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Quantifying Compliance: Article 8 Carbon Budgets as Proof of ICJ-Level Due Diligence

Sardar Yasir Baig
sybaig@gmail.com
LLM, BPP University United Kingdom

Maria Mazhar Kharal
maria.Mazhar@law.iiui.edu.pk
Lecturer, IBADAT International university Islamabad.

Kainaat Shah
Shahkainaat13@gmail.com
Advocate Peshawar High Court

Corresponding Author: * Kainaat Shah Shahkainaat13@gmail.com

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ABSTRACT

States increasingly formalize their climate change commitments in the language of net-zero deadlines, interim emission targets, and carbon budgets, raising the question of whether these quantified benchmarks serve as evidence of legal compliance. This research paper investigates whether Article 8 'requirements for quantifying climate action (in particular, the European Court of Human Rights' recent insistence on timelines, interim targets, and carbon budgets) are probative of a state's compliance with the International Court of Justice (ICJ)'s due-diligence standard for climate obligations. We analyze converging developments in human rights and international law: the Klimaseniorinnen judgment of April 2024, where the ECtHR held that states must enact binding climate targets and carbon budgets to protect the right to private life, and the ICJ's 2025 Climate Change Advisory Opinion confirming states' duty of "stringent" due diligence to prevent foreseeable climate harm. Our findings indicate that quantified climate action frameworks are not only politically salient but also legally significant. Their presence (or absence) is treated as compelling evidence of whether a state is meeting its international obligations. However, we argue that while such "numbers that bind' are necessary indicators of due diligence, they are not sufficient ambition, and implementation remains paramount.

Keywords: *European Convention on Human Rights Article 8; Human rights and climate change; Climate litigation; Carbon budgets; Nationally determined contributions (NDCs); Net-zero targets; Paris Agreement (Article 4).*

INTRODUCTION

Climate change has no longer solely belonged to scientific circles and the political arena but has firmly entered the sphere of legal responsibility. Courts and international tribunals have been asked over the past few years to specify what actual steps states should undertake to meet their obligations in the face of a warming world. An even more noticeable aspect of this new climate jurisprudence is that it concerns itself with numbers, namely, particular temperature thresholds, percentages of emission cuts, years of targets, and carbon caps. These quantifications are when the vocabulary of scientists and policy planners becomes a yardstick for legal or illegal state activities. With the growth and sophistication of climate litigation, there have been questions about the reciprocal interaction of numerical commitments to the climate with legal norms (or the international law obligation of due diligence). According to international law, due diligence establishes the level of behavior desired by states to avoid harm. It was first developed in environmental law and further expounded by the International Court of Justice (ICJ) and other tribunals to

involve a state performing with care that is reasonably foreseeable to prevent a known risk (International Law Commission, 2025; Pulp Mills on the River Uruguay, 2010). Regarding transboundary environmental harm, due diligence implies the implementation of all relevant actions to avoid serious harm (Certain Activities Carried Out by Nicaragua in the Border Area, 2015; Pulp Mills on the River Uruguay, 2010). Due diligence has taken on new dimensions when applied to climate change, causing global harm. In its 2025 Advisory Opinion on Climate Change, the ICJ unanimously declared that states are obliged to act with due diligence to prevent harmful impacts on the climate system caused by greenhouse gas emissions (International Court of Justice [ICJ], 2025). The Court highlighted that this is not only a requirement in climate treaties, but also in customary international law and human rights law (ICJ, 2025). The ICJ has highlighted that all states should cooperate to meet tangible emission reduction goals and act in accordance with their abilities (ICJ, 2025). The lapse in doing so, such as the lack of action by a state in curbing emissions or controlling the high-emission activities of individuals, may be a violation of international law, which will provoke legal outcomes (ICJ, 2025). In line with these changes in international law, courts of human rights have begun to struggle with climate inaction as an act of fundamental rights violation. On April 9, 2024, the Grand Chamber of the European Court of Human Rights (ECtHR) issued its ruling in Verein KlimaSeniorinnen Schweiz and Others v., which became a watershed moment. Switzerland. The ECtHR was first to conclude that ineffective climate change mitigation may violate the positive duty of a state under the European Convention on human rights (Article 8) that there be respect to family and private life (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024). The court decided that the government must fight climate change to ensure that the lives and well-being of its citizens are high, particularly among vulnerable populations (Verein KlimaSeniorinnen Schweiz und Others, v.). Switzerland, 2024). More importantly, the ECtHR did not burden this responsibility with abstract principles, but provided particular quantitative criteria according to which a state is considered to be doing enough. States must establish an actual timeframe for carbon neutrality within, in principle, the next three decades, and the long-term objective must come with a carbon budget (or equivalent) measuring the amount of space that can be emitted. Switzerland, 2024, SSSS 548-550). They should also assume proper interim greenhouse gas (GHG) reduction goals and paths to incorporate the short and medium terms into the net-zero horizon (Verein KlimaSeniorinnen Schweiz und Others v.). Switzerland, 2024, SSSS 548-550). In brief, the effective climate policy is Article 8 of the ECHR, a policy that has been brought to light in figures, including numbers, percentages, and planned tonnages of CO2. The lack of such quantification proved fatal in the case of Switzerland, which found fault with Switzerland owing to its failure to ensure that there was a relevant regulatory framework to address climate change in the country, with specific reference to the fact that Switzerland did not quantify any national GHG emission limits by way of a carbon budget (or similar vehicle) (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024). Having no carbon budget and surpassing previous emission targets, Switzerland was caught violating Article 8 (Verein KlimaSeniorinnen Schweiz and Others v. Switzerland, 2024).

This overlap of events, the formulation of a strict due diligence duty by the ICJ, and the demand of the ECtHR to quantify climate targets begs new questions. Are there more numerical commitments and plans (numbers that bind) than administrative devices? Do they have probative value in legal terms, that is, can carbon budgets, interim targets, and timelines existent or absent be used as evidence of a member state acting within its duty of due diligence in response to climate change? The research question of the current study is as follows: Are the quantification requirements of Article 8 (timeline, interim targets, carbon budget, or equivalent) evidence of adherence to the ICJ's due diligence standards? That is, when a state has codified strong numerical climate targets and tracks into law, it means that it is putting effort into it that international law argues it is supposed to put in, and the converse is also true: Is the lack of such quantified commitments a pointer to a breach? However, this has not yet been investigated in detail. It occupies the intersection point between various legal regimes, including human rights, the international

environment, and climate-treaty laws, which swiftly develop a common lexicon of climate responsibility. To answer this question, one needs to look at recent jurisprudence (e.g., the ECtHR decision and the opinion of the ICJ) and the practice of states in terms of adopting binding climate targets. It also requires knowledge of the due diligence criterion, a loose but tough criterion that measures behavior rather than ultimate results (International Law Commission, 2025; Pulp Mills on the River Uruguay, 2010). Due diligence is not a guarantee that no harm is to be caused but states must make earnest efforts to achieve the agreement (in this case, the prevention of dangerous climate change) (Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, 2011). The quantified climate commitments may be regarded as a concrete expression of the best effort–a means of expressing that a state is designing and acting in a systematic manner to reduce emissions. The next aspect of this article is a review of the development of quantified obligations in climate law and their connection to the due diligence norm (Literature Review). Next, we propose the findings of our study, a synthesis of legal development and state practice, to evaluate the extent to which these numbers have become probative. We consider the following consequences in the discussion section: How does the use of numbers as a measure of accountability and the weaknesses of numbers as a demonstration of compliance? We find that the requirement of a carbon budget in Article 8 and the like is a potent means of due diligence, as they need to prove compliance, but they need to be combined with goodwill and execution, which would go all the way to meet the law. The figures, to make it out briefly, are both fetters and narratives, however, we need to read that narrative in a greater context of action.

Climate Change and the Due Diligence Obligation in International Law

Due diligence is an established principle in international environmental law. In the classic formulations, since the 1941 Trail Smelor arbitration to the 2010 Pulp Mills case of the ICJ, it is held that a state must operate an obligation of care to ensure that serious transboundary injuries are avoided by acting in a proper manner within the means of the state. Due diligence is essentially a big principle: it is not a demand for a particular outcome (because the results might depend on factors that a state is not able to influence) but a demand that a state acts proactively and diligently to overcome the risks that can be forecasted (International Law Commission [ILC], 2025; Pulp Mills on the River Uruguay, 2010). Regarding climate change, the concept of due diligence was initially problematic because the damage was diffuse and climate commitment was multilateral. The term due diligence is not explicitly used in either the 1992 UN Framework Convention on Climate Change (UNFCCC) or the 2015 Paris Agreement. Nevertheless, these treaties incorporate such notions in terms of obligations to act, report, update obligations, and so on, suggesting an element of diligence. An example is Article 4 of the Paris Agreement, which obliges parties to prepare, communicate, and maintain successive nationally determined contributions and pursue domestic mitigation measures to accomplish them (Paris Agreement, 2015, art. 4.2). Article 4.3 of the language also outlines that the next successive National Determined Contributions (NDC) will increase the current one and will be based on the greatest possible ambition of the party (Paris Agreement, 2015, art. 4.3). Although formulated as treaty obligations, these requirements repeat the reasoning behind due diligence in that they require states to continue trying to achieve the treaty's goals according to their changing capabilities and knowledge. This connection has been highlighted explicitly in recent legal studies. The ICJ incorporated the obligation to treaties and the general international law in an amalgamation of due diligence under its July 2025 Advisory Opinion on climate change obligations a historic pronouncement pursued by the UN General Assembly (International Court of Justice [ICJ], 2025; Paris Agreement, 2015). The Court supported that states could not do whatever they liked in the climate realm. In contrast, they are motivated by an obligation to conduct all means at their disposal to safeguard the climate system. (ICJ 2025, para. 281). This involves controlling the emissions of private sector actors, abandoning the use of fossil fuels, and collaborating internationally in a way commensurate with their abilities (ICJ, 2025, paras. 290-292). Notably, the ICJ described

multiple climate commitments to be linked to a high due diligence threshold owing to the serious threat of climate change. As an example, the standard of due diligence is considered to be particularly strong with regard to the preparation and communication of NDCs, despite these being nationally determined considering that the urgency to keep warming to a level of less than 1.5 degC is pressing (ICJ, 2025, para. 3110-3112). The Court also disapproved of the opinion that NDCs are merely hortatory and explained that Article 4.3 involves the use of will in prescriptive form that limits the discretion of the state; every NDC should say the utmost ambition of the party and be able to contribute to the temperature goal (ICJ, 2025, paras. 3050-3057; Oude Elferink, 2025). This makes what was thought to be a mere aspirational promise yardstick against which behavior may be measured. Consistency, as the ICJ determines, is determined by the question of whether a state exercised due diligence and best effort by utilizing all the means available to it to undertake its NDC and overall climate commitments (ICJ, 2025, para. 2974-2976). The due diligence standard is infused into both customary and treaty-based obligations of a climate. According to customary international law, the ICJ reiterated the no-harm principle in climatic terms: States are expected to ensure that their activity in their jurisdiction does not cause great harm to the climate or environment by acting in good faith (ICJ, 2025, paras. 132-139, 271). On a broader level, this customary obligation is extended to all states, not only to major emitters but also to small states, even without climate-specific treaties (ICJ, 2025, paras. 439-443). In practice, due diligence depends on the state; however, when stakes exist, the minimum level will be high. In its 2024 Advisory Opinion on Climate Change, the International Tribunal of the Law of the Sea (ITLOS) made the same reference, indicating that the due diligence requirement must be rigorous because of the potentially disastrous damage, which involves undertaking all necessary measures and abilities to inform the severity of effort (ITLOS, 2024, pp. 84-87; ITLOS Seabed Disputes Chamber, 2011). Overall, current international law presupposes that states should engage in maximum possible efforts to address climate change (ICJ, 2025, para. 3111). This establishes normative standards: non-activity or insincere action is not due to diligence, but active actions are intended to be serious and concrete (in accordance with scientific requirements).

The Role of Quantified Targets in Climate Governance

In the national sense, a carbon budget generally implies a permissible limit on total GHG emissions in an established period of multiple years, which is in line with long-term objectives. This mechanism was first established by the United Kingdom under the Climate Change Act of 2008, which established a five-year binding period for carbon budgets. Since then, this mechanism has been replicated in other countries as well. The European Climate Law of the European Union (Regulation (EU) 2021/1119) also introduced a path to climate neutrality by 2050 and a carbon budget for 2030 (55% decrease compared to 1990 (Regulation (EU) 2021/1119, 2021).

Such laws are such that an abstract goal is converted into quantifiable intermediate checkpoints and governments must prepare at these levels. They inherently establish accountability: Governments are required to report progress periodically, and a failure to do so can result in either legal or political effects (as happened when the UK government was reprimanded by its Climate Change Committee because of the lack of plans to achieve the 4th and 5th carbon budgets).

By mid-2025, quantified climate commitments will be legally embraced. Net-zero emissions targets set in 30 countries and the EU have been established as laws (Law Library of Congress, 2022; Net Zero Tracker, 2025).

Many of these laws require interim targets or budget. For example, the Climate Protection Act of Germany has established milestones of reduction (e.g., 65% by 2030, 88% by 2040) on the path to net zero by 2045, the Energy and Climate Law of France has established carbon budgets on a five-year basis,

and the Climate Change Response Act of New Zealand has established carbon budgets on a five-year basis supervised by an independent commission. This finding indicates that these numbers are influenced by accountability. An objective such as net-zero by 2050 is focused on, and it is measurable as opposed to abstract goals. Figure 1 depicts the state of national net-zero targets at the global level, based on their legal status (legislated, in policy, mere pledge, or under discussion). This demonstrates that dozens of states have consolidated climate targets in legislation, whereas a large number depend on policy statements or have not formalized their ambitions.

An increase in the number of numerical targets raises questions regarding their effectiveness and honesty. Analysts of climate policies warn about the danger of empty numbers promises that are ambitious on paper, but are not implemented. The law of net-zero-by-2050 is not significant when a nation is still constructing coal stations or failing to achieve short-term goals. The Climate Action Tracker concludes that most net-zero commitments are not supported in reality, which could result in a situation in which governments are hiding behind 2030 targets and emission rates are too high (Climate Action Tracker, 2023). This disparity between the objective and the action that the law enters now is. Courts and legislatures seek to seal the procrastination loophole by insisting on not only the ultimate carbon targets, but also intermediate carbon limits and paths. A long-term goal is believable because of the pressure that interim targets (such as the 2030 goal) and carbon budgets impose on the immediate progress. They also serve as yardsticks by which a court can evaluate diligence where a state has repeatedly exceeded its budgets or has not revised its targets in accordance with scientific advice; this is an indication of no due diligence or good faith.

The other quantification concept is the global carbon budget, or the amount of CO2 that can be emitted to a given temperature limit (e.g., IPCC estimates of the remaining amount of gigatons to the 1.5 degC limit) (IPCC, 2018). Although the concept of planetary carbon budget has not been explicitly enshrined in treaty law, it has taken over climate litigation. There is growing debate among petitioners and experts that a country could have a fair share of the world budget, and anything exceeding this would be incompatible with the Paris temperature target. The argument originated in the Klimaseniorinnen case: the applicants called on the fact that Switzerland targets were not in line with what science and equity would require as its quota of the remaining 1.5 degC budget (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024; Hilson, 2024). This debate is indicated by the judgment of ECtHR. It discusses carbon budgets in an ostensibly procedural sense; that is, every state must have a fixed amount, but the manner in which that amount is determined is not specified (Verein KlimaSeniorinnen Schweiz und Others v. Switzerland, 2024; Jackson and Kelleher, 2025). The Court observed that states are given a broad margin of appreciation in the way they establish targets and budgets as long as they are done rationally and in line with democratic processes in the state (European Court of Human Rights, 2024). This tension is inherent in the nature of climate justice: climate justice would mean differentiated efforts (with richer and historically high-emitting countries having to reduce more quickly), but the courts of the international community are wary of encroaching on policy decisions regarding distribution. The implication is that the presence of a certain carbon budget has become a new normal, and the degree to which a given budget is sufficiently strict can continue to be viewed as a highly political issue, at least in the short run (Reuters, 2024; Jackson and Kelleher, 2025).

Human Rights Approaches: ECHR Article 8 and Climate Action

The European Convention on Human Rights, written in the 1950s, has never dreamed of climate change. However, its open-textured obligations, particularly its positive obligation to protect life (Article 2) and to protect the life of the personal/family (Article 8), have been flexible in the face of emerging threats. In Klimaseniorinnen v. The ECtHR took a historic stride: it acknowledged that changes in climate (such as

heatwaves) might infringe on these rights, imposing a duty on states to act effectively to prevent climate change (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland 2024; European Court of Human Rights 2024). With Article 8 (the right to private and family life) specifically, the Court listed what good protection entails in the climate context, and notably explained most of it in planning and figures (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024, SSSS 548-550).

Several principles are reflected in the court logic. First, it is believed that states need to have in place a sufficient legislative and administrative system to reduce climate change (Verein KlimaSeniorinnen Schweiz and Others v. Switzerland, 2024, SSSS 543-551). This framework is at the core of a positive obligation without laws or regulations on emissions, and a state fails to safeguard its rights against the dangers of climate change. However, what was sufficient in this regard? The case is decided with particularity: a sufficient framework measures the way ahead. Therefore, the ECtHR affirmed that to comply with Article 8, a state must: (a) have a clear long-term objective (carbon neutrality by mid-century); (b) have carbon budgets or similar caps that outline the amount of emissions that can be emitted over that period; (c) have intermediate targets and pathways (e.g., a goal of five or ten years of carbon reduction) demonstrating how a state will achieve the long-term goal; and (d) have a system of continuous scientific assessment and updating of targets.

Through the requirement that contains due diligence (point (d) above), the ECtHR directly adopts the idea of general international law and plugs it into the human rights analysis. The Court basically meant: one must not only set targets once and leave them alone; one must constantly reevaluate targets and make them stricter where necessary, working with diligence and employing the available, most suitable science (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024, SS 550(d)). This reflects the principle of progression of the Paris Agreement and the language of the due diligence of the ICJ, which reveals the cross-pollination of legal norms. The ECtHR even applied the term margin of appreciation to permit some flexibility in the implementation steps (such as what policies to follow) but restricted the margin to the existence and sufficiency of targets (Hilson, 2024; Columbia Climate Law Blog, 2024; see also KlimaSeniorinnen, SS 543). That is, a state cannot invoke discretion to avoid having a net-zero date in place, or refusing to quantify its approach would be unreasonable in the face of the universally recognized requirement of quantifying its approach to climate planning (Hilson, 2024; Columbia Climate Law Blog, 2024). However, the Court will permit a state some latitude in the method it uses to follow a pathway that has been established (so long as it is in fact working towards the goals that it has chosen) (Verein KlimaSeniorinnen Schweiz and Others v. Switzerland, 2024, SS 543; Cleary Gottlieb, 2024).

An example of the Swiss case illustrates the implementation of these principles. By 2024, Switzerland had an aspirational net-zero 2050 target; however, the ECtHR considered this to be deficient because it lacked a carbon budget or objectives with clear interim targets to be met by law (Verein KlimaSeniorinnen Schweiz und Others v.). Switzerland, 2024). There were also laggards in meeting the Swiss government's 2020 target (modest [?]20% emissions, which fell short) and no enforceable targets up to 2030. It was concluded that such patchwork was an essentially serious violation of Article 8 in that it failed to provide the necessary measures to protect the rights of applicants against the risks posed by climate change (European Network of National Human Rights Institutions, 2024; Reuters, 2024). It is noteworthy that the verdict did not go that far, specifying what Switzerland specifically needed to do to compensate for the violation and assign the latter task to domestic authorities, which fell under the supervision of the Council of Europe (Committee of Ministers, 2025). However, by pointing out the gaps (there was no carbon budget and no overall binding targets), the Court made it clear that the gaps must be filled to meet the rights of humans (European Network of National Human Rights Institutions, 2024; Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024). As a reaction, Switzerland has

increased its pace of implementing the Climate Act with budgets and stricter 2030 targets, effectively exploiting numbers to cover human rights violations.

The ECtHR movement in this field is backed by a greater tendency towards rights-based climate litigation. Youth activists and city dwellers worldwide claim constitutional and human rights to act in a climate. Rationality is based on measurable yardsticks. As an illustration, in the well-known case of Urgenda (Netherlands, 2015-2019), Dutch courts (relying on the ECHR) directed the government to reduce emissions by at least 25%, relative to 1990 (Supreme Court of the Netherlands, 2019). Climate science (the minimum required by developed countries) provided a particular percentage, and once a legal order was made, the court transformed these numbers into enforcement mechanisms. Similarly, cases still active in France, Germany, and others have made a court questioned whether the current policies of states are in line with their own climate targets, and occasionally, they have found them inadequate and require a change in policy (Conseil d'Etat, 2023; Federal Constitutional Court of Germany, 2021). These cases support the fact that having a target is not the only window dressing that sets the standard against which a diligence is taken. If the policy fails to meet the target, the state may be held negligent in its task (as occurred with the German Constitutional Court finding the original German 2030 target too weak and unfair to the younger generation to push the government to implement deeper cuts sooner) (Federal Constitutional Court of Germany, 2021).

Overall, Article 8 of the ECHR and similar national jurisprudence and human rights laws require states to implement so-called numbers that bind as an element of their duty to safeguard people from climate damage. The figures play two roles: they bridge responsibility (it is clear what course the state should take), and they allow accountability (they are benchmarks for measuring performance). This methodology complements the international due diligence standard; both must be continuous and dynamic, thus ameliorating science-based efforts. The next section discusses how these quantitative human rights law requirements can be regarded as indicative of a state adhering to larger due diligence requirements signed out by the ICJ and other actors.

Intersections of Article 8 Requirements and the ICJ's Due Diligence Standard

An important event in emergent climate law is the interrelationship between human rights courts and international tribunals. The ECtHR quantification requirements in Article 8 and the ICJ's due diligence standards are complementary although their legal frameworks differ. Both culminate in the following question: is the state acting as a reasonably conscientious state to act, given the climate crisis, to secure the protection of those under its protection (self-citizens or, in the eyes of the ICJ, the international community in general)? Measured climate action plans will turn out to be one of the main indicators to respond to this question.

In the eyes of the ICJ, due diligence manifests itself through action and detailed strategies. When the ICJ says that the fulfillment of the Paris Agreement requirements is evaluated on the basis of whether a nation has acted in the best of its ability by applying all available means (International Court of Justice [ICJ], 2025, para. 292, 3342-3345), one immediately seeks concrete expression of the best of its ability. For example, a country that has enacted strict climate legislation limiting emissions and established methods to control them can correctly say that it is practicing due diligence. However, when a country lacks set goals and strategies, it is inconsistent with its work. In this respect, Article 8 (with targets, budgets, etc.) precisely represents the type of evidence considered in the ICJ test. Quantified climate commitments are prima facie evidence of climate due diligence. These are external manifestations in which a state has taken its duties seriously enough to commit them to specific enforceable terms.

In fact, words in the Klimaseniorinnen judgment implicitly led to the lexicon of the ICJ. The ECtHR used the term good time, and with new science, it was like prudence and proactivity that formed the core of due diligence (Verein KlimaSeniorinnen Schweiz and Others v.). Switzerland, 2024, SSSS 550(d)-(e)). It even referred to the obligation to revise targets as time passed by the phrase, because of diligence. Switzerland, 2024, SS 550(d)). Meanwhile, the ICJ's opinion, although not dictating national policies, substantially justifies the type of action required by Article 8. As an illustration, the ICJ emphasized that the demand for the highest possible ambition in the Paris Agreement implies that each state should do its utmost to present ambitious NDCs, meaning that the numbers presented in it must be in line with the global 1.5 degC limit (ICJ, 2025, paras. 242-246, 3110-3112; Paris Agreement, 2015, art. 2(1)(a)). By declaring a net-zero 2050 target and embedding it in legislation with milestones on the way, a state can provide evidence to target the object and purpose of the Paris Agreement (to hold warming to 1.5 °C) (Paris Agreement, 2015, art. 2(1)(a)). Conversely, when the NDC or domestic policies of a state are conspicuously below its fair share 1.5 degC effort, then it might be perceived that the state is not making best efforts, and the absence of sufficient targets would be an obvious piece of evidence.

Other crossroads were also omitted from the analysis. According to the principles of the liability of states, which are affirmed by the ICJ, inaction (i.e., a lack of regulation of emissions) or inaction (i.e., a lack of employing climate-related measures) can amount to a wrongful act where there is an obligation (International Law Commission, 2001). Climatically speaking, no planning fails; the lack of a carbon budget or target is arguably an omission that violates the responsibility of saving the climate. This is precisely the situation in which the ECtHR found Switzerland guilty of not coming up with a carbon budget (Verein KlimaSeniorinnen Schweiz and Others v. Switzerland, 2024, SSSS 548-551). We have an immediate connection: the failure to quantify planning = violation of obligation (Article 8 in that case, and therefore, a violation of the larger duty of care). The ICJ also mentions that the inability of a state to act appropriately to ensure that the climate system is not affected by GHG emissions can lead to an internationally wrongful act (ICJ, 2025, para. 427-431). What is the appropriate action, not the type of systematic action, laws, targets, or policies, that good states should take? Thus, in any subsequent litigation between states (or in international evaluations of NDCs), it is possible to anticipate that the existence of binding climate targets, pathways, and budgets is indicative of a state meeting its obligation, whereas a lack or insufficiency of these issues is indicative of a violation.

Lastly, there is the interdependence of human rights and environmental due diligence, which are recognized by the two fora. The ICJ acknowledged that a clean, healthy, and sustainable environment is key to human rights (ICJ 2025, para. 393). This has a normative bridging effect, ensuring that human rights (such as life, health, and home) are not harmed by climate, which legally defines the protection of the climate system. Thus, compliance with Article 8 's requirements can be regarded as a compliance with international obligations. When a state has a sound climate framework according to ECHR provisions, it reinforces the view that it is fulfilling its responsibility on the international front. On the other hand, a state deficient in Article 8 (as Switzerland was) can barely say that it complies with higher-level due diligence requirements. Indeed, such a human rights judgment would serve as a witness to any international tribunal to prove that the state had violated its climatic commitment. By doing so, the quantitative benchmarks of Article 8 not only show compliance at the domestic level but also echo elsewhere at the international level.

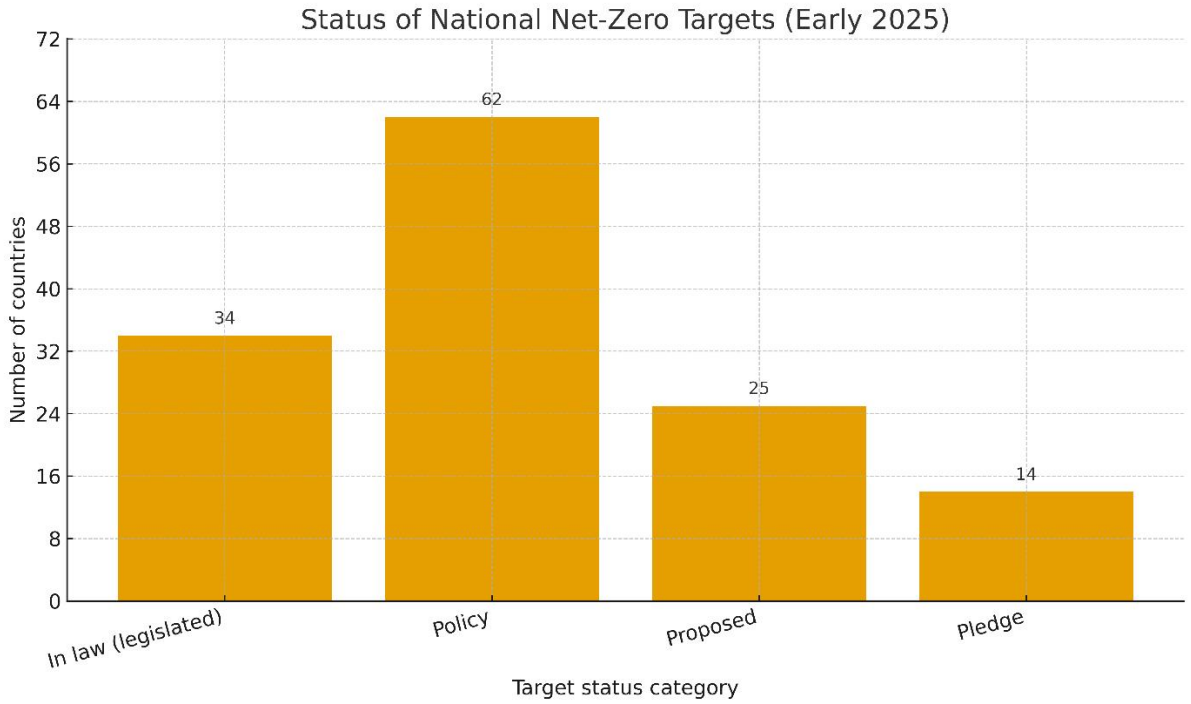
After surveying the literature and the legal background we now move on to the discussion of how these insights translate into practice. The second section (Results) summarizes the evidence on whether and how numeric climate commitments can be used as evidence of compliance, including actual world trends, case results, and state actions, in view of the expectations of due diligence.

RESULTS

Quantitative climate commitment is an evidence of good faith and compliance. Our analysis found a strong correlation between the states that adopted quantified climate frameworks and those deemed to act in good faith to meet their obligations. In legal evaluations, domestic court cases or international reviews of the existence of binding targets, detailed emission budgets, and demonstrable progress increasingly function as *prima facie* evidence that a state is exercising due diligence. Conversely, the absence of such quantified commitments is treated as a red flag, often presenting as an insufficiency or breach.

An analysis of state practice reveals that countries that have enacted legislation climate targets tend to use such laws as arguments for their efforts in legal environments. For example, governments in the UK, EU, New Zealand, and Canada have used their climate legislation (with explicit targets and carbon budgeting systems) to argue that they are legally bound to a decarbonization pathway. It is a compelling point: a court or tribunal investigating due diligence questions what the state has done to avoid harm. A binding system of five-year carbon budgets and an oversight mechanism that is climate law is a solid solution, which implies a structured endeavor in line with scientific recommendations. By contrast, states that do not have such structures find it difficult to show that they are not merely making difficult decisions. The Swiss government's defense in the Klimaseniorinnen case was undermined by the reality that, at the time of litigation, it had aspirational targets and no binding carbon budget and updated carbon targets in legislation (European Court of Human Rights [ECtHR], 2024; Climate Case Chart, 2024). The ECtHR made a direct correlation between the breach of duty and this gap. Basically, the court considered the absence of numeric caps and targets as an indication of insufficient acts, which gave more weight to the probative character of such numbers.

Massive Targets Have Become the New Norm: According to Figure 1, as of early 2025, 34 countries have net-zero targets written into law, 62 countries have them in official policy text, 25 are debating them, and 14 have high-level commitments (the rest has no target) (Energy and Climate Intelligence Unit [ECIU], 2025). Such proliferation has led to making some form of quantified commitment a point of normality as opposed to an exception. A state with no timeline or target is treated as an outlier when it is covered by net-zero announcements, and the proportion of these amounts to nearly 90 percent of total global emissions in the world(Climate Action Tracker, 2023).



Note. Counts reflect the status categories referenced in the manuscript (ECIU/Net Zero Tracker, 2025). Categories shown: In law (legislated), Policy, Proposed, Pledge. Source: Energy & Climate Intelligence Unit (Net Zero Tracker, 2025).

Normative pressure is imposed by peer practice. In international adjudication, tribunals tend to examine general practices to guide them in the content of due diligence. The common culture of making targets may affect expectations of a hard-working state. That is, the due diligence threshold is increasing. In this case, when it was enough to possess general policies in climate matters, the test of care is currently becoming clear, numeric commitments, and in line with global objectives. A state that does not respond to this risk is said to be below the acceptable standards of care.

Case Outcomes: Strengthening Probative Value Legal Outcomes during the last two years reminds us of the fact that courts use numeric benchmarks to assess adherence. Apart from the Swiss case, a noteworthy example comes from France: the French administrative Supreme Court (*Conseil d'État*), in the *Grande-Synthe* decision (2021), held the French state accountable for exceeding its own carbon budget and ordered it to take rectifying measures. The court's reasoning hinged on the fact that France had set a carbon budget for 2015–2018 and failed to stay within it, thus breaching its duty under national law–a duty that ultimately derives from EU obligations and France's Paris Agreement pledge. Here, the carbon budget (number) is literally a yardstick for legality. Similarly, in Germany, the Constitutional Court's 2021 decision leveraged the government's quantified targets: noting that the post-2030 pathway was undefined (thus potentially offloading burdens to the next generation), the Court required the legislature to specify 2030+ emission targets by 2022. The court used the presence of a CO_2 budget constraint for the long term (derived from IPCC data for 1.5 °C) to demonstrate that Germany's current law would exhaust the budget too quickly (Bundesverfassungsgericht, 2021) essentially a quantitative analysis leading to a finding of insufficient diligence towards future generations.

The ICJ's July 2025 Advisory Opinion, but not a contentious case outcome, further cements the probative

role of numbers. The Court not only affirmed the binding nature of the 1.5 °C temperature goal but also implied that national contributions need to add up to that goal (International Court of Justice [ICJ], 2025; International Institute for Sustainable Development [IISD], 2025). By declaring 1.5 °C as "the primary agreed-upon legally binding target (IISD, 2025), the ICJ gave teeth to a number. In practical terms, this means that a state's effort can be evaluated against whether it is on track for 1.5 °C. Therefore, if State X has a net-zero 2070 goal with no nearer-term ambition, one can argue (using IPCC carbon budget mathematics) that State X's plan is incompatible with 1.5 °C and thus not in line with its due diligence obligation. We see this line of reasoning already in climate policy discourse and litigation: for instance, claimants in Australia and Brazil have introduced evidence that the national policies, when projected, would consume a disproportionate share of the remaining 1.5 °C budget, evidencing lack of "appropriate measures" to prevent harm.

Evidence of Compliance in International Proceedings: As of 2025, no contentious case between states on climate responsibility has been adjudicated (beyond advisory opinions), and states are keenly aware of the records they are building. In submissions to the ICJ's advisory proceedings and a parallel case at ITLOS, several states showcased their climate laws and targets as proof of their commitment. Conversely, civil society briefs highlighted the weak targets of laggard countries. This dynamic suggests that if, for example, a climate-vulnerable nation were to bring a case against a major emitter for failing to protect the climate, a central factual dispute would be: Has the defendant state adopted and implemented an adequate climate plan? The existence of binding targets and budgets would be Exhibit A for the defense to claim due diligence or Exhibit A for the plaintiff, if lacking, to claim negligence. The advisory opinion already provides a hint: it notes that states must continuously ratchet up ambition and that NDCs are binding obligations of conduct (Paris Agreement, 2015, art. 4.3; ICJ, 2025, paras. 234–241, 252–253). Therefore, a state that submitted a weak NDC and never updated it or failed to pursue measures to meet it can be shown through these numbers and outcomes to have fallen short. On the other hand, a state with ambitious NDCs aligned to a fair share of 1.5 °C, backed by domestic law, could invoke those facts as evidence of meeting its duty (even if climate harm still occurs, which due diligence does not absolutely preclude).

Intermediate Metrics as a Proof of Trajectory: Another finding is that interim metrics (short-term targets and current emission trends) were used to evaluate whether long-term pledges are credible. In the ECtHR analysis, one bullet point of compliance was "evidence showing compliance with GHG reduction targets" (ECtHR, 2024, § 550(e)). This implies a history of achievements, and the existence of a target is counted. When a state is able to regularly reach its interim goals (or even exceed them), it supports its argument of hard work, thus demonstrating a tendency toward successful execution. Conversely, a state that has high objectives and fails to achieve interim targets consistently compromises security. This was staged in Dutch Urgenda enforcement: The Netherlands had targets but was not performing; therefore, the court ordered action to make up. Therefore, the findings indicate that amalgamation of the existence of numbers and seeing them is becoming the gold standard for compliance.

In summary, our findings suggest that the amount of calculation of climate commitment is much higher than that of a bureaucratic exercise, which is probative by law. The existence of numeric climate targets and carbon budgets and compliance with the same is evidence that a state is not a slacker in tackling its obligations. In the meantime, loopholes in quantification or performance become evidence of possible non-compliance. Such results substantiate the legitimacy of the claim that the carbon budget and associated demands of Article 8 are not merely normatively meaningful but also practically utilized standards of the due diligence assessment. The following discussion explores the implications of this trend, its strengths and limitations, and whether numbers that bind might be occasionally misled, or whether numbers that bind will be the key to climate accountability.

DISCUSSION

The above findings highlight a crucial evolution in climate governance: Hard numbers have become proxies for legal compliance. This development has positive and cautionary implications. In this discussion, we unpack what it means for carbon budgets and other quantified targets to be "probative" of due diligence, and we consider the strengths and potential pitfalls of relying on such metrics to gauge legal compliance.

From soft promises to hard proofs: One clear advantage of the quantification trend is its objectivity and clarity. Due diligence, as a legal standard, can be somewhat abstract if it asks whether a state did enough, a question that can invite subjective judgments. These numbers mitigate this problem by providing concrete reference points. If State A pledged a 40% emissions cut by 2030 and achieved it, whereas State B pledged the same but achieved only 20%, the comparative diligence was visible in plain percentages. Numbers enable courts to move beyond the he-said-she-said or endless expert testimony to the realm of verifiable facts. This was evident in the ECtHR's methodology: the Court could point to Switzerland's "35% cut needed in the next year" to meet its 2030 goal and note that "so far, only 20% reduction" had been achieved a shortfall indicating insufficient action (Bharadwaj, 2024). These findings derive their strength from a quantitative assessment. Similarly, in international law, having a 1.5 °C limit recognized as legally binding (International Court of Justice [ICJ], 2025; International Institute for Sustainable Development [IISD], 2025) transforms debates; states can be pressed on whether their policies collectively add up (with climate science doing the math of projected warming). This represents a maturing of legal standards: climate obligations are no longer gauzy aspirations but targets against which performance can be measured.

Necessity But Not Sufficiency of Numbers: Our analysis suggests that quantified plans are necessary for demonstrating compliance, yet they are not sufficient on their own. They are necessary in the sense that without them, a state's case collapses, as seen in Switzerland's lack of a carbon budget, leading to a violation finding (European Court of Human Rights [ECtHR], 2024). In the ICJ's due diligence terms, not having targets or timelines would almost *ipso facto* prove that a state is not using "all appropriate measures." However, having numbers in books does not automatically guarantee that a state is off the hook. This law distinguishes between planning and implementation. This is because the diligence spans both. A state could tick all Article 8 boxes (net-zero law, interim targets, and budgets) and breach its obligations if it fails to follow through. For instance, if a state enacts a carbon budget, but then vastly exceeds it without justification or corrective action, the gap between commitment and reality could amount to a failure of due diligence (a point not lost in French courts, as noted above). Thus, numbers are best seen as *prima facie* evidence; they create a rebuttable presumption of compliance. If the numbers are in place and the progress is on-track, one presumes that the state is acting diligently. However, if evidence shows that the numbers are being disregarded or patently inadequate relative to the goal, this presumption can be overcome.

Ambition and Equity Considerations: One delicate issue is the quality of numbers. Not all the targets were created to be equal. A country might have a net-zero 2050 law; however, if that country is a small emitter, it might claim to be diligent, while global climate action still falters because of large emitters with weaker pledges. Conversely, a major emitter could point to its net-zero pledge, but if that pledge is way later or less stringent than peers (e.g., net-zero 2070 with rising emissions until then), can it really be considered "highest possible ambition" as the ICJ requires (Paris Agreement, 2015, art. 4.3; ICJ, 2025)? The ECtHR tactfully sidestepped this by not dictating the ambition level of budgets (beyond generic mid-century neutrality) (ECtHR, 2024), deferring to the states' margin of appreciation (ECtHR, 2024). However, the ICJ's opinion and the Paris Agreement framework inject expectations of equity and adequacy. Each state's numbers implicitly invite scrutiny: are they fair given the state's circumstances? Are they aligned

with collective necessity? This could become the next frontier of legal debate. While today a court checks if a number exists, tomorrow it might check if the number is sufficient. We see early signs: the German Constitutional Court used a global budget approach to deem Germany's old targets too lax (Bundesverfassungsgericht, 2021; Intergovernmental Panel on Climate Change [IPCC], 2022); youth plaintiffs around the world are urging courts to compare national policies against what carbon budgeting says is needed for 1.5 °C. Therefore, although carbon budgets and targets are likely to be diligent, their probative value may diminish if they are unambitious. A paper tiger target could even backfire it might prove a form of negligence if the state's target is demonstrably out of step with scientific consensus or if it knowingly adopted an inadequate budget (thus breaching the duty to periodically update with the best science (ECtHR, 2024)).

Risk of Over-Reliance and Formalism: A second issue is the risk of ensuring compliance and overlooking the results of the action. The correct numbers are alluring; they offer a sense of accuracy and power. A state may have a beautiful collection of climate plans and legislation (too many good numbers) but still perpetuates high levels of fossil fuel consumption or deforestation that will nullify those plans. It is possible that a government might cheat on the system by making far-off targets, which are celebrated as promises but actually made (which is also feared by commentators who think that net zero promises are a net-zero action delayer [United Nations Environment Program (UNEP), 2024]). This gap in ambition and action should be maintained by the courts and observers. The fact that due diligence is an action standard facilitates this, it requires continuous prudent action and not a single target setting. Thus, a state that makes climate legislation a check-the-box measure without any policies (e.g., keeps approving new coal mines whose budgets cannot afford them) would be contrary to the spirit, and presumably, to the letter of due diligence. Therefore, indications for the achievement of intermediate goals or the adoption of remedial actions are highly valued (ECtHR 2024). This shows that the figures are not merely ink on paper, but on policy movers and shakers.

Enhancing accountability by ensuring Legal Synchrony: On positive side, the convergence of human rights and international law standards based on numbers constitutes a strong feedback loop. Courts of human rights are capable of forcing laggard states to embrace structures that will consequently place them in a better position to conform to the international level. International organizations, in turn, can refer to these domestic frameworks as models of demanded behavior. The outcome is a ratcheting-up of international responsibility: a state now experiences several layers of criticism; both domestic courts and regional human rights organizations and international opinion demand the same kind of demonstration of seriousness. This further predisposes the government to the challenge of making the first step toward the quantification of climate commitment. After doing this, the path dependency of numbers (e.g., trying to come up with a carbon budget, one needs to think about allocation that compels substantive choices) can motivate action. In other words, the insistence of the law in terms of numbers that bind contributes to changing political promises into legal ones, and makes the expectations of states more concrete. In a way, the legal system must adjust to the type of climate challenge, which is essentially quantitative (the issue of gigatons of CO_2).

Transparency and Public Engagement: A Transparency is yet another advantage of quantified climate obligations that are frequently ignored. The publication of a carbon budget enables civil society, scientists, and markets to see direction and keep the government in check. It also democratizes climate policy, which can be discussed by people as to whether the budget is reasonable or the government is moving in the right direction. This increased involvement is, in itself, a type of pressure that makes sure that they are diligent; a government that is aware that it has to report on the number of emissions it has produced against a set budget will more likely implement measures to ensure that they are within the set limits or risk the real and legal consequences of their actions. The figures, therefore, make not only courts but also

citizens watch dogs. This legally overlaps with the procedural aspects of due diligence, including the duty to inform and consult people. Quantification of targets can help states proclaim a yardstick by which they can be estimated, and the due diligence standard is, therefore, less obscure and more enforceable.

Finally, the contribution of numerical climate commitments as due diligence evidence can be viewed by law as an overwhelming force for enhancing climate action. It offers transparency, allows for responsibility, and aligns various legal systems with a shared measure of compliance. Nevertheless, the legal community and society should take care that they are not complacent because the fact that numbers are good is not a goal in itself, but a beginning. These figures are ambitious, constantly rising, and are converted into actual reductions in emissions. In doing so, the marriage of numbers and due diligence will be among the most successful legal applications in the struggle of humankind to forge a sustainable future.

CONCLUSION

Climate change has become regulated to the extent that figures talk eloquently before law. The purpose of this research was to determine whether the quantification requirements that emerge under Article 8 of the ECHR, that is, the requirements of timelines, interim targets, and carbon budgets, are pointers to international due diligence by the ICJ criterion. Our answer to this question is affirmative: These quantitative promises are highly suggestive of how a given state lives up to its commitments. That binding climate targets and budgets exist in the jurisprudence of Strasbourg to the Hague is considered a sign of a dutiful and bona fide state, and the lack or seeming unproductiveness is a sign of infraction. In practice, a government leading by example would have practical demonstrations of due diligence by setting the law of climate limits and doing so. However, our findings suggest that these figures are insufficient to ensure compliance. They ought to be scientific, ambitious, and concerted when implementing policies. The dynamic due diligence criterion not only requires the provided figures but also the actual performance. It is also likely that, in the future, international and domestic adjudicators would be more inclined to question their existence and the application of carbon budgets and targets. Thus, mathematical numbers have become fundamental to climatic responsibility, meeting legal demands and scientific requirements. They combine states with a course of action, and they equally combine them with the judgment of the law, with objective measures of that course, a growth that can only render the rule of law powerful in an age of climate problems.

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