

# Group of Twenty (G20)

Addressing the effect of the transition from fossil fuel dependency to renewable energy



<b>Forum</b>	Group of twenty (G20)
<b>Issue:</b>	Addressing the effect of the transition from fossil fuel dependency to renewable energy
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## Introduction

*“Addressing the effect of the transition from fossil fuel dependency to renewable energy”* becomes more and more relevant in today’s world. In recent years the global community has come together many times to figure out measures to prevent further escalation of climate change. Our world leaders, entrepreneurs, and civilians think together about this problem. It is clear our world is ready for a transition, but are we also prepared? This report will explore the complex element and effects of the transition from fossil fuel dependency to renewable energy.

## Definition of Key Terms

### Climate change

A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.

### Greenhouse effect

The trapping of the sun's warmth in a planet's lower atmosphere, due to the greater transparency of the atmosphere to visible radiation from the sun than to infrared radiation emitted from the planet's surface. Human activity has increased the greenhouse effect severely which led to a rapid rise of temperature, rising sea levels and starvation of many species.

### Fossil fuels

Fossil fuels - coal, oil and gas are non-renewable resources that take hundreds of millions of years to form.



## Green energy

Energy that can be produced using a method, and from a source, that causes no harm to the natural environment and is sustainable. In this report, the terms “green energy” and “renewable energy” will be used interchangeably.

## Energy transition

A major structural change to energy supply and consumption in an energy system. In this report “energy transition” will be referring to a worldwide transition from fossil fuel energy supplies to green energy.

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## Rare earth metals

Any of a group of chemically similar metallic elements comprising the lanthanide series and (usually) scandium and yttrium. They are not especially rare, but they tend to occur together in nature and are difficult to separate from one another. They are used in batteries, magnets, lights and much more. Our phones, cars and planes use these materials.

## General Overview

### *Job losses*

The most obvious problem that our transition to renewable energy brings, is that it may cost a lot of working people their jobs. At least, it might seem that way. There has been a lot of research on this topic, but most of the research was focussed on the western, developed countries, where there are fewer people working in the oil, gas or coal sectors. Most studies that have been carried out so far quite confidently indicate that the transition to renewable energy will actually have a net positive effect on the amount of jobs, because of the various new sectors that will experience a big growth. However, we should not focus primarily on the western world, but rather on the countries with thousands and thousands of workers carrying out intensive work, such as mining coal or operating pipelines. It is likely that these people will lose their jobs because of the transition. There are many nuances that need to be addressed.

First of all, it is unclear how many jobs will be lost at once. Will one factory shut down per month, or will two shut down weekly in industrial territories? The point is that if the energy transition will go in a quick tempo, that many jobs will be lost at once. If we do it more steadily jobs will still be lost, but not all at once, leaving some opportunity to find new occupancies. The current expectations are that the transition will move faster in the future, but not much faster than now. Many jobs do not directly build experience to fit in at new jobs in the green energy sector. It is therefore highly debatable whether people that work on oil tankers, or coal miners will be able to find new jobs easily.



### *National and regional economies*

Loss of employment is a general issue. As mentioned before, it might impact certain regions more than others. Many countries' economies rely heavily on fossil fuels. The most prominent examples are Middle-Eastern countries such as Saudi-Arabia, Iran and Iraq. But also many African and South-American countries will feel a big impact on their economy because of the energy transition. Oil and big oil corporations have a strong grip over the economies of these poor regions in Africa as can be demonstrated by Shell's activity in Nigeria. Shell has constructed a multitude of pipelines all throughout Nigeria that have had destructive effects on the environment and peoples. However, due to their contribution in taxes to the Nigerian economy (more than 1 billion in 2023), and under the table deals, Shell can keep doing what they have been doing for the last decades. The problem is that cleaning up leakages and repairing pipelines has become the occupation of many Nigerian inhabitants living isolated from the urban world. In cases like this, the energy transition could have disastrous implications for liveliness and economies.

For richer countries, such as Saudi-Arabia or Qatar, the economy would simply suffer because of the sheer amounts of people working in these industries, and the fact that oil export is the primary way these countries have become and remain so rich. Saudi Aramco alone is responsible for earning 440 billion dollars which equates to 40% of the country's GDP in 2023.

From all of the aforementioned can be concluded that the transition will be extremely difficult for certain countries, and easier for others. This might have serious geopolitical consequences.

### *Geopolitical consequences*

For countries largely dependent on oil export for their national GDP, it is difficult to compete against western countries that already have a big lead in the transition, on the geopolitical scale. This will give them less power in negotiating deals and it will generally lessen their impact in important global decisions. This could give the powerful economical blocks in our world even more geopolitical control than they already do.

Moreover, countries that have come far in their transition already, might leverage their help and resources. They might offer their financial or material help, or they could send people to help with building projects to nations not as far along in the energy transition. However, they might ask unreasonably much in return, making the energy transition another way for the rich to get richer.

### *Rare minerals and materials*



This is more of a problem with the transition itself rather than how to restructure our industries. Still, it is important not to neglect the growing dependence on rare earth materials as a result of the energy transition. We use neodymium, samarium or terbium magnets, and lithium, cobalt and nickel are essential components of batteries. Solar panels, wind turbines and electric motors, all require the use of rare materials.

The biggest supplier of rare earth materials by a wide margin is China. It owns 70-80% of the global market and is therefore in high control over its fluctuations and prices. Reliance on China for these materials grows ever more with our growth towards an energy neutral world. Many see this as cause for worrying. They are afraid of falling into Chinese influence too much. What does not help, is that many other mines are situated in Africa, where China has been expanding their sphere of influence for the last few decades. This way China controls, and will control, an ever growing percentage of the market.

Apart from this concern, the process of extracting rare earth materials is often extremely harmful to the environment. River pollution often leads to ecosystems getting polluted as well. Contaminated water and soil can have extremely harmful effects on the flora and fauna.

Another big issue is the social impact these mining operations might have. Since many of the mining operations take place in developing nations, it is no stretch to say acceptable working conditions might get neglected. This is supported by current evidence. Lithium mines in Zimbabwe have recently been in the news for turning a blind eye to Chinese miner's working condition violations around the Bikita Minerals Lithium mine.

## Major Parties Involved

### *United Nations Framework Convention on Climate Change (UNFCCC)*

The UNFCCC oversees international climate agreements and frameworks, such as the Paris Agreement, facilitating global cooperation on reducing greenhouse gas emissions and promoting renewable energy. Other UN committees and bodies, such as the EC or UNEP are actively involved in this issue too, however, the UNFCCC is most directly related to it.

### *International Renewable Energy Agency (IRENA)*

IRENA provides support to countries in their transition to renewable energy through data, policy advice, and fostering international cooperation to accelerate the adoption of sustainable energy technologies. IRENA has 168 members excluding the EU.

### *Directorate-General for Energy (DG ENER)*



DG ENER is a European commission that is responsible for the EU's energy policy, promoting renewable energy, energy efficiency, and the transition away from fossil fuels. They implement the European Green Deal and the Renewable Energy Directive, setting targets and regulations for member states.

### *Environmental Defense Fund (EDF)*

The EDF works on environmental advocacy, including climate and energy initiatives. They engage in research, policy advocacy, and strategic partnerships to promote renewable energy and reduce reliance on fossil fuels, focusing on market-based solutions and innovation

### *United States of America*

The United States is a global superpower. The US is one of the largest oil and gas producers and heavily dictates the pace at which the energy transition happens. It also influences the global markets due to its sheer size and economical resources.

### *People's Republic of China*

All of the same that applies to the US also goes for China, however, China dictates an even bigger piece of the rare-earth materials market, meaning this country will play a major role in our energy transition



## Timeline of Key Events

Date	Description of event
December 12th 2015	Signing of the Paris agreement
December 12th 2019	Adoption of the Green deal
November 13th 2021	Adoption of the Glasgow Climate pact

## UN involvement, Relevant Resolutions, Treaties and Events

- Paris Agreement, 12 December 2015 (FCCC/CP/2015/L.9/Rev.1)
- European Green Deal, 11 December 2019 (COM/2019/640 final)
- Glasgow Climate Pact, 13 November 2021 (FCCC/PA/CMA/2021/L.16)
- International Renewable Energy Agency (IRENA) Statute, 26 January 2009

## Previous Attempts to solve the Issue

### *Energiewende*

Initiated in the early 2000s, Germany's Energiewende (literally: energy transition) is a policy aimed at transforming the country's energy system from fossil fuels and nuclear power to renewable energy sources. The program set ambitious targets for reducing greenhouse gas emissions, increasing energy efficiency, and expanding the share of renewables in the energy mix. Key policies included feed-in tariffs for renewable energy, the Renewable Energy Sources Act (EEG), and substantial investments in wind and solar power infrastructure. The Energiewende successfully increased the share of renewables in Germany's electricity production, reaching over 40% by 2019. However, the transition has faced challenges such as high energy costs, grid integration issues, and a slow phase-out of coal. The economic impact on industries and communities dependent on fossil fuels has also been a significant concern. Germany addresses this issue by creating various job training programs and at times social and economical support for people that used to work in the industry.

### *Organisations*

Various organisations have been established in the last years to combat this issue. The aforementioned IRENA is an organisation that promotes global cooperation in the global energy



transition. This organisation facilitates policy dialogue and exchange of knowledge and technologies between nations. Not unlike IRENA, organisations such as RETD approach the transition not as a threat to our geopolitical circumstances, but rather as an opportunity to collaborate. The main principle is that by promoting dialogue and communication between countries, they will automatically acquire better relations. However, although these organisations are extremely useful, geopolitical tensions will not suddenly disappear because of their efforts.





## Possible Solutions

### *Rare earth market*

Unlike the name suggests, rare-earths are neither rare nor earths. Many different countries have access to these materials and they are able to mine them easily. Of course, some difficulties with the refining process, and the process of separating raw materials from each other remain. These are however technical and chemical difficulties, with which we are already able to deal. The United States could have a lot of potential to compete with China. However, they only have one active mine for such materials at this moment. Luckily the rest of the world is feeling stimulated to research how to refine and mine rare-earths. Hopefully this will only continue in the future. As a result, the global economy would be less reliant on Chinese materials, meaning the world would be less prone to Chinese economic threats, but also possible production crises that may arise in China.

### *International collaboration*

As pointed out previously, it is of utmost importance to collaborate globally in order to solve this issue. Apart from the fact that many countries do not feel an incentive to transition, it would also be bad news for their economy. With technical collaboration, we might soften the hit their economies will take. Examples of such collaboration are: sharing technological advances, subsidising green development, and sending our surplus of green energy over to the countries not far along in their transition. Of course these solutions are all very expensive, and it will take a lot of legislative nuances to implement them. But hopefully our relations will get strengthened and our world will get one step closer to a completed energy transition.



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