**Sustainability e-News Q4 2018 Edition**

# Sustainability e-News Q4 2018 Edition

We are pleased to share the new edition of our Go Green Brief – DHL Global Forwarding's Sustainability Newsletter. With this quarterly newsletter we are aiming to share our insights and knowledge on carbon reporting, reduction approaches and climate change abatement trends as well as other related sustainability topics. We hope you find it of value and we welcome your comments and suggestions.

---

## Green Power Paves the Way to Carbon Free Fuels

**Green electricity is an increasingly popular method of energy conservation that many companies and consumers around the world are adopting. This method generates energy from renewable sources like solar, wind, biomass and geothermal.**

Electricity generation is the largest source of carbon dioxide ($CO_2$) emissions worldwide. The replacement of fossil fuel with renewable sources has become a very popular topic in key political debates throughout many countries, with a significant focus on local employment and environmental risks. This spark of interest has led to a global share of green electricity of 12.1 percent in 2017. But what exactly is 'green electricity' and why is it important?

In general, the term 'green electricity' does not include a standardized set of criteria. It only identifies the resources which contribute to the grid mix. The quality of the electricity and its criteria is ensured through the different existing certification processes. Hence, the term 'electricity from renewable resources' is more accurate and stands for electricity generated from renewable non-fossil sources, such as wind, solar, or biomass. Although electricity from nuclear

power plants does not directly generate $CO_2$ emissions, this energy source is not counted as green electricity.

Electricity from renewable sources means, according to the European Union Renewable Energy Sources Directive (RES-D), electricity from renewable non-fossil sources, namely the following:

- Wind and solar
- Ocean energy and hydropower
- Aero-, geo- or hydrothermal and ocean energy, hydropower and biomass
- Landfill gas, sewage treatment plant gas and biogases

Companies worldwide are investing in green electricity because it can help strengthen a company's license to operate by demonstrating civic leadership towards customers, investors, stakeholders and employees.

Companies interested in buying green electricity can do so via:

1. Green power generation on-site (i.e. solar panels), or off-site where the electricity is purchased via a Power Purchase Agreement (PPA) from a third party.
2. Green power directly procured from the supplier.
3. Renewable electricity certificates.

In European and North American markets, commercial structures for trading green electricity have a long-standing history. For other markets, the International Renewable Electricity Certificate (iREC) Standard, has established a similar system: producers of green electricity sell their electricity into national electricity grids and receive certificates for the amount of electricity fed into the grid. These certificates can freely be traded between companies. In this case, since the company is the end user, as soon as it retires the certificate, the electricity they use becomes green. To avoid discrepancies (i.e. double counting or false claims) in this process, there are strict standards that must be abided. One of these criteria is that certificates are only valid when they are produced and used in the same time frame and geographic region, which is connected to the paired electricity grid.

To trade green electricity properly, a reliable and transparent tracking system needs to be in place. These systems are currently available in Europe and North America with developing markets around renewable energy shortly following behind, even with no long-standing history

with green electricity. With its international approach, the iREC Standard facilitates the creation of a market for green electricity in these countries.

Compared to carbon offsetting, the purchase of iRECs has a clear advantage: it is recognized in the science-based target approach. A target is defined as science-based when it has undergone a review by an independent organization that verifies the target is in-line with the ambition to keep global temperature increase below 2°C above pre-industrial times. As it is very important to actually reduce emissions to achieve this international target, normal carbon offsetting schemes are not accepted, while the use of green electricity, including iREC, is an accepted measure to reduce emissions.

Achieving the shift towards electricity from renewable sources will not only extinguish this source of $CO_2$ emissions, but also enable the path towards $CO_2$-free synthetic fuels. Eventually, these carbon free fuels will allow the second-largest source of $CO_2$ emissions to decarbonize the transport sector.

---

## Power-to-Liquid: A Revamped Technique to Decarbonize

**With a few Power-to-liquid (PtL) plants popping up in the last few years, making PtL more easily accessible, PtL may be a solution many industries will actively look towards to decarbonize and meet their greenhouse gas quotas. While chemically breaking down water with electricity and adding $CO_2$, PtL is slowly becoming one of the best carbon-free fuel alternatives.**

Electricity from renewable resources is not only an important aid in achieving the global demand of the transition to eco-friendly energy, but it also serves as an enabler for large-scale production of synthetic fuels.

To meaningfully contribute to the Paris Agreement, the transport industry has to urgently identify ways to decarbonize their current methods. Biofuels, liquefied natural gas (LNG), hydrogen and PtL are clean energy alternatives for industries currently looking for ways to optimize their carbon efficiency and reduce their absolute carbon footprint. While biofuel can be seen as a short-term solution and LNG as mid-term, both hydrogen and PtL will most likely only play a bigger role in the long-term goals of these industries.

PtL is, in fact, not a new technique. Branded with a modern name, it contains a process known as the 'Fischer-Tropsch process' originally developed in the 1920s. PtL transforms water and $CO_2$ to high-purity synthetic fuels with electricity. If the electricity used is generated from renewable sources, hence 'green electricity,' then PtL fuels are indeed a carbon-free fuel alternative.

PtL production contains three main steps :

1. The production of hydrogen with electricity using the electrolysis of water
2. Conversion by adding $CO_2$
3. Synthesis to liquid hydrocarbons with subsequent upgrading to refined fuels

Simply put, water is being split into its chemical components (hydrogen and oxygen) by using a very significant amount of electricity, followed by the hydrogen being paired with carbon dioxide to produce fluid hydrocarbons, also known as synthetic fuel.


One of the most positive aspects of this process is that essentially the same carbon dioxide we want to reduce is being used to produce fuels that will substitute those producing $CO_2$ during combustion. This means that burning these synthetic fuels is carbon neutral.

One of the biggest challenges for synthetic fuels is the massive need of electricity during the PtL process along with the commercially high impact from renewable electricity. Producing synthetic

fuels with conventional electricity would lead to a similar carbon footprint as using fossil fuels when looking at well-to-wheel emissions.

Our economy today is dependent on the combustion of fossil fuels, in particular the mobility and energy storage sector. Therefore, existing infrastructure is tailored to their storage, handling and transportation habits. Concerns over greenhouse gas emissions and the finite nature of fossil energy reserves demand a switch to renewable energy sources and a replacement of fossil fuels. Hence, this leads to the need for the development of liquid hydrocarbon substitutes. Therefore, when it comes to the transport industry, liquid fuels will still be the fuel of choice for the coming decades. If a choice were to be made between investing in new infrastructure as potential future batteries or a direct replacement of fossil fuels, the answer is easy. The direct substitute of liquid fuels would be the preferred choice.

Overall, synthetic fuels produced through PtL can be the answer to decarbonizing transport, if the energy used for this process is green energy from renewable sources.