



**CALIFORNIA HYDROGEN  
BUSINESS COUNCIL**

*Hydrogen Means Business in California!*

# CHBC 2017 ANNUAL REPORT



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.

[www.californiahydrogen.org](http://www.californiahydrogen.org)

CALIFORNIA HYDROGEN BUSINESS COUNCIL

June 27, 2018

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Report Published: June 6, 2018

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Front cover Photos:

Left: CHBC members take a tour of Stone Edge Farm Microgrid following the 2017 Hydrogen and Fuel Cell Summit  
(Photo taken by Peter Thompson, 9/27/2017).

Right: Attendees of the Hydrogen and Fuel Cells in the Ports Briefing at Banning’s Landing view available  
hydrogen and fuel cell technology at the Show and Tell (Photo Taken by Emanuel Wagner, 12/6/2017).

## Executive Summary

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The 2017 Annual Report of the California Hydrogen Business Council (CHBC) provides an accurate record of the organization's broad array of activities during the year to members, potential members and other energy and environmental stakeholders.

Under its management by Technology Transition Corporation and through collaborative work of the Board of Directors, members and staff, the CHBC reached several important milestones, further increasing its membership and impact. This was accomplished through the hydrogen energy storage program, renewable hydrogen program, public transport program, and the goods movement, heavy duty transportation and clean ports program. The CHBC also promoted networking and advocacy in the hydrogen energy industry sector to expand business opportunities in hydrogen and fuel cells. The CHBC organized a successful summit, three board meetings, four workshops, submitted over 30 comments and letters to legislators, agencies and other entities (See Appendix C), and held monthly member Strategic Action Group (SAG) calls to provide membership engagement in each program area.

Significant changes compared to 2016 included a much stronger advocacy focus, achieved by adding a lobbyist and regulatory consultant for the full year to impact legislative developments.

## 2017 – Program Expansion And Creating Impacts

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California continues to be at the forefront of hydrogen and fuel cell technology adoption, and the 2017 Program Plan and Budget, approved in December 2016, set ambitious goals for the CHBC to support the expansion of the market in all sectors. The 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 2017 strategy for CHBC centered around continuing the focus and development of market sector activities that were started in 2016, with a strong drive to expand membership and California representation of the CHBC. CHBC committees and SAGs were consolidated and drove CHBC's activities, increasing the visibility and advocacy of CHBC market sector interests while reinforcing CHBC's impact and effectiveness. Expanded in 2017 was an aggressive advocacy program which saw the CHBC engage the California legislature and regulatory agencies and raise the profile and awareness of the hydrogen and fuel cell industry in California.

The CHBC continued the **management and advocacy of market sector interests through its committees and market sector Strategic Action Groups (SAGs)** in 2017 with the additional support of the Advocacy Committee, and created regular meetings of active members. 2017 CHBC program committees were the following:

- **Advocacy Committee** – established to coordinate and execute CHBC's policy priorities and goals.
- **Business Expansion and Membership Development Committee** – established to guide the staff in execution of activities in this area.
- **Strategic Communications Committee** – continued to provide staff support for newsletters, and other outreach materials. The Committee also created the Hydrogen FAQs, Opportunities for Hydrogen Fact Sheet and started the complete overhaul of the CHBC website.

The SAGs in 2017 were:

- **Public Transport SAG** – principally, buses, and hydrogen fueling infrastructure for transit agencies. At the end of the year, the SAG grew more interested in rail activities taking place ARB.
- **Goods Movement and Clean Ports SAG** – principally FCEV medium and heavy duty vehicles and all mobile and stationary hydrogen and fuel cell products for freight systems, especially in relation to 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

The CHBC functioned as a **convener** of leaders; enabler of **collaboration**; **communicator** of 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 chairs, 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 the Fall Summit in Sacramento, a half-day 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 2018 program plan and budget.

## 2017 Program Activity

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In the next sections, detailed information on the CHBC’s activities in each program area are provided. Supplementary information is provided in the Appendices.

### ADVOCACY

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In 2017, the CHBC re-organized how it advocated for the interests of the hydrogen and fuel cell industry by creating the Advocacy Committee. Within the Advocacy Committee is a core group that holds weekly calls to discuss CHBC’s positions on legislative and regulatory policies in California. The committee was led by chair Lorraine Paskett, Cambridge LCF, and vice chair Steve Jones, ITM Power. The Committee worked closely with the SAGs to plan and execute the policy goals and gained Executive Committee approval of CHBC’s positions.

Crossing all market sectors, the CHBC grew its **advocacy** effectiveness by participating in California **regulatory, legislative and agency deliberations and funding plans**. CHBC helped lead discussions on energy strategies and technology deployment through its written positions, face-to-face meetings and presentations.

The Advocacy Committee engaged with ARB, CEC, CAISO, PUC, and the legislature on a variety of issues, including the IEPR Scoping memo, AQIP, PUC Storage Proceedings, VW Settlement, SB100, SB1383, SB433, and several roadmaps/reports produced by the respective agencies. Staff also participated in ARB and CEC board meetings, verbally commented on several issues, including the ZEV mandate, IEPR, and the VW settlement. CHBC’s 2017 comments and letters of support on these issues can be found in Appendix D below.

In 2017, the CHBC hired V. John White, Executive Director of CEERT, as its lobbyist. Diane Moss and Bud Beebe continued to support CHBC’s advocacy work.

## STRATEGIC COMMUNICATIONS

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The Strategic Communications 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.

Currently 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. The committee helped identify key issues facing the industry that could be addressed through education and outreach and help develop strategies for reaching out to key stakeholders and decision makers on these issues. The Committee helped guide the organization's development of educational resources and materials and resources for the CHBC website, and provided input on hydrogen information materials.

In 2017, the Committee focused on creating a Hydrogen FAQ and "Opportunities for Hydrogen" Fact Sheet, and oversaw the complete redevelopment of the CHBC website. The Committee provide advice for planning the annual Summit and workshops organized by the SAGs and served as a sounding board for new ideas.

The Committee also planned and executed a CEC AB 8 Joint Report Briefing Webinar, available here: <https://vimeo.com/213147231>

## HYDROGEN ENERGY STORAGE AND RENEWABLE HYDROGEN PROGRAM

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The Hydrogen Energy Storage and Renewable Hydrogen (HES/RH2) SAG continued to address the increasingly important role that energy storage will play in California's energy future. Through the HES/RH2 SAG, the CHBC provided help to California's decision makers in assisting the 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 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 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.

The SAG was led by Jack Brouwer of the Advanced Power and Energy Program at UC Irvine and Steve Jones of ITM Power.

At the beginning of the year, the SAG considered hosting a workshop focused on energy storage, power-to-gas, and renewable hydrogen. However, the workshop was not held and the SAG instead focused on individual education with various agencies. The SAG held three separate meetings with PUC commissioners Peterman, Guzman-Aceves and Rechtschaffen.

CHBC continued to work with EIN to develop the Renewable Hydrogen Roadmap, an effort started in early 2016, and to be published in Q1 2018. After publication, the CHBC will present the findings of the roadmap to key California agencies and host a webinar, led by EIN.

The SAG developed a renewable hydrogen definition throughout 2017, after several rounds of review. The definition is undergoing final revision and then approval. CHBC comments were submitted to CEC on the 2017 IEPR, addressing renewable gas and storage.

The CHBC advocated on a wide array of issues related to the HES & RH2 SAG, including:

- (1) Use of pipelines as an energy storage component;
- (2) Energy storage does not only mean electricity from and to the grid;
- (3) Establish specific pathways for the LCFS;
- (4) Develop natural gas pipeline standards for higher hydrogen levels;
- (5) Wholesale pricing for power related to hydrogen production.

The four issues the SAG focused on had varying outcomes and continued effort will be needed in 2018. The PUC rejected P2G and NG pipelines as an eligible storage technology. CHBC has decided to approach this issue by creating market pull for renewable gas through legislation. The CHBC commented on the 2017 IEPR and CAISO Roadmap to ensure energy storage is not only electricity from and the grid; projects will be needed to extract data on the viability of proposed energy storage concepts, CHBC will need to secure funding for such opportunities. The CHBC began commenting on the LCFS to open more pathways for hydrogen and encouraged its members to apply for pathways in the LCFS. The CHBC did not take action to develop NG pipeline standards in 2017 but will continue to look for opportunities in 2018. The CHBC met with ISO staff to push for wholesale pricing for power related to hydrogen production; CHBC will move to schedule meetings with ISO governors and continue to make the case.

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## GOODS MOVEMENT, HEAVY DUTY TRANSPORTATION, AND CLEAN PORTS PROGRAM

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The 2017 volunteers completed a plethora of activities throughout the year. An important sector for a wide array of CHBC members, this SAG had over 65 individuals involved. The SAG was led by Jim Petrecky of Plug Power and Andreas Truckenbrodt of Loop Energy. This SAG was also supported by CHBC Project Coordinator, Cory Shumaker.

The SAG and a variety of stakeholders advocated at CARB Board meetings to allocate Greenhouse Gas Reduction Funds (GGRF) go toward Class 7 & 8 trucks, through the Sustainable Freight Action Plan. CHBC staff attended ARB workshops, hosted a successful and well attended Freight Workshop at the ACT Expo, followed by the publication of a workshop report and webinar, and commented on ARB's ZEV strategy. CHBC will continue to track rulemaking that affects zero-emission freight.

The SAG sought to advocate for multipurpose demonstrations of hydrogen in the ports and integrating different applications. To accomplish this activity, the CHBC hosted the Hydrogen and Fuel Cell in the Ports Workshop on October 3 in Vallejo, CA and the Hydrogen and Fuel Cells in the Ports Briefing on December 6 at Bannings Landing in Wilmington, CA. The CHBC created a report on each event and scheduled to host a webinar to present the conclusions from these two ports focused events in Q1 2018. CHBC will continue to advocate for hydrogen and fuel cell technology in 2018 by commenting on the ARB's Clean Transportation Incentives.

As a follow-up to the 2016 Hydrogen and Fuel Cells in the Ports Workshop, the SAG conducted a follow-up webinar, available here: <https://vimeo.com/206468843>



## PUBLIC TRANSPORT PROGRAM

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The 2017 volunteers that signed up for Public Transportation SAGs completed numerous activities to advance hydrogen and fuel cell utilization in this sector of the industry. The SAG had 80 members involved in 2017. The SAG is led by chair Lauren Skiver of SunLine Transit Agency and vice chair Nicolas Pocard of Ballard Power Systems.

As part of the CHBC's aggressive 2017 advocacy program, the SAG followed regulations for zero emission bus (ZEB) and near-ZEB and advocated for funding for fuel cell electric buses (FCEBs) to state and federal agencies and transit system operators. The SAG met with ARB staff, who sought CHBC input on its strategy.

The SAG developed a position paper and published it at the May APTA meeting in Reno in collaboration with the California Fuel Cell Partnership. The paper presented recent developments in FCEB commercialization and the value proposition of adopting FCEBs in California. The SAG engaged with Ramboll Environment to correct their misstatements regarding FCEBs in their report for LA Metro.

The CHBC, through the Public Transport SAG, provided a communication forum between transit/fleet operators, bus OEMs, technology providers, and industrial gas providers. Throughout 2017, the newly formed ZEBRA group took on a larger role in communication between transit/fleet operators, bus OEMs, technology providers, and industrial gas providers. The Public Transport SAG will continue to engage with ZEBRA and provide resources to highlight fuel cell bus technology.

In September, the CHBC hosted a Fuel Cell Electric Bus Workshop in Sacramento with speakers from AC Transit, OCTA, SunLine, ARB, and CHBC Members.

## NETWORKING EVENTS

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### MEMBER HAPPY HOUR AT ICEPAG

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On March 28, 2017, the CHBC hosted a member happy hour for CHBC members attending the ICEPAG Conference in Irvine, CA. The reception was held at Eureka Restaurant near the UC Irvine campus.

### HYDROGEN AND FUEL CELL ON-ROAD FREIGHT WORKSHOP AT ACT EXPO

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On May 1, 2017, the CHBC hosted a half-day Hydrogen and Fuel Cell On-Road Freight Workshop at ACT Expo. The workshop focused on building awareness and hearing from a diverse group of panelists on the ability of hydrogen and fuel cell technologies to enable commercial customers to meet sustainability and regulatory compliance objectives, address the technical and non-technical challenges with transitioning hydrogen and fuel cells into fleets, and understand the key drivers of substantive economic and operational benefits. The workshop had 115 attendees.

The Workshop was sponsored by the South Coast Air Quality Management District, Toyota Motor Company, the Port of Long Beach, and US Hybrid Corporation. The CHBC produced a report summarizing the workshop, which is available here: <https://www.californiahydrogen.org/wp-content/uploads/2018/05/Hydrogen-and-Fuel-Cell-On-Road-Freight-Workshop-Report.pdf>

The CHBC also conducted a follow-up webinar to the workshop, available here: <https://vimeo.com/228106604>



*Let's  
Go  
Places*



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## CALIFORNIA HYDROGEN AND FUEL CELL SUMMIT – SACRAMENTO, CA

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The CHBC hosted its 5<sup>th</sup> Annual California Hydrogen and Fuel Cell Summit at the California EPA Headquarters in Sacramento, CA from September 25-26, 2017. Industry leaders and influencers in the policy community came together to advance the interests of hydrogen energy in California and beyond, by exchanging information and addressing opportunities and challenges in key environmental, business and market areas.

As a rich networking event, the Summit covered the breadth of hydrogen and fuel cell markets and technologies. Two conference days of presentations and panels went deep into new and current attention-receiving developments and emerging markets. A third day offered a technology tour at the Stone Edge Farm Winery Microgrid and the Fuel Cell Electric Bus Workshop. CHBC Member meetings and a Board meeting were held as well. This unique range of activities continued to grow the scope of the Summit, drawing over 200 attendees.

### Topics Included:

- Summit Expectations & Overview of Hydrogen and Fuel Cells in California & Vision of the Future
- Industry Keynote by Honda's Jim Burrell
- Government Keynote by California Senator Skinner
- Overview of State Regulation and Legislation
- Renewable Hydrogen Roadmap Publication
- Progress of Stationary Fuel Cell Developments in California
- California Agency Perspectives
- Industry Perspective on Hydrogen's Role in Decarbonization of the Electrical and Gas Grid
- Student Communication Power-to-Gas 2017 Hydrogen Student Design Contest
- Hydrogen and Fuel Cells in the Transit Sector
- Outlook for Day 2 and CHBC Report
- Industry Keynote by Ballard's Rob Campbell
- Formation of the Hydrogen Council
- What's Happening with Vehicles?
- Meeting the Needs of Hydrogen Infrastructure
- Lightning Round - What's happening outside of California?
- Discussion Roundtable – Environmental Benefits of Hydrogen - Meeting California's Climate Goals
- What opportunities do Ports offer to Hydrogen and Fuel Cells?
- Novel Approaches for Hydrogen Applications in Commercial Environments
- Goods Movement and Freight: Hydrogen Fuel Cell Medium and Heavy Duty Trucks



Presenters during the Summit included:

- Dr. Madhav Acharya, Technology-to-Market Advisor, U.S. Department of Energy
- Mallik Angalakudati, Vice President, Corporate Strategy, PG&E Corporation
- Jean Baronas, Hydrogen Unit Supervisor, California Energy Commission
- Wolfgang Beez, CEO, Hitachi Zosen Inova ETOGAS GmbH
- David Bow, Senior Vice President and Executive Officer, Nel ASA and Proton OnSite
- Damian Breen, Deputy Air Pollution Control Officer, Bay Area Air Quality Management District
- Dr. Jack Brouwer, Associate Director, National Fuel Cell Research Center
- Tim Brown, Chief Operations Officer and Principal, FirstElement Fuel
- James Burrell, Assistant Vice President, Advanced Powertrain Group, American Honda Motor Co.
- Rob Campbell, Vice President and Chief Commercial Officer, Ballard Power Systems
- Edie Chang, Deputy Executive Officer, California Air Resources Board
- Fernando Corral, Vice President Sales, Western Region, Plug Power
- Steven Ellis, Manager of Fuel Cell Vehicle Marketing, American Honda Motor Co.
- Bill Elrick, Executive Director, California Fuel Cell Partnership
- Anca Faur, Program Development Manager, Johnson Matthey Fuel Cells Inc.
- Bob Fourie, Vice President, Strategic Partnerships, Air Liquide Advanced Technologies U.S. LLC
- Katrina M. Fritz, Executive Director, California Stationary Fuel Cell Collaborative
- Brian Goldstein, Executive Director, Energy Independence Now (EIN)
- Dr. Abas Goodarzi, Founder and President, Hybrid and US FuelCell Corporation
- Stephen Jones, Managing Director, ITM Power Inc.
- Brian Lindgren, Manager of Research and Development, Kenworth Truck Company
- Bill Magavern, Policy Director, Coalition for Clean Air
- Morry Markowitz, President, Fuel Cell and Hydrogen Energy Association (FCHEA)
- Dr. Andrew Martinez, Air Resources Engineer, California Air Resources Board
- Dr. Marc W. Melaina, Senior Engineer, National Renewable Energy Laboratory (NREL)
- Diane Moss, Owner, dima Communications
- Graham Noyes, Managing Attorney, Noyes Law Corporation
- Ben Nyland, President & CEO, Loop Energy
- Lorraine Paskett, Owner, Cambridge LCF Group
- Jeffrey Reed, Director of Business Strategy and Advanced Technology, Southern California Gas Company
- David Reichmuth, Senior Engineer, Clean Vehicles Program, Union of Concerned Scientists
- Jeff Serfass, Executive Director, California Hydrogen Business Council
- Cory Shumaker, MBA, Project Coordinator, California Hydrogen Business Council
- Senator Nancy Skinner, California Senate
- Dr. Andreas Truckenbrodt, President and CEO, Canadian Hydrogen and Fuel Cell Association
- Pat Valente, Executive Director, Ohio Fuel Cell Coalition (OFCC)
- Gia Brazil Vacin, Zero-emission Vehicle (ZEV) Infrastructure Project Manager, Governor's Office of Business and Economic Development (GO-Biz)
- Emanuel Wagner, Assistant Director, California Hydrogen Business Council

2017 Summit Report is available here: <https://www.californiahydrogen.org/wp-content/uploads/2018/05/2017-CHBC-Summit-Summary-Final.pdf>

The 2017 Summit would not have been a success without the support of its Leadship Sponsors, Toyota Motor Company and Honda Motor Company and the Networking Sponsors, Air Liquide, Ballard Power Systems, and BAAQMD



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#### FUEL CELL BUS WORKSHOP

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On September 27, the CHBC hosted a half-day Fuel Cell Bus Workshop following the 5<sup>th</sup> Annual California Hydrogen and Fuel Cell Summit in Sacramento. The workshop featured two segments, the first focused on educating government stakeholders and transit agencies on the deployment status of the industry, system performance, and fueling options. The second segment hosted a discussion among OEMs and technology providers on remaining challenges and adoption barriers (awareness, total cost of ownership and hydrogen infrastructure), engaging policy and regulatory agents such as the ARB, CEC, and Governor's office. The workshop attracted 90 attendees. The CHBC published a report on the workshop, available [http://californiahydrogen.org/sites/default/files/FCEB%20Workshop%20Report\\_v2.pdf](http://californiahydrogen.org/sites/default/files/FCEB%20Workshop%20Report_v2.pdf)

The CHBC thanks the Fuel Cell Bus Workshop sponsors for their support and making the event an overall success:



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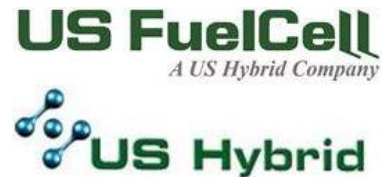
#### HYDROGEN AND FUEL CELLS IN THE PORTS WORKSHOP

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On October 3, 2017, the CHBC hosted the one-day Hydrogen and Fuel Cells in the Ports Workshop in Vallejo, CA. The workshop discussed current hydrogen and fuel cell activities in ports and maritime, heard the needs and challenges from port and maritime customers (port authorities, terminal operators, trucking companies) of California Ports to reduce their emission footprint and meet California state air quality requirements. This workshop was a follow up to the Hydrogen and Fuel Cells in the Ports Workshop 2016, held in Port of Los Angeles. At the 2017 workshop, there were updates from last year with presentations from ports authorities, terminal operators, trucking companies, hydrogen and fuel cell technology providers, and State funding agencies. The workshop had 84 attendees. The workshop report is available here:

<https://www.californiahydrogen.org/wp-content/uploads/2018/05/CHBC-2017-Ports-Workshop-Report-Final-V2.pdf>

The Hydrogen and Fuel Cell in the Ports Workshop would not have been possible without the sponsorship of:



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## HYDROGEN AND FUEL CELLS IN THE PORTS BRIEFING

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On December 6, the CHBC hosted a half-day Hydrogen and Fuel Cells in the Ports Briefing at Banning's Landing Community Center in Wilmington, CA. The Briefing's purpose was to provide an update from the November 2016 workshop on the hydrogen and fuel cell activities in ports and maritime, the needs and challenges from port and maritime customers of California Ports, and hydrogen infrastructure. After the briefing, there was an outdoor "Show & Tell" exhibition of hydrogen fuel cell light- and heavy-duty vehicles and equipment on display. The Briefing had 65 attendees. The briefing report is available here: <https://www.californiahydrogen.org/wp-content/uploads/2018/05/CHBC-2017-Ports-Briefing-Report-.pdf>

The Ports Briefing would not have been possible without the support of its sponsors:



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## MEMBERSHIP

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### BUSINESS EXPANSION AND MEMBERSHIP DEVELOPMENT

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At the beginning of the year, the 2017 volunteers who signed up to assist with a potential Business Expansion event were added to the Membership Development Committee, creating the Business Expansion and Membership Development Committee. The Committee was led by chair Anca Faur, Johnson Matthey.

The Committee's helped support CHBC's membership growth of 31 new members in 2017. A full list of 2017 members is available in the Appendix B.

## MANAGEMENT

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The CHBC held three board meetings in 2017. The first meeting was held on May 2, following the CHBC On-Road Freight Workshop at ACT Expo. This meeting mainly focused on progress made in Q1 2017 and remaining plans. The second meeting was held on September 27 and focused mainly on 2018 CHBC Strategy. The third meeting was held on December 5 and focused mainly on 2017 in review and the 2018 Plan and Budget approval. A list of 2017 Board of Directors is available in Appendix C.

## FINANCES

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The CHBC's revenue in 2017 amounted to \$ 385,706 of which \$265,375 came from dues, with expenses amounting to \$379,310, leading to a \$6,400 net income.

## Appendices

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### APPENDIX A - STAFF AND CONTRACTORS

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Technology Transition Corporation ([www.ttcorp.com](http://www.ttcorp.com)) continued to manage and staff 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](http://www.hydrogencontest.org)) and H-Prize ([www.hydrogenprize.org](http://www.hydrogenprize.org)).

Jeff Serfass, President of TTC has over two 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 and oversees management.

Emanuel Wagner, TTC Program Manager, has 8 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.

Peter Thompson, TTC Project Assistant, has 3 years experience working within trade associations for the forest products industry and representing locally owned businesses in Raleigh, NC. He was hired in July 2017 to support senior CHBC staff in administrative, communication, and project activities, including research, membership support, and event planning.

TTC contracted with several 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 was hired to provide staff support in Los Angeles and lend his expertise on goods movement and transportation, having worked at Vision Motor Company until 2014. At the end of 2017, Cory's role with the CHBC shifted to Development Specialist, where he spearheads the effort to make international connections for the CHBC in addition to broadening the network of ports interested in hydrogen.
- Bud Beebe, who worked at SMUD for many years and now serves the CHBC as its Sacramento representative
- Diane Moss 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.
- V. John White, Executive Director of the Center for Energy Efficiency and Renewable Technologies, has many years of experience advocating and lobbying for renewable energies in California, was hired as CHBC's lobbyist.

## APPENDIX B – LIST OF MEMBERS

### PLATINUM EXECUTIVE

Cambridge LCF Group

Toyota Motor Sales

### PLATINUM MEMBERS

Air Liquide Advanced Technologies U.S. LLC.  
American Honda Motor Company  
Ballard Power Systems, Inc.  
Bay Area Air Quality Management District  
FuelCell Energy, Inc.  
Hydrogenics

Pacific Gas and Electric Company - PG&E  
Plug Power  
South Coast Air Quality Management District  
Southern California Gas Company  
US Hybrid

### GOLD MEMBERS

Alameda-Contra Costa Transit District (AC Transit)  
Beijing SinoHytec  
EWII Fuel Cells LLC  
Hitachi Zosen Inova ETOGAS GmbH  
ITM Power Inc

Linde North America Inc  
Natural Gas Fueling Solutions – NGFS  
Proton OnSite  
Sacramento Municipal Utility District (SMUD)  
Sumitomo Corporation of Americas

### SILVER MEMBERS

Black & Veatch  
BMW of North America LLC  
Center for Transportation and the Environment (CTE)  
CNG Cylinders International  
CP Industries  
ElDorado National – California  
Energy Independence Now (EIN)  
First Element Fuel Inc  
GenCell  
General Motors, Infrastructure Planning  
Giner ELX  
Gladstein, Neandross & Associates  
Greenlight Innovation  
H2Safe, LLC  
HODPros  
HydrogenXT  
Hyundai Motor Company  
Johnson Matthey Fuel Cells  
Loop Energy

Luxfer - GTM Technologies, LLC  
McPhy Energy  
Millenium Reign Energy  
Montreux Energy  
National Renewable Energy Laboratory (NREL)  
Nel Hydrogen|  
New Flyer of America Inc  
Next Hydrogen  
Nuvera Fuel Cells  
PDC Machines  
Port of Long Beach  
Powertech Labs, Inc.  
Rio Hondo College  
Rix Industries  
Schatz Energy Research Center (SERC)  
Sunline Transit Agency  
United Hydrogen Group Inc  
Verde LLC  
Volute, Inc.

### INNOVATOR MEMBERS

Advanced Emission Control Solutions  
Airthium

Anaerobe Systems  
Arriba Energy



Blockchain Champions Inc  
Boutin Jones  
Community Environmental Services  
Dash2energy  
Eco Energy International, LLC  
EPC - Engineering, Procurement & Construction  
Ergostech Renewal Energy Solution  
Geoffrey Budd G&SB Consulting Ltd  
GTA  
H2B2  
H2SG Energy Pte Ltd  
Horizon Fuel Cells Americas, Inc.  
Hydrogen Law  
Hydrogenious Technologies  
HyET - Hydrogen Efficiency Technologies  
Ivys Inc.  
Kontak, LLC  
KORE Infrastructure, LLC  
Life Cycle Associates

Longitude 122 West, Inc.  
MPL Consulting, Inc.  
Natural Hydrogen Energy Ltd.  
Noyes Law Corporation  
Planet Hydrogen Inc  
PowerHouse Energy  
Primidea Building Solutions  
RG Associates  
SAFCell Inc  
Sheldon Research and Consulting  
Solar Wind Storage LLC  
T2M Global  
Tatsuno North America Inc.  
The Leighty Foundation  
TLM Petro Labor Force  
Vaughan Pratt [Individual]  
WireTough Cylinders, LLC  
Zero Carbon Energy Solutions

#### AFFILIATES

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California Air Resources Board (CARB)  
California Fuel Cell Partnership  
CALSTART

Coalition for Clean Air  
University of California, Irvine  
Valley Environmental Associates

## APPENDIX C – 2017 BOARD OF DIRECTORS

### Officers

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## APPENDIX D – 2017 ADVOCACY

CHBC submitted an array of comments in 2017. These include, sorted by date of submission, starting with most recent, the following:

- CAISO Letter
- 11/17: CEC draft staff report 2018-19 investment plan:  
<http://californiahydrogen.org/sites/default/files/CHBC%20ARFVTP%20Comments%20Final.pdf>
- In addition, the CHBC responded to the draft CalSO Microgrid Roadmap with comments, which are [accessible here >>](#).
- 11/13 IEPR General: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-01/TN221729\\_20171113T152855\\_California\\_Hydrogen\\_Business\\_Council\\_CHBC\\_Comments\\_Comments\\_of.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-01/TN221729_20171113T152855_California_Hydrogen_Business_Council_CHBC_Comments_Comments_of.pdf)
- 11/13 EPIC: [http://docketpublic.energy.ca.gov/PublicDocuments/16-EPIC-01/TN221743\\_20171113T154142\\_California\\_Hydrogen\\_Business\\_Council\\_Comments\\_Comments\\_of\\_Calif.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/16-EPIC-01/TN221743_20171113T154142_California_Hydrogen_Business_Council_Comments_Comments_of_Calif.pdf)
- 9/10 SB 433: [http://californiahydrogen.org/sites/default/files/SB433%20-%20CHBC%20Letter%20of%20Support\\_0.pdf](http://californiahydrogen.org/sites/default/files/SB433%20-%20CHBC%20Letter%20of%20Support_0.pdf)
- 9/1 LCFS: <http://californiahydrogen.org/sites/default/files/CHBC%20comments%20to%20LCFS%20changes.pdf>
- 8/11 Letter to AM Ting:  
<https://californiahydrogen.org/sites/default/files/AB1184%20CHBC%20Support%20IF%20Amended%20with%20Amdments.pdf>
- 8/11 Letter to AM Chau Support for AB 739:  
<https://californiahydrogen.org/sites/default/files/AB%20739%20Letter%20of%20Support.pdf>
- 8/11 Letter to Sen. De Leon supporting Commissioner Rechtschaffen:  
<https://californiahydrogen.org/sites/default/files/8-11-17%20Letter%20in%20support%20of%20PUC%20Commissioner%20Rechtschaffen.pdf>
- 8/11 Letter to Sen. De Leon supporting Commissioner Guzman-Aceves:  
<https://californiahydrogen.org/sites/default/files/8-11-17%20Letter%20in%20support%20of%20PUC%20Commissioner%20Martha%20Guzman-Aceves.pdf>
- 8/8 IEPR Renewable Gas: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220613\\_20170808T162152\\_Emanuel\\_Wagner\\_Comments\\_CHBC\\_Comments\\_Market\\_Development\\_Opport.pd](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220613_20170808T162152_Emanuel_Wagner_Comments_CHBC_Comments_Market_Development_Opport.pd)
- 7/21 IEPR IRP: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN220309\\_20170721T164826\\_Emanuel\\_Wagner\\_Comments\\_CHBC\\_Comments\\_on\\_Docket\\_17IEPR07\\_Integ.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN220309_20170721T164826_Emanuel_Wagner_Comments_CHBC_Comments_on_Docket_17IEPR07_Integ.pdf)
- 7/21 IEPR DER: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-12/TN220310\\_20170721T164027\\_Emanuel\\_Wagner\\_Comments\\_CHBC\\_Comments\\_on\\_the\\_June\\_29\\_2017\\_IEPR.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-12/TN220310_20170721T164027_Emanuel_Wagner_Comments_CHBC_Comments_on_the_June_29_2017_IEPR.pdf)
- 7/21 AB 8 funds: <http://californiahydrogen.org/sites/default/files/Letter%20Support%20Stations%20-%20CEC.pdf>
- 7/14 IEPR Renewable Gas: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220235\\_20170714T174624\\_Emanuel\\_Wagner\\_Comments\\_Comments\\_by\\_the\\_California\\_Hydrogen\\_Bus.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220235_20170714T174624_Emanuel_Wagner_Comments_Comments_by_the_California_Hydrogen_Bus.pdf)
- 7/14 IEPR Renewable Gas: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220231\\_20170714T180105\\_Emanuel\\_Wagner\\_Comments\\_Study\\_on\\_Early\\_Business\\_Cases\\_for\\_H2\\_in.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN220231_20170714T180105_Emanuel_Wagner_Comments_Study_on_Early_Business_Cases_for_H2_in.pdf)
- 7/14 Comments to ARB on VW: <https://www.arb.ca.gov/lists/com-attach/25-vw-zevinvestsup-ws-UzBSPFU2UWFSCwFi.pdf>
- 7/14 Letter to Sen. De Leon, Speaker Rendon:  
<https://californiahydrogen.org/sites/default/files/Letter%20Support%20AB%20398%20AB617.pdf>

- 6/26 IEPR Renewable Gas: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN219923\\_20170626T180524 Emanuel Wagner Comments Economics of Power to Gas.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-10/TN219923_20170626T180524_Emanuel_Wagner_Comments_Economics_of_Power_to_Gas.pdf)
- 6/7 Press Release Gov. Brown/Sen De Leon/Paris Accord: <https://californiahydrogen.org/content/california-hydrogen-business-council-supports-statements-governor-brown-and-california-senat>
- 5/25 IEPR IRP: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN217733\\_20170525T152821 Emanuel Wagner Comments California Hydrogen Business Council Co.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN217733_20170525T152821_Emanuel_Wagner_Comments_California_Hydrogen_Business_Council_Co.pdf)
- 5/25: IEPR IRP: [http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN217734\\_20170525T153654 Emanuel Wagner Comments California Hydrogen Business Council re.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN217734_20170525T153654_Emanuel_Wagner_Comments_California_Hydrogen_Business_Council_re.pdf)
- 5/26 SB 1383: [http://californiahydrogen.org/sites/default/files/CHBC\\_Letter\\_CEC\\_SB1383WorkshopComment.pdf](http://californiahydrogen.org/sites/default/files/CHBC_Letter_CEC_SB1383WorkshopComment.pdf)
- 5/16 ESDER Phase 2: <http://www.caiso.com/Documents/CHBCComments-EnergyStorageandDistributedEnergyResourcesPhase2-ThirdRevisedStrawProposal.pdf>
- 4/7 VW Investment Plan: [https://californiahydrogen.org/sites/default/files/CHBC%20Letter%20to%20ARB%20On%20VW%20Settlement%20%20Investment%20Plan\\_Final.pdf](https://californiahydrogen.org/sites/default/files/CHBC%20Letter%20to%20ARB%20On%20VW%20Settlement%20%20Investment%20Plan_Final.pdf)
- 3/24 EPIC Investment Plan: <https://californiahydrogen.org/sites/default/files/CHBC%202017%20EPIC%20Comments.pdf>
- 3/24 CEC 2017 IEPR: <https://californiahydrogen.org/sites/default/files/CHBC%202017%20POU%20IRP.PDF>
- 3/20 SLCP: [http://californiahydrogen.org/sites/default/files/CHBC%202017%20SLCP%20ARB%20%20Comments\\_Appendices\\_0.pdf](http://californiahydrogen.org/sites/default/files/CHBC%202017%20SLCP%20ARB%20%20Comments_Appendices_0.pdf)
- 2/27 CEC DSO: <http://californiahydrogen.org/sites/default/files/2017%20IEPR%20CEC%20Comments.pdf>
- 1/16 VW letter: <http://californiahydrogen.org/sites/default/files/Proposal%20Letter%20to%20VW.pdf>