



E3G

BRIEFING PAPER MARCH 2024

NATIONAL ENERGY AND CLIMATE PLAN ANALYSIS: GERMANY

CHARLOTTE LIEBRECHT & RAPHAEL HANOTEAUX

For a transition that sets us on both a smooth and ambitious path to secure the EU's climate and REPowerEU goals, the National Energy and Climate Plans (NECPs) must detail a comprehensive gas consumption reduction strategy, complete with actionable milestones.

To this effect, E3G assesses whether the NECPs support a smooth transition of the gas sector against six benchmarks. Meeting these benchmarks will ensure that the EU and its member states reduce their vulnerability to supply shortages and that infrastructure plans support the European Green Deal.

Assessment of Germany's NECP: Summary

The German draft 2023 NECP outlines a 27% decline in fossil gas primary energy consumption by 2030 compared to 2019 levels.¹ This marks a significantly greater ambition in terms of reduction than the projected 14% outlined in its 2019 NECP.² But it falls short of the REPowerEU expectation for the EU to achieve a 52% reduction in gas consumption by 2030 compared to 2019. A similar level of reduction, 48%, would be required to put the EU on track for aligning with climate neutrality.³

¹ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**

² European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p.141

³ Agora Energiewende, 2023, **Breaking free from fossil gas. A new path to a climate-neutral Europe**



E3G

Given Germany is the EU's largest gas consumer, this current shortfall in the German gas demand trajectory poses a risk to the EU objectives: addressing it is particularly crucial to keep the EU on track to meet its energy security and climate targets.

In terms of implementing an orderly gas demand reduction trajectory, Germany's NECP should:

- > Align infrastructure planning with the expected decrease in gas demand.
- > Prepare for necessary decommissioning of parts of the gas network to reduce network costs.

An overview of how Germany's draft 2023 NECP performs against the six benchmarks explained in our main briefing note is given in Table 1. The details on each benchmark are set out in the main section of this analysis.

Detailed assessment against the six benchmarks

1. Aligning national gas consumption with the overall EU trajectory

As stated in point 1.1 of the European Commission's guidance on NECPs, "the draft updated national plans should reflect this increase of ambition. Member States should fully embed the new and revised energy and climate targets included in the Fit for 55 and the REPowerEU proposals even though the legislative process for adoption is not yet concluded."⁴

Germany's draft NECP projects a 27% reduction in gas in primary energy consumption by 2030 compared to 2019 under its reference scenario (Figure 1).⁵ This is a much higher decrease than the projected 14% stated in its 2019 NECP.⁶ It almost aligns with the EU's implicit pathway under the Fit for 55 legislation, originally modelled in 2020, which should deliver a 29% drop in gas consumption within the EU over the same time period.

⁴ European Commission Guidance to Member States for the update of the 2021-2030 national energy and climate plans, **Guidance to MS for updated NECPs 2021-2030 - European Commission (europa.eu)**, 2022

⁵ The reference scenario takes into account policies and measures implemented or adopted by 31 August 2022. It does not include policies which have been implemented or adopted since, nor does it include additionally planned measures. It is therefore comparable to what other NECPs describe as a scenario "with existing measures" (WEM), as opposed to the scenario "with additional measures" (WAM), which is not presented in the German draft NECP (European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**).

⁶ European Commission, 2019, p.140, **National energy and climate plans (europa.eu)**



E3G

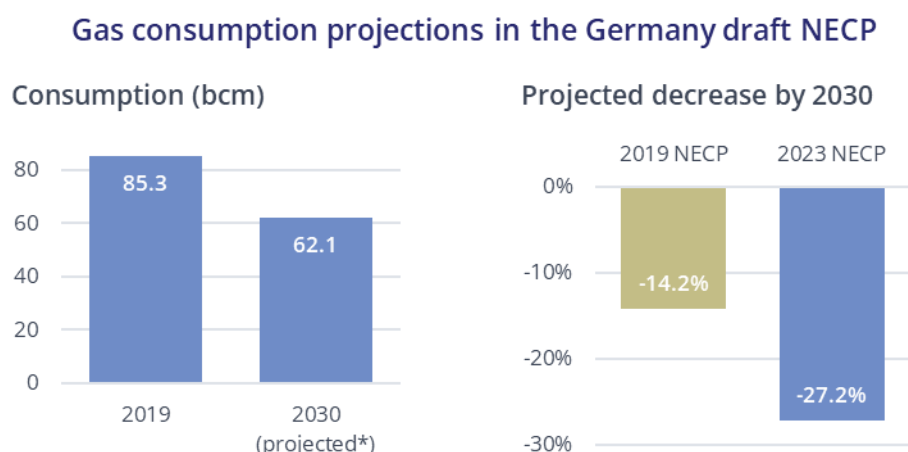
Table 1: Rating Germany's draft 2023 NECP against E3G's six benchmarks – overview.

Benchmark	Key take-away	Rating
1. Aligning national gas consumption with overall EU trajectory.	Germany's draft NECP aims for a 27% decrease in fossil gas consumption by 2030, almost double the 14% projection from the 2019 NECP. Despite this improvement, it falls short of REPowerEU's expectation of a 52% average reduction in EU gas consumption by 2030 as compared to 2019.	Data only
2a. Assessing the feasibility and scale of gas networks to be decommissioned.	The draft NECP does not specifically assess the need for decommissioning the gas distribution grid.	No data
2b. Preparing the gas network for a reduction in fossil gas use.	The draft NECP suggests repurposing the fossil gas network into hydrogen pipelines to address the projected gas demand reduction by 2030. The feasibility of this plan is questionable given the anticipated low volumes of both demand and supply for hydrogen and biogas by 2030.	Data only
3. Planning the phase-out of fossil gas subsidies.	In terms of absolute fossil fuel subsidies, with €13 billion in 2021, Germany ranks first in the EU together with France. ⁷ Substantial financial support persists for fossil gas consumption; there is no plan to reduce these subsidies in line with international commitments.	No data
4. Assessing the potential for renewable gas development.	Germany is pursuing a comprehensive strategy to establish itself as a leader in hydrogen by expanding infrastructure and increasing electrolyser capacity. Yet uncertainties loom over critical aspects of this strategy, such as: budget availability; whether the right amounts of imported and renewable hydrogen will be available and affordable in time for the required transitions in end-uses in industry.	Data only
5. Assessing and addressing the social and economic impact of gas consumption decrease.	Germany has implemented several commendable initiatives to support low-income households in its response to the energy crisis. But the NECP lacks an assessment of the effects of the gas transition on jobs and skills.	Data only
6. Phasing out long-term gas contracts in line with declining fossil gas use and climate targets.	The draft NECP is silent on the future fate of long-term fossil gas contracts, though the Hydrogen and Decarbonised Gas Market Package recently agreed by the EU requires all unabated fossil gas contracts to expire by 2049.	Data only

⁷ European Commission, Directorate-General for Energy, Bon-Mardion, J., Casteleyn, M., Queenan, J. et al., 2023, **Study on energy subsidies and other government interventions in the European Union – Final report – 2023 edition**



E3G



* Projection based on the scenario with existing measures, rather than the with additional measures scenario used in other country projections.



Figure 1: Germany's draft 2023 NECP projects a 27% reduction in gas demand by 2030, which shows greater ambition than in the 2019. However, while the projections are close to aligning with Fit for 55, it falls short of RePowerEU.

But it still falls short of what the REPowerEU aims for the EU to achieve, which is, on average, a 52% reduction in gas consumption by 2030 compared to 2019.⁸ This means that the German NECP plans for a gas demand reduction that is:

- > slightly below what is required as a collective EU trajectory under adopted law
- > significantly below what is required for a successful implementation of the REPowerEU strategy and the EU's climate targets.

Germany is the biggest European gas consumer in absolute terms, with almost 93 billion cubic meters (bcm) consumed in 2021, representing 23% of the EU's overall consumption. This could pose a significant threat to the achievement of European trajectories.

In response to the energy crisis, Germany has put in place a strategy to reduce gas demand in its main gas consuming sectors, as outlined in its 2022 updated Energy Security Act.⁹ This includes measures to cut gas consumption in both industrial (representing ~36% of gas demand in Germany in 2021) and residential sectors (30% of gas demand in Germany in 2021).

⁸ E3G, October 2020, **Are we on track? Repowering towards EU gas demand reduction**

⁹ Federal Ministry of Economic Affairs and Climate Action, April 2022, **BMWK - Federal cabinet agrees amendment to the 1975 Energy Security of Supply Act – Update necessary to strengthen crisis preparedness**



E3G

Based on the Energy Security Act, the Regulation on Medium-Term Energy Supply Security Measures, time-limited until autumn 2024, obliges companies and households to apply immediate energy efficiency measures to reduce fossil gas consumption to a crisis-adequate level. Although targeting industrial and residential sectors is crucial to reduce gas demand, these immediate measures need to be translated into structural ones.¹⁰

The draft German National Energy and Climate Plan (NECP) sets ambitious goals for a substantial reduction in gas consumption by 2030, nearly doubling the 2019 projection. While introducing notable measures to reduce gas demand in key sectors, these initiatives are mostly short term; they do also not fully align with the REPowerEU and climate-compatible pathways for 2030. Considering Germany's status as the largest gas consumer in the EU, addressing this shortfall should be a top priority.

2a. Assessing the feasibility and scale of gas networks to be decommissioned

Although not in the European Commission's NECP guidelines, understanding the future utilisation of the distribution network and its eventual decommissioning is crucial to plan for the expected decrease in gas use. **Germany's draft NECP lacks any reference to decommissioning the gas network.** This is partially due to the extensive repurposing plans from fossil gas to hydrogen pipelines.

However, according to Agora Energiewende, achieving climate neutrality by 2045 would render more than 90% of the existing distribution network obsolete.¹¹ To avoid substantial costs for consumers and the risk of stranded assets for operators, Germany should plan for the orderly retirement of the relevant parts of its gas distribution grid.¹²

A study from BDEW and EY shows that German distribution system operators (DSOs) already modify their planned investments as customers switch to alternative energy sources; the majority does not have plans yet for repurposing or decommissioning existing gas pipelines. The study calls for a regulatory

¹⁰ Fachrat Energieunabhängigkeit, 2024, **Sicherheitsorientierte Energiepolitik – Eine Finanzierungsstrategie (PDF)**

¹¹ Agora Energiewende, April 2023, **Ein neuer Ordnungsrahmen für Erdgasverteilnetze**

¹² Ibid. According to Agora, by 2044 gas grid charges will rise 16-fold for the remaining customers in the business-as-usual scenario.



E3G

framework to avoid rising grid fees as sales volumes will already start dropping within the next five years.¹³

Furthermore, maintaining the current grid is not justified by the transition to hydrogen. Most reports indicate that only a fraction of the current fossil gas demand will be replaced by renewable hydrogen and that it will primarily be used in power plants and industrial facilities, not by consumers connected to the distribution grid.¹⁴

Finally, the recent heating law adopted in Germany may initiate a broad shift towards a municipal heat transition, therefore accelerating the reduction in gas use at local level in the coming years.¹⁵

The draft NECP does not address decommissioning the gas network, focusing instead on plans to repurpose fossil gas to become hydrogen pipelines. But the German goal to achieve climate neutrality by 2045, together with its recent heating law, point to a substantial decrease in gas usage; this reinforces the need for a plan to decommission networks that will no longer be in use.

2b. Preparing the gas network for a reduction in fossil gas use

Point 1.2 of the European Commission's guidance for the NECP, "Increase energy security and affordability, towards a more resilient Energy Union", specifies that "Member States are also encouraged to reflect progress and planning on the infrastructure projects that are identified as significant to meet the European Green Deal and the REPowerEU objectives." This is especially important in the context of an expected gas demand reduction, where infrastructure networks will have to adapt and in certain cases downsize to enable an orderly transition.

Germany's NECP currently does not explain how its planned surge in import capacity will be reconciled with the projected 27% decrease in gas use by 2030. The Act on Accelerating the Use of Liquefied Natural Gas came into effect in July

¹³ EY and BDEW study on German DSO future investments, 2023, **Stadtwerkstudie 2023 - Deutschland An der Wegscheide: Wie die Stadtwerke mit neuen Strategien auf die Energiekrise reagieren**

¹⁴ Julian Wettengel, Clean Energy Wire, 18 Apr 2023, **Germany's move to climate neutrality makes 90% of gas distribution grid obsolete – think tank**

¹⁵ Sören Amelang, Clean Energy Wire, 11 September 2023, **Q&A – Germany agrees phaseout of fossil fuel heating systems**



E3G

2023.¹⁶ It facilitates and accelerates permits for new LNG capacities and promotes “green readiness” of import infrastructure to prevent terminals from becoming stranded assets.¹⁷ In December 2022/January 2023, the German government-initiated LNG terminals in Wilhelmshaven, Brunsbüttel, and Lubmin in the Baltic Sea had already commenced operations.¹⁸

As of December 2023, Germany is the EU state with the highest number of LNG import terminals in development, with 9 LNG terminals proposed and 3 already in construction.^{19,20}

The Act on Accelerating the Use of Liquefied Natural Gas obliges the operator to prove that the terminals run solely on “climate-neutral hydrogen and its derivatives” by 2044 to avoid lock-in effects and meet the 2045 climate neutrality target.²¹ However, there are no interim measures to track progress nor mechanisms to ensure repurposing costs are borne by project promoters. So the expansion of LNG capacity still comes with a significant risk of asset stranding.

Currently no LNG terminal can accommodate hydrogen imports or derivatives, particularly ammonia, without significant investment for retrofitting; this casts doubt on Germany’s ability to achieve this objective.²²

Germany’s draft NECP suggests repurposing the transmission gas network as hydrogen pipelines to address the projected gas demand reduction by 2030. However, it lacks a similar proposal for the distribution grid. Most of the hydrogen demand is projected to come from industry and power plants

¹⁶ German government, July 2023, **Gesetz zur Änderung des LNG-Beschleunigungsgesetzes und zur Änderung des Energiewirtschaftsgesetzes und zur Änderung des Baugesetzbuchs**

¹⁷ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 126

¹⁸ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 4

¹⁹ Global Energy Monitor, Europe Gas Tracker, **Number of LNG import projects by country and status, LNG terminal data from the Global Gas Infrastructure Tracker**, December 2023 release

²⁰ The LNG Acceleration Act currently foresees ten new terminals, of which three are onshore terminals planned to replace the temporary floating storage and regasification terminals; they will be operational past 2040. See DIW Berlin, Aktuell No.92, 19 February 2024, **Gasversorgung in Deutschland stabil: Ausbau von LNG-Infrastruktur nicht notwendig**

²¹ Any operator needs to submit an application to continue operation with climate-neutral hydrogen and its derivatives by 01 January 2035 at the latest to ensure there is enough time to grant permits and modify the existing installations.

²² Fraunhofer Institute for Systems and Innovation Research ISI, 2022, **Conversion of LNG Terminals for Liquid Hydrogen or Ammonia. Analysis of Technical Feasibility und Economic Considerations**



E3G

and therefore will not require the distribution grid to the same extent as fossil gas does today.

3. Planning the phase-out of fossil gas subsidies

Point 1.1 of the NECP guidance specifies that “the updated plans should also reflect the international developments related to the Paris Agreement, in particular the process set out by the Glasgow Climate Pact for raising mitigation ambition. This contains several decisions on energy and climate planning, including the phasing down of coal power, the phasing out of fossil fuel subsidies, and the consideration of further actions to reduce non-CO₂ emissions, including methane, by 2030.”

Germany’s NECP does not provide an exhaustive list of fossil-fuel-related subsidies; but the European Commission’s report on energy subsidies reports €13bn in fossil fuel subsidies in Germany in 2021, raking it highest, in absolute terms, together with France. It further states that about 41% of the fossil fuel subsidies were for fossil gas, so around €5.3bn.²³ This is substantially higher than the EU-average share of fossil gas subsidies which was 21% of all fossil fuel subsidies in 2021. Germany undertakes a sustainability analysis of its subsidies every two years; however, its draft NECP only refer to a coal subsidy phase-out.

According to the European Commission’s report on energy subsidies, Germany’s fossil fuel subsidies are over 20% of its total energy subsidies; it plans to phase out over half of them by 2025.²⁴ Yet international commitments set a deadline for phasing out **all** inefficient fossil fuel subsidies by 2025.²⁵ In particular, the following subsidies risk delaying the energy transition and raise costs for the society:

- > Support for new gas powerplants under the new “Kraftwerkstrategie” (strategy for power plants).
- > Support for new gas boilers.
- > Support for the construction of gas infrastructure terminals.

²³ European Commission, Directorate-General for Energy, Bon-Mardion, J., Casteleyn, M., Queenan, J. et al., 2023, **Study on energy subsidies and other government interventions in the European Union – Final report – 2023 edition**, p.29

²⁴ European Commission, 2023 Report on Energy Subsidies in the, p.15, **EUR-Lex - 52023DC0651 - EN - EUR-Lex (europa.eu)**

²⁵ G7, Berlin, May 2022, **Climate, Energy and Environment Ministers’ Communiqué (PDF)**, p.32: “We reaffirm our commitment to the elimination of inefficient fossil fuel subsidies by 2025.”



E3G

Germany should end fossil fuels subsidies not aimed at cushioning the impact of high energy prices, as required by its European and international commitments. This could free up fiscal room for policies supporting consumers to switch away from fossil fuels within the tight fiscal limits set by the German basic law.

4. Realistically assessing the potential for renewable gas development

The European Commission guidance states that “in their updated NECPs, Member States are encouraged to integrate a component on sustainable biogas and biomethane production and use, assessing the national potentials and defining trajectories to reach those by 2030 and 2050.”

The German Hydrogen Strategy sets a target of achieving 10 GW electrolyser capacity by 2030, doubling the 5 GW capacity previously anticipated in the former national hydrogen strategy.²⁶ The new strategy also foresees imports to address additional demand, with further details to be outlined in the forthcoming national hydrogen import strategy.

By 2030, Germany aims to establish connections between primary production, import, and storage hubs and the corresponding demand centres. This entails the envisioned core hydrogen network, which is set to span approximately 9,700 km by 2032, with over 5,000 km of that expected by 2030, which will cost an estimated €19.8 billion. Of that, 60% will be using repurposed fossil gas pipelines. Germany plans to set up Contracts for Difference (“Climate Protection Contracts”) for industry to incentivise the establishment of hydrogen production facilities and infrastructure.²⁷

Germany’s draft NECP projects demand for hydrogen produced from renewables to be about 0.95 Mt by 2030, with 64.3% of renewable hydrogen needing to be imported.²⁸ This aligns with the renewable liquid and gaseous fuels of non-biological origin (RFNBO) sub-target projections of 20–25 terawatt

²⁶ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 114

²⁷ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 95. This system uses a bidding procedure which rewards the company that uses the least amount of money to avoid one tonne of CO₂ compared to the conventional technology/infrastructure; it does so by bridging the additional cost compared to the conventional technology. Results from the first auction have not been published yet.

²⁸ Umweltbundesamt, 2023, **Projektionsbericht 2023 für Deutschland | Umweltbundesamt**, p.100f



E3G

hours (TWh), or 0.6–0.75 Mt, of renewable hydrogen for industry by 2030.²⁹ Uncertainties remain regarding the balance between renewable and non-renewable hydrogen in overall availability.³⁰

Germany aims to take a leading role in hydrogen technologies by 2030.³¹ The German government plans to allocate €18.6 billion from its Climate and Transformation Fund to hydrogen development, including refuelling infrastructure, from 2024 to 2027.³²

Prioritising hard-to-electrify sectors and setting the right incentives for their decarbonisation is key. However, Germany also plans to use hydrogen in heating, despite various studies showing its very limited added value in that sector.

In early 2023, Germany signed a joint statement with Norway, affirming their long-term commitment to export Norwegian hydrogen to Germany. Initiative Energie Speichern e.V. warns of significant risks of oversized import capacity and corresponding undersized amount of storage by 2050.³³

Biogas accounts for 0.3% of sectoral energy consumption in transport in 2023, and is set to stay at the same level in 2030.³⁴ The draft NECP prioritises increased use of waste and residues for biomass production, steering away from food and feed crop-based biofuels; but it does not include further projections of biomass and biogas production by 2030.

²⁹ German government, 16 June 2023, **Press release: BMWK - Breakthrough in the ambitious EU expansion of renewable energy**

³⁰ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 175ff. The modelling in the draft NECP employs two scenarios to assess the proportion of renewables in energy consumed. One scenario assumes that imported hydrogen and its derivatives are entirely produced from renewable energies, while the other assumes that none of the imported hydrogen will be renewable. The draft NECP states that the actual share of renewable hydrogen imports will be within this range.

³¹ European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 115

³² European Commission, November 2023, **Germany - Draft Updated NECP 2021-2030**, p. 93

³³ Initiative Energie Speichern e.V., 2023, **Stellungnahmen - Initiative Energien Speichern (energiespeichern.de)**

³⁴ Ibid., p.242



E3G

Germany is actively pursuing a comprehensive strategy to establish itself as a leader in hydrogen by expanding infrastructure and increasing electrolyser capacity. However, uncertainties loom over critical aspects of this strategy, such as budget availability and the volume of demand and supply for hydrogen. The lack of transparent biogas projections exacerbates this uncertainty, emphasizing the importance of adaptive planning in a rapidly evolving landscape.

5. Assessing and addressing the social and economic impact of gas consumption decrease

Member states are supposed to “strengthen planning within the NECPs to ensure a fair and just transition, mitigating social and employment impacts, tackling labour and skills shortages, reducing energy poverty, and ensuring affordable access to essential services for all.”

Such an evaluation should analyse what jobs are currently most dependent on gas use, such as boiler installers, timing of impact and age composition of the related workforce. It should also look at whether there are any regional or geographic concentrations of job impacts that might have wider socioeconomic repercussions, e.g. where they may be tied to specific production sites. Finally, as fewer gas customers remain on the grid, rising grid charges will impact those who are unable to come off gas. This will need to be assessed and potentially mitigated by an orderly planned decommissioning of gas grids.

While Germany has implemented several commendable initiatives to support low-income households and address energy-related concerns, notable gaps persist in the draft NECP.³⁵ Germany’s draft NECP does not provide a thorough assessment of impacts nor necessary policies and measures to support an equitable transition as gas consumption reduces over this decade. A thorough examination considering the diverse socio-economic dimensions linked to the reduction of gas usage is absent; this is crucial to formulate strong just-transition measures for mitigating the impacts of decreased gas consumption.

³⁵ Specifically, the Climate Dividend, which is included in the coalition treaty – the basis on which the current government was formed, is unlikely to be implemented due to the now reduced budget of the Climate and Transformation Fund and the prioritisation of different measures.



E3G

6. Phasing out long-term gas contracts in line with declining fossil gas use and climate targets

Although not in the Commission's guidelines, a consolidated view of the long-term contracts of the main EU gas consumers would enable a comparison between the EU's expected gas volumes and its climate commitments.

The draft NECP does not mention long-term fossil gas contracts, although Germany holds extended contracts for LNG:

- > 2.7 bcm/year with Qatar until 2041³⁶
- > 3.1 bcm/year with the US until 2042, and an additional 1.1 bcm/year until 2043.³⁷

These contracts extend to the time when Germany's LNG infrastructure must be repurposed for hydrogen, as mandated by its 2023 Act on Accelerating the Use of Liquefied Natural Gas, raising concerns about the credibility of the ambition stated in its draft NECP.

³⁶ Handelsblatt, 29 November 2022, **Deutschlands Gas-Deal mit Katar deckt nur Bruchteil des LNG-Bedarfs ab**

³⁷ Reuters, 22 June 2023, **Venture Global LNG signs 20-year contract with German energy firm**; Financial Times, 22 August 2023, **BASF signs long-term LNG deal with Cheniere of the US**



E3G

About E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

More information is available at www.e3g.org

Copyright

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License. © E3G 2024