

Luxembourg

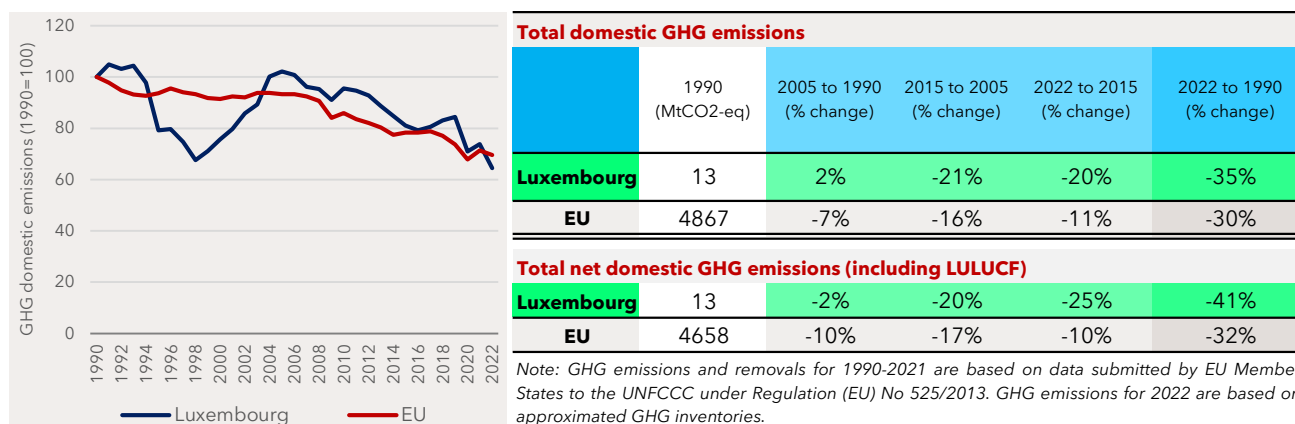
1) Key Highlights

- In 2022, GHG emissions in Luxembourg were 8.2 MtCO₂-eq, 12.6% lower compared to 2021.
- Net GHG emissions (i.e. including LULUCF) in 2022 were 41.4% lower than 1990 levels.
- Emissions covered by the Effort Sharing Regulation decreased by 12.3% compared to 2021.
- By 2050, net GHG emissions in Luxembourg are expected to be 1.3 tonnes per capita.

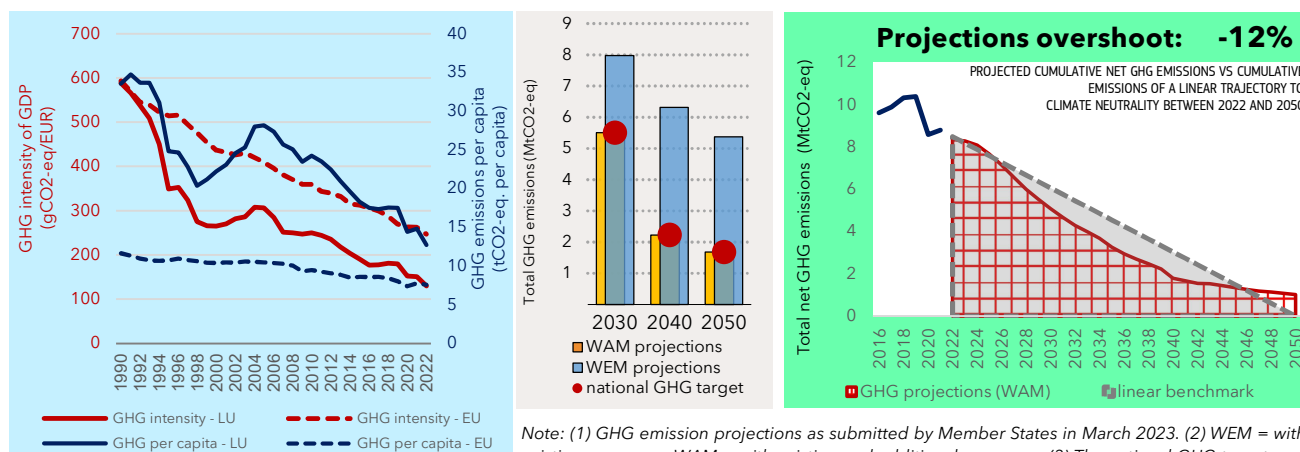
2) Greenhouse Gas Emissions



In 2022, approximated domestic greenhouse gas (GHG) emissions in Luxembourg were 8.2 MtCO₂-eq, 12.6% lower compared to 2021 and 23.5% below pre-pandemic levels. Overall, net domestic emissions, including the Land Use, Land Use Change and Forestry (LULUCF) sector, were 41.4% lower than 1990 levels.



In 2022, net GHG emissions per capita in Luxembourg were 13 tonnes of CO₂ equivalent, above the EU average of 8 tCO₂-eq. In the same year, the GHG intensity of GDP (i.e. net GHG emissions over GDP) was 130 gCO₂-eq/EUR, below the EU average of 247 gCO₂-eq/EUR.



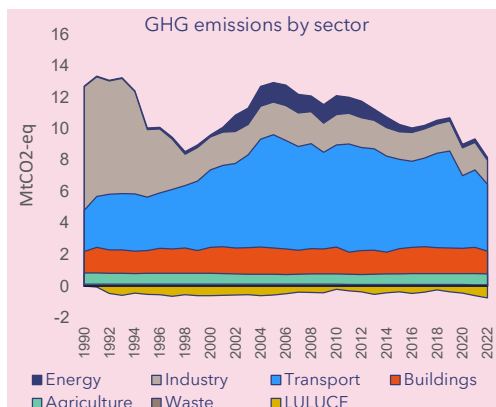
Note: Total net GHG emissions, including LULUCF and excluding international aviation. GHG inventory 1990-2021 and approximated GHG inventory 2022 (EEA). Real GDP in 2015-prices (AMECO). Population (Eurostat).

Note: (1) GHG emission projections as submitted by Member States in March 2023. (2) WEM = with existing measures; WAM = with existing and additional measures. (3) The national GHG targets are from Member States' submissions of NECP progress reports (Annex I, Table 1). Missing data are replaced by other available reported information. (4) The overshoot metric compares cumulative projected net GHG emissions under the WAM scenario (including LULUCF) with cumulative emissions underlying a linear trajectory from 2021 emissions levels to zero by 2050.

Projections submitted in March 2023 under the existing policy scenario (WEM) point to a reduction in net GHG emissions (including LULUCF) of -39% and -62% by 2030 and 2050, respectively, compared to 1990. Taking into account additional measures (WAM), projected reductions are -60% and -92% for the same respective years.

Trajectories are also important. By comparing the cumulative projected net GHG emissions between 2022 and 2050 with a linear trajectory to climate neutrality by 2050, Luxembourg shows an undershoot of 12% (i.e. cumulative projected emissions are lower than those from a linear trajectory).

3) Greenhouse Gas Emissions by Sector



	1990 (MtCO ₂ -eq)	2005 to 1990 (% change)	2015 to 2005 (% change)	2022 to 2015 (% change)	2022 to 1990 (% change)
Energy	0.0	3453%	-62%	-58%	466%
Industry	7.9	-74%	-15%	-15%	-81%
Transport	2.6	174%	-21%	-25%	62%
Buildings	1.4	22%	-4%	-10%	6%
Agriculture	0.7	-10%	7%	2%	-2%
Waste	0.1	2%	-14%	-20%	-30%
LULUCF	0.0	(absolute change) -0.6	(absolute change) 0.2	(absolute change) -0.4	(absolute change) -0.8
International aviation	0.4	228%	6%	41%	390%

Notes: (1) Energy sector refers to electricity and heat production and petroleum refining. (2) Industry includes fuel combustion in manufacturing and construction and emissions in industrial processes and product use. (3) Buildings includes emissions from energy use in residential and tertiary buildings, and energy use in agriculture and fishery sectors. (4) For LULUCF, the table reports differences between the given years in absolute values (MtCO₂-eq). Negative values indicate a reduction of net emissions or an increase in net removals.

In 2022, the highest contribution to GHG emissions in Luxembourg came from the transport sector (42%), followed by the international aviation sector (19%) and the industry sector (15%), while LULUCF net removals amounted to 7.4% of total GHG emissions.

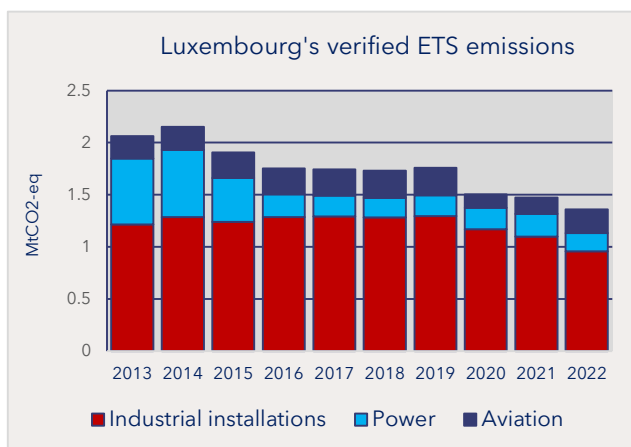
Between 2015 and 2022, the sectors which contributed the most to the change in net GHG emissions (i.e. -25%) were transport, for which emissions fell by 25%, and LULUCF, where net removals increased by 0.4 MtCO₂-eq.

4) Emissions under the EU Emissions Trading System (ETS)



The EU ETS is an EU-wide market instrument to provide an incentive for emission reductions and transformative investments in the covered sectors. This means that it is largely the market that determines where in the EU the emission reductions take place, outside the control of Member States. However, Member States may adopt complementary (sectoral) policies in addition to the ETS's carbon price signal.

In 2022, stationary installations (e.g. power generation and manufacturing industry) in Luxembourg emitted 1.1 MtCO₂-eq (equal to 14% of total GHG emissions in Luxembourg). This is 14.0% lower compared to 2021 and 24.2% below pre-pandemic levels. By 2022, emissions from stationary installations were down by 38.6% against the 2013 level (i.e. -61.2% to the 2005 level). Aviation emissions covered by the EU ETS were 47% higher compared to 2021, but 15% below the 2019 level.



In parallel, Luxembourg has raised over EUR 0.12 billion in auction revenues since 2013, available for further climate action and energy transformation. Luxembourg reported that an average of 60% of revenues was spent for climate and energy purposes over the same period. (*)

MtCO ₂ -eq	2013	2021	2022
Power installations	0.6	0.2	0.2
% change since 2013	-	-65.6%	-72.1%
Industrial installations	1.2	1.1	1.0
% change since 2013	-	-9.5%	-21.3%
Aviation (**)	0.22	0.15	0.23
% change since 2013	-	-28.3%	5.1%

(*) Revenues are not earmarked, example projects have been reported up to 100% of revenues each year. (**) ETS emissions from aviation include flights within the European Economic Area (EEA) and outgoing flights to Switzerland and to the UK.

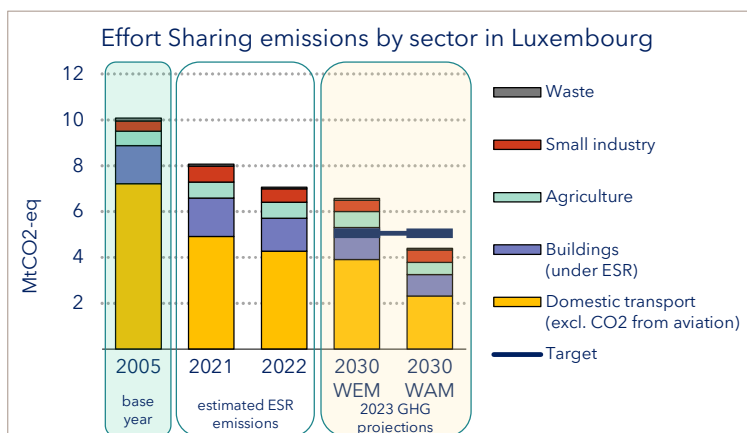
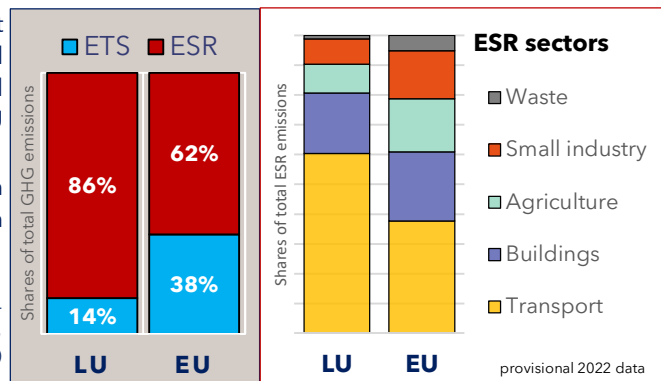
5) Emissions in Effort Sharing Sectors



In 2022, emissions from sectors under the Effort Sharing Regulation (ESR), which excludes ETS and LULUCF emissions and removals, were 86% of total emissions in Luxembourg compared to 62% for the EU as a whole.

In 2022, effort sharing approximated emissions in Luxembourg were 7.1 MtCO₂eq, 12.3% lower than in 2021 and 23.4% below the pre-pandemic level.

Notes: (1) Small industry includes emissions from energy industries, manufacturing and construction, and industrial processes, that do not fall under the EU Emission Trading System. (2) Transport includes emissions from domestic transport activities, excluding CO₂ emissions from aviation. (3) Buildings includes emissions for heating buildings under the ESR.



In 2022, the largest contribution to the absolute change in ESR emissions came from transport, for which emissions decreased by 13.2%, and buildings, with emissions decreasing by 13.5% compared to 2021.

In 2022, transport accounted for 60% of total ESR emissions in Luxembourg, and buildings accounted for 20%.

Note: (1) 2022 ESR emissions are based on approximated inventory reports and the European Environment Agency (EEA)'s calculation of ESR emissions. The approximated emissions can, therefore, deviate from Member States' reported emissions. (2) Projections as reported by Member States under Reg. (EU) 2018/1999, compiled and checked by the EEA. (3) WEM = with existing measures, WAM = with existing and additional measures.

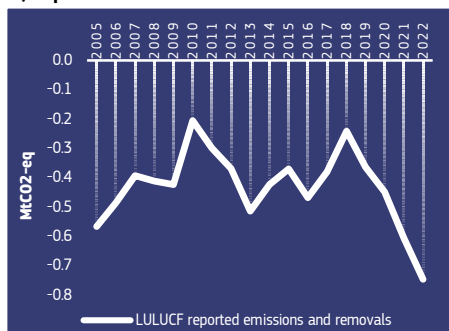
The Effort Sharing Regulation (ESR) sets the 2030 ESR emission reduction target for Luxembourg to 50%, compared to 2005 levels. GHG projections submitted by Luxembourg in March 2023 under the existing measures scenario (WEM) point to a 35% decrease in ESR emissions by 2030 compared to 2005 levels, less ambitious than its ESR emission reduction target by 15 percentage points. Considering the impact of additional measures (WAM), projected ESR emissions point to a 58% decrease, broadly in line with the ESR emission reduction target.

6) Land Use, Land Use Change and Forestry (LULUCF)

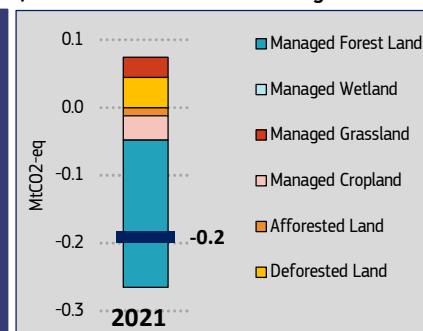


Based on final inventory data, in 2021, Luxembourg reported net removals of 0.61 MtCO₂-eq in the land use, land use change, and forestry sector (LULUCF). Based on approximated data, in 2022, net removals from the LULUCF sector were 0.75 MtCO₂-eq.

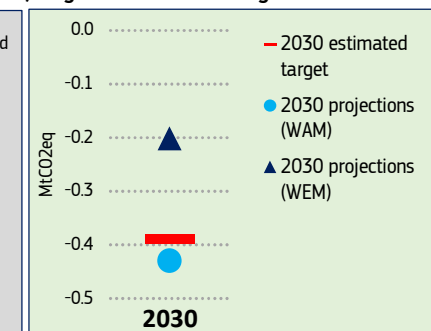
1) Reported LULUCF net emissions and removals



2) Period 2021-2025 with accounting rules



3) Progress towards 2030 target



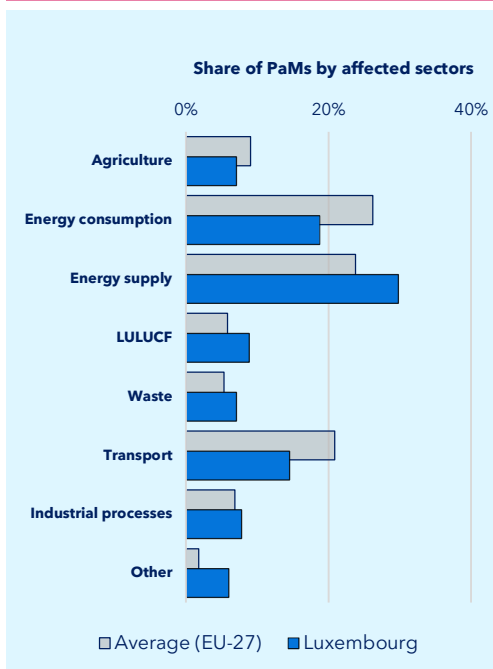
Notes: (1) Figure 1 shows net reported emissions and removals for the LULUCF sector. Net removals are expressed as negative numbers and net emissions as positive numbers. (2) Figure 2 shows the accounted emissions and removals for the LULUCF sector in 2021. Computation of the accounts per land use category, applying the standardised rules in the LULUCF Regulation (EU) 2018/841. The input data for this analysis have been extracted from the EU Greenhouse Gas Inventory Report 2023 for 1990-2021 based on final Member States' inventory submissions under the EU Governance Regulation (EU) 2018/1999. Seven Member States report 2021 data as approximated data for 2022. (3) Figure 3 shows projected progress with existing measures (WEM) and with additional measures (WAM) in relation to the national 2030 target. The LULUCF Regulation sets out binding national 2030 targets for each Member State encompassing all emissions and removals in the LULUCF sector (Art. 4.3). The targets are specified in Annex IIa of the LULUCF Regulation. Individual targets are derived from the EU-wide target of -310 MtCO₂-eq net removals by 2030, Member States' average historic net removals from their GHG inventories for the years 2016, 2017 and 2018 and the countries' share of total EU managed land area.

With current LULUCF accounting rules – with a limited scope – applicable to the period 2021 to 2025, the provisional ‘accounted’ balance for 2021 using the 2023 GHG inventory submission produced an accounted credit of 0.2 MtCO₂-eq.

Managed Forest Land and Deforested Land were the dominating land activities, with accounted net removals of 0.2 and accounted net emissions of 0.0 MtCO₂-eq, respectively.

2023 LULUCF projections for Luxembourg show net removals in 2030 of 0.2 MtCO₂-eq with existing measures (WEM) and 0.4 MtCO₂-eq with additional measures (WAM), a surplus of around 0.0 MtCO₂-eq to the estimated 2030 net removal target of 0.4 MtCO₂-eq.

7) Policies and Measures



In 2023, Luxembourg reported 197 single policies and measures (PaMs), representing an increase of 181% compared to 2021. As of 2023, 42% of the reported PaMs are planned but not yet implemented.

Ex-ante emission savings

Luxembourg did not estimate an expected emission reduction effect for any of its single or group PaMs.

Investment needs

Luxembourg estimates the investment need for 60% of its single and group PaMs. It estimates the initial investment requirement at EUR 10558.5 ml. Actual investments up to and including 2021 amount to EUR 671.3 ml., with EUR 9887.2 ml. remaining to be implemented at this date.

More information and visualisations are available at the EEA integrated national energy and climate policies and measures data viewer.

Source: <https://climate-energy.eea.europa.eu/topics/policies-and-measures/climate-and-energy-policies-and-measures/data>

8) Climate-Neutrality Dashboard



Luxembourg	Total net GHG emissions 2022-1990 (% change)	Total net GHG emissions 2022-2015 (% change)	GHG intensity of GDP 2022-2015 (% change)	Projected net GHG emissions by 2030 (tonnes per capita)	Projected net GHG emissions by 2050 (tonnes per capita)	Overshoot vs. linear trajectory (net GHG emissions 2022-2050)	Overshoot vs. non-linear benchmark (total GHG emissions 2022-2050)	Target year for climate neutrality (NECP progress reports, national long-term strategies or *** other sources)	Legal status of the climate-neutrality target (based on the Net-Zero Tracker)
	-41%	-25%	-36%	7.3	1.3	-12%	-2%	2050	In law
EU27	-32%	-10%	-20%	5.1	3.6	34%	40%	2050	In law

Note to the table: (1) Historical GHG emissions and removals (1990-2022) are based on the EEA's 2023 GHG Inventory and Approximated emissions and removals. (2) GHG intensity of GDP (gCO₂-eq/EUR2015) uses net GHG emissions (i.e. including LULUCF and excluding international aviation). Real GDP and population data from Eurostat. (3) GHG emission projections as submitted in 2023 by Member States under Art. 18 of the Governance Regulation considering additional measures (WAM). EU Population in 2050 is based on the latest Eurostat population projections. (4) The overshoot vs. a linear trajectory compares, for each Member State, the cumulative projected net GHG emissions (including LULUCF) between 2022 and 2050 with a linear trajectory starting from the 2021 emission level to zero by 2050. The overshoot against a non-linear indicative benchmark compares the cumulative projected GHG emissions (excluding LULUCF) with an indicative pathway to climate neutrality based on the scenarios proposed by the European Scientific Advisory Board on Climate Change, and then distributed across Member States according to the country's share of EU emissions in the core policy scenario supporting the initiatives delivering the European Green Deal. Projections consider, where available, the impact of both existing and additional policies and measures. (5) Target dates to achieve climate neutrality as in the NECP progress reports or, with an asterisk **, when from other unofficial sources (Net-Zero Tracker: <https://zerotracker.net/>).

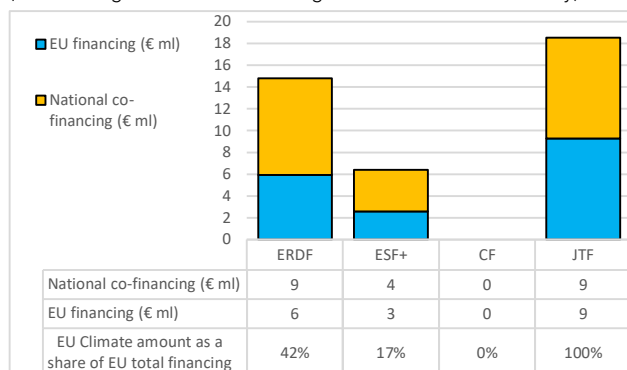
9) Financing Climate Action



Cohesion policy

Luxembourg's planned financing for climate action

(EU financing & national co-financing - 2021-2027 Cohesion Policy)



The chart presents information on investment plans and achievement targets from adopted programmes. Financing for cohesion policy uses a categorisation to provide thematic information on the finances planned.

Source: <https://cohesiondata.ec.europa.eu/>

Innovation and Modernisation Fund

Innovation Fund (Portfolio of signed projects)

	n.	EUR million
Small-scale projects	-	-
Large-scale projects	-	-

Modernisation Fund

(List of confirmed or approved investment proposals)

n.	EUR million
non-beneficiary	

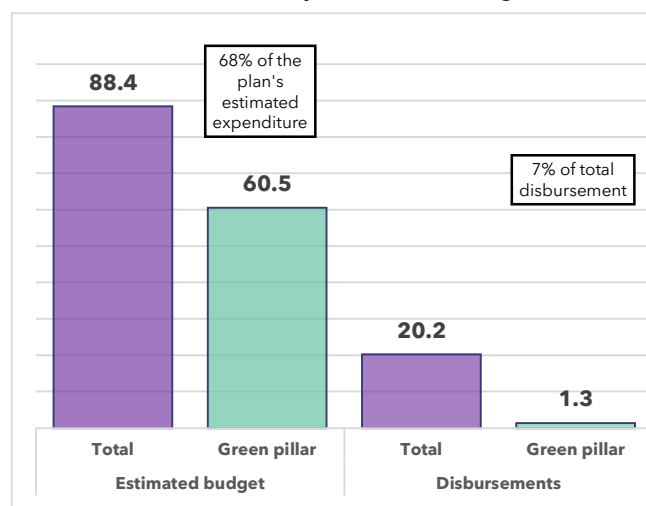
Major Innovation Fund projects

n.a.

Recovery & Resilience Facilities

RRF allocations (EUR billion)	Grants:	Loans:	% of GDP
	0.08	-	0.1

RRF contribution to the Green pillar in Luxembourg (€ ml)



This graph displays: 1) the estimated cost of measures attributed by the Commission, in consultation with the Member State, to the green pillar either as primary or secondary assignments; and 2) how disbursements under the RRF (excluding pre-financing) relate to the green pillar.

Major green transformation RRF recipients

Luxembourg Support scheme for charging points

EUR 30.5 ml.

Luxembourg Protection of environment and biodiversity "Naturpakt"

EUR 6.0 ml.

Source: [Innovation Fund Project Portfolio - Innovation Fund - Portfolio of signed projects | Sheet - Olik Sense \(europa.eu\)](#)

Based on the list of the 100 final recipients receiving the highest amount of funding for the implementation of measures under the RRF per country as reported by the Member State in line with Article 25(a) of Regulation (EU) 2023/435 amending the Regulation (EU) 2021/241 on the establishment of the Recovery and Resilience Mechanism.

Source: https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/index.html?lang=en