

Welcome to **Edition 40** of **P<sub>2</sub>N<sub>0</sub>** covering the drive to avoid, reduce and remove greenhouse gas (GHG) emissions to progress to net-zero GHG emissions (NZE).

This **Edition 40** provides a summary of 2025. **Edition 41** will cover the period from **January 1, 2026, to January 31, 2026**, and will be published during the first week of February 2026.

Access all previous editions of **P<sub>2</sub>N<sub>0</sub>** at [bakerbotts.com](https://www.bakerbotts.com).

## SUMMARY OF JANUARY 1 TO DECEMBER 31, 2025

Key themes arising during calendar year 2025:

- For the author, the following are key themes arising during calendar year 2025:
  - **GHG emissions:** The rate of **avoidance, reduction, and removal (ARR)** of **GHG emissions** is not fast enough to achieve the objectives of the **Paris Agreement**<sup>1</sup>. If there is to be any prospect of staying within reach of those objectives, the rate of **ARR** needs to increase. The best way to achieve this is through the increased deployment of renewable electrical and nuclear energy.
  - **Age of electricity:** The **age of electricity** is upon us. Demand for electrical energy is increasing as countries continue to electrify activities, as populations increase and urbanise, and as demand for electrical energy increases because of the deployment of **artificial intelligence (AI)** and the resulting need for computer capacity and data storage.
  - **Age of Generative AI:** The development of data centres globally in response to the ever-increasing rate and scale of AI has exceeded the expectations of many. Data centres require electrical energy and water for power and for cooling. The available supply of both electrical energy and water is the only thing placing a break on the development of data centres and the deployment of **Generative AI**.
  - **Natural Gas and LNG here to stay:** As the implications of the conflict in Ukraine on energy affordability and security became clear, both affordability and security have resulted in the acceptance that natural gas and LNG are long term sources of fuel and feedstock.
  - **Critical metals and minerals:** While folk have long been aware of the importance of **critical materials, metals, and minerals (CM<sup>3</sup>)**<sup>2</sup> and **rare earth elements (REEs)**<sup>3</sup>, during 2025 this awareness increased as we were snowed with news of **export controls, CM<sup>3</sup>, REE security, supply chain strategies, government funding and bloc and country partnerships**. The IEA has taken a lead to explain who has what, and who needs what. There is a central role for governments to play.

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<sup>1</sup> By way of reminder, **Article 2.1(a)** of the **Paris Agreement** provides for “Holding the increase in the global average temperatures to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C ...”

<sup>2</sup> **CM<sub>3</sub>** are: **1.** Bauxite, High Purity Alumina, and Aluminum; **2.** Antimony; **3.** Beryllium; **4.** Bismuth; **5.** Cobalt; **6.** Copper; **7.** Gallium; **8.** Germanium; **9.** Graphite; **10.** Indium; **11.** Lithium; **12.** Magnesium; **13.** Manganese; **14.** Nickel; **15.** Niobium; **16.** Platinum metals; **17.** Rare Earths Elements (**REEs**); **18.** Silicon and Silicon metals; **19.** Tantalum; **20.** Titanium and Titanium metal; **21.** Tungsten; **22.** Uranium; and, **23.** Vanadium.

<sup>3</sup> **REEs** as: Cerium (Ce), Dysprosium (Dy), Erbium (Er), Europium (Eu), Gadolinium (Gd), Holmium (Ho), Lanthanum (La), Lutetium (Lu), Neodymium (Nd), Praseodymium (Pr), Promethium (Pm), Samarium (Sm), Scandium (Sc), Terbium (Tb), Thulium (Tm), Ytterbium (Yb) and Yttrium (Y).

- **Government Funding Support – a constant need:** The role of government in decarbonization is core to the deployment of technologies to achieve **ARR** of **GHG emissions**. This includes continued funding for renewable electrical energy, carbon capture and storage, and hydrogen (in that order).  
During 2025, the role of Government has expanded to include support for the development of new mines to extract and to produce **CM<sup>3</sup>** and **REEs**. It is likely that Governments will continue to align to address the need for the development of reliable **CM<sup>3</sup>** and **REE** supply chains.
- **Hydrocarbons:** The global economy continues to rely on hydrocarbons. However strong the desire and determination to “transition away from fossil fuels” (now called “the UAE consensus”), it is going to take time. This is not a question of fault! It is what it is! As the author has noted on more than one occasion, the challenge of addressing climate change is best described as an “ever-changing 8.3-billion-piece three-dimensional jigsaw puzzle”, with one piece for each of us.
- **The energy trilemma:** Over the last 18 months or so, the energy trilemma has been defined by reality. The backbone of decarbonisation to address climate change is affordability, with the imperative of energy security, with the medium-term objective of sustainability. While affordability has different meanings in different countries and contexts, what is clear is that certain means of decarbonization are not progressing at the rate anticipated in some countries, including offshore wind and green hydrogen. This said, China and the EU continue to implement policy settings across all forms of decarbonization technology.

As we move into 2026, it is expected that these themes will continue to shape the progress to net zero.

#### **Month-by-month reflection on key news items:**

What follows is a month-by-month summary of key news items covered by P<sub>2</sub>N<sub>0</sub> during calendar year 2025. As always, this reflects the views of one person (the author), and as such is not intended to be either exclusive or exhaustive.

During **January 2025**, the following news items were covered in **Editions 23** and **24** of P<sub>2</sub>N<sub>0</sub>:

- On **January 6, 2025**, the **International Renewable Energy Agency (IRENA)** published [A Just Energy Transition for Communities – Large Scale Wind Solar and Projects in Sub-Saharan Africa](#). The publication was timely and insightful. For those not familiar with the facts and statistics, between 600 and 700 million people globally do not benefit from the supply of electrical energy, with over 80% of those people living in **Sub-Saharan Africa**.
- On **January 10, 2025**, The **World Meteorological Organisation (WMO)** confirmed that 2024 was the warmest year on record: “We saw extraordinary land and sea surface temperatures, extraordinary ocean heat, accompanied by very extreme weather affecting many countries around the world ...”.
- On **January 20, 2025**, the US gave notice of its withdrawal from the Paris Agreement. Towards the end of the first full week of 2026, the US announced its withdrawal from the United Nations Framework Convention on Climate Change (**UNFCCC**).
- On **January 21, 2025**, **electrek** (at <https://electrek.co>, under [China installed a record capacity solar and wind in 2024 – in numbers](#)) reported that **China** had installed **14.6%** of new renewable electrical energy (**REE**) capacity during 2024.

2024 REE		
Increase of 277 GW of photovoltaic solar during 2024, to 887 GW	Increase of 80 GW of wind during 2024 to 521 GW	Increase of 13.5 GW of hydroelectric to 436 GW

- From **January 20 to January 24, 2025**, world leaders from political and business sectors, attended the **55<sup>th</sup> World Economic Forum (WEF)** in Davos, Switzerland<sup>4</sup>. The publication [United for Net Zero – Public-Private Collaboration to Accelerate Industry Decarbonization](#) provided a sense of that alignment was recognized as critical. The publication recognized that:

The numbers are clear		
GHG emissions are increasing at a rate of 1.5% annually.	GHG emissions need to be declining at a rate of 7% annually.	If this continues, the 1.5°C target will be exceeded by 600 GT by 2050.

- On **January 30, 2025**, **BloombergNEF** published [Energy Transition Investment Trends 2025](#). The headlines were that during 2024, investment in energy transition exceeded **USD 2 trillion**, with China investing around **USD 820 billion**, i.e., China invested more than the EU, UK, and US combined.
- On **January 31, 2025**, the **Danish Energy Minister** announced that the **Danish Government** was to provide **USD 1.1 billion** in funding to **Energinet** to allow the development of an **85 km hydrogen pipeline** between **Esbjerg** (a port city in Denmark) and **Germany**.
- During mid-January, the **GCC states** indicated their dash:
  - For BESS:** **Emirates Water and Electricity Company (EWEC)** and **Abu Dhabi Future Energy Company (Masdar)** plan to develop a **5.2 GW / 19 GWh BESS**, with **1 GW** of baseload renewable electrical energy as a result. The **Biggest BESS** will source electrical energy from photovoltaic solar capacity, with an estimated development cost of **USD 6 billion**.  
  
During **January 2025**, the **Kingdom of Saudi Arabia (KSA)** energised its **2.5 GWh Bisha BESS**, with a further eight **Big BESS** projects to be developed over the coming year, to deploy a further **33 GWh** of energy storage capacity; and
  - For gas:** In addition to the development of renewable energy capacity (photovoltaic solar and wind, and BESS) the **Gulf Cooperation Council (GCC)** countries are developing **30 GW** of gas-fired turbine capacity;
- The State of Play in H<sub>2</sub>:** In **January, 2025**, **Hydrogen Europe** published [A Clean Industrial Deal for the European hydrogen industry](#). The publication provided a realistic assessment of the challenges with the development of the renewable hydrogen industry across Europe. China and the EU remain the most invested in the development of their hydrogen sectors.

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<sup>4</sup> Ahead of **55<sup>th</sup> WEF**, a number of publications were released, including the [Global Risk Report 2025: Conflict, Environment and Disinformation Top Threats](#) and [Financing The Energy Transition Meeting a Rapidly Evolving Electricity Demand](#). Both these publications are excellent although the **Financing the Energy Transition** publication is worth a special mention. The **Financing the Energy Transition** publication considers the financing needs of each region, **Africa, East and Southeast Asia, South Asia, Europe, Latin America** and **North America**, and the proposed approach to the provision of finance.

The publication is best read with the EC Clean Technology Observatory's [Renewable Fuels of Non-Biological Origin in the European Union – Status Report on Technology Development, Trends Value Chains and Markets](#). The publication provides a “warts and all” assessment of the development of the RFNBO market (supply and demand).

During **February 2025**, the following received considerable coverage reflected in the news items covered in **Editions 25** and **26** of P<sub>2</sub>N<sub>0</sub>:

- On **February 6, 2025**, **BloombergNEF** published its [Levelized Cost<sup>5</sup> of Electricity Update](#). On an average basis, the generation cost of photovoltaic solar (**PV solar**) was **USD 36 / MWh** and **USD 38 / MWh**<sup>6</sup>. The costs of photovoltaic solar (**PV solar**) and battery energy storage system (**BESS**) continue to fall: from the theoretical thinking of 15 years ago of USD 1 a watt in 2010, we are progressing towards a generation cost approaching USD 0.01 a KWh or 1 cent a KWh, which has been achieved in some parts of the world. This emphasises that renewable electrical energy is the foundation on which progress to net-zero has been built.
- On **February 10, 2025**, **BYD** [announced](#) that it had signed a contract with the **Saudi Electrical Company (SEC)** to supply **12.5GWh** of **BESS** capacity. **BYD** has signed six **BESS** supply contracts with **SEC**. The first of the **BESSs**, the **2.5 GWh Bisha BESS**, commenced operation in **January 2025** (as report above).
- On **February 11, 2025**, the **Ecologic Institute** published [Integrating Hydrogen Emissions Into the EU Policy Framework](#). The basis for the publication is that “Hydrogen (H<sub>2</sub>) is an indirect greenhouse gas (GHG)<sup>7</sup>: ... H<sub>2</sub> emissions contribute to climate change. While hydrogen is not a direct greenhouse gas (GHG), it reacts with atmospheric [compounds], increasing levels of other GHG emissions”. This has long been known, but to have it up in lights is a good thing.
- On **February 12, 2025**, the **International Energy Agency (IEA)** published [India Gas Market Report Outlook to 2030](#). The headline from the publication is that **India’s natural gas demand is set for a 60% rise by 2030, supported by upcoming global LNG supply wave**. For those active in the natural gas and LNG markets, this was not “new news”.
- On **February 14, 2025**, the **IEA** published [Electricity 2025, Analysis and forecast to 2027](#) (**Electricity 2025**). One of the established themes of progress to net zero is the electrification of activities requiring energy or heat, or both – the so-called new **Age of Electricity**. The **IEA** publication starts by recognising this: **“Strong growth in electricity demand is raising the curtain on a new Age of Electricity, with consumption set to soar through 2027”**<sup>8</sup>

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<sup>5</sup> The term levelized cost of electricity is used to provide a unit cost of electricity by reference to all of the costs and expenses arising and incurred across the life-span of generation capacity (including costs and expenses of development, operation (including any fuel costs) and maintenance, and decommissioning) used to generate that unit of electricity.

<sup>6</sup> [Our World In Data](#) provides an excellent graph ([Calculated by Our World in Data based on IRENA \(2024\)](#)) which plots that in 2004 it took 1 year to install 1 GW and in 2023 it took 1 day to install 1 GW, of **PV solar** capacity around the world.

<sup>7</sup> Hydrogen prolongs the period of time that other CH<sub>4</sub> emissions stay in the climate system, and enhances ozone levels in the troposphere, with CH<sub>4</sub> and ozone, by mass, being the second and third greatest GHG emission, after CO<sub>2</sub>.

<sup>8</sup> Continued electrification to provide electrical energy to those without it; increasing populations of developing countries, with attendant increased urbanisation and prosperity (including as measured by ownership and use of electrical appliances); electrification and increased electrification of buildings (for electrical energy and heat); increased electrification of transportation,

- On **February 18, 2025**, **TotalEnergies** [announced](#) that it had signed agreements with **Air Liquide** to develop two projects, to produce 45,000 metric tonnes of green hydrogen a year using renewable electrical energy sourced (for the most part) from the **OranjeWind offshore wind field** developed by **TotalEnergies** and **RWE** (under a 50/50 joint venture).

During **July 2025**, **Air Liquide** took a positive final investment decision to develop its **200 MW green hydrogen production facility** in **Rotterdam, The Netherlands**. **TotalEnergies** will provide renewable electrical energy from its **OranjeWind offshore wind field** to the **Air Liquide** facility, which will produce green hydrogen to displace the use of grey hydrogen at the **TotalEnergies** refinery in **Rotterdam**. This may be regarded as a blueprint for the matching of supply and demand for green hydrogen.

- On **February 26, 2025**, the **European Commission (EC)** adopted [Proposal for a Regulation of the European Parliament and the Council amending Regulation \(EU\) 2023 / 956 as regards simplifying and strengthening the cross-border adjustment mechanism](#). Among other things, it proposed that the obligation to acquire **CBAM Certificates** would commence in 2027, rather than 2026, with an increased threshold to acquire **CBAM Certificates** such that entities importing less than 50 metric tonnes of covered goods are exempt.
- On **February 26, 2025**, the **EC** published the [Clean Industrial Deal](#)<sup>9</sup>. Areas identified for progress with new and revised policy settings included the following:
  1. **Access to affordable energy**, including lowering energy bills, accelerating the roll-out of clean energy and electrification, and ensuring well-functioning gas markets;
  2. **Boosting clean supply and demand**, including the introduction of new measures to ensure development of supply and demand in tandem;
  3. **Boosting public and private investment**, including scaling up support for the Innovation Fund and the establishment of an Industrial Decarbonisation Bank to provide up to € 100 billion of funding (“based on funds in the Innovation Fund from parts of the ETS as well as the revision of InvestEU”). For these purposes, the EC “will launch in 2025 a pilot with a € 1 billion auction on the decarbonisation of key industrial processes across various sectors” and launch Horizon Europe with € 600 million of funding to support fit-for-deployment projects;
  4. **Ensuring secure access to materials and resources**, including **Fast Implementation of the Critical Raw Materials Act** and adopt a **Circular Economy Act in 2026** to promote collection and recycling of materials; and
  5. **Clean Trade and CBAM**, including EU Member States to enter Free Trade Agreements to include Clean Trade provisions, and a comprehensive review of CBAM, critically, to simplify it.

On **May 22, 2025**, the **European Parliament** voted (564 to 20) to approve amendments to the **Carbon Border Adjustment Mechanism (CBAM)** to reduce the number of corporations and other

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and the anticipated increase in the need for electrical energy to power, and to cool, data centres (with increased demand to store increased amounts of data, including resulting from AI).

<sup>9</sup> Formally titled **Communication from The Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions – The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonization**.

organizations importing goods into the European Union: the EC’s **Omnibus Proposal** proposed a 50 metric tonne threshold for CBAM, which would exempt 90% of importers CBAM, while still covering over 99% of emissions from iron, steel, aluminium and cement imports.

In February directional adjustments to the **Corporate Sustainability Reporting Directive (CSRD)**<sup>10</sup> and the **Corporate Sustainability Due Diligence Directive (CSRDD)**<sup>11</sup> were proposed<sup>12</sup>. The **Omnibus Proposal**<sup>13</sup> was discussed consistently throughout 2025 before being approved in December 2025.

On **April 3, 2025**, the **European Parliament** adopted the **Omnibus Stop-the-Clock (STC)** proposal in respect of the **Corporate Sustainability Reporting Directive (CRSD)** and the **Corporate Sustainability Due Diligence Directive (CSDDD)**. The **STC proposal** delayed a number of obligations under the **CRSD** and **CSDDD** in relation to:

- the **CSRD** providing that large enterprises and parents of large enterprises scheduled to begin reporting in 2026 for the 2025 financial year, now have a new reporting start date of 2028 for the 2027 financial year and small and medium-sized enterprises with securities listed in the EU scheduled to begin reporting in 2027 for the 2026 financial year, now have a new reporting start date of 2029 for the 2028 financial year;
- the **CSDDD** providing that the deadline for EU member states to enact the CSDDD into national law has been postponed by one year to 26 July 2027 and the initial phase of the CSDDD requirements for the companies to which the CSDDD is to apply in the first instance (i.e., EU companies with more than 5,000 employees and net worldwide turnover exceeding EUR 1.5 billion and non-EU companies with an EU turnover above this threshold) has been postponed to 2028.

On **December 16, 2025**, the **European Parliament** voted in favor of scaling back sustainability reporting and due diligence requirements (428 votes in favor, 218 against, with 17 abstentions).

Under the **Omnibus**:

<sup>10</sup> The **CSRD** imposes obligations on corporations and other organizations to collect and to report data and information. These obligations relate to sustainability impacts arising from their activities, by reference to the **EU Taxonomy**. The corporations and other organizations subject to these obligations were large EU corporations (being entities with an annual turnover > €150 million) and listed SMEs and non-EU entities with significant EU turnover.

<sup>11</sup> The **CSDDD** imposes obligations on corporations and other organizations (with certain characteristics, but not financial institutions) to assess impacts of their activities on the **environment** and on **human rights** along and arising from supply chains, and to address significant impacts arising from their supply chains. Assessing and addressing these impacts requires due diligence. The due diligence is required to be risk based and does not include an obligation to report on double materiality.

<sup>12</sup>

Changes to extent of CSRD and CSDDD	
CSRD	CSDDD
EU entities with > 1,000 employees and > €50 million turnover or > €25 million assets must report	EU entities with > 1,000 employees and > €450 million turnover must report
Non-EU entities with > €450 million in the EU must report	Non-EU entities with > €450 million turnover in the EU must report
No sectoral ESRS reporting requirements in 2026, and after that unclear	<ul style="list-style-type: none"> <li>• Due diligence five yearly, rather than annually</li> <li>• For the purposes of supply chain due diligence, may request sustainability data only from SMEs in supply chain</li> </ul>

<sup>13</sup> Formally titled **Proposal for a Directive of the European Parliament and of the Council amending Directives 2006/43/EC, 2013/34/EU, (EU) 2022/2464 and (EU) 2024/1760 as regards certain corporate sustainability reporting and due diligence requirements.**

- **CSRD** applies to corporations and other organizations with 1,000 employees and above, having annual net turnover of **€ 450 million** and above. The rules will also apply to non-EU companies with net turnover in the EU of over €450 million and to their subsidiaries and branches generating turnover higher than €200 million in the EU;
- **CSDDD** (or **CSD<sup>3</sup>**) applies to corporations and other organizations with 5,000 employees and above, having annual net turnover of **€ 1.5 billion** and **Climate Transition Plans** are not required;

During **March 2025**, Editions 27 and 28 of P<sub>2</sub>N<sub>0</sub> identified the following as key news items:

- On **March 3, 2025**, the US **Energy Information Administration (EIA)** reported that during **2025**, **32.5 GW** of PV solar capacity, **18.2 GW** of energy storage capacity, and **7.7 GW** of wind capacity would be installed across the US. The installation of **63 GW of renewable electrical energy capacity** across the US, will represent over **92% of new installed generation capacity**. In **April 2025**, the **Federal Energy Regulatory Commission (FERC)** reported that a little less than 98% of new electrical energy generating capacity across the US, with around 75% of that new capacity comprising PV solar.
- On **March 4, 2025**, **Zenon Research** published [Decarbonizing steel production – Is hydrogen the only lever \(Zenon Research Paper\)](#). The **Zenon Research Paper** reminds us that:
  - Primary iron and steel production is essential to the global economy;
  - 90% of current primary iron and steel production of 1.9 gigatonnes uses coal-based blast furnace-basic oxygen furnace (**BF-BOF**) technology; and
  - the total carbon footprint arising from primary iron and steel production (measured by Scope 1 and 2 emissions) is **3.6 giga tonnes of CO<sub>2</sub>-e emissions** (or 3.6 billion metric tonnes).

Each year at least 10% of energy related GHG emissions globally arise from primary production of iron and steel.

- On **March 7, 2025** (at <https://climate.ec.europa.eu>, under [Over-subscribed European Hydrogen Bank auction receives 61 bids for Innovation Fund support, including 8 maritime projects](#)), it was reported that 61 bids from 11 countries (within the European Economic Area) had been received under the **EHB** second auction for the production of renewable hydrogen.
- On **March 8, 2025**, **northernforum** (at [northernforum.net](http://northernforum.net), under [Japan is the first nation to experiment with a complex nuclear technology that also produces hydrogen](#)) reported that the **Japan Atomic Energy Agency (JAEA)** intended “to use a fourth-generation nuclear reactor a high-temperature gas-cooled reactor (**HTGR**) to produce hydrogen without emitting carbon dioxide”. Because **HTGRs** operate at up to, and beyond, 800°C, this high-temperature heat can be used to power the sulphur-iodine cycle (a thermochemical reaction) to split water to produce hydrogen and oxygen.
- On **March 11, 2025**, the **UK Government, Legislative Branch**, (House of Commons Library) published a research briefing, entitled [The forthcoming national security strategy 2025: FAQ](#). The publication recognised that the availability of **CM<sub>3</sub>** is a key part of the national security of the UK.
- On **March 14, 2025**, the **CEOs of RWE and TotalEnergies** signed a long-term green hydrogen offtake agreement under which **RWE** will supply green hydrogen produced at its **300 MW** electrolysis facility at **Lingen, Germany**, to **TotalEnergies** to decarbonise activities at **TotalEnergies’ refinery in Leuna**,

**Germany.** As announced, the long-term agreement commits **RWE** to deliver **30,000 metric tonnes** of green hydrogen a year to **TotalEnergies** for **15 years**. This continued the strategy of **TotalEnergies** to decarbonize its refining activities using green hydrogen.

- On **March 17, 2025**, it was reported widely that **Thailand** had approved **USD 2.7 billion** of investments to allow the development of data centres and cloud services. As reported, the investments approved were as follows: the investment from **Beijing Haoyang** to include the development of a new 300 MW data centre, **Empyryon Digital** to include investment in a new 12 MW data centre, and **GSA Data Center O2** to include investment in a new 35 MW data centre.
- On **March 17, 2025**, **The Business Times** (at <https://www.businesstimes.com>, under [Chinese data centre firm GDS seeks record USD 3.4 billion loan](#)), reported that **GDS Holdings** was seeking a **USD 3.4 billion** loan funding to develop and to operate data centres in **Malaysia**. **The Business Times** reported that: “The southern state of Johor [in Malaysia] – which sits across from the city-state of Singapore – has about 30 projects completed or under construction, plus 20 more awaiting approvals”. This loan funding was obtained in mid-2025.
- On **March 19, 2025**, [Demand and Supply Measures for the Steel and Cement Transition – The case for international co-ordination](#) was published. The publication was developed at the request of the [Climate Club](#). Cement, concrete, iron and steel are essential to the continued development of the global economies. Just as these industries are essential to continued development, and to progress to net-zero GHG emissions, these industries need to be decarbonised. The publication notes that:

“The steel and cement sectors accounts for 14% of global energy and process-related emissions on a direct basis, making them central to the decarbonisation challenge”.
- On **March 24, 2025**, the [Global Energy Review 2025](#) was published. The headlines from the publication were: increased demand for energy, with demand for electrical energy increasing by 4.3%, with increased demand to respond to the increased use of electrical energy for AI, cooling and EVs (EV car sales increased by 25%); that 700 GW of renewable electrical energy capacity was installed during 2024 represented 80% of the new generation capacity installed (with 80% of the 700 GW being new renewable capacity such as solar capacity); and the demand for natural gas (including natural gas) at a record high.
- On **March 25, 2025**, South Korea announced that it was to continue to increase recycling initiatives, with the **Ministry of Trade, Industry and Energy** announcing the [Key Mineral Recycling Activation Promotion Plan](#). The implementation of the Plan is intended to increase recycling rates to 20% in respect of 10 strategic metals and minerals critical to the battery, EV, and semi-conductor industries.
- On **March 25, 2025**, the EC published [Commission Decision of 25.3.2025 recognising certain critical raw material projects as Strategic Projects under Regulation \(EU\) 2024/1252 of the European Parliament and the Council](#). The **EC Decision** recognizes **47** projects as **Strategic Projects** across 13 Member States, Belgium, France, Italy, Germany, Spain, Estonia, Czechia, Greece, Sweden, Finland, Portugal, Poland, and Romania. The **Strategic Projects** cover 14 of the 17 raw materials listed as critical under the [Critical Raw Materials Act](#), including cobalt (10 projects), graphite (11 projects), lithium (22 projects), manganese (1 project), and nickel (12 projects). As reported, to progress the **47 Strategic Projects** to operation, around **€22.5 billion** in capital investment will be required.

- On **March 27, 2025**, **Equinor, Shell and TotalEnergies** announced that they had taken a positive final investment decision (FID) to develop phase 2 of the **Northern Lights CO<sub>2</sub>, transport, and storage project** to increase capacity of the project from **1.5 million metric tonnes** a year, to **5 million metric tonnes** a year by 2028. As reported, the positive FID to develop phase 2 was taken in the context of the **Stockholm Exergi** contracting for storage services for 800,000 metric tonnes of **biogenic CO<sub>2</sub>** annually.
- During **March 2025**, the **China National Bureau of Statistics** reported that during **January and February 2025**, China deployed a further **50 GW** of renewable electrical energy capacity.

During **April 2025**, the following received considerable coverage reflected in the news items covered in **Editions 29 and 30** of P<sub>2</sub>N<sub>0</sub>:

- On **April 3, 2025**, the **Visual Capitalist** published an article entitled [The Projected Rise in US Data Center Energy Use](#).

The article provides the following **Key Takeaway**: From 2023 to 2030, US data center energy use is forecasted to quadruple: “The rise in energy use will be driven by AI and an increasingly digital world, and getting access to power is a critical step in the building of new data centers but this can take up to 10 years in some cases”.

- **GH<sub>2</sub> projects continue to attract government funding support:**
  - On **April 4, 2025**, the **Spanish Government** published the final proposal for **€1.2 billion** of funding support for seven renewable hydrogen projects . The funding, which is State Aid in the EU, had been approved by the **EC** in July 2024.
  - On **April 7, 2025**, the **UK Government** (Department for Energy Security and New Zero), at <https://www.gov.uk>, under [New Hydrogen power projects to boost growth](#), announced that 27 H<sub>2</sub> projects had been shortlisted. As announced, the 27 H<sub>2</sub> projects selected are part of the **Second Hydrogen Allocation Round (HR2)**, and cover projects for ammonia production, brick making, clean power generation, glass manufacturing, and SAF production.
- On **April 4, 2025**, the **EU** announced that it intended to provide funding for raw materials resource development and supply, critical infrastructure, and energy projects. The attached link provides a link to the [announcement](#). **By way of background**, Central Asia comprises Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and within these countries there are approximately 276 metal and mineral production sites and deposits.
- On **April 9, 2025**, the **Government of India** published its [National Critical Mineral Mission](#) “to establish a robust framework for self-reliance in the critical mining sector”. For these purposes, the **Geological Survey of India** is to conduct 1,200 exploration projects.
- On **April 18, 2025**, the **US** announced the **First Wave of Critical Mineral Production Projects** (at <https://www.whitehouse.gov>, under [Trump Administration Advances First Wave of Critical Mineral Production Projects](#)) in response to the [Immediate Measures to Increase American Mineral Production](#) executive order. The initial selected projects listed were Resolution Cooper Project, Stibnite Gold Project, Warrior Met Coal Mines, McDermitt Exploration Project, Southwest Arkansas Project, Caldwell Canyon Mine Project, Libby Exploration Project, Lisbon Valley Copper Project, Silver Peak Lithium Mine, and Michigan Potash.

- On **April 15, 2025**, **Vietnam** published an amended version of PDP8 – [the Revised National Power Development Plan for 2021-2030](#), with a forward-looking perspective to 2050 (**PDP8**). In the context of **P2NO**, the key takeaway is that GHG emissions from electrical energy generation are to be capped at 197 – 199 million metric tonnes of CO<sub>2</sub> by 2030, representing a reduction of 27 million metric tonnes from current “business as usual”, and 170 million metric tonnes of CO<sub>2</sub> by 2030 if JETP is utilized in full.

In the context of **PDP8**, the aim is to phase out use of coal by 2050: by 2050, the power mix will comprise approximately 74 to 76% of renewable energy. Under the forward-looking perspective is Total Capacity of 490,529 MV to 573,129 MW, comprising:

- photovoltaic solar of 168,594 MW to 89,294 MW (33% to 34.4%);
- offshore wind 70,000 MW 91,500 MW (14.3% to 16%); and
- offshore wind 60,050 MW to 77,050 MW (12.2% - 13.4%),

With the balance comprising, among others, storage power sources, thermal power using biomass and ammonia, hydro, biomass, waste to energy, geothermal or new energy, LNG, and hydrogen.

- On **April 16, 2025**, it was reported widely that the world’s largest liquid carbon dioxide (**LCO<sub>2</sub>**) carrier had been launched. As reported, the **LCO<sub>2</sub> carrier** has the capacity to carry **22,000 m<sup>3</sup>** of LCO<sub>2</sub>. The **LCO<sub>2</sub> carrier** is the first of four **LCO<sub>2</sub> carriers** (with a total cost of **USD 756 million**) ordered by the Greek shipping company, **Capital Clean Energy Carriers**, from South Korean shipbuilder, **Hyundai Mipo**.
- On **April 24, 2025**, the **farmingdale observer** (at [www.farmingdale-observer.com](http://www.farmingdale-observer.com), under [A Massive Lithium Deposit Discovered in An Unexpected Location Is Shaking Up The Global Resource Landscape](#)) reported that the **Smackover Formation** in Arkansas has between **5 and 19 metric million tonnes** of lithium resource. In the context of US **CMM** supply security, the development of the resource would reduce, and remove, the need to source supplies of lithium from Argentina, Bolivia, and Chile.
- On **April 24, 2025**, the **US** announced an order titled the [Unleashing America’s Offshore Critical Minerals and Resources](#) (at <https://whitehouse.gov>). Among other things, the order stipulated that:
  - the Secretary of Commerce was to provide a report on the feasibility of an international benefit-sharing mechanism for seabed mineral resource extraction and development in areas beyond the national jurisdiction of any country; and
  - the Secretary of Defence and the Secretary of Energy was to provide a report to address the feasibility and any potential benefits or drawbacks of using the National Defence Stockpile for storage of materials derived from seabed polymetallic nodules and of entering offtake agreements for these materials.
- On **April 24, 2025**, **Eni** took a positive final investment decision, and achieved financial close (in respect of **£2 billion** of funding) with the **UK Government (Department for Energy Security and Net Zero)**, to develop the **Eni** carbon injection and storage project in Liverpool Bay, in the Irish Sea, as part of the **HyNet** decarbonisation initiative in the North-West of England.

The positive final investment decision was taken as **Eni** was granted a **carbon storage permit** from the **North Sea Transition Authority**. This was the second carbon injection and storage project to take a positive final investment decision in the UK, the first being the Northern Endurance project in late 2024.

- On Monday, **April 28, 2025**, at 12.33 CEST there were widespread power outages across Spain and Portugal, and Southern France for up to 10 hours, longer in some areas.

At the centre of the power outages was **Red Eléctrica España** or **REE** (the transmission system operator in Spain). Neither **REE** nor the Spanish Government have been able to confirm the cause of the power outages. What is clear from the data is that at 12.33 CEST there was a sudden drop in electricity transmission across the grid, by some estimates in the region of 15 GW.

In the time leading up to the sudden reduction, France stopped importing electrical energy from Spain, there was a spike in wind generation, and as the circumstances unfolded, nuclear power plants received an overload alert (i.e., overvoltage), with the result that electrical energy ceased to be sent out from them. Add to this the fact that photovoltaic solar dispatch reduced by 10 GW from 18 GW to 8 GW, and you have whole of grid instability.

From all that the author read at the time there was sufficient available generation capacity, and yet the dispatch of it was not managed given the supply-side events that took place within a very short period of time. What is clear is that when there are different sources of electrical energy across a grid, grid management is complex and maintaining integrity and stability becomes increasingly complex.

Later in the year, on **October 3, 2025**, the **European Network of Transmission System Operators for Electricity (ENTSO-E)** issued a **Factual Report** reporting on the data and the facts arising in the lead up to the outage, and its impacts. The **Factual Report** is entitled [Grid Incident in Spain and Portugal on 28 April 2025 – ICS Investigation Expert Panel Factual Report](#).

The headline was that the “root cause” of the outage was “cascading overvoltage” with the grid unable to reboot automatically to stem the problem, and then to reboot.

The **EU** is taking action to avoid any recurrence, with the **EC** reported to be working on the EU energy security framework to ensure that the lessons learned from the outage are fully integrated into updated policies and measures. As reported in P<sub>2</sub>N<sub>0</sub>, the cause of the outage was **not** renewable energy. At the time it was noted that the **EU** was scheduled to share draft legislation to recognize the need for greater resilience in grid infrastructure during **November 25, 2025**. The EU proposed the [EU Grids Package](#) in December 2025.

What is clear is that grid investment is needed, and needed urgently, in the EU and the US. The EC estimates that by **2040** around **€477 billion** needs to be invested in the transmission grid, and around **€730** in distribution networks.

- On **April 28, 2025**, **world nuclear news** (at <https://www.world-nuclear-news.org>, under [Ten new reactors approved in China](#)) reported that the **State Council** of China had approved the development of “five new nuclear power projects – Fanchenggang Phase III, Haiyang Phase III, Sanmen Phase III, Taishan Phase II and Xiapu Phase I – with a total of 10 reactors, including eight Hualong One units”.
- On **April 28, 2025**, the **Council of Ministers** approved around **€2.8 billion** in funding support to develop supply and demand side for green hydrogen within **the Netherlands**. As understood, around **€2.1 billion** of funding support will be provided in respect of the development of green hydrogen production capacity (supply side) and **€662 million** of funding support will be provided in respect of demand-side initiatives.

- **Publications of note during the month of April 2025:**
  - **BloombergNEF** published its 2025 [New Energy Outlook \(NEO\)](#) – one of the must-reads each year. **NEO 2025** outlines the following two key findings:
    1. Continuing demand decline for coal and oil, although the rate of decline is not clear; and
    2. GHG emissions globally may have peaked in 2024, plateau or commence decline during 2025.
  - **IRENA** published [The Powerful Role in Geopolitics is to Manage the Energy Transition](#). The publication, authored by Francesco La Camera, provides a clear-sighted and nuanced perspective, including in respect of energy security and the supply of materials. For these purposes, the publication ties back to [Geopolitics of the Energy Transition: Energy Security](#) and [Geopolitics of the Energy Transition: Critical Materials](#). The three publications are well worth reading in one sitting.
  - **IRENA** published [Renewables in 2024: 5 Key Facts Behind a Record-Breaking Year](#). The five key facts being: 1. Record-high renewable energy capacity additions in 2024 – with 585 GW of new capacity installed during 2024; 2. Renewable electrical energy installations accounted for more than 92% of total power expansion in 2024; 3. Solar power takes the lead, with 42% of the global electrical energy mix now solar; 4. Asia dominates the newly installed renewable electrical energy capacity; and 5. The rate of installation of new renewable electrical energy capacity is still less than the rate required to triple renewable electrical energy capacity by 2030.

During **May 2025**, the following key new items were covered in **Editions 31** and **32** of P<sub>2</sub>N<sub>0</sub>:

- On **May 1, 2025**, **Ukraine** and the **US** signed an [agreement](#) under which a reconstruction fund will be established, to be managed by Ukraine and the US jointly. The reconstruction fund will comprise funding from various sources, with Ukraine itself, to be a key source, with 50% of the profits received by the Government of Ukraine from new energy and resource developments (after the developments have been in operation for 10 years) to be paid into the fund. New energy and resource developments which are the subject of the agreement include **CM<sub>3</sub>** and **REEs** (with 55 materials specified) projects, and natural gas and oil projects.
- On **May 2, 2025**, **datacenterdynamics** (at <https://www.datacenterdynamics.com>, under [Meta raises AI data center capex forecast to up to \\$72 bn](#)) reported that **Meta** expected its **2025** capital expenditure to increase to between **USD 64 billion** and **USD 72 billion**. In the first **quarter of 2025**, **Meta** spent **USD 13.7 billion**, primarily on servers, data centers, and network infrastructure.
- On **May 5, 2025**, **utility dive** (at <https://www.utilitydive.com>, under [PJM fast-tracks 11.8 GW, mainly gas, to bolster power supplies](#)) reported that **PJM Interconnection** had selected **51 projects** to join a fast-track interconnection review process as part of a broad effort to ensure that the grid operator has adequate supplies of electrical energy to ensure the integrity and stability of the transmission system. As reported (and as may be expected), **gas-fired power generation** accounted for **69%** of the capacity selected, **BESS 19 %**, and **nuclear 12%** (with 0.1% coal), with 90% of the projects to be operating by 2030. The article is well-worth a read. While the article goes to the integrity and stability of the **PJM grid**, the underlying need that is explained is relevant for most transmission systems.

- On **May 7, 2025**, the **CSIS** (at <https://www.csis.org>, under [G7 Cooperation to De-Risk Minerals Investments in the Global South](#)) reported that all **G7** member countries regard the security of supply of **CM<sub>3</sub>** as a strategic imperative. **CSIS** states that:
  - the level of combined investment for these purposes is **USD 590 billion to USD 2 trillion by 2040**: the actual level of investment provided by **G7 governments** is in the region of **USD 13 billion**. **CSIS** suggests that the **G7** should establish a **G7 Critical Minerals Investment Fund**;
  - recounts the existing **G7 initiatives**:
    - The [Partnership for Global Infrastructure and Investment \(PGI\)](#); and
    - The [Minerals Security Partnership \(MSG\)](#).
- On **May 7, 2025**, the **IEA** published its [Global Methane Tracker 2025](#) for **Methane (CH<sub>4</sub>)**. The **Global Methane Tracker 2025** lays out the basic facts: **1. CH<sub>4</sub>** is responsible for **30%** of the increase in global average temperatures since the 1850s; and **2.** The energy sector is responsible for **35%** of GHG emissions arising now. Avoidance and reduction in GHG emissions from the energy sector offers a present opportunity to address climate change.

The key findings are that the energy sector is responsible for around **120 million metric tonnes** of **CH<sub>4</sub>** emissions annually, and while each of the Agriculture, Forestry, and Other Land Use (**AFOLU**) and the **waste** sectors is responsible for material quantities of **CH<sub>4</sub>** emissions, the avoidance and reduction of **CH<sub>4</sub>** emissions across the energy sector offers the most immediate means of benefit through abatement.
- On **May 15, 2025**, the **Chamber of Representatives in Belgium** voted in favour (102 votes in favour, eight votes against, and 31 abstentions) of the repeal of the 2003 legislation that prevented the development of new nuclear power stations within the country and provided for the shuttering of seven existing nuclear power plants. With the repeal of the 2003 legislation the first order of business will be to extend the lives of the nuclear power plants.
- On **May 15, 2025**, it was reported widely that during the first quarter of 2025, GHG emissions declined by **1.6%** across China, and **5.5%** across the power sector in China, year-on-year (compared to Q1 of 2024). This decline is notable of itself and because year-on-year electrical energy consumption across China increased by 2.5%.
- On **May 16, 2025**, the **Danish Energy Agency** announced that **10 CCS** projects were to receive up to **DKK 28.4 billion** (around **€3.7 billion**) in government funding support. The **10 CCS** projects comprise 1 cement plant, 2 biomass combined and heat and power projects, and 7 waste-to-energy projects. If all projects are developed, up to **5.3 million tonnes** of **CO<sub>2</sub>** will be sequestered from them.
- On **May 20, 2025**, the **EU** announced the results of the second auction for **RFNBO Hydrogen** in the [Results of the IF 24 RFNBO Hydrogen Auction](#). The second auction was seeking to procure **RFNBO Hydrogen** in a general category and in a maritime category.

As announced, **61 bids** were received from **10** different **European Economic Area (EEA)** countries<sup>14</sup> amounting to **6.3 GW** of electrolyser capacity, with a total bid value of **€4.48 billion** in the general category and **€399 million** in the maritime category. For further narrative, click through to <https://europa.eu.commission>, under [Nearly € billion awarded to boost development of renewable hydrogen](#) and <https://climate.ec.europa.eu>, under [Clean Industrial Deal](#).

Total funding of **€992 million** was awarded across 15 projects. The funding will be sourced from the EU **Innovation Fund**. In turn, the EU ETS provides the revenue for the **Innovation Fund**.

In addition to the funding from the **Innovation Fund**, it is understood that **Austria, Lithuania and Spain** have allocated up to **€836 million** in funding for projects in their countries under [Auctions-as-a-Service](#).

- On **May 21, 2025**, the IEA published the [Global Critical Minerals Outlook 2025](#). The publication provides a comprehensive assessment of the market for (**CM<sub>3</sub>**) and **REEs**, including detailed outlooks for cobalt, copper, graphite, lithium, manganese, nickel, platinum metals, REEs, silicon, silver, and uranium.

To provide some context, **Elements** produced [Visualizing the Abundance of Elements in the Earth's Crust](#) among other things, indicating that bauxite (aluminium) is the most abundant element found in the earth's crust (at 8.23%), followed by iron (5.6%), calcium (4.15%), sodium (2.36%), magnesium (2.33%), potassium (2.09%) and titanium (0.565%). Other **CM<sub>3</sub>s** and **REEs** are to be found with other elements comprising 0.48% of the earth's crust.

- On **May 21, 2025**, the **European Commission** adopted a Delegated Regulation ([Commission Decision specifying the pro-rata contribution to the Union CO<sub>2</sub> injection capacity objective by 2030 from entities holding an authorisation as defined in Article 1, point 3, of Directive 94/22/EC of the European Parliament and of the Council](#)) prescribing that oil and gas producers must contribute 50 million metric tonnes of CO<sub>2</sub> storage capacity by **December 31, 2030** in proportion to their production of oil and gas from 2020 to 2023. The forty-four oil and gas companies are listed in Annex 1, and each has an obligation for these purposes.
- On **May 25, 2025**, **ENEOS** and **Honeywell** announced plans to develop a transport system to transport hydrogen vector **methylcyclohexane (MCH)**. **MCH**, a hydrogen energy vector, is produced by the combination of toluene and hydrogen (**H<sub>2</sub>**). The **H<sub>2</sub>** is extracted from **MCH** by dehydrogenation, with **ENEOS** refineries deploying dehydrogenation facilities to extract hydrogen from the **MCH**.
- On **May 26, 2025**, the **Indonesia Ministry of Energy and Mineral Resources (MIMR)** issued the [Electricity Supply Business Plan \(RUPTL\) 2025 - 2034](#). The **RUPTL** is based on the **National Energy Policy (KEN)** and the **National Electricity General Plan (RUKN)**. While there are many points to note, the headlines were:
  - An additional 69.5 GW of generation capacity is planned:
    - 75% of which will be renewable energy (42.6 GW), and associated electrical energy storage, including BESS and pumped storage (10.3 GW):

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<sup>14</sup> The EEA States comprise the 27 EU Member States and the three European Free Trade Association Member States, Iceland, Liechtenstein, and Norway.

- the 42.6 GW of renewable energy will comprise: photovoltaic solar – 17.1 GW, hydroelectric – 11.7 GW, Wind – 7.2 GW, Geothermal – 5.2 GW, Bioenergy – 0.9 GW, and Nuclear 0.5 GW (comprising two new build 250 MW nuclear power stations)<sup>15</sup>; and
- the 10.3 GW of electrical energy storage will comprise 6 GW of pumped storage and 4.3 GW of BESS; and
- with the balance (of 16.6 GW) to be non-renewable, with 10.3 GW of gas-fired capacity and 6.3 GW of coal-fired capacity.
- The new electrical energy generation capacity is to be undertaken across Indonesia.
- The augmentation and expansion, and development of new transmission infrastructure will be essential. Over the period covered by the RUPTL, PLN has scheduled the development of around 47,000 km of transmission lines and an increase in substation capacity by 107,950 MVA.
- The increased electrification across Indonesia.

During **June 2025**, the following key news items were covered in **Edition 33** of P<sub>2</sub>N<sub>0</sub>:

- On **June 4, 2025**, the EC approved a list of **13 Strategic Projects** to develop raw materials outside the EU: details of the 13 projects can be found at the EC website at <https://commission.europa.eu/Commission-selects-13-Strategic-Projects-in-third-countries-to-secure-access-to-raw-materials-and-to-support-local-value-creation>.
- **UK Government committed to stepped change in nuclear:**
  - On **June 12, 2025**, the [UK Government committed](#) to the development of the **£2.5 billion Spherical Takamak For Energy Production (STEP) facility**. The **STEP facility** will be developed on the site of a shuttered coal-fired power plant at Burton, Nottinghamshire, England.
  - On **June 10, 2025**, the [UK Government committed](#) to the development of the **GBP 14 billion Sizewell C nuclear power facility**. **Sizewell C** will be developed in the Ipswich, Suffolk region of the UK.
- On **June 10, 2025**, the **UK government** allocated **£9.4 billion** (over nine years) to maximize use of the **East Coast Cluster** and **HyNet Cluster**, and to continue to support the development of **Acorn** and **Viking Clusters** to advance their delivery.
- On **June 12, 2025**, the **Solar Energy Corporation of India Limited (SECI)** continued its procurement initiatives, this time to procure **2 GW** of PV solar capacity and **4 GWh** of BESS, using a Build Own Operate model under which the private sector will develop the photovoltaic solar and BESS capacity and provide electrical energy to **SECI**.
- On **June 12, 2025**, the **Philippines' Department of Energy (DOE)** commenced the process for its **Fifth Green Energy Auction (GEA-5)**, inviting bids to develop up to **3.3GW** of fixed-bottom offshore wind field capacity. This follows the continued progress of **GEA-4** (with an advisory update on June 11, 2025), and the publication of the **Green Energy Auction Reserve Prices for GEA-4** (on June 13, 2025) providing caps.

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<sup>15</sup> More broadly up to **10 GW** of nuclear generating capacity may be expected by 2040.

As announced by the DOE, in respect of GEA-4, evaluations of bids were scheduled during the final week of June 2025, followed by notification to bidders qualified to bid, with the bid process to take place by auction on September 2, 2025. Awards occurred in November 2025, with GEA-4 resulting in awards for 123 projects covering 10 GW of REE capacity.

In respect of GEA-5, the DOE launched the process on **November 25, 2025**, following the same process as GEA-4 with pre-bid bidder registration, and the auction process to conclude and the successful bidders to be notified during the first half of 2026.

- On **June 13, 2025**, energystorage (at <https://www.energy-storage.news>, under [Japan: Gurin Energy picks technology provider for first phase of 2GWh battery storage project](#)) reported that Gurin Energy has chosen Salt as the technology provider for its BESS to be developed in Soma, Fukushima.
- On **June 17, 2025**, the EC published its [Proposal for a Regulation of the European Parliament and of the Council on phasing out Russian natural gas imports, improving monitoring of potential energy discrepancies and amending Regulation \(EU\) 2017 / 1938](#).

On **December 17, 2025**, the EU Parliament approved the gradual phase out of the import of natural gas by pipeline, and for the EC to prepare for a ban on the import of oil from Russia during 2027.

- On **June 20, 2025**, the IEA published [Assessing emissions from LNG supply and abatement options](#).

The key facts and statistics are:

- The IEA estimates that extraction and production, processing, refining and treatment and transport of oil and natural gas (and LNG) give rise to around **5.2 Gt CO<sub>2</sub>-e a year, 3.5 Gt CO<sub>2</sub>-e from oil, and 1.6 Gt CO<sub>2</sub>-e from natural gas (and LNG)**, operations (i.e., from activities within the Scope 1 and Scope 2 emissions across the sectors).
- It is estimated that **350 million metric tonnes of CO<sub>2</sub>-e GHG** emissions arise in the LNG supply chain (from extraction and production to the point of use). The IEA estimates that it would take USD 100 billion to reduce these GHG emission by 60%. The means of achieving this reduction are detailed in the IEA report.

It is estimated that **41.6 Gt CO<sub>2</sub> emissions<sup>16</sup>** arose in 2024 from fossil fuel use (**35.8 Gt**), cement production (**1.6 Gt**) and land use (**4.2 Gt**). A further **5.2 Gt CO<sub>2</sub>-e** emissions arising as Scope 1 and 2 emissions<sup>17</sup> of the oil and natural gas (and LNG) industries. The IEA<sup>18</sup> estimates that **37.8 Gt** of CO<sub>2</sub> emissions arose from the combustion of fuel (including CO<sub>2</sub> emissions from fuel combustion, industrial processes and fugitive and flaring emissions).

- During **June 2025**, flagship reports were published by the [International Gas Union \(IGU\)](#) and [International Group of LNG Importers \(GIIGNL\)](#). The reports provide a helpful analysis of the LNG market.

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<sup>16</sup> 2024 Global Carbon Budget report by Global Carbon Project.

<sup>17</sup> Greenhouse Gas Protocol published by the World Resources Institute defines Scope 1 and Scope 2 emissions as follows: **Scope 1 Direct Emissions**, being emissions that arise from sources owned or controlled by the corporation or other organization whose GHG emissions are being measured and **Scope 2 Electrical Energy** indirect GHG emissions being emissions that arise from the generation of electrical energy used by the corporation or other organizations. Scope 3 Other Indirect Emissions being emissions that arise as a consequence of the activities of the corporation or other organizations.

<sup>18</sup> From the IEA Global Energy Review 2025, CO<sub>2</sub> Emissions.

The key facts and statistics are:

- Total natural gas production was circa **4.2 trillion cubic metres** in the calendar year to the end of 2024, equating to 3.044 billion metric tonnes of natural gas, giving rise to around 7.5 billion metric tonnes of CO<sub>2</sub> emissions on combustion; and
- Total LNG production was circa **406 to 420 million metric tonnes of LNG** in 2024, equating to around 1.165 billion metric tonnes of CO<sub>2</sub> emissions on combustion.

Of the LNG exported, 69% went to Asia, 24% to Europe, 4% to the Americas and 3% to the Middle East and Africa. It is estimated that by 2050, total production globally of natural gas will reach 5.3 trillion cubic metres annually (or 3.841 billion metric tonnes).

- On **June 18, 2025**, it was reported widely that **TotalEnergies** had been successful in bids for **1.2 GW** of OWF capacity in the most recent Federal German government tender process (for **N-9.4**). **TotalEnergies** was successful based on its bid to pay **€180 million** to entitle it to develop the OWF.

As reported, **TotalEnergies** was one of two bidders who submitted negative bids (i.e., they are not seeking government support). The negative bids indicate that the **OWF market** (at least in the German sector of the North Sea) has reached maturity.

- On **June 19, 2025**, the findings of [The Energy and Resources Institute \(TERI\)](#) study were reported. The headline grabbing find was that India has the potential to develop up to **10,830 GW** of PV solar capacity.
- On **June 23, 2025**, [pv-magazine](https://www.pv-magazine.com) (at <https://www.pv-magazine.com>, under [China hits 1 TW solar milestone](#)) reported that China had installed **92 GW** of PV solar capacity in May 2025.
- On **June 23, 2025**, came to market to undertake a tender by way of reverse auction for the supply of up to 724,000 metric tonnes of green ammonia under 10-year contracts. As reported, the green ammonia supplied will be used to produce fertilizer. In addition to the use of green ammonia, it is expected that use of biochar (by adding biochar to soil to provide for slow release of carbon and to facilitate the release of other minerals) will develop.

During **August 2025**, the following outcomes of the reverse auction were reported:

1. **ACME** to supply **Paradeep Phosphates Limited** with **75,000 metric tonnes** of NH<sub>3</sub> a year at 55.75 rupees per kg (or **USD 641** per metric tonne) under a 10-year term contract;
2. **NTPC Renewable Energy** to supply **Krishana Phoschem Limited** with **70,000 metric tonnes** of NH<sub>3</sub> a year at 51.80 rupees per kg (or at **USD 591** per metric tonne) under a 10-year term contract;
3. **Oriana Power** to supply **Madhya Bharat Agro Projects Limited** with **60,000 metric tonnes** a year at 52.25 rupees per kg (or at **USD 596** per metric tonne) under a 10-year term contract;
4. **SCC Infrastructure** to supply **Madhya Bharat Agro Projects Limited** with **70,000 metric tonnes** a year at 53.55 rupees per kg (or at **USD 596** per metric tonne) under a 10-year term contract;
5. **Onix Renewable** to supply **Gujarat Narmada Valley Fertilisers & Chemicals** with **50,000 metric tonnes** of NH<sub>3</sub> a year at 52.50 rupees per kg (or at **USD 596** per metric tonne) under a 10-year term contract;

6. **Jakson Green Private Limited** to supply **Coromandel International Limited** in Kakinada, Andhra Pradesh with **85,000 metric tonnes** of **NH<sub>3</sub>** a year at 50.75 rupees/kg (or at **USD 579** per metric tonne) under a 10-year term contract;
  7. **ACME** to supply **Coromandel International** with **50,00 metric tonnes** of **NH<sub>3</sub>** a year at 52 rupees per kg (or at **USD 593** per metric tonne), under a 10-year term contract; and
  8. **Suryam International** to supply **Madras Fertilisers Limited** with **4,000 tonnes** **NH<sub>3</sub>** a year at 50 rupees per kg (or at **USD 567** per metric tonne).
- On **June 25, 2025** the [Monthly Energy Review](#) (published by the **EIA**) reported that the primary energy consumption in the US during 2024 was at record levels. As is the case in other countries, as the use of coal, as a primary energy source, decreases, the role of natural gas increases: 38% of primary energy production in the US was from natural gas. In second place behind natural gas was crude oil, providing 27% of primary energy production.

During **July 2025**, the following news items were covered in **Edition 34** of P<sub>2</sub>N<sub>0</sub>:

- On **July 2, 2025**, the EC published the proposed amendment to the **EU Climate Law: [Proposal for a Regulation of the European Parliament and of the Council amending Regulation \(EU\) 2021/1119 establishing the framework for achieving climate neutrality](#)**<sup>19</sup> To accompany the proposed amendment, the EC published [Delivering on the Clean Industrial – Communication](#)<sup>20</sup>. The proposed amendment provides for a 90% reduction in net-GHG emissions by 2040 compared to 1990 (**EURT**).

On **November 5, 2025**, **EU Climate Ministers** agreed a **2040 GHG emissions reduction target**, which providing for a reduction of **90% of GHG emissions by 2040 compared to 1990**. In a move away from the position outlined in proposed legislation on **July 2, 2025**<sup>21</sup>, **EU Climate Ministers** agreed to allow **EU Member States** to purchase carbon credits from countries outside the EU to match up to 5% of the 2040 90% GHG emission target reduction.

On **December 10, 2025**, the **European Council and European Parliament** agreed to the **2040 90% GHG emissions reduction and the use of carbon credits to offset up to 5% of that target**: the **EU Climate Law** will be amended to provide for a **90% reduction in GHG emissions by 2040 compared to 1990 levels**.

- On **July 2, 2025**, the **Japanese Ministry of Economy, Trade, and Industry (METI)** convened a meeting of experts to discuss and to develop the detailed design for the **GTS-ETS**.

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<sup>19</sup> While there was support for the use of carbon credits to reduce the cost of decarbonisation, in the final analysis, the **EU** is allowing for a possible limited use of high-quality carbon credits to discharge liability arising under the **EU ETS** (commencing in 2026). This approach is consistent with thinking around the world: the **EU ETS** is intended to place a price on carbon that provides an incentive for corporations and other organisations to adopt lower, low and no carbon technologies so as decarbonize their activities (to achieve actual avoidance, reduction and removal) of GHG emissions, with carbon credits to be used to offset activities that cannot be decarbonised.

<sup>20</sup> In addition, among other things, the EC published: Commission Recommendation on tax incentives to support the Clean Industrial Deal in light of the Clean Industrial Deal State aid Framework; and Commission Recommendation on Innovative Renewables, Grid Infrastructure, and Future-Proof Network Charges.

<sup>21</sup> On **July 12, 2025**, the **EU** decided not to allow offsets until 2036 at the earliest. The stated policy driver for this was that lower, low and no carbon technologies should be maximized, and only those activities that could not be decarbonized should be able to offset.

The **GTS-ETS** was scheduled to commence operation at the start of Q2 of 2026. As things stand, from April 2026, pricing will be provided for corporations and other organizations averaging scope 1 emission of more than 100,000 metric tonnes of CO<sub>2</sub>-e over the previous three years.

- **China ESS sector running hot:**

- On July 4, 2025, pv-magazine (at [www.pv-magazine.com](http://www.pv-magazine.com) under [World's largest vanadium flow battery goes online in China](#)) reported that the **China Huaneng Group vanadium redox flow battery (VRFB)** had been completed. The source of renewable electrical energy for the VRFB is a **1 GW photovoltaic solar farm**. The VRFB is reported to have capacity aligned with the renewable energy capacity at **200 MW / 1,000 MWh**.
- During the first week of **July 2025**, **PowerChina** commenced the construction of its **USD 880 million 1 GW / 6 GWh** electrochemical energy storage project in **Ulanqab, Mongolia**. As reported, the project will comprise up to **1,200 units**, each of **5 MWh lithium phosphate energy storage capacity**. More detail on the project can be found at <https://www.energy-storage.news> under [PowerChina begins construction of "world's largest generation-side" battery storage project](#).
- On **July 13, 2025**, the **Kingdom of Saudi Arabia**, signed agreements for the development of seven new renewable energy projects. The agreements were signed under the **National Renewable Energy Program**, administered by the **Ministry of Energy**, with **ACWA Power** in consortium with **Badeel** (owned by PIF) and **Aramco Power** (owned by Saudi Aramco) parties to the agreements. As reported, the seven projects, with a total capacity of 15 GW, will have a total capital cost of USD 8.3 billion.

The seven projects are:

- five solar energy projects: Afif 1 – 2,000 MW; Afif 2 – 2,000 MW; Humaij – 3,000 MW; Bisha – 3,000 MW; Khulis – 2,000 MW; and
- two wind energy projects: Starah – 2,000 MW; and Shaqra – 1,000 MW.
- On **July 23, 2025**, the **UK Government (Department for Energy Security and Net Zero)** published the [Contracts for Difference \(CfD\) Round 7: Contract Allocation Framework](#). Critically, the **UK Government** has recognized the need for long-term CfDs, from **15-years** to **20-years**. In addition, there is an increase in the **Administrative Strike Price (ASP)**, with offshore wind to **£113 MWh** fixed-bottom, **£271 MWh** for floating wind, and **£92** for onshore wind. The **ASP** for PV solar decreased to **£75 MWh**.
- On **July 23, 2025**, the **International Court of Justice (ICJ)** gave an **Advisory Opinion on Climate Change** in response to questions posed in resolution of the **UN General Assembly** on **March 29, 2023**. The **Advisory Opinion** relates to the [Obligations of States in respect of Climate Change](#).

During **August** and **September 2025**, the following were the key news items covered:

- On **August 6, 2025**, **Inside Climate News** (at <https://insideclimatenews.org>, under [Why Prices Are Soaring in the Country's Largest Grid Region, Explained in 5 Charts](#)) reported that **PJN Interconnection** is experiencing high prices in its auction process, which matches electricity demand across its grid with supply. These elevated prices were driven by a combination of hot weather and increasing electricity demand, primarily from energy-intensive data centers.

- On **August 11, 2025**, it was reported widely that **Indonesia plans** to develop and to deploy **80 GW of renewable electrical energy capacity across 80,000 villages**. The development and deployment of the **80 GW of remote** (off-grid) PV solar capacity will be accompanied by the development of **20 GW of centralised** (on-grid) PV capacity.
- On **August 15, 2025**, the BBC (at <https://www.bbc.com>, under [Data Centres to be expanded across UK as concerns mount](#)) reported that the estimated 477 data centres in the UK is to increase by around 100 in the near to near to medium term, i.e., within the next five years. Among the data centres identified are a **£10 billion** AI data centre in Blyth, near Newcastle upon Tyne (to be developed by Blackstone Group), four data centres planned by Microsoft, with two in the Leeds area, one in Newport, Wales, and one in Acton, Greater London. Google is developing a **£740 million** data centre in Hertfordshire.

- **China continues to break records:**

- On **August 21, 2025**, it was reported widely that **CO<sub>2</sub> emissions** in **China** had reduced during the first six months of 2025 (H1) by up to 3% from the generation of electrical energy; and
- Also, during **August 2025**, it was reported widely that during **H1 of 2025**, China had installed a further **268 GW** of photovoltaic solar (212 GW) and wind (56 GW) electrical energy capacity (taking the capacity for photovoltaic solar and wind to close to 1,650 GW of installed capacity).

In the first six months of 2025, China:

- generated more than 500 TWh of electrical energy from PV solar, broadly stated a little more than the demand for electrical energy in Japan; and
- installed more PV solar capacity (of 212 GW) than the US has installed to date.

Taken with other renewable energy capacity, China has nearly 2,200 GW (or 2.2 TW) of renewable electrical energy installed.

- On **August 18, 2025**, hydrogeninsight (at [www.hydrogen.com](http://www.hydrogen.com), under [Second-largest in China State-owned firm to build giant 2.2GW green hydrogen-to-ammonia project](#)) reported that **China Energy Investment Corporation** had been given the green light to develop a **2.2 GW green hydrogen-to-ammonia project**. The project will cost around **USD 1.8 billion** to develop and will produce up to **1.35 million metric tonnes of green hydrogen a year**.
- On **August 18, 2025**, hydrogeninsight (at <https://www.hydrogeninsight.com>, under ["No showstopper identified" / Five gas pipeline operators complete study on 3,400 hydrogen corridor](#)) reported that five transmission service operators (TSOs), **Eurstream** (Slovakia), **Net4Gas** (Czechia), **OGE** (Germany), **Snam** (Italy) and **TAG** (Austria) had concluded that there are no showstoppers to the development of the **SunSHyde Corridor**. As reported, the conclusion is that the **SunSHyde Corridor** can be developed by 2030, with capacity of **450 GWh a day** (or **5 million metric tonnes a year**). The **SunSHyde Corridor** will comprise 85% repurposed existing pipeline systems.
- On **August 25, 2025**, it was reported widely that **Gentari** (the green limb of PETRONAS) and **Gamuda** are to develop jointly **1.5 GW PV solar** and **BESS** capacity under Malaysia's **Corporate Renewable Energy Supply Scheme (CRESS)**.

In a joint statement, **Gentari** and **Gamuda** noted:

"As ... critical facilities for cloud computing, AI and digital services, hyperscale DCs ... are projected to require 5GW of reliable power by 2035".

- On **August 25, 2025**, the **Northern Lights Project** injected its first CO<sub>2</sub> to effect storage permanently. For **Equinor, Shell and TotalEnergies**, this marked the successful development of **Phase 1** of the **Northern Lights Project** as part of the **Long Ship Project** backed by the Government of Norway.

As reported, the CO<sub>2</sub>, captured at the **Heidelberg Minerals** cement plant, in **Breivik, Norway**, transported to the **Northern Lights Project** consolidation and storage facilities **Øygarden, Norway**, and then sent out 100 km for injection 2,600 metres below the sea-floor of the Norwegian sector of the North Sea.

The injection of CO<sub>2</sub> marked the start of operation of **Phase 1** of the **Northern Lights Project**, under which **1.5 million metric tonnes** of CO<sub>2</sub> will be injected each year.

- On **August 28, 2025**, **ExxonMobil** published [ExxonMobil 2025 Global Outlook](#). The **publication** provides the outlook of ExxonMobil through 2050. The by-line for the **ExxonMobil publication** is:

"Increasing global energy supply and reducing emissions is not only possible. It's essential."

The key takeaways from the **ExxonMobil publication** are as follows:

- All types of energy are needed for a lower emission and prosperous future, with:
  - Renewable energy capacity installation increasing at the fastest rate through 2050;
  - Coal is to decline the most; and
  - Natural gas and oil to make up more than 50% of the energy mix;
- Increasing living standards and urbanization in developing economies will result in a 25% increase in energy use, including as a result of increased rates of electrification, as well as increased use;
- The industrial and transport sectors underpin the world economy, and each sector will require increased supply of energy;
- CO<sub>2</sub> emissions arising globally will fall by 25% by 2050, the affordability of decarbonization being determinative; and
- Sustaining investment in the natural gas and oil sectors will be more important than ever.
- During **September 2025**, it was reported widely that, across the Australia National Electricity grid:
  - 48.8% of the electrical energy transmitted across the national grid was generated from renewable electrical energy; and
  - 47.6% of electrical energy generated from coal powered sources.
- During late **September 2025** it was announced by **TotalEnergies** that it is to develop and to operate the **1.5 GW Centre Manche 2** offshore wind field (**OWF**) off the coast of Normandy, northern France. As announced, **TotalEnergies** will invest **€4.5 billion** in the development of the OWF.
- Also during late **September 2025**, the [bp Energy Outlook – 2025 edition](#) was published.
  - The headlines from the **bp publication** are as follows:

- **Artificial Intelligence** or AI applications are providing a new source of energy demand, including in markets in which demand growth for electrical energy has stalled or reduced;
- **Energy efficiency** improvements have not progressed at the rate hoped or needed, and has resulted in a lag in the progress in energy transition; and
- **CO<sub>2</sub> emission have not yet peaked:** We are approaching the 10<sup>th</sup> anniversary of the signature of The Paris Agreement in December 2015. If CO<sub>2</sub> levels stay at current levels for the next 10 years, it will be “increasingly challenging” to stay “within a 2°C carbon budget”.

The trends identified in the **bp publication** include the following:

- **Energy Security** continues to be a key focus of most countries across the world. While the trend is clear, the impact of the trend at a country-by-country level is different. A deeper dive on this trend, is recommended;
- **Natural gas and oil production** continues to grow year-on-year, with demand in China and in developing countries contributing to oil production and the growth in LNG production capacity, with no sign of a slowdown in the medium term and citing the **bp publication**: “global LNG exports are set to increase by more than half by 2035 relative to 2024”;
- **Low carbon energy** continues to be a function of the increased development and deployment of photovoltaic solar and wind capacity, with increased development and deployment keeping pace with rising demand for electrical energy and is now being developed at a rate to displace non-renewable sources of electrical energy generation.

As recognized consistently, the challenge for the deployment of renewable electrical energy is the need to develop, augment and expand transmission and distribution systems and infrastructure.

- During the final week of **September 2025**, the **Ministry of the Ecology and Environment of the People’s Republic of China** published its [Progress Report on China’s National Carbon Market](#). The **Progress Report** notes that that “National Carbon Market has become an essential tool in accelerating green transition in all aspects of economic and social development”.

Further, the Progress Report notes that advancing the National Carbon Market is:

- a potent and cost-effective measure for achieving “Dual Carbon Goals”;
- a crucial task in deepening reform in ecological conservation; and
- a vivid practice of supporting high-quality development with high-level protection.

The [Interim Regulations for the Management of Carbon Emission Trading](#) entered into force in May 2024.

The **Ministry of Ecology and Environment (MEE)** has worked to ensure effective implementation of the **Interim Regulations**. Under the **Interim Regulations**, **Departmental Rules** exist, in the form of [Measures for the Administration of Carbon Emissions Trading](#) and [Measures for the Voluntary Greenhouse Gas Emission Reduction Trading](#), with three sets of Supporting Guidelines under each of the Measures.

During **October** and **November 2025**, the following received considerable coverage reflected in the news items covered in **Editions 36** and **37** of P<sub>2</sub>N<sub>0</sub>: [**Note**: *We have not repeated new items arising from the stand-alone Key News Items Arising from COP30, covered in Edition 38 of P<sub>2</sub>N<sub>0</sub>*]

- On **October 6, 2025**, it was reported widely that the Federal German Government had announced the provision of up to **€6 billion** in funding support to decarbonize the industrial sector, including, for the first time, to fund carbon capture and storage.

It is understood that the funding will be provided under 15-year contracts under which the Government will provide funding to support the industrial sector transitioning to low, lower and no carbon technologies. As reported, corporations and other organizations wishing to participate in the funding rounds for 2026 will have to register interest by **December 1, 2025**.

- On **October 7, 2025**, **Ember** reported (under [Global Electricity Mid-Year Insights 2025](#)) that:  
“... solar and wind outpaced the growth in the global electricity demand in the first half of 2025, resulting in a very small decline in [the use of] both coal and gas, compared to the same period last year”.

In the context of the **Ember** report, Senior Electricity Analyst, Malgorzata Wiatros-Motyka stated:

“We are seeing the first signs of a crucial turning point. Solar and wind are now growing fast enough to meet the world’s growing appetite for electricity. This marks the beginning of a shift where clean power is keeping pace with demand growth”.

- On **October 7, 2025**, the **IEA** published [Renewables 2025 – Analysis and forecasts to 2030](#).

The headline findings from the publication are as follows:

- Global renewable electrical energy capacity is expected to increase to 4,600 GW by 2030, with photovoltaic solar capacity to account for 80% of the increase;
- In the context of the long-identified need to triple renewable electrical energy capacity (reflected in the pledge arising from COP-28 in November 2023 to which 200 countries committed), the increase to 4,600 GW will fall short of tripling but may be regarded as keeping the tripling within stretching distance.
- On **October 20, 2025**, **New Atlas** (at [newatlas.com](#), under [Amazon goes nuclear with new modular reactor plant](#)) reported that **Amazon Web Services (AWS)** is to invest in restarting or developing nuclear power plants to provide reliable “around-the-clock” electrical energy to power its data centers. As reported, **AWS** is to use the **X-Energy Xe-100 Small Modular Reactor (SMR)** to be installed near the **Energy Northwest Columbia Generating Station** in the US State of Washington. The **Xe-100 SMR** is a high-temperature gas-cooled reactor (HTGR).“
- On **October 23, 2025**, it was reported widely that **Google** had contracted in respect of electrical energy to be supplied from the **Broadwing Energy** project. As reported, the **400 MW Broadwing Energy** project will be located at an existing industrial facility owned and operated by Archer Daniels Midland, Decatur, in the US State of Illinois, and will use carbon capture technology from **Mitsubishi Heavy Industries**, which is understood to be designed to capture up to 90% of the CO<sub>2</sub> arising from combustion of natural gas. This is a first for North America.

- On **October 23, 2025**, pv-magazine (at [www.pv-magazine.com](http://www.pv-magazine.com), under [China expands highway solar as provinces races to decarbonize transport](#)) reported that **China** is installing **PV solar** renewable electrical energy generation capacity along highways. As reported, as at the end of 2024, **1.7 GW** of PV solar renewable electrical energy capacity had been installed. The **China Academy of Transportation Sciences** has estimated that up to **940 GW** of PV solar capacity can be installed along transport networks across China.
- On **October 28, 2025**, it was reported widely that **NextEra** had signed a 25-year power purchase agreement with Google under which it will supply electrical energy from the **Duane Arnold Energy Center** in the US State of Iowa. As reported, reopening the power station will cost in the region of **USD 1.6 billion**.
- On **October 28, 2025**, **Mr Bill Gates** published an essay entitled [Three tough truths about climate](#).

At the start of the essay Mr Gates writes: "What to know:

- Climate change is serious, but we've made great progress. We need to keep backing the breakthroughs that will help the world reach zero emissions.
  - But we can't cut funding for health and development – programs that help people stay resilient in the face of climate change – to do it.
  - It's time to put human welfare at the center of our climate strategies, which includes reducing the Green Premium to zero and improving agriculture and health in poor countries."
- On **October 31, 2025**, it was reported widely that the **Chair and CEO of ExxonMobil**, Mr Darren Woods, had stated that **ExxonMobil** was in advanced talks with power providers and tech corporations to supply electrical energy from gas fired power plants at which carbon capture technology is used.  
Technology corporations, including the hyperscalers (Alphabet, Amazon, Meta and Microsoft), seem to be positioning to contract for the supply of lower or lower carbon intensity electrical energy.
  - On **November 21, 2025**, after publication in the Official Journal, [Delegated Act on low-carbon hydrogen](#) became law. The Delegated Act details the basis upon which hydrogen produced using non-renewable electrical energy (including grid electricity, and natural gas and nuclear generated electrical) can be characterized as **low carbon**, and as such qualify for funding from the EU.
  - On **November 22, 2025**, Global Times (at [www.globaltimes.cn](http://www.globaltimes.cn), under [World's largest Hualong One nuclear power base successfully of State Grid](#)) reported that **No 2 Unit of Zhangzhou** nuclear had connected to the **State Grid**. The connection of **No 2 Unit** is located within **Hualong-I** and marks the first step in the deployment of the **Hualong-I** reactor series in **Shandong Province, China**. Six reactor units are planned, but how long this will take is not known yet.
  - On **November 22, 2025**, the **UK Government (Department for Business and Trade and Department for Energy Security and New Zero)** published [The UK's Modern Industrial Strategy, Critical Minerals Strategy](#).

The publication sets out:

“the UK’s long term-term ambition for securing critical minerals and harnessing [the UK’s] competitive advantage in recycling and innovative midstream processing – the transformation of mined or recycled materials into refined or upgraded forms suitable for manufacturing”.

- On **November 25, 2025**, the **businesstimes** (at <https://www.businesstimes.com>, under [Johor, Ditolric Energy partner World Bank’s IFC to develop US\\$ billion solar-and-storage hub to power JS-SEZ](#)) reported on plans to develop a **USD 6 billion** solar-and-storage corridor to power the next phase of its industrial expansion. As reported, **IFC, PDT and Ditolric Energy** have signed a collaboration letter, to provide a framework for the development of their project within the **Southern Johor Renewable Energy Corridor (SJREC)**. The project will comprise **4 GW** of photovoltaic solar capacity, and **5.12 GWh** of BESS capacity.
- On **November 26, 2025**, **Uniper** announced that it had signed a framework agreement with **thyssenkrupp Unde** to allow **Uniper** to develop ammonia cracking plants using **thyssenkrupp Unde** technology. The development of the cracking plants will allow the dehydrogenation of ammonia imported by ammonia carriers delivering ammonia to Uniper’s import terminal at Wilhelmshaven.

During **December 2025**, the following key news items were covered in **Edition 39** of P<sub>2</sub>N<sub>0</sub>:

- On **December 3, 2025**, the **European Commission** published **RESourceEU**, the initiative of the **EU** to secure **CM<sup>3</sup>** across the **EU**: [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, RESourceEU Action Plan Accelerating our critical raw materials strategy to adapt to a new reality](#).

The **RESourceEU Action Plan** builds on the structure provided by the **Critical Raw Materials Act (CRMA)**. Under the **Action Plan**, during the first few months of 2026, the **EC** will establish the **European Critical Raw Materials Centre** and the **Raw Materials Platform**. These initiatives will facilitate assessment of demand, coordinate the purchase of raw materials and to arrange off-take agreements. For more detailed coverage of the **Action Plan** and **CRMA**, see [Commission adopts RESourceEU to secure raw materials, reduce dependencies and boost competitiveness](#) at <https://ec.europa.eu>.

- In early **December 2025**, it was reported widely that **Yara** is to capture up to **800,000 metric tonnes of CO<sub>2</sub>** annually from its **Sluiskil plant**, in **the Netherlands**. As reported, the plant produces ammonia and fertilizer, with **CO<sub>2</sub>** arising from production to be captured, processed and treated, and liquified and transported for injection and storage in the **Northern Lights Project**.
- On **December 8, 2025**, **CNBC** (at [www.cnn.com](http://www.cnn.com), under [NextEra working with Exxon to develop gigawatt data center for hyperscaler](#)) reported that **NextEra** and **ExxonMobil** are working together to develop a data center to be powered by **1.2 GW gas-fired power plant**, with the power plant to capture **CO<sub>2</sub>** arising from the combustion of the natural gas, and the natural gas and carbon capture technology to be provided by **ExxonMobil**.
- On **December 10, 2025**, **NextEra** signed **11 renewable energy purchase agreements** and **two renewable energy storage agreements** with **Meta** to supply **2.5 GW** of renewable electrical energy to **Meta** across the United States. As reported, the renewable energy and renewable energy storage capacity are to be developed in phases, going live during 2026 to 2028.

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\* Michael Harrison is the primary author of **P2N0**, and editor. Any error is Michael's. **P2N0** is written early each Saturday morning. In writing **P2N0**, Michael sources from original material. If a news item is covered broadly, the words **reported widely** connote that at least three sources have covered that news item, and **reported** connotes at least two sources. If there is only one source that is not the original material, that source is named.

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