

An Lorg Carbóin – Carbon Outlook (a Subsidiary of Ár gComhlúadar, a Community Development Undertaking with Muinntir Dún Chaocháin)

A] Climate Disruption Impacting European Economies

Climate disruption does not radically affect people's daily lives, as yet, and effectively dealing with this is not a mainstream concern. The purpose of this subsidiary of Ár gComhlúadar is to explain coming challenges. **Climate change impacts—now in southern Europe—are expanding northwards.**

Because of climate change, olive groves in Andalusia, specifically in Jaén, already suffer from prolonged droughts and annually diminishing rainfall. Large areas of once lush, green fields are now brown and barren. The dried-out soil is visible. Crop yields have been damaged. Satellite imagery shows the spread of desertification over recent years, as in this image.



<https://www.oliveoiltimes.com/production/climate-change-andalusia-olive-oil-production/110963> Aug. 1, 2022

A new study by **the Coordinadora de Organizaciones de Agricultores y Ganaderos (COAG** - a union of farmers and ranchers), estimated that climate change has already cut Spanish annual agriculture turnover by 6% (a loss of €550m). **Pablo Resco**, an agronomist and director of agricultural risk at COAG, told Olive Oil Times: “The impacts of climate change are different on different crops but it might also affect different industries in different ways, **and people too.**”

An estimated 2.7m hectares of olive groves are located in Spain. Nationally, drought and extreme weather may shrink GDP by 7% if average global temperatures **rise by 2 °C**.



The Vinuela reservoir (near Malaga) c10% full. <https://www.bbc.com/news/world-europe-62707435> 29 August 2022

Called the Olive Oil Capital of the World, the Jaén province contains 20% of the global supply of ‘green gold’. A report by the **Global Drought Observatory** noted that Europe had suffered its worst drought in 500 years. Under threat from desertification and drought, Spain's so-called ‘green gold’ becomes rarer, with crop yields plummeting – and prices soaring.



Olive trees in dried soil in Chiclana de Segura, near Jaen, Spain 8/9/2023. REUTERS/Jon Nazca
<https://www.usnews.com/news/world/articles/2023-09-14/in-climate-fight-europes-olive-wine-farmers-turn-to-tech-and-tradition>

B] The Inevitable Impacts of Climate Disruption around Europe

While nations may work to reduce their carbon emissions, there is an elephant in the room: for large portions of the world, local conditions are becoming too extreme and there is **no way to adapt**.

People will have to move to survive. Over the next 50 years, hotter temperatures combined with more intense humidity are set to make large swathes of the globe lethal to live in. The number of migrants has doubled globally over the past decade, and the issue of what to do about rapidly increasing populations of displaced people will only become greater and more urgent as the planet heats.

Developing a radical plan for humanity to survive a far hotter world includes building vast new cities in the more tolerable far north whilst abandoning huge areas of the scorched tropics. It involves adapting our food, energy, and infrastructure to a changed environment and demography as billions of people are displaced. Perhaps all too demanding?

Many places will be uncomfortable if not intolerable by 2050. By 2100 it will be a different planet.

Global heating is shifting the geographical position of our species' temperature niche northwards, and people will follow. 1 to 3bn people are projected to be left outside the climate conditions that have served humanity well over the past 6,000 years. They add that, 'in the absence of migration, 1/3 of the global population is projected to experience mean average temperatures [that are currently found mostly] in the Sahara.' Populations are going to shift inland, towards lakes, higher elevations and northern latitudes.

Problematically, many wealthier nations have also struggled politically with immigration with a migrant 'crisis' that is far smaller than the great climate migration to be seen over the next 75 years. North of the 45°N parallel —will be the 21st century's haven: it is currently home to a small fraction of the world's aging people. The situation of vulnerable cohorts is itself a topic.

Despite increased pledges and targets to tackle climate change, current policies still leave the world on course for around 2.7 °C end-of-century global warming above pre-industrial levels—far from the ambitious aim of the Paris Agreement to limit global warming to 1.5 °C. Even fully implementing all 2030 nationally determined contributions, long-term pledges and net zero targets, nearly 2 °C global warming is expected later this century. Calls for Climate Justice highlight the vital need to address the social injustices driven by climate change.

Climate change has already put ~9% of people (>600 million) outside this niche. By 2080–2100, current policies leading to around 2.7 °C global warming could leave 1/3 (22–39%) of people outside the niche. One study identifies an average annual temperature of 29°C as the upper limit of the "human climate niche". Above this temperature threshold, regions will become unliveable.

C] Climate Disruption and Immigration

To adapt to the extremes of climate change, a significant adjustment in how billions of humans conduct their lives will be needed over the next 50 years - some parts of the Earth will become uninhabitable and others horrifically inhospitable. Beyond our control is Arctic Permafrost: it

contains 1.8 tons of carbon, more than twice as much as now in the atmosphere. 2°C of warming used to be considered the upper allowable limit. Now 2°C is the goal, under the Paris agreement. Experts calculate we shall miss it. **Tens of millions of climate refugees will enter an unprepared world.**

The INTERNATIONAL ORGANIZATION FOR MIGRATION (IOM & IPCC) estimates that, by 2050, up to 1bn people could be displaced because of climate change. Net migration north within Europe may be roughly estimated to reach **61.584m**. Net migration north into Europe may be roughly estimated at **375m**. A total figure of **437m** migrants towards Northern Europe fits intuitively into the 1bn figure.

The EU Pact on Migration and Asylum (11 June 2024) does not specify a fixed annual quota for immigrants into Ireland. The Pact aims to create a more efficient and equitable system for managing migration across the EU. Over 11 million people immigrated into the EU since 2000 (700,000pa) - 6.98m immigrants came in 2022. 1.5m people immigrated into Ireland since 2000 (93,000pa) - 120,700 immigrants came in 2022 – 0.17% of the total.

Ireland has a relatively high proportion of immigrants compared to other EU countries. This is due in part to official policy, the English-speaking population and Irish economic growth in recent years. If the policy governing the proportion of immigrants remains unchanged, the country will receive of **742,900 migrants by 2050**. The population of Mayo which lives in towns is approximately 107,000. If this were to double, in extremis, with an immigrant population, **Mayo would be taking in somewhere around 100,000**. Refinement of these figures would be welcomed.

D] Climate Disruption which impacts People

The U.N. Intergovernmental Panel on Climate Change issues serial reports, often called the ‘gold standard’ of climate research. They project we shall hit 4°C of warming by 2100, assuming no effective controls are placed mainly on fossil fuel production. The consequences with which we shall struggle include a **lack of food, the arrival of plagues, the degradation of air quality, wildfires and permanent economic collapse.**

Food: The basic rule for staple cereal crops grown at optimal temperature is that, for every degree of warming, yields decline by 10-15%. If the planet warm 5°C by 2100, there may be 50°C more people to feed and 50° less grain for them.

Plagues: Trapped in Arctic ice are diseases that have not circulated in the air for millions of years — in some cases, since before humans were around to encounter them. Our immune systems will be unable to fight back when prehistoric plagues emerge from melting ice. As the tropics creep northward and mosquitoes migrate in the same direction, dengue or malaria will be concerns.

Degraded Air Quality: Carbon Dioxide (CO²) has exceeded 400ppm: concentrations may hit 1,000 ppm by 2100, assuming no effective controls mainly on fossil fuel production are put in place. At that concentration, compared with the air we breathe now, human cognitive ability will decline by 21%.

Wildfires: According to the U.S. Forest Service, wildfires will be twice as destructive by 2050 as they are today; in some places, the area burned could grow fivefold.

Permanent Economic Collapse: These factors, and others, will put such strain on economies that collapse will ensue.

E] Climate Change Impacts on the Location and Markets of the Ecotour

Carbon Outlook aims to explain in clear terms why climate change is occurring and what its affects are. The markets of the Ecotour, for cultural reasons, are France and Germany. The Ecotour takes visitors around Mayo and its surrounding areas. The coming impacts on these areas are estimated as follows.

1] In southern France, Provence is known for its beautiful lavender fields, vineyards, and rolling hills. With advancing climate change causing desertification, this area will turn into a dry, barren landscape, with withered crops and abandoned farms. Such climate impact will occur around 2080-2100.



The future Provence is pictured (using AI - assuming no effective laws on global fossil fuel production are implemented.)

2] In southern Germany, Bavaria is typically known for its forests, rivers and fertile farmland. With advancing climate change, this region faces extreme drought and desertification. The lush landscape will become barren, with dried riverbeds, dying forests, and empty fields. Experts predict significant desertification within the next 50-100 years.



The future Bavaria is pictured (using AI - assuming no effective laws on global fossil fuel production are implemented.)

3] Dún Chaocháin, NW Mayo, **from Ceathrú Thaidhg to Cill Ala**, may emerge as a beacon of hope and resilience, as southern Europe suffers from the devastating effects of Climate Change. The once-quiet, unspoiled, northerly region could transform into a hub of activity, as refugees from across the globe, flee scorching temperatures and extreme weather.

The stone-walled Neolithic Céide Fields form the oldest and largest Stone Age monument, dating back c6,000 years. They can again become, even more, a revered symbol of human ingenuity and survival. The megalithic structures can thus stand as testament to the enduring spirit of humanity. The surrounding bogs, once desolate and unproductive, will be become fertile and sustainable ecosystems.



Mayo, Ireland, photo by milomc123 on Unsplash

Dún Chaocháin assuming no effective laws on global fossil fuel production are implemented.

A sustainable, equitable future, for what survives of humanity, will not come about of itself. Policies for mass immigration, on a scale not seen in the historic period, and rising global emissions need to be elaborated. The matter of refugees who will grace our shores is an open question.

E] Looking at where Fossil Fuels are produced and consumed.

BIGGEST CONSUMERS OF FOSSIL FUELS IN 2023

OIL:

1. The United States consumed 9,960.66 terawatt-hours (TWh) of oil.
2. China consumed 9,090.51 TWh of oil.
3. India consumed 2,936.97 TWh of oil.

COAL:

1. China consumed 25,538.52 TWh of coal.
2. India consumed 6,105.9 TWh of coal.
3. The United States consumed 2,276.87 TWh of coal.

GAS:

1. The United States consumed 8,865 TWh of gas.
2. Russia consumed 4,534 TWh of gas.
3. China consumed 3,048 TWh of gas.

BIGGEST PRODUCERS OF FOSSIL FUELS IN 2023

OIL:

1. The United States produced 9,620 TWh of oil.
2. Russia produced 6,300 TWh of oil.
3. Saudi Arabia produced 6,183 TWh of oil.

COAL:

1. China produced 25,861 TWh of coal.
2. India produced 4,653 TWh of coal.
3. The United States produced 3,288 TWh of coal.

GAS:

1. The United States produced 10,353 TWh of gas.
2. Russia produced 5,864 TWh of gas.
3. Iran produced 2,517 TWh of gas.

BIGGEST CO₂ EMITTERS IN 2022

1. China released 11.4 billion tonnes of carbon dioxide (CO₂).
2. The United States released 5.06 billion tonnes of CO₂.
3. India released 2.83 billion tonnes of CO₂.

CLIMATE TARGETS

1. The United States' Nationally Determined Contribution (NDC) target is 50–52% below 2005 levels by 2030. As of 2022, the US has achieved about one third of its 2030

emissions reduction target. Without additional, drastic emission reductions measures, the US will still be far from meeting its domestic climate target, let alone get its emissions onto a 1.5°C trajectory. Overall, the Climate Action Tracker (CAT) rates the US climate targets, action and climate finance as “insufficient”.

2. China’s targets are: peaking carbon dioxide emissions before 2030 and achieve carbon neutrality before 2060, lower carbon intensity by over 65% in 2030 from the 2005 level, share of non-fossil fuels in primary energy consumption to around 25% in 2030, increase forest stock volume by around 6 billion cubic metres in 2030 from the 2005 level, and increase the installed capacity of wind and solar power to over 1,200 GW by 2030. Projections suggest that China's emissions will peak before 2025 and there are early signs in 2024 that emissions may be starting to decline from the 2023 peak. China has surpassed its NDC target for wind and solar capacity six years ahead of schedule, reaching 1,206 GW in July 2024, with forecasts predicting 1,310 GW by year-end. However, coal remains China’s primary energy source and the largest emissions source. The CAT’s overall rating for China’s policies and targets remains “highly insufficient”.
3. India’s targets are to reduce its emissions intensity by 45% below 2005 levels by 2030 and to increase the share of non-fossil power capacity to 50% by 2030. CAT data indicates a slightly lower estimate of 2030 emissions under current policies due to the increased renewable energy adoption and reduced power sector emissions. However, under current policies, India's overall emissions are still expected to rise beyond 2030. To ensure a fair contribution to the global climate crisis, India’s emissions would need to stay below the emissions projected under current policies. The CAT’s overall rating of India’s climate targets and action is “highly insufficient”.
4. Russia’s targets are: limiting greenhouse gas emissions to up to 70% compared to 1990 levels by 2030, taking into account the maximum possible absorptive capacity of forests and other ecosystems, and subject to sustainable and balanced socio-economic development of the country. Russia’s efforts to tackle climate change remain very low. Russia’s existing policies indicate no real commitment to curb emissions. The Energy Strategy to 2035, adopted in 2021, focuses almost exclusively on promoting fossil fuel extraction, consumption, and exports to the rest of the world. Russia’s lack of any substantial contribution to international climate finance goals, together with its highly insufficient domestic target and climate policies result in the CAT giving Russia an overall rating of “critically insufficient”.

A MESSAGE ON SUSTAINABILITY TO OUR FRIENDS, BOTH FAR AND NEAR

The 2010 Living Planet Report of the Worldwide Fund for Nature (WWF) signalled that the world’s population was consuming the output of 1.5 sustainable Earths. This has now increased to 1.75 Earths as of the WWF 2022 Living Planet Report.

Fossil fuels (coal, oil and natural gas for example) are the biggest contributors to the planet's greenhouse gas emissions. Greenhouse gases lead to global warming which destabilises the climate, changes the oceans, diminishes ecosystems and contributes to the extinction of species. Fossil fuels are a finite resource, and their future shortage could have devastating consequences unless greener alternatives are adopted. For example, machines used to harvest crops need fossil fuels to run and without this machinery we could see starvation on a wide

scale. Global warming and climate change are also affecting crop production. Soil degradation is occurring due to the pollution of artificial fertilisers. Using climate model simulations, NASA predicts maize crop yields will decline 24% by 2030 due to high greenhouse gas emissions.

Deforestation is one of the many issues leading to climate change- in fact it is the cause of around 10% of global warming. Trees absorb and store CO₂ (carbon dioxide), and if forests are cleared, or even disturbed, this CO₂ is released into the atmosphere. Yet every year we lose around 10 million hectares of forests. Deforestation leads to changes in rainfall which creates warmer, drier local climates, thus increasing droughts and fires. Farming that relies on rainfall uses 80% of global croplands and is responsible for 60% of all food produced. Forest destruction could therefore put the food security of billions of people and the livelihoods of millions at risk. Crop failures, drought, floods and fires have also created an increase in modern slavery: these disasters force migration that can leave those displaced vulnerable to human trafficking, forced labour and other human rights abuses.

Other factors that impact climate change include low Sunspot numbers (e.g. the Sporer Minimum) and Earth Orbit Variations. Regarding the latter, geophysicist Milutin Milankovitch proposed that elements of Earth-Sun geometry affect climate through:

- Eccentricity (the Earth's orbit which varies circular to elliptical): When the Earth's orbit is more elongated, there is more variation in the amount of radiation the planet receives.
- Obliquity (the tilt of the Earth's axis): A greater tilt makes the seasons more extreme.
- Precession (the direction in which the Earth's axis points): Precession combined with eccentricity affects the Earth's proximity to the Sun.

Sunspot cycles are areas on the Sun where the magnetic field is about 2,500 times stronger than Earth's. Radiation increases dramatically during high sunspot activity. Sunspot cycles experience wide variations in their average 11-year period. Orbital changes occur over thousands of years and orbital forcing of climate takes equally long.

Since 1990, global CO₂ emissions have increased by more than 60 percent. In 2022, global CO₂ emissions from fossil fuels and industry totalled 37.15 billion metric tons. In 2023, they exceeded 40 billion metric tons for the first time ever. Global oil production reached a record level of over 96 million barrels per day, and coal production reached its highest ever level of 179 EJ (exajoules). According to the National Oceanic and Atmospheric Administration, global atmospheric CO₂ set a record high at 419.3 parts per million and is now more than 50% higher than pre-industrial levels.

The biggest contributor to global greenhouse gas emissions is China, followed by the United States. China is the largest consumer of primary energy in the world, using around 170.7 EJ in 2023, while the United States consumed around 94.28 EJ.

In 2022, Saudi Arabia exported 16.2% of the world's oil and produced 12.44 million barrels per day. The United States exported 8.16%, and produced 20.30 million barrels of oil per day, about 21% of the global total, making it the world's largest producer of oil. World Oil Statistics show that there are 1.35 trillion barrels of proven oil reserves left, only 46.6 times the world's annual consumption. This means there are about 47 years of oil left at current consumption levels.

The Irish Corrib Gas Field in Co. Mayo, Ireland, sees suboptimal use of gas by Shell. As feedstock for chemical production, it can (per cubic metre) be most economically advantageous. Long-term contracts for high-value products with stable, growing demand provide price stability for industries essential to the global economy. The Irish Government will only combust the entire reserve (for c\$3.5 billion). Electricity and heating are lower in the value chain than conversion into chemicals and high-value products. Using the gas for high value uses would have netted the Irish Government from c\$7 billion to \$17.5 billion.

The UN Climate Change Conference, held in Paris in 2015, created a set of long-term goals to combat climate change known as the Paris Agreement. As of 2024, 194 states and the European Union have joined the Agreement. The goals of the Paris Agreement are to:

- Reduce greenhouse gas emissions to keep global temperatures to well below 2°C above the pre-industrial levels of the late 1800s, ideally limited to 1.5°C above pre-industrial levels
- Assess the progress of the countries involved through the submittal of a five-year climate action plan by each one
- Provide financial support to developing countries for climate change reduction goals.

A report from the European Union's Copernicus Climate Change Service states that between June 2023 and 2024, global temperatures reached above the Paris Agreement limit of 1.5°C higher than pre-industrial levels. NASA confirmed that 2023 was the warmest year on record. Projections show that greenhouse gas emissions are likely to increase exponentially.

There is a gap between what governments have promised to do, and what independent scientific analysis has tracked using CAT (Climate Action Tracker). The United States is currently not on track to reach its target of reducing 50-52% of emissions by 2030, with CAT projecting it will be 23%-27% short of its reduction goal. The United States is planning to increase its liquified natural gas export capacity by more than 40% in 2026. In 2023 a major oil drilling project was approved despite promises to halt new oil and gas drilling on public lands and waters. The UN's Intergovernmental Panel on Climate Change (IPCC) says that global warming will reach 1°C above pre-Industrial levels around 2030- a full decade earlier than previously forecast.

To fulfil the first goal of the Paris Agreement (lowering global temperatures below 2°C above pre-industrial levels), CO₂ emissions must fall by about 25% by 2030 and reach net zero by about 2070. 1/3 of oil reserves, 1/2 of gas reserves and more than 80% of coal reserves need to be preserved. Reaching the more aspirational goal of 1.5°C would require even more drastic cuts, meaning 58% of oil, 59% of gas and 89% of coal needs to remain untouched.

In order to decrease the amount of greenhouse gases being released into our planet's atmosphere, a number of steps need to be taken. The annual production of fossil fuels needs to be regulated, and the exploitation of natural resources need to be administered at international level in line with advice from an executive branch of the UN (with any safeguards required) by one-tenth of its membership. All countries should progress towards a more comparable distribution of resources and climate action with support provided to developing countries. The rate at which some countries have used up world resources before other countries have developed is severe. The proportion of world resources which a country consumes should ideally be related to the average value of its contributions to global well-

being, both achieved and forecast. The complexity of this challenge is commensurate with the threats to be faced from a deteriorating climate.

Some ways in which governments can undertake this in a way that targets the supply side of fossil fuel production rather than the demand side (the consumption of fossil fuels) include a temporary prohibition of activity, other restrictions on new fossil fuel development, coal export taxes, restricting the leasing of land for fossil fuel extraction and the removal of subsidies to fossil fuel production. However, since fossil fuels are the world's primary source of energy, investment in fossil fuel supply holds the largest share of world energy investment. Governments around the world support the production and consumption of fossil fuels through licensing and permitting, as well as tax breaks and other subsidies. The governments and fossil fuel industries of the world plan to increase production despite the Paris Agreement and low oil reserves.

Changes in weather patterns and global temperatures have been concentrated in tropical areas, leading to speculation about global warming in the Global North. Scepticism needs to be met with open-source education which should be promoted using electronic social networks. The combination of the dangerously high levels of CO₂ in the atmosphere and the dwindling amount of fossil fuel preserves is information that many are unaware of. By raising awareness of these facts, mobilisation and lobbying can begin in earnest.

To ensure that the will of the people in any country be not subordinated by special interest groups, a mechanism for amending the structures and operation of government should be put in place. In this way, any misuse of power and position could be addressed, both openly and with vision, and to general satisfaction. Furthermore, this mechanism could, in general, engender discussion on and clarification of issues for the general population, in the preparation of official policies aimed at meeting national and international requirements.

The Rainforest Alliance lists several ways to fight climate change through individual actions, which include writing to government representatives to support climate action policies, supporting organisations that work to ensure access to education in rural areas, supporting Indigenous and local land rights around the world, and eating a plant-based diet.

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