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Rainforest Foundation Norway

UNFCCC Submission:

Roadmap for the Transition Away from Fossil Fuels in a Just, Orderly and Equitable Manner

Rainforest Foundation Norway is a leading independent international Non-Governmental Organisation dedicated to protecting the world's rainforests and securing the rights of Indigenous and forest peoples, in collaboration with a broad network of partners in 6 rainforest countries.

Rainforest Foundation Norway welcomes the opportunity to provide input on the Roadmap for the Transition Away from Fossil Fuels (hereafter, "TAFF Roadmap"). Our submission will highlight the links between the TAFF Roadmap and the Deforestation Roadmap, covering the *demand- and supply side perspective of the energy transition,* and *policy instruments and market mechanisms* that contribute towards a just, orderly and equitable transition.

RISING MINERAL DEMAND PUTS TROPICAL FORESTS AT RISK

An ambitious, Paris Agreement-aligned energy transition requires access to sufficient transition minerals. Renewable energy systems are currently mineral-intensive, and a spike in demand for several minerals is expected as the energy transition proceeds. Demand for many of these minerals is also rising for other purposes, from information technologies to defense, and is increasingly subject to geopolitical competition.

Rising mineral demand risks driving a new wave of global deforestation. A significant share of current extraction and identified reserves of transition minerals are in rainforest countries, with many key raw materials found beneath critical forest landscapes *(upcoming RFN report, Kuepper et al. 2025)*. Mining activities may already affect between 10% and one-third of the world's forests (*Bradley, 2021*). Between 2001 and 2020, 8,533 km^2 of tropical and subtropical rainforest were lost as a direct result of mining, with Indonesia (3,537 km^2) and Brazil (1,654 km^2) accounting for the largest shares (*Kramer et al. 2023)*. Mining also has a significant indirect deforestation footprint, with forest loss and degradation occurring within a 50 km radius of most mines, in some cases extending up to 100 km (*World Bank, 2019)*.

Steeply rising investment in 'critical' minerals is expected to exacerbate pressure on forests in the Amazon rainforest, the Congo Basin and in South-East Asia-Oceania rainforests *(upcoming RFN report, Kuepper et al, 2025)*. Furthermore, 69% of energy transition mineral projects are already located on or near Indigenous and Peasant Peoples' Lands (*Owen et al. 2023)*, often where insufficient consultation, consent and permitting processes are widespread problems, risking rights violations and their license to operate.

New scenarios developed by the University of Sydney show that **transition mineral demand could successfully be met while avoiding mining in rainforests and vulnerable ecosystems, with significant resource savings**. This requires measures to reduce demand for newly extracted minerals, such as adopting progressive transport policies and high recycling rates for transition minerals; and the implementation of restricted areas for mining, so any new extraction is directed away from rainforests and vulnerable ecosystems (*Teske et al, 2026*). Mineral demand reduction is necessary because resources are finite, and intensive mining causes biodiversity loss, habitat destruction, water and air pollution, and significant carbon emissions.

Protection of critical environmental, ecological, natural and IP&LCs rights areas from mineral extraction related activities is essential, especially given that we have breached 7 out 9 planetary boundaries that define the safe living space on Earth (*Stockholm University, 2023*). Moving forward, stakeholders across global mineral supply chains must acknowledge and respect a common set of Restricted Areas *(see recommendation 3 below)*, including places that are off-limits to mining under any circumstances.

UNSUSTAINABLE BIOENERGY ADDS PRESSURE ON FORESTS

Bioenergy is energy derived from biomass, including liquid biofuels (such as biodiesel and bioethanol) used primarily in transportation, and solid biomass (notably wood pellets) used for industrial and household heating. In recent years, governments worldwide have implemented policies and subsidy programmes to support the adoption of biofuels. These measures are driven by climate emission reduction goals as well as energy security objectives. However, **bioenergy can have high GHG emissions related to its feedstocks and should be treated with utmost caution in the transition away from fossil fuels** (Sandford et al., 2025).

The IEA Net Zero Emissions (NZE) 2050 Scenario foresees a rapid increase in the use of modern bioenergy to displace fossil fuels by 2030, while highlighting the need to avoid negative social and environmental consequences. Decarbonisation goals in aviation and shipping contributes to this expected demand growth for biofuels, which could be compounded by the use of bioenergy in decarbonization of heavy industries such as mining smelters and processing in renewable energy production (e.g. of batteries).

Deforestation and land-use change are persistent issues for several bioenergy sources. Biofuel from palm and soybean oil, sugarcane or grains, compete with other uses of land areas, such as food production, forest and peatland conservation (IPCC, 2022). Meeting the projected 2030 global demand for biofuel would require an estimated 52 million hectares of additional cropland, ultimately driving indirect land use change globally (Sandford et al., 2024). Advanced and waste-based biofuels could present more sustainable alternatives to agricultural crops, but has limited availability and faces fraud risks (Transport & Environment, 2025). Therefore, **direct electrification, energy efficiency, and renewable electricity-based fuels like hydrogen are the most promising alternatives to decarbonize transport**.

Solid biomass in the form of wood pellets is also linked to forest conversion, while emissions from combustion are often higher than forest regrowth can capture (*upcoming RFN report, Kuepper et al 2025)*. The recent shift to co-firing wood pellets in coal-fired power plants, for example in Indonesia and Japan, is boosting demand. Rising demand has severe consequences, not only for the transition away from fossil fuels. Demand for biomass incentivizes wood energy plantations, which already has had devastating consequences in South-East Asia, where the conversion of native tropical rainforests to short-rotation plantations for crops, timber and wood pellets is a substantial driver of deforestation (*upcoming RFN report, Kuepper et al 2025*). Therefore, **the transition away from fossil fuels should not rely on solid biomass for industrial and household heating**.

RECOMMENDATIONS

Given the high socio-environmental risks from rising mineral and bioenergy demand for the transition away from fossil fuels, political leadership and multilateral collaboration are urgently needed.

A just, orderly and equitable transition away from fossil fuels must:

1. **Ensure that halting deforestation is a clear cross-cutting principle in all roadmaps and documents.** The Deforestation and TAFF Roadmaps must be connected and informed by one another, given the high deforestation risks linked to the transition away from fossil fuels.

2. **Reduce the need for new mining.** Limit demand for newly mined minerals, by:
    a. **Prioritising minerals for essential energy transition uses**.
    b. **Investing in solutions that reduce dependence on virgin raw materials**. Accelerate circular economy solutions; scale up mineral recycling, infrastructure and technology; and develop less mineral-intensive battery technologies.
    c. **Promoting knowledge-sharing and international collaboration** to encourage the circular economy and technological innovation in recycling and battery technologies.
    d. **Investing in progressive transport policies** such as shared mobility systems, public transport, smaller and more efficient vehicles.

3. **Protect key Restricted Areas** from mining activities, grounded in internationally recognised environmental and human rights protections. Stakeholders must acknowledge and respect a common set of Restricted Areas, defined by scientific, legal and social criteria on climate impacts, biodiversity, nature and Indigenous Peoples and Local Communities' rights, including: Protected Areas Recognised by International Conventions and Agreements; High Conservation Value Areas; High Carbon Stock Areas; Significant Natural Ecosystems; Critical Water Bodies; and Indigenous Peoples' and Local Communities' Territories (*Teske et al., 2026; Greenpeace International, 2026; upcoming policy brief, 2026*).

4. **Ensure Free, Prior, and Informed Consent** is a clear expectation and requirement across the transition away from fossil fuels, in line with the strongest established international conventions and agreements. Indigenous Peoples and Local Communities' rights must be protected, and their decisions respected, including when consent is not given or withdrawn.

5. **Ensure responsible sourcing with due diligence and full disclosure** is a clear expectation and requirement across the transition away from fossil fuels, in line with the strongest established international standards and agreements like the OECD Guidance for Responsible Business Conduct. This includes measures to prevent assets laundering within the supply chain and to promote good governance, traceability, transparency, and accountability along entire supply chains. In the current system, several certification schemes fall short both for minerals and bioenergy, making strong due diligence and rigorous third-party audits key requirements in responsible sourcing for the TAFF.

6. **Avoid reliance on unsustainable bioenergy.** Bioenergy development and use should be limited to truly sustainable alternatives, prioritising direct electrification and more sustainable alternatives. First-generation biofuels should be phased out, while waste-based feedstock should be subject to sustainability safeguards to exclude fraud. The limited volumes and competing uses of feedstocks with proven environmental benefits need to be considered in bioenergy development. Subsidies for unsustainable feedstocks and their use, for example, in co-firing, should be halted.

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