Hydrogen Technologies Association

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MESSAGE FROM THE PRESIDENT



Dear Readers

The process we are in is at an extremely critical stage. In addition to the beginning of the hydrogen era and the acceleration of transformation for both our country and other countries of the world, the introduction of carbon taxes creates the need to draw a new road map by taking climate change into consideration. At this point, associations, especially organisations such as the Hydrogen Technologies Association, play a critical role.

By undertaking this critical task in our country, we aim to contribute to the development of our country at individual and institutional level and to support the transition to the hydrogen age. These contributions are generally in the form of training, activities, publications, consultancy services and individual contributions. In addition to these, we also take important steps on how to establish and maintain an ecosystem by organising conferences and workshops in cooperation with public institutions and universities.

As an association and with the institutional structures we are affiliated with, we are trying to increase Turkey's success in this transformation. In our quarterly bulletin, we share the activities of the association, short reports covering important events in Turkey and abroad, information sharing, and important projects and transformations in our country. In addition, we also include various laboratory studies and studies of public institutions in our bulletin.

We want to introduce the companies in the sector, highlight the industrial sector and especially emphasise our corporate members and highlight their contributions in this process. From renewable energy to human resources, our aim is to start a successful hydrogen age process by acting with a common motivation for the hydrogen age.

This transformation is a historical opportunity for our country. We must come together to successfully complete this story and embrace this success. This will be the success story of both our country and hydrogen.

Love and respect to all of you.

LETTER FROM EDITOR



Hydrogen Technologies Association E-Bulletin has been published on our website every six months since September 2015. We included news about hydrogen in Turkey and worldwide, informative articles from you, and introducing our members and member institutions in the Bulletin. Thank you for your contributions. Now is the time to make some innovations. The newsletter will be published every three months starting in 2024. By publication rules, it now has an ISBN. We are waiting for your suggestions and contributions to new developments. Letters to the editor can be a step in this regard. We want to increase our young readers and publish their news and articles. Please get in touch with us.

Greetings and regards

İnci Eroğlu



What are the Advantages of Hydrogen Energy?

This week's guest of Green Energy is Our Chairman of the Board of Hydrogen Technologies Association, Mr. Prof. Dr. İbrahim Dinçer. What are the Advantages of Hydrogen Energy? He shared it in detail on AGRO TV.

In this section, hydrogen, one of the primary resources and future energy sources of the future, was discussed. What is hydrogen, and how is it produced? What is the role of hydrogen in clean energy production? What is the difference between Green Hydrogen and Clean Hydrogen? What are the developments in the field of hydrogen in Türkiye and around the world? Focused on the subject.

Click for news details.

Critical role of Hydrogen in transforming transportation and energy-intensive sectors

Prof. Dr. Aysel Kantürk Figen

In the "Hydrogen Technologies Panel" at the BIG Event organized by Ford Otosan, we discussed the critical role of Hydrogen in transforming transportation and energy-intensive sectors. Our RD&D activities for Hydrogen Vehicles and Green Transportation were explained at our Hydrogen Research Center.

Click for news details.



Our Honorary President Mr. Prof. Dr. Nejat Veziroğlu is 100 Years Old.

World-famous Turkish Prof., who has carried out groundbreaking research and projects on hydrogen energy in the world. Dr. Nejat Veziroğlu celebrated his 100th birthday with his family, loved ones and colleagues.

We wish our honorary chairman, Prof. Dr. T. Nejat Veziroğlu, many happy and healthy years.



Hydrogen Technologies Talks



Hydrogen Technologies Talks will continue in 2024 on the Hydrogen Technologies Association YouTube channel. Prof. Dr. Adnan Midilli is the moderator of the talks.



Hydrogen Talks -29th Section: "Anion Exchange Membrane Electrolyzer" was explained by Prof. Dr. Yılsel Devrim from Atılım University, Dean of Engineering Faculty.



Hydrogen Talks -30th Section: "Industrial Applications of Electrolyzers and Fuel Cells" was discussed by Prof. Dr. Selmiye Alkan Gürsel from Sabancı University, Deputy Dean for Research.

Energies of the Future Yenişehir

Yenişehir Municipality organized for the second time this year. It brought together scientists from different universities in Turkey and leading sector representatives in the "Energies of the Future Yenişehir" panel. Yenişehir Mayor Abdullah Özyiğit explained "Yenişehir's Energy Vision". Hüseyin Devrim (TEK-SİS) and Assoc. Prof. attended the panel held at Atatürk Cultural Center. Dr. Mustafa Karaoğlan (Dokuz Eylül University) attended and made their presentations.

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The Cooperation Protocol between the Turkish Cogeneration Association and the Hydrogen Technologies Association

The Cooperation Protocol between the Turkish Cogeneration Association and the Hydrogen Technologies Association was signed on 14.02.2024.

A cooperation protocol was signed between the Turkish Cogeneration Association (KOJENTÜRK) and the Hydrogen Technologies Association on February 14, 2024. The protocol signed at the KOJENTÜRK office consists of goals enabling the two associations to achieve their common goals and create a more environmentally friendly and sustainable impact on society.

At the signing ceremony, Yavuz Aydın, Chairman of the Board of Directors of the Turkish Cogeneration Association, and Prof. from the Hydrogen Technologies Association. Dr. İbrahim Dinçer signed the cooperation protocol and emphasized their determination to work together.

This cooperation protocol will enable the two associations to work on various projects by combining their expertise. This partnership will allow both associations to share their knowledge and experience and develop more environmentally friendly projects to reduce foreign energy dependency.



Clean Energy Technologies National Workshop

Assoc. Prof. Dr. Hüseyin Turan Arat and Dr. Hüseyin Şahiner from Sinop University were invited to give talks at the Clean Energy Technologies National Workshop organized in Ankara in cooperation with the Chamber of Electrical Engineers Ankara Branch, Gazi University, Nişantaşı University, and OSTİM Technical University. The OSTİM Organized Industrial Zone hosted the organization.

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AWARDS

Nejat Veziroğlu Special Award

This award was created on behalf of Prof. Dr. Nejat Veziroğlu, who is an international leader in hydrogen energy, the father of hydrogen technologies, and the permanent honorary president of the Hydrogen Technologies Association. It is given to people who have proven themselves in the field of hydrogen energy and technologies both domestically and internationally and have made internationally recognized contributions.

Service Award of Hydrogen Technologies Association

This award is given to the people who have dedicated themselves to hydrogen energy and have served for at least 20 years in the development and application of this field, have contributed to the communal, social, technological, and economic development of the country in this field, have been a pioneer in the education and training of youth, have made institutional contributions and are active in industrial applications.

Technology Award

This award has been created for institutions that work effectively on hydrogen energy technologies and develop technologies. It is given to institutions that develop a product for the development of hydrogen technology, establish a pilot or industrial facility in the field of hydrogen energy and technologies, have patents in the field of hydrogen energy and technologies or support technology development.

Young Researcher Award

This award has been created for researchers, who are under the age of 35 (not less than 35 years old as of the date of IHTEC-2023 conference, where the award will be given) and have at least a master's degree. It is given to people who have done successful studies on hydrogen energy technologies that are recognized at the national and international levels.

Student Researcher Award

This award is given to undergraduate, graduate, or doctoral students. Candidates are expected to be under the age of 30 as of the date of the IHTEC-2023 conference, where the award will be given. The candidates who will be nominated for this award or who will apply themselves, will be preferred for this award if they have developed an invention, a new application, or a unique method for hydrogen technologies

Winners of these prizes will be invited to attend the conference in which they will participate in the award ceremony, and their transportation and hotel expenses will be covered by the association.

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www.hidrojenteknolojileri.org

The last day for application is April 15, 2024

IHTEC2024

Dear Scholars, Researchers, and Industry Professionals,

In celebration of our university's 50th anniversary, we invite you to the Eighth International Hydrogen Technologies Congress (IHTEC 2024), a multidisciplinary international conference. From May 12 to 15, 2024, the congress will be held in Diyarbakır, an ancient cultural metropolis that connects the Mediterranean to the Persian Gulf and the Black Sea to Mesopotamia.



The congress will cover a broad range of topics related to hydrogen technologies, including, among others, hydrogen economy, hydrogen infrastructure, hydrogen management, safety, production, and transformation. The conference will concentrate on a variety of hydrogen-related technologies.

Thank you in advance for contributing to this important congress hosted by Dicle University and organized by the Hydrogen Technologies Association.

Best Regards,

Prof. Dr. Mehmet KARAKOÇ
Rector of Dicle University

GCGW-2024

On behalf of my university, I am pleased to welcome you to Şanlıurfa for the 12th Global Conference on Global Warming (GCGW-2024) Conference. The GCGW has effectively established itself as a prominent congress in this field since 2008, with GCGW-2024 marking the 12th installment of this conference series. We are thrilled to have the chance to share the unique Turkish hospitality and showcase the breathtaking beauty of the city of Şanlıurfa with you. As the global community knows, Şanlıurfa is a city akin to Göbeklitepe, challenging established conventions and knowledge.



As evident from our conference theme, this event will foster a significant shift in perspective regarding global warming. GCGW-2024 is a multidisciplinary, international conference covering various facets of global warming, encompassing its origins, effects, and potential remedies. I anticipate that this conference will create a platform for the interchange of technical insights, sharing impactful research findings, and introducing novel policies and scientific advancements, all of which contribute to the advancement of sustainable development and energy security. We extend a warm invitation to participants from diverse disciplines associated with global warming, including but not limited to ecology, education, engineering, natural sciences, social sciences, economics, management, physical sciences, and information technology. Your valuable contributions are encouraged at this year's event, which will take place at Harran University. The scientific segment of GCGW-2024 will encompass presentations by keynote and invited speakers, as well as oral and poster sessions featuring contributions from attendees. We anticipate everyone will have a rewarding and delightful experience at the upcoming conference, GCGW-2024.

Moreover, we encourage you to relish the historical, cultural, and natural splendor of Sanliurfa, Turkey. We eagerly await the chance to warmly welcome all Sanliurfa participants from May 16-19, 2024.

Prof. Dr. Mehmet Tahir GÜLLÜOĞLU
Chair of GCGW-2024 Conference
Rector of Harran University

Turkey's first Hydrogen Valley Project of the "South Marmara Hydrogen Shore Platform" Guided Project, 'South Marmara Hydrogen Shore - HYSouthMarmara' has started.

Hydrogen technologies have been at the center of discussions about the future of energy in recent years, and 'green hydrogen' is an important element in the push towards decarbonization and net zero objectives. Europe's steps towards green hydrogen have accelerated recently. It is shown that electrolyzer capacities increase with renewable energy investments. Various national and Union mechanisms support these new investments. Initial steps need to be taken quickly in order not to fall behind in this technological transformation and, more importantly, to mitigate the financial obligations that Turkish companies will face due to the European Union's Carbon Border Adjustment Mechanism (CBAM), which is approaching a protectionist line at the border where about 50% of exports take place.

'**Hydrogen valleys**' are considered a starting point to ease the path to deploying green hydrogen and accelerate energy investments in green hydrogen. **A Hydrogen Valley** is a geographical area – a city, a region, or an island– where several hydrogen applications are combined into an integrated hydrogen ecosystem that consumes a significant amount of hydrogen, improving the green hydrogen economy. It should ideally cover the entire hydrogen value chain, including production, storage, distribution, and end-use.

Grant agreement of "South Marmara Hydrogen Shore – HYSouthMarmara" Hydrogen Valley Project funded by Commission the European Commission was signed on June 30th, 2023, marking the beginning of the implementation period. With a total budget of approximately 38 million EUR, the HYSouthMarmara Valley Project has achieved a record for Turkey in the history of Horizon Europe Framework Programs with the granted support amount of 8 million EUR. This project will be carried out under the coordination of the Southern Marmara Development Agency (GMKA) and consists of 16 stakeholders. Within the scope of the project, the electricity produced in EnerjiSa Üretim's wind and solar renewable energy facilities established in Bandırma will be produced as 500 tons per year of green hydrogen with the electrolyzer with a minimum 4 MW capacity to be installed within the scope of the project. Kale Seramik A.Ş., Şişecam A.Ş., Hidrojen Peroksit A.Ş. and Eti Maden İşletmeleri in the region will use the green hydrogen produced. Sabancı University and IICEC will be involved in the analysis of the valley's multidimensional contributions in the fields of energy and climate, the creation of logistics processes, scientific and technical support in the installation and commissioning of electrolyzers for green hydrogen production, and enhancing the impact of the project and building a communication strategy.



The first General Assembly and Board of Directors meetings of Turkey's first Hydrogen Valley Project were held on November 28, 2023, in Çanakkale, along with the kick-off meeting. Progress in the work packages de-

signed within the project's scope was shared with all HYSouthMarmara Consortium members. When the project is completed, the critical steps that will be taken for the development of the hydrogen ecosystem in Turkey can be listed as follows:

- With the installation of Türkiye's first MW scale electrolyzer, the green hydrogen facility with the largest capacity in the Turkish industry will begin production.
- Türkiye's first regional hydrogen roadmap will be prepared, including plans for pipelines capable of holding 100% hydrogen.
- Initial investment feasibility studies will emerge for the green production of hydrogen derivatives such as ammonia and methanol, which Türkiye is almost 100% dependent on imports.
- The commercial production of a new boron chemical and sodium borohydride storing hydrogen in solid form will occur for the first time.
- Experience sharing will be ensured by establishing interactions with mature valleys and valley candidate regions.
- Studies will be carried out to increase the project's impact and create communication strategies.



It is envisaged that the HYSouthMarmara Hydrogen Valley Project will make a significant contribution to the production and use of green hydrogen, the development of related technology-oriented infrastructures, and the strengthening of Turkey's potential in this field.

Türkiye's Place in the Hydrogen Economy



Prof. Dr. İnci Eroğlu made a presentation as an invited speaker on "Türkiye's Place in the Hydrogen Economy" at METU Alumni Association Energy Commission on February 6, 2024. The meeting was organized as a free session and a hybrid meeting in ZOOM environment. Alumni who attended the session contributed with many questions and comments on the Future of Hydrogen Energy.

WIN EURASIA brings together the first and most important showcase of hydrogen energy in Türkiye

WIN EURASIA, the leading fair of industrial transformation, brings together the industry's rising value Hydrogen energy with the industry in its 30th year. WIN EURASIA, which will open its doors on June 5-8, 2024 at Istanbul Expo Center (IFM), Yeşilköy, will be the center of innovation in the industry this year as every year.

WIN EURASIA, which has hosted thousands of innovations and countless product launches with hundreds of companies in the past 30 years, is preparing to lead the industrial transformation with the Hydrogen Special Area this year.

The Hydrogen Special Area, which will be located in Hall 2, where future energy solutions will be exhibited and hydrogen technology will be explained to the industry with conferences and panels, will be the center of attention of industry professionals.

Why Hydrogen Energy?

In order to prevent environmental pollution caused by fossil fuel-based energy production and consumption, we are discussing the production and applicability of more sustainable and cleaner Hydrogen energy in the Hydrogen Special Area at WIN EURASIA 2024.

Heavy industry is one of the main uses of hydrogen energy. The development of technology and infrastructure for the production, storage, transportation and utilization of Hydrogen Energy brings many new jobs and projects. The production lines of industries with high carbon emissions have started to adapt their infrastructure to Hydrogen technology.

Thanks to the Hydrogen Special Area at WIN EURASIA 2024, you will witness the processes and projects in this transformation and have the opportunity to get to know and experience the solutions.

What awaits you in the special field of hydrogen?

- The opportunity to be on the most important stage of renewable energy technology
- The latest solutions from companies playing a role in industrial transformation
- Opportunity to experience new products directly
- Opportunity to discover compatible solutions and services for hydrogen technology before anyone else
- New investment opportunities in Turkey



and much more

- The opportunity to listen to all your curiosities about hydrogen energy from the leading names of the sector with seminars and panels

Hydrogen Special Area, the New Center of Future Energy, will host the industry at WIN EURASIA Hall 2!

Join us at WIN EURASIA, the center of innovation, on June 5-8. In this special 30th anniversary year, discover the energy of the future in the Hydrogen Special Area!

Free registration: https://platform.win-eurasia.com/register/tr?tag=H2_feature_area

#WIN30Years Old | June 5-8, 2024, Istanbul Expo Center, Yeşilköy

The Power of Nature Move to the Future

Green hydrogen is the harbinger of a clean and renewable future as the vanguard of a sustainable energy transition. This powerful resource will transform the energy sector, enabling us to reduce our carbon footprint and transition to an environmentally responsible energy system.



BCS Energy set out in 2009 to provide technical services for furnaces in the iron and steel and aluminum industries. However, it went beyond this goal and developed automation systems and regenerative combustion technologies, resulting in significant savings in gas consumption. Today, BCS Energy is a pioneer in industrial combustion systems and a leader in sustainable energy solutions.

With 15 years of experience, BCS Energy has accomplished many successful projects in Turkey and abroad. In particular, following its success in industrial combustion systems, it has continued its innovative work by focusing on hydrogen production, combustion, and electrolysis systems for the last six years. BCS Engineering plays an important role in the future sustainable energy solutions of hydrogen.

BCS Engineering specializes in high-efficiency and environmentally friendly energy production with electrolysis technology and offers small and large-scale hydrogen production solutions. While small-scale electrolysis devices produce 800 kg of hydrogen annually, large-scale 1 MW electrolyzers can produce 160 tons of hydrogen annually. These solutions are widely used in industrial applications and are essential to a sustainable energy future.

One of BCS Engineering's most remarkable innovations is hydrogen combustion technology. Thanks to this technology, the temperature achieved by burning hydrogen can reach up to 2700°C. This high temperature offers various industrial applications and optimizes productivity by increasing energy efficiency.

A project that overlaps with BCS Energy's work Towards the end of 2018, Tosyalı Holding installed and commissioned a Hybrid test furnace for annealing iron and steel products, which can also run on 100% hydrogen. This is a first in the industrial sector, proving the potential of hydrogen's utilization and an essential step towards sustainability.

As a result, BCS Energy plays a pioneering role in industrial transformation. By advancing hydrogen technology with innovative approaches, the company aims to leave a more livable world for future generations by offering environmentally friendly solutions in sustainable energy production and industrial applications.

"Hydrogen is the greatest energy source in the universe and will light up the future of humanity."

Nikola Tesla

BOOK REVIEW



The book entitled "**Research on the Synthesis and Dehydrogenation of Metal Hydrides**" in Turkiye was published by TENMAK-BOREN Boron Research Institution in 2022 by the authors Dr. Metin Gürü, Dr. Çetin Çakanyıldırım, Dr. Murat Bilen, Dr. Tuğba Akkaş Boynueğri and Dr. Ahmet Fırat Karabulut. This book provides information about metal borohydrides that are suitable for chemical hydrogen storage in borohydrides. The authors of this book present their research on this subject, supporting their theoretical knowledge with experimental results. The study and results carried out in Turkiye on the synthesis of sodium borohydride and calcium borohydride, the production of metal borohydride from borate compounds in different compositions, and the examination of the production mechanism and their results are explained in detail. Research results on calcium borohydride synthesis from anhydrous boroxide and anhydrous colemanite are interpreted. Many researchers have studied the usability of metal borohydrides in the hydrogen cycle for years. Many of these studies are given as sources in the book.



Hydrogen Technologies Association publishes reports to be a resource for Turkiye's Hydrogen Roadmap and Strategy and researchers. In this context, the report titled "BORON ON HYDROGEN ECONOMY" was prepared for publication by Prof. Dr. İnci Eroğlu and Prof. Dr. Aysel Kantürk Figen. The report aims to highlight the emerging importance of boron in the hydrogen economy. For this purpose, research and projects on boron chemicals that may be included in the hydrogen system, especially sodium borohydride and ammonia borane, are presented in detail. Although the applications are still limited, they are increasing daily, and new systems are being designed. There are many publications on this subject in Turkiye and worldwide. Although some of these articles cannot be included, this report is expected to be helpful to the reader, with the number of sources reaching 570.

Within the scope of this report, detailed information about boron-based hydrogen storage materials, fuel cell types, hydrolysis catalysts, and production cycles is presented. In particular, it is essential that Turkiye, which has 73-78% of the world's boron reserves, has the potential to use rich boron reserves for hydrogen storage and boron reserves for energy applications and develop new applications. In this context, the "Boron on the Hydrogen Economy" report is hoped to be a guiding source for using boron in hydrogen technologies in Turkiye.

NEWS

The 24th WORLD HYDROGEN ENERGY CONGRESS WHEC 2024 will be held in Cancun, Mexico, on June ,27-23 2024. You can find detailed information on the website.

www.wheccancun.org

HYPOTHESIS XIX will be held in Hiroshima, Japan, on July 2024 ,18-14. You can find detailed information on the website.

www.hypothesis.ws

Koç University Hydrogen Technologies Research Center was established.

Hydrogen Technologies Application and Research Center was established within Koç University. Source: Koç University Hydrogen Technologies Research Center was established.

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