Sustainability e-News Q1 2019 Edition

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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.

Climate Change Rulebook: The Global Agreement Reached at COP24 Katowice December 2018

For many, COP24 was a success: there is a defined way forward—a rulebook—that allows countries to adhere to the Paris Agreement with little opportunity to deviate from the plan. However, as the deadline-filled year 2020 approaches, some believe vital questions were left unanswered.

The 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP24) took place in Katowice, Poland from Dec. 2 to Dec. 14, 2018.

Long awaited, the countries present settled on most of the content of the 'rulebook' an operating manual for putting the 2015 Paris Agreement into practice. It represents the first-ever universal system for countries to track and report climate action progress. This includes how governments will measure, report and verify their emissions-cutting efforts. Such a rulebook is crucial for the success of the Paris Agreement in keeping the global temperature rise to 2 degrees Celsius because it ensures all countries will work under the same proper standards and have fewer ways of sidestepping their commitments. The rulebook addresses how countries should report their greenhouse gas emissions or contributions to climate finance, as well as what rules should apply to voluntary market mechanisms, such as carbon trading.

Even though COP24 can be seen as a success because of the rulebook achievement, critics also pointed out that a very important discussion point was left out: the key question of how countries will sharpen their targets on reducing emissions. Before the conference, a special report had been published by the Intergovernmental Panel on Climate Change (IPCC). The findings show 'climate change is running faster than we are - and we are running out of time' as UN chief António Guterres summarized. The Paris Agreement aims to hold the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursues efforts to limit the increase to 1.5 degrees Celsius—hence the need for countries to commit to sharper targets on reducing emissions is of even higher importance. The global stock take process will, as of 2023, invite countries to regularly review the progress, and it is expected to support an ambition based on the latest available science.

Furthermore, it was raised that the COP24 failed to agree on the way forward regarding the greenhouse gas emission markets/carbon markets. Carbon credits are awarded to countries for their emissions-cutting efforts and their carbon sinks, such as forests, which absorb carbon. Countries can then use these credits to achieve their emissions-cutting targets. For this process a new form of wording was requested by certain countries that would allow double counting of credits, undermining the integrity of the system. This issue has been postponed to next year. Observers also highlighted there were disputes about financial topics, including how money would be transferred to less developed countries to help with climate protection projects that mitigate the severity of climate impacts such as drought.

This year, COP25 will be hosted in Chile to finalize the open topics of the rulebook and start working on future emissions targets. The crucial (and most likely very difficult) milestone will be the year 2020, when countries face the first deadline for meeting their current emissions commitments and have to agree to new targets for 2030 and beyond. These targets, so-called Nationally Determined Contributions (NDCs), are expected to be way more ambitious pledges than the current ones. The Talanoa Dialogue was introduced by the Fijian COP23 Presidency to support the process of achieving these pledges. The political phase of the Talanoa Dialogue ended at COP24 with a 'call to action' issued jointly by Fijian and the Polish COP Presidency. Throughout 2018, parties and non-party stakeholders cooperated in more than 90 events associated with the Talanoa process to facilitate mutual exchanges. The three agreed guiding questions were: 'Where we are?', 'Where do we want to go?' and 'How do we get there?'. High expectation surrounded the third question 'How do we get there,' but the final declaration of the

Talanoa Dialogue appeared to be more of a moral appeal and rather than suggesting legal character. This increases pressure and expectation for the milestone year 2020. As these questions start to get answered, companies can meanwhile start contributing to these goals by proactively implementing targets, in parallel to their respective governments, which can reduce their own emissions.

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While its implementation is still in its infancy, switching to hydrogen fuel is a strong contender in the search for a zero-carbon alternative for the modern shipping industry. As transport is responsible for 22 percent of energy-related greenhouse gas (GHG) emissions worldwide, its decarbonization is increasingly imminent—but many factors could hinder hydrogen's adoption as a substitute for traditional bunker fuel.

Hydrogen is considered an enabler for the transition to a renewable-energy system, as well as a clean-energy carrier for a wide range of applications. Hydrogen-powered vehicles, with their high performance and the convenience offered by fast refueling times, can complement battery electric vehicles to achieve a broad decarbonization in transport segments, especially the road-transport sector. As one of the lightest elements, hydrogen's renewability and inexhaustibility point to a promising long-term alternative energy source, one able to cleanly generate and store electricity. Compared to batteries, hydrogen can store more energy in less weight, making fuel cells suitable for vehicles with heavy payloads and long ranges. But due to its low volume, high pressure or liquefaction is needed to store hydrogen—and both options require a significant amount of energy. Moreover, the still-expensive hydrogen tanks also need further development. Hence, how batteries and hydrogen relate will depend on how battery technology evolves and how quickly cost reductions from scaling fuel-cell production can be realized.

Considered the fuel of the future, hydrogen itself is not a source of energy but a form of making energy storable and transportable. It can be produced from fossil resources such as natural gas but then it would not be a green alternative. In order to be a true green alternative, hydrogen has to be produced through electrolysis using green electricity: using electricity, water is split into hydrogen and oxygen in an electrochemical process. The more common fuel cell, on the other hand, is very similar to electrolyze but works in reverse mode: it converts hydrogen into electricity, which is then used in an electric engine for propulsion.

Looking at the different sectors, road transport will most likely benefit from hydrogen technology soonest and most. Currently, battery electric vehicles are making headlines, but fuel cells are gaining momentum. Both technologies benefit, as electric mobility's growing acceptance and scale reduces costs for electric drivetrains and other components. According to McKinsey, industry experts believe the total cost of battery electric and fuel-cell electric vehicles could converge over the next decade, becoming competitive with internal-combustion-engine vehicles just 12 or 15 years from today. Furthermore, the commercialization of hydrogen vehicles has already started for passenger cars.

Benefits and obstacles

Low-density hydrogen fuel cells are often used to power propelling vehicles. In fact, NASA has used liquid hydrogen since the 1970s' to launch space shuttles and other rockets. Its zero-carbon emissions, coupled with its higher combustion rate, decentralized process and recorded 25 percent higher efficiency than internal combustion engines, all highlight hydrogen's potential for the transport and logistics sector. Moreover, as it can be locally generated from renewable resources and technologies, such as hydropower, solar or wind, hydrogen is a truly renewable fuel.

Despite its benefits, many questions still remain when it comes to widespread use of hydrogen fuel in the industry. How safe is transporting and storing large quantities of hydrogen? Can current infrastructure support hydrogen fuel on a commercial level? What will the cost impact of this switch be? Aside from the passenger cars already available, how can fuel cells be implemented on ships or aircrafts?

The hydrogen production industry is quite advanced, but infrastructure for storing and transporting it remains among the key challenges to fully implementing this technology in the modern transport and logistics chain. Hydrogen requires cryogenic storage at low temperatures (-253°C or 20K), which are associated with large energy losses and highly insulated fuel tanks. Alternatively, high pressure storage is possible, which also causes relevant energy losses and reduces the tank capacity.

Other obstacles include energy-intensive production, high investment costs, the dimensions and weight of fuel cell installations and their expected lifetimes. Especially when it comes to the high investment costs, industry, investors and policymakers have been asked to significantly increase efforts to reach scale and lower costs. While available industry technology may not yet support its broad usage, successful niche applications for specialized cars—particularly in combination with hybrid battery systems—may not be so distant. Hydrogen could well become transport’s alternative fuel source for the future.