

Low Carbon Pulse - Edition 18

GLOBAL DEVELOPMENTS IN PROGRESS TOWARDS NET-ZERO EMISSIONS



Welcome to Edition 18 of Low Carbon Pulse – sharing significant current news on progress towards net-zero emissions globally. This Edition covers the period from Monday May 17, 2021 to Sunday May 30, 2021 (inclusive of each day).

Please click [here](#) for the previous Edition of Low Carbon Pulse. Please also click [here](#) and [here](#) for the first two articles in the ***Shift to Hydrogen Series (S2H2): Elemental Change*** series: the *S2H2* series provides a narrative and perspective on hydrogen generally. The first feature in the ***Hydrogen for Industry (H24I)*** series was published on May 28, 2021: the *H24I* series is intended to cover the role that hydrogen is playing or may play in each industry and sector, and how. The intention is to publish a *H24I* feature every other month.

THE WEEKS AHEAD:

PRC ETS trading commencing:

The Ministry of Ecology and Environment for the PRC has indicated that work has been completed that will allow the commencement of the PRC's national carbon trading market by the end of June 2021.

Editions 6, 9 and 12 of Low Carbon Pulse provide an outline of the PRC ETS.

See: [China to launch nationwide carbon trading market by June](#)

WHAT A WEEK!

- **IOC's under increasing scrutiny:**

RDS judgment: Edition 17 of Low Carbon Pulse outlined the decision of the German constitutional court to the effect that one of the policy settings reflected in Germany's Climate Protection Act was unconstitutional, in part because it did not deal with GHG emissions arising after 2030.

On May 26, 2021, the District Court in The Hague, in the Netherlands, delivered its judgment in a case brought against Royal Dutch Shell plc (**RDS**) by Mileudensie (et al). This judgment requires *RDS* to reduce the net CO₂ emissions of the *RDS* group by at least 45% by 2030, compared to 2019. The required reduction is across Scope 1, 2 and 3 emissions, not in respect of each Scope. The judgment is founded on *RDS* owing a duty of care to all Dutch citizens. It is expected that *RDS* will appeal the judgment.

CVX and XOM resolutions:

In the court of shareholder opinion:

- the following resolution was passed by around 60% of the shareholders of Chevron Corporation: "Shareholders request [Chevron substantially to reduce] the greenhouse gas (GHG) emissions of [its] energy products (Scope 3) in the medium - and long term future, as defined by [Chevron]"; and
- two new directors were appointed to the 12 member board of Exxon Mobil Corporation. The two new directors were selected from four directors nominated by Engine No. 1. Engine 1 is not a major shareholder in Exxon Mobil, but major shareholders, including BlackRock, backed the appointments.

Each international oil company is responding to the need for transition to net-zero in a manner intended to maintain shareholder value, while transforming its business from reservoir to bowser. What is becoming clear is that IOCs are facing increasing scrutiny.

In Australia, the Federal Court found that the Federal Environment Minister has a legal duty not to cause harm to young people of Australia by exacerbating climate change in the context of approving new or expanded coal mine projects. On the day of judgment, the concept of a legal duty of care was not determinative, but the concept may play in role in future decisions.

• Indonesia on the road:

- **Phasing out coal-fired power:** On May 27, 2021 Perusahaan Listrik Negara (**PLN**) announced its intention to shutter all of its coal-fired power plants by 2056. It is reported that the shuttering will be phased: conventional plants to be shuttered by 2035 (9 GWs), "supercritical" plants by 2040 (10 GWs) and ultra-supercritical" by 2056. The shuttering is intended to be consistent with carbon neutrality by 2060.

The shuttering of the **PLN** coal-fired plants may be viewed as the start of a broader move to new policy settings in Indonesia, and is certainly consistent with the decision not to develop any new coal-fired power stations.

See: [Indonesian state utility to retire coal power plants gradually](#)

- **Phasing in of renewable electrical energy and phasing out of coal-fired:** On May 27, 2021, it was reported widely that the Government of Indonesia will not approve the development of any new coal-fired power stations, recognising that coal-fired power stations under construction, and at the state of financial close, will proceed.

See: [No new coal plants in Indonesia in another bid to cut emissions](#)

IEA Roadmap and G7 Meeting of Climate Change and Environment Ministers:

In Edition 17 of Low Carbon Pulse, the publication of the *IEA Roadmap* was foreshadowed. The key themes arising from the *IEA Roadmap* and the communique from the G7 Meeting of Climate Change and Environment Ministers are set out at the end of this edition of Low Carbon Pulse.

First UK ETS auction – no surprises:

On May 19, 2021, the UK ETS scheme commenced. As a member state of the EU, the UK was part of the EU ETS. On leaving the EU, a UK ETS was required. Both the EU ETS and the UK ETS are cap and trade emissions trading schemes (see [Edition 12](#) of Low Carbon Pulse for high-level outline).

Under the UK ETS there is an initial cap of 155.7 mtpa (for 2021), reducing to 117.6 mtpa by 2030. The first auction of UK Allowances (**UKAs**) took place under the UK ETS on the afternoon of May 19, 2021, between 12:00 hours and 14:00 hours London time. The auction reserve price was set at GBP 22 per tonne. On the first auction, the reported clearing price was GBP 43.99, with all UKAs being auctioned successfully to 15 successful bidders. Sixteen bidders submitted bids for nearly five times the number of UKAs available in the May 19, 2021 auction. Further auctions will take place every other Wednesday until December 15, 2021, when all of the UKAs will have been offered through the auction process.

BESS round-up

- **Hot – don't touch: 16.5 GW pipeline of BESS under development in the UK:** On May 21, 2021, Energy Storage News provided an overview of the level of BESS activity in the UK. We include a link below to the article. It is a great article, providing a complete picture of the UK BESS market.

See: [Large-scale battery storage in the UK: Analysing the 16GW of projects in development](#)

- **Compelling combination:** On May 25, 2021, it was announced that Shell Energy is partnering with the New South Wales Government and Edify (a leading independent Australian renewable energy company) to provide electrical energy to public buildings, including community and medical centres, and schools. The partnering arrangements include the development and use of 100 MW / 200 MWh of BESS to be built near Griffith, in the Riverina region of New South Wales, Australia.

It is reported that the arrangements are reflected in a 10 year contract under which 1.8 TWh of electrical energy will be supplied each year. These arrangements are aligned with the commitment of the NSW Government to achieve net-zero GHG emissions by 2050.

See: [Edify and Shell Energy sign a long-term services agreement to deliver a new large battery in South West NSW](#)

- **Big Battery Storage Map for Australia:** Leading renewable energy publication, reneweconomy, has published a Big Battery Storage Map detailing each BESS. A link is included below.

See: [Big Battery Storage Map of Australia](#)

Germany rounds up 62 large-scale hydrogen projects

On May 28, 2021 it was widely reported that German Federal and State Governments are to provide €8 billion in funding across [62 large-scale hydrogen projects](#).

The 62 large-scale hydrogen projects (selected from a reported 230 proposals) cover the entire hydrogen value chain, and reflect the oft-stated position of the German Government: "We want to become number 1 in the world in hydrogen technologies". This ambition, and the reported funding, is good news for all.

The funding of the 62 large-scale hydrogen projects is part of an EU initiative - Important Projects of Common European Interest (IPCEI) Hydrogen.

Green Metals:

Previous editions of Low Carbon Pulse have included sections on Green Steel. In light of the greening of metals, we have decided to refer to Green Metals.

- **Salzgitter update:** [Edition 13](#) of Low Carbon Pulse provided an overview of the plans of Salzgitter to develop a direct reduced iron (**DRI**) plant able to operate using both natural gas and hydrogen. The pilot **DRI** plant is now under construction, with first production of DRI expected during the first half of 2022.

As noted, the **DRI** will be used in the blast furnace to reduce the mass of coal in pulverised coal injection form (PCI), and at the electric arc furnace of Salzgitter at Peine.

See: [Salzgitter begins construction of hydrogen project for low-carbon steel production](#)

- **Alcoa updating:** The production of alumina from bauxite uses steam as part of the process to refine bauxite to produce alumina: traditionally, the steam is derived from the use of fossil fuels to power boilers to produce steam. It is estimated that 70% of the GHG emissions arising from alumina production arise from the use of fossil fuels for this purpose.

On May 21, 2021, Alcoa announced that it is to test the feasibility of using "mechanical vapour recompression" to electrify alumina production. This move is supported by funding from ARENA (the Australian Renewable Energy Agency).

See: [Alcoa to investigate low emissions alumina](#)

- **Everfuel and Norsk to test mettle:** It has been announced that Everfuel and Norsk (formerly Norsk Hydro) signed a memorandum of understanding (**MoU**) on May 20, 2021.

The **MoU** is stated to provide a basis for Everfuel and Norsk to develop a framework to allow optimisation of electrolyser use, including in the use of aluminium production, and "in the growing green mobility market in Europe". It is understood that Norsk is actively considering a number of projects for development in Norway and Europe.

In a separate announcement, Everfuel has outlined its plans to develop hydrogen refuelling infrastructure, with 19 hydrogen refuelling stations to be in operation by the end of 2023. This is part of Everfuel's "Scandinavian green hydrogen fuelling strategy for trucks, buses and cars, connecting the main traffic corridors in Sweden, Norway and Denmark".

See: [Norsk](#) and [Everfuel](#)

E-fuel / Future fuel round-up:

- **Hunter Valley to Hydrogen Valley:** The Australian states of New South Wales and Queensland have long produced both thermal coal and metallurgical coal for both domestic and export markets. In New South Wales, the heartland of coal production is the Hunter Valley.

On May 18, 2021, advisory firm, Energy Estate, outlined plans for a Hunter Hydrogen Network (**H2N**) (echoing the Hunter valley Coal Chain) as part of the development of the Hunter Valley to Hydrogen Valley, with the development of the Valley to involve Australian industry heavy weights AGL Energy (integrated energy company) and APA Group (Australia's largest gas pipeline company), and the UK's ITM Power (a PEM electrolyser manufacturer). As the development of the Hydrogen Valley takes shape, future editions of Low Carbon Pulse will report on it.

See: [Hydrogen Valley: Plan unveiled to turn Hunter into a renewables hydrogen hub](#)

- **Blue Hydrogen and Blue Ammonia "to go", and Green Hydrogen on the go:**

- On May 18, 2021, it was reported that policy settings in the United Arab Emirates (**UAE**) are being developed in recognition of the need to decarbonise energy production and use. Playing to the country's strengths, Blue Hydrogen and Blue Ammonia offer viable means of achieving this, through plans to develop supply to match demand.

To commercialise these policy settings, ADQ, Abu Dhabi National Oil Company (**ADNOC**) and Mubadala Investment Co have formed a hydrogen alliance for the purposes of developing the use of Blue Hydrogen in the **UAE** as part of creating a hydrogen economy and positioning for export markets.

- **ADNOC grey to blue:** produces around 300,000 tonnes of grey hydrogen a year, and intends to expand its production to around 500,000 tonnes a year. It is understood that the cost of production of grey hydrogen is between USD 1.30 and 1.50 per kg. The marginal cost of this increased production may be regarded as relatively small, with the key cost being the construction and installation of CCS / CCUS technology. **ADNOC** plans to increase its CCS / CCUS capacity to 5 mtpa of CO₂ by 2030.

On May 24, 2021, **ADNOC** announced plans to develop a Blue Ammonia facility at the Ta'ziz industrial complex at Ruwais. The Blue Ammonia facility is expected to be scaled to produce 1 mtpa (or 1,000 kilo-tonnes per annum).

- **Green Hydrogen:** This does not mean that the **UAE** does not believe that Green Hydrogen will not be developed, quite the contrary: Masdar (owned by Mubadala) is developing a Green Hydrogen facility, and as noted below (under "**DEWA fulfils the promise of its name**") the Dubai Water and Electricity Authority has developed the first Green Hydrogen facility in the Middle East and North Africa. However, the development of Green Hydrogen supply is likely to take longer, and it appears logical to develop Blue Ammonia production in priority to Green Hydrogen given the current economics.

See: [Masdar plans to complete design on hydrogen project this year, executive says](#)

- **Green Hydrogen and Green Ammonia:** Further, on May 25, 2021, the Khalifa Industrial Zone Abu Dhabi (**KIZAD**) announced the development of a Green Hydrogen facility by Helios Industries. The Green Hydrogen facility is to be developed in phases, and on full development will produce up to 40,000 tonnes of Green Hydrogen and 200,000 tonnes of Green Ammonia per year. It is understood that the Green Hydrogen facility is to be powered by a 800 MW solar photovoltaic farm within **KIZAD**. Head of Industrial Cities & Free Zone Cluster, Mr Abdullah Al Hameli, said that: "Abu Dhabi Ports is proud to be the host of an innovative company like Helios Industries, and one of the region's first green ammonia plants with zero-carbon emissions".

See: [Abu Dhabi Ports announces green ammonia production project](#)

- **Hydrogen from Sea-water :** On May 19, 2021, Gransolar announced the development of a Green Hydrogen facility (**GHF**) in the southern Spanish seaport of Port of Almeria. The **GHF** will use a double-reverse osmosis technology, with the deionized water being electrolysed using proton exchange membrane (**PEM**) technology, with the PEM reported to have installed capacity of 20 MW, and hydrogen production capacity of 1,000 tonnes a year. The Green Hydrogen produced is intended to provide hydrogen for FCEVs. The **GHF** will be powered by renewable electrical energy from a 30 MW solar photovoltaic wind farm and 20 MWh BESS.

The use of sea-water as a feedstock for the production of hydrogen remains an area for further development: the production of hydrogen from sea-water having desalinated the sea-water is energy intensive, and as such the economics of the **GHF** will depend on the cost of renewable energy and the price point for Green Hydrogen.

See: [Solar-plus-storage to produce hydrogen from seawater](#)

- **E-Fuel - eMethanol:** On May 19, 2021 it was announced that Liquid Wind is proceeding with front-end engineering and design (**FEED**) in respect of its eMethanol (or renewable methanol) production facility (**eMPF**) to be located in Ornskoldsvik, Sweden. The **eMPF** is expected to produce 50,000 tonnes of eMethanol each year. The **eMPF** will use CO₂ captured at a biomass-fired power plant, and combine that biogenic CO₂ with Green Hydrogen. eMethanol is an e-fuel that may be used by the shipping industry, and also it may be used as a feedstock to produce chemicals (including adhesives, plastics and solvents), and in both cases its use will displace the use of fossil fuel.

See: [Combining green hydrogen and biogenic CO2 to create renewable methanol](#)

- **Cummins welcomed:** On May 19, 2021 it was reported that the Cummins Wuhan Energy Engineering Center (**CWEEC**) had opened officially. The **CWEEC** is intended to provide a facility at which various technologies can be trialled, including for fuel cells and pipelines.

For Cummins, this continues the roll-out of its global footprint in key jurisdictions, as it continues to pivot from its traditional business.

See: [Cummins Hydrogen Energy Engineering Center Starts Operation in Wuhan, China](#)

- **DEWA fulfils the promise of its name:** On May 20, 2021 it was announced that the Dubai Water and Electricity Authority (**DEWA**) has produced Green Hydrogen within two and a half years of commencing the development of its Green Hydrogen Facility (**DEWA GHF**). The **DEWA GHF** derives its renewable electrical energy from the Mohammed bin Rashid Al Maktoum Solar Park (see [Edition 8](#) of Low Carbon Pulse).

DEWA CEO, Mr Saeed Mohammed Al Tayer has explained the thinking behind the development of the **DEWA GHF**, fundamentally going to the role of **DEWA**, and the flexibility of Green Hydrogen as an energy carrier:

"This is a system that allows for buffering of renewable energy production, but for fast response applications [from storage], as well as long-term storage. The [DEWA GHF] has been built to accommodate future applications and test platforms for the different uses of hydrogen, including potential mobility and industrial uses".

Nothing has changed since inception to completion: in 2019 Mr Al Tayer said that: "The hydrogen produced .. will be stored and deployed for re-electrification, transportation and other uses".

The **DEWA GHF** is the first solar photovoltaic powered Green Hydrogen facility in the Middle East and North Africa.

See: [UAE: First Green Hydrogen Plant to be Inaugurated This Week](#)

- **West Africa – untapped potential for hydrogen production:** On May 21, 2021, it was reported that the German Federal Ministry of Education and Research (**BMBF**) regards West Africa as a highly prospective region for the development of Green Hydrogen. Much has been written about the regions of the world with the greatest potential to produce Green Hydrogen, being regions with world class and scale renewable energy sources in the form of solar and wind.

Rather than concentrating on solar and wind resources alone, **BMBF** has looked at the world class and scale hydro-electric sources of renewable electrical energy in West Africa. The work of the **BMBF** estimates that all three sources of renewable electrical energy in combination could produce up to 165,000 TWh of renewable electrical energy for use in the production of Green Hydrogen. The scale of these estimates is staggering.

See: [Atlas of Green Hydrogen Generation Potentials in Africa](#)

- **Bell Bay ringing:** The State Government of the Australian island state of Tasmania, like a number of other states in Australia, is actively involved in promoting the development Green Hydrogen and Green Ammonia production in its State. The focus of this activity is Bell Bay, in the northwest of the island, on the River Tamar.

Over the last two weeks or so further steps have been taken towards the development of proposed projects at Bell Bay:

- **Fortescue Future Industries and IHI Corporation aligned:** On May 21, 2021 it was announced that Fortescue Future Industries (**FFI**) and IHI Corporation (**IHI**) signed a memorandum of understanding (**MoU**). It is reported that the MoU provides for the exploration of "green ammonia supply chains between Australia and Japan", including from Bell Bay.

As reported in earlier editions of Low Carbon Pulse, Fortescue Metals' green energy company (**FFI**) is active globally, driven by the vision of Fortescue founder, mining magnate and green

generation champion, Dr Andrew Forrest. Like *FFI*, *IHI* has been active globally, including in Australia, the Kogan Hydrogen Demonstration Project, and the US.

As reported under "**IHI and JERA granted means to commence co-firing**" below, those engaging with *IHI* have a clear line of sight to the market into which Green Ammonia is to be sold.

See: [Fortescue Future Industries investigating green ammonia supply chain between Australia and Japan](#)

- **Woodside Energy Limited and Japanese green giants, Marubeni and IHI aligned:** On May 21, 2021 it was reported that Woodside, Marubeni and *IHI* have signed a heads of agreement (**HoA**) to investigate the production and export of Green Ammonia to Japan.

See: [Woodside, IHI and Marubeni to Study Hydrogen Exports as Green Ammonia from Tasmania](#)

- **New core activities for Becancour:** Earlier in 2021, Air Liquide completed the development of its Green Hydrogen facility in the City of Becancour, in Quebec, Canada. In [Edition 16](#) of Low Carbon Pulse, the Hyzon and Raven SR plan to develop up to 100 waste-to-hydrogen hubs was outlined: each hub to take waste to derive renewable hydrogen from waste. (Deriving hydrogen from waste is covered in detail in [Hydrogen from Waste](#)).

On May 23, 2021, [H2 V Energies](#) announced plans to develop a hydrogen facility using a broad range of solid waste as feedstock to produce renewable hydrogen. While the project is at a relatively early stage, it seems to have strong backing.

As is the case with other projects proposing to derive hydrogen from waste, future editions of Low Carbon Pulse will cover developments in this area, as part of broader coverage of advanced bioenergy.

- **IHI and JERA granted means to commence co-firing:** On May 24, 2021 it was announced that *IHI* and JERA have received notice of acceptance of their joint grant application to undertake a demonstration project to co-fire ammonia in the generation of thermal power.

It is understood that the co-firing project will commence in June 2021 and continue until March 2025, with the plan to progress to commence co-firing at JERA's Unit 5, Hekinan Thermal Power Station from August to December 2021. With the rate of co-firing to increase over time, so that by 2024, co-firing will be taking place at a rate of 20% Green Ammonia, 80% coal, at Unit 4, Hekinan Thermal Power Station.

As is a recurring theme reflected in Low Carbon Pulse, this is another world first for Japan - the first large scale ammonia and thermal coal co-firing project. The co-firing project is consistent with the policy settings in Japan.

(The grant was approved under the New Energy and Industrial Technology Development Organization's "Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation / Research, Development and Demonstration of Technologies for Ammonia Co-Firing Thermal Power Generation" program: an approval process likely shorter than the name of the program under which it was granted).

See: [JERA and IHI to Start a Demonstration Project Related to Ammonia Co-firing at a Large-Scale Commercial Coal-Fired Power Plant](#)

- **Cummins welcomed again:** On May 24, 2021 Cummins, Inc announced plans to develop one of the world's largest electrolyser production plants (scalable to 1 GW a year) to allow production proton exchange membrane (**PEM**) plants. The Gigafactory is to be located in the central region of Castilla-La Mancha, Spain. It is reported that the Castilla-La Mancha *PEM* Gigafactory project will provide the electrolysers for the planned Iberdrola Palos de la Frontera Green Hydrogen project, which is to supply Green Hydrogen to Fertiberia for the production of Green Ammonia.

It is understood the Iberdrola has made submissions in respect of 53 hydrogen related projects to the Next Generation EU program (the program is intended to provide funding of up to €2.5 billion to achieve annual production of 60,000 tonnes a year of Green Hydrogen by 2030).

The announcement of the *PEM* Gigafactory is the fourth announcement of a Gigafactory in Europe in 2021: ITM Power, McPhy and NEL each having announced plans for a Gigafactory. Haldor Topsoe has announced plans for a 500 MW plant to produce its high-efficiency solid-oxide electrolysers.

See: [Cummins Selects Spain for its Gigawatt Electrolyzer Plant & Partners with Iberdrola to Lead the Green Hydrogen Value Chain](#)

- **Sinopec sites Green Hydrogen facility in Inner Mongolia:** On May 25, 2021 it was reported that Sinopec is locating its first Green Hydrogen facility in Ordos, Inner Mongolia, with production to commence in 2022. Production is anticipated to be up to 20,000 tonnes per annum.

The Green Hydrogen produced by the project is to be supplied to Zhong Tian He Chiang Corp, a joint venture between China Coal Energy Co, Sinopec, Shenergy, and Inner Mongolia Manshi Group.

Sinopec is the largest producer of hydrogen in the PRC (see [Edition 5](#) of Low Carbon Pulse).

See: [Sinopec to launch first green hydrogen project in 2022](#)

- **County Cork to go from Green to Greener:** On May 25, 2021 it was announced that EI-H2 intends to develop a 50 MW Green Hydrogen facility in Aghada, County Cork, Ireland.

See: [€120m green hydrogen facility planned for Co Cork](#)

Wind round-up:

- **Ørsted teaming for Japan off-shore wind auctions:**

- On May 19, 2021, Ørsted announced that it is partnering with Japan Wind Development Co (**JWD**) and Eurus Energy to bid for future off-shore wind field developments as part of the auction process that closed on May 27, 2021.

Ørsted, JWD and Eurus Energy are developing two projects under the Offshore Renewable Energy Act 2018. The two projects are the Norshiro/ Mintane/ Oga Project and the Yurihonjo Project. Both Projects are proceeding through permitting, and will then proceed to construction and installation.

See: [Ørsted, JWD, and Eurus form offshore wind partnership in Akita](#)

- On May 27, 2021 Ørsted announced that it had, with TEPCO RP, submitted a joint bid for the Choshi Offshore Wind field project.

See: [TEPCO and Ørsted sign MoU to work jointly on offshore wind projects](#)

- **Poland polishes off-shore wind program:** Editions 8 and 14 of Low Carbon Pulse reported on progress in the development of the Polish off-shore wind program. Edition 14 reported on the award of a contract for differences for the 1.5 GW Baltica 2 and 1 GW Baltica 3 off-shore wind field projects.

On 20 May, 2021 it was announced that the European Commission has approved the state-aid inherent in the Polish off-shore wind program. The state-aid in question arises from the two-way contract for differences used to provide the required revenue for the off-shore wind field projects to be developed. While the state-aid approval process is not always visible, it is nevertheless front and centre for governments providing a means of assuring revenue.

"The Polish scheme is a very good example of how competition policy can enable Member States to support green energy projects ... It gives the incentive to companies to invest in such green [energy] projects where they would otherwise not have invested. We hope that we will see many such initiatives in the future, which contribute to the EU's Green Deal, without unduly distorting competition in the Single Market".

The [article](#) in renewsbiz is well worth a read.

- **HIP in the grove:** On May 21, 2021, [Hecate Independent Power Limited \(HIP\)](#) announced that it intends to develop the HIP Atlantic Project – a USD 30 billion, 10 GW off-shore wind field project, in the North Atlantic, off Iceland: the Project will deploy both fixed and floating turbines.

The renewable electrical energy generated from the Project will be delivered to the UK grid by high-voltage direct current (**HVDC**) subsea transmission cables.

See: [HIP plans wind power exports to UK from pods offshore Iceland](#)

- **BASF and RWE proposing off-shore wind field to decarbonise chemical production:** On May 23, 2021, BASF and RWE presented a plan to develop a 2 GW off-shore wind field project in the German sector of the North Sea to supply up to 7,500 TWh of renewable electrical energy to the BASF Verbund chemical complex in Ludwigshafen, Germany, to allow the production of "CO₂ free" hydrogen and CO₂ reduction using innovation technologies (**Offshore-to-X Project**).

It is anticipated that the renewable electrical energy from the **Offshore-to-X Project** will be used as follows:

- 80% in eCracking (renewable electrical energy to produce steam for use to produce chemicals, displacing the use of natural gas for this purpose) and in methane pyrolysis (using renewable

electrical energy to achieve disintegration of methane to derive hydrogen and carbon, with the carbon captured in solid form, carbon black, with the Turquoise Hydrogen produced used to produce Turquoise Ammonia);

- 20% in the production of Green Hydrogen for use across the north west of Germany.

See: [Peugeot e-Expert Hydrogen now in series production](#)

- **Equinor, Norsk and RWE cooperate to bid for Southern North Sea 2:** Oil major (Equinor), aluminium giant (Norsk) and giant utility (RWE) are reported to have signed a cooperation agreement to inform the basis of a joint bid for the fixed bottom off-shore wind field auction in respect of Sorlige Nordsjo II), in the Norwegian sector of the North Sea.

Sorlige Nordsjo II is one of two areas that the Norwegian Government has opened up for development, the other being Utsira Nord, which is to be developed as a floating offshore wind field development. In respect of Utsira Nord, Equinor is cooperating with Eni SPA and HitecVision.

See: [Equinor partners with RWE and Hydro in joint bid for Norwegian offshore wind area](#)

- **A fair wind:** On May 25, 2021, Norseman Wind Consortium (**NWC**) announced that it has applied for a licence to develop a €3 billion, 1.4 GW off-shore wind field project off Norway, in respect of the Sorlige Nordsjo II area. The **NWC** comprises ASKO Fornybar, EnBw, NorgesGruppen, and Norseman Wind. The **NWC** business model is reported as meaning that its proposed off-shore wind field project will be developed without the need for government support of any kind: "Our business model means that we do not need government subsidies. Thus the state's green money can rather be spent on floating offshore wind at Utsira Nord as well as on hydrogen and carbon capture".

See: [Norseman Website](#)

Sustainable Energy round-up:

Previous editions of Low Carbon Pulse have included sections to provide a general renewables round-up. To cluster news items a little more, we have decided to do so around "sustainable energy" generally. Also this allows us to include projects that involve both solar and wind under one heading:

- **EU continues to accelerate:** On May 18, 2021, it was reported that the quantity of renewable electrical energy contracted under corporate power purchase agreements (or clean energy contracts) in the EU exceeded the quantity sold in calendar year 2019. By mid-May, a little short of 3.0 GW of renewable electrical energy had been contracted, compared to 2.5 GW contracted in 2019.
- **Fostering Effective Energy Transition:** The World Economic Forum published [Fostering Effective Energy Transition 2021 \(FEET\)](#) towards the end of April 2021. In the context of providing the readers of Low Carbon Pulse with a report that gives a sense of the progress of countries towards the transition to sustainable energy outcomes, **FEET** provides granularity for the countries featured in it.

In combination, **FEET** and the *IEA Roadmap* (see below) provide a guide to what has worked and where, and what still needs to be done – in combination a good report card, including on how we can all do better.

- **Bioenergy increased activity:** One of the many interesting parts of the *IEA Roadmap* is the analysis of the bioenergy sector, and the need for it to develop to process and to treat wastewater and waste as part of the pathway to net-zero outlined by the *IEA*. This is touched on in the first *H24I* [feature](#) on Hydrogen from Waste.

On May 21, 2021, in Bioenergy Insight, there is an update on the WSSC Water and Washington Gas project to derive biogas from wastewater: the project involves increasing the extent to which CH₄ can be realised from the biosolids arising from the treatment of wastewater to as to derive biomethane (Renewable Natural Gas) for use across the Washington Gas network.

See: [WSSC Water, Washington Gas to develop RNG project](#)

- **Oman goes Green by Blue:** On May 22, 2021, plans for the development of the USD 30 billion, 25 GW, Oman Green Energy Hub (**OGEH**) were announced. The **OGEH** is to be located close to the Arabian Sea. The development of the **OGEH** is to be spear-headed by InterContinental Energy, in partnership with OQ (state owned Omani oil and gas company) and EnerTech (Kuwaiti based investor). The renewable electrical energy produced from onshore solar and wind farms, will allow the production of 1.8 mpta of Green Hydrogen / 10 mpta of Green Ammonia.

Construction of **OGEH** is to be undertaken in phases, and is scheduled to commence in 2028, with completion of the final phase scheduled for 2038. On full development, the **OGEH** is to be powered by 25 GW of solar photovoltaic and wind.

InterContinental Energy is a name that will be familiar to those following the Asian Renewable Energy Hub being developed in the Pilbara Region of Western Australia (see [Edition 2](#) of Low Carbon Pulse).

See: [Green fuels mega project set to make Oman world leader in green hydrogen and green ammonia](#)

- **Panasonic announces global circuit developer:** On May 24, 2021, Panasonic Corporation announced the development of the world's first "RE100" (Renewable Energy 100%) factory to be located at Kusatsu, Shiga Prefecture.

The Panasonic RE 100 factory will be powered using hydrogen fuel cells and solar photovoltaic panels, and BESS, to provide 100% renewable energy at all times from within an "in-house" renewable electrical energy system to allow all activities at the factory to be undertaken without the use of any non-renewable energy source.

See: [Panasonic to Demonstrate RE100 Solution Using Pure Hydrogen Fuel Cell Generators](#)

- **RE 100 – an ever growing cohort of corporations:** It is estimated that the load of current signatories to [#RE100](#) will reach 455 TWh by 2030. While RE100 can be achieved from both on-site and off-site sources, it appears likely that most signatories will seek to achieve RE100 by sourcing off-site. If the current projected demand for renewable electrical energy from signatories is realised, new corporate power purchase agreements (or clean energy contracts) will be needed for renewable electrical energy from 95 and 100 GW of new solar photovoltaic and wind capacity.

See: [RE100](#)

Solar round up:

- **Floating solar still below the radar, but on the rise:** On May 19, 2021 it was announced that the floating photovoltaic project planned for the Cirata reservoir in West Java, Indonesia (**PVC Project**) is to proceed. The *PVC Project* is being developed in joint venture by Pembangunan Jawa-Bali Investasi (**PJBI**, a subsidiary of PLN) and Masdar, using project company Pembangunan Jawa Bali Masdar Solar Energi (**PMSE**). On development, the *PVC Project* will be South East Asia's largest floating solar photovoltaic project.

See: [Decarbonizing Indonesia with Southeast Asia's largest floating solar power plant](#)

- **Roof-top solar below the flight path / on the radar:** On May 20, 2021, the publication, Popular Mechanics, reported that roof-tops at airports are a missed opportunity: the argument is that airports in certain parts of the world are ideal locations for roof-top solar photovoltaic panels, and possibly so too is air-side – airports are in wide-open locations in which the panels are not in locations subject to shade / shadow.

A recent study from the Royal Institute of Technology (**RMIT University**) suggests that the deployment of roof-top solar on the 21 Federally owned airports around Australia could produce up to 466 GWh of electrical energy each year.

See: [If We Put Solar Panels on Top of Airports, We Could Power Entire Cities](#)

Port and Land Transport round-up

- **President Biden makes the case:** On May 18, 2021, US President, Mr Joe Biden, outlined a USD 170 billion battery electric vehicle (**BEV**) proposal to US car-makers, encouraging them to build *BEVs* in the US. The case made by President Biden to encourage US investment involves "cost-sharing grants to support new high capacity battery facilities in the United States" and to produce parts and vehicles, and to build vehicles.

The financial basis for the case made by President Biden is the provision of USD 100 in consumer assistance, USD 45 billion for the electrification of school and transit buses, USD 10 billion in tax credits in respect of medium to heavy duty work vehicles, and USD 15 billion to develop 500,000 EV charging stations by 2030.

See: [Biden pitches US\\$174 billion EV plan in Michigan, takes truck for a spin](#)

- **Air Liquide to refuel Daimler trucks:** On May 17, 2021 it was reported that Air Liquide is to supply liquid hydrogen, and a refuelling system, to Daimler, as part of the Daimler heavy-goods vehicle (**HGV**) development program. The use of liquid hydrogen is considered likely to double the range of *HGV*'s in comparison to the use of compressed gaseous hydrogen.

As with the combination of Daimler and Volvo reported in Edition 17 of Low Carbon Pulse, these developments are telling: the issue is not if, the issue is when, FCEV will start to displace diesel as the preferred power and propulsion for *HGV*'s.

See: [Air Liquide to support Daimler Trucks with liquid hydrogen and an enhanced refuelling system](#)

- **Daimler and Shell combine:** On May 20, 2021 it was announced that Daimler and Shell have signed an agreement to promote the adoption of the use of fuel cells in HGVs across the EU. The simultaneous development of the supply of HGVs and hydrogen refuelling infrastructure (**HFI**) is critical to the growth of the market for HGV powered and propelled by Fuel Cells (**HGVFCEVs**), and the ability of Shell to supply hydrogen from **HFI**, and prescribe the use of **HGVFCEVs** to transport its products, to deliver on its GHG emission reduction targets, and ultimately, achieve net-zero.

It reported that Shell intends to develop its **HFI** network in a way that aligns with the development of Green Hydrogen hubs, including at the Port of Rotterdam and Cologne and Hamburg. The supply of hydrogen will precede the demand for it: Shell intends to commence operation of its **HFI** network from 2024, with Daimler intending to make delivery of its first **HGVFCEVs** in 2025.

In combination, Shell plans to expand the **HFI** network to 150 **HFI**s by 2030, with Daimler planning to have delivered 5,000 **HGVFCEVs** by 2030.

This continues the initiatives from Daimler and Shell (see [Edition 17](#) of Low Carbon Pulse); since the start of 2021, each organisation, entirely aware of the importance to the global carbon budget, is seeking to reduce use of fossil fuels in the road freight industry.

See: [Daimler Truck AG and Shell target accelerated rollout of hydrogen-based trucking in Europe: simultaneously building truck refuelling infrastructure and rollout of fuel-cell vehicles](#)

- **Tracking and mapping HFIs:** On May 20, 2021, an interactive map was published to give a sense of the spread of **HFI**s across the EU and their location by country. It is projected that by 2030 there will be at least 60,000 commercial FCEVs across the EU and the UK, matched by at least 1,000 **HFI**s, with at least one **HFI** every 200 kms. This a fertile area for involvement of government, at the very least in policy setting.

See: [Interactive map – Truck hydrogen refuelling stations needed in Europe by 2025 and 2030, per country](#)

- **Hyzon Motors joins Utrecht initiative:** On May 20, 2021 it was announced that Hyzon Motors has joined a new initiative in Utrecht to deploy 300 hydrogen-powered heavy goods vehicles (**HGVs**), 1,500 lighter vehicles, two to five buses and two vessels, and up to 10 hydrogen refuelling stations by 2050. (For these purposes, Hyzon is reported to have executed the Covenant on Hydrogen Mobility.)

This initiative is part of the broader HyTruck initiative to put 1,000 hydrogen-powered trucks on the roads of Belgium, western Germany and the Netherlands. (In [Edition 5](#) of Low Carbon Pulse, reporting on European Hydrogen Week, we noted the broader initiative to deploy 100,000 hydrogen-powered trucks and 1,000 hydrogen refuelling stations.)

See: [Hyzon Motors Signs Covenant to Join Utrecht, The Netherlands' 1,800 Hydrogen Vehicle Initiative](#)

- **Hyundai committed:** On May 24, 2021 it was reported widely that later in 2021 Hyundai Hydrogen Mobility (**HHM**) intends to deliver its new class of Xcient Hyundai HGV into the EU. While **HHM** has been at the forefront of the development of **HGVFCEVs** for some time, it appears that being a front runner is likely to start to yield increasing sales.

As noted in [Edition 2](#) of Low Carbon Pulse, **HHM** entered the Swiss market in 2020. It is expected that **HHM** will enter Germany and the Netherlands, and then Austria, Denmark, France, Italy, Norway and Spain, responding to the demand from countries at the forefront of hydrogen infrastructure development and equipment deployment.

- **Port of Cromarty Firth to import hydrogen from Norway:** The role of sea ports in world trade is long-understood ([Ashurst Ports Compendium](#)). In the context of the development of the market for hydrogen, sea ports are going to be the lynch pin – they will be hubs for hydrogen production in exporting countries, and hubs for import, bunkers and distribution in importing countries.

On May 24, 2021, the Port of Cromarty Firth, Scotland, announced that it is partnering with Gen2 Energy (Norwegian renewable energy company) to import Green Hydrogen from Norway into the UK. The Port sees this partnership as part of its broader strategy to become a hydrogen hub.

See: [Port Of Cromarty Firth Signs Historic Green Hydrogen MoU With Norwegian Clean Energy Firm Gen2 Energy AS](#)

- **EU accelerating on transport:** On May 27, 2021 it was reported that the EU is going to accelerate progress towards net-zero for the transport sector, including a substantial acceleration to increase the pace to climate neutrality. The suggestion is that the transport sector needs to increase renewable energy sources, in fact to double them, by 2030.

In July 2021, the EU Commission will present its *Fit for 55* package (referring to the 55% reduction in GHG emissions by 2030 – see Edition 16 of Low Carbon Pulse). In November, the EU will present energy sector specific initiatives, including decarbonisation of the gas market, and for hydrogen.

Low Carbon Pulse will cover these initiatives as they arise.

See: [EU to push transport sector to rapidly adopt greater use of renewables](#)

CO2 shipping:

On May 19, 2021 it was announced by Danish shipowners, Evergas and Ultragas that they have combined to establish Dan-Unity CO₂ to develop and to supply both CCS / CCUS technology and CO₂ carriers. Also, Dan-Unity CO₂ is reported to have partnered with Carbfix (an Icelandic corporation) that is developing CCS / CCUS technology intended to store CO₂ by "creating" stone: the process is reported to involve dissolving CO₂ in water, and injecting it into the volcanic bedrock in Iceland. Carbfix estimates that up to 2,500 Gt (or 2.5 trillion tonnes) of CO₂ can be stored in this way, which equates to sufficient capacity to store 50 years of global GHG emissions at current levels of annual emission.

See: [Two Danish Firms Launch CO2-Transport Shipping Line](#)

Global Carbon Exchange:

On May 20, 2021, plans for a new global carbon exchange were announced. The global carbon exchange is to be located in Singapore. DBS Bank, Singapore Exchange, Standard Chartered Bank and Temasek have established a joint venture, Climate Impact X (**CIX**), for this purpose. The stated intention of the CIX is to provide "high-quality carbon credits to address hard-to-abate emissions".

Managing Director of the Monetary Authority of Singapore, Mr Ravi Menon, noted that the CIX represented the adoption of a "twin strategy" of the reduction of GHG emissions and the off-set of GHG emissions, which provides a "practical and effective" way to achieve the Paris Agreement Goals.

See: [New global carbon exchange to be headquartered in Singapore](#)

Net-zero round-up:

- **MUFG to net out over time:** On May 18, 2021, Mitsubishi UFJ Financial Group (**MUFG**) made an announcement covering a number of GHG reduction initiatives, including: 1. *MUFG* is aiming to move to net zero GHG emissions across its finance portfolio by 2050, 2. *MUFG* is aiming to reduce GHG emissions arising from its operations to achieve carbon neutrality by 2030, and 3. *MUFG* intends to join the United Nations Net-Zero Banking Alliance.

See: [Mitsubishi UFJ pledges net zero emissions in finance portfolio by 2050](#)

- **Singapore Airlines leans forward:** On May 24, 2021, Singapore Airlines (**SIA**) Group (comprising Singapore Airlines, SIA Cargo and Scoot) announced its commitment to achieve net-zero carbon emission by 2050. In announcing the commitment, *SIA* noted that it intended "to use multiple levers to achieve this goal ... [including] investing in new generation aircraft, achieving higher operational efficiency, adopting low-carbon technology such as sustainable aviation fuels and sourcing high quality carbon offsets". Given the Global Carbon Exchange, it is possible to see *SIA* sourcing its high quality carbon offsets from the Exchange.

See: [Singapore Airlines Group Commits To Net Zero Carbon Emissions By 2050](#)

- **Sydney Airport laid back:** On May 24, 2021 it was reported that Sydney Airport committed to the achieving net-zero emissions by 2030. The commitment comprise both Scope 1 and Scope 2 emissions (see [Edition 13](#) of Low Carbon Pulse). Sydney Airport is committed to continuing its program to target Scope 3 emissions.

See: [Sydney Airport commits to net zero by 2030](#)

Paris circles 11 projects to transform Paris' airports into hydrogen hubs:

On May 28, 2021 it was widely reported that 11 applicants have been chosen to contribute to the development of the **H2 Hub Airport Project**. Publication h2-view.com provides a [summary](#) of the successful applicants, and the role of each of them.

THE WEEK THAT WAS MAY 17 TO 21, 2021:

A pathway, to some a mosaic to others crazy paving:

- **Origin and Purpose:** On May 18, 2021, the *IEA* published [Net Zero by 2050 – A Roadmap for the Global Energy Sector \(IEA Roadmap\)](#). The *IEA Roadmap* outlines a path to achieving net-zero by 2050 by the energy sector. As such, the *IEA Roadmap* relates to the sourcing, production and use of energy so as to achieve net-zero across the energy sector by 2050.

The *IEA Roadmap* was prepared at the request of the UK President of COP 26 (Mr Alok Sharma). Ahead of COP 26, the *IEA Roadmap* sets a pathway for what needs to be done to achieve the Stretch Goal. The *IEA Roadmap* is stated to incorporate insights and lessons from earlier *IEA* publications.

How net-zero is achieved, in fact, will differ from the *IEA Roadmap*, but it is reasonable to expect that many of the initiatives identified will play a role. More than this, the *IEA Roadmap* provides a basis for countries to develop their own policy settings and timelines to achieve their targets, and net-zero: as the *IEA Roadmap* states:

"Getting to net zero will involve countless decisions by people across the world, but our primary aim is to inform the decisions made by policy makers, who have the greatest scope to move the world closer to its climate goals".

- **IEA Roadmap about energy sector only:** While the *IEA Roadmap* points out the need to decarbonise other sectors that give rise to GHG emissions, it does not include a pathway for their decarbonisation, critically, it does not provide a pathway for the Agriculture, Forestry and other Land Use (**AFOLU**) sector, which emits around 12 Gt (or 12 billion tonnes) of GHG emissions per year.
- **Different models, different outcomes, but neither "nets" net-zero GHG emissions:** The *IEA Roadmap* presents two models, one based on *specific* policy settings and GHG commitments (**STEPS**), the other based on *announced* pledges (**announced pledges case** or **APC**).

If the *STEPS* model is implemented, the *IEA Roadmap* signposts that GHG emissions will increase to 36 Gtpa by 2030, and remain at this level until 2050. If the *APC* model is implemented, the *IEA Roadmap* signposts that GHG emissions will fall to 30 Gtpa by 2030, and to 22 Gtpa by 2050.

Neither model achieves net-zero by 2050. As such the *IEA Roadmap* provides its own *NZE* pathway.

- **Key themes:** The *IEA Roadmap* emphasises a number of a themes, most of which had emerged ahead of the publication of the *IEA Roadmap*:
 - the need for specific policy settings to support increased *NDCs* as soon as possible, and the implementation of those specific policy settings;
 - generally the need to accelerate implementation of specific policy settings to 2030, and to accelerate new and replacement infrastructure for these purposes;
 - the development of renewable electrical energy is at the core of the energy transition, and net-zero;
 - global electrical energy demand (26,800 TWh in 2020), will increase by over 80% by 2050, with 85% of the increased in demand from developing countries and emerging market countries;
 - CCS / CCUS has a key role to play, including to capture GHGs arising from (i) production of low-carbon hydrogen production, (ii) industrial processes, and (iii) residual fossil fuel use;
 - hydrogen will be a key energy carrier, with 520 Mtpa of low hydrogen production (62% Green Hydrogen & 38% using CCS / CCUS) annually by 2050: 207 Mtpa for transport and 187 Mtpa for industry;
 - bioenergy is to play a key role in the decarbonisation of the energy sector, in fact it is one of the seven pillars of the decarbonisation of the energy sector.

The *IEA Roadmap* notes that had it made more pessimistic assumptions for CCS / CCUS or bioenergy, achieving net-zero emissions by 2050 will be more costly and difficult.

- **The Seven Pillars:** Some of the themes outlined above are best summarised in the Seven Pillars of decarbonisation of the energy sector: **1.** Energy Efficiency, **2.** Behavioural Change, **3.** Electrification, **4.** Renewables, **5.** Hydrogen and Hydrogen-Based Fuels, **6.** Bioenergy, and **7.** CCUS.
- **The benefit of the IEA Roadmap:** The *IEA Roadmap* provides a framework for countries to develop plans to implement roadmaps. In addition, the *IEA Roadmap* provides prompts for countries, and policy makers: many matters are addressed that will require consideration by all countries, and some matters will be country specific, for example, countries reliant on tax revenue from fossil fuels will have to anticipate and to provide for the decline of that revenue overtime.

- **Net-zero without offsets and low reliance on negative GHG emissions initiatives:** The *IEA Roadmap* seeks to achieve reductions in GHG emissions by decarbonising activities, rather than the use of "offsets from outside the energy sector, and with low reliance on negative emissions technologies".
- **What is not covered in this Edition 18:** Consistent with all editions of Low Carbon Pulse, this Edition 18 does not cover the costs identified in the *IEA Roadmap*, or the commentary and narratives from others on it. This said, we note the push-back from a number of countries around the *IEA Roadmap* on coal and natural gas: the *IEA Report* provides a pathway, not the pathway, and as such the *IEA Roadmap* should be read in full.

REMINDER OF DEFINITIONS	
Stretch Goal: Limit the temperature increase to 1.5°C above pre-industrial levels	Stabilisation Goal: Limit the temperature increase to well below 2°C above pre-industrial levels
CCS: CO2 / carbon capture and storage	CCUS: CO2 / carbon capture, utilisation and storage

The fourth article in the ***Shift to Hydrogen (S2H2): Elemental Change*** series considers hydrogen roadmaps of countries that have them, and ties back to some of the themes relevant to hydrogen arising from the *IEA Roadmap*. This will follow the third article in the series on **CCS / CCUS: What and Where?** (including the legal framework required), and will inform the fifth article on the legal and regulatory requirements of a hydrogen economy.

G7 – carrying forward themes:

Following the release of the *IEA Roadmap* and ahead of the G7 leaders meeting scheduled to take place in the UK in June, G7 Ministers responsible for Climate and Environment met virtually to discuss climate change on May 21 and 22, 2021. (The G7 comprises Canada, France, Germany, Italy, Japan, the UK and the US.) It is reported that the G7 Ministers were joined by climate and environment ministers from Australia, India, South Africa, and South Korea.

The G7 Ministers' [Communique](#) is comprehensive, and while it is worth reading in full, a number of key outcomes appear to be worthy of note, as follows:

- **G7 countries to deliver firm commitments to achieve Stretch Goal:** The G7 Ministers were aligned in the need to deliver firm commitments to reduce GHG emissions consistent with the Stretch Goal. The following is extracted from the [Communique](#):

"... we will make ambitious and accelerated efforts to reduce emissions to keep a limit of 1.5°C temperature rise within reach ..."

Without wishing to bang an editorial drum too much, it would be good to see the G7 countries increase their GHG emission reduction targets so as to achieve deeper and quicker reductions, and to assume responsibility more broadly, not just for their GHG emissions.

- **Fossil fuel development funding:** The G7 Ministers have agreed to cease the direct funding of new coal-fired power stations to developing countries by the end of 2021, expressed as follows in the communique:

"We commit to take concrete steps towards an absolute end to new direct government support for unabated international thermal coal power generation by the end of 2021."

Much of the reporting of this commitment, has not then gone on to include the following:

"Recognising that coal power generation is the single biggest cause of global temperature increases, we commit .. rapidly [to scaling-up] technologies and policies to ... accelerate ... away from unabated coal capacity ..."

This leaves open funding for abated coal-fired power generation, including those using CCS / CCUS. Also the communique states that:

"We will phase out new direct government support for carbon-intensive international fossil fuel energy".

While this statement does not refer to any fossil fuel energy in particular, it should be assumed that it includes all carbon-intensive fossil fuel energy, including natural gas. While this is broadly aligned with the *IEA Roadmap*, there is an argument that natural gas is core to electrification in parts of the world developing quickly, including India, Bangladesh, Pakistan and Indonesia.

While this policy setting has been on the agenda for a while, as it firms-up to become a reality, it is important that the G7 countries provide support to allow developing countries to increase the level of electrification: effectively, funding and supporting for the development of low or no carbon technologies, and take an holistic view about energy transition, and the road to net-zero.

- **Fugitive emissions:** Consistent with themes emerging from the Leaders' Summit in April (see Editions 15 and 16 of Low Carbon Pulse), the G7 Ministers recognised the "importance of ambitious and urgent action to reduce emissions and leakage of methane [(CH₄)] from the energy sector... [and]... the waste and agriculture sectors ... in order to slow global warming". This is consistent with the *IEA Roadmap*.
- **Land Use:** In [Edition 14](#) of Low Carbon Pulse it was noted that:
"It is becoming increasingly clear that one policy setting that is emerging is to ensure that areas of land are to be preserved completely from any land use ... It is understood that the EU and the US policy settings are being considered to ensure that at least 30% of their respective land-masses remain free from land use for human activities, or land is returned to non-use, free from human activities".

While this policy setting has been signalled for some time, it is good to see that the policy setting is now well and truly on the policy setting agenda, with the G7 Ministers' communique stating that:

"We commit to champion ambitious and effective global diversity targets, including conserving or protecting at least 30% of global land and at least 30% of the global ocean by 2030 to halt and reverse biodiversity loss .. and address climate change".

It is reported that the decisions of the G7 Ministers are to be carried forward at the G7 financiers meeting on June 4, 2021.

The author of Low Carbon Pulse is Michael Harrison.

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We bring together lawyers of the highest calibre with the technical knowledge, industry experience and regional know-how to provide the incisive advice our clients need.



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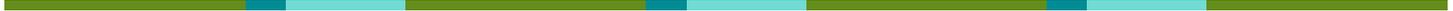
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