Leaning on Uncertainty

Assessing governments' reliance on industrial carbon removals and land sinks to reach climate targets

ITALY CASE STUDY
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CARBON MARKET WATCH

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At a glance...

For more information on carbon dioxide removals and a glossary, click here.

Italy's approach to long-term climate planning prioritises the compensation of projected 2050 emissions through land-based removals over deep emission reductions, and assumes the risk of a degrading land sink by increasing logging levels. Its government relies on unspecified carbon capture solutions, including industrial carbon dioxide removal (CDR), without identifying adequate policy measures.

Italy does not have a dedicated national climate law in place, and implements broad climate targets that stem from EU legislation. In particular, the country has mandatory targets for gross emissions reductions and net natural removals by 2030, derived from the EU's Effort Sharing Regulation (ESR) - covering road transport, buildings, agriculture, small industry and waste - and Land Use, Land Use Change and Forestry (LULUCF) Regulation, respectively. These targets correspond to 43.7% emission reductions in effort-sharing sectors and net removals of -35.8 Mt CO_2eq in its land sink by 2030. The commitments are designed to meet the EU's overarching commitment under the European Climate Law to achieve a 55% reduction in emissions by 2030.

In addition, Italy's 2021 Long Term Strategy (LTS) establishes a carbon neutrality target by 2050 and broadly outlines how net-zero would be achieved (pp. 8, 19, 20). The strategy projects 65-85 Mt CO_2eq of remaining annual emissions by 2050. Of this, 45 Mt is to be compensated by land-based removals and between 20 and 40 Mt by industrial carbon management. Yet, the LTS does not specify how much of the latter will be delivered by Carbon Capture and Storage (CCS), Carbon Capture and Utilisation (CCU), or industrial removals. Projections by the Italian National Institute for Environmental Protection and Research (ISPRA) (414/2025, p. 80) of the currently planned emission-reduction policies evidence the need for additional measures to achieve the net-zero goal by 2050.

Italy's climate plans prioritise loosely defined 'carbon capture technologies' over fundamental changes in technology and consumption patterns, an approach that carries significant risk. By treating structural emissions reductions as secondary to carbon capture and permanent removals, the plans leave Italy exposed if industrial CDR fails to deliver as expected.

Italy's land sink projections reveal high volatility and unresolved risks. Following a data correction in 2024 going back to 2015, ISPRA's projections for the land sink (414/2025, p6) now exceed Italy's LULUCF target for 2030. However, forest harvesting is planned to increase to 40-45% annually until 2030 before stabilising (pp65-66), this approaches levels that sensitivity analysis shows would shrink and potentially eliminate the land sink entirely (LTS, p. 81, fn. 82). Italy's 2024 National Energy and Climate Plan (NECP)

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acknowledges that rising bioenergy demand may put further pressure on forests. Yet assessments do not account for the potential increase in biomass demand through Bioenergy with Carbon Capture and Storage (BECCS) or provide sourcing strategies (p109).

Critical infrastructure gaps remain unaddressed. While Italy identified 750 Mt of theoretical storage capacity within its territory (NECP 2024, p. 85), CO_2 transport and storage plans are in the early assessment stage, and sources of additional renewable capacity for industrial CDR are unspecified (p34).

TARGET SETTING	REMOVALS POLICY	TRANSPARENCY	FEASIBILITY
residual emissions definition	industrial removals	land use & sequestration rates	land use & sequestration rates
residual emissions quantification	land sink	technology & energy	technology & energy
general transparency	financing	transport & storage	transport & storage
reliance on international offsets	depth of assessments	biomass	biomass

Table 1: Traffic light graph; cell colours represent the level of transparency, depth, and plausibility of made assessments and plans; green = overall relatively transparent and plausible, yellow = partly lacking transparency or depth, red = severe transparency gaps or identified delivery risks. The classification is meant to provide an overview of key issues and best practices and is relative to the other reviewed countries.

Methodology Note

The case study was developed by reviewing publicly available policy and assessment documents, supplemented by transparency requests to national ministries and agencies. Data on 17 themes, including residual emissions, technology assumptions, and biomass sources, were analysed to identify gaps and best practices in countries' industrial CDR and land sink strategies. From the identified themes, 12 indicators were selected, as visible in Table 1. The collected information was clustered into themes, and key issues were broken down and underscored by references to authoritative documents in the detailed analysis section.

The scope of the analysis was limited to documents created by or on behalf of government ministries and agencies, with supplementary documents included where necessary. Detailed information on the methodology is available in the accompanying report. All reviewed documents and supplementary sources are either directly linked in the text or can be found in the list of sources at the bottom of this document.

Detailed Analysis

Target setting

● Residual emissions and removal targets

Italy's climate targets rely entirely on European Union law and are not further disaggregated by sectors.

To implement the Effort Sharing Regulation (ESR), the country is committing to a 43.7% reduction in emissions from effort-sharing sectors, including transport, buildings, and agriculture, by 2030 compared to 2005 levels (see Annex 1). For the Land Use, Land Use Change, and Forestry (LULUCF) sector, Italy commits to achieving annual net-removals in the land sink of -35.8 Mt CO_2eq by 2030. Nonetheless, as per the European Climate Law, Italy must contribute to EU-wide carbon neutrality by 2050, but it has no domestic legislation that commits to achieving net-zero emissions. The lack of legislative climate architecture in Italy is a missed opportunity for greater transparency and clearer, more granular sectoral responsibilities.

Italy's official documents and reports suggest a national 2050 climate-neutrality goal and a not transparently quantified reliance on CDR.

Italy's 2021 LTS, which outlines the policies and measures needed to achieve the country's climate targets, sets out the ambition to reach climate neutrality by 2050. For this, 45 Mt CO_2eq of land-based removals, as well as 20 Mt CO_2 of industrial removals, CCS and CCU are planned to compensate for residual emissions (p4). The goal is further defined as reaching net-zero GHG emissions domestically. A report by the Italian Institute for Environmental Protection and Research (ISPRA) from 2024, titled "Greenhouse Gas Emissions in Italy: Reduction targets to 2030" (339/2024), also acknowledges the necessity to reach global climate neutrality by 2050 (p7). However, no national legally binding target for 2050 has been established, and Italy's 2024 National Energy and Climate Plan (NECP) notes that estimates of reliance on Bioenergy with Carbon Capture and Storage (BECCS) and Direct Air Carbon Capture and Storage (DACCS) are not yet available (p87).

Italy projects 65-85 Mt of residual emissions in 2050 and relies on optimistic levels of land sink removals, CCS, and industrial removals to reach net-zero.

Residual emissions are projected in Italy's 2021 LTS to be 65-85 Mt CO_2eq (p8), but no sectoral breakdown of these emissions, nor adequate definitions or assessments, are provided in the reviewed documents. In the LTS, the goal to restore the land sinks to the historic maximum of about 45 Mt CO_2eq is noted (p8), but no measures to support this development were identified.

For the remaining 20-40 Mt CO_2eq of residual emissions, after accounting for the expected land sink, the LTS refers to the available national CCS potential as a solution (p8). On industrial CDR, Italy is less clear, but some formulations hint at the reliance on BECCS to decarbonise the waste sector and cement production. The 2024 NECP notes that waste incinerators in Italy produce around 7,5 MtCO_2 (presumably in 2022), including emissions from biogenic feedstocks (p83). A mix of technologies with highly different applications, bundled under the title "Carbon Capture Utilisation and Storage" (CCUS), including industrial CDR, CCU and CCS, is seen as the main, or even the only, lever of decarbonisation for the sector (p83). However, the reviewed documents are unclear about the projected contribution of each of these technologies. Further, Italy's 2021 LTS notes BECCS as a potential "decarbonisation" option for the cement sector (p55). The lumping of emissions reduction and avoidance options, such as electrification or circular-economy measures, which need to take priority, with industrial removals, represents a lack of safeguards against mitigation deterrence.

Projections of planned measures indicate that current emission-reduction policies are insufficient to achieve the proposed residual emissions.

ISPRA provides emissions projections in their 2025 report on reduction targets and emission scenarios (Report 414/2025, p. 80). The With Existing Measures (WEM) scenario (p67) projects emissions in 2050 (excluding LULUCF) to be 271.42 Mt CO_2eq, about 4 times Italy's aimed volume of remaining emissions. In their With Additional Measures (WAM) scenario, which accounts for planned and not yet implemented policies, gross emissions in 2050 are estimated at 175.6 Mt (excluding LULUCF), decreasing further to 156.8 Mt in 2055 (p80). Compared to the 65-85 Mt of residual emissions expected in Italy's 2021 LTS (p8), the WAM scenario shows that the currently planned measures are insufficient to reach that goal.

Large amounts of emissions from industries are broadly labelled "hard-to-abate", but no adequate in-depth assessments are cited for this conclusion.

Italy's 2024 NECP defines steel, cement, ceramics, chemical, refinery, and glass production as "hard-to-abate industries" (p86). It calculates emissions from these sectors in 2022 to be 67,5 Mt CO_2eq. Only about 20 % of these are process emissions, while the majority are energy-related (p86-87). Emissions from other industrial sectors, according to the 2024 NECP, amount to 22 Mt CO_2eq in 2022 (p86). Additionally, the same document states that all of these emissions, both the hard-to-abate ones and others, do not appear to be significantly reduced by 2030 (p86). The lax and imprecise scope of "hard-to-abate" emissions and projected sluggish emission reductions in industry sectors demonstrate a lack of ambition in Italy's climate policies.

Following corrections of the underlying data, Italy's projections of its land sink have shifted considerably, now exceeding the 2030 LULUCF Regulation target.

Recent projections from ISPRA (Report 414), published in 2025, show that Italy will have met its 2025 no-debit goal and will exceed its 2030 target of -35.8 Mt CO_2eq under the LULUCF Regulation (p6). Net land-sink removals in 2030 would be at -42.8 Mt CO_2eq (p6).

In contrast, earlier projections in Italy's 2024 NECP (p15) and Biennial Transparency Report (p144) indicated that Italy would miss its LULUCF Regulation target for 2030 by 7.4 Mt.

The 2025 National Inventory Report (p. 296) explains that earlier underestimations resulted from an error in soil estimates for land converted to forest.[1] The document shows that recalculations go back to the year 2015, with new net-removal estimates in 2022 differing by about 15.2 Mt CO_2 (p297). However, there are high fluctuations in the data, which are not explained in the reviewed documents. Reported removals in the National Inventory Report jumped from -39.2 Mt in 2022 to -53.6 Mt in 2023 (p57). No further explanation of the error, recalculations, and the high fluctuations is included in the reviewed documents, therefore exhibiting poor transparency.

General transparency

Climate planning documents exhibit low transparency and conceptual weaknesses regarding industrial removals, posing inherent risks to effective and reliable climate action.

[1] ISPRA, National Inventory Report, 2025, "The deviation occurred in the reporting year 2015, comparing the 2025 and 2024 submissions, is due to an error found and fixed in the soil estimates, for land converted to forest land subcategory." (p296)

In the reviewed documents from Italy, CCS, BECCS, and DACCS are often incorrectly conflated as "CCS", leading to a lack of clarity about which technologies are being referred to. This conflation is made explicit in Italy's 2024 NECP. In the document, the use of DACCS and BECCS is mentioned as part of "Carbon Capture and Storage" (p80).

In addition, the reviewed documents don't separate emission reductions and removals, and the necessary prioritisation of emission reductions is missing throughout them. An example of this can be found in the 2021 LTS, which falsely labels DACCS and BECCS as emission reduction channels (p34). Both the amalgamation of CCS, BECCS, and DACCS, and the disregard for prioritising emission reduction over removals may elevate the risks of mitigation deterrence.

● Reliance on international offsets

Italy neither officially relies on nor excludes the use of international offsets to reach its climate targets.

The reviewed publicly available documents do not allude to the reliance on international offsets. A response by the Italian Ministry of the Environment and Energy Security, issued in October 2025, to a request for additional information leaves more room for ambiguity (p2). The response refers to the current EU NDC that excludes the use of international credits. In parallel, it also mentions the European Commission's proposal to revise the European Climate Law, which introduces the possibility of using international credits to meet the 2040 EU climate target. The statement does not exclude the possibility of using such credits should the new European Climate Law allow for them (p2).

With the finalised revision of the European Climate Law in December 2025, the potential use of international carbon credits is foreseen. Whether Italy chooses to use such credits, which already show risks of being far less effective than expected, remains to be seen.

Removals policy

● Specific plans and foreseen measures

Italy's Long-Term Strategy establishes a hierarchy that prioritises carbon removals over emission reductions, creating structural conditions for mitigation deterrence.

Italy's 2021 LTS sets out an explicit sequence of climate measures to achieve climate neutrality in the long run: first, the absorption capacity of the LULUCF sector is to be considered (p19); second, carbon capture and storage technologies in steel and cement industries and biogenic power generation would be deployed, and third, “disruptive changes” in technology, consumption patterns, and production methods would come into play (p20). This ordering places deep emission reduction measures, described in the strategy as ‘disruptive changes’, the lowest priority.

Italy's 2022 Plan for Ecological Transition states that CCS, CCU and industrial CDR are intended for "unavoidable emissions/residual emissions" (p66). This is confirmed in Italy’s updated NECP, in which CCUS, here including DACCS and BECCS, are labelled as crucial for limiting emissions, especially for hard-to-abate sectors. Nevertheless, this framing is inconsistent with the LTS's prioritisation structure, which sequences removals and capture technologies before the transformative measures that would establish what emissions are genuinely unavoidable.

The prioritisation framework in Italy’s 2021 LTS may displace feasible and reliable emission reduction efforts, potentially delaying or preventing the implementation of measures necessary to meet emission reduction targets.

While BECCS is included in Italy’s climate plans, the expected volumes or timelines are not disclosed.

Italy’s 2021 LTS identifies heavy industries like steel and cement as promising candidates for carbon capture. It estimates that in these sectors 10-20 Mt of CO_2 could be captured (p52). However, the strategy does not specify how much of that captured carbon would come from biomass, and therefore could be considered a carbon removal, nor does it provide a timeline for when capture could realistically occur. A table on page 55 refers to possible negative emissions: "If the plant uses a zero-emission fuel (e.g. biomass, biomethane, synthetic methane), applying CCS results in negative emissions (a particularly interesting option for cement plants that lend themselves well to fuel switching[2] to solid biomass)." (p55). Thus, BECCS is seen as a viable climate mitigation option for Italy.

A study from the Italian Ministry of the Environment and Energy Security, titled ‘CCUS Study: Analysis of technical, economic and regulatory aspects relevant to the development of the CCUS supply chain’, presents some reservations. On page 51, the study lists carbon

[2] Fuel switching is the practice of replacing a carbon-intensive fuel with a lower-carbon or zero-carbon alternative to power an industrial process or generate electricity.

capture technologies by relevance for the decarbonisation of Italy's industries. BECCS is found in the lowest category due to limited interest and limitations of the current regulatory framework (p51).

Italy's LTS includes ambitious targets for LULUCF removals but provides limited detail on the planned policy measures needed to achieve them.

Italy's 2021 LTS, in the decarbonisation scenario, outlines planned measures to restore land sinks to their historic maximum of approximately 45 Mt CO_2eq by 2050 (p8). It states that these levels of removals in the land sink would be possible through "sustainable soil management" and "strengthened fire prevention action, with the creation of infrastructures and warning systems" over the territory (p83).

The 2022 Plan for an Ecological Transition outlines broad measures to offset residual emissions by 2050, including a programme of reforestation, sustainable management of existing forests, and the use of wood resources with a cascade approach as an alternative to high-emitting structural products - presumably referring to harvested wood products (p61). These interventions are intended to increase carbon sink capacity beyond levels established in the LULUCF Regulation and National Forestry Accounting Plan, as referenced in the National Forestry Strategy (p61). However, ISPRA's 2025 report (n°414) indicates that current land-based removal levels may be threatened "in the face of an increase in emissions due to an increase in areas affected by fires". But, these would still be sustained through "substantial maintenance of forest absorption capacity and a halt to urban expansion" (p78), without specifying concrete policies.

Notably, the 'with additional measures' (WAM) projections included in the ISPRA report (p80) are identical to 'with measures' (WM) projections (p67), implying that no additional policy interventions are planned.[3] Meanwhile, the same report, consistent with the National Forestry Accounting Plan referenced in the LTS, anticipates harvesting activities will increase to 40-45% by 2030 from current levels of 33% (p65-66). This increase in harvesting appears contradictory to the goals of maximising carbon sequestration in the sector. Despite that, the report fails to separately assess the effects of this increased harvesting on Italy's land sink.

[3] Projections in ISPRA report 414/2025 are based on policies and measures set out in its 2024 NECP, including implemented measures until the end of 2022 in its WM scenario, and all measures planned and not yet implemented by then in its WAM scenario (ISPRA 414/2025, p58).

● Associated financial cost and source of financing

Planning for financing industrial CDR is still in the research phase and has not yet been reflected in Italy's climate strategies and policies.

The Italian Ministry of the Environment and Energy Security's 2025 'CCUS Study'[4] outlines potential financial support mechanisms and reviews the strategies of multiple European countries for financing CCS, CCU, and industrial CDR. Cost estimates for the transport and storage of CO_2 are included, along with extensive detail on assumptions, such as capture efficiency and capture technology, and an elaborate breakdown of the costs (p61). However, separate cost estimates for the mentioned carbon dioxide removal technologies are not included in the study. For the complete carbon capture and storage supply chain in Italy to reach an annual injection capacity of 4 Mt by 2030, with Ravenna's CCS hub as the reference project (as mentioned in Italy's 2024 NECP (p82)), total capital expenditure would range from about 3.6€ billion to 6.1€ billion. Operational costs are projected to range from 260€ million up to 455€ million (p93). As a source of financing for CCU, CCS and industrial CDR, the study proposes using ETS auction revenues supported by system charges for electricity and gas (p94). The study calls for consideration and mitigation of potential impacts from competition with other decarbonisation measures (Ibid.).

Constraints and risks

● Land use and sequestration rates

The growth of Italy's land sink until 2030 seems to be enabled by farmland and urban areas ceasing to expand, and a decrease in grazing land.

Italy's 2024 Biennial Transparency Report (p131) and ISPRA report 414/2025 (p65) appear to share identical assumptions for the modelling of Italy's LULUCF emissions and removals. However, Italy's BTR includes net-removal estimates from before the methodologies were revised in 2024. It is assumed that agricultural areas will continue to expand until 2040, after which they are expected to stabilise. For grazing land, a decrease is expected due to a reduction in grazing animals. In line with the goal of limiting land consumption, settlement

[4] The study fulfils the mandate under Decree Law No. 181/23 (CCS law) to, among others, carry out feasibility and sustainability analyses, including cost analysis, of CO2 capture processes for different types of users.

areas are expected to remain at their current size, while forest areas are expected to increase until 2030 and then remain constant thereafter.

Apart from more frequent and intense forest fires, no other climate-change-related disturbances are explicitly modelled in the land sink projections.

Report 414/2025 by ISPRA assumes a "significant increase in the frequency/intensity of fires [...] with the area affected possibly almost doubling compared to the long-term average." (p78). The report notes that this would result in significant increases in emissions, but doesn't provide any quantitative estimate. Moreover, it is not explained how these additional fire-related emissions are balanced in the overall projections to stabilise the land sink. Other natural disturbances, such as floods, pests, and storms, that are likely to be exacerbated by climate change, are not explicitly incorporated in the projections. Failing to include them in assessments and modelling undermines the credibility and robustness of the land-sink projections.

● Technology and energy

Italy's plans for industrial CDR rest on assumptions of a radical transformation of its electricity system, but the source of renewable energy to power these technologies is unspecified.

Italy's LTS acknowledges that for the decarbonisation scenario to 2050, "the electricity system should transform radically", with electricity identified as essential for carbon removal technologies such as Direct Air Capture (DAC - excluding the carbon storage part of the process) (p34). The strategy outlines three macro conditions necessary to enable DAC and BECCS deployment: "1. Increase in electricity production and its complete decarbonisation; 2. Ability to handle a massive share of intermittent sources; and flexibility of the electricity system; 3. Strong integration of electricity infrastructure with the rest of the energy system, optimising the management of different energy carriers" (p34). The LTS estimates that DAC would require 0-3 TWh of energy annually under the decarbonisation scenario (p36) and envisions DAC technology as part of combined systems alongside e-fuels production and power-to-heat plants (p37). Additionally, adding carbon capture to power plants, as done for BECCS, would reduce their efficiency by 7-10% due to the energy required for CO_2 capture and compression (p39). Still, the strategy does not specify potential sources of additional renewable energy capacity to meet demands beyond the existing electricity needs.

Transport and geological storage of CO_2

Italy acknowledges substantial unresolved challenges in deploying carbon capture and storage infrastructure at scale.

Italy's 2021 LTS already explicitly recognises critical systemic issues that must be resolved, including the transport and storage of CO_2 (p35). The strategy further notes that "[...] safe storage sites should be located, and adequate carbon dioxide transfer plans should be put in place, especially in the case of remoteness from industry to the chosen site." (p52).

Recently, Italy has taken first steps to enable industrial CDR by allowing geological CO_2 storage and identifying potential storage and injection capacity.

According to its 2024 NECP, Italy amended its legal framework in 2023 to enable permits for CO_2 storage in suitable geological formations (p80). The same document refers to an analysis of domestic CO_2 storage potential, which identified 750 Mt of total storage capacity, though availability varies considerably by location and timeline (p81). Of this total, 104 Mt can be stored in onshore sites and would be simpler to implement, 130 Mt of storage in offshore sites will only become available after 2040 due to geological complexity, and the remaining 515 Mt will also be offshore, but it is not specified when it will be available (p81).

According to the 2024 NECP, storage in saline aquifers has additional potential, though Italy's total capacity in such formations is largely unknown (p81). Two studies are referenced in the NECP that estimate that these have a combined minimum capacity of approximately 5 Gt CO_2 (p81). For the Ravenna hub, Italy's largest offshore geological storage site, indicative development plans, including projections of annual injection capacities, are provided in Italy's 2024 NECP. It projects annual planned injection capacities of 4 Mt CO_2 by 2030, scaling to 12 Mt CO_2 by 2035, and plateauing at approximately 16 Mt CO_2 from 2040 to 2050 (p82).

A critical caveat in Italy's approach in its 2021 LTS, 2024 NECP, and the 2025 CCUS Study is that geological storage and injection plans are not disaggregated for CCS, BECCS, and DACCS, which represents a low level of transparency. This also risks hampering further planning and assessments, since transport needs may differ vastly between fossil carbon capture, which will take place in industrial hubs, and DAC, which may happen at remote locations.

Biomass supply

Italy's 2024 NECP acknowledges that bioenergy demand could affect the land sink but fails to note the possible impact from BECCS.

Italy's 2024 NECP notes that bioenergy demand is projected to rise to meet energy needs in the heating and transport sectors, and will mostly be met using biomethane (p109). A stable trend is expected for solid biomass consumption (p109). Potential effects on the LULUCF sector emissions/removals are acknowledged, but no quantified estimate is provided (p109). Potential biomass feedstocks for BECCS are not explicitly mentioned in this assessment. However, the 2024 NECP notes that in the included WAM scenario, domestic production of liquid biofuels used in agriculture, housing and transport would only meet 70% of demand by 2030 (p109). This suggests that the remaining 30% of biofuel demand would be sourced from abroad, potentially shifting the land-use pressures to other countries with weaker deforestation legislation.

A sensitivity analysis of higher logging levels shows the tipping points of the land sink; nonetheless, Italy continues to increase harvesting levels.

Italy's LTS includes a sensitivity analysis of the effects an increase in logging might have on future LULUCF emissions (p81, fn. 82). At a 50% increase in logging, compared to the 2010-2020 period, net removals would fall sharply, and Italy would miss its LULUCF target for 2030 - the sector would even be a net emitter. The main model in the LTS includes an increase of logging to 40-45% (p81), following the National Forestry Accounting Plan and the National Forestry Strategy. While this model uses LULUCF data prior to the 2024 correction, which is more conservative than an assessment based on current LULUCF data, the analysis exemplifies the high volatility of the land sink. The maximisation of logging levels to satisfy growing biomass demand is clearly established as a risk for the land sink that the Italian government seems willing to take.

Key issues

Italy relies heavily on novel technologies to achieve climate targets, conflates CCU, CCS, and industrial removals, and positions these measures ahead of deep emission cuts, potentially delaying the adoption of more efficient and reliable solutions. Its climate plans lack credibility as Italy has not set climate targets in national legislation. Instead, it builds on the expectation that the land sink will provide removals in 2050, while failing to identify measures that would reliably achieve the desired levels.

1. The order of prioritisation of measures to reach net-zero in 2050 reveals a preference for offsetting before the needed deep emission cuts. Italy's 2021 LTS positions LULUCF removals and CO_2 capture and storage solutions (including CCS, CCU, and BECCS) as the first two options to counterbalance poorly defined "hard-to-abate" residual emissions in the country (p19). Only as a third alternative, structural transformations in technologies, habits (e.g., diet change), and production methods would be pursued. Such prioritisation risks locking in continued high emissions by delaying the profound socio-technical changes that are widely acknowledged as essential to successful decarbonisation.

2. Italy lacks national legislation that establishes sectoral climate targets, instead relying directly on EU-level commitments. Currently, Italy's climate targets under EU legislation are the Effort Sharing Regulation target of a 43.7% reduction compared to 2005 levels, and the LULUCF Regulation target to reach annual net-removal levels of 35.8 Mt CO_2eq in its land sink by 2030. The broad sectoral scope of these targets demonstrates low transparency and a lack of determination to reduce emissions. Additionally, this approach risks accountability issues down the line and may fail to ensure that climate mitigation measures are continually pursued at the national level.

3. Italy's climate plans fail to clarify the role of industrial CDR. Removal technologies such as BECCS and DACCS are continually conflated with CCS and CCU, resulting in a lack of transparency (e.g., 2021 LTS, 2024 NECP). Italy's climate plans lack projections for the different technologies but still rely on them to reach long-term targets, undermining its credibility in working toward net-zero.

4. Policy choices in the LULUCF sector do not reflect the vulnerability identified in existing assessments. Italy's LTS includes plans to reach the historical maximum of -45 Mt CO_2eq net removals from the land sink to reach net-zero in 2050. Assessments indicate that the currently identified policies will not achieve these desired levels. Still, the Italian government plans to increase logging levels in its Forestry Accounting Plan and fails to identify long-term measures to protect and enhance carbon sinks.

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