EUROPEDIPLOMATIC

MAGAZINE

PUTIN'S POWER PLAY

Unraveling the threat of war in Europe

February 2024

Nº55

3€

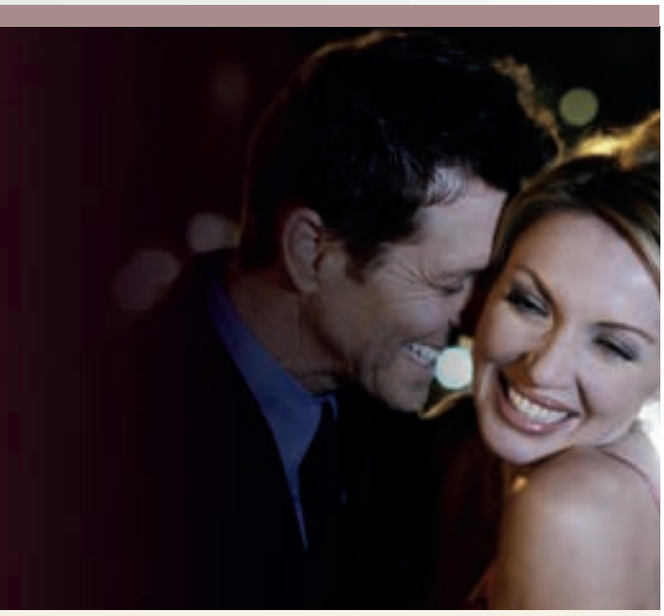
BRUSSELS - PARIS - GENEVA - MONACO

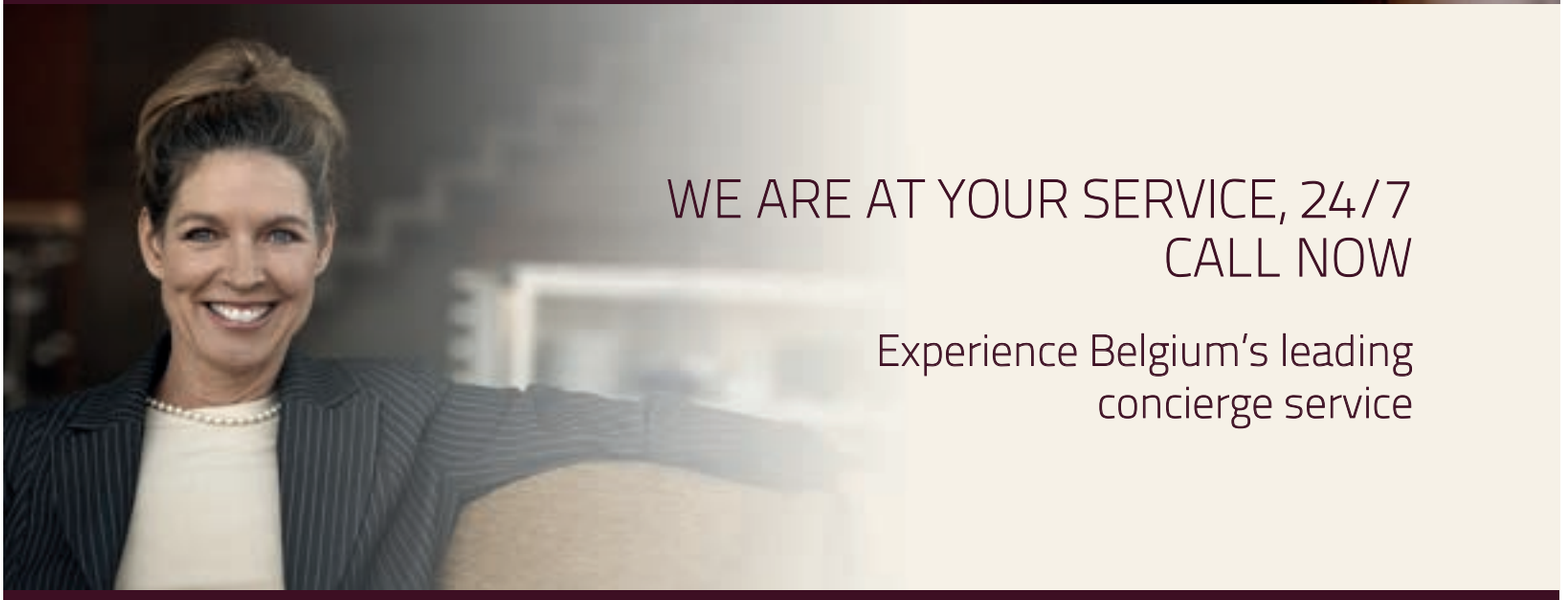
SAVVIVA

Concierge Services

EFFICIENT PERSONAL SUPPORT IN BUSY TIMES

- Personal assistance
- Private concierge
- Property management





WE ARE AT YOUR SERVICE, 24/7 CALL NOW

Experience Belgium's leading concierge service

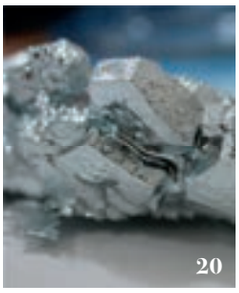
SAVVIVA

www.savviva.be | +32 2 669 07 29 | concierge@savviva.be

Nº55 February 2024

EUROPEDIPLOMATIC
MAGAZINE

IN THIS ISSUE



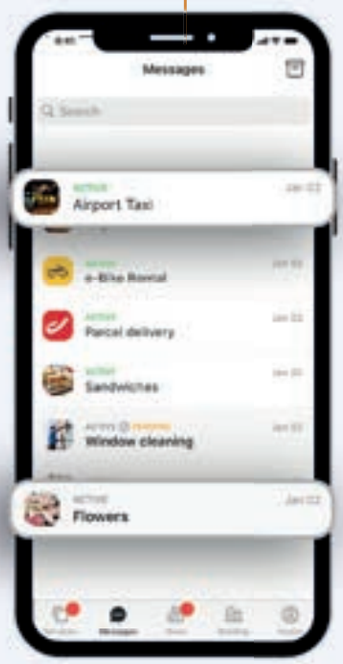
"Europe Diplomatic Magazine" is characterized by a very open editorial line that allows it to capture all the themes that affect directly or indirectly the European political, economic, social and security issues. Whether piracy in the Gulf of Aden and its threats to the global economy, articles about political leaders, geostrategic situations or technological developments affecting our civilization, Europe Diplomatic Magazine strives to work in comparing opinions and providing an objective analysis based on extensive research. For a wide audience composed of both members of the diplomatic corps, lobbyists, international officials or academics, the magazine gives everyone the necessary and useful information about all topics that make up our daily lives. Covering sensitive issues such as nuclear, the rise of Islamism and energy dependence, the magazine opens its pages to recognized specialists who would like to express first order and exclusive information. But Europe Diplomatic Magazine is not only a source of information on recent topics. It is also addressing older facts with deep thought fur further analysis. Whether it's news, security, diplomacy, technology, energy, terrorism, European affairs, no subject is treated superficially. Europe Diplomatic Magazine is an independent media, conveying balanced ideas of openness and analysis based on almost 30 years of experience in the journalistic world.

Visit our site and please
give us your comments:
https://europe-diplomatic.eu/
europediplomaticmagazine@gmail.com

ask nestor

Bring Your Building To Life.

Asistance — Services — Community — Information



Your **all-in-one digital service platform** for **your building** and **community**.

Download and Contact Us For a Demo Code

info@asknestor.com

+32 2 669 07 29

asknestor.com

App Store Google Play

Nikola Hendrickx

PEACE IN OUR TIME? NO CHANCE!

People may say they yearn to return to that imagined time of blissful peace, but in reality, there never was one

Was there ever an age of peace? If there really was, the history books don't appear to record it. Of course, that could be because times of bloody conflict make for more exciting reading and more interesting stories, but possibly fewer observers in a position to write anything down or record it. Looking back at the history of our trouble world, it could be because there's never really been a time of peace, at least not for very long or over a wide enough area. There have been plenty of wars, of course, since the first recorded use of war chariots in around 2,400 BCE. It's not as if people didn't fight before then, or that armies didn't clash, armed with sharp things. But it was less well organised, and it took longer to slaughter large enough numbers to matter much. Wars at sea are nothing new, either, with the first to be recorded having taken place in 56 BCE, with the navies of classical Rome and the Veneti Gauls coming to blows somewhere in the Atlantic. The Romans won that one, by the way. Of course, it was a long time ago, between powers that no longer exist as global entities. No details of acts of heroism are recorded, it seems, so the outcome is an irrelevance anyway. That is generally the case for most wars, which in any case could probably have been avoided with a little diplomacy.

© NRF

UH-1D helicopters during the Vietnam war in 1966

It was back in 1969 that the American singer Edwin Starr recorded "War (What is it Good For?)", which was heard over and over again throughout the 1970s. It was mainly about the ongoing war in Vietnam, of course, but its message is still relevant today. There's seldom been a shortage of wars to sing about, if you're so inclined. Of course, for some people, war can be quite profitable. The big oil companies spring to mind, but they're not the only ones to profit from wars. Indeed, it seems that quite a lot of people see little wrong in launching and then stoking conflicts that kill, although the people who make money out of such activities are seldom to be found anywhere near the front line. You'd be amazed (or possibly not) by how many people view warfare as something from which profit can be extracted. For those who would join a war, it has always been a way to build one's reputation, as the playwright William Shakespeare put it in his list of what he called "the Seven Ages of Man", in the play "As You Like It". Many men seem to like dressing up in conflict gear as he steps from one phase of life to another, progressing from "the infant", to "the whining schoolboy", then "the lover" and so on and on: "Then a soldier; Full of strange oaths, and bearded like the pard, Jealous in honour, sudden and quick in quarrel. Seeking the bubble reputation Even in the canon's mouth." Bang.

© WIKICOMMONS

From left to right: Neville Chamberlain, Édouard Daladier, Adolf Hitler, Benito Mussolini, and Galeazzo Ciano pictured before signing the Munich Agreement (1938)

If you search current conflicts online you'd be amazed at just how many there are going on as you sit reading this. Right at this moment, as you're turning the page, somebody somewhere is copping a live military round, probably 7.62 mm, somewhere painful, and very possibly somewhere terminal. As for that quotation "Peace in Our Time", it comes from a speech given by the then British Prime Minister, Neville Chamberlain, in 1939, just after holding talks with Hitler in Munich in a bid to avoid war. It was nonsense then and it still is. Just under a year after Chamberlain said it, Hitler's invasion of Poland launched the Second World War. It was a misquote, too: in his speech he really spoke of "peace ¬for our time". Peace in Our Time is a line from a popular 7th century hymn, and is more of a prayer than an observation about an international peace conference, especially the 1938 Munich Accords.

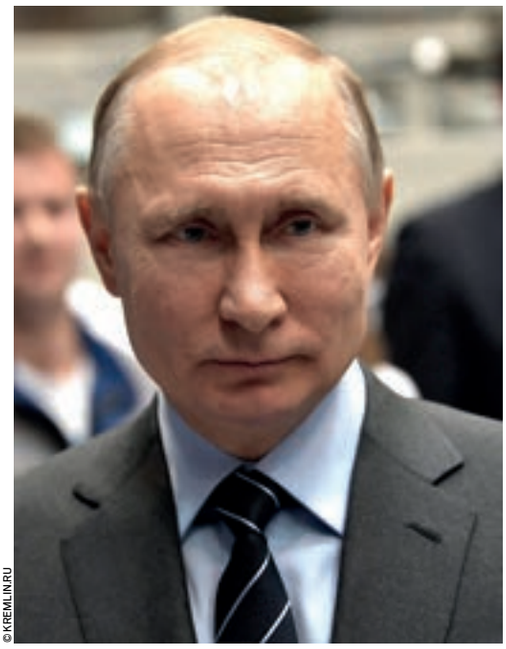
They did little except give Hitler more time to prepare for war, even if Chamberlain and others realised back then that they'd merely been unsuccessful in stopping an unhinged kleptomaniac leader from launching an attack on all those neighbours whose territory he coveted. And now it's happening again, even if this time the unhinged kleptomaniac coveting other people's territory lacks a silly moustache and baggy jodhpurs. We have to make do with a supercilious half-smile instead, intended to distract us from his wish to rule the world. If he did, of course, unlike that song, every day would NOT be the first day of Spring but more likely the last day of peaceful co-existence. Perhaps the "first day of the end of the world" is all we're likely to see, accompanied I suppose by Putin's manic laughter.

MAKING MONEY OUT OF CONFLICT

Of course, there are always people who see a commercial opportunity in the business of dealing in arms. In the UK, questions are being asked about a Conservative MP, Mark Pritchard over allegedly providing his expert services to a

Macedonian company, ATS, trading in arms and developing new military equipment, some of it for law enforcement purposes. As he pointed out, however, that in itself is not illegal, even if you personally find it distasteful.

Even so, if you were under attack in the street, you'd expect the police to arrive with weapons they are able to use. According to the Open Democracy website, more than 210 members of the UK parliament receive incomes (permitted and declared) from non-parliamentary sources. In other words, they do some additional work on the side to boost their incomes, or – as it's often called in certain quarters – "moonlighting".



© KREMLIN.RU

Russian President Vladimir Putin

A bit of extra profit is one thing, but wars seldom leave everyone unscathed, even among those deeply engaged in fighting. In this most recent case, we see Putin's Russia edging ever closer to war with no real obvious motivation. In fact, Putin has given a variety of different reasons for launching his attack on Ukraine. Of course, Ukraine was at one time a part of the Soviet Union (although never a part of Russia itself), which looked to Moscow for control and guidance until the Soviet Union's collapse in December 1991, since when it has considered itself an independent country. Independence was the verdict of a referendum, although Putin still refers to it as being Russian and denies its nationhood. He even told former US President George W. Bush that Ukraine is not a real country. He never did take much notice of public opinion, however overwhelming. One commentator has alleged that many Russians see Kiev as "the mother of Russian" cities, which means it has to be inside Russia, even if that involves redrawing boundaries.

© BMVG.DE

German Defense Minister Boris Pistorius : " We hear threats from the Kremlin almost every day ... so we have to take into account that Vladimir Putin might even attack a Nato country one day"

It was in Kiev many years ago that I saw lots of students dressed up as Disney characters and also where I bought from a street trader a roll of toilet paper with Putin's face printed on every sheet. It seems that Ukrainians don't like him and nor do they share his view that Ukraine is really Russian. Journalist Rachel Hall told Business Insider that: "Russia can't claim a thousand years of history because Kyiv was already in existence 1,200 years ago, when Moscow was a forest."

Hall also told the publication that: "Putin's opinion has always been that Ukrainians and Russians are the same people, that they're part of the Slavic Brotherhood of Russia, Belarus, and Ukraine." It's a view shared by quite a few Russians but hardly any Ukrainians, even if Belarus has handed itself to Moscow on a plate. Ukraine, however, has been an important economic asset to Russia for a very long time, supplying much of its coal and steel, and thus securing its economic wealth in the later years of the 19th century and after. But if Ukraine is a natural part of Russia, why was it so keen to break away? According to Putin's narrative, "Russia has a right to rule Ukraine. Russians and Ukrainians are one nation and one people." He clearly doesn't think the Ukrainians should have a say in that and he blames the West for the current impasse, because NATO's borders were stretching ever closer to Russia's. But even if that excuses had a founding in reality it would be a very poor excuse for what Russia has been doing in Ukraine.

© PRESIDENT.GOV.UA

President of Ukraine visiting the front lines

Putin has made the claim that Ukraine is run by Nazis, even though its President, Volodymyr Zelenskyy, is Jewish. What the Nazis did in horrible places like Auschwitz deeply shocked the Russian troops who liberated it, although they were, of course, committed Communists. Whoever is now involved in running

Ukraine, it certainly isn't Nazis. One expert wrote that Putin's anxiety revolves around this question: "Am I going to be a footnote in Russian history or are they going to write books about me like they do Peter the Great, Catherine the Great, Stalin." The ones written about Stalin are hardly flattering, mind you, although the one written by Oleg V. Khlevniuk and simply called "Stalin – New Biography of a Dictator" is excellent. Is that really how Putin wants people to remember him? Wouldn't he prefer to be remembered like Vlad the Impaler, or Dracula? As for the timing of the Russian invasion, in February 2022, it seems that Putin took the decision because he thought that Zelenskyy, being an actor and TV comic, would be easy to manipulate. That, clearly, was a very silly mistake. It seems Putin truly believed that Russia would conquer Ukraine in a matter of days. Another mistake. Indeed, some experts have suggested that Putin suffers from megalomania, exacerbated by his relative isolation in global politics. He certainly hasn't enhanced his popularity. When the defence ministers of the Baltic states – Latvia, Lithuania and Estonia, met in Riga in January, they signed an agreement to set up a joint "Baltic Defence Line" to strengthen their eastern borders, not only of their own countries but also of the European Union and NATO. They don't favour a visit from Putin's forces, whatever he may think.

Another thing that's likely to annoy the man in the Kremlin is the Ukrainian taste for laughter. Zelenskyy, we must recall, was a comedian before he took on the unenviable task of running the country, and stand-up comedy is now all the rage there, while an earlier taste for Russian humour has faded away. From very little interest before the invasion, Ukraine's comics now perform to audiences of 1,500 or more. The performances now tend to be in the Ukrainian language, rather than Russian, as used to be the trend. The Economist magazine quotes one Ukrainian comedian, Vasyl Byduck, as saying: "Comedians are like rats: we survive any disaster and are the first to emerge from tragedy." As for the choice of subjects, that's not a problem either. "I don't think a dead Russian is OK," said comedienne Nastya Zukhvala, "I think a dead Russian is very good, actually." Yes, it's "black humour", but having invaded the country with the intention of taking it over, Putin can hardly be surprised.

© MINISTRY OF DEFENCE OF LATVIA

Estonian, Latvian and Lithuanian defence ministers (from left to right), signing the agreement on Baltic Defence Line that will further reinforce the external borders of the Baltic States and NATO's eastern border

GIMME, GIMME, GIMME

Meanwhile – perhaps unsurprisingly – Russia continually tries to point the finger at the West. The Russian military magazine Mobilization News quotes official Russian sources as saying that a deadly attack on Donetsk (situated in Ukraine but under Russian control) involved the use of Western, NATO-made weapons. Few people believe it; Putin's reputation for lying is considerable. Meanwhile, the publication also claims that new recruits to Russia's rag-tag army are being mistreated by their commanders at a training ground in Volgograd Oblast, including beatings and a lack of adequate protection against freezing weather.

© NATO/DANIELE FACCIO

Allied aircraft from Italy, Spain and Lithuania flying training missions above Lithuania on simulating close formation flight and aerial combat drills to demonstrate combined capabilities in support of NATO deterrence and defence

The newly-conscripted Russian troops are reportedly being forced to purchase their own uniforms and sleeping in unheated tents. Young men dragooned unwillingly into fighting are seldom treated well, and it's been reported that Russia is losing more soldiers than it can compensate for through conscription. It's now reckoned that the number of casualties on both sides comes to more than half a million. That's a half a million lives lost just to satisfy Putin's vanity.

America's Council on Foreign Relations (CFR) points out that Russia is continuing to shell and bomb Ukrainian cities, as well as blockading its ports, while Ukraine has stepped up drone attacks on Russian ships and installations. Ukraine has received some $350-million (€321.28-million) in aid to help it repel the unprovoked Russian attack, which includes $77-million (€70.7-million) from Washington, although there are growing fears of "donor fatigue" that must make Putin smile. Fighting, which includes air strikes, has inflicted almost 22,000 civilian casualties, according to

CFR, with some 5.1-million people internally displaced and 6.2-million people having fled the country.

© NRF

Swedish Chief of Defense, General Michael Bydèn, showing photos from the battlefield in Ukraine and asking the audience: "Do you think this could be Sweden?"

It would be very unwise to underestimate Russian firepower. Back in 2021, Russia climbed from being the fifth biggest spender on military equipment to being the third biggest. It seems that Russia (or at least Putin, which is not necessarily the same thing) really likes going to war. We should not forget how Stalin took a decision to "Sovietize" and absorb his neighbours, adding to the territory over which he had gained influence under the Molotov-Ribbentrop pact, apparently believing it would prevent attacks on Russian territory via that route.

He tried not to annoy France or Britain too much, but his army group commander Vasily Chuilkov, still exultant over his army's rapid victory in Poland, then boasted in a radio interview, that his troops could easily take Berlin. Stalin was furious, although it became illegal in the Soviet Union to criticise Hitler or the Nazis. In 1939, Stalin decided to invade Finland (a small neighbouring country without much firepower; sound familiar?). Stalin insisted on placing a Soviet military base there and on taking a large area of Finnish territory not far from Leningrad. Finland, which had won its independence in 1917, was suspicious of Russia's imperialist ambitions.

Vasily Chuikov attending the victory parade on Red Square in Moscow

The Red Army invaded Finland in 1939, expecting a quick and easy victory (once again, it makes the invasion of Ukraine resemble a replay). Finland was tiny, with just 4-million inhabitants and when the "Winter War" as it became known, began, it had just 26 tanks with which to repel the USSR's 1,500. Stalin was convinced it would all be over in a trice, but Finland fought back hard and well and other nations around the world increasingly took its side. As it turned out, Finland did lose quite a lot of its territory but the USSR was expelled from the League of Nations, while France and Britain prepared to intervene. The Red Army lost some 130,000 troops. What made it worse was that Hitler was enjoying extraordinary success in Germany's invasions, including forcing France to capitulate in just a matter of weeks. Russia did, however, gain control of Latvia, Lithuania and Estonia, along with Bessarabia and part of Bukovina, snatched from Romania. So there we have the almost-perfect template for Putin's invasion of Ukraine. We may not agree with Stalin but at least he had a political model he wanted to impose: Marxism. Putin, on the other hand, has no policies he believes would improve life for Ukrainians, because he appears not to care about them at all. It's all about possession and nothing more. Stalin may have been guided by misplaced idealism, but Putin seems to be guided solely by greed and his own inflated ego.

© VLADIMIR SMIRNOV/TASS

Russian intercontinental ballistic missiles

"I WANT" NEVER GETS

I can remember grown-ups saying that in response to children's demands. And the expression could well apply to Putin. He seems not to be gaining much through his kleptocracy, however. His troops seized the Ukrainian village of Krokhmalne, in the Kharkiv region, but it only had a population of 45, which means it's not much of an achievement, even if Ukrainian forces withdrew from the area, and Ukrainian military sources say that Russia is losing ordnance ten times as fast as Ukraine. Meanwhile, Russian soldiers' wives have been staging protests outside Putin's campaign headquarters, demanding the return of their husbands, although it's rumoured that Putin plans to conscript more men to boost his fight. If his aim is really to be recorded in Russian history as a great man, he has partly succeeded: he will undoubtedly be remembered, but probably not as a great man.

© NATO

Admiral Bauer, Chair of the Nato Military Committee : " ..We have to realize it's not a given that we are in peace and that's why we have the plans. That's why we are preparing for a conflict with Russia if they attack us.."

Russia can boast some 1.33-million active military personnel and 5,977 nuclear weapons, a number almost equalled by combining those of the United States, France and the United Kingdom, but Russia can only boast a very few more than 4,000 military aircraft, compared with NATO's 20,633. NATO has a lot more warships, too. The Foreign Affairs commentator for Britain's Guardian newspaper, Simon Tisdall, quipped in 2023 that "Russia's blundering army" couldn't defeat "Ukraine's 2nd XI" even when sober and "with the wind behind it". There must be a lot of people in Kyiv who hope that he was right. Tisdall also wrote that a Russia-NATO conflict would be, for Putin, "political and military suicide." Of course, he may be gambling on the fact that in any war the final outcome is uncertain until the last soldier has given in and the last bullet is fired (probably at the last soldier).

© JESPER SUNDSTRÖM/SWEDISH ARMED FORCES

Soldiers and officers from Sodankylä in Finland training with a Swedish armoured battalion in Boden in the northern part of Sweden

The Swedish neighbourhood is a distinct border area between Russia and the West.The Baltic Sea Region is of significance to European security and Russia is clearly seeking to increase influence over what it considers as its area of interest, including at least parts of Sweden's neighbourhood.

Meanwhile, Russia, now with very few friends, seems to be attempting to intensify its relations with North Korea, another relatively unpopular country on the global scene. But for isolated Russia, North Korea is an important ally. The head of Ukraine's military intelligence bureau, the GUR, is Kyrylo Budanov, who told the media that Pyongyang had provided Russia with large quantities of artillery shells, which could be vital for Russia. It is known to have been experiencing shortages. In fact, the deputy head of the GUR reckoned that North Korea had delivered one million rounds of artillery ammunition to Russia from September to November 2023. Apart from money, we are left to wonder what's the advantage of such a deal for North Korea. In today's world, nobody does anything for nothing.

© WIKICOMMONS/TOM SAMUELSSON

Carl-Oskar Bohlin, minister for civil defence, Sweden : " There could be war in Sweden

Of course, there remains the risk that Putin may turn his weapons on a NATO country, however suicidal that may turn out to be. Germany's defence minister, Boris Pistorius, believes it's a possibility and that it could happen within the next decade, albeit not immediately. Meanwhile, the issue of Ukraine's continuing demand for ordnance is putting a strain on its allies. At the height of Ukraine's counter-offensive in the summer of 2023, it was getting through around 7,000 shells every day, which is more than the Russians were using, but that has changed. Ukraine is now using around 2,000 shells each day, while Russia fires five times as many. The European Union would, for the most part, very much like to make up the shortfall, but Viktor Orban, Hungary's Russia-loving leader, has vetoed the idea. He is a permanent fan of Putin, it seems. EU member states, unaffected by the veto, are doing their best individually to maintain a flow of armaments, but it's not the same. Putin must be rubbing his hands with glee. Much of the problem stems from a long-running dispute over the rights of an ethnic Hungarian minority currently resident in the western Ukrainian region of Zakarpattia, even though both countries maintain embassies in each other's country, along with sizeable minority populations. In the case of Hungarian nationals living in Ukraine, it's not a very small minority; there are around 150,000 of them. What's more, if Trump wins the next Presidential election in the US, the war may end quite suddenly and soon. Guess who the winner may be? The world has seldom faced a more uncertain future. Could that be what's driving the race to put humans on the Moon again? It may be the last peaceful place in the Solar System.

Robin Crow
robin.crow@europe-diplomatic.eu

PRODUCTIONS
NOUBA MUSIC

Choose the Best Artists for your
Luxury Private and Corporate Events

♦

Make your high society cocktail reception,
birthday party or wedding celebration a
unique and unforgettable happening

♦

More than 20 years of experience worldwide

♦

Our staff has been trained to ensure
Covid19 compliance outdoor parties

Tel. : +33 (0)4 93 20 43 32 - Port : +33 (0)6 22 14 45 60 / +33 (0)6 23 46 79 53
Email : contact@noubamusic.com - Web : www.noubamusic.com

NEWS IN BRIEF

BEAMING, THE BIOECONOMY ALLIANCE FOR STIMULATING INNOVATIVE AND INCLUSIVE GREEN TRANSITION

- The European project seeks to boost innovation and knowledge sharing in the field of bioeconomy through collaboration among European higher education institutions
- BEAMING has received €3.9 million in funding from the European Union's Horizon Europe Research and Innovation programme

The Bioeconomy Excellence Alliance for Stimulating Innovative and Inclusive Green Transition

(BEAMING) is an innovative project dedicated to advancing excellence and promoting innovation within the field of bioeconomy. The initiative seeks to address the need to enhance the competitiveness and visibility of Higher Education Institutions (HEIs) in Europe, with a particular focus on Widening countries in Eastern European EU Member States, and the Western Balkans.

To this end, the BEAMING project will bring together HEIs from diverse regions, promoting the transfer of knowledge and technology, and fostering a culture of collaboration by focusing on various key objectives: strengthening the skills and capacities of early-career researchers in

bioeconomy research, fostering institutional reform, promoting cross-disciplinary collaboration, enhancing technology transfer, and encouraging an inclusive institutional culture.

The initiative will follow a methodology based on the Quadruple Helix innovation ecosystem approach, which involves collaboration between HEIs, industry, government, and civil society. This approach will enhance the capacity for innovation and the practical application of research results, as well as engage the general public in processes facilitating changes in consumer behaviour and environmental awareness.

In conclusion, BEAMING is committed to fostering cross-border collaboration in the bioeconomy sector, with a focus on raising excellence and innovation. By bringing together higher education institutions, promoting an inclusive culture, and enhancing technology transfer, the project aims to strengthen the role of HEIs within their quadruple helix innovation system and facilitate institutional change. This collaboration is expected to improve the empowerment of HEIs to create a dynamic ecosystem that yields both regional and global benefits in the bioeconomy sector.

Current challenges in the bioeconomy

The bioeconomy is an economic system that utilizes renewable biological resources to produce a wide range of goods and services, aiming for sustainability and reduced reliance on non-renewables. However, in the present day, bioeconomy faces significant challenges. There is an urgent need to address sustainability issues, such as the depletion of resources, climate change and rising inequality. Moreover, the effective transfer of knowledge and technology among key stakeholders of higher education institutions, governments, civil society, and industry is essential to drive innovation and the practical application of advancements in bioeconomy.

The sector requires structural and policy reforms that promote excellence and transdisciplinary collaboration. These challenges underscore the need to establish effective cross-border collaboration to address current issues in bioeconomy and harness its potential for sustainable development.

TRADE IN PRODUCTS CONTAINING BENZENE INCREASED EU IMPORTS OF HAZARDOUS CHEMICALS

The reported volume of hazardous chemicals imported to and exported from the European Union (EU) under the Prior Informed Consent (PIC) Regulation continued to increase in 2022.

The European Chemicals Agency's (ECHA) annual report on the trade of chemicals that are banned or severely restricted in the EU shows that the imports of PIC chemicals increased over 20 fold-, from 883 119,74 tonnes in 2021 to 19 698 668,33 tonnes in 2022. This is due to benzene as a constituent being added to the list of chemicals subject to PIC in 2022.


© SHENGHANG SHIPPING

A Chinese chemical tanker

Substances containing benzene is the first "substance in substance" entry under the PIC Regulation, with 96% (18 845 530,34 tonnes) of imports reported in 2022 concerning these substances.

The report also found a 24% increase in exports of banned or severely restricted chemicals to non-EU countries from 2021 to 2022. Overall, almost 980 941,51 tonnes of PIC chemicals were exported during the year.

Background

24 EU countries and 543 companies provided data to ECHA on the export of PIC chemicals from the EU in 2022. Three EU countries and Northern Ireland declared that they had not exported PIC chemicals.

21 EU countries and Northern Ireland provided data on imports of PIC chemicals into the EU in 2022. The information came from 191 companies. Six EU countries declared that they had not imported PIC chemicals.

Article 10 of the PIC Regulation requires importers and exporters to give information about the annual trade of chemicals listed in Annex I of the regulation to their designated national authorities by 31 March of the following year. Each EU country must then provide the aggregated information to ECHA so that it can be summarised at EU level and non-confidential information can be made publicly available.

A CRITICAL MEDICINES ACT TO SECURE EUROPE'S PHARMACEUTICAL INDEPENDENCE

In a recently adopted opinion, the European Economic and Social Committee (EESC) warns that the EU's overreliance on imports of active pharmaceutical ingredients and finished medicines from Asia poses threats to the health and well-being of EU citizens. The EESC therefore proposes a Critical Medicines Act.

The European Union faces a growing challenge in securing its supply of essential pharmaceuticals, with the majority of its active pharmaceutical ingredients (APIs) and finished medicines currently imported from Asia, with China being the single largest supplier. This reliance on external suppliers has raised concerns about the EU's resilience to supply chain disruptions, price volatility and potential geopolitical risks.

"We are jeopardising our citizens' health by relying on external suppliers for essential pharmaceuticals. Europe cannot afford to gamble with the lives of its citizens. We must act now to ensure that Europeans have access to the medications they need," stated Lech Pilawski, EESC rapporteur for the opinion.

To address these concerns, the EESC recommends that the EU take a number of steps to strengthen its domestic pharmaceutical production capacity. These include:

- Establishing a new EU mechanism to support the production of APIs and finished medicines in Europe. The proposed Critical Medicines Act is envisioned as a comprehensive EU mechanism, presented in the form of a regulation, to actively support the production of APIs and finished medicines within the European Union. This mechanism would provide funding for research and development, infrastructure development and operating costs.
- Encouraging the development of innovative production technologies. This could involve investment in research and development, collaboration with academia and industry and the adoption of cutting-edge manufacturing practices.
- Promoting the use of APIs and finished medicines produced in Europe. Public procurement policies, subsidies and other incentives should be implemented to encourage the use of APIs and finished medicines produced in Europe.
- Adopting fair pricing mechanisms for APIs and finished medicines to ensure that patients have access to affordable healthcare. This could involve measures such as price controls, competitive bidding processes and the promotion of generic medicines.

The implementation of these recommendations will require significant investment and cooperation between EU Member States. The EESC is calling on the European Commission to take the lead in coordinating this effort and to develop a comprehensive strategy that can protect Europe's health security, promote economic prosperity and ensure the affordability of medicines for EU citizens.

OVER 60 INSPECTORS FROM 21 EU MEMBER STATES TRAINED BY THE EUROPEAN LABOUR AUTHORITY

The European Labour Authority (ELA) has organised in Bratislava, Slovakia a week-long Training for labour and social inspectors. More than 60 inspectors participated in the training, which ended with a roadside mock-inspectio. The objective of the training was to enhance the inspectors' knowledge and skills on cross-border inspections.

The training programme covered five key topics:

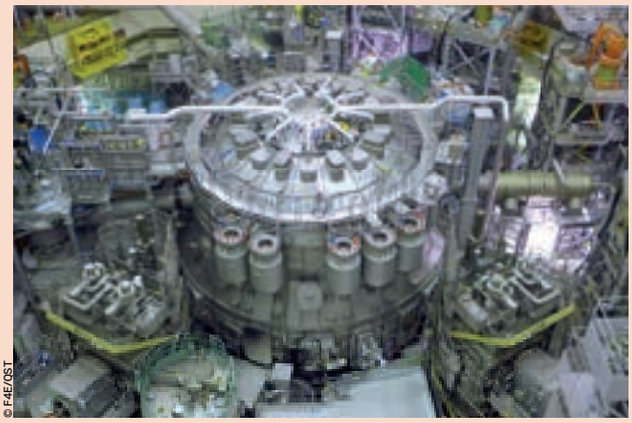
- concerted and joint inspections in practice;
- international cooperation and information exchange;
- coordination of social security systems;
- EU legislation on posting of workers and enforcement, and;
- soft skills and trust-building between inspectors.

The training related to labour mobility and social security coordination. It had a practical approach which included training sessions on the tools and procedures used for planning, executing and following up on cross-border inspections.

The training programme concluded with a simulated and practical road transport inspection carried out at a parking lot in central Bratislava. The mock-inspection was designed to train the participants in real life scenarios. In addition, the participants had the opportunity to exchange good practices and share their experiences from different Member States and sectors.

ELA's training programme on inspections is part of ELA's efforts to support the capacity building in Member States in the area of labour mobility. This type of training will be held annually and will eventually evolve into a formally recognised training programme.

JT-60SA IS OFFICIALLY THE MOST POWERFUL TOKAMAK



© F4E/QST

The JT-60SA device located at the seat of the National Institutes for Quantum Science and Technology (QST), Naka, Japan

In a surprise move, one day after the official opening of COP-28 where countries meeted to discuss how to phase out or phase down fossil fuels, Europe and Japan chose their moment right to unveil JT-60SA. The most powerful experimental device to date, built by the two parties, is a landmark achievement for their policy and scientific communities, research organisations and industry. It's a clear demonstration of their commitment to invest in fusion, which is efficient, safe, and environmentally friendly.

During the ceremony, the European Commissioner for Energy, Kadri Simson, together with Japan's Minister for Education, Culture, Sports, Science and Technology, Masahito Moriyama, and Japan's Minister of State for Science and Technology Policy, Sanae Takaichi, were joined by senior politicians, representatives from industry, and the research community, to inaugurate the JT-60SA facility and witness from the control room a plasma operation.

© EUROPARL.EUROPA.EU

European Commissioner for Energy, Kadri Simson

JT-60SA results from the Broader Approach Agreement, a scientific collaboration signed between the European Union and Japan, to promote the advancement of know-how in fusion through various projects. Works for the device started in 2007 and were completed in 2020 with the end of assembly. Since then, a series of technical improvements were carried out, with first plasma operations towards the end of 2023. The overall cost of the project for the phase of construction, is estimated to be in the range of 560 million EUR in today's values, shared between Europe and Japan. The project is considered a fine example of science diplomacy and has been praised for the spirit of collaboration, its efficient management, and exemplary execution. Click on the video to learn more.

EUROPEAN SUMMIT OF REGIONS AND CITIES MONS, BELGIUM 18-19 MARCH 2024

©VISITWALLONIA.BE

Mons Grand Place, Belgium

Join the European Summit of Regions and Cities!

Thousands of mayors, councillors, regional ministers and top European and global decisionmakers will gather in Mons, in the Walloon Region of Belgium, in the heart of Europe, to debate the challenges and solutions for the future of Europe and beyond.

Organised by the European Committee of the Regions together with Walloon Region and the Belgian Presidency of the Council of the European Union, the 10th European Summit of Regions and Cities will bring a new perspective

on topics at the heart of people's concerns, such as democracy, sustainable development, the future of the European Union and its enlargement, the need to ensure social, economic and territorial cohesion, and dealing with the consequences of the war against Ukraine. Global challenges will be addressed by bringing together different perspectives from across the world. The European Committee of the Regions is particularly proud that this occasion coincides with its 30th anniversary, and invites you to join the celebrations.

Are you one of the 1.2 million locally and regionally elected representatives, or involved in the life and future of your community? Join us on 18-19 March 2024 in Mons!

You'll be joining a Summit that is sustainable and socially responsible, global and local at the same time, inclusive and diverse.

The Sustainable Summit

For the 10th European Summit of Regions and Cities, the European Committee of the Regions has decided to showcase its commitments by focusing on three dimensions which are fundamental to its work and values, both in terms of debate subjects and practical actions.

1. Sustainability and social engagement

The Committee of the Regions' newly established Strategy for the contribution to the EU's goal of climate neutrality is also being implemented at this Summit.

These include, for example, reducing CO2 emissions, promoting local and seasonal food, implementing a waste management plan, and promoting the use of digital resources.

The social responsibility aspect plays a key role as well. During this Summit, apprentices from neighbouring schools will be among those working to make this Summit happen.

2. Global and local

This is the first Summit that will include the participation of cities and regions from across the globe, as building bridges that connect various parts of the world helps us find solutions to the global challenges we face.

The Summit is local, and we wouldn't have it any other way, because it brings the realities of our communities to the centre stage. It is also local because it is rooted in the community – Mons and the Walloon Region – that will welcome us, showcasing its culture and diversity and putting forward its people and local traditions.

3. Inclusion and diversity

Gender equality and diversity will be the cornerstones of the Summit. The Committee is committed to ensuring gender balance in its debates, but also inclusiveness and diversity in of its selection of speakers.

REGISTER : https://register.euconf.eu/mons-2024/index.php?lang=en

NATO TO BUY 1,000 PATRIOT MISSILES TO ENHANCE ALLIES' AIR DEFENCES

NATO's Support and Procurement Agency will support a coalition of Allies, including Germany, the Netherlands, Romania and Spain to procure up to 1,000 Patriot missiles to strengthen their air defences amid Russia's war against Ukraine. The contract will expand the European production of the missiles, enhancing supply and ensuring the replenishment of Allied stockpiles. "I welcome Allies' timely announcement to invest in up to 1,000 new Patriot air defence missiles to bolster the Alliance's security", said NATO Secretary General Jens Stoltenberg. "This investment shows the strength of transatlantic defence cooperation and NATO's commitment to keeping our people safe. Russian missile and drone attacks on Ukrainian civilians, cities and towns show how important modern air defences are. Scaling-up ammunition production is key for Ukraine's security and for ours."

© NATO.INT

A Patriot missile

The $5.5 billion contract has been awarded to COMLOG, a joint venture between the US company Raytheon and German company MBDA, located in Schrobenhausen, Germany. The large volume of the order will support the set up of a production facility for Patriot missiles in Germany. Patriot air defense systems can be used to defend against aircraft, helicopters and missiles, intercepting them at great distances. In the wake of Russia's war against Ukraine, NATO has deployed Patriot missile batteries to protect its Allies on its eastern flank. NATO Allies have also delivered Patriot systems to Ukraine and are committed to further bolstering Ukraine's defences.

OPTIMUS-GEN 2: ELON MUSK'S LATEST AI ROBOT ABLE TO BOIL EGGS

Tesla recently introduced the Optimus Gen 2, a humanoid robot that has capabilities beyond basic locomotion and communication. The improved robot has increased walking speed, hand movements, tactile sensing on fingers, and many other features.

Optimus Gen-2, can walk on its own, perform dancing moves, and handle objects.

In order to imitate human motion, Optimus Gen-2 includes electronics and sensors that are integrated with actuators. It also has hands with 11 degrees of freedom a neck that can move in 2 different directions, feet that can sense torque, finger sensors that can detect touch, and a neural network that has been trained from start to finish.

The robot's talents extend beyond physical activities; with its advanced 11-DoF hands, it gently grasps an egg and puts it into a boiling device.

SWEDEN: VOLVO CARS TO GO FULLY ELECTRIC WITH EIB BACKING

The all electric Volvo C40 Recharge

- Volvo Car Corporation has signed a €420 million loan agreement with the EIB for the development of a new all-electric vehicle platform.
- The investments will cover research and development, software development and implementing next-generation manufacturing technologies for fully electric vehicles.
- The financing supports the brand's strategy to become a fully electric car manufacturer by 2030, while simultaneously aiming to lower barriers for e-vehicle adoption.

In line with the European Union's push for a green transition, Volvo Car Corporation and the European Investment Bank (EIB) have signed a €420 million financing agreement in support of the Swedish carmaker's decision to become fully electric and carbon neutral. The operation is expected to contribute to the decarbonisation of road transport, a major source of emissions and pollution globally.

The EIB's funding will support the development of a new, fully electric car platform, as well as the necessary research and development and roll-out of resource-efficient, advanced manufacturing technologies for electric cars. The European Union has introduced progressively more stringent environmental regulations for road transport, with the aim of making all new passenger vehicles sold emissions free by the middle of the next decade.

The project is expected to result in even safer and more sustainable technologies for e-vehicles, including reduced weight and faster charging, which can help lower the barriers to purchasing an electric car. As such, the operation is fully in line with the EIB's goal to finance a just and swift transition to a net-zero economy, both in Europe and across the world.

EIB Vice-President Thomas Östros said: "I think Sweden can be proud of the leading role Volvo Cars is taking in making the automotive industry more sustainable. Making cars that run on electricity instead of fossil fuels is only one part of the puzzle. The industry itself is still very carbon-heavy, something that Volvo Cars is actively working on changing. As the EU climate bank, this is one of the many facets in the green transition that we are financing, and we're glad to partner with Volvo Cars to accelerate the change."

CFO of Volvo Cars Johan Ekdahl added: "Volvo Cars continues to work diligently towards the ambition of becoming a climate-neutral company by 2040. One way in which we are aiming to do that is by eliminating tailpipe emissions from our model line-up and investing towards becoming a fully electric car company by 2030. We have a long-term relationship with the EIB and are happy that they continue to support us on that exciting transformation journey."

WOMEN STILL UNDERREPRESENTED IN GREEN AND DIGITAL SECTORS

A debate organised by the European Economic and Social Committee (EESC) highlighted that, despite recent initiatives, men continue to be predominant in science, technology, engineering and maths. The EU needs to adopt new specific measures to promote women's participation and so ensure a just green and digital transition.

The sectors at the forefront of new technologies continue to be among the least diverse and inclusive workplaces. Science, technology, engineering and maths, the so-called "STEM", are still male-dominated and the current green work policies risk further embedding gender inequalities in the labour market and hindering a just transition.

The thematic debate "Women in a gender-just transition", held by the EESC's section for Transport, Energy, Infrastructure and the Information Society (TEN), revealed alarming data.

Research shows that in the energy sector, around 80% of the workforce is made up of men. When it comes to renewable energy in particular, women represent on average 35% of the labour pool, which is slightly higher but still significantly unbalanced.

This gap does not necessarily reflect the lack of female participation in STEM education. The majority of Master's

students in science are women, but it is just that they tend to leave the sector at higher rates. This is a recognised phenomenon known as the "leaky pipeline".

Moreover, like everywhere else in the labour market, standard gender divides remain and women are still overrepresented in lower paid sectors and underrepresented in decision-making positions.

© NRF

Filling the gender gap

All in all, even though inequalities still exist, the EU has made significant progress over the past few years. In 2020, the European Commission adopted its "EU Gender Equality Strategy 2020-2025", highlighting the discriminatory social norms and stereotypes about women's and men's skills, and pointing out the undervaluation of women's work in certain sectors.

The end objective is a gender-equal Europe, a Union where women and men are free to pursue their chosen path in life in all their diversity and have equal opportunities in our European society.

In addition, against the background of the European Year of Skills 2023, the Commission set out the goal of matching people's aspirations and skill sets with labour market opportunities, calling to bridge the divide between women graduates and their employment in STEM careers.

Likewise, in the 2023 revision of the National Energy and Climate Plans, Member States were invited to indicate specific action plans to promote clean energy jobs for women and reduce gender imbalances in the sector.

Specific measures to ensure women's contribution

The EU has a key role to play in moving towards greater gender equality and inclusion and needs more initiatives on this track, in particular to oppose the "leaky pipeline" phenomenon and ensure a gender just transition.

We need focused interventions to ensure that the digital and green transitions are inclusive, and allow women to contribute to achieving the EU Green Deal, said TEN president Baiba Miltoviča. This can be done by promoting women's participation in technical fields, fostering gender balance in various roles and ensuring equal pay for equal work.

The debate, which saw the participation of Ana Carrero from the European Commission's DG EMPL and Rasma Pīpiķe, representing Latvia's Association of Young Researchers, was held as part of the European Gender Equality Week 2023.

CHINESE SMARTPHONE MAKER XIAOMI CHALLENGES THE EV MARKET WITH ITS SU7

Xiaomi EV's first product - the highly anticipated Xiaomi SU7, has been "pre-launched," with its design, performance, range, safety, and other details making global debut. Positioned as a "full-size high-performance eco-technology sedan," Xiaomi SU7 aims to push the limits of performance, ecosystem, and mobile smart space.

Quoting a sentence of Chinese poetry, "with firm strides we are crossing its summit." Lei Jun, founder, chairman, and CEO of Xiaomi Group, stated that Xiaomi's entry into the automotive industry marks a significant leap from the smartphone industry and a crucial step toward closing the loop of the Human x Car x Home smart ecosystem. Lei Jun further expressed that the century-old automotive industry offers little room for maneuvering today: "Xiaomi has decided to invest tenfold, starting from the development of fundamental core technologies, committing to constructing an outstanding vehicle. Through 15 to 20 years of effort, Xiaomi aims to become one of the top five global automakers."

Xiaomi EV has invested over 10 billion CNY in the initial research and development phase. The R&D team comprises over 3,400 engineers and over a thousand technical experts in critical domains both in China and abroad.

The all-wheel drive SU7 Max operates at 800 volts and provides a total of 495 kW (664 hp; 673 PS) and 500 N·m (51.0 kg·m; 369 lb·ft). The SU7 goes from 0-60 in 5.3 seconds.

Its competitor the 2024 Tesla Model 3 Dual Motor Long Range goes from 0-60 in 4.0 seconds;

© XIAOMI

The Xiaomi SU7

The SU7 Max goes from 0-60 in 2.78 seconds. (The Porsche Taycan Turbo 0-60 mph in 2.4 seconds and the Tesla X Plaid 0-60 mph in in 1.99 seconds). Speed is limited to 210 km/h (130 mph) for the base model, and 265 km/h (165 mph) for the SU7 Max.

The electric 4-door 5-seater SU7 started mass production in December 2023, and deliveries will begin in February 2024.

Xiaomi is one of the world's leading smartphone companies. In September 2023, MAU of MIUI reached approximately 623 million globally. The company has also established the world's leading consumer AIoT (AI+IoT) platform, reached approximately 699 million smart devices connected to its platform (excluding smartphones, laptops and tablets) as of September 30, 2023. Xiaomi products are present in more than 100 countries and regions around the world. In August 2023, Xiaomi was included in the Fortune Global 500 list for the fifth year in a row, ranking 360th.

CHINA LOVES THE STONES!

China's near-monopoly on rare-earth elements

No, Xi Jinping has not developed a passion for the music of Mick Jagger (as far as I know), but China seems keen to corner the market in rare earth minerals. And they, of course, are stones. Valuable, unusual, and extremely weird but useful stones

How much do you know about gallium? I can inform you that it's silvery-white in colour and it is so soft that it can be cut by hand with a knife. Along with mercury, caesium, and rubidium, it is one of the very few metals that could actually melt in your hand, or at a little above room temperature. It has the atomic number 31 and is described as a "post-transitional metal". There are several. Most of the so-called "rare earth elements" (REEs) were discovered accidentally and their usefulness only became apparent with the advent of advanced technology. Strange as it may seem, there are a number of chemical elements that may belong among the post-transitional metals, but scientists aren't sure of their position in the list of chemical elements. They include nihonium, flerovium, moscovium and livermorium, and there are various others whose status is uncertain, including polonium. Chemistry was never my strong point at school, although I blame my chemistry teacher, who seemed more interested in his own climb up the slippery (if relatively unimportant) slopes to local authority fame and glory than to imparting his knowledge to us children. Anyway, I always preferred physics. Post-transition metals have a wide variety of uses, however, and are more interesting than they may appear at first glance: aluminium and tin, for instance, are used to make cooking utensils and in electronics and soldering; bismuth helps relieve the agonies of indigestion, indium is useful in making flat-screen displays and gallium serves in the manufacture of semiconductors and fuel cells, while lead is used in making batteries, of course.

© WIKICOMMONS

The stone forest in Shilin, Yunnan, China

Incidentally, aluminium is known to be the commonest post-transition metal and the third most abundant element on Earth, while bismuth, which has helped so many of us, has recently been shown to be mildly radioactive. Not only will that meal you found indigestible be brought back through vomiting; perhaps it may even glow in the dark.

Although they're referred to as "rare-earth elements", they're not really very rare at all. It's more accurate to say that there is quite a lot of most of them but they're rather difficult to extract, having once been formed close to the core of the new planet. They also have a tendency to attach themselves by covalent bonds to other minerals, making them difficult to separate and employ separately. In case you were wondering, in a covalent bond the atoms of the elements involved share one or more of their electrons. But having formed close to the core, some of them move up towards the surface, where they are known as "xenoliths", from the Greek for foreign rock.

They are, as Natalie Starkey notes in her fascinating book, "Fire and Ice", which is all about the many and varied volcanoes of the solar system, "an extraneous component within the magma". They shouldn't really be there, in other words. They formed under different pressure, temperatures and depths from the conditions they travel through to reach the surface, she explains. Nevertheless, they formed many millions of years ago in the Earth's mantle, which makes them very instructive to those scientists still trying to work out the Earth's deepest history. How did it all begin? They're also rather useful in other fields of endeavour, such as high-tech electronics, computing, and communications, for various reasons.

In terms of the worldwide distribution of REEs, China seems to have been blessed with a more than adequate sufficiency, although it is a wealth China appears reluctant to share. Given their importance in our increasingly high-tech world, perhaps that's not surprising. In fact, they are often described as "technology metals". In view of their link with ancient, long-dead volcanoes, REEs are useful in dating the eruptions of long ago and learning more about them. But that's not why China has banned the export of the processing technology for rare-earths: it's all

Top global producers (5-year average 2016–2020) by mineral

about national security. In fact, the ban has been placed on the export of the technology to make rare earth magnets, and this is in addition to the existing ban on the technology required to extract and separate critical materials. China, we should remember, is the world's biggest processor of rare earths, that group of seventeen metals used in the manufacture of magnets that are vital in making electric vehicles, wind turbines and other kinds of electronics because they can be used to turn power into motion. A few months earlier, the Chinese government asked for public opinion on adding the technology to make samarium-cobalt magnets, neodymium-iron-boron magnets and cerium magnets to its long (and ever-lengthening) "Catalogue of Technologies Prohibited and Restricted from Export". It also added a ban on exporting the technology needed to make rare-earth calcium oxyborate and a number of other rare-earth metals. China gave as its reason for doing so the "protection of national security and public interest". The protection of its considerable commercial interests may also be a significant issue. They're worth a lot of money.

CATCHING UP WITH THE STONE AGE

Why does this matter? Well, as our TV adverts have amply demonstrated recently, electric vehicles are the way to the future, it seems. They're being promoted as less environmentally damaging, a cleaner technology. But in fact, some of the materials being used to reach this goal are carbon-intensive and environmentally quite harmful. Permanent magnets are no different. Driven by the successful miniaturisation of magnetic materials, the technique is attractive but is not without cost, which makes the choice of the magnetic alloy being used very important. Before the 1980s, the best magnets available in terms of energy-density were made of samarium-cobalt (SmCO), but a Japanese company seeking a less costly solution came up with a nyodymium-iron-boron (NdFeB) magnet, which was found to be cheaper to make and just as powerful. This switch was aided by civil war in the Democratic Republic of Congo (formerly Zaire) from which came much of the global supply of refined cobalt. The conflict made prices unpredictable (mainly it put them up by a considerable amount), so the NdFeB alternative proved to be easier to source, with more stable prices. Ever since then, NdFeB permanent magnets (PMs) have been cropping up everywhere, such as in hard disk drives and electric vehicle power trains. So, NdFeB PMs seem to have become universal, although the older SmCO type have the advantage of being less susceptible to corrosion.

Neodymium magnets

The NdFeB magnet, however, is the most powerful yet developed, at least at the time of writing, which is why it accounts for around 95% of the permanent magnets currently in use.

China's tighter rules, however, have placed western industry and researchers at a disadvantage. Companies in Western Europe and the United States have sought ways to reduce their dependency on rare earths from China. The fact remains that almost 90% of the refined global output comes from China, which has also mastered the techniques needed to refine the strategic materials. Those places outside of China that have a (somewhat more limited) supply of such things have found themselves much in demand. Nobody seems certain (at least, outside of Beijing) just how much of China's enviable output and know-how is actually being exported. It is certain, however, that China aims to exploit its many advantages in this field, and who can blame it? The problem was discussed at a 2023 meeting of the International Energy Agency (IEA), but there is clearly deep concern over China's apparent stranglehold on the processing of materials that can be used in everything from electric vehicles to wind turbines, and – perhaps most alarmingly – missile guidance systems. And China, of course, accounts for more than half of global production of the metals used in batteries, such as lithium, cobalt, and manganese, as well as something approaching 100% of rare earths. That is a very substantial amount. As it is, a trade war has developed between the United States and China over the production of gallium, which is used in semiconductors as well as in military radar systems, among other important things.

© GANFENG LITHIUM

China's Ganfeng Lithium holds a stake in the Mount Marion lithium project in Western Australia

China has imposed restrictions on exporting it, of course. Gallium is a substance sometimes used by young (and quite often inebriated) chemists to play tricks on each other. What happens is that the chemists (mainly students, it must be admitted) make a spoon out of gallium (it is a metal, after all and looks convincing) and when the victim has stirred their tea or coffee and removed the spoon from the cup, they find it has disappeared, and so they drink gallium in the beverage (or probably throw it away, I imagine; I know I would). It's said to be harmless to human health, although it can stain the skin dark brown. Perhaps it's a trick that's popular among French students, as gallium is named after the Latin word for France (Gallia).

The neodymium-iron-boron magnet was found to be stronger than any other known magnet and it revolutionised the low-cost mass production of what are called permanent magnets, making possible the production of smaller motors and hard disk drives. Without this technology, we would be living in a somewhat more primitive and far less technically advanced society. Think about it the next time you use your mobile phone or your laptop. China, of course, has mastered the solvent extraction process needed to refine strategic minerals, a skill that Western companies are struggling to match. The research currently being carried out in the United States to find a solution is being funded, at least partially, by the US Department of Defense, which suggests where the greatest interest lies.

© PEXEL

Extracting raw materials from a mine

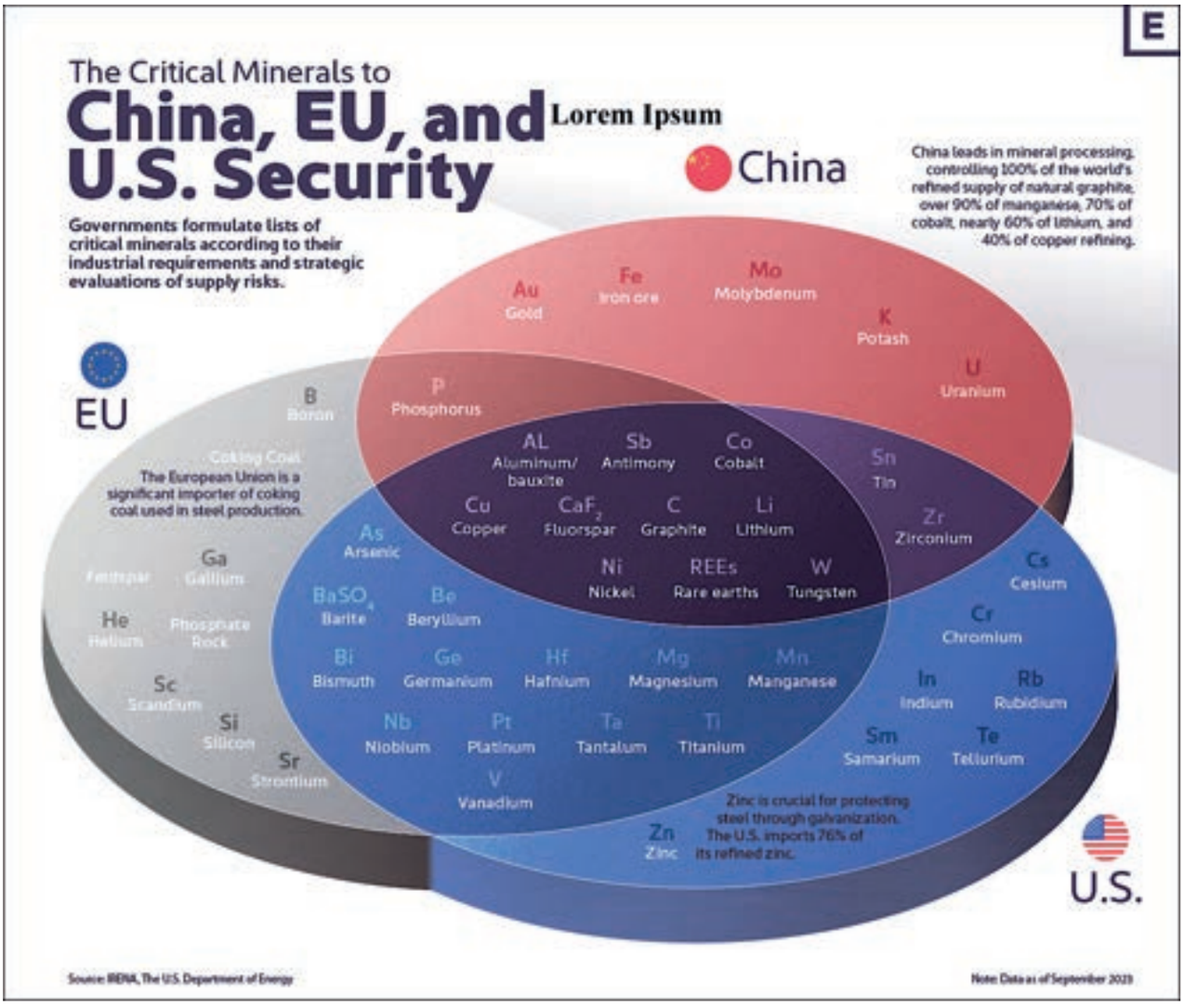
KEEP SEARCHING

There are seventeen rare-earth elements in all, fifteen of which make up what's called the lanthanide series, with atomic numbers ranging from 57 to 71 consecutively. We've already met neodymium, which is used in permanent magnets, but there are others that are also useful. There's dysprosium, for instance, which is one of the most highly magnetic elements in existence in its natural form, and is used in electronics, computer disks, various kinds of recording equipment and in the production of powerful infrared lasers. If you're engaged in making telescope lenses or infrared absorbent glass, on the other hand, you'll need lanthanum. Or there's yttrium, the silvery-coloured metal that's used in superconductors, lasers, and in surgical supplies. So just how rare are these rare-earth elements? Not so rare as you might imagine. Even the rarest of them, thulium, is still 125 times as abundant as gold, while the commonest of them, cerium, is 15,000 times as common. Separating them from other elements is where it gets difficult and very expensive. Furthermore, so far no-one has discovered suitable alternatives with which to replace them, although the EU's Horizon 2020 programme is trying to do just that, aided by funding of around €15.09-million, while a research team at Birmingham University in the UK is working towards a similar goal, supported by €5.06-million provided by SUSMAGPRO, which stands for Sustainable Recovery, Reprocessing and Reuse of Rare Earth Magnets in a European Circular Economy. Finding ways to recover and re-use such elements, in other words. The researchers there say they're confident that the new technology they're developing will be able to produce some twenty tonnes each year of recycled rare earth magnets.

© IMAGES-OF-ELEMENTS

Germanium is an element widely used in the electronics industry

It's an encouraging thought: germanium and gallium are both key to the production of semiconductors. It was germanium that was used to make the very first transistors, so we children of the 1960s should be very grateful because they enabled us to annoy older people with our music, and it's still vital for thermal imaging cameras, solar panels and the fibre optics used in telecommunications. China has a tight grip on the production of gallium, as well as controlling 68% of the global production of refined germanium., according to the US Geological Survey. Gallium, meanwhile, is vital for the production of the gallium arsenide chemical compound (GaAS) which allows semiconductor junctions to operate at higher frequencies and temperatures than those made with silicon. China has a virtual monopoly on gallium and germanium thanks to some clever manoeuvring on world mineral markets during a period of surpluses in the years from 2012 to 2017. China has clearly mastered the mysteries of capitalism, too. Meanwhile, Western companies are playing down the likely impact of China's sanctions and export restrictions, although it's hard to see why. 70% of the gallium Japan imports each year comes from China and car manufacturers are concerned about the prospect of a shortage of chips, but most Western governments seem to be doing little to encourage the search for alternative sources or alternative methods and materials The policy of the West as a whole would appear to be one of complacency, despite the concern expressed by some car manufacturers. Volkswagen has expressed an interest in taking



© CGTN.COM

The Koktokay No. 3 Pit is the largest mine in the world with a spiral of mountain paths along its side walls. Koktokay is located in the central Altai Mountains to the northeast of Fuyun County in Xinjiang, China. Eighty-six kinds of minerals are mined here

whatever measures are necessary to retain its supplies while the chairman of France's Renault company has warned of a "Chinese storm" on the horizon. Western companies are being urged to cooperate in confronting the Chinese threat, even if that means setting aside their tendency towards nationalism when faced with any crisis.

I feel I must just mention here, however irrelevant, that the report I was studying about the growing crisis kept leaving the middle "m" out of germanium and added a superfluous "s" to the end of the word. It was probably the result of some sort of computer spell-checking programme. I'm sorry to say that the thought of western nations holding crisis talks because of the risk that China had cornered the global market in geraniums made me laugh out loud. It's a lovely vision and much more amusing than what's really been happening. Want a geranium, anyone? But I digress.

The Council of the European Union expects the demand for rare earth elements to increase exponentially in the years immediately ahead. It believes that by 2040 there will be four times the current demand for critical minerals and clean energy technologies. The UK government, for one, accepts that mineral supply chains are "complex and opaque", the market itself is "volatile and distorted" and that China is very much the dominant player. It also accepts that "jobs and industries rely on minerals that are vulnerable to market shocks, geopolitical events and logistical disruptions at a time when global demand for these minerals is rising faster than ever." Needless to say, the UK (like other countries) has a strategy to address the growing crisis. This will involve accelerating the growth of the UK's domestic cap on overuse within its borders, collaborating with international partners and enhancing international markets to make them "more responsive, transparent and responsible". It doesn't mention how it plans to achieve this miracle, which will be harder since Britain left the EU. Working together with others in cooperation is invariably a more sensible way to approach such problems.

WAYS THROUGH THE MAZE

The EU, of course, has its own plans for minimising damage resulting from China's near-monopoly on rare-earth elements. In November 2023, the Council reached a provisional agreement on what it called a "European critical raw materials act", which looks like a good idea, especially with the fast-growing demand for rare-earth elements that looks set to continue. The Act specified raw materials that are of high economic importance for the EU but which face a high risk of supply disruption while affordable substitutes either do not exist or are not available. In order to address this crisis, the EU plans to diversify supply of the EU's critical raw materials (if it can), strengthen what it calls "circularity" (which basically means improving recycling), and support for research and innovation on what it refers to as "resource efficiency" (which probably means "waste not, want not"), along with the development of substitutes, if any can be found. Basically, the problem here is that many of Europe's defensive systems rely on the availability of rare-earth elements, of which we have relatively few, and China has lots. It's not a pretty picture.

The West's somewhat panicky response to the crisis so far is, of course, an invitation to Western firms to come up with a profitable solution. For instance, the US-based Noveon Magnetics company extracts materials from discarded commercial magnets. As the old saying goes: "waste not, want not".

However, with China closing the door to exports, it's getting increasingly difficult to ensure that the supply of such elements stays stable. The International Energy Agency (IEA) is convinced that demand for REEs will reach up to seven times its current level by 2040, while demand for lithium and certain other vital and hard-to-obtain substances may soar to 40-times its present level. There are several ways to obtain the necessary REEs: mining, if you have access to such supplies, recovery from end-of-life products – recycling, in other words – or extracting them from unconventional sources, which includes such industrial wastes as coal ash and waste material from mining. The US has one active mine producing REEs: the Mountain Pass Rare Earth Mine and Processing Facility in California, but opening a new mine – even supposing you can find the material you're after – can take decades. That's why so many scientists are devoted to looking into unconventional alternative sources, and not without good reason: all but one of the 17 Rare earth elements are listed as "critical materials", which means they're economically very important but vulnerable to supply issues.

© NOVEON.CO

EcoFlux magnet made from recycled end-of-life scrap material

The Massachusetts Institute of Technology (MIT) points out that the list includes praseodymium, which is used in aircraft engines, gadolinium, which plays a vital part in MRI imagining and neodymium, which can be found in computer hard drives. The "rare" description in REEs refers to how difficult it is to find them in commercially exploitable volumes: there's no real shortage but what there is can barely justify the effort involved in getting them out of the ground. They're scattered in tiny quantities in a great many locations. Even so, coal ash – the leftover waste from coal-fired power plants – contains small concentrations of REEs and could emerge as a vital domestic source and is generally mixed with water to form a kind of slurry and stored in ponds. These ponds are quite dangerous to the environment and can, if not carefully contained, contaminate local water supplies with mercury, cadmium, and arsenic. In fact, research in the US has shown that the majority of these ponds (and there are lots of them) have been and still are polluting nearby groundwater. Extracting the required Rare earth elements is no easy task, in addition to which extreme weather events can spread the poisons far and wide. Obtaining the desired materials is a struggle and successful methods are swiftly patented: they're very valuable. Rivalia Chemical is one of the companies at the forefront of this research, backed by Georgia Institute of Technology.

© PEGGY GREB, US DEPARTMENT OF AGRICULTURE

Rare earth elements, which are used in batteries

So, it's a long and winding road with no easy short cuts, but it's vitally important to reach the end of it in order to secure technological progress. It's possible, of course, that we could find supplies of REEs on those other planets that have experienced vulcanism, but we cannot – as yet – get to the places and prospect for them. In the long term, they may provide a solution, but we're not there yet. Even where they're known to exist, it is often in very minute quantities. Half of the 5,000 or so minerals to be found on Earth exist in five or fewer locations, while the volume of some appears to be less than one cubic centimetre. What's more, some of the minerals to be found on Earth are rarer than REEs and evaporate on contact with air or decompose on exposure to sunlight. Hazenite, for instance, is a hydrous phosphate that is only found in the highly-alkaline waters of California's Mono Lake, where it is precipitated out by microbes. Minerology is an interesting but frustrating study. A crystalline form of carbon dioxide is only stable at below -78.5 °C, although it has been spotted on Mars. The more we progress, the more the challenges mount. If we ever learn how to work together without killing each other, we may even go further towards a bright future. Anyone want a geranium?

Jim Gibbons
Jim.Gibbons@europe-diplomatic.eu

EPIONE

CABINET ELISABETH THURAT

YOUR TRUSTED PODIATRY AND MEDICAL PEDICURE CLINIC IN BRUSSELS

PLANTAR REFLEXOLOGY
LASER THERAPY
TARGETED AROMATHERAPY

- Uses APIVITA natural French products
- Proposes various treatments using organic essential oils
- Uses the unique Low Level Laser Therapy (manufactured by Erchonia, a US company and world leader in the field of Low Level Laser Therapy)
- Bespoke treatment programs and state-of-the-art equipment
- Spotless hygiene

We provide the best care possible

ELISABETH THURAT CLINIC offers a wide range of care specifically tailored for young children, teenagers, adults, athletes, and people with disabilities.

AT EPIONE CLINIC, YOUR FEET ARE IN GOOD HANDS !

www.cabinet-thurat.be • +32 4 94 04 84 24

Avenue Brugmann 292 • 1180 Uccle • Belgium

Consultations only by appointment · From 8am to 8pm · Monday to Saturday

© CELL-AGRITECH

"Meat without slaughter" is the motto of Cell Agritech, a Malaysian company creating meat using biotechnology, by growing it directly from animal cells

STEAKS OR FAKES, ANYONE?

The science of making – and I mean making, (or possibly even faking) – dinner

In 2013, after 5 years of research, Dr. Mark Post, a professor at Maastricht University came up with the first cultured hamburger made entirely from lab-grown stem cells. The burger consisted of about 20,000 thin strips of cultured muscle tissue and cost 300.000 euros to produce

I became a vegetarian many years ago after filming a news report at a vary large abattoir. I shall not name it, because not everyone will share my revulsion at what I saw, but I haven't touched meat since. I was with a cameraman (who still eats meat, as far as I know) in the main room where the slaughtering takes place, surrounded by a large number of understandably nervous-looking and somewhat noisy young cattle, who were about to meet their maker, or possibly a chef. The entire operation was overseen by a veterinarian expert who checked that the creatures were (or had been prior to death) healthy. At one point, the severed head of a newly-slaughtered young bull was taken away for examination in another room and shortly afterwards was brought back to show to the slaughterman himself. The vet or one of his minions held it up for all to see. It was, of course, no longer attached to the body and the skin covering it had been removed, effectively peeled away, so it was not a pretty sight. However – and this was what troubled me – there was still a detectable and quite prominent pulse in its neck. I saw that, which must be something that occurs every day, and I vowed there and then never to eat meat ever again, and I haven't. I must be the bane of my poor wife's life! She copes extremely well, of course, producing delicious but meat-free meals.

It's now just over a decade since the world was first introduced to what's become known as "lab-grown meat". It happened at Maastricht University in the Netherlands and the fake meat thus produced was then consumed at a press conference in London, where it met a mixed reception, although everyone who tasted it – including those who didn't like it much – believed it would have a bright future. The aim of creating cell-cultured meat was not to help vegetarians like me find easier alternatives, it was simply to reduce the need to farm animals so that feeding the fast-growing population wouldn't take up so much land. It could help deal with the climate crisis, too, although the fake meat thus produced must not only be tasty and adaptable, it must also meet the widely varying food standards that are in place, even across the European Union. And it must taste like real meat, of course, and yield to the tender skills of a large number of chefs, as well as being tasty.

Since meat is produced without manufacturing anything, but rather by feeding animals we seem to have evolved to eat, just what exactly is cell-cultured meat, or simply "cultured meat", as it's often called? It's not legal to refer to the product as "meat" or "beef" in the United States because of action by the National Cattlemen's Association (yes, the days of Rawhide and six-guns live on), although some of the resulting cultures are produced by reproducing animal protein. The US Department of Agriculture has also given the green light to sales of lab-produced meat, even if it has to bear an appropriate label. The desire to

achieve a "meat-free" meat market is partly driven by concern over the environmental cost of real meat production, in terms of the consumption of resources and the releases of greenhouse gasses. So, in biological terms, "cultured meat" is identical to meat produced conventionally, even if no animals are killed in the process. Another driving factor is its value on global markets, although accurate labelling remains a major issue. However, in this case the starting point is with animal stem cells, which are harvested using what are described as "minimally invasive" measures. Cells are developed into muscle and fat cells in some kind of growth medium, in larger and larger bioreactors until they reach "optimal cell density." They are then separated from growth medium, using centrifuges and finally, the cells are then processed, or else additives are combined to achieve such things as texture. The resulting texture depends on exactly what kind of "meat" the product is meant to imitate.

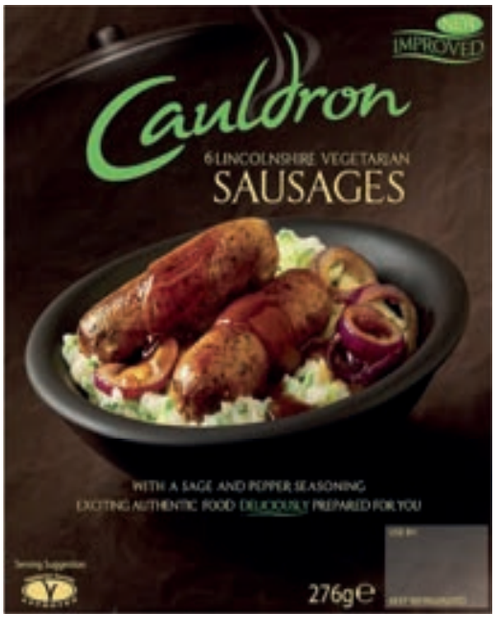
The market is developing, meanwhile. It was back in 2020 that cultured meat, produced in bioreactors, first went on sale in the UK, which was seen as quite a breakthrough. Needless to say, it's far easier to raise a food animal in some way, through the normal processes of feeding and providing shelter, than to manufacture what tastes like one from scratch. Probably cheaper, too. But we're looking ahead to a future that may be somewhat different. I have a personal attachment to cheese, especially French cheese, but I like English cheese, too, of course: nothing quite compares with a slice of blue Stilton. The nutty, creamy flavour of cheddar cheese varies according to a delicate balance of bacteria, according to Chen Ly, writing in the New Scientist magazine. Now, it seems, those bacteria have been identified. As its makers have long known, the flavours of various cheeses rely on the various bacteria, such as streptococcus thermophilus and various kinds of lactococcus, while it would seem that while lactocremoris appears to regulate the development of the chemicals diacetyl and acetoin, which apparently provide a buttery flavour but if overused can result in the cheese tasting "off", according to Chen Ly in a January edition of New Scientist. Lactocremoris can also increase the concentrations of compounds that add "subtle meaty and fruity notes". All cheeses begin with the addition of "starter cultures" to milk, which also adds an acidic note to give the cheese a tangy taste. The latest findings could help cheese makers to adjust their products in ways that give them a particular flavour. Can I offer to be the researchers' taster, please?

© BEYOND MEAT

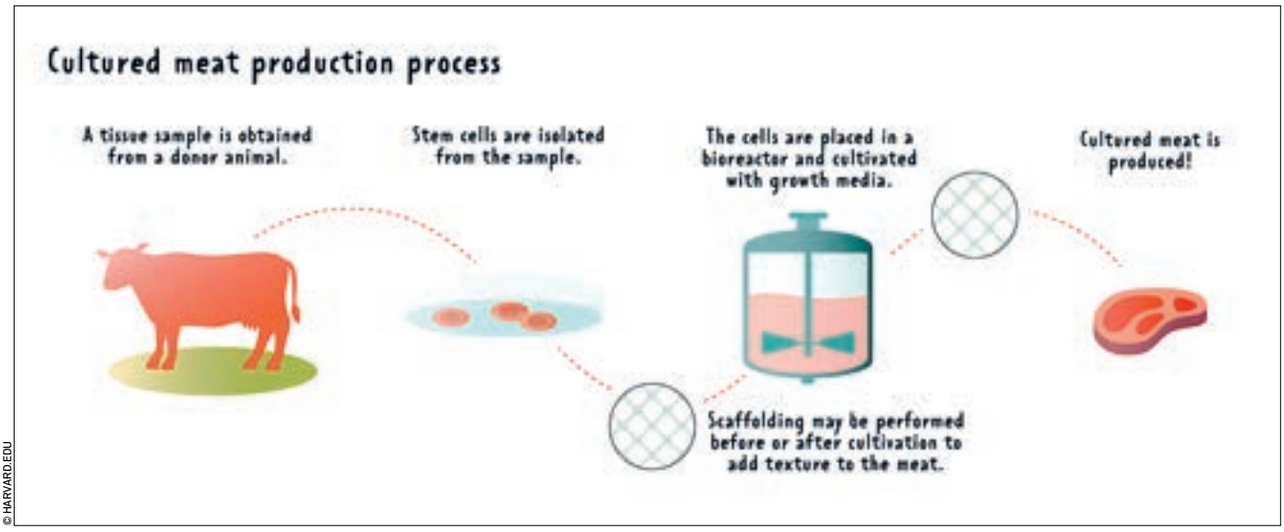
The Beyond Burger is a plant-based burger that looks, cooks, and satisfies like beef. It has all the juicy, meaty deliciousness of a traditional burger, but comes with the upsides of a plant-based meal

ANOTHER SLICE OF PEA, PLEASE

At present, the production and sale of cultured meats varies from country to country but is regulated in the EU under the Novel Foods regulation. Even so, the rapid growth in sales of lab-grown meat has been predicted: a report by the global consultancy company AT Kerney has claimed that by 2040 most meat would be produced that way, rather than from "dead animals", as it put it. The current evidence doesn't fully support that view. A worldwide survey of consumers for the vegan firm Strong Roots found that although 61% of consumers are increasing their consumption of plant-based foods, 40% are also reducing their use of fake meats, mainly because of flavour but also because of uncertainty about what chemicals they may contain. In fact, while the contents listed on packets of the stuff may be puzzling, they would seem to be fairly safe.



The latest packet of Cauldron vegetarian "Lincolnshire Sausages" my wife bought lists their contents like this: "rehydrated textured vegetable protein (45%),water, soya protein, potato starch, wheat gluten, stabiliser (dicalcium phosphate), water, onion, rapeseed oil, Lincolnshire seasoning (5%) yeast extract, salt, potassium chloride, herbs, fructose, white pepper, rusk, (made of wheat flour, salt, the raising agent ammonium bicarbonate), barley malt extract, carrot powder, leek powder, sage extract, nutmeg extract), dried free range egg white, soya protein, with methyl cellulose as the stabiliser. Such a list may not make many people's mouths water but the finished product tastes very good.



© HARVARD.EDU

Furthermore, any meat you eat doesn't come with a list of ingredients. If it did, it might put you off eating it. Another product, under the interesting name: "This Isn't Pork Sausages" contains a lot of "textured pea protein", as well as such elements as rapeseed oil, xanthan gum and a variety of other substances, some of which (like methylcellulose, konjac and carrageenan) I must confess are unfamiliar to me. But I'm definitely going to plant some peas in my garden.

The raising of livestock for food carries a large environmental cost, of course. Additionally, there is growing public concern about the animals' welfare. The demand for meat in its various forms leads to the slaughter of 130-million chickens every day, along with 4-million pigs. According to Britain's Guardian newspaper, 60% of the mammals that share this planet with us are livestock. By comparison, only 36% are human and a measly 4% are actually wild.


© EATJUST

"Just Egg", an vegan egg substitute made by Eat Just, cooked like scrambled eggs. Presented with blueberries and bread and jam

The company Eat Just grows its products in a 1,200-litre bioreactor and then mixes them with plant-based ingredients. Currently, it's quite expensive to produce but a spokesperson for East Just has said that as demand and output increase, the cost will come down. Furthermore, we humans currently eat more meat than is good for us or our planet, so it's time we looked again at our diet. Do we really need so much meat (or fish)? The brilliant pen-and-ink artist Frank Patterson who especially recorded the craze for cycling in all its forms once said that his idea of a "satisfying banquet", as he put it, involved "tomatoes, bread and butter, cheese, a few apples and a pint of ale – two pints not coming amiss". He reckoned it was even more satisfying if consumed in an old-fashioned pub of the type he so often drew. He ran a successful farm on just such a diet, too. A series of scientific studies have shown that people in wealthy nations eat more meat than is good for their health or for the good of the planet. Indeed, the Guardian reports that cutting down on the consumption of meat is not only vital for tackling the climate crisis but is also the best single environmental action an individual can take. It's also safer because it avoids the risk of bacterial contamination that is present in real meat and the danger that whatever animals you're consuming may have suffered an overuse of antibiotics and hormones. I can see and understand the dangers here but I also have a sneaking fear that without the need for animals to feed us, even if only with milk or eggs, our money-centric world would simply get rid of them, leaving us with a world of uninterrupted concrete. What a ghastly thought!

BIG BUSINESS, BUT IS IT SUSTAINABLE?

Meanwhile, there has been growing demand for plant-based alternatives to meat, which was partly driven by the COVID lockdown as consumers around the world stayed at home, engaged in cooking and started to think seriously about the impact of their dietary choices on the planet as a whole. According to the research organisation GlobalData, the market value of the global meat substitutes reached $7-billion (€6.4-billion) in 2021, growing at a CAGR of 8.82% over the years from 2017 to 2021, and even faster in the United States. The increased demand also led to innovation on the part of manufacturers. Meati, a new entrant in the US food sector, for

instance, announced two new chicken substitutes to be sold directly to consumers, with the chicken replacement in this case coming from fermented mycelium, part of the root structure of mushrooms. I'm inclined to think that fungi will play an increasing important part in human dietary habits in the years ahead.

© MEATI.COM

Meat made from nutrient-rich mushroom root. Mushroom root is very similar to muscle tissue, making it easy to gently form the main ingredient into any shape

It's been estimated that worldwide sales of meat substitutes will grow from $5.88-billion (€5.38-billion) in 2022 to $12.30-billion (€11.26-billion) by 2029, at a compound annual growth rate (CAGR) of 11.11% in forecast period, 2022-2029. According to Fortune Business Insights, the arrival of the COVID pandemic raised doubts about the sustainability of meat production, obliging producers to seek viable alternatives. There is some doubt being expressed, however, about the long-term prospects for meat substitutes: we are a fickle bunch, we humans, and what seems like an attractive idea one day can be swept away the next, and there are faint signs that interest in alternatives to meat may be already beginning to fade. Healthy lifestyles have their appeal but it's easier, perhaps, to go jogging or make trips to the gym than to give up your favourite burger and French fries or even your steak Diane, if you're a little too sophisticated for burger and fries.

However, the US Department of Agriculture (USDA) has given the go-ahead to companies that want to start producing and selling cultivated chicken products in the United States. Lab-grown meat, also referred to as "cell-based" meat is based on real animal cells that have been fed nutrients and amino acids in factory-scale bioreactors, resulting in a product that should look like and – hopefully – taste like the animal from which the sample cells were obtained. I'm assured that the production facilities don't look like a science laboratory, with test tubes, flasks and pipettes all over the place but rather more like a brewery, with large vats full of liquid. But the appeal of lab-grown meat is not likely to be its flavour primarily (although the kind I've been eating is very nice), it will be because it is less damaging to the environment. The resulting non-meat The idea is receiving a range of reactions: some countries (the Netherlands, for instance) is at the forefront of the non-meat revolution, with producers like Mosa Meat and Meatable pushing for EU regulatory approval, while in the United States, two companies backed by Bill Gates, namely Memphis Meats and New Age Meats, are doing much the same to win over regulators in Washington DC.

Needless to say, the whole idea has its detractors, nowhere more so than in Italy, where the government has completely banned lab-grown meat. Its agriculture minister, Francesco Lollobrigida of the far-right Brothers of Italy party (it doesn't appear to include sisters) said: "Italy is the world's first country safe from the social and economic risks of synthetic food." It's an odd claim, since there are, it seems, no such risks and the vote led to confrontations between those in favour of a ban and those equally strongly opposed. There was even a small fight. Those who want to see the development of more lab-grown meat were branded "criminals" and "hooligans". Anyone who tries to produce non-meat meats faces a €60,000 fine. If the EU ever gives the go-ahead for lab-grown meat, it could lead to Italy's new law being challenged. Meanwhile, Coldiretti, whose name stands for Confederazione Nazionale Coltivatori Diretti and which represents the interests of traditional farmers, has promised to continue efforts to retain the controversial ban, despite threats from animal welfare groups. The ban has also been condemned by Professor Elena Cattaneo, a life-long senator and leading bio-scientist, who dismissed the ban and the publicity surrounding it.

© POLITICHEAGRICOLE

Francesco Lollobrigida

But despite the environmental and even animal welfare advantages of factory-produced meat, it is unlikely to replace normal meat in the very near future. For one thing, it's more expensive to produce, although it uses far less land and much less water, although US experts have warned that it may involve greater energy consumption. According to the BBC, Cyrille Filott, the global strategist for Rabobank, the question is "how many boxes the lab grown product will tick for 'early adopters' to remain interested. 'Taste, texture, price, sustainability, a long list of boxes. Will the novelty wear off or stick?" she wonders.

US company New Age Eats promoting their plant-based and cultivated pork products on the internet. "Our plant-based and cultivated pork products relieve us of the need to harm pigs in any way, while maintaining all the irresistible sensations of traditional pork sausage". The company ceased operations in March 2023 due to insufficient market penetration and investment

It's an interesting question but I suspect the answer lies in its potential for profit. Money drives everything in commerce, after all. If lab-grown meat proves profitable, it will succeed, accompanied by massive advertising campaigns to encourage us to consume it, in preference to traditional meat.

The global consultancy company AT Kearney has predicted that by 2040 more meat will come from factory production than from real animals. However, it's thought likely that plant-based products (we're getting back to peas again) are more likely to replace such processed "meat" products as burgers and sausages. A convincing steak Diane would be a challenge. The switch to lab-grown meats would be expensive, of course, requiring massive financial investment, which is unlikely to be forthcoming unless a substantial ready return can be confidently anticipated.

PROS AND CONS

Extrusion technologies have long been used in food preparations. It involves mixing the required ingredients together and forcing them under high temperature through a small opening. It has been more commonly employed in the manufacture of pet foods, but it is also used for pie fillings and sausages. It ensures a regular, well mixed product that can then be shaped in a mould of some kind. Extrusion allows for the mass production of food through a continuous and efficient system that guarantees uniformity. Human foods produced that way include pasta, some kinds of bread, breakfast cereals, confectionary, biscuits of various types, baby food and so on. Of course, growing meat in a lab has its opponents, although their motives sometimes appear a little suspect. The University of California Davis and the University of California Holtville say that producing meat in a laboratory produces between four and twenty-five times as much carbon dioxide as raising cattle. Not every research company has reached the same conclusion, of course, while raising beef cattle is an important industry for California, which may have coloured opinions. But there have also been strong arguments against manufacturing meat in a laboratory. After all, if eating meat is bad for the environment, we could simply agree to eat less of it, rather than creating substitutes. Or we could agree to eat more vegetables instead.

According to the US sea food company BlueNalu, their cell-cultured seafood provides a consistent, high-quality alternative to conventional seafood products that are inherently high in contaminants and that can be overfished, imported, or difficult to farm-raise

There is another thing to take into consideration. It's all very well for us folk in the wealthy countries to alter their diets for the sake of the environment, but what about the lives of the billion or so poor people around the world who depend on livestock

for their livelihoods. Obviously they cannot switch to bioreactors and artificial means of producing meat, so presumably they and their families could simply starve. And recalling the interests and habits of developers, without animals grazing the fields, someone will soon be along with a lorry load of concrete and the architect's drawings for a load of nearly identical bungalows. Only legal action of some kind can keep them away, it seems. Yes, I know we need homes for people. But must they be everywhere?

© NRF

A bioreactor producing sustainable meat

According to a report on lab-grown meat produced for Oxford University, replacing cattle with cultured meat may not be a simple swap. The report, under the Livestock, Environment, and People (LEAP) programme concludes that lab-grown meat cannot be seen as a cure-all for the damaging climate impacts of meat production, unless it's part of a large-scale transition to decarbonised energy. Greenhouse gas emissions from raising animals for meat account for some 25% of global warming. But not all greenhouse gases, the report continues, generate the same degree of impact nor last as long in the atmosphere.

The report was co-written by Raymond Pierrehumbert, Halley Professor of Physics at Oxford. "Cattle are very emissions-intensive," he writes, "because they produce a large amount of methane from fermentation in their gut. "Methane is an important greenhouse gas," he continues, "but the way in which we generally describe methane emissions as 'carbon dioxide equivalent' amounts can be misleading because the two gases are very different." One of the main and most worrying differences is that although methane has a greater effect in terms of warming the atmosphere, its effects are comparably much shorter-lived, lasting for just twelve years, while "carbon dioxide persists and accumulates for millennia".

The report, rather worryingly, concludes that if the effects of methane release over the next millennium are taken into account, it's a very mixed picture. Perhaps if we all became vegetarians the problem might – I only say 'might' – be resolved. But that very clearly isn't going to happen. We have to take into account the need for increasing areas of grazing land, which would inevitably mean few trees and forests, which would in turn be damaging.

The report's conclusions are, at best, ambivalent, and the ultimate outcome may depend on the discovery of a sustainable low-carbon source of energy, which would make what's being called "labriculture" more viable in the long term. Meanwhile, as research continues, I shall just continue to eat my vegetarian no-meat meals and enjoy them, relying on my wife's considerable culinary skills!

T. Kingsley Brooks
T.Kingsley.Brooks@europe-diplomatic.eu

© CELLX.CO

"Eat meat, not animals" is the motto of CellX, a Chinese company that claims to be China's first cultivated meat pilot facility & food space

© GLOBAL TOSHIBA

The world´s largest-class hydrogen production, Fukushima Hydrogen Energy Research Field (FH2R)

WATER + ROCK = POWER

Striking it rich below ground

It was a typical afternoon in his underground laboratory, where Professor Jacques Pironon spent most of his time sifting through the ancient rocks and sediments of the Lorraine Basin in north eastern France for traces of methane. Little did he know that fate had something even more significant in store for him.

While his team from the University of Lorraine's GeoRessources Laboratory collected the usual readings, they noticed an anomaly in the data. When they drilled down to examine it, they were shocked to discover not methane, but a truly gigantic reservoir of pure hydrogen that had been trapped at depth for unknown millennia and was only now being released for humanity's future needs. According to their calculations, the deposits' potential came to between 6 and 250 million metric tons of hydrogen at a depth of around 3,000 metres. "*This was no ordinary find, but a true gift of chance,*" said the astonished Pironon later.

Not so long ago, such a find would have been consigned to the annals of geology. But at a time when the world is looking for solutions to the transition from carbon, this hydrogen harvest has a much greater significance.

Some called it fate, others simply luck. But everyone agreed that day that it was Professor Pironon's destiny to unearth a treasure that could light the way to global net zero. A reward for curiosity and perseverance in the subterranean darkness that could bring a new dawn to the world above.

© UNIVERSITÉ DE LORRAINE

Professor Jacques Pironon : Research Director, GeoRessources Laboratory, Université de Lorraine

This wasn't the first discovery of underground hydrogen in this area. Philippe De Donato, co-director of research at the University of Lorraine and Jacques Pironon "accidentally" came across a similar discovery as part of the Regalor research project in collaboration with the Française de l'Energie (FDE), an independent multi-energy company, the University of Lorraine and the CNRS, the National Centre for Scientific Research.

In May 2023, FDE announced the discovery in a press release and pointed out that the hydrogen measurements had been carried out at the Folschviller drilling site, which had previously been drilled in the carbonaceous aquifer of the Lorraine basin.

Launched in 2018, the project aimed to validate an assessment carried out in 2012 by the French Institute for Petroleum and New Energies IFPEN. After analysing a soil sample from the basin, the institute found that it contains 370 billion m3 of methane, which is equivalent to eight years of gas consumption in France.

© UNIVERSITÉ DE LORRAINE

Philippe De Donato, Director of Research, CNRS, Université de Lorraine

Be that as it may, in recent years, a revolutionary new fuel has captured the imagination in boardrooms and council chambers around the world. Clean hydrogen is being touted as the silver bullet to solving our climate problems and achieving a net zero future.

Governments have unveiled ambitious plans to use hydrogen in everything from buses and boilers to blending it into our gas pipelines. Industry giants have unveiled bold visions of hydrogen-powered airplanes and homes heated by this clean energy source.

The hype around hydrogen's potential has reached fever pitch, with glowing predictions of a bright green future. But wait a minute - behind the promises lies a harsh reality!

Because while hopes are high, the production of clean hydrogen today is still in its infancy.

© WIKIMEDIA COMMONS

Singapore hydrogen-electric bus

Most studies show that the cost of scaling up the production of green hydrogen in this decade will still be very high. It must be used wisely so that budgets do not evaporate into thin air. Before we get carried away imagining a hydrogen-powered world, we should heed the analysts' words of warning. The hype threatens to exceed what is really possible given today's technologies and costs.

It will take far more than policies and prototypes to fulfil the promise of hydrogen. Only if the breakthrough is achieved will this fuel be able to play the ambitious role envisaged in the net zero plans. Its time may yet come - but that day is not quite here yet.

Hydrogen bicycle

A universal fix?

The Carbon Trust is a non-profit organisation based in the United Kingdom, established in 2001 with the aim of supporting businesses and the public sector in reducing their carbon footprint and moving to low-carbon operations; it provides a range of carbon management and consulting services.

According to a study published in June 2023, the uptake of clean hydrogen is critical to achieving net zero targets as it facilitates the decarbonisation of challenging sectors and the entire integrated energy system. However, over-enthusiasm for hydrogen also risks diverting focus from more efficient low-carbon alternatives in certain sectors, thereby hindering progress towards net zero.

Most of the hydrogen produced today is anything but clean. 'Grey hydrogen' emits carbon from converted methane into the sky. 'Blue hydrogen' captures this carbon, but some of it still escapes through the cracks. 'Black hydrogen' is forged from the dirty flames of coal itself.

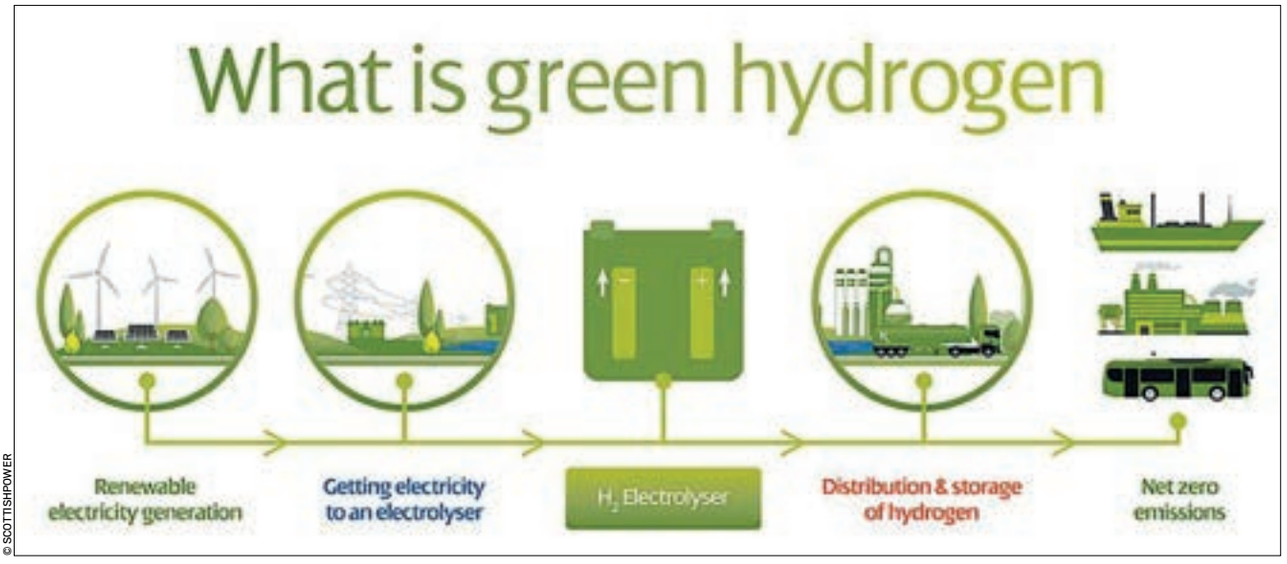
Only a tiny fraction - the elusive 1 per cent - is produced by the original splitting of water. Its production is both costly and limited and is therefore aptly named 'green hydrogen'. Any other carbon-free form would be a blessing in disguise.

And so rumours circulated about a pure hydrogen that came not from industry, but from the hidden riches of nature. Some called it gold, others white, but all agreed that it was a gift from the ground. Through a mysterious geological alchemy, water and ferrous rock come together, splitting the former to release its hydrogen richness.

© RESEARCHGATE

Dr Geoffrey Ellis

Proof of the existence of this mystical hydrogen has now been found. A natural spring flowed under the sands of western Mali, and a mega-cache lay beneath the Lorraine rocks in France.



© SCOTTISHPOWER

Surely there are more in other countries and seas waiting to be discovered.

Could this hydrogen, which forms without effort, be the key to the purity of the planet? An Eldorado for clean energy, where water and minerals combine to produce emission-free energy, provided free of charge by the invisible hand of nature? The world is watching and hoping that this promise will one day be fulfilled.

© BREAKTHROUGHENERGY

Bill Gates

With the discovery of a huge hydrogen deposit deep underground, scientists in France may have stumbled upon a treasure trove of clean energy. According to estimates by Professor Pironon, the deposit contains an incredible 250 million tonnes of the coveted fuel - enough to meet global demand for years to come.

But could this discovery be just the tip of the renewable energy iceberg? Curious scholars at the US Geological Survey (USGS) are betting that countless more deposits of the clean-burning gas lie dormant around the world, with some projections putting the total at thousands or even billions of megatons.

But not all of these underground hydrogen deposits are so easy to tap. As prudent petroleum geochemist Dr Geoffrey Ellis notes, most of it lies hidden in inconspicuous or impractical niches kilometres underground or in the sea. "*This is the global model, and the vast majority is going to be inaccessible - too deep or too far offshore, or in accumulations that are much too small for it to ever become economical to actually access,*" he muses, pointing to locations too remote or reserves too small to justify the cost of extraction. On paper, the Earth's hydrogen supply may be abundant, but tapping into its true potential presents us with puzzles yet to be solved.

But even if the inaccessible supplies are considered, the USGS forecasts still reveal unimagined possibilities. They calculate a readily available supply of around 100,000 megatons worldwide - enough to meet global demand for centuries.

According to the insightful Dr Ellis, harnessing these underground riches could use technologies we already have in hand. "*The methods should be similar to those used for natural gas,*" he says. Where the mastery of methane extraction is well advanced, the extraction of hydrogen could be child's play by comparison.

So far, Bourakébougou in Mali is the only commercial producer of the 'white gold', but only extracts five tons per year. There are however more and more endeavours to expand the hydrogen harvest worldwide. Earlier this year, Bill Gates' company Breakthrough Energy Ventures invested 91 million dollars in Koloma, an American start-up company that is searching for untapped white reserves within the borders of the United States. The visionaries see the huge opportunity right under our feet - if our ingenuity can finally unlock this buried wealth.

© EERE.ENERGY.GOV

Praxair is the first company in the United States to produce oxygen from the air using a cryogenic process. It transports hydrogen by pipeline or over the road, using tube trailers and cryogenic liquid hydrogen tankers

© GOLDHYDROGEN

Workers during drilling at the Ramsay Project, a 100% Gold Hydrogen owned exploration project in South Australia

In the meantime, British seismic prospecting firm Getech are scouring promising areas on the trail of hydrogen in Morocco, Mozambique, South Africa and Togo. With their experienced eyes, they search for telltale traces of the clean-burning gas under a wide variety of soils.

Another hotspot that is attracting a lot of interest is South Australia, which, in 2021, added hydrogen to the list alongside petroleum and other terrestrial energies authorised for exploration under the Petroleum and Geothermal Act 2000.

With the amended regulations, South Australia has thrown the once closed doors to discovery wide open. Surveyors can spread out across the unspoilt expanses and adjust their instruments to locate all the hidden sources that this visionary policy has brought within reach. Getech and its pioneering colleagues around the world are now pressing forward, fuelled by the conviction that the future of clean energy lies not just above our feet, but below them.

Just recently, a new Australian company called Gold Hydrogen caused a stir with the discovery of a sprawling field of hydrogen hidden deep in the state of South Australia. If all goes according to plan, the riches could start flowing next year or the year after.

For now, however, the titans of the industry are keeping their cards close to their chests. "*The big oil companies, I think, are very interested, but they're currently sitting on the sidelines, watching, taking a bit of a wait-and-see attitude. They're letting the start-ups take the risk - at this point this is a highly risky venture,*" says Goeffrey Ellis. "*Once we see some production data from some of these wells, we will certainly see the major oil and gas companies moving into this space.*"

Only when real production data is available will the experienced oil and gas giants get involved, he predicts. Until then, there is a lack of local hydrogen markets, which reduces the incentive for exploration. According to the Hydrogen Council, Europe is leading the way in renewable energies with 35% of global investments, while North America and Latin America are each doing their bit, with around 15%.

But a conundrum is keeping supply and demand in a bind, says Ellis. "*So there's a sort of chicken and egg problem: markets aren't really developing until they see the supply, and the supply won't really be developed until they see the market,*"

But where political will is driving the cause of discovery, our clever mind sees solutions within reach. "*I think it's a function of how much effort we put in. If we really decide this is something we need to figure out quickly, I think it could be done.*" he muses.

Determined pioneers could crack the code and set a clean cycle in motion.

Clean hydrogen is a promising building block in our quest for net zero. However, the road there is winding and harbours potential dangers around every bend. For governments and industry to steer hydrogen towards its decarbonising destiny, a deft hand at the helm is required.

This technology alone cannot eradicate carbon - it is just one weapon in our armoury against climate chaos. So, proponents of hydrogen technology must be wary of seeing it as a silver bullet. Even if the hydrogen charter sets out new frontiers for a fossil fuel-free future, we must approach the realisation of its potential with our eyes wide open.

We need to appreciate the pitfalls of hydrogen as much as we praise its potential. Priorities must be set to maximise system-wide decarbonisation, not short-term gains. The risks must be contained, not ignored. Only through prudent governance can we steer the development of hydrogen in a direction that gets us closer to net zero - not drifting towards ambiguous goals.

There is still a long way to go. But if the harbingers of hydrogen focus on the far horizons and the near obstacles, this emerging energy may yet deliver the decarbonisation success we crave.

Hossein Sadre
hossein.sadre@europe-diplomatic.eu

ERASMUS+

Promoting global mobility and cultural exchange

The origins of Erasmus+ go back to an earlier initiative, the Erasmus programme. Launched in 1987 by the European Community (now the European Union), the Erasmus programme was part of an effort to deepen integration and cooperation in the field of education in Europe. It aimed to promote student mobility and exchange opportunities in higher education across the European continent. By promoting cross-border learning and cultural exchange, the programme aimed to foster a stronger European identity among students. The name 'Erasmus' itself is an acronym that stands for 'European Community Action Scheme for the Mobility of University Students'.

The programme offered students the opportunity to complete part of their studies at a university or college in another European country. During their stay abroad, students were able to earn credits that were recognised by their home university. Over time, the Erasmus programme has expanded and diversified to include various additional aspects. These included the mobility of university staff, increased co-operation between academic institutions and the development of partnerships between universities and companies from different sectors.

In 2014, the original Erasmus programme was expanded and integrated into the more comprehensive Erasmus+ initiative which now covers areas beyond higher education, including vocational education and training, school education, adult education, youth activities and sport. This has allowed Erasmus+ to serve as an overarching banner for a wide range of mobility and co-operation opportunities in different areas across Europe.

The original Erasmus programme was based on the fundamental idea that international cooperation and cultural exchange are essential for a peaceful and prosperous future. The expanded Erasmus+ programme continues to provide important educational opportunities that promote student mobility through study abroad periods across Europe, allowing students to experience different cultures within the continent and broaden their cultural and academic perspectives. Having participated in an exchange programme myself, I am well aware of the impact such an experience can have on a person's development. While Erasmus+ is traditionally associated with European countries, the future vision for Erasmus+ is a more globalised approach. Looking to the future, it is vital that we explore how the programme can evolve to meet the challenges and opportunities of the 21st century. Erasmus+ can extend its reach beyond European borders by promoting co-operation with universities and institutions around the world. This could further enrich the cultural diversity of study experiences while contributing to a more interconnected global society.

Portrait of Desiderius Erasmus of Rotterdam with Renaissance Pilaster by Hans Holbein the Younger

Many prominent figures from business and politics were former Erasmus students and have benefited from the intercultural experience offered by the programme. Examples include French President Emmanuel Macron, who studied philosophy at the University of Paris-Nanterre and completed an exchange programme at the University of Bristol in the UK as part of Erasmus in 1993. Another example is Jens Stoltenberg, Secretary General of NATO and former Prime Minister of Norway, who studied economics at the University of Oslo and spent a semester as an Erasmus student at the University of Belgrade. Both Macron and Stoltenberg have publicly acknowledged their participation in the impactful Erasmus programme. Today, Erasmus graduates are successful in a variety of fields including politics, business, science and the arts and have gained valuable international perspectives through the educational opportunities the programme offers.

It is important to consider the impact of Brexit on the UK's participation in Erasmus+. Before leaving the EU, the UK was an active participant in Erasmus+ and many UK students, researchers and

organisations benefited greatly from the funding opportunities and the chance to collaborate across Europe. However, from 2021, UK students and institutions have no longer had access to Erasmus+ financial support, cooperation programmes and mobility options. The UK has decided not to participate in the 2021-2027 Erasmus+ funding cycle and instead, it announced the creation of the Turing Scheme, an alternative programme with a broader global focus beyond Europe, designed to support international student mobility in the UK.

© FACEBOOK

Although the UK is no longer officially participating in Erasmus+, bilateral agreements have been concluded to facilitate student and researcher exchanges between the EU and the UK. Looking to the future of Erasmus+, the coming years will undoubtedly bring changes to reflect the changing needs of society. A greater emphasis on inclusivity, digital innovation and sustainability will shape the way the programme will continue to play a central role in the education and experiences of students in order to foster a generation that not only excels academically, but also has global awareness and social responsibility. Erasmus+ promises a world where borders are overcome and knowledge knows no boundaries.

Desiderius Erasmus dictating to his ammenuensis Gilbert Cousin or Cognatus

While the European Union initiates and mainly funds Erasmus+, other important players are also involved. Educational institutions such as universities, schools and colleges across Europe actively participate in Erasmus+ by involving their students and staff in mobility experiences and projects. National governments also play an important role by promoting the benefits of the programme and encouraging the participation of students, teachers and trainers. Non-governmental organisations involved in education, youth development and related issues often work with Erasmus+ to achieve the objectives of the programme. The programme receives financial support from the European Union, which allocates the budget via the European Commission. This budget is then distributed to support various Erasmus+ activities and initiatives. The European Commission oversees the implementation of the programme and defines its overall strategic direction. In addition, each participating country has a national agency responsible for managing and promoting Erasmus+ in that country.

Concerted efforts are currently being made to ensure that the benefits of international mobility opportunities are accessible to a wider variety of students, such as those from disadvantaged backgrounds or students with disabilities.

The amount of financial support provided by an Erasmus+ grant can depend on a number of factors, including the destination country, the length of time spent abroad and whether students are studying on an undergraduate or postgraduate programme. The scholarship is intended to help cover the additional costs of studying abroad, but cannot cover all expenses as affordability may depend on individual circumstances and the cost of living in the host country. The appropriateness of the Erasmus+ grant is therefore a subjective decision that depends on the student's personal situation and the cost of living in the chosen location.

Erasmus+ scholarships generally cover the costs of travelling to and from the host country. Students also receive a monthly grant to help cover the cost of living during the studies abroad. The scholarships also provide health, accident and liability insurance cover for the duration of the mobility experience. However, the scholarship does not cover all costs associated with studying abroad. Individuals often have additional expenses such as accommodation, meals, local transport, study materials and personal items that need to be financed in other ways.

Therefore, it is advisable to find out about the cost of living in the city or region where one plans to study and budget accordingly before deciding to embark on such an experience. Furthermore, students are encouraged to consider additional sources of funding such as scholarships, possible part-time work (if permitted in the host country) and personal savings to supplement the Erasmus+ grant and ensure a financially sustainable and comfortable stay abroad.


© FACEBOOK

MEP Nicu Ștefănuță

Some argue that the current Erasmus+ grants, which amount to between 300 and 450 euros per month and in some cases up to 600 euros, are insufficient and marginalising for many, as families still have to cover part of the costs of such a stay abroad. Even when additional funding is available for internships, most students have to find alternative sources of income to support themselves while participating in the programme.

Nicu Ștefănuță, is a member of the European Parliament since 2019 and is general rapporteur for the European Union's 2023 budget. He presented his views about the funds allocated to Erasmus+ and his vision for this important European initiative: "*Although the level of Erasmus scholarships varies depending on the country of study and the country of destination, I believe that the amount is still below what is needed for a decent life, without additional support. The problem is that the financial aspect is essential and as an ESN (Erasmus Student Network) survey showed, it is the main reason why many students do not even dare to apply for an Erasmus scholarship, because they know that they cannot afford it. Unfortunately, Erasmus+, despite being the flagship program of the European Union, still favors somehow children from wealthier families. It is true that there is a top-up system, which offers the possibility of granting a supplement of 250 EUR (practically as a social grant), but the obtaining procedure is cumbersome. We must increase the budget of the Erasmus program and increase the amount of student grants. I estimate that 1,000 EUR per month could be an acceptable level, but we are still far from it. In 2022 we managed to increase the scholarships by 67 EUR and in 2023 by another 34 EUR. It's neither much nor little… The total budget of the Erasmus+ program has been improved by EUR 200 million, but the idea is not to increase the number of beneficiaries of these scholarships, but to make them accessible to any young student who wants such an experience*".

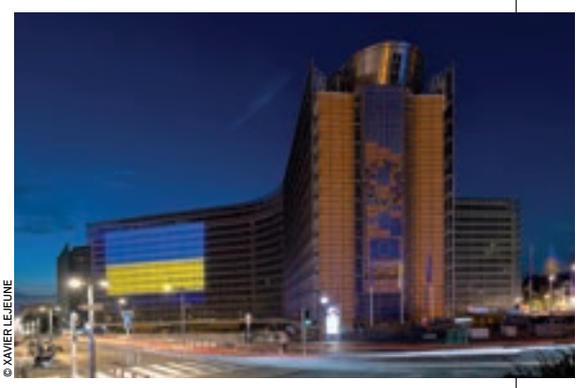
ESN (Erasmus Student Network) is an independent, non-profit international association supported by the Erasmus+ Programme of the European Union and the European Youth Foundation of the Council of Europe. Its aim is to promote the interests of students who spend part of their studies abroad. The organisation is committed to improving the experience and living conditions of exchange students and promoting study abroad. The ESN network comprises 280 local chapters in 32 European countries and Azerbaijan. After interviewing thousands of students, the ESN survey mentioned by Nicu Ștefănuță revealed that more than 50% of respondents felt that Erasmus+ grants only covered 50% of their costs, while 37% said that the grants were not enough to cover their living expenses in full.

In March 2023, the European Commission adopted a revised Erasmus+ annual work programme, increasing the total budget for 2023 to a record €4.43 billion. This is the highest annual financial support the programme has ever received. Increasing the budget is certainly a step in the right direction. EU officials explained that "the review entails a slightly higher budget while increasing support for the needs of Ukrainians who have left their country."

© ESN

In 2022, a total of 26,000 projects and about 1.2 million participants were involved in various Erasmus+ programmes. The latest call for proposals under Erasmus+ has a budget of 189.2 million euros and runs from 3 October 2023 to 6 February 2024. This call aims to facilitate the expansion of the European Universities initiative to more than 500 universities.

The Erasmus+ programme has undoubtedly reached important milestones and has played a crucial role in promoting European integration, as well as contributing to the development of a common European identity and shared values. Since the introduction of Erasmus+, millions of students have taken part in study exchanges and gained valuable international and intercultural knowledge by studying abroad. In addition, Erasmus+ has encouraged co-operation between higher education institutions across Europe, leading to an improvement in the quality of education and research. At the same time, the programme has focused on developing skills that meet the needs of the labour market. By offering practical experience and internships, it has effectively improved the employability of its participants over the years. In addition, Erasmus+ actively promotes innovation, language learning and social engagement.



© XAVIER LEJEUNE

The Berlaymont (headquarters of the European Commission in Brussels) illuminated in blue and yellow to mark Ukrainian National Day. The European Commission allocated 4.43 billion euros to the Erasmus+ programme Europa.eu in 2023

In view of the urgent global need to combat climate change, the Erasmus+ programme actively incorporates the principles of environmental sustainability. It plans various initiatives to promote eco-friendly travel opportunities, carbon offsetting programmes and projects dealing with sustainable development. By promoting environmental awareness and supporting responsible practises, Erasmus+ aims to contribute to the creation of a more sustainable and environmentally conscious global community.

Erasmus+ is also taking steps to become more environmentally friendly. One approach is to promote the use of environmentally friendly transport methods. For example, the programme offers additional scholarships if participants use the train instead of the plane, as air travel has a greater impact on the environment. Erasmus+ also promotes online study programmes as a more environmentally friendly option. While online alternatives can be more cost-effective as they reduce relocation costs, it is important to recognise that they may limit students' ability to gain the intercultural experience that comes with studying abroad.

In this context, Nicu Ștefănuță, who was recently elected Vice-President of the Green Group in the European Parliament, emphasised that the experience of the Covid-19 years has shown that online education, despite its potential shortcomings in certain areas, can also have a significant intellectual impact. The presence of technical barriers and inequalities in digital infrastructure can hinder access to virtual opportunities. In the meantime, Nicu Ștefănuță encourages young people to embrace Erasmus+ programmes with confidence and urges them to set out and have the transformative experience of learning and living in a different place to where they were born. Undoubtedly, such experiences will prove valuable in the long run.

Although the Erasmus+ programme has achieved considerable success in promoting international mobility, cooperation and cultural exchange, it faces various challenges. The demand for scholarships often exceeds the allocated budget, and the stability of the programme can be affected by political uncertainties and geopolitical tensions within the European Union or in neighbouring regions. Furthermore, events such as natural disasters or global health crises can temporarily disrupt international travel and bring mobility initiatives such as Erasmus+ to a standstill, emphasising their vulnerability to unforeseen obstacles. Consequently, it is imperative for the programme to adapt and formulate strategies that are aligned with the evolving and challenging global landscape.

The Erasmus+ programme, by facilitating the mobility of students and professionals across Europe, can potentially contribute to certain migration patterns, including the movement from East to West within the continent. However, the existence of accurate statistics measuring the extent and correlation between these phenomena remains uncertain. While the programme undeniably enhances the skills and experience of individuals who eventually return to their home countries, some argue that it may also contribute to "brain drain, as some students choose to remain in more economically developed countries after their Erasmus+ experience. Participation in Erasmus+ is often viewed favourably by employers as it offers increased employment opportunities both domestically and internationally.

Nevertheless, it is important to support and further develop the Erasmus+ programme for a number of compelling reasons. These range from promoting cultural understanding and tolerance, supporting quality education and empowering youth, to promoting global co-operation and stability. The programme plays a central role in building a sense of European identity among participants and promotes shared values and innovative ideas. In view of the many positive results, it is essential to invest in the future of Europe by supporting and expanding the Erasmus+ programme.

Several other international programmes that focus on study abroad have similarities to Erasmus+ in that they also provide opportunities for international mobility, cultural exchange

and academic enrichment. The US government-sponsored Fulbright Programme is the flagship international educational exchange programme. It awards grants to students, scholars, teachers and professionals who wish to study, teach and conduct research abroad and facilitates the stay of foreign colleagues in the United States. The German Academic Exchange Service (DAAD) promotes international academic exchange through various scholarships and programmes for students and scholars that include study grants, research stays and language courses. The Chevening Scholarship, initiated by the UK government, is an international scholarship programme aimed at supporting leaders from around the world. It offers fully funded scholarships for one year of postgraduate study in the UK.

The ASEM-DUO (Asia-Europe Meeting) Scholarship Programme facilitates student exchanges between universities in Asia and Europe and promotes collaboration. CAMPUS Asia, a trilateral exchange programme, involves universities in China, Japan and South Korea. The New Colombo Plan, an Australian Government initiative, encourages Australian students to study and undertake internships in the Indo-Pacific region, strengthening Australia's regional ties. JASSO offers scholarship programmes for international students who wish to study in Japan. Switzerland also offers scholarships to foreign scholars and researchers to enable them to pursue research or postgraduate studies at Swiss universities, which are notoriously expensive.

The Canadian government offers various scholarship programmes, including the Vanier Canada Graduate Scholarships, the Banting Postdoctoral Fellowships and others, to attract and retain top talent from around the world. All of these programmes, including Erasmus+, have the common goal of promoting international educational collaboration, promoting cultural exchange and providing students with a deeper understanding of international interdependence and expanded opportunities to broaden their academic and personal knowledge.

To conclude our examination of the profound impact and significance of Erasmus+, it is important to recognise that this programme goes beyond a purely academic initiative. It serves as a powerful catalyst for positive change, fostering connections across borders and demonstrating the belief that investment in education is tantamount to investment in the fabric of our common humanity and global peace.

As we look to the future, we should take inspiration from Erasmus+ and use it as a model, knowing that the collective destiny of our world depends on the understanding and co-operation we foster today. In an increasingly interconnected world, we hope that Erasmus+ will pave the way for a brighter and more inclusive future, where barriers are broken down and opportunities for personal and intellectual growth are accessible to all.

Alexandra Paucescu
alexandra.paucescu@europe-diplomatic.eu

THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Identifying types of cyberattacks that manipulate behavior of AI systems

Publication lays out "adversarial machine learning" threats, describing mitigation strategies and their limitations.

- AI systems can malfunction when exposed to untrustworthy data, and attackers are exploiting this issue.
- New guidance documents the types of these attacks, along with mitigation approaches.
- No foolproof method exists as yet for protecting AI from misdirection, and AI developers and users should be wary of any who claim otherwise.

Adversaries can deliberately confuse or even "poison" artificial intelligence (AI) systems to make them malfunction — and there's no foolproof defense that their developers can employ. Computer scientists from the National Institute of Standards and Technology (NIST) and their collaborators identify these and other vulnerabilities of AI and machine learning (ML) in a new publication.

Their work, titled Adversarial Machine Learning: A Taxonomy and Terminology of Attacks and Mitigations (NIST.AI.100-2), is part of NIST's broader effort to support the development of trustworthy AI, and it can help put NIST's AI Risk Management Framework into practice. The publication, a collaboration among government, academia and industry, is intended to help AI developers and users get a handle on the types of attacks they might expect along with approaches to mitigate them — with the understanding that there is no silver bullet.

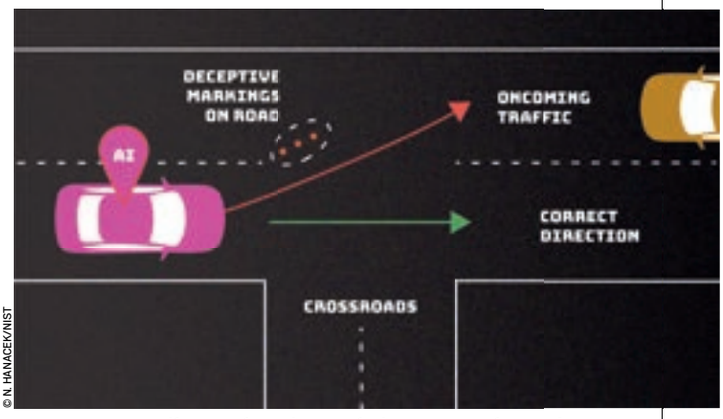

© NIST.GOV

Apostol Vassilev

"We are providing an overview of attack techniques and methodologies that consider all types of AI systems," said NIST computer scientist Apostol Vassilev, one of the publication's authors. "We also describe current mitigation strategies reported in the

literature, but these available defenses currently lack robust assurances that they fully mitigate the risks. We are encouraging the community to come up with better defenses."

AI systems have permeated modern society, working in capacities ranging from driving vehicles to helping doctors diagnose illnesses to interacting with customers as online chatbots. To learn to perform these tasks, they are trained on vast quantities of data: An autonomous vehicle might be shown images of highways and streets with road signs, for example, while a chatbot based on a large language model (LLM) might be exposed to records of online conversations. This data helps the AI predict how to respond in a given situation.



© N. HANACEK/NIST

An AI system can malfunction if an adversary finds a way to confuse its decision making. In this example, errant markings on the road mislead a driverless car, potentially making it veer into oncoming traffic. This "evasion" attack is one of numerous adversarial tactics described in a new NIST publication intended to help outline the types of attacks we might expect along with approaches to mitigate them

One major issue is that the data itself may not be trustworthy. Its sources may be websites and interactions with the public. There are many opportunities for bad actors to corrupt this data — both during an AI system's training period and afterward, while the AI continues to refine its behaviors by interacting with the physical world. This can cause the AI to perform in an undesirable manner. Chatbots, for example, might learn to respond with abusive or racist language when their guardrails get circumvented by carefully crafted malicious prompts.

"For the most part, software developers need more people to use their product so it can get better with exposure," Vassilev said. "But there is no guarantee the exposure will be good. A chatbot can spew out bad or toxic information when prompted with carefully designed language."

In part because the datasets used to train an AI are far too large for people to successfully monitor and filter, there is no foolproof way as yet to protect AI from misdirection. To assist the developer community, the new report offers an overview of the sorts of attacks its AI products might suffer and corresponding approaches to reduce the damage.

The report considers the four major types of attacks: evasion, poisoning, privacy and abuse attacks. It also classifies them according to multiple criteria such as the attacker's goals and objectives, capabilities, and knowledge.

Evasion attacks, which occur after an AI system is deployed, attempt to alter an input to change how the system responds to it. Examples would include adding markings to stop signs to make an autonomous vehicle misinterpret them as speed limit signs or creating confusing lane markings to make the vehicle veer off the road.

Poisoning attacks occur in the training phase by introducing corrupted data. An example would be slipping numerous instances of inappropriate language into conversation records, so that a chatbot interprets these instances as common enough parlance to use in its own customer interactions.

Privacy attacks, which occur during deployment, are attempts to learn sensitive information about the AI or the data it was trained on in order to misuse it. An adversary can ask a chatbot numerous legitimate questions, and then use the answers to reverse engineer the model so as to find its weak spots — or guess at its sources. Adding undesired examples to those online sources could make the AI behave inappropriately, and making the AI unlearn those specific undesired examples after the fact can be difficult.

Abuse attacks involve the insertion of incorrect information into a source, such as a webpage or online document, that an AI then absorbs. Unlike the aforementioned poisoning attacks, abuse attacks attempt to give the AI incorrect pieces of information from a legitimate but compromised source to repurpose the AI system's intended use.

"Most of these attacks are fairly easy to mount and require minimum knowledge of the AI system and limited adversarial capabilities," said co-author Alina Oprea, a professor at Northeastern University. "Poisoning attacks, for example, can be mounted by controlling a few dozen training samples, which would be a very small percentage of the entire training set."

© NORTHEASTERN.EDU

Alina Oprea

The authors — who also included Robust Intelligence Inc. researchers Alie Fordyce and Hyrum Anderson — break down each of these classes of attacks into subcategories and add approaches for mitigating them, though the publication acknowledges that the defenses AI experts have devised for adversarial attacks thus far are incomplete at best. Awareness of these limitations is important for developers and organizations looking to deploy and use AI technology, Vassilev said.

"Despite the significant progress AI and machine learning have made, these technologies are vulnerable to attacks that can cause spectacular failures with dire consequences," he said. "There are theoretical problems with securing AI algorithms that simply haven't been solved yet. If anyone says differently, they are selling snake oil."

TIMELESS CHIC

STANDOUT FASHION AND BEAUTY TRENDS

FEBRUARY REFRESH

Update your wardrobe mid-season

© PINTEREST

1 -The Grandpa Aesthetic: when grandfathers inspire fashion

Fashion appears to embrace a wistful longing for the past. In 2024, a glorious whiff of retro inspiration seems to be enveloping our wardrobes, as the latest Pinterest Predicts report (*) shows.

The "Eclectic Grandpa aesthetic", (that's its name), is all about unisex loose-fitting and oversized clothing, including large pants (the funkier the better), knitted beanies, chunky-knit cardigans, or even corduroy jackets.

2 - Red tights are everywhere

They not only serve the practical purpose of keeping your legs warm, but can also add a good dose of style and warmth to your wardrobe.

To seamlessly integrate your bright tights into your ensemble, coordinate them with another red element. Whether it's a matching nail polish, a subtle hair accessory or a statement handbag, another red element can effectively complement your tights and create a unified and coherent look.

And for maximum inspiration, the keywords "red tights outfit" are published by tens of millions on the leading social media platforms (Instagram, Pinterest, TikTok...).

© INSTAGRAM / @FASHIONBYTAMAR

3 - When Marimekko meets Uniqlo

Finnish design house Marimekko, known for its distinctive prints and vibrant colours since its founding in 1951, has teamed up with Japanese clothing brand Uniqlo to create an exclusive limited-edition collection. This remarkable collaboration combines simplicity and creativity, showcasing timeless silhouettes that capture the essence of both brands.

What's on the agenda?

A cosy and stylish wardrobe designed for a vibrant winter season, suitable for both indoors and outdoors: printed fleece jackets and skirts, complemented by turtleneck tops, socks and shoulder bags. Each pattern is inspired by the beauty of Nordic nature and evokes a tranquil winter landscape with shades of pearl grey, muted gold and timeless black. **(unqilo.com)**

© UNIQLO X MARIMEKKO

(*) Pinterest is one of the biggest visual discovery engine worldwide for finding ideas like recipes, home and style inspirations.

THE PEACH FUZZ
A captivating buzz

Peach Fuzz, Pantone's (*) Color of the Year for 2024, has arrived and is already making waves in the worlds of fashion, beauty and home decor. Let's explore how we can embrace this latest colour trend!.

© MAX MARA

© PINTEREST

Symbol of sweet elegance

According to the Pantone® Color Institute Executive Director Leatrice Eiseman "*Peach Fuzz captures our desire to nurture ourselves and others. It's a velvety, gentle peach tone whose all-embracing spirit enriches mind, body, and soul. In seeking a hue that echoes our innate yearning for closeness and connection, we chose a color radiating warmth and modern elegance*".

© PANTONE

Incorporate Fuzz Peach into your personal style!

1. Say yes to monochrome

For a bold and sophisticated look, go for a monochromatic ensemble that showcases a range of peach tones. Experiment with different textures and fabrics to create dimension and intrigue within your outfit.

2. Combine with Neutral hues

Combine Peach Fuzz with neutral tones such as white, off-white, beige or caramel to effortlessly create chic ensembles that will elevate any look.

Experiment with a white button-up shirt paired with peach-coloured trousers or a skirt to create a vibrant and refreshing outfit. Or try a peach blouse over a white skirt for a playful pop of colour.

3. Consider accessorizing

If you're still hesitant to fully embrace the Color of the Year, you can still integrate it into your style, for example with accessories such as scarves, handbags, belts, hats or jewellery in this shade. These accents will add a pop of colour to your outfit and serve as an eye-catcher without overpowering your overall look. You can also experiment with Peach Fuzz in your make-up and beauty routine and use it for lipstick, blusher, eye shadow, nail polish and more.

(*) For over 20 years, Pantone's Color of the Year has influenced product development and purchasing decisions in multiple industries, including fashion, home furnishings, and industrial design, as well as product packaging and graphic design

Let's go shopping !

1. Gia Borhini x Rosie Huntington Whitely collaboration sunnies
(spotted on fwrd.com)

2. Kate Spade New York Peach Huggie Earrings
(spotted on saksoff5th.com)

3. Tom Ford Bitter Peach Eau de Parfum fragrance

4. L.K.Benett peach suede clutch
(spotted on debijenkorf.be)

5. Max Mara Teddy Bear Icon coat
(maxmara.com)

6. Steve Madden semi-low heel pumps
(stevemadden.eu)

7. Satin shirt
(xandres.com)

8. M.A.C lip gloss in a soft pinky-peach hue
(maccosmetics.com)

9. OPI "Sanding in Stilettos" nailpolish

EUROPE Diplomatic magazine

Your Essential monthly Newsmagazine

Offer a printed edition subscription to a friend

Contact us : europediplomaticmagazine @ gmail.com

BY YOUR SIDE IN MONACO FOR MORE THAN 100 YEARS

Discover our solutions in Private Banking,
Retail Banking and Corporate Banking.

privatebanking.societegenerale.mc

THE FUTURE IS YOU

SOCIETE GENERALE