



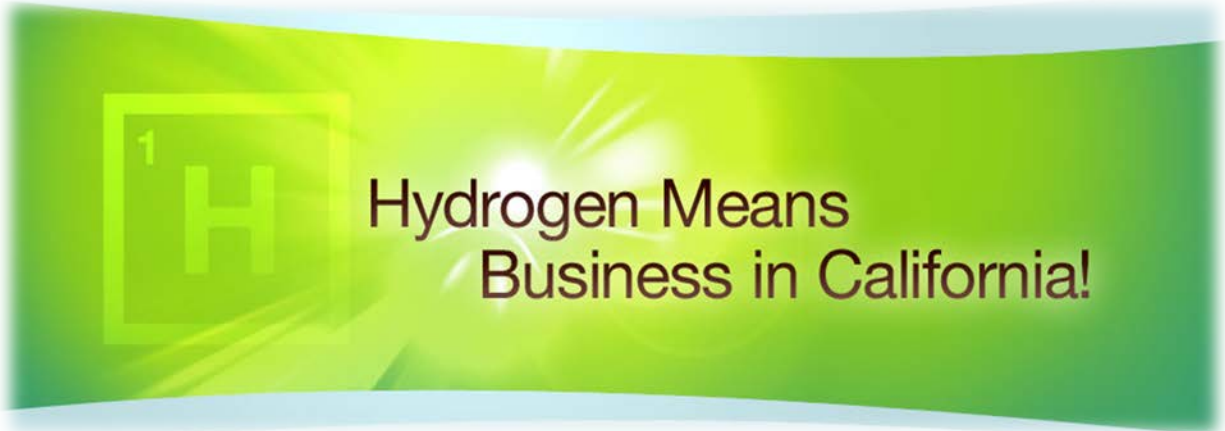
ANNUAL REPORT 2016

MARCH 30, 2017

ABOUT THE CHBC

The California Hydrogen Business Council connects hydrogen technology developers, businesses, energy leaders, government, and infrastructure providers with a common vision of energy and transportation fueled by zero-emission hydrogen.

Our members develop, adapt, and implement technology and services that are taking the hydrogen economy into the mainstream.



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2016 – YEAR OF PROGRAM EXPANSION AND CREATING IMPACTS

In 2016, the CHBC set out to achieve a number of ambitious goals at a time when hydrogen and fuel cell technology have become a reality in the California marketplace. Three programmatic areas were designed to support market growth and attract new business to California to help create new jobs, new projects, cleaner air and a healthier environment for all residents of the Golden State.

The overall 2016 strategy centered around continuing and executing on what was started in 2015, with a strong drive to expand membership and California representation of the CHBC. 2015 events not held by the end of 2015 were held in 2016.

The CHBC completed the transition to **management and advocacy of market sector interests through its Sector Action Groups (SAGs)** in 2016, making them the key drivers on CHBC's activities, with regular meetings of active members. The SAGs in 2016 were:

- **Heavy Duty Transportation, Goods Movement and Clean Ports SAG** – medium and heavy duty fuel cell vehicles and all mobile and stationary hydrogen and fuel cell products and services for freight systems, goods movement, and the ports.
- **Hydrogen Energy Storage and Renewable Hydrogen SAG** – the focal point for energy storage, renewable pathways to hydrogen and work that relates to utilities and stationary power, the Public Utility Commission and Cal ISO
- **Transportation and Public Transit SAG** – principally, FCEV vehicles and buses, and hydrogen fueling infrastructure

In addition, two committees provided additional guidance:

- **Business Expansion and Membership Development Committee** – established to guide the staff in supply chain development and membership growth.
- **Education and Outreach Committee** – continued to provide staff support for newsletters, and other outreach materials.

The principal functions of the CHBC can be summarized as follows: be a **convener** of leaders; enable **collaboration**; **communicate** information to the public; and **advocate** for CHBC market sector interests. The SAGs, in most settings were the primary leaders for these functions. Under the leadership of the SAG chair, each SAG met by conference call or in person once a month to be proactive in recommending CHBC program and advocacy positions in their market sector. At both Summits, a one to two hour period was set aside for face-to-face SAG meetings. Each SAG reviewed the CHBC calendar for procurement planning, regulatory and legislative opportunities for CHBC action and responded to staff and leadership requests for review of CHBC advocacy positions and other written statements. Furthermore, each SAG provided guidance for the following year program plan, recommending funding strategies where activities may require additional resources.

STAFFING

Technology Transition Corporation (www.ttcorp.com) managed and staffed the growing depth and breadth of the CHBC's activities. TTC is a known name in the hydrogen and fuel cell industry, having managed the National Hydrogen Association (NHA) from its founding in 1989 to the merger with the U.S. Fuel Cell Council to create the Fuel Cell and Hydrogen Energy Association (FCHEA) in 2010. TTC also continues to manage the Hydrogen Education Foundation (HEF) and its programs, the Hydrogen Student Design Contest (www.hydrogencontest.org) and H-Prize (www.hydrogenprize.org).

Jeff Serfass, President of TTC has three decades of experience in clean energy, mainly in hydrogen sector, serving as President of the NHA and the HEF. As CHBC Executive Director he provides strategic guidance to the organization.

Emanuel Wagner, TTC Program Manager, has 7 years experience in managing clean energy projects for the Hydrogen Education Foundation and 8 years experience of program management for the Biomass Thermal Energy Council. Since 2012, he serves the CHBC as Assistant Director, managing the day-to-day operations of the organization.

TTC also contracted with a number of consultants to provide their experience and California relationships and connections to assist with on-the-ground support for special events like technology tours and meetings as well as information gathering and policy support. Contractors are:

- Cory Shumaker, hired to provide staff support in Los Angeles, lend his expertise on goods movement and transportation, having worked at Vision Motor Company until 2014.
- Bud Beebe, who worked at SMUD for many years and now serves the CHBC as its Sacramento representative
- Mark Abramowitz, who serves as a South Coast Air Quality Management District Governing Board consultant to the Governor's appointee on the Board, Dr. Joseph K. Lyou. Mark also runs his own consulting firm, Community Environmental Services, where he provides policy, strategic, regulatory, business development and other air quality and energy assistance to a broad range of private and public sector clients.
- Diane Moss, who supports CHBC as an Advisor in PUC and energy storage related issues. She is owner of dima Communications & Strategic Partnerships, which provides consulting services on communications and forging key relationships to sustainability related projects and businesses. Areas of core expertise include public relations, policy analysis, government affairs, business development, events, media.

2016 PROGRAM ACTIVITY

In the next sections, detailed information on the CHBC's activities in each program area will be provided. This includes Advocacy, Hydrogen Energy Storage, Education and Outreach, Events, and Membership. Additionally, goals and plans for the future will be reviewed at the end of the report. Supplementary information is provided in the Appendices.

ADVOCACY

CHBC advocacy work was directed by each SAG for their specific program area, pending approval by the Executive Committee prior to execution. Where specific advocacy work crossed SAGs, and where there is no SAG directly relevant to the particular issue, the CHBC Executive Committee provided guidance and approval of advocacy work.

Crossing all market sectors, the CHBC grew its **advocacy** effectiveness by participating in California **regulatory, legislative and agency deliberations and procurement planning**. CHBC has a broad opportunity to lead the discussion of energy strategies and technology deployment through its written positions, face-to-face meetings and presentations. The Board, SAGs and CHBC members are each important components of CHBC advocacy work, as is staff engagement and leadership.

In 2016, CHBC added Bud Beebe and Diane Moss to represent the CHBC at agency meetings and provide testimony on legislation relevant to CHBC. Staff also helped establish advocacy plans with each SAG and refreshed regularly.

HYDROGEN ENERGY STORAGE AND RENEWABLE HYDROGEN PROGRAM

The Hydrogen Energy Storage (HES) Committee was created in 2013 to address the increasingly important role that energy storage will play in California's energy future. HES has the potential to become a significant business opportunity in California, as the state moves to an ever increasing use of renewable energy, currently set for 33% by 2020. Through the HES Committee, the CHBC can provide help to California's decision makers in assisting this market growth of renewable energy and address challenges caused by this build-out. Recognition for the unique role that hydrogen energy storage can play is the focus of that work, by helping to manage the intermittency of the dominant renewables, in addition to broader grid management. The actual uses of hydrogen that can be produced off-peak by solar and wind facilities include augmenting natural gas delivered in pipelines by creating a renewable component of that gas, and its use as a

transportation fuel. Hydrogen added to a natural gas pipeline could also be retrieved downstream, thus using the pipeline itself for storage. All of these uses of renewably produced hydrogen are potential components of a hydrogen energy storage strategy.

In 2016, HES, P2G, renewable paths to hydrogen and related utility engagement was led by the HES P2G and Renewable Hydrogen SAG. The new combined SAG had over 80 individual involved. The CHBC Board Chair, Jeff Reed of Southern California Gas stepped down as SAG Chair. Jack Brouwer, UC Irvine became the new chair and Steve Jones, ITM Power remained the vice chair of this SAG.

The SAG continued to develop a critical mass of utilities and companies engaged with utilities in the CHBC; PG&E joined the CHBC with SMUD and SoCalGas already as utility members. The CHBC also joined California's ongoing energy discussions and was involved with energy storage rulemaking and became party to Distributed Energy Resource rulemaking.

On March 29, HES leadership and staff met with Carla Peterman and CPUC staff which resulted with CHBC supporting several legislative efforts and ended with amending SB1838 to be inclusive of hydrogen and fuel cell technology.

GOODS MOVEMENT AND CLEAN PORTS PROGRAM

The 2015 volunteers assisting with goods movement and clean ports activities were combined into one Goods Movement and Clean Ports SAG which included sustainable freight interests. An important sector for a wide array of CHBC members, this SAG had over 60 individuals involved. The SAG chair is Pinakin Patel, FuelCell Energy.

ARB continued to implement a number of competitive procurements to address the drive to zero emission trucks, cleaner ports and other efforts to address the environmental challenges of disadvantaged communities that often exist around ports and freight distribution centers. Staff continued to increase it relationship building with key stakeholder organizations.

On November 10, the SAG held a Clean Ports Workshop in Long Beach, CA. The workshop had 100 attendees. The SAG also submitted a letter of support (Appendix A) for AB 1657 (O'Donnell) "The California Green Port Funding Act".

TRANSPORTATION AND PUBLIC TRANSIT PROGRAM

The 2015 volunteers that signed up for Transportation and Public Transit SAGs were combined into one Transportation and Public Transit SAG which included fueling infrastructure interests. This combined SAG had 65 members. The SAG chair is Lauren Skiver, SunLine Transit.

CHBC continued to work with the California Fuel Cell Partnership in areas of infrastructure development and deployment planning for light duty vehicles. CHBC provided its independent, broader industry voice for fueling station financing and deployment, including opportunities to bridge functionality across LDV fueling, transit fueling, power to gas, and other market sectors.

On February 12, the SAG executed a gathering of California transit agencies hosted at SunLine Transit in Thousand Palms followed by a technology tour. The meeting resulted in two new CHBC members, New Flyer and El Dorado, as well as the formation of the ZEBRA group.

On April 27, staff supported CTE at the Zero Emission Transit Panel on Capitol Hill.

The CHBC provided a letter of support (Appendix B) for AB2673 (Harper) "Sales and Use Tax Exemption and Income Tax Credits for Hydrogen Refueling Station Equipment".

EDUCATION AND OUTREACH

Formed in 2012, the Education and Outreach Committee was tasked with identifying low cost high value efforts to educate customers, policymakers, investors, media and other stakeholders on the facts related to hydrogen energy and fuel cells.

Chaired by Bob Desautels, the committee works to develop or connect parties to information resources that advance the level of knowledge and interest in hydrogen and fuel cell technologies, products and markets.

Unlike the other CHBC committees, E&O Committee members are recruited from the entire membership. They help identify key stakeholders and key issues facing the industry that could be addressed through education and outreach. They assist in the development of materials and other educational resources and help develop strategies for reaching out to key stakeholders and decision makers on these issues. CHBC members can use these CHBC educational resources to help build market understanding for products and services.

The Education and Outreach Committee helps guide the organization's development of educational resources and outreach strategies, identifies materials and resources for website development, and provides input on hydrogen information materials. In 2016, the Committee focused on increasing public awareness through the use of social media outreach and shorter, more frequent newsletters.

The Committee's responsibilities were expanded to guide staff and Board leadership in assessing the need for broad public education to assist in the launch of Fuel Cell Electric Vehicles in 2016 and beyond, as well as other market sectors. The Committee also was strengthened to provide advice for planning the annual Summit.

NETWORKING EVENTS

As described in the subsequent sections, the CHBC held several successful events in 2016. The CHBC will continue to expand upon this success in 2017.

ZERO EMISSION BUS TOUR AND TRANSIT LEADERSHIP EVENT

On February 12, 2016, the CHBC held a gathering of California transit agencies hosted at SunLine Transit in Thousand Palms followed by a technology tour. The meeting resulted in CHBC engaging with the transit agencies as well as the formation of the Zero Emission Bus Resource Advocacy group.

SUPPLY CHAIN EXCHANGE AND PARTNERSHIP DEVELOPMENT WORKSHOP

On May 5, 2016, the CHBC, APEP and GO-Biz hosted a half day workshop in Long Beach, CA. The workshop cultivated new relationships between suppliers and system integrators, as well as attract and introduce new companies to the hydrogen and fuel cell market in California.

SPRING SUMMIT AT ACT EXPO – LONG BEACH, CA

The CHBC's Spring Summit, held on May 2-3, 2016 at the Long Beach Convention Center in Long Beach in conjunction with the Advanced Clean Transportation Expo. The Summit provided a balanced forum for businesses, academia, and government agencies to explore hydrogen and fuel cells through intelligent conversation, captivating presentations and thought-provoking sessions. Over 120 attendees participated in the Spring Summit.

Topics included:

Day one (May 2) includes sessions on:

- Session I: Strategic Vision on Hydrogen Infrastructure
- Session II: Spotlight on Public Transit
- Session III: Hydrogen Energy Storage and Renewable Energy
- Session IV: Spotlight on Goods Movement, Heavy Duty Transportation and Clean Ports
- Session V: Additional Topics

Day two (May 3) includes sessions on:

- Education Outreach Committee Meeting
- Transportation and Transit Sector Action Group
- Hydrogen Energy Storage and Renewable Hydrogen Sector Action Group
- Goods Movement Sector Action Group

Speakers at the Summit included:

- **Mark Abramowitz**, President, Community Environmental Services
- **John Boesel**, President and CEO, CALSTART
- **Jack Brouwer**, APEP, UC Irvine
- **Chris Cannon**, Director of Environmental Management, Port of Los Angeles
- **Yachun Chow**, Manager of Zero Emission Truck and Bus Section, ARB
- **Fernando Corral**, V.P. Sales, Western Region, Plug Power
- **Rob Del Core**, Director, Business Development, Fuel Cell Power Systems, Hydrogenics
- **Steve Ellis**, Manager, Fuel Cell Vehicle Marketing, American Honda Motor
- **Joe Gagliano**, Infrastructure Business Development, California Fuel Cell Partnership
- **Brian Goldstein**, Executive Director, Energy Independence Now
- **Abas Goodarzi**, President and CEO, US Hybrid
- **Pascal Mauberger**, CEO, McPhy
- **Diane Moss**, California Hydrogen Business Council
- **Wayne Nastri**, Interim Executive Director, South Coast Air Quality Management District
- **Pinakin Patel**, Director, Research and Special Systems at Fuel Cell Energy
- **Nicolas Pocard**, Director of Marketing, Ballard Power Systems
- **Darryl Pollica**, President and CEO, Ivys Inc. / Team Leader, SimpleFuel, H2 Refuel H-Prize Finalist
- **Jeff Reed**, Director of Emerging Technology, Southern California Gas Company
- **Jeff Serfass**, Executive Director, California Hydrogen Business Council
- **Lauren Skiver**, CEO & General Manager, Sunline Transit Agency
- **Heather Tomley**, Director of Environmental Planning, Port of Long Beach
- **David Warren**, Director of Sustainable Transportation, New Flyer

This meeting owed its success to Southern California Gas Company, the hosting organization, as well as Hydrogenics, the Gold Sponsor, and ITM Power and the California Fuel Cell Partnership, Break Sponsors. In addition thanks needs to be given to the members of the CHBC, attendees and the gracious help of volunteers from UC Irvine. The presentations for the Spring Summit are available on the Members Only section of the CHBC website, www.californiahydrogen.org.



CALIFORNIA HYDROGEN AND FUEL CELL SUMMIT – SACRAMENTO, CA

The California Hydrogen and Fuel Cell Summit was held on October 5-6, 2016 at the California EPA in Sacramento. The Summit featured national and international hydrogen and fuel cell energy industry experts and policy makers to create a forum for the exchange of information about both stationary and mobile fuel cells. The Summit helped participants recognize the already important commercial markets for these technologies and new products and technologies about to enter the commercial marketplace.

Topics included:

- Renewable Energy in California - The Vision and Challenges for the Cleantech Industry
- Envisioning Clean Air in California
- Decarbonization of the Energy Sector - Roles of Power-to-Gas and Power-to-Fuel
- Hydrogen Fueling Station Infrastructure Progress and ZEV Plans
- Experiences and New Innovations in Hydrogen Fueling Station Infrastructure Development
- Fuel Cell Electric Vehicle Rollout
- On the Road to Zero Emissions: Fuel Cell Electric Vehicles in Medium and Heavy Duty Application
- The Energy Priorities of the 2017 California Legislature
- The Legislative Landscape
- Passage of SB32
- Show & Tell, Member Updates and "The Business of Hydrogen": Case Studies of Fuel Cell Projects
- Regional Leadership To Achieve Emission Reduction Goals
- Government Programs Supporting Hydrogen Technology
- Private Financing of Clean Technology
- Governor's Office Energy Priorities for 2017
- Solutions & Opportunities for Integrating Renewables into the Grids
- Zero-Emission Transit
- Hydrogen Activities Outside CA – Where is Market Progress – Roundtable

Presenters during the summit included:

- **Mallik Angalakudati**, Vice President, Corporate Strategy, Pacific Gas & Electric
- **Michel Archambault**, Director, Business Development & Sales, Hydrogenics
- **Jean Baronas**, Hydrogen Unit Supervisor, California Energy Commission
- **Bud Beebe**, Senior Advisor, California Hydrogen Business Council
- **Analisa Bevan**, Chief, Sustainable Transportation Technology Branch, California Air Resources Board
- **Robert Bienenfeld**, Assistant Vice President, Environment & Energy Strategy, American Honda
- **Lauren Bissey Turner**, Strategic Analysis and Development - Biogas Clean Energy Solutions, Air Liquide
- **Nico Bouwkamp**, Technical Program Manager, California Fuel Cell Partnership
- **David Bow**, Senior Vice President Sales, Service and Marketing, Proton OnSite
- **Dr. Jack Brouwer**, Associate Director of UC Irvine, National Fuel Cell Research Center
- **Tim Brown**, TrueZero (a First Element Fuel Subsidiary)
- **Mark Cohen**, Vice President, Product Management, Stationary, Plug Power
- **Kevin De León**, California Senate President pro Tempore
- **Bob Desautels**, Principal, Golden State EPC, Inc
- **Tyson Eckerle**, GO-Biz, Office of Governor Brown
- **Josh Eichman**, Research Analyst, National Renewable Energy Laboratory
- **Steve Ellis**, Manager, Fuel Cell Marketing, American Honda Motor Co
- **Bill Elrick**, Executive Director, California Fuel Cell Partnership
- **Anca Faur**, Program Development Manager, Johnson Matthey Fuel Cells
- **Fabio Ferrari**, Founder and CEO of Symbio FCell and the head of The H2Mobility France Consortium
- **Angelina Galiteva**, California ISO Board of Governors, Renewables 100 Policy Institute
- **Dr. Abas Goodarzi**, President and CEO, US Hybrid Corporation
- **Craig Irwin**, Senior Research Analyst, Roth Capital Partners

- **Steve Jones**, Managing Director, ITM Power
- **Taylor Jones**, Advisor, Office of Governor Edmund G. Brown Jr.
- **Ed LaRocque**, National Manager, Fuel Cell Vehicles, Toyota Motor Corporation
- **Jaimie Levin**, Senior Program Manager, Director of West Coast Office, Center for Transportation and the Environment
- **Mike Levin**, Director Government Affairs, FuelCell Energy
- **Bill Magavern**, Policy Director, Coalition for Clean Air
- **Akiteru Maruta**, Project Manager, Technova
- **Chris McWhinney**, CEO, Millennium Reign Energy LLC
- **Daniel Mehay**, Horizon Fuel Cell Technologies
- **Mike Mills**, Senior Advisor, Sustainable Transportation, U.S. Department of Energy
- **David Moard**, CEO, PowerHouse Energy Americas
- **Diane Moss**, Energy and Environmental Policy and Government Relations Advisor, dima Communications & Strategic Partnerships
- **Mary Nichols**, Chair, California Air Resources Board
- **Graham Noyes**, Of Counsel at Keyes, Fox & Wiedman LLP & Acting Executive Director, Low Carbon Fuels Coalition
- **Lorraine Paskett**, Owner, Cambridge LCF Group
- **Fran Pavley**, Senator, California Senate
- **Nicolas Pocard**, Director of Marketing, Ballard Power Systems
- **Cliff Rechtschaffen**, Senior Adviser, Office of Governor Edmund G. Brown Jr.
- **Jeff Reed**, Director, Business Strategy and Advanced Technology, Southern California Gas Company
- **Joel Rinebold**, Director of Energy Initiative, Connecticut Center for Advanced Technology, Inc.
- **Rajinder Sahota**, Assistant Division Chief, California Air Resources Board
- **Jeff Serfass**, Executive Director, California Hydrogen Business Council
- **Cory Shumaker**, California Hydrogen Business Council
- **Lauren Skiver**, CEO and General Manager, SunLine Transit
- **Dr. Cornelius von der Heydt**, Hydrogenious Technologies GmbH
- **Sam Wade**, Branch Chief, Transportation Fuels Branch, California Air Resources Board
- **Emanuel Wagner**, Assistant Director, California Hydrogen Business Council

The presentations for this Summit are available on the Members Only section of the CHBC website, www.californiahydrogen.org. This Summit would not have been successful without the support of its Platinum Sponsor, Toyota, and its two break sponsors, Honda and Hydrogenics.



101ST STATION WORKSHOP

On June 14, 2016, the CHBC held a Financing the 101st Station Workshop in San Marino, CA. The workshop was planned after the State of California authorized \$200 million in cost-sharing to build 100 fueling stations to meet the initial needs of the market for light duty hydrogen fuel cell electric vehicles (FCEVs). The Workshop had a group of experts, thinking outside their conventional boxes, participated in a historic event to develop breakthrough concepts for building the hydrogen infrastructure primarily with private capital. The purpose of the workshop was to develop financeable business models for building hydrogen refueling stations, as California state funding was expected to trend downward. The workshop concluded, from a purely financial point of view, that early stations for the purpose of servicing passenger cars were not good investments, though they remained critical for getting the FCEV marketplace off the ground, and that public funding would have to continue. The full report can be [accessed here](#).

HYDROGEN AND FUEL CELLS IN THE PORTS WORKSHOP

On November 10, 2016, the CHBC held the Hydrogen and Fuel Cells in the Ports at Banning's Landing Community Center, Port of Los Angeles. The purpose of this event was to develop an understanding for the needs and challenges of California

ports to reduce their emissions footprint and meet California State air quality requirements as well as present current hydrogen solutions. At the conclusion of the event, the CHBC produced a report on the Ports Workshop that presented key findings, which included:

1. Port managers are keenly aware of the need to reduce emissions, and have recently delivered an updated Clean Air Action Plan. They are interested in where hydrogen and fuel cells can play a role. Suppliers need to work closely with the players at the ports to understand operations and to match technology solutions appropriately
2. Commercial fuel cell and hydrogen systems exist to provide clean mobile power in many types of vehicles and stationary power for onsite operations. The technologies need to be proven in the port environment and available in industrial quantities to move into this market.
3. Funding sources with various agencies can be accessed to move hydrogen technology into the ports, and port managers are willing and welcoming for further discussion.

The full report can be accessed here:

<https://californiahydrogen.org/sites/default/files/CHBC%20Final%20Ports%20Workshop%20Report.pdf>

BUSINESS EXPANSION AND MEMBERSHIP DEVELOPMENT

This year, the 2015 volunteers who signed up to assist with the Business Expansion in California Briefings and the Membership Development Committee were combined into the Business Expansion and Membership Development Committee. The Committee had 9 individuals involved with Anca Faur, Johnson Matthey serving as Committee Chair.

In 2016, the Committee developed a supply chain workshop for sectors with limited product options. The workshop was hosted with GOBiz and ACEP/UC Irvine at the ACT Expo and resulted significant stakeholder interest; CHBC produced a matchmaking spreadsheet of participating supply chain members, which can be accessed here:

<https://californiahydrogen.org/sites/default/files/Copy%20of%20Matchmaking%20Schedule%20-%20Tally%20Sheet.pdf>.

Using membership engagement tools and marketing materials, the Committee's work provided considerable support to CHBC's continued membership growth with 27 new members added in 2016. A full list of 2016 members is available in the Appendix.

MANAGEMENT

The CHBC held three board meetings in 2016. The first meeting was held on May 3, following the CHBC Spring Summit. This meeting mainly focused on progress made in 2016 and remaining plans. The second meeting was held on October 6 and focused mainly on 2017 CHBC Strategy. The third meeting was held on December 13 and focused mainly on 2016 in review and the 2017 Plan and Budget approval. A list of 2015 Board of Directors is available in Appendix C.

FINANCES

The CHBC's revenue in 2016 amounted to \$313,505 of which \$128,750 came from dues, with expenses amounting to \$288,014, leading to a \$25,491 net income.

PLANS FOR THE FUTURE

In 2017, the CHBC will work together with industry, government and non-profits to continue our groundbreaking work in hydrogen energy storage and power to gas; renewable hydrogen pathways; public transit; and clean ports, heavy duty transportation and goods movement. New in 2017 will be expanded government affairs activity with one or more legislative

and regulatory professionals to proactively guide and help execute our new advocacy efforts in Sacramento. This new support will be in addition to the consultants hired in 2016. This activity will include tracking bills, articulating CHBC positions, managing the process, engaging with other trades and NGOs, and leading consideration of CHBC-led proactive positions in partnership with our allies.

By 2020, the CHBC will seek to quantifiably reduce air and greenhouse gas emissions by contributing to the goals of bringing 20,000 FCEVs on the road in California; featuring 100 operating public fueling stations; putting several hydrogen medium and heavy duty fleet operations in place; and demonstrating progress toward 2025 public transit goals of 150 FCEBs on the road with fueling stations, have at least 5 transit agencies operating more than 20 FCEBs with one fueling station each in California; at least one transit agency with more than 50 FCEBs in service, more than 25 additional transit agencies informed of FCEB progress, performance, cost, and infrastructure five operating Power-to-Gas projects; and 50% of hydrogen for transportation from renewable sources.

To maximize the CHBC's effectiveness, the staff and the Board will continue to increase collaboration and cooperation with other key organizations and events in the California and beyond. The Program Plan and Budget for 2017 is available on the CHBC website (<https://californiahydrogen.org/home>).

APPENDICES

APPENDIX A – LETTER OF SUPPORT FOR AB1657

RE: SUPPORT, IF AMENDED—AB 1657 (O'Donnell) Ports Cap and Trade Funding

Dear Assemblymember O'Donnell,

The California Hydrogen Business Council (CHBC) is pleased to write in support of your AB 1657, if amended, which would direct cap-and-trade funding to California's public ports. We request clarification on the definition of zero- and near-zero emissions of Greenhouse Gases.

The CHBC is an industry association comprised of organizations and individuals involved in the business of hydrogen. Its mission is to advance the commercialization of hydrogen in transportation and stationary sources to reduce greenhouse gas, criteria pollutant emissions and dependence on oil.

California's ports are some of the most heavily utilized in the world, serving as key international gateways for billions of dollars in products entering and exiting the United States. With millions of jobs supported statewide, the state's economy and quality of life depend on the efficient and safe delivery of goods to and from our ports.

At the same time, the high volumes of trucking and shipping services associated with cargo movement generate criteria pollutants, toxic air contaminants and greenhouse gas emissions. In order to further reduce the environmental impacts of port operations and achieve new air quality benchmarks, the enhancement of existing port infrastructure is needed. AB 1657 fills this critical gap by providing our state ports with funds to become greener and more energy efficient.

We request clarification of the definition of zero and near-zero emissions. The bill currently does not define zero and near-zero emissions. These terms are normally used to describe criteria pollutants, yet the bill very specifically targets greenhouse gas emissions.

While these criteria pollutants are sometimes greenhouse gases, as currently written, the bill may require a 100% use of renewables to meet the definition, or some other zero or near-zero equivalency measure that is not clear. That does not appear to be what's intended.

With proper clarification of definitions and requirements, AB 1657 could fill a critical gap by providing our state ports with funds to become greener and more energy efficient.

AB 1657, once amended, could not only enable California ports to reduce emissions, but also would have the potential to lower port operating costs, resulting in improved competitiveness and job growth.

For these reasons, CHBC supports the objectives of AB 1657 and stands ready to offer full support once appropriately amended to clarify the definitions of zero and near-zero in this context.

If you have any questions, please contact me at (310) 455-6095 x360 and ewagner@californiahydrogen.org.

Sincerely,

Emanuel Wagner
CHBC Assistant Director

APPENDIX B – LETTER OF SUPPORT FOR AB2673

Attention: Assemblymember Matthew Harper, Ms. Oksana Jaffe, Chief Consultant, Committee on Revenue and Taxation, Mr. M. David Ruff, Principal Consultant, Committee on Revenue and Taxation

Re: AB2673 (Harper)- Sales and Use Tax Exemption & Income Tax Credits for Hydrogen Refueling Station Equipment

Dear Assemblymember Harper and the California State Assembly Committee on Revenue and Taxation,

The California Hydrogen Business Council is comprised of organizations and individuals involved in the business of hydrogen. Its mission is to advance the commercialization of hydrogen in transportation and stationary sources to reduce emissions and dependence on foreign oil. As such, the CHBC would like to express our strong support for AB2673 (Harper), which provides the following for hydrogen fueling stations:

1. a sales and use tax exemption from January 1, 2017, through December 31, 2029; and
2. an income tax credit for calendar year 2016, which can be carried over in succeeding years until exhausted, for sales and use taxes paid from January 1, 2014 through January 1, 2017.

There are no existing exemptions from state sales and use tax for the purchase or lease (or for the storage, use or consumption) of hydrogen fueling station equipment. We strongly believe that grant monies should be used to build additional hydrogen refueling stations and not reabsorbed back into the state general fund for uses other than those for which the grants were intended.

As background, fuel cell electric vehicles (FCEVs), powered with hydrogen fuel, are just now being introduced in mass volumes by automakers including Toyota, Honda, Hyundai. Additional manufacturers are preparing their market entry, like General Motors, Audi, BMW, and Mercedes-Benz. While these vehicles are being commercialized throughout the world, California's vision and mandate for zero emission vehicles (ZEVs) make the state one of the focal points for the initial introduction and success of FCEVs.

FCEVs can be two to three times more efficient than conventional vehicles. They are fueled with hydrogen gas, which is stored on the vehicle, and they emit no pollutants - only water and heat. Similar to conventional vehicles, they can fuel up in less than 5 minutes and have a driving range of more than 300 miles. Other benefits to FCEVs include increasing U.S. energy security and strengthening the economy.

Hydrogen can be produced from a variety of fuel sources, including renewable electricity and biogas, which supports California's greening of the transportation sector.

Recognizing the importance of FCEVs, the State of California passed AB 8 (Perea), which requires the California Energy Commission California's to allocate \$20 million annually until there are least 100 publically available hydrogen-fueling stations in California. However, when companies use this state grant money to purchase, lease, store, use, or otherwise consume equipment, parts, software or property used to operate or maintain their hydrogen refueling stations, they pay between 7.5% and 10% back to the state in sales or use taxes. California is not maximizing its investment in hydrogen refueling stations.

Sincerely,

Jeff Serfass
Executive Director | California Hydrogen Business Council
310-455-6095 x312
jserfass@californiahydrogen.org

**APPENDIX C – COMMENTS OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON
THE LOW CARBON FUEL STANDARD**

The Honorable Kevin De León
Senate President Pro
California State Senate, Room 205
Sacramento, CA 95814

The Honorable Anthony Rendon
Tempore Assembly Speaker
California State Assembly, Room 219
Sacramento, CA 95814

July 5, 2016

Re: California Fuel Producers Support the Low Carbon Fuel Standard

Dear Senate President Pro Tem De León and Speaker Rendon:

The California Hydrogen Business Council (CHBC) writes in support of the Low Carbon Fuel Standard.

The CHBC, an industry association with a mission to advance the commercialization of hydrogen in transportation and stationary sources to reduce greenhouse gas, criteria pollutant emissions and dependence on oil, strongly supports the Low Carbon Fuel Standard (LCFS), which will reduce the carbon intensity of California's fuels by 10 percent by 2020. The LCFS is a critical tool that California needs in order to achieve its ambitious goal of reducing greenhouse gas emissions 80% below 1990 levels by 2050.

The LCFS has already reduced 16.6 million tons of harmful carbon pollution by increasing clean fuels use 36% and avoiding 6.6 billion gallons of petroleum.

Without the LCFS, California would not benefit from the \$650 million that has been invested in clean fuel production. In addition, LCFS will help reduce the cost of hydrogen as a transportation fuel, thereby offsetting some of the higher, initial costs associated with new infrastructure. Hydrogen is an essential component of California's low-carbon strategy, and the LCFS will aid in that transition.

California's LCFS supports a market-based transition to clean, low-carbon fuels through technology innovation that is helping California meet its long term climate, clean air, and public health goals, all the while benefiting our economy. This innovative regulatory framework is fuel and technology neutral, which helps to unleash healthy competition.

The LCFS is a good policy, delivering the clean fuels we need today and going forward. The LCFS has helped spur job creation in our industry, and staying the course is important for continued accelerating growth.

Sincerely,



Jeff Serfass

Cc: The Honorable Members of the California State Senate
The Honorable Members of the California State Assembly
California Governor Jerry Brown
Mary Nichols, Chairman, California Air Resources Board
California Air Resources Board Members

APPENDIX D – COMMENTS OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON ON SCAQMD’S DRAFT 2016 AIR QUALITY MANAGEMENT PLAN

Executive Director Jeff Serfass appreciated the opportunity to provide in-person comments on SCAQMD’s Air Quality Management Plan (AQMP) at its Diamond Bar workshop on July 14th. The comments below expand on his verbal comments.

In the Plan’s attention to distributed generation resources, it should be recognized that hydrogen and fuel cells used for stationary power and in microgrids can eliminate the need for some combustion energy facilities. Generation of fuel cell electric energy close to commercial and industrial loads, and even residential facilities, can provide the advantages of distributed resources without production of NO_xs and other products of combustion turbines and engines.

The Plan places appropriate emphasis on the role of solar and wind resources. Hydrogen produced from intermittent, sometimes excess renewable energy can be a management tool that enhances a solar and wind strategy. Hydrogen produced from solar and wind, that is then used in power to gas strategies and directly as a transportation fuel, will help match the combination of loads and the renewable resources. We ask that SCAQMD work with the California ISO and others to plan to maximize the use of solar and wind resources with hydrogen as a keystone to the strategy.

Mobile source control strategies promoted by the California Air Resources Board don’t explicitly mention hydrogen and fuel cell technologies which are well suited for now and in the future. For example, hydrogen can be employed in ports to create a full hydrogen economy there, serving the entire goods movement chain with an integrated systems approach.¹ Very importantly, this allows for the synergism of co-benefits that can also be applied to light duty vehicles throughout the basin with fuel infrastructure benefits.

The Plan states that renewable energy technologies must still be supplemented by fossil fuel generation due to the intermittency of renewable energy. This is simply not true. Energy storage, and in particular, bulk energy storage supplied by hydrogen strategies, can make a 100% renewable energy electric system possible.

In the Plan, energy storage is considered as an electron to electron system and fails to understand the role of power to gas and the opportunities for larger scale energy storage systems that can’t easily be met by battery or other limited storage options. It is easy to conclude that hydrogen energy storage in an “electrons to storage to electrons” strategy does not meet efficiency or cost objectives, but hydrogen energy storage strategies through power to gas and supply of hydrogen as a vehicle fuel can meet efficiency and cost goals, offering larger-scale, longer duration storage systems. At the Workshop, interest in power to gas information and data was expressed so attached to these comments is the CHBC White Paper on Hydrogen and Energy Storage and Power to Gas.

The Plan could benefit from asserting what the end game is, to provide certainty about where we really need to get to.

The AQMP should assert its role in ensuring that the hydrogen infrastructure is built faster, for support of a faster turnover from combustion engines to non-combustion fuel cell electric vehicles. The AQMP needs to work with industry to accelerate fleet turnover. The current regional and state plans do not necessarily reduce emissions as “expeditiously as practical” and needs to recognize the urgency for quicker action.

¹ See “The Port of the Future: The Potential of Fuel Cells to Green Our Nation’s Ports” at <http://hfcarchive.org/wp-content/uploads/2012/02/Port-of-the-Future.pdf>

APPENDIX E – SB 1383 (LARA) SUPPORT

The Honorable Das Williams
Chair, Assembly Committee on Natural Resources State Capitol, Rm 4005
Sacramento, CA 95814
August 29, 2016

RE: SB 1383 (Lara) SUPPORT

Dear Chairman Williams:

The California Hydrogen Business Council (CHBC) writes to reiterate our support of Senate Bill 1383. This bill will enable the state to take urgently needed action to control short-lived climate pollutants, which will not only help mitigate climate change, but also reduce air pollution and improve public health.

We also understand that the Assembly Committee on Natural Resources is considering the attached amendments (see Attachment A), which we additionally support. We thank the Members for taking this broader approach to the provision. If possible to make further changes, we recommend that the words “renewable gas” replace the word “biogas” at the end of paragraph 1) a). This will enable a more holistic approach to developing a renewable gas market that can fulfill the bill’s aim of reducing short term climate pollutants.

SB 1383 is in line with the priorities of CHBC, an industry association with a mission to advance the commercialization of hydrogen in transportation and stationary sources to reduce greenhouse gas, criteria pollutant emissions and dependence on oil.¹ For the past several years, the CHBC and its members have been working with various government agencies and other renewable gas market participants to expand market opportunities for existing and developing technologies for renewable gas, including renewable hydrogen. Much of our work is aligned with existing California greenhouse gas emission reduction and short-lived climate pollutant statutes and regulations.

CHBC views SB 1383 as an important addition to California’s global leadership on protecting our environment, and we appreciate and support your effort.

Regards,

Emanuel Wagner

Cc: The Honorable Jerry Brown
The Honorable Anthony Rendon
The Honorable Kevin de León
Chair, Members, Chief Consultant Assembly Natural Resources Committee

¹The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies.

APPENDIX F – COMMENTS OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON VOLKSWAGEN CALIFORNIA ZEV INVESTMENT COMMITMENT

December 16, 2016

The California Hydrogen Business Council (CHBC) strongly supports the planned Air Resources Board's (ARB's) process aimed at using the Volkswagen (VW) California Zero Emission Vehicle (ZEV) Investment Commitment in a way that maximizes adoption of ZEV's to advance California's leadership in environmental policy. The CHBC applauds ARB's strong encouragement for VW to include hydrogen infrastructure and outreach efforts in its consent-decree investment plans. In particular, the CHBC encourages inclusion in the plans:

- The funding of public outreach efforts aimed at making the general public in California fully aware of, and comfortable with, hydrogen FCEV's, infrastructure and associated technologies
- Early expansion of the hydrogen refueling station network and supporting infrastructure
- Fuel cell powered transit applications
- Fuel cell powered goods movement and freight transport
- Hydrogen production that that enables primary renewable energy development, including multi-megawatt power-to-gas deployment
- Development of the above hydrogen infrastructure in ways that further the Green Cities Vision
- Deployment of hydrogen refueling stations that enable ZEV's for the 40% of Californians living in multi-family dwellings
- Support for large scale renewable hydrogen production facilities to enable cost-effective zero carbon fuel for FCEVs

CHBC believes strongly that ARB needs to assure that the settlement money is equitably used to fund a balanced portfolio of zero emission vehicles technologies. VW should not be allowed to direct most of the funding to Battery Electric technology. If allowed to do so, VW would be reaping an unintended benefit of having its settlement funds disproportionately reward the technology it is backing.

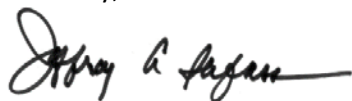
The CHBC is composed of over 100 companies, agencies and individuals involved in the business of hydrogen. Our mission is to advance the commercialization of hydrogen in the energy and transportation sectors, including passenger vehicles, goods movement, and stationary power systems to reduce emissions and dependence upon petroleum products. More information is at www.californiahydrogen.org.

The CHBC has been requested by its Board of Directors to follow the ARB VW ZEV Investment Plan process closely, and to provide help and encouragement in that process where possible.

Many CHBC members have or will be submitting project proposals to VW for their consideration. We have great expectation that these projects will well support ARB's current and long term goals and will meet ARB's guidelines for consideration in VW's investment plan.

The CHBC looks forward to working with the ARB and the Volkswagen Group as this process continues.

Sincerely,



Jeffrey A. Serfass

Executive Director | California Hydrogen Business Council

Tel. 310-455-6095 x312 | jserfass@californiahydrogen.org

APPENDIX G – LIST OF MEMBERS

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South Coast Air Quality Management District	
Bay Area Air Quality Management District	
Southern California Gas Company	
AC Transit	Hydrogenics Corporation
American Honda Motor Co., Inc.	Pacific Gas and Electric Company - PG&E
Ballard Power Systems	Plug Power, Inc.
Cambridge LCF Group	Toyota Motor North America Inc.
FuelCell Energy, Inc.	US Hybrid Corporation

GOLD MEMBERS

American Honda Motor Co., Inc.	Sumitomo Corporation of Americas
IRD Fuel Cells LLC	United Hydrogen Group LLC
Proton Onsite	

SILVER MEMBERS

Air Liquide Advanced Technologies U.S. LLC.	Intelligent Energy
Bethlehem Hydrogen Inc	ITM Power Inc
BMW of North America LLC	Johnson Matthey Fuel Cells
Center for Transportation and the Environment	Linde North America Inc
ElDorado National - California	McPhy Energy
Electro Power Systems	National Renewable Energy Laboratory
Energy Independence Now	Nel Hydrogen
First Element Fuel Inc	New Flyer of America Inc
General Motors Corporation	Next Hydrogen Corporation
Giner, Inc.	Nuvera Fuel Cells LLC
Gladstein, Neandross & Associates	PDC Machines, Inc.
Golden State EPC Inc	Port of Long Beach
Greenlight Innovation	Powertech Labs, Inc.
H2Safe, LLC	Rio Hondo College
HydrogenXT	Schatz Energy Research Center
Hyundai Motor Company & Kia Motors Corp	SunLine Transit Agency
i-2-m	United Hydrogen Group Inc
Idaho National Laboratory	Sacramento Municipal Utility District

BRONZE MEMBERS

ACE Cogeneration Company	Horizon Fuel Cells Americas, Inc.
China Hydrogen Fuel Cell Corporation	Hydrogen in Motion
Community Environmental Services	Hydrogenious Technologies
E4 Strategic Solutions	Ivys Inc.
GTA, Inc.	Longitude 122 West, Inc.
GTM Technologies Inc.	Loop Energy Inc
H2B2	MPL Consulting, Inc.
H2Tech Systems	Paramount Energy West LLC

PowerHouse Energy Americas
Ramco Consulting Company Inc
Rose Communications Inc
SAFCell Inc

Terrella Energy Systems Ltd
WireTough Cylinders, LLC
Zero Carbon Energy Solutions
Ztek Corporation

AFFILIATES

Advanced Power and Energy Program - UC Irvine
California Fuel Cell Partnership

CALSTART
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APPENDIX H – 2016 BOARD OF DIRECTORS

Last Update: 11/28/2016

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