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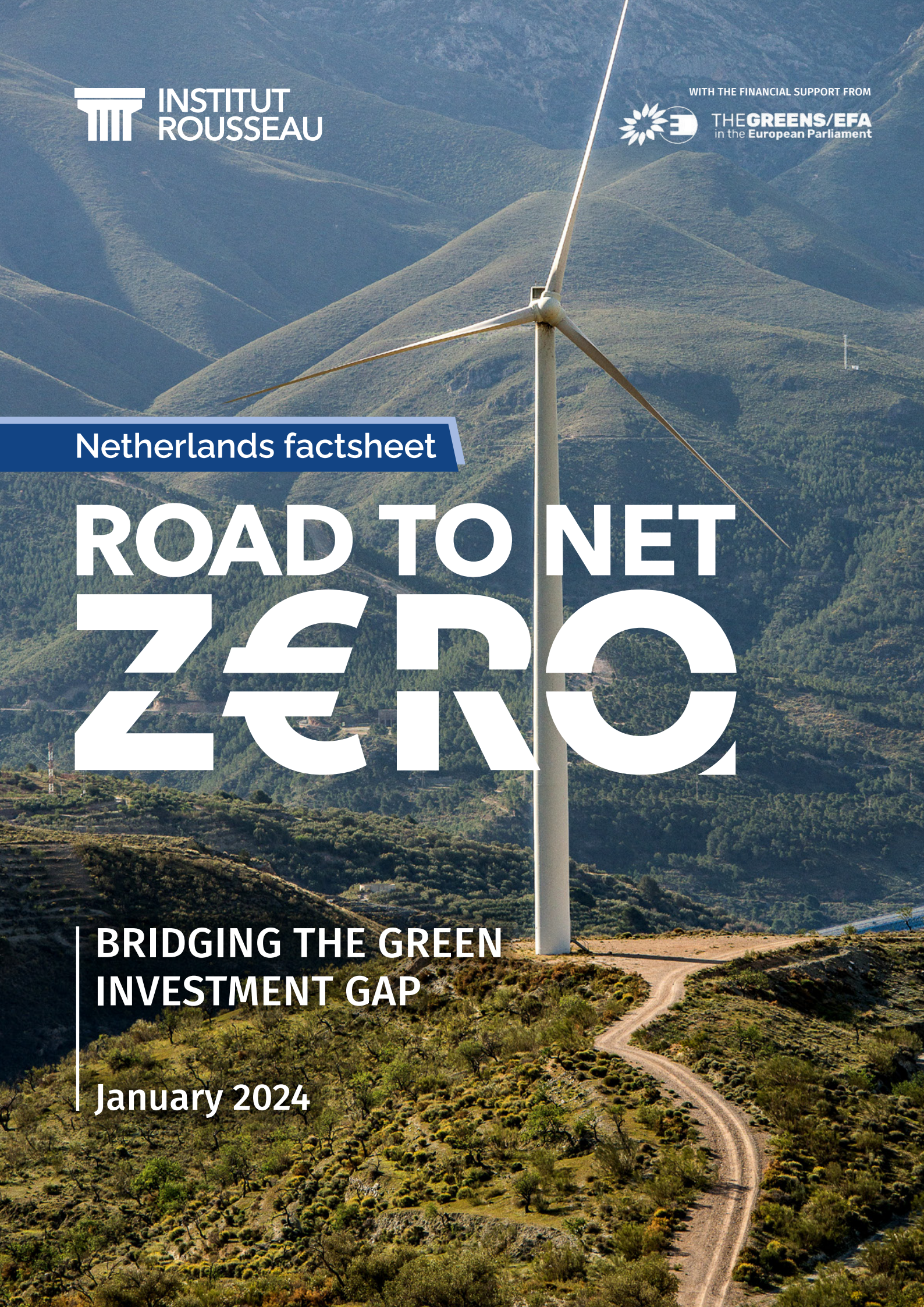


Netherlands factsheet

ROAD TO NET ZERO

BRIDGING THE GREEN INVESTMENT GAP

January 2024

This document is an appendix of the Road to Net Zero report. For more details and EU-scale results, please refer to the full report. For more information about the methodology used, please refer to the Methodological Appendix.

Key takeaways

- **An additional €17 billion investment is needed by 2050 to decarbonise the Dutch economy, averaging around 1.8% of current GDP** yearly.
- This extra-investment plan can be **partially financed by redirecting fossil fuel subsidies**, will be **offset by a sharp decrease in energy costs**, is **~50% less expensive than the EU Com plan** (thanks to more efficiency & sufficiency) and **~6 times less than the cost of inaction**.
- **The Netherlands' public expenditure should triple** from €10 to €30 billion per year. **This additional public investment of €20 billion per year amounts to around 2.1% of the current GDP**. Biggest needs for additional public support are in the **buildings sector**.

TRANSPORT

While soft mobility is already an example for other countries, transport investments should be more than doubled, of which **more than 65% has to be done for public transportation development (mainly train)**.

BUILDINGS

Public extra investment needs for efficient renovation are particularly high in the Netherlands considering the very limited current public support, the high % of individual houses and the very high surfaces/inhabitants.

AGRICULTURE

Extra-investments needed are relatively limited considering the country area, but **the needs of extra-support/ha and to compensate for herd reduction remains high**.

ENERGY PRODUCTION AND INFRASTRUCTURE

In relation to its GDP, the Netherlands has to invest more than the European average to move away from a gas-based system (including through the local production or proportionally more expensive e-gas, leading to a tripling of power generation capacity by 2050) **and execute on its wind power potential.** The extra-investment however remains moderate due to an already high investment trend, both in production and in the power grid. **The extra public investment cost is one of the highest**, due to a higher share of more highly subsidised technologies in the production mix (typically offshore wind).

CARBON SINKS (LULUCF)

Netherland's wetlands and peatlands aren't costly to protect but essential to reach high levels of decarbonization. **If half of Netherland's peatlands were to be degraded, additional 1.38 Mha of forest** (about 4 times the total wooded area) **would need to be planted** to temporarily offset such a loss.

CROSS-SECTOR/R&D

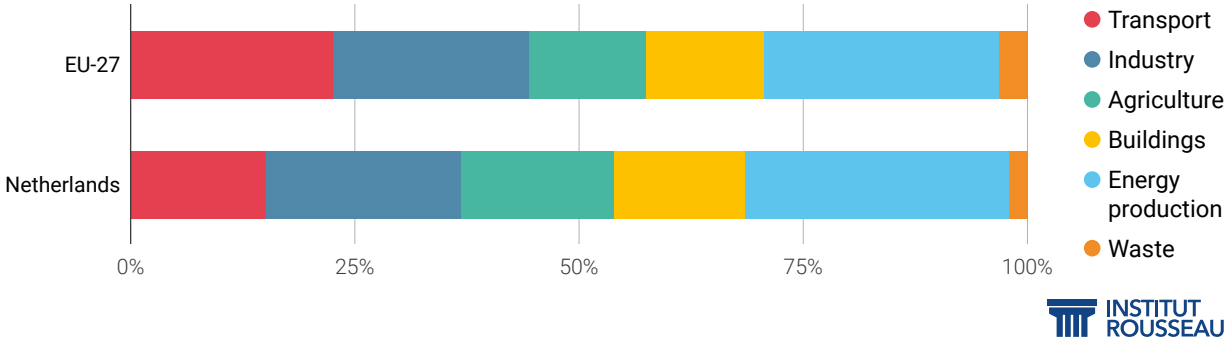
As in Germany, Netherlands align closely with the EU average in terms of energy and agriculture current R&D and extra-investment needs but **also need a strong reorientation of its agriculture public R&D toward agroecological systems**.

1 Current GHG emissions, decarbonisation potential and action levers available

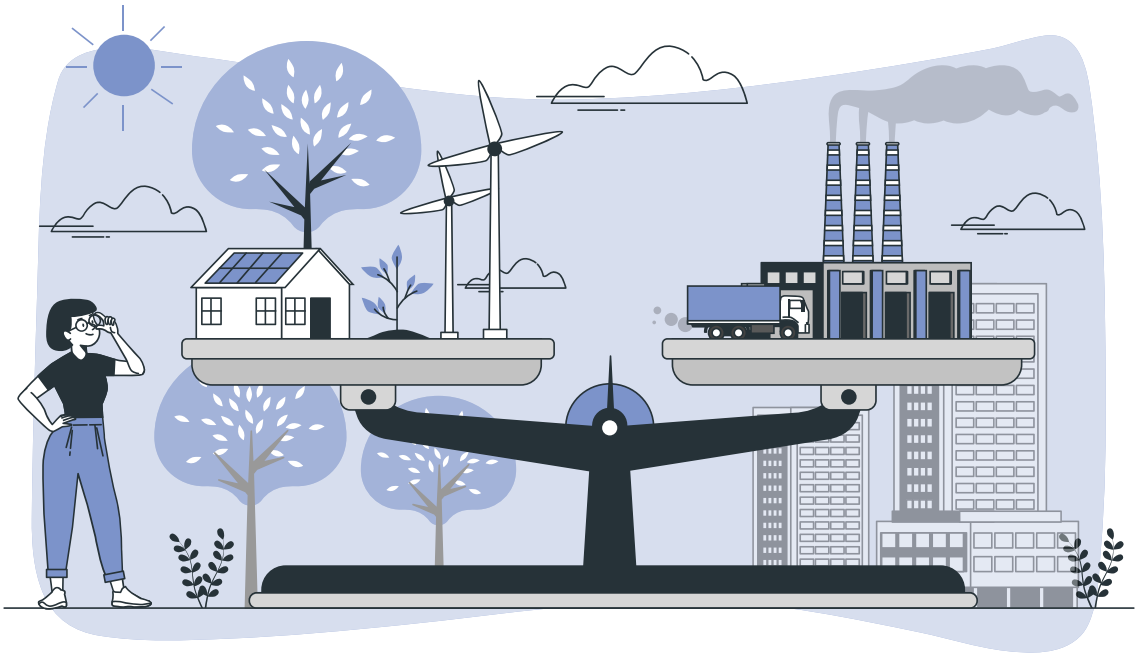
1.1 Current GHG emissions profile

The Netherlands' territorial emissions are primarily due to transport (29%) and industry (23%). Agriculture follows with 17% before transport and buildings (which consume energy for heating, cooking, etc.), with 15% each. Waste management constitutes the remaining 2%, primarily attributed to methane emissions resulting from the natural decomposition of organic waste in landfills.

Fig. 1 **Sectoral breakdown of the Netherlands and EU-27 current domestic emissions (2021), in %**



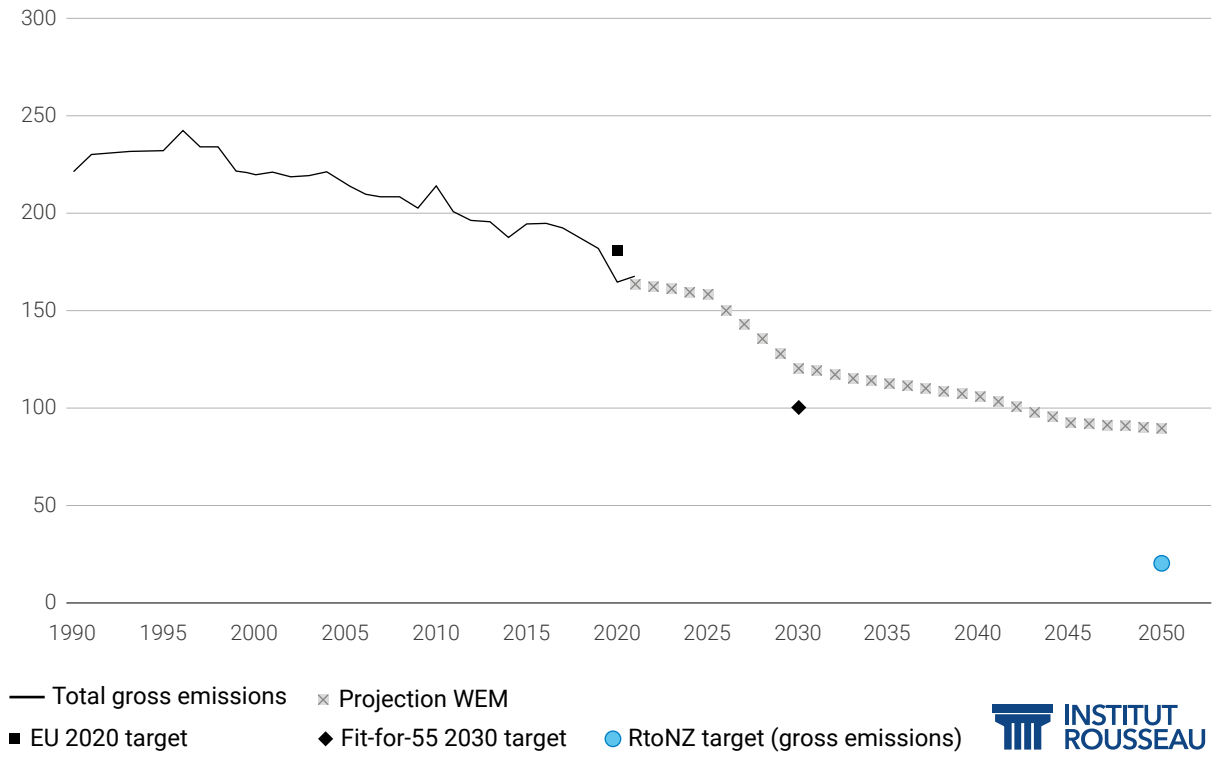
Compared to the rest of the EU, the Netherlands stands out with a proportionally more emissive energy production sector and a much less emissive production sector.



1.2 GHG emissions trend

The Netherlands is the sixth greenhouse gas emitter in Europe. It contributed 168 million tons of CO_2-eq in 2021, approximately 5% of the European Union's emissions. Since 1990, the country's emissions have decreased by 25% or 1.8 million tons per year on average (compared to -29% for EU-27), as shown on Figure 2.

Fig. 2 **The Netherlands's past domestic emissions and progress towards achieving 2030 and 2050 targets, in million tons of CO_2 equivalent ($MtCO_2e$).**



WEM: With Existing Measures. European Environment Agency, 'Total net greenhouse gas emission trends and projections in Europe', 2023.

1.3 Decarbonisation levers

To meet these targets, it is necessary to activate multiple levers. There are 37 decarbonisation levers in total, outlined in Figure 3. Key decarbonisation levers with significant emission reduction potential involve energy (power production), transport (cars, trucks) and building renovations. But there is no single solution for instantly decarbonising the Dutch economy. All listed levers, regardless of their scale or economical efficiency, must be engaged to reach the goal of carbon neutrality.

Fig. 3 **Decarbonisation levers proposed and modelled in this study, by sector**

TRANSPORT

1. Reduce the number of vehicles and convert them to low-carbon technologies
2. Develop public transportation
3. Develop soft mobility
4. Reduce air traffic and switch to Sustainable Aviation Fuels
5. Transition to zero carbon navigation

INDUSTRY

1. Reduce industrial production through end-use sufficiency
2. Increase material efficiency
3. Increase energy efficiency
4. Decarbonize industrial energy mix
5. Develop low-carbon innovative processes
6. On-site Carbon Capture, Utilisation and Storage
7. Develop EU strategic industrial sectors for the transition

AGRICULTURE

1. Reduce herd size and adapt breeding practices
2. Convert crop systems to agroecology
3. Convert tractors to low-carbon technologies

BUILDINGS

1. Efficient renovation of housing
2. Efficient renovation of public tertiary buildings
3. Efficient renovation of private tertiary buildings

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ENERGY PRODUCTION AND INFRASTRUCTURE

1. Decarbonize and adapt the power system
2. Switch from fossil gas to biogas and other 'green' gases
3. Phase coal and oil out, end conventional refining activities
4. Decarbonize heat production for district heating

WASTE MANAGEMENT

1. Separately collect and recover biowaste
2. Reduce plastic use, increase plastic recycling and substitution with other materials
3. Reduce wastewater treatment emissions through process adaptation
4. Produce biogas from waste and sludge

CARBON SINKS (LULUCF)

1. Improve forest management
2. Revitalise degraded ecosystems
3. Support wood industry adaptation
4. Increase forest area
5. Turn grasslands back to net sinks
6. Plant hedgerows and field trees
7. Protect wetlands and peatlands
8. Reach net zero artificialisation

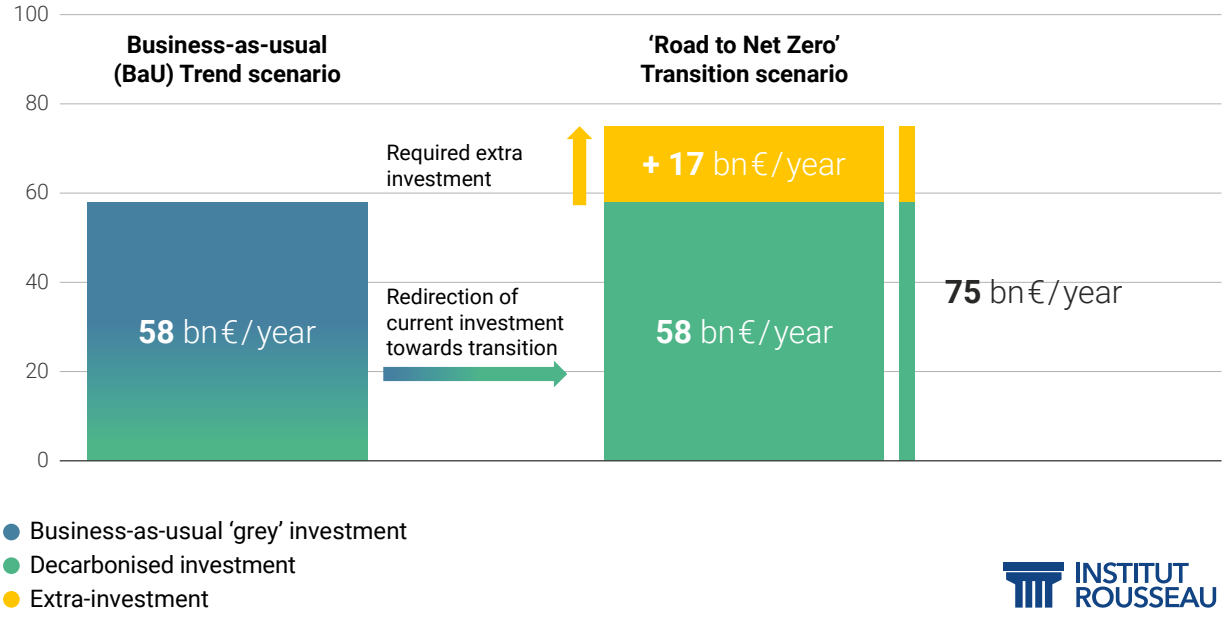
CROSS-SECTOR LEVERS

1. Enhance Research & Development in transition solutions
2. Foster public awareness of environmental issues
3. Boost the Fair Transition Fund to support professional transitions

2 Global investment required

The collective investment required to activate all decarbonisation measures is estimated at €2 trillion by 2050, averaging €75 billion yearly (Figure 4). This equals almost 7.8% of current GDP. This contrasts with the ongoing business-as-usual (BaU) scenario, estimated at around €1.5 trillion between now and 2050, averaging €58 billion per year (6% of current GDP). The difference, about €470 billion or an average of €17 billion per year, represents the 'extra investment' needed for carbon neutrality. This extra investment represents a 30% increase compared to the baseline scenario and around 1,8% of current GDP.

Fig. 4 **Concepts and amounts of total EU-27 investment required for the transition and extra investment compared with a business-as-usual scenario (in billions of euros per year)**



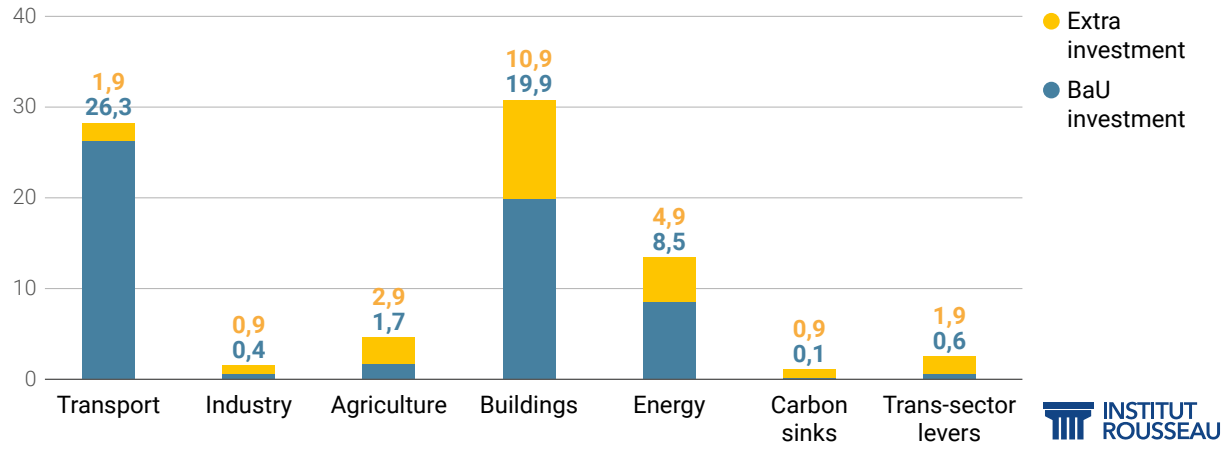
These estimates are correct only under the express condition that all BaU investments are actively redirected towards the transition by 2050. This implies a massive divestment from sectors that have become partially to completely obsolete. Without this active shift, not only will carbon neutrality not be achieved, the above-mentioned extra cost will also be higher.

In terms of total investment (Figure 5), approximately 76% is focused on two sectors: buildings (**40%**, €30 billion annually) **and transport** (**36%**, €27 billion annually). This is due to the large-scale nature of these sectors, which invest in tens of millions of vehicles and buildings. These sectors are followed by energy production and infrastructure (17%, €13 billion annually) and agriculture (5%, €3.5 billion annually). Industry (€0.8 billion annually), cross-sector measures (€1.2 billion annually), carbon sinks (€0.2 billion annually) and waste management require only 4% of total investment.

When considering extra investment compared to the business-as-usual trend, the building and energy production sectors require the most substantial extra effort, with respectively 47% (€10 billion per year) **and 25%** (€4 billion per year) of the total extra investment required. In the building sector, this is attributed to the need for an accelerated renovation pace and a shift towards com-

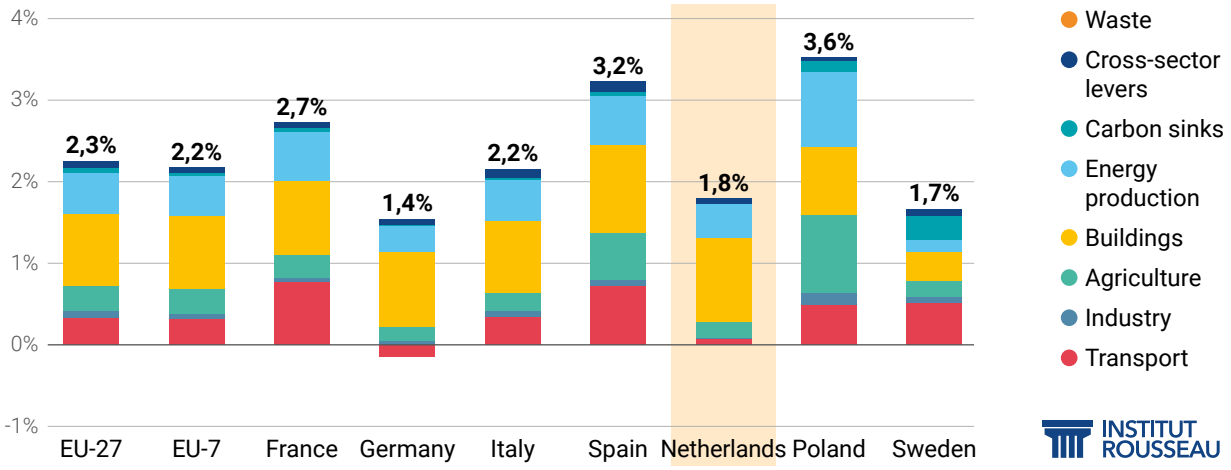
prehensive renovations, which are individually more expensive. On the energy side, the assumption of strong electrification in the transition scenario leads to a doubling in electricity consumption compared to the trend scenario. The transport sector's decrease in extra investment ranking is mainly due to reducing the private car fleet.

Fig. 5 **Dutch trend investment, extra-investment and total investment per sector, in billion euros per year, on average, by 2050.**



All sectors considered, the Netherlands requires one of the lowest additional investments among the studied countries, as depicted in Figure 6. **This is primarily due to significant potential savings in the transportation sector**. The country stands to make substantial savings in its automotive industry through fleet reduction and downsizing, surpassing investments in alternative transportation modes. Nevertheless, considerable investment is still necessary for new tracks and lines, especially to bolster the modest passenger modal share. **The netherlands also requires lower investments in agriculture due to a smaller agricultural surface area per unit of GDP**, compared to other countries.

Fig. 6 **Yearly extra investment needed by sector per country (in % of GDP 2022)**

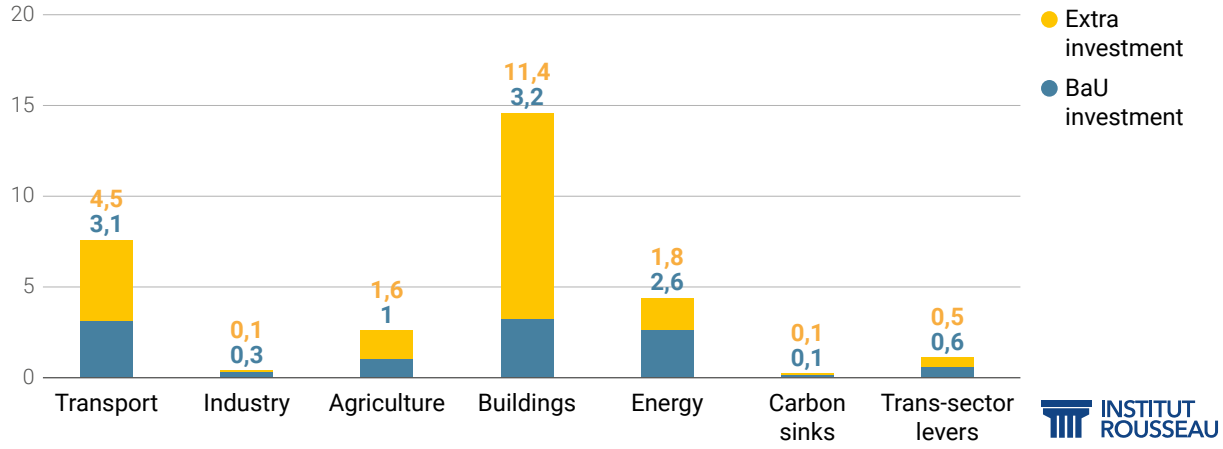


3 Public investment required

This study also outlines 73 public policy proposals to catalyse these investments, categorised for each of the 37 decarbonisation levers.

The total public cost of these measures for the Netherlands is estimated at €30 billion annually, with €20 billion exceeding the trend scenario. This is equivalent to tripling average annual public investment.

Fig. 7 **Dutch public trend investment, extra-investment and total investment per sector, in billion euros per year, on average, by 2050.**

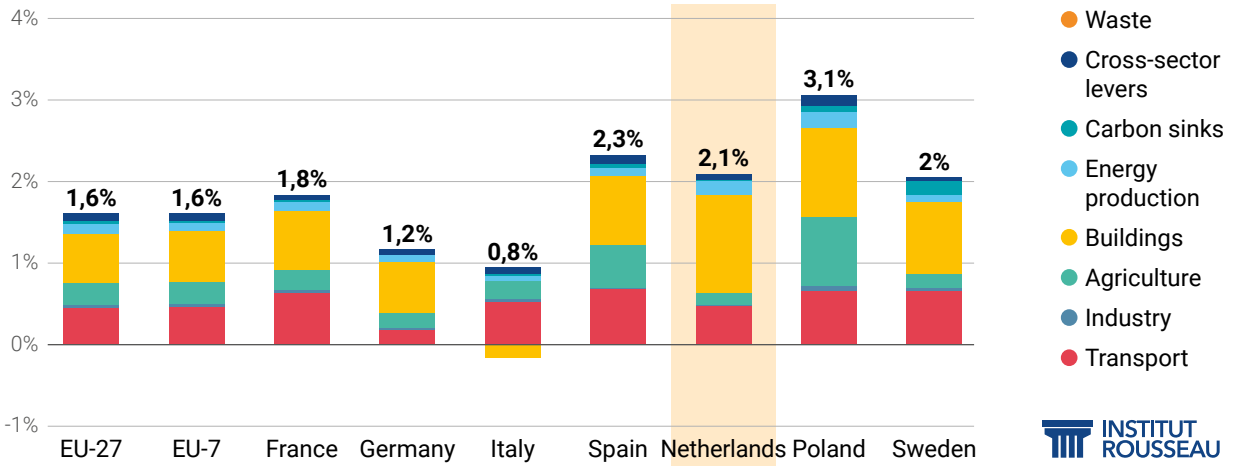


The sectoral breakdown of the €30 billion investments shows that the buildings sector (47%) and the transport sector (25%), together account for 72% of the required public investment. Energy production and infrastructure stands for 14%, which brings these three sectors to a total of 86% of the essential public investments. Compared to other countries, energy ranks higher, while agriculture ranks lower.

When considering extra public investments, the same two sectors alone account for 80% of the extra public investment needs: buildings (57%) and transport (22%). Energy production and infrastructure (9%), agriculture (8%) and cross-sector measures (2.6%) come next. The ranking remains consistent with total public investment needs, since public support allocations are generally calculated within the same scope between the transition and reference scenarios. Buildings claim an even greater portion of the extra public investments ranking due to comparatively lower business-as-usual investment levels in this sector compared to the transport sector.

These €20 billion per year of additional public investment amount to approximately 2.1% of the current Dutch GDP. This figure surpasses that of most other studied countries and the EU average, primarily due to the significant public investment required for efficient renovation in the building sector. The elevated level of investment in building renovations stems from the currently limited public support, the prevalence of individual houses, and the high ratio of surface area to inhabitants. **While much lower than the buildings sector, the extra public investment needed in the energy production and infrastructure sector is the highest among studied countries**, due to high investment needs to phase fossil gas out and a higher share of more highly subsidised technologies in the production mix (typically offshore wind).

Fig. 8 **Yearly public extra investment needed by sector per country (in % of GDP 2022)**



Other notable shifts in public investments in the Netherlands include:

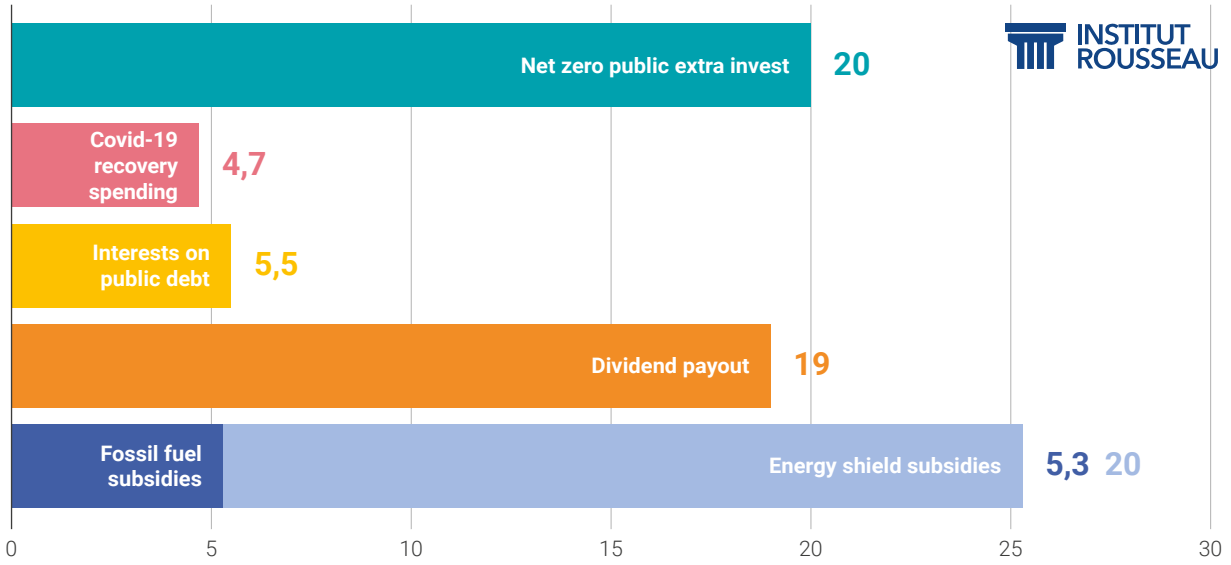
- **While the Netherlands already sets an example for other countries in soft mobility, there is a need to more than double transport investments**, with over 65% earmarked for the development of public transportation, particularly trains.

- **Additional investments needed in agriculture are relatively modest considering the country's size, but there remains a high demand for extra support per hectare and to offset herd reductions.**

- Regarding Research & Development, while additional investments are limited, the Netherlands requires a significant reorientation of its public R&D in agriculture toward agroecological systems.

Contextualising the proposed €20 billion per year is crucial. This amount, allocated to empower public authorities in stimulating, encouraging, and overseeing all stakeholders while setting the necessary pace to meet the European Union's climate objectives, must be viewed in perspective (cf. Figure 9). **€20 billion per year is comparable to the national dividend payout and less than what the Netherlands spent on fossil fuel subsidies (including price caps) in 2022.**

Fig. 9 **Contrasting extra public investment with known yearly budget (2022 values)**



This additional investment plan :

- Can be partially financed by redirecting existing fossil fuel subsidies.
- Will be offset in the short term by a significant decrease in energy costs for households, businesses, and public authorities.
- Is approximately six times less expensive than the potential cost of inaction[1][2].
- Will generate numerous local jobs, amounting to several million net positions at the European scale. All conventional sectors affected by the transition to net zero will require social support through a dedicated Just Transition Fund, included in the investment plan.
- Will yield returns by reducing the need for future public expenditure, such as unemployment insurance, energy bills, and costs related to climate change adaptation.
- Is nearly 50% less expensive than the investment plan proposed by the European Commission[3] (on a similar scope of sectors), thanks to a reduction in final energy consumption achieved through both efficiency and sufficiency measures.

If sufficiency and local production options are prioritized, it will also enhance the EU's energy security, economic sovereignty, competitiveness, and trade balance.

Images: Storyset.com/Freepik.com, Unsplash.com

Notes

1. Kotz & al., The economic commitment of climate change, published in the journal Nature in April 2024.
2. Additionally, ADEME estimates adaptation costs for France alone at €260 billion per year; 'Climate risks and their costs for France: to preserve the economy, the urgency to act now', December 2023. To be compared to a + €70 billion per year of global (public + private) net zero extra investment in our scenario, i.e. a × 4 ratio.
3. European Commission 2040 climate target, feb 2024.