Bobbie Cane**

On March 6, **Hydrogen Village – 2024** brought together approximately 300 hydrogen enthusiasts in front of the California State Capitol. The dynamic event was organized by the Hydrogen Fuel Cell Partnership and RE+ Events.

This year, the impressive displays highlighted a hydrogen-powered bus from AC Transit and trucks from Toyota, Hyzon, Cummins, and Hyundai along with exhibitors from Fuel Cell Energy, BayoTech, ARCHES and others. Featured in the program were several speakers, including pro-hydrogen Senators Anna Caballero and Roger Niello, and Assemblymembers Devon Mathis and Steve Bennett, among a variety of other industry, educational and community leaders

Along with the Association’s Gen 2 Mirai (with “H2 for the Future” logo prominently displayed on both sides 😊), CHCOA was able to staff a table in the event tent. Highlighted were posters and hand-outs with our messages of, **“200 (H2 Stations) by 2030”**, and **“Green Before the Grid”**.

Early in the morning, Greg and I, along with fellow CHCOA member, Shelia Jackson, walked over to the Legislative building, and went to every legislative office (all 120!) to give them a small “palm card” with an invitation to the Village event on one side, and our logo and talking points on the other.

In addition to Shelia and ourselves, CHCOA members Tadashi Ogitsu and Glenn Rambach rounded out our contingent and we spent the day talking with many folks who were interested in the Association, and in light-duty FCEVs, in general.

Of particular interest to us, were two groups of students from the St. John Notre Dame Middle School. They were involved in the [California Horizon Educational Hydrogen Grand Prix](#) (H2GP) program. The H2GP program challenges them to design, build and race their own

hydrogen-powered cars from a kit containing a fuel cell and mechanical components. If they continue to be successful, these Toyota-sponsored teams will compete in a thrilling world final in Anaheim this September. The student’s excitement was contagious, and the future of hydrogen in transportation is looking brighter already!

To read more about Hydrogen Village - 2024, take a look at the [Post-Show Report](#).



CHCOA members speaking with visitors at Association’s Hydrogen Village display



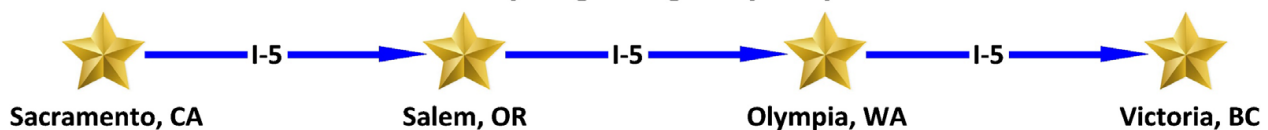
“Diligent and Courteous Advocacy”

Our association is a 501(c)(6) nonprofit, mutual benefit, organization and not a 501(c)(3) charitable organization. As a mutual benefit organization, we are allowed to advocate for a cause. Our cause is to work to make sure that light-duty FCEVs play an important role in California’s green energy future. As the description says, we are a nonprofit group; we are all volunteers working for a cause that we believe in.

The Association Bylaws state that our advocacy shall be “diligent and courteous”. We do this, not because we are nice people (which we are 😊), but because we believe that this *modus operandi* will best further our cause.

To help us keep track of past, present and future work, we have added an [“Advocacy” section](#) to our website. It will be updated weekly to help us coordinate our efforts.

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True Zero Santa Ana Facility

Working to Stay Ahead of the Curve

Last month, seven CHCOA members and Sheen Sidhu (District Representative from Sen. Josh Newman’s office) had the privilege of touring the First Element Fuel (FEF) offices / fabrication facility in Santa Ana, CA. Our host was Dr. Matt Miyasato, Chief Public Policy & Programs Officer. Matt was assisted by Josh Adams, Director of Product Engineering, Tyler Furuya, Director of Systems Engineering, and Hiroaki Oka, Director of Finance.

The first stop was at their office area, where we could see large high-definition monitors showing the status of all 41 of their stations, both gaseous and liquid. By using the cameras and monitors at each station, they are able to check dozens of components in real time, so they can send out a technician with the right tools to fix problems when they arise. They can also reboot a station remotely and usually try this first before sending out a technician. The Harris Ranch station, near Coalinga, is their number one focus, as anyone who makes the long drive between LA and San Francisco will be happy to hear - it is the only station in the Central Valley between the two cities.

FEF, which operates the True Zero hydrogen refueling stations (HRS), owns 85% of all HRS in California.



Admittedly, one of the few things they can’t control is the Point of Sale Interface (POS) as there is a separate company that takes care of these. If there is a problem with the POS, they won’t know it at True Zero, unless a customer calls in, or they notice that a station has not had anyone

fueling there for several hours. Matt mentioned that there is a possibility that in the future, fueling may be able to be done with a phone app, perhaps even a unified app that can be used at any HRS, regardless of ownership.

In addition, they have a “score board” where they can see how their stations are doing on a daily/weekly/monthly/yearly basis and how they compare to last year. This board also keeps track of how many million miles have been driven by customers fueling at their stations, and how many millions of

pounds of CO₂ have been saved since they began operating stations in 2013 – very inspiring!

While they acknowledge that there have been many issues with their gaseous stations, often due to the availability of hydrogen gas, their liquid stations have an impressive uptime average of 95-98%.

From there we went to the manufacturing floor. As would be anticipated, like a true machine shop, there were massive computer-controlled lathes and milling machines; FEF finds that the real value of having a machine shop in-house is the rapid turnaround time when parts need to be fabricated.

Here, True Zero is building most of the components for their stations. Such was the case for their most recent station at the Port of Oakland, their first “mixed-use” station. The station equipment was fabricated here in just 4 months and then shipped to the site (the station will be commissioned in the next few months). They can also store equipment here – they have a large inventory of pumps so that if one goes out somewhere in their stations, they can replace it quickly.

In order to make upgrades to the facility, FEF recently received a \$7 million grant from the California Energy Commission. Soon, they will be adding additional equipment with the goal of “bringing station complexity down, and the performance up”.

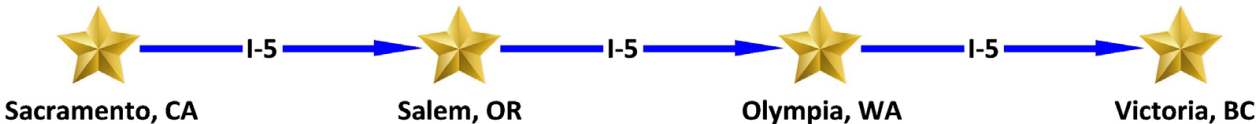
The Santa Ana site is also a testing facility, for their own equipment, and others. FEF invites prospective suppliers to come and test their equipment. Necessarily, First Element must have certain expectations of the components to be installed in their stations. If a prospective supplier’s equipment doesn’t measure up, they find someone else to work with.

One of their next stations will be at McClellan Park, due to be completed in 2025; this station should help relieve some of the fueling challenges in the Sacramento area, which has been operating with just one station for some time now. Another exciting fact that we were very happy to hear - from now on, every True Zero heavy-duty station will include light-duty dispensers.



Parts fabrication on computer-controlled lathe.

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From Biogas, to the Future

A Visit to the H2B2 SoHyCal Facility

On our trip to southern California in mid-March, we stopped in Kerman, CA (near Fresno) to tour the 2-acre H2B2 hydrogen plant. The project is a combined Biogas/Solar PV hydrogen production facility which they have aptly named “SoHyCal” (Solar-Hydrogen-California).

Our tour guide was Miguel Ruelas, who is in charge of Business Development and Client Relations. According to their website, the facility, which started hydrogen production in September 2023, is “the largest operational green H₂ production plant powered entirely by renewable energy in North America, to date”. H2B2 is based in the US, but as well in Spain and India, in addition to the Kerman production facility with some other projects in several geographies such Europe, Latin America and Middle East .



Miguel, born and raised in Fresno, has worked for H2B2 for one year. He was happy to show us the various components of the plant and to talk about the current and future operations.

The facility is located next to the Bar 20 Dairy farm, from which they obtain excess biogas from the anaerobic digestion of the manure. The biogas powers an internal combustion engine/generator which, in turn, sends power to the PEM electrolyzers for the production of hydrogen. The engine/generator emits CO₂. Still, the process reduces greenhouse gas emissions and is widely accepted as being climate-friendly.*

The produced hydrogen is transferred to tube trailers at up to 520 bar (7,500 psi). Using this “drop and swap” method, they are currently supplying offtakers in the Central Valley.

At the present time they are able to produce up to 1,200 kgs per day of hydrogen. H2B2 has received a \$3.95 Million grant from the California Energy Commission (CEC) for the Phase 1 part of the project. Phase 2 will include the installation of solar PV arrays on the adjacent property. The use of the PVs to additionally

power the electrolyzer will permit the project to run at its full nameplate capacity of 3 tonnes per day. Work is anticipated to be completed on Phase 2 in the 2nd quarter of 2025.

As CHCOA members know, it is the first goal of the Association to increase the number of hydrogen refueling stations (HRS) in California.

Like any good business, H2B2 plays their cards close to the vest. Having said that, there are hints that they are considering the construction of an H₂ station in the greater Fresno area in the not-too-distant future.

– What a great new location for the expanding HRS network that would be!

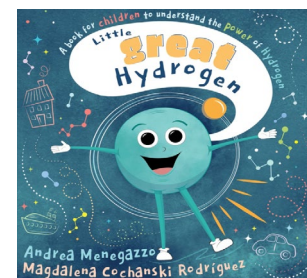


Aerial View of SoHyCal Hydrogen Production Facility

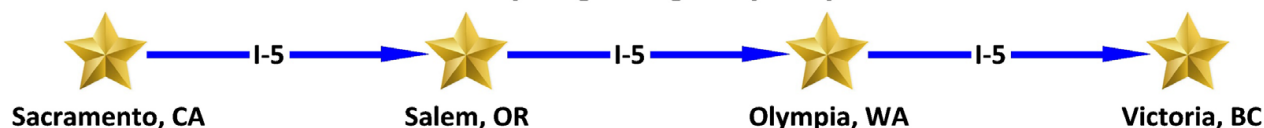
*From *Sustainable Sanitation and Water Management*, Authored/Compiled by Niels Sacher (Xavier University), et al
 “Biogas systems are an environmental(ly) friendly way of energy production and have a positive impact on climate change. In fact, the contribution of a methane molecule (CH₄) to the greenhouse effect is 21 times greater than that of a carbon dioxide molecule. Therefore burning methane, even though producing CO₂, reduces its impact on the environment.”

We’re indoctrinating our grandkids at an early age.

Our daughter found this great children’s [book on hydrogen](#).



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A Company Well-Positioned for Hydrogen’s Green Energy Future

A Most Informative Visit with Joe Gagliano

While down in Southern California in mid-March, we had the chance to sit down at a Starbucks with Joe Gagliano, Regulatory Manager - Hydrogen for Mobility - Americas at Air Products. Joe has a degree in electrical engineering with a master’s in public policy. He has an impressive hydrogen resume, with previous experience at United Hydrogen (now part of Plug Power) and the Hydrogen Fuel Cell Partnership.

For us it was a fascinating look into a company that *“...works across all facets of the hydrogen value chain, including production, distribution, storage, and dispensing...”*.

CHCOA: We see that Air Products (AP) is currently building, or will soon be building, numerous hydrogen refueling stations (HRS).

With all this activity, AP must be hopeful about the future of hydrogen in transportation?

JG: Yes, we are looking at many sites, and, as you say currently in the process of station development. The first will be the Galt station (south of Sacramento) which is expected to come online in 2025. We received a grant from the CEC for that station and the Visalia station.



CHCOA: Will they be for light-duty vehicles?

JG: Yes, they will all be multi-modal; LD/MD/HD. It takes about 24 months, on average, to build a station, and there are a lot of variables involved. Sometimes you have to get an area rezoned, also there are environmental and traffic studies, working with the planning commissions, etc.

CHCOA: Will the stations be liquid H₂?

JG: Yes, all the stations from now on will be liquid, that is, have cryogenic storage.

CHCOA: Beside Galt and Visalia, where else will the stations be?

JG: We are considering a number of sites that are in the [SB 671 report](#) (about 10 or 11 AP stations are listed there) in addition to about 50 Nikola stations. They are along priority freight corridors.

CHCOA: Does AP sell H₂ to other companies?

JG: We used to, but now that we are focused on building our own HRS, we are using the hydrogen we produce for our own stations.

CHCOA: Will most of your green hydrogen be from solar and wind?

JG: We are building a green electrolyzer [plant in Casa Grande, AZ](#), which is expected to be done in 2025. We are also building a blue H₂ facility in TX and another in Edmonton, Alberta.

CHCOA: Some CHCOA members are hoping to make a trip from the Golden Gate Bridge to the Lions Gate Bridge in Vancouver, BC in the fall of 2025, so we are interested in mobile fuelers. Does AP have mobile fuelers?

JG: Yes, we have many. I will give you the name of a person who works with projects to deploy mobile fuelers.

CHCOA: Do you drive an FCEV?

JG: In the past, yes, I have driven one since 2015. Recently, my lease ran out on a Clarity, so now I’m waiting for Honda to make their [new FCEV hybrid CR-V](#) available later this year.

CHCOA: Can our Association help your company in any way?

JG: Yes, it would be helpful if any of your members could attend public meetings in areas where we are trying to build stations to voice support. Also, letters of support when we are asking for funding would be appreciated.

CHCOA: Do you have any additional words of wisdom for us?

JG: Hydrogen and electric are going to be the gas and diesel of the future, and you can quote me on that! Also, make no mistake, heavy-duty needs light-duty, and vice versa.

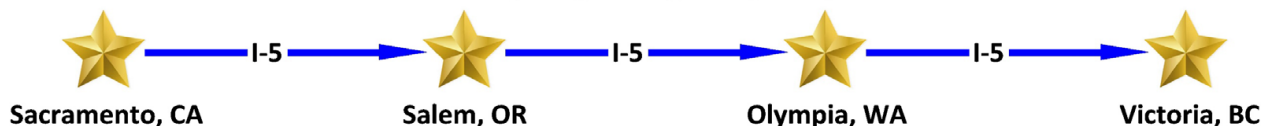


Big Rigs / Small Rigs,
a “Symbiotic Relationship”



Image source: CHCOA Newsletter – Sept. 2023

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Another Solid Vote of Confidence for Hydrogen Cars in CA

A visit to the Honda Torrence R & D facility - March 20th, 2024 -

By Steve Mirkin, Member, CHCOA Executive Committee

Evolution, is defined as “the gradual development of something, especially from a simple to a more complex form.”

We humans evolved from the simplest of single cells to the people you see every day.

The automobile began as a simple car developed by Karl Benz in 1886. The first electric car was developed in 1891 (sorry Elon, you were not the first). The first gasoline hybrid car was developed by Honda in 1999. The first fuel cell car sold was made by Honda in 2008. And, on March 20th, 2024, Honda unveiled its newest car, the CR-V fuel cell “hybrid” car.

Why the quotation marks? Well, all fuel cell vehicles use a battery in between all the electronics of the car, including the motor.

However, this car has a large enough battery to allow it to be a plug-in model, allowing it to be recharged at any available charging station, including at your own home as well. The Mirai has only a 1.24 kWh battery, used as a “traction” battery for acceleration. The CR-V has a 17.7 kWh battery allowing it to hold enough electrical power to travel 29 miles on pure battery. The proposed distance on hydrogen is about 270 miles for a combination of nearly 300 miles; short of the Mirai’s 400-mile range. This is due to a smaller load of H₂ compared to the Mirai. However, the CR-V is an SUV,



The 2025 Honda CR-V eFCEV

allowing it to have a much larger storage capacity of 106 cubic feet.

The CR-V is to be “hand” assembled in Marysville, Ohio (where the NSX sportscar was built) and should be available later in 2024. Honda will only be leasing the car and pricing for the monthly lease has not been determined as of yet. To start, Honda plans to make only about 300 vehicles per year, so get in line quickly if you want to get one of these new cars.



Perzynski reviews the capabilities of the stationary fuel cell power station

Interesting side note: David Perzynski, Assistant Manager, Honda Hydrogen Solutions Business Development, took us to see the Stationary Power Station on the Honda campus. It is the backup power for the data

center at the campus and is powered by eight retired Clarity fuel cells for a total of 500 kWh of electrical power (no dirty diesel engines for backup power). Talk about intelligent repurposing!

Marc Deutsch, Assistant Manager Alternative Fuels Sales and Marketing at Honda was there to answer questions from the audience, and he told us that Honda plans to be a zero emissions company by 2040, moving forward by developing both light and heavy-duty hydrogen vehicles (a class 8 truck is planned for 2027). Honda wants to be a leader in fuel cell power and their plans are far reaching, including to one day having a sustainable mission on the Lunar surface.

Back on Earth, I was able to drive the CR-V around the campus and found it to be a fun little SUV. The layout of the interior is much in line with the gasoline CR-V, yet Honda has made it upscale in quality of parts, design, and safety features. It is peppy, handles turns with ease and is a car anyone can jump into and drive. I think consumers are ready for a hydrogen powered SUV.

Why, we even got lunch. All in all, a very excellent presentation by Honda and as I told Perzynski, the more hydrogen cars there are, the merrier we all will be. Remember: Demand Drives Distribution.

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