

GREENPEACE



**VEREIN KLIMASENIORINNEN AND OTHERS v SWITZERLAND (53600/20)
COMMUNICATION**

In accordance with Rule 9.2. of the Rules of the Committee of Ministers regarding the supervision of the execution of judgments and of terms of friendly settlements by

Greenpeace International, Climate Litigation Network

the Conference of INGOs of the Council of Europe, Generation for Right Over the World, Center for Spatial Justice, Institut Biosphère, Diritto Diretto, BRAVA, Clima NOW, Klima-Allianz Schweiz / Alliance Climatique Suisse, humanrights.ch, NGO-Plattform Menschenrechte Schweiz, European Environmental Bureau, Protect the Future/Védegylet Egyesület, Global Legal Action Network, Operation Libero, Notre Affaire à Tous, Porgera Red Wara (River) Women's Association Incorporated, Green Rights Coalition, Association for Farmers Rights Defense, AFRD Georgia, Child Rights International Network, Center for International Environmental Law (CIEL), Aurora, Noé21, ClientEarth, A Sud Ecologia e Cooperazione, Centre for Environmental Justice, Community Law and Mediation, Urgenda, Open Society Justice Initiative, Climate Action Network (CAN) Europe, Just Planet, Italian Climate Network & the International Commission of Jurists



17 January 2025

COMMUNICATION

In accordance with Rule 9.2. of the Rules of the Committee of Ministers regarding the supervision of the execution of judgments and of terms of friendly settlements by Greenpeace International, Climate Litigation Network and 31 others

VEREIN KLIMASENIORINNEN AND OTHERS v SWITZERLAND (53600/20)

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EXECUTIVE SUMMARY

This submission¹ shows that the measures set out in Switzerland’s Action Report of 8 October 2024 fall short of implementing the Court’s judgment *Verein KlimaSeniorinnen Schweiz and others v Switzerland*. It highlights that Switzerland must implement a number of general measures pursuant to the judgment but has failed to do so. This pertains to the obligation to quantify a fair share, 1.5°C aligned national carbon budget, as required by the judgment, and to devise a regulatory framework that sets the requisite objectives and goals and to act in good time and in an appropriate and consistent manner when devising and implementing the relevant legislation and measures. As the submission will show, the Court’s decision is clear that measures can only be capable of protecting human rights against the worsening impacts of climate change if they are based on a scientifically grounded quantification of a fair share of the necessary global efforts to limit temperature rise to 1.5°C. An emissions reduction timeline based on anything other than such quantification is arbitrary and ineffective in mitigating climate change. This is why the Court found that Switzerland’s failure to quantify national GHG limitations through a national carbon budget or otherwise (§573) constitutes a “critical lacuna [...]”, amounting to a violation of Article 8 of the Convention (§573), which has to this date not been remedied. In that light, the submission recommends, *inter alia*, that the Committee of Ministers adopt a decision which:

1. *Rejects* Switzerland’s request to conclude supervision.
2. *Expresses concern* with the response by Switzerland, which reiterates critiques on the Court’s judgment previously addressed and dismissed by the Court and fails to set out the measures necessary to implement the judgment.
3. *Requests* Switzerland to provide an action plan setting out the measures necessary to implement the judgment, including an indicative timetable reflecting the urgency of the matter.
4. *Rejects* Switzerland’s claim that a national carbon budget cannot be calculated due to an alleged lack of agreed methodology for quantifying a State’s fair share.
5. *Requests* Switzerland to “take immediate action” (§549) to quantify a national carbon budget that represents Switzerland’s *fair share* of the remaining global carbon budget

¹ This submission was authored by (in alphabetical order): Louise Fournier, Richard Harvey, Maria Alejandra Serra Barney, Floris Tan, Joe Udell and April Williamson. The authors are grateful for the numerous reviewers.

for limiting global temperature rise to less than 1.5°C, based on the best available science and taking into account the principles of the international climate regime (e.g. as done in the report based on ESABCC methodology - see [Annex II](#)), and to *report* on this quantification to the Committee of Ministers in time for its September 2025 Human Rights meeting;

6. *Requests* Switzerland, with the greatest urgency and on the basis of the remaining national carbon budget identified above, to start the democratic process for revising domestic climate legislation to align with its GHG limitations.
7. *Monitors* the execution of the KlimaSeniorinnen judgment with increased frequency and reschedules the case for examination with oral debate during its September 2025 Human Rights meeting.

PART A – INTRODUCTION

I. Introduction

1. Pursuant to Rule 9.2 of the Rules of the Committee of Ministers for the supervision of the execution of judgments and Article 46 § 1 of the Convention, we, the undersigned, Climate Litigation Network and Greenpeace International, supported by 31 non-governmental organisations ([Annex I](#)) endorsing this submission, (the NGOs), submit this joint Communication on the execution of *Verein KlimaSeniorinnen Schweiz and others v Switzerland (KlimaSeniorinnen)*. The submission argues that general measures proposed by the Swiss Government’s Action Report of 27 September 2024 are not sufficient to address the violations of Article 8 of the European Convention on Human Rights identified in the European Court of Human Rights judgment of 9 April 2024. We respectfully ask the Committee to disregard the request to end the supervision of the judgment’s execution and to request the Swiss authorities to develop and implement appropriate general measures, as set out below.

II. The NGOs and their role

2. The **Climate Litigation Network (CLN)** is a non-profit foundation that provides support to organisations worldwide pursuing legal action to secure the adoption and implementation of climate plans that ensure a safe and sustainable climate for all. CLN was founded by the Urgenda Foundation following its landmark climate case against the Dutch government.

3. Stichting Greenpeace Council (**Greenpeace International**) serves as a coordinating body of the independent global network of 25 independent national and regional organisations that act to change attitudes and behaviour, protect and conserve the environment and promote peace in over 55 countries worldwide (Greenpeace). Greenpeace International and Greenpeace Switzerland have been supporting the association of the Verein KlimaSeniorinnen Schweiz since its inception in 2015.
4. In addition, this submission is supported by 31 non-governmental organisations, including the **Conference of International Non-Governmental Organisations of the Council of Europe**, the representative body of the INGOs enjoying participatory status with the Council of Europe (Annex I). The signatories of this submission cover a wide geographical and topical scope and focuses on, *inter alia*, human rights, the environment, future generations, and climate protection.

III. Case Summary

5. In its judgment of 9 April 2024, the Grand Chamber ruled that there were some critical lacunae in Switzerland's process of putting in place the relevant domestic regulatory framework, including: a failure to quantify, through a carbon budget or otherwise, national greenhouse gas emissions (GHG) limitations; as well as a failure to meet past GHG emissions limits. The Court concluded that Switzerland failed to act in good time and in an appropriate and consistent manner regarding the devising, developing and implementation of the relevant legislative and administrative framework to fulfil its positive obligations under the Convention in the context of climate change in violation of Article 8. The Court also found a violation of the right to access to court protected by Article 6 §1 of the ECHR.
6. The Grand Chamber found that Article 8 of the ECHR guarantees the right to effective protection from the harmful effects of climate change (§§519, 544). Positive obligations flowing from this right include the adoption and effective application of regulations and measures capable of mitigating the existing and potentially irreversible future effects of climate change (§545). They must be “aimed at preventing an increase in GHG concentrations in the Earth's atmosphere and a rise in global average temperature beyond levels capable of producing serious and irreversible adverse effects on human rights” (§546). The Court indicated that such an effective regulatory framework to address climate

change cannot be put in place “without quantifying, through a carbon budget or otherwise, national GHG emissions limitations” (§570) and noted that reliance on the State’s Nationally Determined Contributions (NDC) under the Paris Agreement was insufficient (§571). The Court established that a carbon budget should be determined by a State “on the basis of equity and in accordance with their own respective capabilities” (§571).

IV. Alleged implementation of the judgment

7. Switzerland considers that the measures taken will prevent similar violations and that Switzerland is, therefore, complying with its obligations under Article 46 § 1 of the Convention in this case.
8. As the NGOs will show in this submission, notwithstanding its claim in the Action Report, Switzerland has not remedied the violation of Article 8 of the Convention. Furthermore, the Action Report indicates that Switzerland has failed to calculate a national carbon budget and continues to rely on the same emission reduction targets, which the Court already deemed insufficient.
9. As a reaction to the judgment, both Houses of the Swiss Parliament have adopted declarations calling into question the legitimacy of the Court.² They argue that the Court has gone beyond the limits of evolutive interpretation and disregarded the principle of subsidiarity.
10. The eyes of the world are on the implementation of the *KlimaSeniorinnen* judgment, which has become a standard for climate litigation worldwide.³ Recently, the ruling was praised as exemplary by numerous parties in their oral presentations to the International Court of Justice’s 2-13 December 2024 hearings on Obligations of States in Respect of Climate

² 24.053 Objet du Parlement. Déclaration du Conseil des États. Arrêt de la CEDH « Verein KlimaSeniorinnen Schweiz et autres c. Suisse » <https://www.parlament.ch/fr/ratsbetrieb/suche-curia-vista/geschaefft?AffairId=20240053>; 24.054 Objet du Parlement. Déclaration du Conseil national. Arrêt de la CEDH « Verein KlimaSeniorinnen Schweiz et autres c. Suisse » <https://www.parlament.ch/fr/ratsbetrieb/suche-curia-vista/geschaefft?AffairId=20240054> (both last accessed 02 January 2024).

³ See for instance the following domestic cases: [Milieudefensie et al. v. Royal Dutch Shell plc](#); [Greenpeace Spain, Oxfam Intermón and Ecologistas en Acción & Coordinadora de ONG para el Desarrollo v Government of Spain](#); [Finnish Association for Nature Conservation and others v Finland](#). ECtHR cases: [Mullner v. Austria](#); [Greenpeace E.V. And Others v. Germany](#); [Greenpeace Nordic and Others v. Norway](#). Advisory Opinions: EFTA Court, [The Norwegian State v Greenpeace Nordic, Nature and Youth Norway](#) (E-18/24); ITLOS, Advisory Opinion on Climate Change and International Law, [Judge Pawlak Separate Opinion](#) (last accessed 14 January 2025).

Change. Despite the international recognition of the judgment, Switzerland’s representative in the International Court of Justice’s hearings notably refrained from referencing the *KlimaSeniorinnen* case or addressing Switzerland’s human rights obligations. Instead, he reiterated the argument rejected by the Grand Chamber that “there is currently no legal basis, either in customary international law or in treaty law, for setting specific emission reduction targets or specific emissions budgets for individual states.”⁴

11. These statements by Switzerland’s executive and legislative branches of government undermine the Court’s judgment and show a lack of willingness to faithfully implement it. Compliance with the Court’s judgments is a cornerstone of the system of human rights protection in the Council of Europe, and the Committee of Ministers has the important task of supervising such compliance. The NGOs respectfully recommend that the Committee of Ministers reject Switzerland’s position.

PART B – GENERAL MEASURES

I. Introduction

12. The NGOs would like to begin by noting the scientific consensus that global warming of 1.5°C “is not considered ‘safe’ for most nations, communities, ecosystems and sectors and poses significant risks to natural and human systems as compared to the current warming of 1°C”.⁵ This consideration is reflected in the judgment, where the Court explicitly stated that environmental degradation, including climate change, has created “serious and potentially irreversible adverse effects on the enjoyment of human rights” (§431). The Court made its findings on the basis that “climate change poses a serious current and future threat to the enjoyment of human rights guaranteed under the Convention” (§436) and “that the relevant risks are projected to be lower if the rise in temperature is limited to 1.5 above pre-industrial levels and if action is taken urgently” (§436).

⁴ “La Suisse soutient qu’il n’existe actuellement aucune base légale, ni en droit international coutumier ni en droit conventionnel, pour fixer des objectifs spécifiques de réduction d’émissions ou des budgets d’émissions spécifiques pour les États individuels.” Verbatim Record, International Court of Justice, 11 December 2024. <https://www.icj-cij.org/sites/default/files/case-related/187/187-20241211-ora-02-00-bi.pdf>, pp.55-56 (last accessed 14 January 2025).

⁵ IPCC, Special Report on the Global Warming of 1.5 (2018), Chapter 5, <https://www.ipcc.ch/sr15/chapter/chapter-5/> (last accessed 14 January 2025).

13. In Part II of this Communication, the NGOs address Switzerland’s failure to quantify its fair share carbon budget based on a detailed analysis of the Court’s reasoning (section 2). The NGOs then demonstrate Switzerland’s failure to implement even its existing inadequate targets (section 3). Finally, the NGOs underline the urgency of the matter (section 4).

II. The obligation to quantify national GHG limitations

14. The Court set out in §550(a) the obligation to “adopt general measures specifying a target timeline for achieving carbon neutrality and the overall remaining carbon budget for the same time frame, or another equivalent method of quantification of future GHG emissions, in line with the overarching goal for national and/or global climate-change mitigation commitments”. This obligation is imperative if we are to hold global warming to no more than 1.5°C, as acknowledged by Switzerland.⁶

15. The obligation to define a timeline for achieving carbon neutrality based on a carbon budget that is also “updated with due diligence and based on best available evidence” (§550(d)) forms the substantive heart of States’ mitigation obligations under the Convention in relation to climate change. Regarding these substantive obligations, the Court accorded States a “reduced margin of appreciation” (§543).

III. The obligation to quantify a fair share 1.5°C aligned carbon budget

16. Crucially, the “regulatory obligation” (§572) formulated in §550(a) requires States to quantify national GHG emissions limitations through a national carbon budget that is set: (1) in relation to the remaining global carbon budget for 1.5°C; and (2) based on a quantification of a national fair share of the remaining global budget.⁷

17. States are required to act in accordance with their international commitments, particularly under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, and the scientific evidence, notably from the Intergovernmental Panel on

⁶ Switzerland 2024 Action Report, section 5.2.5; see also Switzerland’s information necessary for clarity, transparency and understanding in accordance with decision 1/CP.21 of its updated and enhanced NDC under the Paris Agreement (2021-2030), 9 Dec. 2020, available [link](#) (last accessed 14 January 2025).

⁷ The Norwegian and Dutch National Human Rights Institutes reached the same conclusion, see <https://www.nhri.no/wp-content/uploads/2024/11/The-Norwegian-climate-change-framework-in-light-of-Article-8-of-the-ECHR.pdf>; <https://publicaties.mensenrechten.nl/file/ec625eb6-0b4f-a061-1640-33edd102313c.pdf> (both last accessed 14 January 2025).

Climate Change (IPCC), to prevent increases in GHG concentrations and global temperatures beyond levels capable of producing serious and irreversible harm to human rights (§546). Domestic policies must be shaped by the global objective of limiting temperature increases, as agreed upon by States in the Paris Agreement in accordance with the best available science (§547).

18. To provide factual context, the IPCC defines a carbon budget as the amount of cumulative CO₂ emissions that can be emitted globally while still staying below a certain level of global warming.⁸ Scientifically, the steps are as follows: 1) determine a global temperature threshold (i.e. 1.5°C), 2) based on that, calculate a global carbon budget, and 3) based on the global carbon budget, quantify the national carbon budget.
19. Thus, as stated above, national carbon budgets are calculated using the global carbon budget as a starting point. There are numerous methodological approaches to dividing the global carbon budget between all individual states, which are referred to in the academic literature as “effort sharing” approaches.
20. Only a national carbon budget that is set in relation to the remaining global budget can be *capable* of mitigating the consequences of climate change, and thus *practically and effectively* protect human rights from the worst and most catastrophic impacts of climate change. It follows that Switzerland can only fulfil its “primary duty” to adopt and apply “regulations and measures *capable* of mitigating the existing and potentially irreversible, future effects of climate change” (§545, emphasis added) if national emissions reduction efforts are set in relation to the still-remaining global carbon budget for 1.5°C.
21. To effectively mitigate climate change, States must collectively stay within the global carbon budget for 1.5°C. The Court’s judgment establishes, and indeed Switzerland acknowledges (Action Report, section 5.2.5), that States must quantify their fair share of the remaining global carbon budget in order to set their national carbon budget. The Court

⁸ The IPCC states: “the estimated cumulative amount of global carbon dioxide emissions that is estimated to limit global surface temperature to a given level above a reference period, taking into account global surface temperature contributions of other GHGs and climate forcers”; IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562 (all last accessed 14 January 2025).

held: (A) that national carbon budgets should align with the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC) (§§442, 545); (B) that fairness principles need to be *quantified* rather than merely alluded to (§§570-571); and (C) that Switzerland had violated the Convention because its targets were insufficient even against the equal per capita fairness principle (§§569).

A. National carbon budgets must be in line with CBDR-RC

22. Following its well-established principles, the Court interpreted Article 8 of the ECHR considering international law (§§455-456), including the UNFCCC and the Paris Agreement. A central commitment in those instruments is that States must share the burden of reducing emissions *fairly* and based on CBDR-RC. Accordingly, “each State has *its own share of responsibilities* to take measures to tackle climate change and that the taking of those measures is determined by the State’s own capabilities rather than by any specific action (or omission) of any other State” (§442, emphasis added).

23. The Court’s interpretation of the Convention, in light of CBDR-RC, and its emphasis on a State’s obligation under the Convention to do “its part” (§545), requires States to determine their national carbon budget that is based on a fair share determination, taking account of CBDR-RC, and grounded in equity (§571). It then consequently requires an emissions reduction pathway that respects that budget. Switzerland acknowledges that the global budget must be distributed according to fair share.⁹

B. Fairness principles must be quantified rather than alluded to

24. As the Court notes, it is not sufficient for a State to merely claim that principles of fairness and CBDR-RC were considered in setting emission reduction targets (§§569-572). That falls short of the obligation “to adopt general measures specifying a target timeline for achieving carbon neutrality and the overall remaining carbon budget for the same time frame, or another equivalent method of quantification of future GHG emissions, in line with the overarching goal for national and/or global climate-change mitigation commitments” (§550(a)). Instead, States must *quantify* their budgets by reference to fairness principles. In the proceedings, Switzerland acknowledged the importance of fair share, claiming that its efforts reflected the principles of responsibility and capability, the two central components of the principle of CBDR-RC (§360). In this context, Switzerland

⁹ Switzerland 2024 Action Report, section 5.2.5, (English translation).

referred to its communication to the UNFCCC accompanying its updated Nationally Determined Contribution (NDC), in which it stated that “it is important to Switzerland that the global community shares the required efforts to combat global climate change fairly and equitably” and that its NDC reflected both fairness and equity (§563).¹⁰ Switzerland sought to substantiate this position with reference to an “internal assessment” prepared in 2020 (§§ 360, 570).¹¹

25. The Court rejected this argument since neither the “internal assessment” nor the substantiation of its NDC as submitted to the UNFCCC included a *quantification* of the fairness principles, stating that: “the Court is not convinced that an effective regulatory framework concerning climate change could be put in place without quantifying, through a carbon budget or otherwise, national GHG emissions limitations (see paragraph 550(a) above)” (§570).

26. Switzerland acknowledged during the proceedings that it had not *quantified* a fair national carbon budget but argued that its contributions were fair, even though it had performed no calculations (§360). Switzerland argued that “there was no established methodology to determine a country’s carbon budget” (§570). However, the Court explicitly rejected Switzerland’s purported explanation, concluding that the absence of a quantification of a fair national budget was part of the “critical lacunae” (§573) that could “hardly be compensated for by reliance on the State’s NDC under the Paris Agreement, as the Government seemed to suggest” (§571).

C. Switzerland’s targets violated the Convention due to their insufficiency, even against the equal per capita fairness principle

27. In finding Switzerland’s emissions reduction targets insufficient, the Court relied on estimates of the remaining Swiss carbon budget that the applicants submitted with an expert

¹⁰ See also ‘Switzerland’s information necessary for clarity, transparency and understanding in accordance with decision 1/CP.21 of its updated and enhanced nationally determined contribution (NDC) under the Paris Agreement (2021 – 2030)’ (2021) 13 https://unfccc.int/sites/default/files/NDC/2022-06/Swiss%20NDC%202021-2030%20incl%20ICTU_December%202021.pdf, (last accessed 18 December 2024).

¹¹ Swiss Federal Office for the Environment, ‘Klimawandel und das Pariser Abkommen: Welcher NDC der Schweiz ist «fair und ambitiös»? (2020) internal working document <https://www.klimasenioren.ch/wp-content/uploads/2023/04/230329_written-submission-Switzerland_annex_2_internal_working_document.pdf> (last accessed 19 December 2024).

report (§§569, 323).¹² The Court noted that “[o]n the basis of its current and planned targets”, Switzerland would deplete its carbon budget to remain within 1.5°C by 2030, or 2034 at the latest (§569).

28. The NGOs note that the Court concluded on this basis that “under its current climate strategy, Switzerland allowed for more GHG emissions than even an “equal per capita emissions” quantification approach would entitle it to use” (§569). In other words, the Court determined that Switzerland’s mitigation policies fell short of what it was required to do *even* under the most lenient approach to calculating fair share, which does not take into account principles such as CBDR-RC – thereby clearly indicating that more stringent fair share methodologies are necessary.¹³

D. Interim conclusion on national carbon budget obligations

29. The Court found that Switzerland had failed to quantify a national carbon budget that was calculated as its fair share of the remaining global carbon budget. Its policies, which were not based on such a budget, were therefore insufficient to protect the applicant’s rights under Article 8.

30. Measures can only be capable of protecting human rights against the worsening impacts of climate change if they are based on a scientifically grounded quantification of a fair share of the necessary global efforts for holding temperature rise to 1.5°C. A State’s emissions reductions must remain within these boundaries in order for their measures to be deemed capable of effectively protecting human rights. An emissions reduction timeline based on anything other than such quantification is arbitrary and ineffective in mitigating climate change. This is why the Court found that Switzerland’s failure to quantify national GHG limitations through a national carbon budget or otherwise (§573) constitutes a “critical lacuna [...]”, amounting to a violation of Article 8 of the Convention (§573).

¹² Referencing §323, fn 171; Yann Robiou du Pont and Zebedee Nicholls, ‘Calculation of an emissions budget for Switzerland based on Bretschger’s (2012) methodology’ (2023) <https://www.klimaseniorinnen.ch/wp-content/uploads/2023/04/230427_53600_20_Annex_Doc_2_Robiou_du_Pont_Nicholls_Expert_Report.pdf> (last accessed 25 December 2024).

¹³ This position is also reflected in the applicants’ challenge to the validity of the equal per capita approach compared with the ‘highest possible ambition’ standard set out in the Paris Agreement and the principle of CBDR-RC. ‘Observations on the facts, admissibility and the merits’ (§39) <https://www.klimaseniorinnen.ch/wp-content/uploads/2022/12/221202_53600_20_Observations_GC_KlimaSeniorinnen_and_others_v_Switzerland.pdf> (last accessed 01 January 2025.)

IV. Switzerland's failure to quantify any carbon budget

31. Switzerland's Action Report cites unquantified measures that it argues comply with the Court's judgment, for instance, the new 2025 Federal Act on Secure Electricity Supply with Renewable Energies.¹⁴ Although the NGOs welcome these measures, the "critical lacunae" identified by the Court remain unaddressed. The general measures described in the Action Report fail to address the core issues identified in the Court's judgment, as they fail to:
1. quantify a fair national contribution towards limiting global warming to 1.5°C
 2. revise the climate targets based on the quantification (define a target timeline for achieving carbon neutrality, including intermediate targets by sectors or other relevant methodologies) and establish concrete measures in domestic law that are capable of mitigating climate change.
32. Thus far, Switzerland has failed to calculate any national carbon budget.
33. Switzerland has failed to quantify its share of the remaining global carbon budget for 1.5°C. In its Action Report, Switzerland states that it plans to emit 0.66 GT of CO₂ equivalent between 2020 and 2050, or "approximately 0.13 % of the global budget still available for the period 2020 to 2050 to limit global warming to 1.5°C (probability: 50%)" that it plans to emit under its current and planned climate policies.¹⁵ However, Switzerland did not put forward any quantification of a budget, let alone a fair (and thus effective) contribution towards holding global warming to no more than 1.5°C. This is in contrast with Switzerland's position in the proceedings, in which it acknowledged the importance of fair share, claiming that its efforts reflected the principles of responsibility and capability, the two central components of the principle of CBDR-RC (§360). Switzerland could, for example, have calculated its share according to its respective capabilities, or "own capacities", as indicated in the Court's judgment (§442). This would have required an in-depth investigation of the reduction possibilities of all emissions sources. Instead, it has simply taken the current climate targets and mapped the amount of cumulative emissions expected to flow from those. This is simply a declaration of intent to emit GHGs irrespective of the remaining global carbon budget and of its fair share.

¹⁴ Federal Act on Secure Electricity Supply with Renewable Energies, AS 2024 679 ([link](#)), (last accessed 14 January 2025).

¹⁵ Switzerland 2024 Action Report, section 5.2.5

34. The Court already expressly rejected the argument that Switzerland’s “national climate policy could be considered as being close to an approach of establishing a carbon budget” (§§ 360, 571). The implementation stage is not meant to reargue points the Court has already expressly rejected or to put again into discussion the continued failure to quantify its fair share carbon budget, to define a corresponding timeline to net-zero and take the necessary measures to achieve that.
35. It should be noted that Switzerland has a 2050 net-zero target (§360), and its emission reduction pathway was nevertheless found in breach of Article 8 ECHR. This is why § 548, where the Court finds that the Convention requires that each Contracting State undertake measures for the substantial and progressive reduction of their respective GHG emission levels, with a view to reaching net neutrality within, “in principle, the next three decades”, should not be misconstrued as meaning that States comply with their obligations as long as they reduce their emissions to net zero around 2050. Switzerland rightly does not adopt this position. This is because the objective of reaching carbon neutrality in 2050, as recognised by the Court in its assessment of the facts relating to climate change (§113), flows from global pathways presented by the IPCC in its Sixth Assessment Report, which provides a greater than 50% chance of limiting global warming to 1.5°C at the end of the century. These global pathways, however, do merely apply “in principle” and are not considered as fair shares of individual states towards the global burden of mitigating climate change (§§ 442, 545 and 571).
36. Finally, regarding the other equivalent methods for quantification mentioned by the Court (§573), as detailed above, Switzerland still failed to provide any quantification of a fair contribution that is effective in limiting global warming to 1.5°C.

E. Estimation of Switzerland’s remaining carbon budget based on the European Scientific Advisory Board on Climate Change’s methodology

37. To put Switzerland's planned emissions reduction targets into context, the Verein KlimaSeniorinnen Schweiz and Greenpeace Switzerland commissioned a scientific analysis of Switzerland's carbon budget (Annex II). This report is based on the most up-to-date global carbon budget estimates for 1.5°C and uses the methodology used by the European Scientific Advisory Board on Climate Change (ESABCC) in its report, *Scientific*

advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050 ('EU 2040 Target Report').¹⁶

38. The ESABCC was established as an independent scientific advisory body under Regulation No 401/2009 of the European Parliament and the Council.¹⁷ Under the 2021 European Climate Law, the ESABCC is given a central position as “a point of reference for the Union on scientific knowledge relating to climate change” based on its ‘independence and scientific and technical expertise’.¹⁸ It thus provides the EU with scientific knowledge, expertise and advice relating to climate change based on the “best available and most recent scientific evidence”.¹⁹ The EU 2040 Target Report was undertaken by the ESABCC as part of the requirements of the European Climate Law.²⁰ Using the ESABCC’s methodology provides an established scientific foundation for the expert report and allows for comparability between Switzerland and EU countries (i.e. the majority of Council of Europe States).
39. Using the IPCC’s estimate of the global carbon budget for 1.5°C as a starting point, the ESABCC applied a range of effort-sharing methodologies to determine the EU’s carbon budget range (*EU 2040 Target Report*, p. 28). The ESABCC presented estimates of the EU’s carbon budget from 36 effort-sharing approaches, which reflected principles such as equality, historical responsibility and capability. The ESABCC excluded effort-sharing methodologies that were based on cost-effectiveness or dividing the budget based on States’ current emissions (“grandfathering”), as the scientific literature did not consider these to reflect equity standards.

¹⁶ European Scientific Advisory Board on Climate Change, *Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050* (15 June 2023) <<https://climate-advisory-board.europa.eu/reports-and-publications/scientific-advice-for-the-determination-of-an-eu-wide-2040>> (last accessed 14 January 2025).

¹⁷ Regulation (EC) No 401/2009 of the European Parliament and of the Council of 23 April 2009 on the European Environment Agency and the European Environment Information and Observation Network [2009] OJ L 126, art 10a.

¹⁸ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (European Climate Law) [2021] OJ L 243, art 3(1).

¹⁹ *ibid* art 3(3).

²⁰ *ibid* art 4.

40. The expert report takes the same approach as the ESABCC (Annex II, pp. 13–15). However, rather than presenting 36 results, the experts only estimated Switzerland’s carbon budget using four effort-sharing approaches. This includes (i) the equal per capita approach (i.e., all States are allocated a budget based on their share of the global population), as well as approaches seeking to reflect (ii) responsibility, (iii) capability and (iv) responsibility & capability (Annex II, p. 23). The methodological approaches that were selected by the Verein KlimaSenrionnen Schweiz from the EU 2040 Target Report were chosen because they produced the most generous carbon budget results for the EU. The implication is that if national carbon budget results are negative (i.e., Switzerland’s budget is already exhausted) for each methodology, the remaining 32 methodologies in the EU 2040 Target Report would also produce negative budgets.
41. Taking the effort-sharing approach that reflects responsibility and capability (i.e., the most stringent approach considered in the expert report), Switzerland’s budget would be -0.99 gigatonnes (Gt) CO₂ from 2023 onwards (Annex II, p. 16). The fact that this value is negative effectively means that Switzerland exhausted its budget several years ago and exceeded its fair budget by nearly a gigatonne of emissions by the start of 2023. The capability approach also produces a negative budget from the start of 2023 (-0.09 Gt CO₂), while the responsibility approach produces a budget so small that it will likely be exhausted over the course of 2025 (0.09 Gt CO₂) (Annex II, p. 16). As such, any estimation of Switzerland’s carbon budget that reflects responsibility and/or capability would either be exhausted or will imminently be exhausted.
42. Once carbon budgets are used up, it is no longer possible to remain within the warming limit of 1.5°C with domestic measures alone. In addition to having to take all feasible domestic measures with highest possible ambition, emissions in excess of the fair share budget must be compensated by way of additional reductions achieved through financing emissions reductions abroad and/or permanent removal of CO₂ from the atmosphere while accounting for feasibility constraints, environmental risks and technological deployment challenges (Annex II, p. 21).
43. Only the equal per capita approach - the most lenient interpretation of an equitable fair share as defined by the ESABCC, and the approach that the Court determined was the bare

minimum standard for a fair share assessment (§569) - provides Switzerland with a non-negligible budget of 0.26 Gt CO₂ from 2023 onwards.

44. Switzerland's Action Report estimates that it will emit 0.66 GT of CO₂ equivalent between **2020** and 2050. The expert report estimates that Switzerland's cumulative emissions between **2023** and 2050 will be 0.53 Gt CO₂ equivalent. This volume of emissions is more than double Switzerland's maximum remaining CO₂ budget for a 50% probability of staying within the 1.5°C limit, which the expert report estimates to be just 0.26 Gt CO₂.
45. If Switzerland pursues the emissions trajectory resulting from the policies it identified in its Action Report (50% reduction until 2030 and 75% until 2040 compared to 1990), then the NGO's own calculations show that Switzerland's most lenient remaining carbon budget of 0.26 Gt CO₂ will be entirely used before the end of 2032 (Annex III). Thus, Switzerland presents a climate policy framework that - if copied by all countries - would exceed the remaining CO₂ budget to stay within the 1.5°C-limit (50% probability) in ways which, in the words of the Court, pose "existential risks" (§417) with the potential to destroy "the basis of human livelihoods and survival" (§421).

V. Switzerland's failure to devise a regulatory framework that sets the requisite objectives and goals and to act in good time and in an appropriate and consistent manner when devising and implementing the relevant legislation and measures

46. In addition to failing to quantify an adequate national carbon budget from the remaining global budget to stay within the 1.5°C limit and to revise the climate targets accordingly, Switzerland did not detail how it plans to implement the positive obligation under Article 8 to "devise a regulatory framework setting the requisite objectives and goals" (§§ 550(a)-(b), 562), keep the relevant GHG reduction targets updated with due diligence, and based on the best available evidence (§§550(d), 434); and act "in good time and in an appropriate and consistent manner when devising and implementing the relevant legislation and measures" (§550(e)).
47. Therefore, the NGOs respectfully request the Committee to note the Court's following observations on Switzerland's lack of an appropriate regulatory framework (§550(a)-(b)) and its failure to act in good time and in an appropriate and consistent manner when devising and implementing the relevant legislation and measures (§550(e)):

1. **2020 Climate Target:** Switzerland's 2011 CO2 Act set a target that was insufficient to meet global climate protection efforts (§558) and even that target was not achieved (§559).
2. **2030 Climate Target:** There was a gap in the regulatory framework from 2025-2030 (§§561, 566), which the NGOs acknowledge has been closed in the meantime.
3. **2040 and 2050 Climate Targets:** The 2022 Climate Act sets targets but lacks concrete measures for achieving them (§§565, 567) and, as the Court found, the “mere legislative commitment to adopt the concrete measures ‘in good time’, as envisaged in the Climate Act” was insufficient to guarantee effective protection from the harmful effects of climate change (§567).

VI. The urgency of the matter

48. Finally, the NGOs recommend that the Committee of Ministers request Switzerland to quantify and revise its climate targets with a reasonable deadline, reflecting the urgency and irreversible nature of climate change. As recognised by the Court, addressing the adverse effects of climate change requires immediate and decisive action grounded in “the existing and constantly developing scientific evidence on the necessity of combating climate change and the urgency of addressing its adverse effects, including the grave risk of their inevitability and their irreversibility” (§434). The Court noted the “urgency of near-term integrated climate action”, the “rapidly closing window of opportunity to secure a liveable and sustainable future for all” (§§ 118, 542) and that “to avoid a disproportionate burden on future generations, immediate action needs to be taken” (§549).
49. As such, allowing Switzerland more than a few months to quantify its carbon budget and then revise its national climate targets “in good time” would run contrary to the “pressing urgency of climate change and the current absence of a satisfactory regulatory framework” (§567). In the words of the Court, “the intergenerational perspective underscores the risk inherent in the relevant political decision making processes, namely that short term interests and concerns may come to prevail over, and at the expense of, pressing needs for sustainable policy making” (§420). The Committee must now ensure that this risk does not materialise.
50. Thus, a request by the Committee of Ministers requiring action by the September 2025 CMDH meeting would be appropriate in light of the distinct nature of the violation as

detailed by the Court, specifically, the elements pointing to the special urgency of the matter (§542).²¹

PART C: RECOMMENDATION TO THE COMMITTEE OF MINISTERS

51. Having in mind the arguments set out above, the NGOs respectfully recommend that the Committee of Ministers:

1. *Rejects* Switzerland’s request to conclude supervision;
2. *Expresses concern* with the response by Switzerland, which reiterates critiques on the Court’s judgment previously addressed and dismissed by the Court, and fails to set out the measures necessary to implement the judgment;
3. *Requests* Switzerland to provide an action plan setting out the measures necessary to implement the judgment, including an indicative timetable reflecting the urgency of the matter;
4. *Rejects* Switzerland’s claim that a national carbon budget cannot be calculated due to an alleged lack of agreed methodology for quantifying a State’s fair share;
5. *Requests* Switzerland to “take immediate action” (§549) to quantify a national carbon budget that represents Switzerland’s *fair share* of the remaining global carbon budget for limiting global temperature rise to 1.5°C, based on the best available science and taking into account the principles of the international climate regime (e.g. as done in the report based on ESABCC methodology - see Annex II), and to *report* on this quantification to the Committee of Ministers in time for its September 2025 Human Rights meeting;
6. *Requests* Switzerland, with the greatest urgency and on the basis of the remaining national carbon budget identified above, to start the democratic process for revising domestic climate legislation to align with its GHG limitations;
7. *Monitors* the execution of the KlimaSeniorinnen judgment with increased frequency and reschedules the case for examination with oral debate during its September 2025 Human Rights meeting.

²¹ The “scientific evidence as regards the manner in which climate change affects Convention rights, and taking into account the scientific evidence regarding the urgency of combating the adverse effects of climate change, the severity of its consequences, including the grave risk of their reaching the point of irreversibility, and the scientific, political and judicial recognition of a link between the adverse effects of climate change and the enjoyment of (various aspects of) human rights (...), and the States’ generally inadequate track record in taking action to address the risks of climate change that have become apparent in the past several decades, as evidenced by the IPCC’s finding of “a rapidly closing window of opportunity to secure a liveable and sustainable future for all” (§542)

ANNEX I List of signatory organisations

1. Conference of INGOs of the Council of Europe,
2. Generation for Right Over the World
3. Center for Spatial Justice,
4. Institut Biosphère
5. Diritto Diretto
6. BRAVA,
7. Clima NOW
8. Klima-Allianz Schweiz / Alliance Climatique Suisse,
9. humanrights.ch
10. NGO-Plattform Menschenrechte Schweiz,
11. European Environmental Bureau
12. Protect the Future/Védegylet Egyesület
13. Global Legal Action Network
14. Operation Libero
15. Notre Affaire à Tous,
16. Porgera Red Wara (River) Women's Association Incorporated
17. Green Rights Coalition
18. Association for Farmers Rights Defense (AFRD) Georgia
19. Child Rights International Network,
20. Center for International Environmental Law (CIEL),
21. Aurora
22. Noé21
23. ClientEarth,
24. A Sud Ecologia e Cooperazione,
25. Centre for Environmental Justice, Community Law and Mediation
26. Urgenda
27. Open Society Justice Initiative,
28. Climate Action Network (CAN) Europe
29. Just Planet
30. Italian Climate Network
31. the International Commission of Jurists

*Clima Now



CONFERENCE OF INGOs
OF THE COUNCIL OF EUROPE

CONFERENCE DES OING DU
CONSEIL DE L'EUROPE



klima
allianz
schweiz



een initiatief van
urgenda
SAMEN SNELLER DUURZAAM

OPEN SOCIETY
JUSTICE INITIATIVE



OPERATION
LIBERO



noé21
économie, énergie et société



CRIN CHILD RIGHTS INTERNATIONAL NETWORK

ClientEarth



EEB
European Environmental Bureau



Institut Biosphère
SCIENCE AND LAW



NOTRE
AFFAIRE
A TOUS



EARTHJUSTICE
BECAUSE THE EARTH NEEDS A GOOD LAWYER



ITALIAN
CLIMATE
NETWORK

Brava

Ehemals TERRE DES
FEMMES Schweiz

NGO-Plattform
Menschenrechte Schweiz
Für eine starke
Menschenrechtspolitik

ANNEX II Estimates of fair share carbon budgets for Switzerland

Estimates of fair share carbon budgets for Switzerland

13 January 2025

Dr. Setu Pelz



D. Yann Robiou du Pont



Dr. Zebedee Nicholls



All authors contributed equally.

This scientific report is based on the most recent and best available science. The authors are uninfluenced as to form or content by the exigencies of litigation.

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His results, published in *Science*, *Nature Climate Change* and *Nature Communications*, visible on the Paris-Equity-Check.org interactive website that assesses the ambition of countries emissions pledges. His studies are used in IPCC and UNEP reports, court cases, by diplomats at UN climate negotiations and by national and subnational governments to set their emissions targets (net-zero target and 2030 NDC of the UK, the Government of Victoria).

His background is in physics, with a Magistère in fundamental physics and a Master in climate physics. Prior to his current research focus, he conducted research in physical oceanography (University of Harvard and Paris Sorbonne), hydrology (University of California, Berkeley), sea-ice modelling (McGill University) and cosmology (University of Oxford).

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Alongside A/Prof Malte Meinshausen, he leads the Reduced Complexity Model Intercomparison Project (RCMIP). In the IPCC's Sixth Assessment Report, he led the writing of Cross-Chapter Box 7.1 on reduced complexity models used for scenario classification in AR6, was a Contributing Author to WG1 Chapters 1, 4, 5, 6, 7 and Technical Summary and WG3 Chapter 3 and Annex C. He completed his PhD at the Climate & Energy College within the University of Melbourne's School of Geography, Earth and Atmospheric Sciences in 2021, and his undergraduate Masters course in Physics at St. John's College, University of Oxford, where his Master's thesis was supervised by Prof Myles Allen. He is currently working on the next phase of RCMIP, taking MAGICC open source and developing more regionally detailed emulators.

Full profile available at: <https://iiasa.ac.at/staff/zeb-nicholls>

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1. Request from Verein KlimaSeniorinnen Schweiz and Greenpeace Switzerland

This report is drafted at the request of Verein KlimaSeniorinnen Schweiz and Greenpeace Switzerland. On 20 September 2024, the authors of this report presented a study on estimates of fair share carbon budgets for Italy. On 20 November 2024, Verein KlimaSeniorinnen Schweiz and Greenpeace Switzerland requested a report for the Switzerland in line with the report that had previously been drafted for Italy. The specific request made to us was as follows:

The European Scientific Advisory Board on Climate Change (ESABCC) released its Scientific Advice for the determination of an EU-wide 2040 climate target (ESABCC Report) in June 2023. The ESABCC Report was used as a basis by the European Commission to recommend the European Union's (EU) 2040 emissions reduction target, which is in the process of being formally adopted. The ESABCC Report determines fair share budgets for the EU based on an assessment of effort-sharing approaches informed by relevant legal and ethical principles. The ESABCC identifies that, for some interpretations of fairness, the EU has already emitted more than its fair share of the emissions budget that leads to 1.5°C warming. In addition, the ESABCC identifies that the most ambitious emissions reductions modelled for the EU in the scientific literature result in cumulative emissions that are higher than the most lenient EU fair share budget. The ESABCC recommends that the EU should be looking to address this shortfall as part of its commitment to the Paris Agreement temperature goal.

In this report, we request that you cover the following issues:

- I. Background to effort sharing approaches and fair share;*
- II. An overview of the approach taken in the ESABCC Report with respect to calculating the EU's fair share, and how this influenced its recommendations for the EU's 2040 target;*
- III. Switzerland's fair share of the remaining global carbon budget to remain below 1.5°C with a 50% likelihood, for different interpretations of fairness, using the same methodological approach as the ESABCC Report and the underlying scientific study authored by Pelz et al. (2023);*
- IV. Estimate when Switzerland would run out of its fair share carbon budget based on a linear reduction of its emissions;*
- V. Project what Switzerland's annual and cumulative greenhouse gas (GHG) emissions will be, assuming Switzerland achieves the following targets: 50% reduction in 2030 (compared to 1990 levels), 75% reduction by 2040 (compared to 1990 levels), and net-zero by 2050*
- VI. In light of (IV) and (V), provide commentary on what the implications are in terms of the adequacy of Switzerland's existing 2030 target.*

In respect of request (III), we request that you provide results for territorial emissions using the following methodological approaches that were used in these reports, using the most lenient / generous parameters considered by the ESABCC or Pelz et al. in each case:

- 'Equality', as expressed through an equal per capita division of the global carbon budget, accounting from 2015;*

- **'Responsibility'**, as expressed through an equal per capita division of the global carbon budget, accounting from 1990;
- **'Capability'**, considering Switzerland's relative per-capita GDP, accounting from 2015; and
- **'Responsibility and Capability'**, considering Switzerland's relative per-capita GDP, accounting from 1990.

2. Background to effort-sharing approaches and fair share

The Paris Agreement sets the global common objective to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels”.

This temperature threshold requires limiting global anthropogenic emissions, including a cumulative amount of CO₂ emissions (referred to in this report as the **global carbon budget** or the **global CO₂ budget**). These carbon budgets are based on consideration of various likelihoods to stay below a given warming threshold, in light of physical uncertainties. To achieve this common goal, the Agreement requires each Party to submit Nationally Determined Contributions (NDC) that reflect “its highest possible ambition, reflecting equity and its common but differentiated responsibilities and respective capabilities (CBDR-RC), in the light of different national circumstances.” In the first submissions, Parties were invited to explain how their contributions are “fair and ambitious in the light of its national circumstances” (UNFCCC, 2018). In upcoming submissions, each Party is mandated to ‘provide the information necessary for clarity, transparency and understanding’ of increased ambition ‘reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances’.

The Intergovernmental Panel on Climate Change (IPCC) explains that “it is only in relation to such a ‘fair share’ that the adequacy of a state’s contribution can be assessed in the context of a global collective action problem” (IPCC, 2022). The quantification of a countries’ fair share of the global emissions reduction effort is needed to assess the adequacy of countries’ contribution to the common emissions objectives of the Paris Agreement. Both the recent Global Stocktake under the United Nations Framework Convention on Climate Change (UNFCCC) and the latest IPCC reports have recognised the collective insufficiency of current emissions pledges to hold the global temperature increase below 1.5°C without specifying which of the Parties’ NDCs are sufficient.¹

The IPCC has presented a range of emissions allocations methods categorized by the dimension of equity they represent (IPCC, 2014). Yet, it has not presented the numerical results of these studies, which suggest fair and Paris-aligned emissions levels for countries that can be compared to NDCs. In addition, only part of this literature aligns with international law (Rajamani et al., 2021) and represents countries’ “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”, as set out in Article 2 of the Paris Agreement. Independent scientific advisory bodies have leaned on this literature to discuss the ambition of possible emissions objectives of their governments.

¹ The IPCC does not specify which Parties’ NDCs are sufficient or not, because this is not within the IPCC’s mandate.

3. European Scientific Advisory Board on Climate Change report on the EU's 2040 target

a. Introduction

The ESABCC was established by the European Climate Law of 2021 as an independent scientific advisory body, mandated to provide the EU with scientific knowledge, expertise and advice relating to climate change.

In its report, the ESABCC conducts three separate analyses that provide the basis of its recommendations. Firstly, it provides results based on different perspectives on the EU's fair share of the remaining global carbon budget that is consistent with limiting global warming to 1.5°C (chapter 3). Secondly, it analyses emissions reduction pathways for the EU implementable within its borders that are consistent with global emission pathways that limit warming to 1.5°C (chapter 4). Thirdly, it analyses the shortfall between the feasible domestic reduction pathways and its fair share estimates (chapter 5). We will follow this structure in outlining the main findings of the ESABCC in its report below.

b. Fair share budget analysis

For the determination of EU fair share budgets in the ESABCC report, both legal and ethical perspectives are analysed and taken into account.

With regards to legal perspectives, the ESABCC finds relevant the legal responsibilities under the Paris Agreement to pursue the achievement of the temperature goal set out under Article 2, based on its highest possible ambition, CBDR-RC and fairness (also described above).² In addition, the ESABCC attached weight to emissions allocation based on various principles that are (amongst others) laid down in the European Climate Law, such as the polluter pays, precautionary and do no significant harm principles.³

Based on these legal principles, as well as ethical principles described in the literature on 'fair shares', the ESABCC presents remaining carbon budget allocation estimates that are directly informed by a study conducted by *Pelz et al.* Grandfathering and cost-effectiveness methodologies are excluded from the fair share calculations, as neither of these approaches are considered to be a 'standard of equity'.⁴

With regards to the results of the fair share calculations, the ESABCC concludes the following:

[...] from the start of 2020, the highest budgets (20-27 Gt CO₂, or seven to nine times the EU's CO₂ emissions in 2021) were associated with equal per capita allocation of emissions. Approaches based on the polluter pays principle (which is cited as a guiding principle in the European Climate Law) lead to lower budget estimates, such as those using historical emissions since 1850 or 1990. Several of these estimates are already negative. The most stringent budget

² ESABCC report, p. 26.

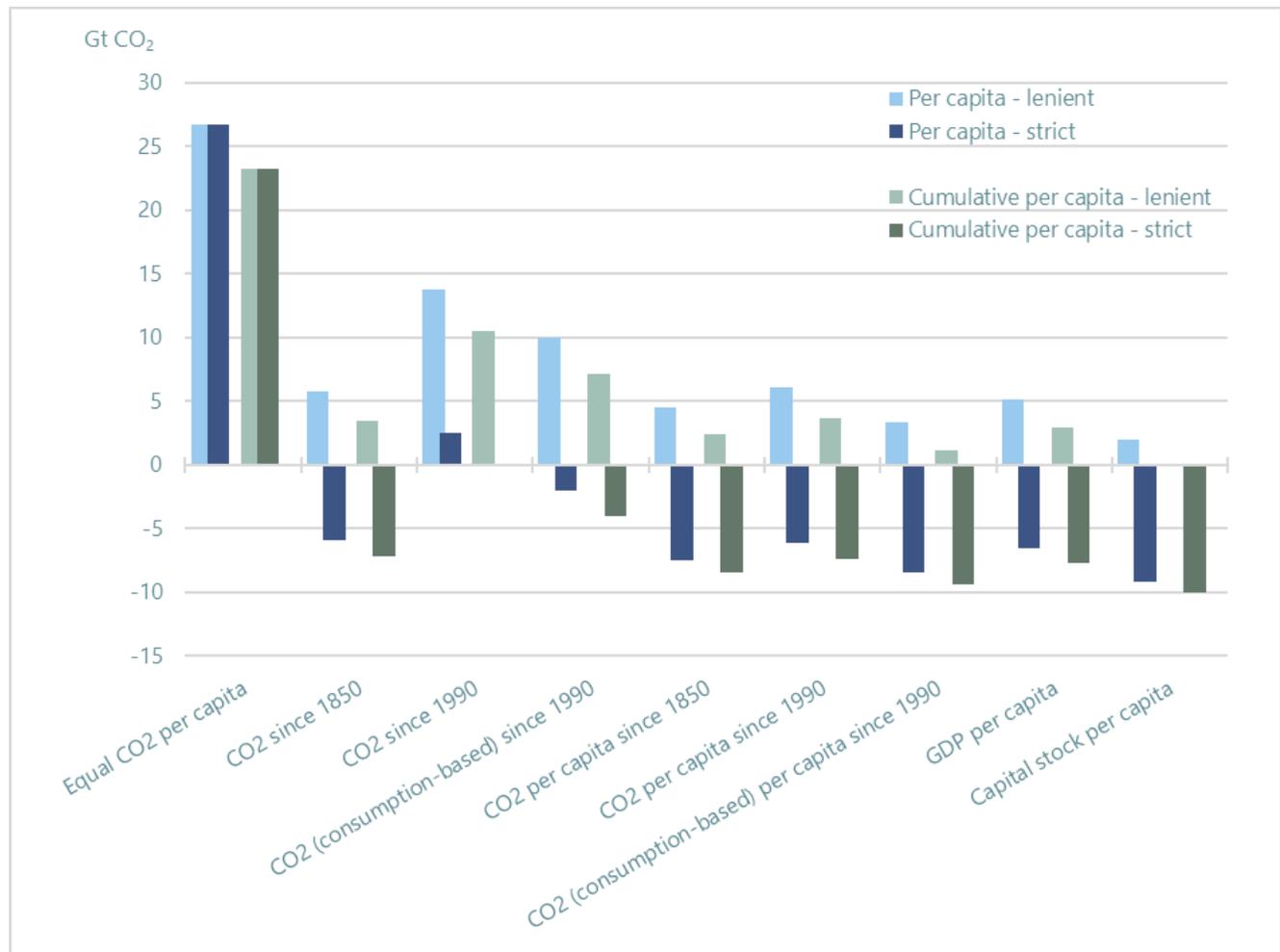
³ *ibid.*

⁴ p. 27.

estimates were found when the carbon budget was adjusted to reflect the ability to pay principle (interpreted as capital stock per capita).⁵

The results of the fair shares calculations (which are based on calculations undertaken in the study by Pelz et al.) are summarised in a figure in the report (reproduced below in Figure 1).

Figure 1 – Reproduction of Figure 3 of the ESABCC Report, showing estimates of the EU’s remaining fair share 1.5°C carbon budget from 2020, according to different principles and allocation methods. Negative budgets imply that the EU has already exhausted its fair share of the global emission budget.



⁵ p. 28.

c. Feasible domestic emissions pathways

The ESABCC also presented an analysis of emissions reductions pathways for achieving climate neutrality implementable in the EU territory and consistent at the global level with at least a 50% chance of limiting warming to 1.5°C at the end of the century with no or limited overshoot.⁶ Taking into account limitations with regards to the availability of negative emissions technology (in the report termed as ‘environmental risk levels’) and short-term technological scale-up, the ESABCC found that GHG emissions reduction levels of at least 88% and up to 92% (from 1990) could be achieved by 2040. A reduction of 95% could be achieved if technological scale-up challenges are overcome.⁷ The ESABCC noted that while reductions of 90-95% could be achieved taking the existing EU 55% GHG reduction target for 2030 as starting point, some of the emissions reduction scenarios show the feasibility of achieving higher emission reductions of up to 70% by 2030.⁸

The ESABCC noted that while the EU emissions pathways were derived from a global pathway to a 1.5°C warmer world, no explicit judgement was made about whether these scenarios’ allocation of emission reductions between the EU and the rest of the world should be considered fair.⁹ Conversely, in its fair share analysis, different fairness principles were used to estimate EU fair share carbon budgets but without explicit consideration of domestic feasibility.¹⁰ The fair share analysis was instead used to justify proposing the highest possible domestic ambition within the feasible range, recognising the need for complementary measures outside the EU.¹¹

d. Shortfall between domestic feasible emissions reductions and those required under a fair share budget

In order to make the estimates of the EU’s remaining carbon budget comparable to the implied cumulative emissions under domestic pathways, the ESABCC Report added estimated CO₂ LULUCF and non-CO₂ emissions, from the most ambitious scenario that it considered, to the fair share carbon budget (which, together, the ESABCC Report terms ‘**equity based fair share estimates**’). It does so by taking account of EU decarbonisation pathways, which assume CO₂ LULUCF and “non-CO₂ emissions from the most ambitious scenario”, in order to address fair-share considerations through the allocation of the carbon budget.¹² The EU’s GHG emissions allocation range for the 2020 to 2050 period was estimated to be between 40 and -85 gigatonnes (Gt) of CO₂ equivalent (CO₂e).¹³ As explained, the size of the negative budget value indicates that the EU may have already significantly exceeded its equity based fair share by the start of 2020. The ESABCC subsequently compares the range of fair share emissions allocation to the cumulative GHG emissions resulting from the most ambitious (95%) emission reduction pathway that that does not overly rely on negative emission technologies (defined as ‘environmental risk levels’ in the ESABCC Report). The ESABCC then concludes that even under the most ambitious domestic emissions pathway, EU domestic emissions would exceed the most lenient

⁶ p. 24.

⁷ p. 14.

⁸ p. 15.

⁹ p. 24.

¹⁰ *ibid.*

¹¹ p. 48.

¹² Table 10, p. 46.

¹³ p. 47.

interpretation of the EU's equity based fair share estimates. The shortfall between the most ambitious domestic emission pathway (based on global, cost-optimal analysis) and the equity based fair share estimates range identified by ESABCC is shown in Table 1 below.

	95% emissions reduction pathway	Equity based fair shares	
		Highest estimate	Lowest estimate
Total GHG emissions between 2020-2050 (Gt CO ₂ e)	52	40	-85
Shortfall (Gt CO ₂ e)	N/A	12	137

Table 1 - Adapted from Table 11 of the ESABCC Report (page 47). The results on the shortfall (row two) are derived based on the difference between pathway and fair share emissions (row one).

e. Recommendations based on the fair share and domestic feasibility analysis

Given the shortfall between feasible domestic emissions pathways and even the most lenient equity based fair share estimates, the ESABCC recommends that the EU aims for the highest emission reduction level within its own territory, with a minimum reduction of 90% by 2040 (with 95% being the most ambitious option), and to address the shortfall between its territorial emissions and fair share budget through supporting emissions reductions outside of its territory.¹⁴

The following are citations from the report with some of the ESABCC's conclusions and recommendations in relation to addressing the shortfall (at page 15):

As the most ambitious reductions result in cumulative emissions that are higher than the most lenient equity-based fair share estimate (based on equal global per capita emissions), the Advisory Board considers that the EU should be looking to address this shortfall as part of its commitment to the Paris Agreement temperature goal. [...]

[...]

A fair contribution to climate change mitigation requires ambitious reductions in domestic emissions, complemented by measures outside the EU [...]

To deliver a contribution to achieving the Paris Agreement that is both fair and consistent with the physical science of climate change, the Advisory Board recommends that ambitious

¹⁴ p. 10, 15 & 48.

reductions in domestic emissions be complemented by measures outside the EU [...]. The EU must therefore ensure that it does the following.

- 1. **Aim for the highest level of ambition in domestic emission reductions and carbon dioxide removals**, while accounting for feasibility constraints, environmental risks and technological deployment challenges. The Advisory Board notes the importance of the EU communicating how it considers its contribution to be fair and ambitious, when submitting its post-2030 target as a nationally determined contribution under the Paris Agreement.*
- 2. **Contribute to direct emission reductions outside the EU**, in the light of the shortfall identified between the feasible pathways and fair share estimates.*
- 3. **Pursue sustainable net negative emissions after 2050**, as required under the European Climate Law, which would help manage temporary temperature overshoots, and support the international balancing of greenhouse gas emissions.*

4. Determining a fair share for Switzerland

a. Description of the global carbon budget

In its Sixth Assessment Report (**AR6**), the IPCC provides estimated values for the remaining global carbon budget, which correspond to the net quantity of CO₂ emissions that can be released over the century to the atmosphere from the start of 2020 while keeping global warming to 1.5°C. The exact value of the budget depends on several factors, including the pursued probability of keeping global temperature rise to within this limit, and the assumed path of non-CO₂ GHG emissions (which also contribute to warming).

The IPCC's estimates of the remaining carbon budget for 33%, 50% and 67% probabilities of limiting temperature rise to 1.5°C have been included in Table 2, below. The fair shares for the EU in the ESABCC Report are based on a remaining global carbon budget of 500 Gt CO₂ from the start of 2020, for a 50% chance of remaining below 1.5°C.

b. Update of the global carbon budget

In order to provide values based on best available science, this report bases its calculations on estimates of the remaining carbon budget from the following studies:

- I. A recent study by *Forster et al.* (2023), which provides an updated carbon budget using methods “as close as possible” to the IPCC in AR6, but with updated datasets, from 2023. The study's methodological proximity to the IPCC's work means that it is an authoritative piece of work. For example, this report was used as the basis of the most recent fair share assessment undertaken by the German Advisory Council on the Environment (SRU, 2024). A previous publication of the SRU was used as a basis by the German Constitutional Court in its ruling on the unconstitutionality of the German Climate Act.¹⁵
- II. A recent study by *Lamboll et al.* (2023), which provides the most up to date estimate of the remaining global carbon budget from the start of 2023. The study by *Lamboll et al.* uses updated data and an improved methodological approach to estimate the remaining carbon budget and represents the latest best available science.

Estimates of the remaining carbon budget for 33%, 50% and 67% probabilities of limiting temperature rise to 1.5°C from *Forster et al.* and *Lamboll et al.* have been included in Table 2, below. For reference and comparison, the IPCC's remaining carbon budget estimates from AR6, updated to account for global emissions that have taken place between 2020 and 2022 (the most recent year for which data is available) (the '**Updated AR6**' budget), have also been included in Table 2.

Both the studies by *Forster et al.* and *Lamboll et al.* use updated data sets compared to AR6. They also use improved methodological approaches to calculating the remaining carbon budget, as well as improved estimates of recent global temperature increase. As a result, estimates of the remaining

¹⁵ German Federal Constitutional Court, 2021, see: <https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/EN/2021/bvg21-031.html>

carbon budget in 2023 from these studies are considerably smaller than the ‘Updated AR6 budget’, which only takes into account global emissions since 2020 until the end of 2022 without the updated datasets and temperature estimates that are taken into account in the more recent studies. We therefore consider both *Forster et al.* and *Lamboll et al.* to represent the best available science, on the basis of which Switzerland's fair share budget calculations should be based.

Source	Budget from	Global carbon Budget (Gt CO ₂)		
		33%	50%	67%
<i>IPCC AR6</i>	<i>2020</i>	650	500	400
Updated AR6	2023	530	380	280
Forster et al.	2023	300	250	150
Lamboll et al.	2023	480	247	60

Table 2 – The remaining global carbon budget from 2023 onwards, as estimated using AR6 (updated to reflect emissions between 2020 and 2022), *Forster et al.* and *Lamboll et al.* The IPCC AR6 budget from 2020, which was used in the ESABCC Report, is also presented in italics for comparative purposes.

c. Description of allocation methods for dividing the global carbon budget amongst countries

The allocation methods in this report are drawn from the ESABCC Report. A separate report by *Pelz et al.* (2023) formed the basis of the ESABCC’s work on fair share allocations in its report. *Pelz et al.* provides further detail on allocation methods that are used but not presented in the ESABCC Report, as well as additional fair share emissions allocations using these methods.

Pelz et al. note that the choice for allocation methods and *their* operationalisation requires several value judgements aligned to desired foundational principles. These include deciding on parameters such as (i) the year at which the carbon budget is calculated (e.g., the year the Paris Agreement was signed) (ii) the starting year for allocation to express historic responsibility (e.g., 1990 or 1850), (iii) the proxy variable representing ability to pay (e.g., GDP per capita), and (iv) whether to base calculations on the population in the year that the budget is divided, or the cumulative population over the entire period from the starting year until net-zero CO₂. Some of these parameters must be transformed to an inverse range, for example to allocate proportionally lower budgets to countries with higher levels of capability. The value judgements necessary in this transformation (or penalty function) are illustrated through the presentation of ‘lenient’ and ‘strict’ results for each of the methodological approaches that it assesses.

The parameters selected in the ESABCC Report are described in the notes below Figure 3 of the report (at pages 28 - 29).

The ESABCC Report uses 2015 (the year that the Paris Agreement was signed) as the baseline year for calculating the EU's fair share of the remaining carbon budget, based on equity and capability approaches. The ESABCC Report, published in 2023, subtracts historical carbon dioxide from fossil fuels and industry (**CO₂ FFI**) emissions between 2015 and 2019, to present remaining fair share carbon budgets for the EU from 2020. This report updates the findings of the ESABCC Report by also taking into account historic emissions between 2020 and 2022 (the latest available year that global emissions data is available). This report presents remaining carbon budgets for Switzerland from 2023.

In respect of the remaining parameters, the plaintiffs have requested that these are selected to reflect the most lenient or generous results for the EU quantified by the ESABCC. This choice of parameterisation is not based on any particular value judgement. Stricter interpretations for the EU are justifiable and should not be discarded, but would require normative equity discussions outside the scope of this report (which simply seeks to compare Switzerland's pledge to emissions allocations consistent with the ESABCC methods). By selecting the parameters that provide the most generous quantifications submitted to the EU, this approach ensures that a breach of the allocations presented here would characterise a breach of any submitted parameterisation. As such, the baseline year for responsibility has been set to 1990, GDP per capita (as expressed in purchasing power parity, which is the basis used in the ESABCC Report) will be used to represent capability / ability to pay, and budgets will be distributed in per capita terms determined by the population at the year that Switzerland's national budget is calculated. In terms of the penalty function applied in *Pelz et al.*, the lenient approach identified in the ESABCC Report has been taken to provide a single result for each methodological approach.

In Figure 1, above, which presents the EU's fair share estimates shown in Figure 3 of the ESABCC Report, the methodological approaches that we use in this report correspond to the (i) 'Equal CO₂ per capita', (ii) 'CO₂ per capita since 1990' (although the methodological approach in *Pelz et al.* has been used - further information in this regard is available in Annex 1) and (iii) 'GDP per capita'. In addition, a fourth approach reflecting both capability and responsibility has been included, whereby 'GDP per capita' is calculated from 1990 - this approach has been included in *Pelz et al.* but is not presented in the ESABCC Report. A full overview of the parameters included in each methodological approach has been included in Annex 1.

The only methodological deviations from the approach taken in the ESABCC Report and *Pelz et al.* concerns the treatment of emissions from aviation and shipping. As these are not typically reflected in national emissions inventories due to emissions accounting norms, it is more robust from a methodological point of view to remove them before calculating national fair share carbon budgets.

d. Switzerland's historical emissions

Consistently with the ESABCC report, in this report we compared the remaining carbon budgets to Switzerland's CO₂ FFI emissions. In order to calculate Switzerland's latest remaining carbon budget in

line with the ESABCC report, Switzerland's past emissions must be taken into account at least from the year 2015. The latest year for which global official emissions data is reported is 2022. Between 1990 and 2022, Switzerland's territorial emissions from CO₂ were approximately 1.39 Gt CO₂. Between 2015 and 2022, Switzerland's territorial emissions from CO₂ were 0.30 Gt CO₂.

5. Results

a. Estimates of Switzerland's remaining 1.5°C carbon budget

The application of the allocation methods outlined above provide a range of estimates of Switzerland's carbon budget, presented in Table 3. Estimates of the remaining carbon budget are presented from the start of 2023.

For Switzerland, the 'equal per capita' allocation is the most lenient of all the allocation methods we consider. As indicated in the previous section, this allocation method does not take into account responsibility for historical emissions since 1990 or capability considerations, as expressed in the principle of CBDR-RC as laid down in the Paris Agreement.

From 2023, Switzerland's **remaining carbon budget is between -0.99 Gt CO₂ and 0.26 Gt CO₂** for the allocation approaches considered here. Across all methodologies, only the 'equal per capita' approach provides Switzerland with a positive remaining carbon budget that could last several years under current levels of CO₂ emissions (emissions from fossil fuel and industry (**CO₂-FFI**) were approximately 0.035 Gt CO₂ in 2022). While a small amount of budget (0.08 - 0.09 GtCO₂) remains under the 'responsibility' approach from the start of 2023, this would be exhausted by the end of 2025 if Switzerland's emissions remain approximately constant.. As such, **any estimate of Switzerland's fair share budget that reflects capability or responsibly would have already been exhausted, or will likely be exhausted in the near future.**

Remaining carbon budget from 2023 for Switzerland in Gt CO ₂				
Source	Equal per capita ('Equality')	CO ₂ per capita since 1990 ('Responsibility')	GDP per capita ('Capability')	GDP per capita since 1990 ('Responsibility and capability')
<i>Updated AR6</i>	0.41	0.26	-0.04	-0.94
Forster et al.	0.26	0.09	-0.09	-0.99
Lamboll et al.	0.25	0.08	-0.09	-0.99

Table 3 – Overview of Switzerland's remaining carbon budget, using the global carbon budgets from Forster et al. and Lamboll et al. as the basis for calculations. Budgets that have been exhausted by 2023 are presented in red. Estimates of Switzerland's carbon budget using the Updated AR6 carbon budget as the basis of calculations have been included for reference in grey.

b. Estimate of when Switzerland would need to reach net zero CO2 emissions, if it reduced its emissions on a straight-line trajectory

As is shown in Table 3, above, the allocation methods that take into account principles of ‘capability’ and ‘capability and responsibility’, indicate that Switzerland’s carbon budget has almost certainly already been exhausted. The year of budget depletion for these allocation methods, taking historical CO2-FFI emissions into account, are shown in Table 4. Switzerland would have had to reach net zero CO2 emissions in the years indicated below to remain within the respective budgets.

Source	Year by which Switzerland’s carbon budget was exhausted	
	GDP per capita ('Capability')	GDP per capita since 1990 ('Responsibility and capability')
Forster et al.	2020	1999
Lamboll et al.	2020	1999

Table 4 – Overview of the years by which the carbon budgets for Switzerland are exhausted for allocation methods that take into account principles of capability, or both capability and responsibility, for global budgets as reported in Forster et.al and Lamboll et.al.

The allocation methods that provide Switzerland with remaining budget are the ‘equal per capita’ and ‘responsibility’ approaches. Assuming Switzerland’s CO2-FFI emissions in 2023 and 2024 were at a similar level to those in 2022, its remaining budget under the ‘responsibility’ approach will be nearing depletion and would likely be exhausted before the end of 2025. When looking forward - the point that the carbon budget will be exceeded depends on assumptions about Switzerland’s CO2 pathway. In the absence of information concerning how Switzerland will reduce its non-fossil-fuel and non-CO2 emissions over time, the conclusions of this report relate solely to CO2-FFI, unless otherwise stated. Furthermore, addressing fair-shares of non-CO2 and land-use, land-use change and forestry (LULUCF) CO2 emissions is a separate matter that was not specifically considered in the ESABCC report.

If Switzerland were to reduce its CO2 emissions on a straight line basis from 2023, it would need to **reach net zero CO2 emissions by 2038** in order to remain within its ‘equal per capita’ carbon budget. Emissions would need to decline by approximately 0.002 GT CO2 per year, which implies an annual decline equivalent to approximately 6.4% of emissions in 2022 every year until net zero. This trajectory, alongside Switzerland’s historical CO2 emissions, has been included in Figure 2, below.

c. Estimates of Switzerland's projected GHG emissions assuming Switzerland's targets are met

Looking ahead, if Switzerland achieves GHG emissions reductions in line with its own national targets it will emit approximately 0.53 Gt CO₂e between 2023 and 2050. This figure is not directly comparable with Switzerland's CO₂ budget, as it reflects emissions of other GHGs, and more work would be needed to convert Switzerland's CO₂ budget into an indicative GHG budget as we have already noted. However, for context, in 2022, Switzerland's CO₂ emissions from FFI represented about 82% of its total GHG emissions.

For illustrative purposes, Figure 2 shows Switzerland's historical GHG emissions, which includes Switzerland's CO₂ FFI emissions, LULUCF CO₂ emissions and non-CO₂ emissions. Switzerland's projected GHG emissions between 2023 and 2050 have been included, which reflect Switzerland's targets. For ease of reference, these targets (which are outlined in the plaintiff's request) are:

1. At least a -50% reduction in greenhouse gas emissions by 2030 compared to 1990 (Climate and Innovation Act);
2. At least a -75% reduction in greenhouse gas emissions by 2040 compared to 1990 (Federal law on climate protection goals, innovation and strengthening energy security); and
3. Net zero by 2050 (Federal law on climate protection goals, innovation and strengthening energy security).

Given that Switzerland would need to reach net zero in 2038 to respect its carbon budget under the 'equal per capita' methodology, Switzerland's current emissions trajectory implies that its carbon budget would be overshoot considerably by 2038, as well by as the time it reaches net zero in 2050.

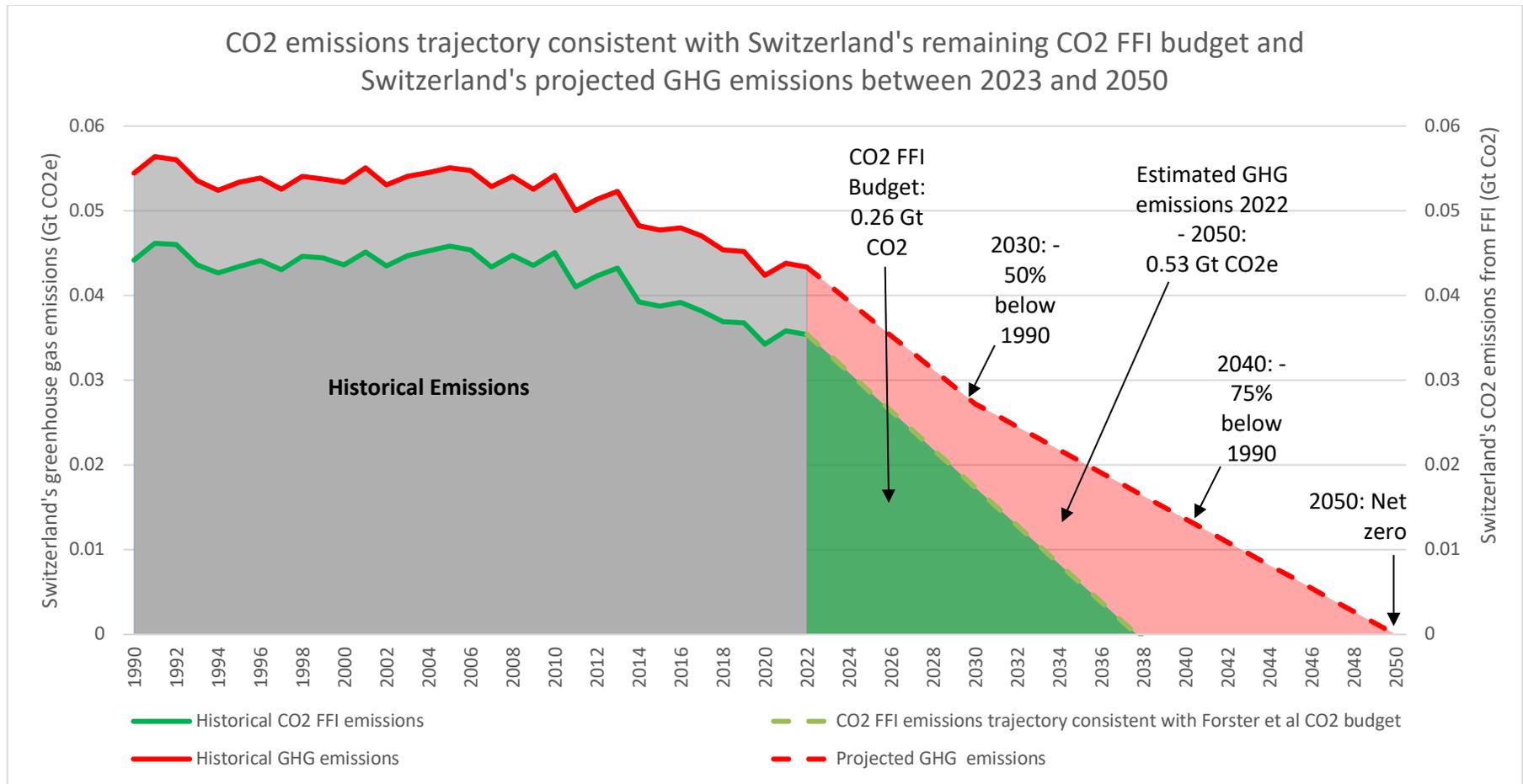


Figure 2 – Switzerland’s historical CO2 emissions from Fossil Fuel and Industry (FFI) are represented by the green solid line. Switzerland’s estimated trajectory to reach net zero while remaining within its carbon budget (‘equal per capita’ approach, using the Forster et al. budget as a basis) is represented by the green dashed line. Assuming a budget of 0.26 Gt CO2 available from the start of 2023, Switzerland would need to reach net zero CO2 in 2038. For illustrative purposes, Switzerland’s historical greenhouse gas emissions are represented by the solid red line (in Gt CO2e). Switzerland’s projected greenhouse gas emissions between 2023 and 2050, assuming it achieves emissions reductions in line with its targets, are represented by the red dashed line. Cumulative emissions over this timeframe are projected to be 0.53 Gt CO2e. This report does not discuss possible assumptions for non-CO2 emissions nor LULUCF CO2 emissions, hence the two cumulative emissions numbers are not directly comparable in terms of fairness principles alone.

6. Conclusion and commentary regarding the implications of Switzerland's carbon budget for its 2030 target

This report has estimated fair share budgets for Switzerland based on the methodological approaches taken in the ESABCC report and the underlying scientific study authored by *Pelz et al. (2023)*, using the most up-to-date estimates of the remaining global carbon budget as a basis for calculations.

Estimates of Switzerland's carbon budget that are derived from allocation methods reflecting capability or a combination of responsibility and capability, as defined here, would have already been depleted by cumulative CO₂ emissions from fossil fuels and industry in the years 2020 and 1999, respectively. All CO₂ emissions since these years (i.e., since budget depletion) are in excess of Switzerland's carbon budget using these fair share approaches. Exceeding the fair share budgets either comes at the cost of the fair share budgets of other countries, or leads to overshoot of the globally available carbon budget.

While a small amount of budget remains under the 'responsibility' approach from the start of 2023, if emissions remained at a similar level as in 2022 then this will be exhausted before the end of 2025. Only the 'equal per capita' approach (the most lenient interpretation of an equitable fair share as defined in the ESABCC report) provides Switzerland with a non-negligible remaining carbon budget of 0.25 to 0.26 Gt CO₂ from the start of 2023. To remain within its 'equal per capita' budget on the basis of a straight line reduction, Switzerland would need to reach net zero CO₂-FFI emissions in 2038. This would require annual emissions reductions equivalent to approximately 6.4% of its CO₂-FFI emissions in 2022 every year until net zero. If Switzerland reduces its greenhouse gas emissions by 50% by 2030 (compared to 1990 levels) and is on track to meet its 75% emissions reduction target in 2040, Switzerland is likely to overshoot its 'equal per capita' carbon budget considerably by 2038 – and even more so by the time it reaches net zero in 2050.

Recalling the ESABCC's recommendations in its report, fair share carbon budgets do not necessarily need to be met entirely within a country's territory. The ESABCC's recommendation was that the EU, '*Aim for the highest level of ambition in domestic emission reductions and carbon dioxide removals*' as well as '*Contribute to direct emission reductions outside the EU, in the light of the shortfall identified between the feasible pathways and fair share estimates*'. Emissions reductions that are necessary to stay within fair share budgets thus do not entirely need to be achieved within the state's own territory. This is increasingly important in light of feasibility constraints rendering extreme reductions in territorial emissions difficult or impossible.

For the 'capability' and 'responsibility and capability' approaches, it is no longer possible to remain within the fair share budgets. As such, all additional domestic CO₂ emissions should be compensated through planned carbon dioxide removal (CDR) or emissions reductions or removals taking place abroad. Net-negative emissions may also help to compensate for the exceedance of Switzerland's fair share budget, but the timing of this matters. Unless these net-negative emissions are in the very near-term, it is more complex to assess whether this would allow for direct compensation or not.

As a further consideration, the remaining global carbon budget from 2023 for a 50% chance of remaining below 1.5°C is estimated to be 247-250 GT CO₂, which is equal to less than 7 years of current emissions levels (global CO₂ emissions from FFI in 2022 were 37.2 Gt CO₂). Delays in addressing any

exceedance of the global remaining carbon budget may lock the world into breaching the 1.5°C target. This overshoot may become permanent if feasibility limits mean that any temperature exceedance cannot be addressed in its entirety.

To reduce the risks of contributing to both temporary, or permanent, overshoot of the remaining carbon budget, any emissions in excess of Switzerland's fair share carbon budget would need to be compensated as soon as possible and in the near-term. Consequently:

- For the 'equal per capita' allocation:
 - o If Switzerland's CO₂-FFI emissions were to follow a straight line trajectory to net zero in 2038, it would need to be net zero from 2039 onwards.
 - o If Switzerland's annual CO₂-FFI emissions consistently exceed the annual CO₂-FFI emissions under the straight line trajectory, Switzerland would need to reach net zero CO₂-FFI emissions at the date that the budget is depleted, which (depending on the level of annual exceedance) could be considerably earlier than 2038. If it is not net zero at this time, it would need to set a net negative target to compensate for any overshoot of the budget.
- Under the budget allocated under the 'responsibility' approach, a net zero target would be required from the year the budget is depleted. If emissions in 2023, 2024 and 2025 were/are at a similar level to those in 2022, the budget will be depleted over the course of 2025 and a net zero target would need to be set from 2026 onwards.
- For the budgets allocated using the 'capability' and 'responsibility and capability' approaches, net negative targets would need to be set immediately for all allocations, until the total overshoot has been compensated.

Annex 1

Table 1 - Full description of the parameterisation each allocation approach

Fair share approach	Description of method / parameterisation
Equal per capita	An equal per capita allocation of the remaining carbon budget in the year 2015.
Responsibility	An equal per capita allocation of the remaining carbon budget in the year 1990.
Capability	A per capita allocation of the remaining carbon budget in the latest year of allocation, 2015, scaled in inverse proportion to GDP per capita in the year 2015, expressed in current purchasing power parity (2024).
Both Responsibility and Capability	A per capita allocation of the remaining carbon budget in the year 1990, scaled in inverse proportion to GDP per capita in the year 1990, expressed in current purchasing power parity (2024).

Annex 2 - Data and Methods

GDP Data:

- **GDP (Purchasing Power Parity, PPP):** A dataset from the World Bank's World Development Indicators is used, found in the API_NY.GDP.MKTP.PP.CD_DS2_en_csv_v2_1090665.csv file. This dataset includes GDP values adjusted for purchasing power parity, which accounts for the relative cost of living and inflation rates between countries.

Population Data:

- The historical population data comes from Our World in Data (OWID), specifically the population.csv file. This dataset includes population estimates for countries from 1990 to 2019. Source: <https://ourworldindata.org/grapher/population>.

Carbon Emissions Data:

- **Territorial CO2 Emissions:** The territorial fossil carbon emissions data is sourced from the Global Carbon Project, found in the National_Fossil_Carbon_Emissions_2023v1.0.xlsx file (sheet 2). This dataset includes country-level emissions from fossil fuel combustion and industrial processes. Source: <https://essd.copernicus.org/articles/15/5301/2023/>.
- **Data availability:** All underlying data for this report can be made available on request.

Data processing and analysis:

- **Coding script availability:** The full coding script used in this report to implement the parameterisation set out above can be made available on request.

Annex 3 - References

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**ANNEX III NGOs calculation of CO2 Emission
projections 2023-2050 according to actual law
and law proposals**

**Title CO2 Emissions 1990-2022 according to the swiss greenhouse gas inventory
CO2 Emission projections 2023-2050 according to actual law**

Source: <https://www.bafu.admin.ch/greenhouse-gas-inventory>

Year	Mio t CO2 Emissions	Budget CO2 only Sum in Gt	Share of 1990	Yearly change rel. to 1990	
1990	44.541		100.00%		
1991	46.507		104.41%		
1992	46.365		104.09%		
1993	43.931		98.63%		
1994	42.976		96.49%		
1995	43.698		98.11%		
1996	44.375		99.63%		
1997	43.294		97.20%		
1998	44.853		100.70%		
1999	44.661		100.27%		
2000	43.825		98.39%		
2001	45.277		101.65%		
2002	43.644		97.99%		
2003	44.814		100.61%		
2004	45.383		101.89%		
2005	45.921		103.10%		
2006	45.507		102.17%		
2007	43.497		97.66%		
2008	44.834		100.66%		
2009	43.654		98.01%		
2010	45.167		101.40%		
2011	41.101		92.28%		
2012	42.362		95.11%		
2013	43.287		97.19%		
2014	39.334		88.31%		
2015	38.826		87.17%		
2016	39.280		88.19%		
2017	38.272		85.93%		
2018	36.959		82.98%		
2019	36.824		82.67%		
2020	34.328		77.07%		
2021	35.875		80.54%		
2022	32.913		73.89%		
2023	32.412	0.032	72.77%	1.125%	2023-2050: PROJECTIONS Domestic reduction compared to 1990
2024	31.911	0.064	71.64%	1.125%	
2025	30.304	0.095	68.04%		Actual CO2-Act until 2025
2026	28.697	0.123	64.43%		New CO2-Act until 2030 (assumption: 50% reduction in Switzerland. Up to 20% will come from other countries)
2027	27.091	0.150	60.82%		
2028	25.484	0.176	57.21%		
2029	23.877	0.200	53.61%		
2030	22.270	0.222	50.00%		Target for 2030 50%
2031	21.157	0.243	47.50%		Climate and Innovation Act until 2040
2032	20.043	0.263	45.00%		
2033	18.930	0.282	42.50%		
2034	17.816	0.300	40.00%		
2035	16.703	0.317	37.50%		
2036	15.589	0.332	35.00%		
2037	14.476	0.347	32.50%		
2038	13.362	0.360	30.00%		
2039	12.249	0.372	27.50%		
2040	11.135	0.384	25.00%		
2041	10.022	0.394	22.50%		Climate and Innovation Act until 2050 AND longterm climate strategy of government
2042	8.908	0.402	20.00%		
2043	7.795	0.410	17.50%		
2044	6.681	0.417	15.00%		
2045	5.568	0.422	12.50%		
2046	4.454	0.427	10.00%		
2047	3.341	0.430	7.50%		
2048	2.227	0.433	5.00%		
2049	1.114	0.434	2.50%		
2050	0.000	0.434	0.00%		

CO2 used from 1.1.2023 434 Mio t CO2 Federal Council offers no CO2 quantification in its Action Plan to the CoM