



International Partnership  
for Hydrogen and Fuel Cells  
in the Economy

## ***Brazil* Update**

33<sup>rd</sup> IPHE Steering Committee Meeting

16 – 19 June 2020

Virtual Meeting

# Announcements and/or New Initiatives *Brazil*

- Discussions are being held with different stakeholders in Brazil with the objective of considering the insertion of hydrogen energy in the Brazilian Energy Matrix, involving:
  - the Ministry of Science, Technology, Innovation (MCTI)
  - the Brazilian Hydrogen Association (ABH2)
  - the Ministry of Mines and Energy (MME)
  - the Brazilian Electricity Regulatory Agency (Aneel)
  - the Brazilian Energy Research Office (EPE) and
  - academy and industry representatives

# Announcements and/or New Initiatives *Brazil*

## FEI UNIVERSITY CENTER wins 2020 Brazil Student Regional Conference – AICHE with an open cathode fuel cell car

CHEM-E-CAR COMPETITION “AICHE2020 - American Institute of Chemical Engineers from Student Regional Conference - Brazil

www.fei.edu.br



<https://www.aiche.org/chenected/2020/02/centro-universitario-senai-cimatec-student-chapter-hosts-first-brazil-student-regional-conference>



### New Lab at FEI University Center - Electrochemical Engineering Laboratory / Chem. Eng. Dept.



# Announcements and/or New Initiatives *Brazil*



Demo project: 8 million Euros supported by the Federal Fund for R&D projects of the electrical energy sector

Hydrogen-based energy storage plant, in which surplus hydroelectricity and solar PV electricity are converted into hydrogen by water electrolysis, the hydrogen being stored for utilization during dry seasons and peak times. The hydrogen-based energy storage pilot plant includes a 20 Nm<sup>3</sup>/h PEM Electrolyser, a 600 Nm<sup>3</sup> tank for hydrogen storage @ 25 bar, and a 100 kW Fuel Cell used to reconvert the hydrogen back to electricity.



# Announcements and/or New Initiatives *Brazil*



Demo project: 11.9 million Euros supported by the Federal Fund for R&D projects of the electrical energy sector  
 Large-scale deployment of the hydro-solar synergy in which areas around hydro dams and even floating PV plants on the surface of hydraulic reservoirs; both dispatch energy as an unique combined energy source; it works to fill up seasonal and hourly gaps in the transition from one to the other energy source in the optimization of both as part of the interconnected system. The pilot plant includes a 50 Nm<sup>3</sup>/h Alkaline Electrolyser, a 900 Nm<sup>3</sup> tank for hydrogen storage @ 27 bar, and a 300 kW Fuel Cell used to reconvert the hydrogen back to electricity.

# Announcements and/or New Initiatives *Brazil*

In June 2020, the Brazilian/German Industry and Commerce Association (AHK) has started a three months pre-project together with GIZ and MME to prepare a study called Sector Mapping Hydrogen Brazil. The objective of this study is to identify the main stakeholders for a Brazilian Green Hydrogen Roadmap. In addition, the study will give a general vision about the main technologies for green hydrogen production and Power-to-X, and its status in Brazil.



# Announcements and/or New Initiatives *Brazil*



**WEBINAR**  
**BW TALKS**  
**Transformação Energética – Hidrogênio**  
quarta-feira  
**17/06**  
das 15h às 16h45

**Monica Saraiva Panik**  
Curadora do Núcleo Temático BW  
**Transformação Energética – Hidrogênio**

**Paulo Emilio Valadão de Miranda**  
Prof. titular da UFRJ, Dir. do Lab. de Hidrogênio da Coppe.  
Pres. da Associação Brasileira do Hidrogênio

**Camilo Adas**  
Presidente do Conselho da SAE Brasil

**Daniel Gabriel Lopes**  
Sócio e Dir. Executivo da Hytron e Coord. Tecnologia e Inovação para Mobilidade com Hidrogênio da SAE Brasil

**Silvano Pozzi Jr.**  
Dir. de Linha de Produção e Estratégia de Produto da Ballard Power Systems

**Vagner Barbosa**  
Mediador  
BW Expo, Summit e Digital 2020

Transmissão Ao Vivo  
SOBATEMA  
Casa do Youtube

In January 2020 the 3rd Biosphere World (BW EXPO 2020), a multidisciplinary event of technologies for sustainability of the environment, organized by SOBATEMA (the Brazilian Association of Technology for Construction and Mining), has included a new Curator Topic called “Energy Transformation – Hydrogen” among the existing ones such as Sustainable Agribusiness, Conservation of Water Resources, Sustainable Construction, Recycling, Waste to Energy, Valorization of Degraded Areas and Circular Economy.

<https://www.bwexpo.com.br/transformacao-energetica-hidrogenio/>



# Announcements and/or New Initiatives *Brazil*



In April 2020 the SAE BRASIL, an affiliate of the SAE International, with activities for the dissemination of knowledge and technological updating in the industry, focused on innovation and trends in Brazilian and international mobility, became partner of the BW EXPO 2020, created a working group called “Mentoring in Technology and Innovation for the Mobility with Hydrogen” and is organizing the **“SAE Brasil & Ballard Student H2 Challenge”** among universities and research institutions in Brazil. Ballard Power Systems from Canada has donated 10 fuel cell stacks, technical support and online courses for the challenge, which will be to design and construct 10 small vehicles for the event.





# Examples of Lessons Learned and Impact (Brazil)

Program initiative, policy, regulation or mandate	Lessons Learned/Outcomes
<p>Science, Technology and Innovation Plan for Renewable Energies and Biofuels</p>	<ul style="list-style-type: none"> <li>Public Consultation was carried out with strategic partners (governmental, industrial and academic). The plan received 65 contributions which reinforces society's demand.</li> </ul>
<p><a href="https://www.mctic.gov.br/mctic/export/sites/institucional/publicacao/arquivos/Plano-de-Ciencia-Tecnologia-e-Inovacao-Para-Energias-Renovaveis-e-Biocombustiveis.pdf">https://www.mctic.gov.br/mctic/export/sites/institucional/publicacao/arquivos/Plano-de-Ciencia-Tecnologia-e-Inovacao-Para-Energias-Renovaveis-e-Biocombustiveis.pdf</a> (Only in Portuguese)</p>	



# Thank you



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# Highlight to Include in IPHE Newsletter *Brazil*

- FEI will represent Brazil in the Chem-E-Car world championship of AIChE, which is supported by IPHE, using the concept of open cathode fuel cell integrated into the vehicle (2020).



FEI Student Team

# Status of Applications and Goals *Brazil*

Application	Status (As of <i>June, 2020</i> )	Goal
<b>1) H<sub>2</sub> Applications</b>		
a. Energy Storage (e.g. MW, GW of capacity)	<i>7 MWh/day</i>	<i>No target yet</i>
b. Electrolyzers	<i>1500 Nm<sup>3</sup>/day</i>	<i>No target yet</i>
c. Other (e.g., Steel, Marine, Fertilizer, etc.)	<i>None</i>	<i>No target yet</i>
<b>2) Transportation</b>		
a. Light Duty Vehicles	<i>None</i>	<i>No target yet</i>
b. Medium and Heavy Duty Vehicles	<i>None</i>	<i>No target yet</i>
c. Buses	<i>1 hybrid HFC</i>	<i>No target yet</i>
d. Trains	<i>None</i>	<i>No target yet</i>
e. Forklifts	<i>None</i>	<i>No target yet</i>
<b>3) Stationary</b>		
a. Residential	<i>None</i>	<i>No target yet</i>
b. Commercial	<i>None</i>	<i>No target yet</i>
c. Back Up Power	<i>None</i>	<i>No target yet</i>
<i>4) Other (applicable to your country and not covered in the categories listed above)</i>		<i>No target yet</i>