



Monthly Sustainability Newsletter

February 2017, Vol. 1, Issue 1

CHAIRMAN'S MESSAGE



Dear members, partners, friends and stakeholders. It is my pleasure to introduce to you a new monthly Newsletter from the Abdullah Bin Hamad Al-Attiyah International Foundation for Energy and Sustainable Development. In this publication, we intend to share current news and information on topical sustainability issues relevant to the energy sector.

Energy, particularly the hydrocarbons, have been playing a crucial role in industrialization since the beginning of the last century. The energy sector has been the backbone of economic development of the region and we see this still continuing in the future. However, the sector will need to adapt rapidly to a changing business climate and continue to innovate and diversify.

The changing business environment is characterized by increasing concerns of climate change and environmental pollution, with steady move towards cleaner energy sources, such as renewable energy. The energy world is moving towards a quest for collective green growth based on the appropriate energy mix for each country. This should be enhanced by technological development and innovative approaches to address challenges, such as: security of supply, climate change and air pollution. No doubt that energy efficiency also play a vital part.

In this maiden edition of our Monthly Sustainability Newsletter, we bring you news tidbits on alternative energy sources. I hope you will find it an interesting read and informative.

THIS MONTH'S NEWS AT A GLANCE

Nuclear Power: Nuclear Power in the Spotlight.

Biofuels: Are people willing to pay more to be more sustainable?

Hydrogen Production: Hydrogen Production as a Future Energy Source?

Electric Cars: How Sustainable Are they?

Renewable Simulation: Global 100% Renewable brought to life.

Carbon Captures: Carbon Capture made Easier.

Upcoming Events

Mar. CEO Roundtable Series 3.

May. 5th Annual Energy Awards.

May. CEO Roundtable Series 4.

Sep. CEO Roundtable Series 5.

Dec. CEO Roundtable Series 6.

Important Announcement

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5th Annual Energy Awards

The Abdullah Bin Hamad Al-Attiyah International Energy Awards are celebrating their 5th Anniversary in 2017, and in commemoration of this special occasion a one day forum will be produced in alignment with the annual awards to gather all the former winners and relevant stakeholders for an international brainstorming conference.

Dates: May 16th & 17th 2017

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CEO Roundtable Series 5

The Implications of the Paris Agreement for Oil and Gas Companies in Qatar

~ Opportunities and Challenges ~

Date: 12th September 2017

Nuclear Power in the Spotlight

An international team of scientists suggests that we must ramp up energy production by nuclear power if we are to succeed in warding off the worst effects of greenhouse gas emissions on climate change. The team suggested in the “International Journal of Global Energy Issues” that beginning in 2020 we could achieve an annual electricity output of 20 terawatts without needing to develop carbon dioxide trapping and storage technology for the tens of billions of tons of emissions that would otherwise drive global warming to catastrophic levels. **Can we meet global energy demands with nuclear power?** The team concluded that "Nuclear power could both answer the climate challenge and give a perennial solution to humanity's energy needs for thousands of years," However, the jury is still out on this as Nuclear power is not free of challenges. Public perception and acceptability of nuclear technologies is a major issue with concerns regarding nuclear safety, liability, and waste disposal are seen as serious environment concerns. (Source: www.inderscience.com)



Biofuels – Are People Willing to Pay More?

Second generation biofuels can cost more than conventional fuel, so are people willing to pay more to be more sustainable? A Washington State University research shows this may be the case. In fact, the study found that **consumers may be willing to pay a premium of nearly 11 percent over conventional fuel in order to be more sustainable.** The paper, "Consumer Preferences for Second-Generation Bioethanol," was published



in the Energy Economics journal. First generation biofuels use potential food sources which can cause the price of food to rise. Second generation biofuels, on the other hand, are made from sustainable biological non-food sources. Advances on potential use of second generation biofuels could be seen by the recent Alaska airlines flight, from Seattle to Washington D.C, which was fueled by second generation biofuel produced from wood scraps. This new biofuel doesn't exist commercially as of yet but the studies finding show there is obviously a market as people are becoming increasingly concerned with their carbon footprint. (Source: www.wsu.edu)



مؤسسة عبدالله بن حمد العطية الدولية للطاقة والتنمية المستدامة

World Energy Consumption 2016

Unit: Mtoe

Highest ten ▾

China	3,101
United States	2,196
India	882
Russia	718
Japan	435
Germany	305
Brazil	299
South Korea	280
Canada	251
France	246
Iran	244
Indonesia	227



-42%

Decline in CO₂ intensity of Annex I countries since 1990

Source: Enerdata

How Viable is Hydrogen as a future Energy Source?

Some Scientists feel Hydrogen gas could be a promising alternative energy source to overcome our reliance on carbon-based fuels. Hydrogen has shown benefits of producing only water when it is reacted with oxygen. However, hydrogen is also highly reactive and flammable, so it requires careful handling and storage. Typical hydrogen storage materials are limited by factors like water sensitivity, risk of explosion and the difficulty of control of hydrogen-generation.



Hydrogen gas can be produced efficiently from organosilanes, some of which are suitably air-stable, non-toxic, and cheap. Catalysts that can efficiently produce hydrogen from organosilanes are therefore desired with the ultimate goal of realizing safe, inexpensive hydrogen production in high yield. **Generation of hydrogen from inexpensive organosilanes without additional energy input represents an exciting advance towards the goal of using hydrogen as a green energy source.** Ideally, the catalyst should also operate at room temperature under aerobic conditions without the need for additional energy input. A research team at Osaka University have now developed a catalyst that realizes efficient environmentally friendly hydrogen production from organosilanes. (Source: www.osaka-u.ac.jp)

Electric Cars – How Sustainable Are they?

Does it really help to drive an electric car if the electricity you use to charge the batteries as well as the batteries themselves were produced using coal?

In order to address this important question, it is necessary to consider the



holistic environmental impact of electric cars from production pants to “on the road”. Researchers at the Norwegian University of Science and Technology's Industrial Ecology Program have looked at all of the environmental costs of electric

vehicles to determine the cradle-to-grave environmental footprint of building and operating these vehicles. The researchers report on a model that can help guide developers as they consider new nanomaterials for batteries or fuel cells. So how Sustainable are elective Cars? **With the help of such models and cooperation from manufactures, electric cars could become increasingly more sustainable.** The hope is that by identifying all the environmental costs of different materials used to build electric cars, designers and engineers can help “make the right” design selections which optimizes the sustainable lifecycle of the product. (Source: www.ntnu.edu)



مؤسسة عبدالله بن حمد العطية الدولية للطاقة والتربية والاسعاد

Percentage of Renewable Energy in Electricity Production

Global Top Ten 2016

Unit: %	Highest ten ▾
Norway	97.9
New Zealand	80.0
Brazil	73.5
Venezuela	68.9
Colombia	67.9
Sweden	64.3
Canada	62.7
Portugal	49.3
Romania	42.6
Chile	41.6



20%

Share of wind and solar in electricity production in Germany

Source: Enerdata

Simulation Brings Global 100% Renewable Alive

A new model developed by Lappeenranta University of Technology (LUT) in Finland shows how an electricity system mainly based on solar and wind works in all regions of the world. It shows the functioning of an electricity system that fulfils the targets set by the Paris Agreement by using only renewable energy sources. The model is designed to find the most economical solution for a renewable electricity system. The model shows how the supply of electricity can be organized to cover the electricity demand for all hours of the year. This means that best mix of renewable energy generation, storage and transmission components can be found to cover the electricity demand. Every country in the world has to find pathways to achieve the Paris Agreement targets. **This visualization shows what a fully renewable electricity global system could look like in the future.** The researchers have ambitious goals to develop the model further with future upgrades that will go from looking only at the electricity sector to showing the full energy sector, including heat and mobility sectors. (Source: www.lut.fi)



Easier Carbon Capture

Scientists at the Department of Energy's Oak Ridge National Laboratory have discovered a simple, reliable process to capture carbon dioxide directly from ambient air, offering a new option for carbon capture and storage strategies to combat global warming. The process, which captures and releases carbon dioxide, requires minimal energy and chemical input. It uses a compound which, when left in the atmosphere, causes prism-like crystals of carbonate to form. **If direct carbon capture becomes an increasingly easier and inexpensive process, it may become a very viable solution for carbon reduction.** However, while the direct air capture method is gaining traction, the process needs to be further developed and aggressively implemented to be effective in combatting global warming. (Source: www.ornl.gov)



Journal Reference

Nuclear Power: www.inderscience.com
Biofuels: www.wsu.edu
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Carbon Captures: www.ornl.gov

Information

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مؤسسة محمد بن راشد آل مكتوم للبيئة والتنمية المستدامة

CO2 Emissions From Fuel Combustion 2016

Unit: MtCO₂

Highest ten ▾

China	8,948
United States	5,160
India	2,166
Russia	1,620
Japan	1,132
Germany	713
Iran	592
South Korea	577
Saudi Arabia	558
Canada	543



-0.4%

Drop of CO₂ emissions in China

Source: Enerdata