

Better Planning for a Just Green Energy Transition in Romania Biomass Use & Energy Poverty



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Summary	This document provides recommendations for the future revision process of the Romanian long-term climate strategy

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Introduction

A deep, rapid, and sustained reduction in global greenhouse gas emissions is imperative to mitigate climate change, as emphasized in the latest IPCC synthesis report (Sixth Assessment Report). Renewable energy stands out as one of the primary sectors capable of driving such reductions. In the domain of bioenergy, achieving a balanced utilization of different biomass feedstocks and their levels of energetic use is a critical aspect of climate mitigation strategies. This is particularly evident in the case of forestry biomass, where a growing conflict arises between the imperative to preserve biodiversity and the necessity of maintaining or increasing carbon stocks, juxtaposed with the utilization of biomass for renewable energy. As a result, long-term climate strategies grapple with controversial plans, highlighting the urgent need to strike the right balance.

According to Governance Regulation (EU 2018/1999), Member States were required to submit their long-term strategies by January 2020. The Romanian government, however, submitted theirs in May 2023. According to Article 15 of the Regulation on the Governance of the Energy Union and Climate Action, "Member States should, where necessary, update [their national long-term strategies] every five years". Over the past year, several reasons have made the revision process unavoidable. The "Fit for 55" package, which includes revisions to the LULUCF Regulation and the Renewable

Energy Directive (EU 2023/2413) (RED III), also impacts long-term planning regarding biomass. The heightened ambitions set forth not only by the Fit for 55 package but also by RePower EU are already evident in the revision of the National Energy and Climate Plans (NECP). These increased ambitions, alongside the proposed 90% reduction in net greenhouse gas emissions by 2040, should also be incorporated into the long-term planning document.

The objective of this document is to support the Romanian government in the future revision of the Romanian long-term climate strategy, with a specific emphasis on long-term LULUCF carbon sequestration, biomass-specific recommendations and the issue of energy poverty within this strategic framework.



Key messages

1. **The revision of the LTS should take place in 2025**, as recommended by the Governance Regulation, to align with the more ambitious targets in the NECP.
2. The **overall ambition has to rise**, setting the 2040 target at least in line with the EU objective. **Ambitious targets should be set for emission reduction, LULUCF sequestration and industrial removal.**
3. **Transparent planning of the future supply and demand of biomass is needed**, in order to ensure that the planned demand is fully covered by future available biomass, considering the impact of the sustainability criteria and the LULUCF targets.
4. From the sustainability criteria, it is key to **integrate the long-term impact of the cascading use implementation.**
5. **Ensure that the projected need for natural sequestration can be secured, and well-defined measures are planned to reach that.**
6. To reach the planned drastic level of firewood use reduction on household level, **dedicated household energy efficiency measures for firewood user households is needed, which promotes deep renovation, and overcomes the energy poverty aspect as well.**
7. **The Internal Energy Market Dimension** should encompass a suite of **policies, actions, and measures** directed towards **reducing energy poverty.**



General recommendations

The draft revised NECP offers a 2050 outlook for GHG emissions and allows for a comparison of planned energy-related emissions with the LTS. However, there are notable differences between the sectoral targets in these documents. To address this, a future revision of the LTS should aim to revise and harmonize these sectoral targets, incorporating the 2040 target of a least 90% reduction in GHG emissions. This is the minimum level of the -90-95% reduction that the European Scientific Advisory Board on Climate Change (ESABCC) [recommended](#).

Also as per the agreement reached at the UNFCCC level to adopt a common five-year timeframe, and also to more accurately depict the emission reductions required to remain within the carbon budget, the LTS should also incorporate interim targets for 2035 and 2045.

Transparency of planning with biomass

The Governance Regulation gives more flexibility to Member States regarding the structure of the strategy compared to the NECP, however, the level of detailness in the latter provides a sound basis for reliable planning. This is especially important for biomass, as it has to be ensured that the planned use of biomass is covered by sufficient amounts of sustainably sourced feedstock in a way that its use does not threaten to reach the LULUCF targets.

Overall, in RO LTS case, the planned energy use is presented in a relatively sufficient manner, distributed by the different sectors, while the supply side remains unclear.

All three scenarios target a similar share of RES in 2030: 34.3% in the Reference scenario, 35.9% in the Middle, 36.3% in RO Neutral. In contrast to the REF scenario, which targets a RES share of 56.9% in 2050, and the Middle scenario, which aims for a RES share of 76.9% by 2050, the growth in the RES share is more significant in the RO Neutral scenario: 89.9%. At the same time, the gross final energy consumption will decrease in all three scenarios. In terms of technologies, by 2050, the most important role will be played by hydrogen, solar and wind in all three scenarios, as well as biomass, especially in the REF scenario.

Among the decarbonisation hypotheses which were considered for obtaining the LTS objectives set for the residential sector, there are the energy demand partially fulfillment by hydrogen CHP and the employment of high efficiency technologies for heating & cooling and heating the water, along with the increase in share of heat pumps. As well, the use of electricity technologies for cooking will be increased, where natural gas and biomass-based technologies will be replaced (the use of biomass technologies for cooking in the rural areas will be reduced to 0% in 2050).

In the revised RO NECP, the projected trajectory of bioenergy demand shows that biomass will remain the main fuel used. Biomass consumption in 2030 will remain at a level similar to that of 2021, so that its share will remain around 90% throughout the analyzed period. The sectoral analysis highlights that most of the bioenergy demand is due, as expected, to the use of



biomass in the heating and cooling sector. The objective of the updated version of the NECP was to reduce the share of this sector in the demand for bioenergy from 85% in 2019 to 78% in 2030, at the same time increasing the share of bioenergy in the field of electricity, due to the construction and commissioning of new plants of production based on biomass and biogas. That is similar to the RO LTS counting in all three scenarios, on one of the key assumptions for the energy system, which is the development of new biomass CHP of 10 MW each year by 2050.

Moreover, it is envisaged that no coal or natural gas based-CHPs will be used starting from 2037, after which the heat will be produced by biomass, biogas and hydrogen-based CHPs and will be used in all sectors, including industry.

None of these programmatic documents are putting beside the estimated trajectories on bioenergy demand, the biomass supply by feedstock and/or origin (without distinguishing between domestic production and imports), while for forest biomass there is no applied assessment of its source and impact on the LULUCF sink. **Comprehensive supply analysis, comparison with future planned biomass demand is needed in the LTS as well.**

In order to ensure that there will be enough solid biomass for energy purposes (as there will be a switch of the use of biomass from heating & cooling to the production of electricity), the supply analyses should analyses on future planned primary forestry biomass use, and need to include other feedstocks, like non-primary woody biomass (e.g. industrial by-products, agricultural residues). Besides the carbon sink and sustainability limitations, described below, assessment of non-energy demand for these feedstocks are also mandatory, in order to avoid any future demand conflicts. The different units of feedstocks should be converted to primary heating value, in order to be comparable with the future planned energy use.

It is a well-known issue that currently the reported biomass energy use is around two times higher than the available biomass supply by the different statistics. The BioScreen CEE project [developed a detailed analysis](#) of this gap, and also developed [specific policy recommendations](#) which could contribute to eliminating the gap between the two sides.

The future impact of the sustainability criteria

Since the Renewable energy directive was revised again (EU/2023/2413), from a biomass sustainability perspective, the most important changes are that a link has been created between the planned biomass use and the LULUCF targets (see below next point), and that the biomass cascading principle was established. The cascading principle prioritizes using wood for long-lived material products, and to re-use and recycle those products as many times as possible, and only use it for energy purposes when wood would be otherwise disposed.

The RO LTS do not refer to the sustainability criteria, nor to cascading use of wood.



However, in the initially approved version of the NECP, was highlighted the large share of the biomass use in H&C sector, which has a questionable framework because at the national level there are no clear statistics on the real potential of biomass for energy, and the unclear national legislative framework in this field leads to some uncertainties regarding the classification of certain resources, such as firewood, which is used at a high level especially in rural areas, in the biomass category. Additionally, given that this target is expressed as a ratio between the amount of SRE and the final gross energy consumption, both variables can influence the value of the target. Therefore, uncertainties about the final gross energy consumption, which can be affected by various factors, such as weather conditions or the volume and type of industrial activity, can lead to difficulties in reaching the H&C target. In the revised NECP version from December 2023, there are marginally mentions of the need for measures to ensure a sustainable production and use of biomass.

Integrate in the LTS the cascading use implementation and its long-term impact, even though the directive is very generous in terms of possible derogation, for nature protection and climate purposes the adaptation of the directive should not undermine its main objective, i.e. to decrease the share of primary forestry biomass in the energy use.

The use of wood for wood products and new processing technologies for long-term storage of absorbed CO₂ must be also highlighted as an opportunity in the LTS.

The role of forest carbon sink

In the RO LTS the biomass is considered as renewable source, it is envisioned that its consumption will be reduced since conservation of LULUCF absorptions is of great importance, as well as due to the adverse air quality consequences of biomass consumption.

According to the RO Neutral scenario, Romania need to lower its net emissions by 78% by 2030, or its emissions (excluding LULUCF) by 67% from 1990 levels, in order to become climate neutral in 2050.

In the same time, it is considered that the LULUCF sector is the only one with net absorptions and it is crucial for reaching carbon neutrality since it has to balance out the emissions from all the other sectors. The LULUCF sector has the major role in the absorption of the GHG emissions. Due to the fact that this sector already achieves significant absorptions, it is assumed, in all three scenarios, in order to reach climate neutrality, the LULUCF absorptions should be at least 14% larger in 2050 compared to 1990, which is similar to what was already achieved in 2005.

As a result of the policies and measures foreseen to be implemented in the Agriculture sector and the continuation of measures leading to GHG absorptions in the LULUCF sector, when analysing these two sectors as a whole, an increase of the total net GHG absorptions will occur in 2050 compared to 1990, in all three scenarios. When compared to 2019, these net absorptions will be increased by 65% in 2050 in the RO Neutral scenario. The RO Neutral



scenario is 32% more ambitious than the REF scenario. In terms of individual GHG, the highest share of the absorption concerns CO₂, while the highest share of the emissions is due to N₂O, followed by CH₄. The emissions reduction in LULUCF is assumed based on the fact that the annual average forest burned area by 2050 will be equal to the average forest burned area during 2010-2019 in all three scenarios.

The GHG emission and removals that Romania reports to UNFCCC in the National Inventory of GHG (INEGES), the total GHG emissions and removals (net emissions, including the LULUCF sector) were 85.46 Mt CO₂-eq in 2019, which represents a reduction of 70% compared to emission level in 1989.

If the removals from the LULUCF sector are not accounted for, then the total GHG emissions in 2019 were 113.94 Mt CO₂-eq (63% less compared to 1989). The prevailing share of emissions originated from the Energy sector (throughout the entire 1989-2019 period), accounting for total emissions 67% in 2019, followed by Agriculture, with nearly 17%, IPPU (industrial processes and product use) sector with around 11% and Waste sector with 5% share.

In the LTS graphs, the 24,342 kt CO₂-eq level of absorption from the forestry sector of LULUCF is to be maintained constant by 2050, which is similar with the assumptions from the NECP which proposes a cautious approach regarding the evolution of the level of absorption in the forestry sector of LULUCF, indicating its maintenance at approximately 24,342 ktCO₂e in 2030.

Although, neither the LTS, nor the NECP analyzes directly the link between the biomass use and supply with its sustainable production, some important information can be found in the National Inventory Report from April 2023 Romania's Greenhouse Gas Inventory 1989-2021. In the Report, the most important category recognized to be the main source of CO₂ removals is forest land (FL) use category. This situation is, to some extent, related to the smaller annual harvest rates compared to annual forest growth in biomass, generating a significant amount of carbon stock change. The evolution of net emissions shows that the sector has functioned as a sink for the entire time period. The main factor behind this trend was the category of FL, including associated forest vegetation land (defined as an area covered by woody vegetation larger than 0.25 hectares with a minimum tree height of 5 meters at maturity and a canopy cover over 10 percent and wider than 20 m). Forest biomass in forest land remaining forest and forest soils, in land converted to forest land categories, are the predominant carbon pools in the category, contributing significantly to the category sink function.

Regarding the approach for forest land area representation for the Report, the forest definition elected by Romania to report the Forest land use IPCC category, matches the national definition of the forests included in the National Forest Fund (NFF), administered by forest districts and subject to national regulations for forest management plans, for which quantitative data is available in the national statistics. However, new data evidence (National Forest Inventory - NFI estimates) showed that the forest area in Romania is more extensive than what is included in the NFF, which led to new area estimation efforts. The digital boundary of the NFF includes approximately 80% of the 6.5 million hectares of the Forest in the management plans, which are strictly regulated by the forest code (Law no. 46/2008) and thus considered roughly constant throughout the time series.



Moreover, the total removals from the FL category in the year 2021 are -29,179.28 kt from which the land converted to forestland accounts for 5.42%. An abrupt increase in the CO₂ removals for the 1989 - 2000 period was a direct consequence of the marked decrease in harvest rates after the communist period (a reduction of 39% comparing average values for decades before and after 1989). Although the annual area of land converted to forest land decreased over the years, it was still higher than deforestation activity, which resulted in an increase in total forest area by 1.8% between 1989 (6,864.23 kha) and 2021 (6,990.72 kha).

Forests have a complex structure and high (bio)diversity; the forest stands with two or more tree species covering more than 72% of the total area, while natural forest types with predominant native species occupy over 90% of the total forest area. On the other hand, about 85% of the total forest area is even-aged. The majority of forest areas (over 90%) are included in the management plans where the application of forest regime according to forest code and norms is required. Romanian forestry has a long tradition: the first management plans were developed in the last half of the XVIIIth century. Notable improvements in forestry occurred under the communist regime, driven by centralized planning at the national level. Governmental technical norms, long-term planning of wood harvesting, and consequent industrial processing guided the strict implementation of management practices. Since 1990, due to land property change, Romanian forestry has been registered under an inconsistent regulatory framework and pressure from international wood markets. It initially proved to fall short in applying sustainable management principles. In the past years, Romania has managed to set and follow objectives addressing forest protection and preservation by choosing and promoting treatments based on natural regeneration that consider environmental conditions and socio-economic requirements. The maximum allowable cut is fixed annually by national authorities (MEWF) and distributed among all forest districts based on their annual harvest possibility (estimated by each forest district according to management plans and later aggregated and agreed upon nationally) without exceeding the national threshold. This rule has preserved the sustainability management of forests in Romania. Indeed, the annual national harvest level was lower than the allowable cut all over the reporting period.

Not the last, in the National forestry accounting plan of Romania for the first compliance period (2021-2025) the forest reference level (FRL) estimation includes all emissions and removals from LB (aboveground biomass and belowground biomass), HWP (Harvested Wood Products) and DW (Deadwood), which are taken into account for projecting FRL in the first compliance period 2021-2025 assuming the continuity of Forest Management Practices (FMP) in the Reference Period (2000-2009).

Ensure that the projected need for natural sequestration can be covered, and measures are well-defined for that, including its potential limitation on biomass use.

In the revision process, the gap between the projected level of natural sequestration, and the modeled demand for carbon sequestration has to be addressed. In order to close that gap, further action plans need to be identified.





Household energy efficiency

LTS assumes that firewood use on household level will drop until 2050 but it is not clear how the government would like to achieve such a dramatic shift in the firewood user households only by increasing up to 25% share of heat pumps and increase the share of solar thermal collectors in the useful energy demand for heating & cooling and the use of electricity technologies for cooking that will be increased. Also without special programs and funding the exponential renovation rate from 0.69% annual renovation rate up to 4.33% during 2041-2050 seems an impossible objective.

Comprehensive household energy efficiency measures are necessary to encourage deep renovations for households using firewood, ensuring the anticipated significant reduction in firewood consumption. The LTS should incorporate customized measures for firewood-using households, ensuring they are not overlooked by future funding opportunities simply because biomass is classified as renewable energy. This plan should also include a detailed roadmap to address energy poverty, with specific targets and measurable progress indicators.

Energy Poverty

Although governments are not obligated to include and document a chapter on energy poverty in the LTS, it is nevertheless important in the Internal Energy Market Dimension to detail objectives, targets, and clear measures for reducing energy poverty. This is especially crucial since without directly addressing this issue, energy efficiency targets in the residential sector may not be achievable. Additionally, without state support in improving the energy efficiency of vulnerable households, achieving an ambitious reduction of 4.33% during 2041-2050 seems like an impossible goal.

Furthermore, we want to draw attention to the danger of "shifting" biomass consumption from the residential sector to the industrial sector (New biomass CHP – 10 MW each year by 2050), which could lead to increased prices for the population, further exacerbating the widespread issue of energy poverty in Romania.

In the current LTS, it is stated that most investments will be made by individuals, including the purchase of high-performance cars and household appliances, efficient technologies for heating, space cooling, water heating, cooking, lighting, as well as thermal renovation of houses and apartments. However, there is no mention of support and assistance for the population experiencing energy poverty who may not be able to afford these costs.