NEWS AND VIEWS ON THE DRIVE TOWARDS NET-ZERO GHG EMISSIONS

Welcome to the **eleventh edition** of **P_2N_0** covering the drive to reduce greenhouse gas (**GHG**) emissions to net-zero (**NZE**). **P_2N_0** identifies significant news items globally, reporting on them in short form, focusing on policy settings and project developments. **P_2N_0** will not cover news items relating to climate change generally, M&A activity, or news items that are negative. In this edition, we broaden the subject matter to include transport and waste.

The **twelfth edition** of **P_2N_0**, covering May 2024, will be published during the first week of June 2024. Apologies for the slight delay in publication of this **eleventh edition**, the author has been on the road since **April 17**, **2024**.

Access previous editions of **P_2N_0** by clicking **here**.

Content:

Edition 11: covering significant news items arising during April 1, to April 30, 2024.

HEADLINES FROM APRIL 2024

During **April 2024**, the following significant news items arose globally and seem to us to be the most news-worthy in the context of progress towards net-zero::

- **G7 gee-up**: On **April 30**, **2024**, among other things, the **G7 Group of Nations** announced that they were committed to ending the use of unabated coal-fired power generation capacity by 2035. The communique from the meeting of the Energy and Environment Ministers is broad ranging.

  It was encouraging to learn that the **G7** has asked the **International Renewable Energy Agency** (**IRENA**) to track the contribution of the **G7 Group of Nations** collectively to triple installed renewable electrical energy capacity by 2030. As covered in **Edition 6** of **P_2N_0**, at **COP28** "tripling renewable energy capacity globally … by 2030" was agreed. This reflected the analysis of **IRENA** in **World Energy Transitions Outlook**.

  IRENA has prepared for the **G7 Group of Nations** the following reports:
  - **Decarbonizing Hard-to-Abate Sectors with Renewables: Perspectives for the G7**;
  - **Tripling Renewable Power by 2030 – The role of the G7 in turning targets into action**; and
  - **The Energy Transition in Africa: Opportunities for international collaboration with a focus on the G7**,

  each of which is well-worth a read, and each of which ties to the outcomes agreed upon at **COP28**, directly or indirectly.

  Also, during **April 2024**, the good folk at **IRENA** published:

  - in partnership with the **Clean Energy Ministerial Multilateral working group**, **The Global Atlas for Renewable Energy – a decade in the making**;
  - **Public Finance for Universal Energy Access**; and
  - **Geopolitics of the Energy Transition – Energy security**,

  each of which has relevance to the publications that **IRENA** prepared for the **G7 Group of Nations**.

- The **European Union** (**EU**) **announced** the seven successful bidders in the first **European Hydrogen Bank pilot auction**. Through the auction process the **EU** has agreed to provide **€720 million** in funding to bridge the gap between the cost of the production of renewable hydrogen and equivalent fossil fuel. This support will be provided by grants.

As reported, the bid prices by the successful bidders are low, surprisingly so, with the lowest bid being €0.37 a kilogram of renewable hydrogen. Among other things, the following table sets out the projects that were successful, and their bid prices, with lowest bid prices first, and where the bid price was the same, the lowest bid price and the greatest capacity supporting the bid price in order.

Project	Developer / Sponsor	Country	Mass bid (metric tonnes) over 10 years	Capacity supporting bid	Bid price (€/Kg)
eNRG Lahti	Nordic Rengas	Finland	122,000	90 MW	0.37
El Alamillo	Benbros Energy	Spain	65,000	60 MW	0.38
Grey2Green-II	Petrogal	Portugal	216,000	200 MW	0.39
Hysencia	Angus	Spain	17,000	35 MW	0.39
Catalina	Renato PtX	Spain	480,000	500 MW	0.48
MP2X	Madoquapower 2x	Portugal	511,000	500 MW	0.48
Skiga	Skiga	Norway	169,000	111 MW	0.48

Following the agreed award for each project, each developer / sponsor must sign a grant agreement by November 2024, and commence supply of the renewable hydrogen within five years. What is telling about the bid prices is that they are similar. The grant funding will be provided from the **EU Innovation Fund**.

As reported, 132 projects bid, from 17 countries across the EU. Bid prices ranged from €0.37 per kg, to €4.5 per kg (€4.50 per kg being the cap on the bid price).

- **UN Panel on Critical Energy Transition Minerals launched**: On **April 26**, **2024**, the **United Nations** launched its **Panel on Critical Energy Transition Minerals** with a speech from the **UN Secretary General**. Information on the Panel is to be found at **https://www.un.org**, under **The UN Secretary General's Panel on Critical Energy Transition Minerals**. The key point to note is that it is estimated (conservatively) that the demand for critical minerals will grow by three and a half times by 2030.

  The **Panel** comprises Government and Intergovernmental Actors, and Non-State Actors. While there are unlikely to be any surprises, the Government and Intergovernmental actors comprise the **African Union** and the **EU** and all countries mining and using critical minerals. For the author, this is a significant and timely development, which hopefully will guide and support significant and timely development of critical mineral resources.

  It is encouraging to see the **UN** establishing the **Panel**, with the focus being how to develop and implement initiatives to provide support for the increased production and use of critical energy transition minerals. For the second time this year, the **UN** has recognized the need for it to provide the basis for support of a key element of the energy transition, and progress to net-zero GHG emissions: **Edition 8** of **P_2N_0** reported that the **UN IPCC** is to develop a **Methodology Report on carbon dioxide reduction** (**CDR**), recognizing that CDR, including CCS / CCUS, is another key element of progress to net-zero GHG emissions.

- **IPCC Scoping Special Report on Climate Change and Cities**: From **April 16** to **19**, **2024**, an **Intergovernmental Panel on Climate Change** working group met to scope the **Special Report on Climate Change and Cities**. This Special Report will focus entirely on climate change arising from urbanization, and the means to mitigate the impact of it.

- **VLAC orders on the rise**: On **April 12**, **2024**, **Splash.247.com** (at **https://splash247.com**, under **The rise of the seaborne ammonia trades**) reported that since the start of 2024, 15 very large ammonia carriers (**VLAC**) had been ordered. This rise in orders points to an increase in global trade of ammonia, with upwards of 65 million metric tonnes of ammonia expected to be traded by 2040. This increase in trade is a function of the use of ammonia as a fuel (stand alone or for co-firing) and as a vector for hydrogen.

- **European Court of Human Rights** (**ECHR**): On **April 9**, **2024**, the **ECHR** found in favour of a claim made by older Swiss women that policy settings in Switzerland were not addressing effectively the increased risk to them of death from heatwaves as a result of climate change.

  At the core, the judgment of the **ECHR** found that the Switzerland had not addressed the risk, and had violated the human rights of the claimants. The **judgment** of the **ECHR** provides grist for the mills on both sides of the debate as to whether courts or governments should initiate and implement policy settings to address climate change. What is clear is that the judgment is likely to result in a number of further cases, each case representing, at the very least from those bringing the actions, an expression of frustration that policy settings are insufficient.

- **Shell Appeal in Court**: On **April 2**, **2024**, it was reported widely that the appeal of the decision made in May 2021 is underway: in May 2021, the District Court in The Hague, in the Netherlands, delivered its judgement in a case brought against **Royal Dutch Shell plc** (**RDS**) by Mileudefensie (et al). This judgment required **RDS** to reduce the net CO_2 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. At the time, the author noted that whatever one's views on climate change, the decision of the court resembled policy making on a piecemeal basis, and that Governments were better placed to formulate and to require implementation of these policy settings.

  As reported, the opening arguments from the lawyers acting for **RDS** ran along these lines. It seems likely that **RDS** and **Friends of the Earth** will continue to exchange home truths. We will follow the outcome of the appeal.

- **The Carbon Majors Database Launch Report**: During the first week of **April 2024**, **Carbon Major** launched a report entitled **The Carbon Majors Database**. The **Database** was the subject of a good number of headlines on its launch. Unsurprisingly, the **Database** illustrates that which is already known – the largest producers of cement, coal, and natural gas and oil have contributed most of the anthropogenic CO_2 emissions, around 80 corporations and government owned enterprises have contributed 70% of CO_2 emissions from these activities. From 2016 to 2022, the **Database** indicates that that 57 corporations and government owned enterprises have emitted 80% of GHG emissions.

  The report is worth a read, if only to confirm that we know what needs to be done, and by whom.

  What is absent from the **Database**, and the headlines, is the role that these activities have played, and continue to play, in economic development. We have all benefitted in economic development, and we will all benefit in the avoidance, reduction and removal of GHG emissions in a timely and sustainable manner.

- **UNEP FI – PRB / ESRS Inoperability**: During the first week (or so) of **April 2024** the author had cause to work through a number of resources intended for folk in the finance sector to align thinking across the **Corporate Sustainability Reporting Directive** (**CSRD**) and the **Principles of Responsible Banking** (**PRB**).

  For those with interest in the matters, and with a couple of hours to spare, the following are useful, very useful: **UNEP FI-ESRS Interoperability Guide**, **UNEP FI-ESRS Data Points Mapping**, **UNEP FI-ESRS Topics Mapping**, and **UNEP FI-ESRS Conversion Tool**.

Africa

In previous editions of **P_2N_0**, we have grouped developments in **Africa** with the developments in the **Middle East** and **South Asia**. We have decided to include a standalone section considering developments in **Africa**. The reason for this is the ever increasing role that **Africa** will play in the energy transition, and the importance of **Africa** to achieving net-zero GHG emissions, directly and indirectly, including:

- the increased electrification across **Africa**, both to provide electrical energy to the existing population and the increasing population and the attendant increase in urbanization, and the deployment of renewable electrical energy for this purpose;

- the development of Hydrogen and Ammonia production capacity across **Africa**, including to supply Green Hydrogen and Green Ammonia, and to allow the use of Hydrogen to produce hydrogen-derived fuels;

- the development of natural gas resources across **Africa** both for domestic use and for export as LNG. As part of the just energy transition, the use of natural gas will be an important part of the electrification of **Africa**; and

- the development and supply of critical metal and minerals from resources across **Africa** for the benefit of the countries in which those resources are located.

During **April 2024** four publications, from **IRENA**, **the US Institute of Peace**, the **Department of Higher Education and Training in South Africa**, and from the International Energy Agency (**IEA**) respectively have provided perspectives on the energy transition in **Africa** as follows:

- the need for commitment from the **G7 Group of Nations** to **The Energy Transition in Africa: Opportunities for international collaboration with a focus on the G7**;

- the role of **Africa** in the development and supply of **Critical Minerals in Africa**, and **how African nations** may work with other countries in a way that provides mutual benefits;

- the role of **African countries** in developing the skills for their people to participate in the energy transition – **Identification of Skills Needed for the Hydrogen Economy**; and

- what is needed to bring electrification to the 600 million people in Africa who do not have consistent access to electrical energy – **Africa's electricity access planners turn to geospatial mapping**.

In the context of the **importance of Africa to the energy transition**, as noted above, the UN has established the **UN Panel** on **Critical Energy Transition Minerals**. Of the 24 Governments and Intergovernmental Actors, nine (or over a third) are from Africa: African Union, Botswana, Democratic Republic of the Congo, Egypt, Namibia, Nigeria, South Africa, Zambia and Zimbabwe. This is telling.

In future editions of **P_2N_0**, we will consider developments across **Africa** through the lenses of electrification (critically through the development of renewable electrical energy), hydrogen and hydrogen derived fuel production, bioenergy and biofuel production, carbon capture and storage and carbon credits, including arising from nature-based solutions.

We will do the same for the Gulf Cooperation Countries and East Asia.

Middle East and South Asia

Masdar and TAQA part of Framework: On **April 24**, **2024**, it was reported widely that the **Sultanate of Oman** and **UAE** (including Masdar and TAQA) had signed a memorandum of agreement to assess the feasibility of the development of green aluminum and green steel.

Americas

EPA and CCS: On **April 25**, **2024**, the US **Environmental Protection Agency** (**EPA**) released a **new regulation** under which coal-fired power generators will be required to reduce their **GHG** emissions by 90% by 2039. For these purposes, coal-fired generators may use carbon capture and storage to capture CO_2 arising from the continued use of coal-fired capacity.

When the draft regulation was published in May 2023 it contemplated the capture of CO_2 and the co-firing of clean hydrogen with coal to achieve the reduction target of 90% by 2039. In dropping co-firing of clean hydrogen with coal, the EPA appears to have recognised the continued uncertainty as to the mass of clean hydrogen available, and its price.

Mexico good to go green: On **April 16**, **2024**, **hydrogeninsight** (at **https://hydrogreninsight.com**, under **Mexico has about 7 GW of green hydrogen projects under development without any subsidies lined up**) reported that the **Asociacion Mexicana de Hidrogeno** has indicated that "at least 15 projects" are underway, with estimated capital cost of **USD 20 billion**. It will be interesting to follow as more detail is made available about the projects.

Cal 100% renewables: On **April 15**, **2024**, **electrek** (at **electrek.co**, **under California exceeds 100% of energy demand with renewables over a record 30 days**) reported that renewable electrical energy supply exceeded 100% of demand for electrical energy across the US State of California's main grid for 30 out of 38 days. As reported, the consistent matching of supply and demand in this way is a first.

APAC

Japan CO_2 Value Chain: On **April 27**, **2024**, **S&P Global** reported that Japan is to start the capture of **CO_2** from the **Maizuru coal-fired power station**, with the **CO_2** captured to be liquefied to produce **LCO_2**, with the **LCO_2** to be transported 1,000 km before being stored permanently or used.

DNV Energy Transition China Outlook: On **April 23**, **2024**, **DNV** published its **Energy Transition China Outlook**. The publication is excellent, providing a balanced and insightful (as ever from **DNV**) assessment.

ASEAN Regional Grids:

- On **April 15**, **2024**, **Bain & Company**, **GenZero**, **Standard Chartered** and **Temasek** published a report entitled **South-ease Asia's Green Economy 2024 – Moving the Needle**. The report is well worth a read, providing a clear assessment of how countries across the region may work together to reduce GHG emissions so as to achieve nationally determined contributions, while at the same time providing assurance in respect of both energy and food security.

- This follows the publication by **DNV** in **March**, **2024**, of its **ASEAN Interconnector Study**: **Taking a Regional Approach to Decarbonization**. The **Study** considers the development of cross-border electrical energy interconnectors (including to allow BESS infrastructure development) and hydrogen networks. This is a matter covered by the author in a number of shorter pieces and presentations over the last 15 months or so. The **Study** considers three approaches, Individual, Moderate and Regional Cooperation.

Decarbonizing Asia's Industrial Giants: During **April 2024**, the **Asia Society Policy Institute** published a report entitled **Green Hydrogen for Decarbonizing Asia's Industrial Giants**, *Analysing H2 Electrolyzer Market Opportunities in Key Industrial Applications*. As might be expected, the **Report** hones in on the size of the market opportunity in China, India, Japan, and South Korea, with the focus on the use of Green Hydrogen to decarbonize the production of iron and steel, and the use of Green Ammonia and Green Methanol. The **Report** is worth a read.

Australia announces Future Made in Australia Act: On **April 11**, **2024**, the **Federal Australian Government** announced the introduction of policy settings intended to promote the development of a clean energy industry, including the development of manufacturing capacity.

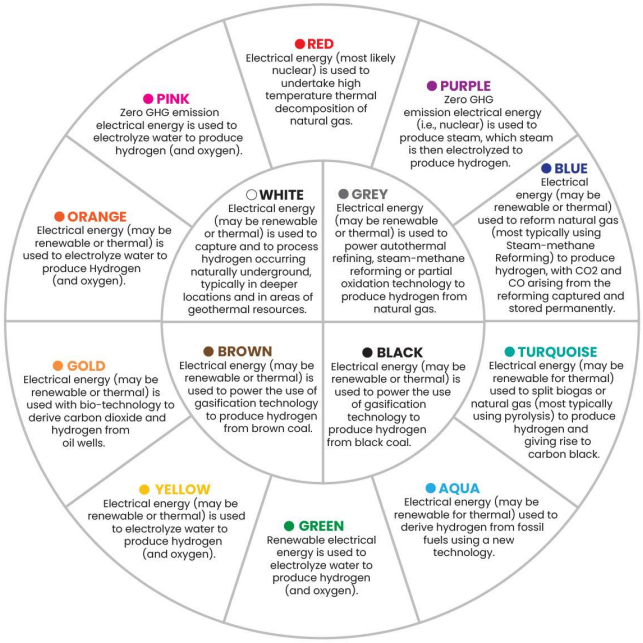
While the announcement is short on detail, it would seem that Australia is following the lead of the USA and the EU to allow public funding to be provided in support of the development of private sector projects. While the **Federal Australian Government** has provided some funding, it has not embraced the need for the Government to lead the way to promote accelerated manufacturing capacity and project development as has been the case in the USA and EU.

Fortescue opens giga-factory: On **April 8**, **2024**, **Fortescue Ltd** opened its giga-factory in Gladstone, Queensland, Australia. As announced, the giga-factory has capacity to manufacture up to 2 GW of "proton exchange membrane (PEM) electrolyser stacks" a year. This is an exciting development, and with the **Future Made in Australia Act** is hoped that more developments will occur.

Japan eyes nuclear hydrogen production capacity: On **April 4**, **2024**, **Nikkei Asia** (at **asia.nikkei.com**, under **Japan eyes hydrogen production using next-gen nuclear reactor**) reported that the **Japanese Government** intends to commence the production of clean hydrogen using the high heat arising from High Temperature Reactors.

On **March 28**, **2024**, the **Japan Atomic Energy Agency** tested the **High Temperature Engineering Test Reactor** (**HTTR**).

The **Baker Botts Hydrogen Circle** below explains at a high-level the colours used to describe hydrogen.



Singapore eyes nuclear capacity building: On **April 3**, **2024**, **Dr Tan See Leng**, Second Minister for Trade and Industry for Singapore, in answering a question in Parliament said that Singapore intends to bring together around 100 nuclear energy experts to enable to Singapore to assess the possible development and deployment of nuclear power capacity.

BIGST Cluster CO_2 Solution: On **April 1**, **2024**, it was reported widely that **PETRONAS Carigali** and **JX Nippon Oil and Gas** are to proceed with the development of the **BIGST Cluster** – a 4 TCF natural gas development offshore peninsula Malaysia. As reported, the development will proceed with **CO_2** capture and storage from the natural gas resource which is high in CO_2. This follows the **Kasawari Project**. Like the **Kasawari Project**, the **BIGST Cluster** project is not an EHR project, rather it is a project involving the capture of CO_2 in one field, and the injection of the captured CO2 into another field that is depleted.

Third FLNG for PETRONAS: Also on **April 1**, **2024**, it was reported widely that steel cutting had commenced at the **Samsung Heavy Industries Shipyard** in Geoje Island, South Korea on the build of the third floating liquified natural gas (**FLNG**) vessel to be used for the nearshore 2 million metric tonnes a year FLNG project, wit the vessel to be moored at the **Sipitang Oil and Gas Industrial Park**. **PETRONAS** has led the way in the deployment of FLNG, with PFLNG Satu and PFLNG Dua.

China's Gaps: During **April 2024,** the good folk at the **Global CCS Institute** published **A Gap Analysis of China's Regulatory Framework for CO_2 Geological Storage**. The publication is useful and confirms many of the issues that arise in legislative and regulatory regimes globally, not just in China.

Europe and the UK

European Hydrogen Observatory: In late **April 2024**, the good folk at the **European Hydrogen Observatory** published the **European Hydrogen Policy Landscape**. The publication provides a useful database and useful

summaries of **EU** policy settings and legislation and regulation, and national hydrogen strategies and policy settings, and legislation and regulation across Europe.

Germany and UK joint understanding: On **April 24**, **2024**, **Germany** and the **UK** agreed to undertake jointly a feasibility study to assess the export of hydrogen from the UK to Germany. The study will be undertaken as an initiative under the **Joint Declaration of Intent of the German-UK Hydrogen Partnership** (see **Edition 3** of **P_2N_0**) signed on **September 26**, **2023**.

H2Carrier floats major project: On **April 23**, **2024**, **hydrogeninsight** (at **www.hydrogeninsight.com**, under **Giga-scale green hydrogen project announced in Arctic Norway using world's first floating ammonia production vessel**) reported that **H2Carrie**r has plans to develop 1.55GW of off-shore wind capacity to produce Green Ammonia using a floating vessel technology solution (the **True North Green Ammonia project**). The project will produce 109,000 metric tonnes of Green Hydrogen (using electrolyser capacity of around 1 GW) capable of combining that Green Hydrogen with Nitrogen to produce up to 610,000 metric tonnes of Green Ammonia a year. The floating production vessel will comprise desalination, electrolyser and Haber-Bosch technology – the **P2XFloater**™.

Denmark goes to market: On **April 23**, **2024**, it was reported widely that **Danish Energy Agency** has commenced the procurement process to procure up to **6W** of offshore wind field capacity. The primary intention is that the renewable electrical energy to be generated will be used to satisfy load across 10 million homes. The secondary intention is that the renewable electrical energy may be used to produce **power-to-X products**.

City of Szeged's geothermal energy: On **April 15**, **2024**, **euronews** (at **www.euronews.com**, under **The future is geothermal: Hungarian city leads the way with renewable energy**) reported on the largest geothermal system within the **EU**, which is providing heat and power (including cooling systems) to the **City of Szeged**. Over time it is expected that the geothermal system will reduce natural gas use. The geothermal system comprises 27 wells, 16 heating plants, and heat distribution through 250 kilometres of pipelines.

European Parliament adopts Renewable and Natural Gas (RNGH) Directive: On **April 11**, **2024**, the **European Parliament** adopted the **RNGH Directive** and the **RNGH Regulation** (aka the Decarbonised Gas and Hydrogen Package). Having been approved by the European Parliament, the **Directive** and the **Regulation** will be approved by the European Council, following which the **Directive** and the **Regulation** will come into effect 20 days after being published in the **Official Journal of the EU** (**OJ**). The **Directive** and the **Regulation**, and the **TEN-E Regulation** (see below) will govern the development and repurposing of natural gas networks across the EU. The good folk at **The Oxford Institute for Energy** published a paper entitled **From natural gas to hydrogen: what are the rules for the European Gas Network decarbonisaton and do they ensure flexibility and security of supply**.

EU publishes PCI-PMI List: On **April 8**, **2024**, the **European Commission** published the first list of 166 **Projects of Common Interest (PCI)** and **Projects of Mutual Interest (PMI)**. The **PCIs** and **PMIs** were published in the **OJ**. Each of the **166 PCIs** and **PMIs** will be eligible to apply for financing under the **Connecting Europe Facility**, with calls for application made during the second half of **April 2024**, with applications to be submitted by the end of October 2024. The full list of the **PCIs** and **PMIs** is in the **OJ**. By way of a quick summary, 85 of the projects are electrical energy projects (consistent with the **European Grid Action Plan**), offshore and smart electrical energy grid projects, 65 projects are hydrogen projects, and 14 are CO_2 network projects.

Finland energy storage complex: On **April 7**, **2024**, **New Atlas** (at **newatlas.com**, under **90-GWh thermal energy storage facility could heat a city for a year**) reported on the proposal from **Vantaan Energia** to develop underground energy storage capacity for the **city of Vantaa**. The energy storage project has a total volume of 1.1 million m^3 (comprising three caverns measuring 300 m in length, 40 m in height and 20 m in width, in bedrock up to 140 metres below the **city of Vantaa**). The water (heated by renewable energy sources) is to be stored at around 140 ^{O}C at a pressure that will avoid boil-off and steam release.

EU GHG emissions reducing: On **April 3**, **2024**, it was reported widely that during 2023, the mass of GHG emissions, the subject of the **EU ETS**, reduced by 15.5% compared to 2022. As reported by Reuters (at **www.reuters.com**, under **EU carbon market emissions fall record 15.5% as renewable power soars**): "Around 45% of the European Union's

output of greenhouse gases is regulated by the EU ETS … [which charges] for the right to emit carbon dioxide [with auctions for emissions permits setting the amount of that charge]".

As renewable electrical energy has been deployed, displacing non-renewable sources of electrical energy, the demand for emissions permits has reduced, and with reduced demand has come lower auction prices in the primary market for emissions permits, and lower prices in the secondary market.

Ballard and Solaris firm up 1,000 fuel cell units: On **April 1**, **2024**, it was reported widely that **Ballard Power Systems** had agreed on the supply of up to **1,000 fuel cell units** to power and to propel up to **1,000 buses** in the **Solaris Bus and Coach** fleet. As reported, **Ballard** and **Solaris** have signed a long-term supply agreement for these purposes, which combines existing orders for 300 units, and adds a further 700 units. After a period of less activity in this sector, this agreement may be taken to indicate increased confidence.

CO_2 Value to Europe: During **March 2024**, the **CO_2 Value Europe** published **The Contribution of Carbon Capture & Utilization Towards Climate Neutrality in Europe – A scenario development and modelling exercise**. The publication is well worth a read to those working on policy settings and plans of development for CCS deployment nationally and regionally.

EU sustainability activity round up, and what a round up! By way of a role-call, during Q1 of 2024 and a little into Q2, the **EU** has progressed material and substantial legislative and regulatory initiatives across a number of areas as follows:

European Union making progress during Q1				
Corporate Sustainability Reporting Directive (**CSRD**) – See **Editions** 7 *	Corporate Sustainability Due Diligence Directive (**CSDDD**) – see **Edition** 10	European Critical Materials Act (**CRM Act**) see **Edition** 1	EU Carbon Removals Certification Framework (**CRCF**) see **Edition** 4	Nature Restoration Regulation – see **Edition** 9
Packaging and Packaging Waste Regulation	Protection of the Environment Through Criminal Law Directive	Regulation on products made with forced labour	Right-to-repair (R-2-R) Directive	Unfair Commercial Practices Directive

On **April 30**, **2024**, the **EU** approved a delay in the application of the **European Sustainability Reporting Standards** (**ESRS**) under the **CSRD**. Under the approved delay, non-EU corporations and other organizations will not have to adopt **ESRS** until June 2026.

The **CRM Act** will come into force during May 2024. The **CRCF** was approved by the **European Parliament** on **April 13**, **2024**, and will be approved by the European Council, and will enter into force 20 days after publication in the **OJ**, anticipated to be before the end of 2024. When the **CRCF** enters into force it will be central to the **EU** policy settings.

In addition:

- On **April 25**, **2024**, the **European Parliament** approved the **Net Zero Industry Act** (**NZIA**), among other things, under which the **EU** aims to produce 40% of its annual needs for net-zero technologies by 2030. Having been approved by the **European Parliament**, the **NZIA** will be approved by the European Council and once approved it will enter into force 20 days after publication in the **OJ**.

- On **April 16**, **2024**, the **European Parliament** approved **EU guidelines for the development of the trans-European transport network** (**TEN-E Regulation**) Having been approved by the **European Parliament**, as with the **NZIA**, the guidelines will be approved by the **European Council**, and following approval with enter into force 20 days after publication in the **OJ**.

HELPFUL PUBLICATIONS AND DATA BASES

The most noteworthy publications read by the author during **April 2024** are as follows:

- **Batteries and Secure Energy Transitions**: In **April 2024**, the **IEA** released a **report** on the state of the development of the battery manufacturing capacity for EVs globally. The report highlights that the cost of batteries fell in 2023, reflecting the fall in the cost of metals. In addition to EVs, the report notes the importance of batteries for EVs and for electrical energy storage. The report is well worth a read.
- **IATA Transition Airways**: In **April 2024,** the **International Air Transport Association** (**IATA**) published **Aviation Net Zero CO2 Transition Pathways Comparative Review**. The publication takes and considers a number of prospective means to decarbonize aviation. Each of the prospective means assumes a key role for **Sustainable Aviation Fuel** (**SAF**) (with **SAF** responsible for 24% to 70% of the energy fuel). The publication is excellent.
- **UK Department of Transport comes into land**: Also, during **April 2024**, the **UK Department of Transport** published **Sustainable Aviation Fuel Mandate – Final stage Cost Benefit Analysis**. Among many other useful matters, the publication provides an uptake trajectory for **SAF**, which is aligned with the **Jet Zero Strategy**. The publication and the matters canvassed in it are excellent and provide a clear basis for the development of **SAF** policy settings.
- **Contracts for Differences – back to the future**: In **April 2024**, **The Oxford Institute for Energy Studies** published **Contracts for Difference: the Instrument of Choice for the Energy Transition**. Since the commencement of gross-pool markets (with vertically disaggregated power market participants), contracts for differences have been used to manage the wish to pool price exposure of those who earn revenue based on the pool price, and those to have to pay the pool price. Contracts for difference have been used to underpin the development of the renewable energy sector in the UK, and for a number of years, and increasingly, contracts for difference are being used to promote the use of CCS and the production and purchase of Green Hydrogen. The publication provides a useful introduction for those seeking to understand the use of contracts for difference across energy transition.
- **IRENA GH2 International Co-operation**: In **April 2024**, **the International Renewable Energy Agency** (**IRENA**) published a paper entitled **International Co-operation – To Accelerate Green Hydrogen Deployment**. The paper provides a helpful health check in relation to the key issues affecting the rate at which Green Hydrogen production capacity is increasing, including the supply and demand side dynamics. As noted on a number of occasions, supply and demand need to develop in tandem, with supply a little ahead of demand, with certainty around mass and price from the supply side to be established before demand side will make the investment decisions to transition to Green Hydrogen. This is a continuing theme.
- **Waste Management Transformation**: On **April 19**, **2024**, **Roland Berger** (at **https://www.rolandberger.com**, under **Waste Management Transformation**) shared thoughts on the importance of enhancing waste and resource management across nations. The shared thoughts introduce the publication **Waste Management Transformation**. The publication is excellent, and a timely reminder to us all that the energy transition is a part of a broader transition.
- **IEA and GenZero publish on Carbon Credits**: On **April 16**, **2024**, the **IEA** and **GenZero** published **The Role of Carbon Credits in Scaling Up Innovative Clean Energy Technologies – How high-quality carbon credits could accelerate the adoption of low-emissions hydrogen, sustainable aviation fuels and direct air capture**. The title of the publication does not leave the reader in any doubt as to its purpose and its conclusion. The thesis is that the use of high-quality carbon credits is one of the means by which the development of these projects may be accelerated, with revenue from high-quality carbon credits helping fund the viability gap. The publication is helpful. All that the author would say to those reading the publication is, keep in mind the fundamentals of carbon credits that recognise the removal of the CO_2.
- **Emissions Trading Worldwide**: On **April 10**, **2024**, the good folk at the **International Carbon Action Partnership** (**ICAP**) published its **Emissions Trading Worldwide 2024 Status Report**. The **Report** runs to **250 pages**, and as such is best read on screen. For those wishing to take a deeper-dive, **pages 157 to 240** provide summaries of the regimes around the world intended to impose obligations on emitters to reduce GHG emissions. It is important to

note that not all of regimes summarised are what may be regarded as emissions trading schemes in the sense of imposing a price on carbon. This said, the Report is a useful resource. The **Report** is well worth a read.

- **Critical Minerals in Africa**: During the first half of **April 2024**:
  - The good folk at the **United States Institute of Peace**, published **Critical Minerals in Africa**. The publication is helpful and timely in the context of the increasingly competitive dynamics in the search for critical minerals to enable the continuation and the acceleration of the energy transition.
  - The good folk at **Resources for the Future** published **Global Energy Outlook 2024: Peaks or Plateaus?**. The publication punches above its weight, being heavy on substance. The publication is well-worth a read.
- **Green Hydrogen Imports into EU**: During the first week of **April 2024**, the good folk at **The Oxford Institute for Energy Studies** published **Green Hydrogen Imports into Europe: An Assessment of Potential Sources**. The publication provides a helpful progress check on the potential import of Green Hydrogen from **Australia**, **Chile**, and **Morocco**, three countries with world class radiative heat resources, and differing options for the delivery of Green Hydrogen and Green Ammonia. The publication is well-worth a read.
- **UNEP Finance Initiative**: During the first week of **April 2024**, the **UN Environmental Programme Finance Initiative** (**UNEP FI**) published its **2024 Climate Risk Landscape Report**. The **UNEP FI's Climate Risk and Task Force on Climate-related Financial Disclosures** (**TCFD**) has leadership in developing best practices to identify, measure and assess, and disclose and manage climate risks in the financial sector. The **Report** is something of a progress check for the financial sector, on where things stand, and where to next, and as such what next. The **Report** is helpful.
- **Guidelines for Carbon Credits**: During **April 2024 IETA** published **Guidelines for High Integrity Use of Carbon Credits**. The **Guidelines** are worth a read.
- **Net Zero Tracker**: During **April 2024** the good folk at **MSCI** published the ninth edition of **The MSCI Net-Zero Tracker**. The tracker provides an update on progress to net-zero in the context of the hottest year on record, 2023, during which the global average temperatures increased to a little over 1.5^{O}C. As usual the tracker considers the increased level of renewable electrical energy, the voluntary carbon market, and the progress that corporations are making in setting and achieving climate targets.
- **CCS and Carbon Markets**: During **April 2024** the good folk at **The Oxford Institute for Energy Studies** published **The Role of Carbon Markets in Enabling Carbon Capture and Storage (CCS).** As readers of **P_2N_0** will know, there is an ongoing debate about treatment of CO_2 capture for the purposes of **Article 6 of the Paris Agreement**, i.e., is CCS carbon dioxide removal (**CDR**) or not. What is clear is that the capture and storage of CO_2 avoids CO_2 being emitted to the climate system. CO_2 captured and stored will count towards the achievement of that countries nationally determined contribution. The publication is worth a read.

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