

What are the most critical barriers — whether physical, economic, financial, institutional, technological or social— preventing a transition away from fossil fuels?

Thematic Area: Just transition and differentiated pathways

Communication on and engagement for Just Transition

From an EU standpoint, open and effective communication and awareness pose significant and constant challenges towards public engagement and participatory transitions. Affected communities and worker groups are not being well aware of what a just transition entails in their local context, causing misinterpretations and fear of loss. Furthermore, awareness campaigns must be cultivated on the very “whys” of the phasing out of fossil fuels, how the latter cause the climate to change, and how climate change in turn affects local livelihoods. Indicatively, almost [half of EU population struggles to reach legitimate information on climate change](#) on Social Media and traditional media. This shows that **in-person awareness raising campaigns** need to be operationalised to break down misinterpretations on climate change and just transition.

Furthermore, diverse stakeholder groups within transitioning regions and industries, require tailored communication and engagement strategies. Every single stakeholder influences and is concurrently influenced by one another, and therefore, communication should not be merely “siloeed” bilaterals, but also multistakeholder consultations and assemblies.

Thematic Area: Economic and financial systemic risks

Youth Employability is Challenged by Market and Regulatory Inconsistencies

Younger generations comprise a unique set of stakeholders; in the EU, a constantly growing segment ([roughly 44% in 2024](#)) of young people (25-34) is well-qualified to lead just transition efforts, having acquired higher education, in disciplines important for the just transition, such as engineering, social sciences, psychology, political sciences, physics etc. Youth, both university graduates or other, are the next generation of the workforce. Nevertheless, employability challenges remain, as energy production plants are shutting down and/or energy-intensive industries are having a hard time adapting their operations, thereby losing over competing industries and/or regions bound by more flexible climate and environmental commitments and auditing. This causes young people to leave their home regions, and local societies being faced with an aging population that struggles to renew, accompanied by a gradual loss of local culture, identity and productive capacity.

Thematic Area: Energy transition: supply & demand-side perspective

Energy Communities and Cooperatives in the EU

Localised energy systems and energy communities pose a significant and just solution for top-down, profit-driven, privatised and corporate players we are seeing trying to profit from the energy transition. However, we must not follow this petrochemical structure, prevalent in the oil and gas industry and leaving many people behind. We must look to other forms of inclusive governance on our energy and resources, such as community-owned energy models (e.g. energy communities and cooperatives). Since 2018, the EU has set out a regulatory framework that enables the legal establishment of renewable energy communities. Nearly 10 years on, [significant roadblocks and inefficiencies remain](#).

- On the one hand, the issue is rather societal: Multi-apartment buildings compose nearly 50% of housing in the EU. The internal administrative and decision-making procedures due to mixed ownership models of the apartments adds further bureaucracy for someone to join a community.
- On the other hand, the issue is a combination of market and technical obstacles: Grid networks are regularly congested, unable to carry extra energy produced by energy communities. Also, in this framework, established energy suppliers are lobbying against extensive allowances for energy communities due to the limited capacity of the grids.

Thematic Area: Physical and climate systemic risks

Resource (in)justice and (in)sufficiency

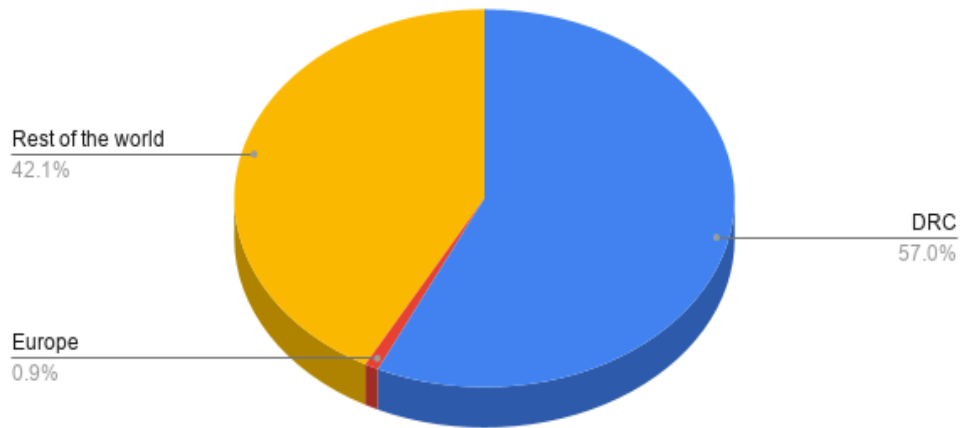
- It is well documented that the countries and regions possessing the greatest amounts of critical minerals, are not the ones directly benefiting from their end use. *With regards to current knowledge*, critical minerals needed for the phasing-out of fossil fuels are concentrated in a few geographies of the planet. The [Global Critical Minerals Outlook 2025](#) aptly showcases the staggering disparities, for instance in cobalt sourcing: As seen in Fig. 1, whilst a single African state - the Democratic Republic of Congo (DRC) possesses more than half of the global share of cobalt reserves, the European continent holds merely a tiny fraction of the global cobalt reserves. Yet, the vast majority of renewable energy production in DRC does not come from renewables that rely on critical minerals, but rather is generated by hydropower. What is more, *renewable energy production does not automatically mean having access to it*. According to [2022 data](#), the share of modern renewables in final energy consumption (SDG 7.2) in DRC accounted for only 7%, whilst biofuels and waste made up 92% of the total final energy consumption (Fig. 2).
- One of the most critical barriers to transitioning away from fossil fuels lies in physical and systemic climate risks combined with uneven resource distribution. Renewable energy systems depend heavily on land, water, and mineral resources, which are not evenly available and often located in rural or ecologically sensitive areas. This creates tensions where rural communities are effectively “sacrificed” for the rapid

deployment of wind farms, solar parks, or mining for critical minerals, frequently without fair compensation or meaningful participation in decision-making. At the same time, climate change itself - through extreme weather, droughts, and disrupted ecosystems - undermines the reliability of renewable infrastructure and supply chains, making large-scale transitions more complex and uncertain. These physical constraints intersect with issues of resource (in)justice, where the benefits of clean energy are concentrated in urban or wealthier regions while the environmental and social costs are displaced onto already vulnerable populations.

- Equally significant are economic, technological and social barriers tied to how energy is currently prioritised and consumed. A growing share of energy demand is being driven by data centres, artificial intelligence systems and other energy-intensive digital infrastructures, diverting clean energy capacity away from essential human needs such as housing, heating and basic services. This reflects a deeper issue of (in)sufficiency: the transition is not just about replacing fossil fuels with renewables, but about questioning what energy is used for and who it serves. Financial systems and policy frameworks often favor rapid returns and large-scale industrial users, reinforcing inequalities and slowing investments in decentralised, community-based energy solutions. Without addressing these structural imbalances - ensuring that energy transitions prioritise social well-being over purely economic or technological growth - the shift away from fossil fuels risks reproducing existing injustices rather than resolving them.
- As whole socioeconomic systems steer towards phasing out fossil fuels, it is essential to also draw attention to sufficiency and redistribution measures with regards to critical minerals. The race for the latter raises questions of whether the current model of constant productivity - dictated by GDP indicators - can be sustained in the face of finite resources. Studies have shown significant projected increase in critical minerals demand, particularly on meeting the ambitious 1.5 degrees, of around 600% in 2030 and up to 1500% in 2050, [solely in the EU](#). The picture is similar based on a study conducted for [China's energy transition pathways](#), indicating a demand increase of 1200%, and a huge struggle in meeting material constraints within planetary boundaries. However, there is little talk in economic and political spaces of energy sufficiency, or degrowth, that allow us to stay within planetary boundaries while also transitioning to renewable energy. The taboo on these terminologies and concepts means the transition may never be just if we keep plundering our resources for "infinite" growth.

Fig. 1

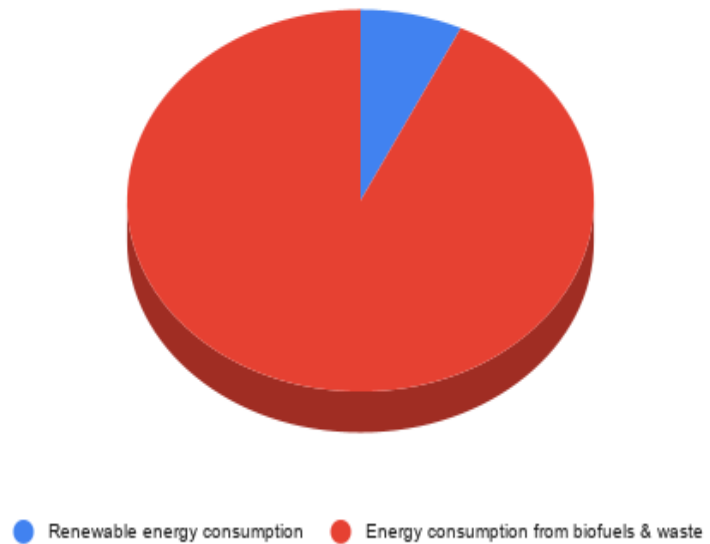
Share of Global Cobalt Reserves



Source: International Energy Agency, 2025

Fig. 2

Share of energy consumption sources in DRC



Source: International Energy Agency, 2023

What potential levers, whether economic, financial, institutional, social or technological, exist for accelerating the implementation of the transitioning away commitment?

Thematic Area: Technological solutions and innovation pathways

Repurposing of Retiring Coal Plants and Mines

[Decommissioned coal pits are being repurposed into solar parks across the world](#). It is crucial that planned energy transitions prioritise former coal plants as renewable energy hubs. It is sensible from an infrastructure, environmental, and societal point of view. These areas are already connected to the grid, less new land (potentially arable, or of high ecological significance) needs to be appropriated, and local new jobs in renewable energy can be generated, maintaining income security for the local workforce. This approach should be enforced before finding new, arable land or land in rural areas used by communities. We are seeing injustices related to land grabs across Europe for both lithium minerals and solar/wind installations, and wholly are against this.

Speeding up Battery Energy Storage Systems

Renewable energy stored in batteries is gaining traction across the EU. [Today, Battery Energy Storage Systems \(BESS\) in the EU amount to a capacity of 77 GWh, with 27.1 GWh being added only in 2025](#). The rollout of renewable energy storage batteries as a means to achieve flexibility on the grids and contribute to energy security suggests a crucial technological advancement for the energy transition. Research has shown that BESS can particularly be a powerful tool for the energy security and sufficiency [of remote and island regions](#), which are usually dependent on centralised energy systems that better serve the economic and population centers. Finally, BESS are becoming increasingly financially competitive, showcasing a 93% price drop between 2010 and 2024 [according to IRENA](#).

Thematic Area: Economic diversification and transition management

Whole-of-Society and Whole-of-Economy approach

The Just Transition Mechanism under UNFCCC suggests an opportunity to reimagine the structures of local economies that heavily rely on the fossil fuel sector. Besides the environmental and climate implications generated by the burning of fossil fuels, global

dependence upon the latter proves to be the wrong way to go for a second time in 4 years - first in 2022 and the war in Russian-Ukrainian territories, now the war in the Persian Gulf region. Fossil fuel dependence showcases how fragile the global energy and transportation systems are, especially considering that [3/4 of the global population lives in net-importer states](#). Shifting the focus on localised renewable energy systems increases local energy security and sovereignty (e.g. through local energy communities and cooperatives), and lowers the prices across the whole value chain of different economic sectors. Furthermore, just transitions can go beyond energy systems; they comprise an opportunity to rebuild local resilient, human-centric and regenerative economies that can leverage their contextual productive capacities and resources. For instance, the Just Transition Mechanism of the EU, not only leveraged dedicated funds, but required the drafting of Territorial Just Transition Plans, which set up the foundations to the economic diversification of those regions. Ecology teaches us that the most resilient ecosystems are built on biological diversity. Likewise, experience has proven that economies and societies are more fragile and exposed when they rely on poorly diverse economic activity and decision making processes that overlook the diverse realities, capacities and needs across societal and economic actors.

Degrowth-Oriented Policies

A more concrete degrowth-oriented policy approach would focus on directly reducing excessive and inequitable energy demand while prioritising essential uses. Governments could introduce binding energy demand reduction targets, particularly for high-consuming sectors such as data centres, aviation, and luxury real estate, alongside progressive energy pricing that guarantees affordable access for basic household needs but sharply increases costs for excessive consumption. Policies could also include caps or strict efficiency standards on energy-intensive infrastructures (e.g., limits on new data centre expansion unless powered by additional renewable capacity), mandatory energy budgeting at national or sectoral levels, and the redirection of subsidies away from high-growth, high-energy industries toward public services like housing, healthcare, and public transport. Shorter working weeks and support for low-energy sectors - such as care, education, and local agriculture - can further reduce overall energy demand while improving quality of life.

In addition, fiscal and planning tools are essential to embed sufficiency into the transition. This could involve wealth and carbon taxes targeted at the highest emitters, bans on particularly wasteful practices (such as private jets or excessive advertising that drives consumption), and strict resource use regulations tied to planetary boundaries. Public investment strategies should prioritise retrofitting homes, expanding decentralised renewable systems, and supporting repair, reuse, and circular economy initiatives, rather than large-scale industrial expansion. Crucially, these policies must be paired with participatory governance - such as citizens' assemblies on energy and climate - to ensure democratic legitimacy and social acceptance. By combining demand reduction, redistribution, and institutional reform, degrowth policies can make the transition away from fossil fuels both faster and more equitable in practice.

Thematic Area: Institutional and governance frameworks

Citizen Climate Assemblies (CCA)

- CCA bring together a diverse group of everyday people selected by democratic lottery to learn, deliberate and make recommendations on aspects of the climate crisis. Thanks to the very nature of citizen recruitment, they foster diversity of perspectives, protection from electoral dynamics and vested interests, challenge societal injustices and ultimately, build public awareness, legitimacy, and acceptance of climate action, and more particularly, just energy transition plans.
- Youth Climate Assemblies: targeted youth-focused CA, bringing to the fore youth-related and youth-led concerns and proposals. Again, transitions affect whole regions and sectors, but younger generations are the ones expected to bear the effects of the transitions for a longer period of time, whilst having contributed the least to the climate crisis.

Energy Cooperatives and Communities

- Strengthening institutional and governance frameworks is a key lever for accelerating the transition away from fossil fuels, particularly by making it easier to establish and scale energy cooperatives and community-led energy systems across different countries. This involves harmonising regulations, simplifying licensing procedures, and removing administrative and financial barriers that currently disadvantage small, local actors compared to large energy corporations. Governments and regional bodies can play a decisive role by creating supportive legal frameworks, offering public financing mechanisms, and ensuring grid access for community-owned renewable projects. Such measures not only democratize energy production but also help redistribute economic benefits more equitably, empowering citizens and local communities to actively participate in and shape the energy transition rather than being passive consumers within centralised systems.

Thematic Area: Policy instruments and market mechanisms

Private financial levers

There are initiatives that need to be further documented and tapped into. In the light of seeking multi-stream private-public funding for the green and just transition, we highlight:

- The [Millionaires for Humanity](#) initiative, a coalition of multi-millionaires and billionaires willing to be annually taxed on their wealth at least 1%, besides targeted ad hoc philanthropy donations.
- Fossil fuel profits are taxed, and this revenue goes to financing a just transition.
- The [1% for the Planet](#) initiative, where for-profit businesses pledge to donating at least 1% of annual sales directly to environmental organizations.

In this framework, particular focus should be drawn connecting these private initiatives to states and regions with the least financing means to drive clean and affordable access to energy, whilst also stepping up efforts for institutional and policy reforms aligned with the vision of advancing access to clean and affordable energy. It is nevertheless important that

precautions and mechanisms are being put in place that will prevent the possibility of co-optation and tokenistic phenomena.

What country, regional or sector roadmap experiences, best practices, and lessons learned can be shared?

Thematic Area: Institutional and governance frameworks (& transition management)

The European Fair Transition Observatory

A newly established Project, led by the European Commission. Among others, it aims to:

- Foster knowledge and evidence-based policymaking
- Monitor how particular sectors are impacted and are adapted to the transition needs whilst associating them with the wider regional and Member States' socio-economic trends (e.g., taxation of more harmful sectors and tax alleviation for people working in transitioning sectors)
- Ensure transparency and accountability on stakeholder negotiations
- Development of indices to make the above aims quantifiable and measurable.

[The Just Transition Platform \(JTP\)](#)

The EU Commission has set up as part of its Just Transition Mechanism, the Just Transition Platform (JTP), a digital portal where everyone, either a regional stakeholder or merely a curious citizen, has access to a vast data and knowledgebase on just transition matters. On top of JTP, a dedicated JTP Working Groups (JTP WGs) initiative has been set up to steer and facilitate the transition of the relevant regions and sectors on the grounds of stakeholder engagement, equal opportunities, and the funding and policy future of the just transition in the EU. The participation and representation of relevant and eligible stakeholders is ensured through open calls for expression of interest. Each WG meets at least twice a year with ad-hoc online meetings organised as needed.

[Ireland's Just Transition Commission](#)

An independent advisory body mandated by the Irish government in 2024. Its main functions entail strategic analysis of climate-related data that will inform domestic policy and investment planning, including risks and opportunities in the country's economy and societal cohesion; assessment of alignment of the Irish climate policies with just transition principles; facilitation of stakeholder engagement to foster inclusive and informed decision making.

Thematic Area: Just transition and differentiated pathways

Conceptual and Technical Integration of Just Transition into NDCs

Until 18 March 2026, [79 out of 198 Parties](#) of the UNFCCC explicitly refer to the concept of just transition in their submitted NDCs. In fact, 15 out of the 79 Parties added just transition considerations in their 3rd NDCs package. Commitment to just and equitable transitions away from fossil fuels in NDCs suggests a significant institutional step of acknowledgement of the multifaceted implications that the phasing-out process holds. In this context, there are multiple ambitions on the [UNFCCC Plans to Accelerate Solutions](#) with regards to the alignment of NDCs and Just Transition indicators and policy toolkits, thereby enhancing transparency, inclusivity, and procedural justice along the way of the energy transitions.

Youth Participation Shaping the Just Transition Implementation in the EU

[EUTeens4Green](#) has been an EU-Funded project that ran between 2022 and 2024. It offered an opportunity for teens and young adults (15-24 y.o.) to take ownership and become agents of change while proposing actions in their just transition regions.

What makes this project to be considered as a “best practice”:

- It helped map youth experiences and hardships to actively participate in the Just Transition
- Through its design, it allocated small sub-grants for youth-led initiatives in the Just Transition regions, allowing youth to co-create and *context-specific* climate action and engage their local communities; it didn't just contribute to the capacity building of youth - it provided the means to youth to actually design and implement activities thanks to their raised built capacities
- The sustainability of the project was ensured through the publication of a policy recommendations report on strengthening youth involvement in policy-making processes and increasing their capacity to shape and lead the green transition.