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Separated targets are not enough: How spatiotemporal fixes and policy corridors embedded mitigation deterrence in Swedish net-zero politics

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ABSTRACT

Researchers and civil society have proposed separating targets for emissions reductions and carbon dioxide removal to prevent mitigation deterrence – the risk that the anticipation of future removals delays decarbonisation. In 2017, Sweden became the first state to adopt separated targets, specifying that its 2045 net-zero target must be reached through a minimum of 85% domestic emissions reductions, with the remaining 15% achievable through carbon removal. I reconstruct the policy process that resulted in the separated net-zero framework using Historical Materialist Policy Analysis based on interviews with seventeen policymakers, stakeholders and experts involved. My analysis shows that state knowledge apparatuses, especially climate scenarios, pre-structured a policy corridor that made carbon removal appear technically unavoidable rather than a political choice. The separation of targets was not a safeguard against mitigation deterrence; some actors viewed the quantification of a removals target as a potential license to delay. Moreover, the separation worked as a spatio-temporal fix which displaced conflicts between actors advocating rapid decarbonisation and a coalition seeking to protect the competitiveness of Swedish industry. The 15% removals target was a concession necessary to reach agreement on the 2045 net-zero date, a leftover of the compromise on 85% reductions rather than any assessment of sustainable removal potentials or what would be a socially necessary or globally just level of residual emissions. The Swedish case shows that without such reflexive assessment, and awareness of the prescriptive influence of climate scenarios, even separated targets can embed mitigation deterrence into climate policy.

1. Introduction

In the decade since the Paris Agreement, net-zero has become the standard for climate policy (Buck et al., 2023). The agreement defines net-zero as “balancing out sinks and sources” of greenhouse gases – which means that some anthropogenic emissions are considered impossible to get rid of. Net-zero targets balance remaining residual emissions against compensatory measures – either Carbon Dioxide Removal (CDR) or offsets.

Research warns that net-zero goals can legitimize delayed reduction of carbon emissions – so called *mitigation deterrence* (Carton et al., 2023; Markusson et al., 2018; McLaren, 2020). Expectations on CDR can reduce the sense of urgency of emissions cuts – especially when such expectations are included in formal climate targets. Researchers have shown how visions of future removals and offsets reinforce the idea that climate targets are reachable without any radical changes to production and consumption patterns (Carton, 2019; Markusson et al., 2018, 2022).

To lower the risk of mitigation deterrence, scholars and civil society actors have proposed that states set separate targets for emissions

reductions and carbon removals (Carbon Market Watch, 2024; Lamb et al., 2024; McLaren et al., 2019). These proposals centre on two main conditions that separated targets should fulfil to effectively guard against deterrence. First, they must be determined using independent frameworks, through democratically grounded estimates of necessary residuals and ambitious decarbonisation efforts respectively. Second, they must guard against fungibility between the frameworks used for removals and reductions, as such fungibility would directly allow for expectations on removals to lessen decarbonisation efforts (Brad and Schneider, 2025; Lamb et al., 2024).

In 2017, Sweden became the first nation to set a separate target for carbon removal. A comprehensive climate framework introduced a 2045 net zero target that distinguishes a minimum amount of domestic emissions reductions from a corresponding maximum amount of removals and offsets (Governmental Bill 2016/17:146). This target specifies that by 2045 emissions must be 85% lower than in 1990 – with the remaining 15% (approximately 10.7 megatons of CO₂eq) being managed by what the climate framework calls “supplementary measures”. Three such supplementary measures were specified; bioenergy

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with carbon capture and storage (BECCS), increases in natural carbon sinks within Sweden, and carbon offsets through foreign investments. The climate objectives also included interim reduction targets for 2030 (63%) and 2040 (75%), in which removals are allowed to account for set percentages of the total reduction (8% in 2030 and 2% in 2040).

The separated net-target resulted from a policy process in the All-Party Committee on Environmental Objectives (Swedish: *Miljömålsberedningen*). The committee presented its unanimous recommendations to the Government in two reports in 2016 (*Miljömålsberedningen*, 2016b; 2016a), and Parliament adopted the separated targets as part of the Swedish Climate Act in 2017 (*Governmental Bill 2016/17:146*). In the years since, BECCS especially has received strong financial and institutional support in the form of a system of reverse auctions implemented by the Swedish Energy Agency.

The majority of Swedish research on BECCS aligns with a socio-technical imaginary – an overarching vision of how technological advances enable desirable futures (*Jasanoff and Kim*, 2013) – that frames the technology as beneficial to incumbent industry and Swedish competitiveness (*Lefstad et al.*, 2024). Much of the research aligned with that imaginary has concentrated on technical and economic feasibility (eg. *Fuss and Johnsson*, 2021; *Ganti et al.*, 2022; *Zetterberg et al.*, 2021), rather than critically assessing risks. Several studies do address social and political dimensions of relying on removals, and the risks of mitigation deterrence (*Almqvist-Ingersoll*, 2025; *Christiansen and Carton*, 2021; *Holmgren et al.*, 2022; *Olsson et al.*, 2024).

Previous analysis of the policy process that led to the Swedish Climate Act has focused on what factors enabled agreement between policymakers (*Karlsson*, 2021), but there has been no research on what caused the inclusion of a separated removals target of 15%. With this article I aim to fill that research gap by unpacking how the fractions of removals and reductions in the Swedish net-zero equation were politically negotiated, showing how stakeholders used the promise of carbon removal politically and how the separation of targets influenced the final policy. The paper presents Historical Materialist Policy Analysis (HMPA) as its theoretical and methodological approach followed by empirical findings structured according to context, actors, and process analysis, before a discussion of the implications of the Swedish case for wider target separation debates.

2. Research approach

Historical Materialist Policy Analysis (HMPA) is an approach within critical policy studies that seeks to uncover the contradictions and competing interests from which policies emerge. Such competing interests emerge from the material bases and social antagonisms of capitalist societies, making policy formation processes inherently conflict laden. This stands in contrast to mainstream policy analysis which largely views policy as emerging from rational decision-making processes (*Brand et al.*, 2022). In HMPA, the state and its institutions are not neutral arbiters, but rather “a relationship of forces, or more precisely the material condensation of such a relationship among classes and class factions” (*Poulantzas*, 2000). HMPA centres the material context in which policy processes happen and examines how antagonisms between social groups are reflected in both the processes and the resulting policies.

Applying HMPA to climate policy, *Schneider et al.* (2023) suggest that it enables researchers to understand the structural determinants of whether such policies are adequate to the challenge of climate mitigation. This requires analysing policy against the backgrounds of “competing and contradictory interests of different social forces” (*Schneider et al.*, 2023, p 115). Looking at EU climate policy, they found that policy processes are shaped by groups of actors who have specific interests in pushing for the inclusion of net-zero and the use of carbon removal in setting climate objectives. *Brad and Schneider* (2023) applied HMPA to the question of mitigation deterrence within the European Union (EU), concluding that to increase chances of avoiding

mitigation deterrence carbon removals should be clearly separated from emissions reductions (as first argued by *McLaren et al.*, 2019) – although their later research has shown that such target separation is not a safeguard against mitigation deterrence in and of itself (*Brad and Schneider*, 2025).

Scholars using HMPA understand policy processes as state-mediated attempts at regulating social and political conflicts and contradictions, rather than an objective and rational decision-making processes (*Kannankulam and Georgi*, 2014; *Schneider et al.*, 2023). HMPA shares a critical stance toward assumptions of rationality in policy processes with other forms of critical policy analysis, but centres analysis on conflicts between social groups or between society and nature (*Brand et al.*, 2022; *Spash*, 2014). I proceed from an understanding of the Swedish climate policy process as an attempt to regulate conflicts between actors with potentially incommensurable goals, and contradictions emerging from the material bases of Swedish political economy. I seek to understand what conflicts needed to be regulated to reach consensus on the Swedish targets and what role residuals and removals played in such conflict regulation.

A central approach within HMPA is the use of a three-step research process – context, actor, and process analysis – to unpack how policy processes regulate or manage contradictions and conflicts that threaten socio-political stability (*Brand et al.*, 2022; *Haas*, 2019; *Kannankulam and Georgi*, 2014).

Context analysis looks at the historical and institutional structures within which policy processes and conflict regulations take place – including material conditions, crisis tendencies, and institutional selectivities. This dimension unpacks how such forces create limited “corridors” for policy formulation and thus constrain what forms of political action is possible. In the Swedish case, this means understanding the political landscape in which the policy process emerged, and what pressures or contradictions prompted its initialisation. The context analysis for this paper is based on interview data and existing research on historical and institutional structures in Swedish environmental policy. To understand how the 15% target emerged and was stabilised, I focused primarily on the climate scenarios that formed the knowledge base of the policy process. Rather than treating such scenarios as purely technical, I follow HMPA in understanding them as products of state knowledge apparatuses — institutions that actively shape how actors understand the problems and conflicts they are mandated to resolve, rather than serving as mere arenas for deliberation and objective knowledge production (*Brand et al.*, 2022; *Stützle*, 2011). I therefore understand climate scenarios as inherently political and reflective of strategic-relational structures that constrain what appears politically feasible while marginalizing alternatives (*Jessop*, 2010). This resonates with Science and Technology Studies (STS) accounts of science-policy co-production (*Jasanoff*, 2004), though the analysis here proceeds primarily from a political economy perspective.

Actor analysis identifies key stakeholders, their positions, and how they may be grouped according to their shared positions and interests, examining how power asymmetries and strategic resource access influence policy agendas and outcomes. Through a combination of document analysis and interviews, I identified key stakeholder groups in the Swedish target-setting process and examined their strategic orientations and material interests in relation to the structural constraints identified in the context. Contrasting stakeholder descriptions were key to understanding how coalitions emerged specifically around the double issue of defining the residual and determining the role of carbon removal in Swedish mitigation, examining how such coalitions had conflicting hopes and expectations on the three forms of removal under consideration, and what central conflicts emerged between actor groups.

Process analysis traces how actors and structures interplay dynamically over time. This means using descriptions of the process gathered from interviews and documentation in relation to the context and actor analyses to identify key turning points and phases in the process, looking for the spaces where conflict between actor groups are

enacted, and how institutional forces influence the path the process takes. Conflicts regarding specific policy measures – such as the balance between carbon removal and decarbonisation – are understood as reflecting underlying political economic contradictions, and the policy process, enacted in the state apparatus, as an attempt to regulate such contradictions. Using the perspectives of actors within and outside the major coalitions identified, I examine where conflicts arose, how they were managed, how compromises were negotiated, and which interests prevailed. This involves analysing how both structural factors, such as the scenarios and material interests identified in the context analysis, and discursive factors, such as the positions and arguments brought to the table by the different actor groups, shaped what was politically possible. I identify three phases in the policy process; an initial knowledge building phase, a series of round-table debates where actor coalitions formed, and a final phase where policymakers negotiated the final policy text.

2.1. Methods

The empirical work entailed reconstructing and analysing the target setting policy process. The empirical material consists of seventeen semi-structured interviews with persons who participated in the committee that proposed the Swedish net-zero objective between 2014 and 2016. The informants fall into three categories: policymakers, stakeholders and experts. The committee consisted of representatives from the parties in Parliament (*policymakers*), along with permanently invited representatives of industrial and social interest groups (*stakeholders*). A secretariat of civil servants with relevant expertise supported the committee, alongside external advisors (*experts*). Between April and June 2025, I interviewed six of the seven policymakers along with eight stakeholders and three experts. Further details about informants are not given due to agreements on anonymity. I transcribed and coded the interviews using HMPA's analytical dimensions alongside themes where conflicting views were most evident: supplementary measures, scenario influence, and target setting. The interviews work as windows into broader actor constellations and material interests shaping the policy process. Qualitative analysis and triangulation of documents and actor narratives give an approximation of the process, and which factors were most decisive in the outcome.

3. Results

3.1. Context analysis

At the time the policy process started, Sweden was positioning itself and largely regarded as a leader in climate policy (Gronow et al., 2019; Matti et al., 2021), while also receiving criticism for not restricting surplus allowances under the EU Emissions Trading System (EU ETS), and its reliance on so called flexible mechanisms for achieving emissions reductions (Hysing, 2014; Tobin, 2015). Tobin (2015) describes Sweden as having a strong commitment to leadership on climate but a focus on market solutions, development of exportable green technology, and voluntary reductions by industry – characteristic of so called weak ecological modernisation that prioritises market-driven change rather than fundamental transformation (Hysing, 2014; Lidskog and Elander, 2012). Sweden has a long history of environmental governance based on strong participation by industry leaders, labour unions, and civil society organizations (Gronow et al., 2019).

This governance pattern reflects the historical relationship between industry and knowledge institutions in Sweden. Since at least the 1960s, Swedish industrial capital has actively shaped environmental knowledge institutions, establishing joint state-industry research bodies that ensured that environmental knowledge frameworks were compatible with industrial competitiveness (Bergquist and Söderholm, 2011). Ekberg and Pressfeldt (2022) show that Swedish business interests used competitiveness arguments from the 1980s onward to constrain

environmental ambition. These efforts towards market-based climate regulation intensified in the early 2000s during a period of increased financialization and neoliberalization of Swedish politics (Anshelm and Hultman, 2014; Belfrage and Kallifatides, 2018; Skyrman et al., 2023). This resistance is visible in how energy-intensive industries adopted a discourse of decarbonisation while simultaneously resisting regulations that would compel actual transformation in the time leading up to the 2017 climate act (Hildingsson et al., 2019).

3.1.1. Visions and scenarios forming the policy corridor

In 2009, a vision for a Sweden with net-zero emissions by 2050 was adopted by the right-wing coalition government (Karlsson, 2021). This led to the Swedish Environmental Protection Agency (SEPA) being tasked with delivering a roadmap for a “Sweden with no emissions” in 2050 (Naturvårdsverket, 2012). After a shift in government, the Green Party in 2014 proposed tasking the All-Party Committee on Environmental Objectives to develop a comprehensive framework for national climate action, inspired by the British Climate Change Act (Romson and Forsbacka, 2020). The ensuing government directive specified that Sweden's climate policy must cost-effectively reach net-zero while maintaining Swedish leadership and competitive advantages (Governmental Directive 2014:165) – in line with the conception of Sweden as a front-runner in decoupling economic growth and environmental protection (Hysing, 2014; Lidskog and Elander, 2012). Many informants highlight that the ambition of the committee was to achieve consensus around the new policy framework, in line with the corporatist tradition in Swedish governance and to ensure the long term relevance of the new framework.

The 2012 SEPA roadmap formed the basis of two primary scenarios that were presented to the committee. These scenarios are based on expert assessments in combination climate models developed by SEPA and by the International Energy Agency (IEA) (Miljömålsberedningen, 2016b appendix 5; Naturvårdsverket, 2012). The first scenario achieves between 90% and 95% emissions reductions in 2050 by substantial policy innovation, including three forms of *supplementary measures* to compensate for residual emissions: 1) additional emissions reductions through Carbon Capture and Storage, 2) increased LULUCF (Land Use, Land Use Change and Forestry) uptakes, and 3) reductions through international investments. The other scenario is a linear reduction of emissions that projected then-current reduction rates into the future, ending up with 70% reductions by 2050 and no net-zero ambition.

According to Karlsson (2021), the policy process leading up to the Swedish Climate Act started by building a “common knowledge platform”. The SEPA scenarios formed the core of this platform. Stakeholder interviewees agreed that the scenarios defined the boundaries within which political choice appeared to operate. One expert characterized this as “nudging”: “The playing field was set by those who led the work. [...] They were strategic when producing documentation.” Another stated: “If you draw clear boundaries on the whiteboard from the beginning, the ensuing discussion is highly likely to be contained by those boundaries.” Stakeholders and experts agreed that subsequent negotiations operated within the 70–95% reductions range established by these scenarios – with whatever remained forming a separate target for removals.

In contrast to stakeholders, policymakers described target-setting as political negotiation rather than scenario-based decision-making. One stated directly: “Those 15% [the residual] don't have a scientific basis. If there are sectorial analyses of marginal costs and reductions, those are tacked on. In that case it's a retrofit, because it was simply a political compromise.” This discrepancy, which I elaborate on in the discussion, shows that the scenarios exerted structural power while their political nature remained invisible to policymakers – who experienced “pure” negotiation while operating within pre-set boundaries. Several informants reported that alternatives to scenario-based target setting – such as back-casting or carbon budgeting – were dismissed as “politically unviable” by both policymakers and the secretariat, one of whom

responded that carbon budgeting “would be like having a planned economy”.

3.1.2. Paris agreement pressure and embedded assumptions

The Paris Agreement's adoption of a 1.5°C target (UNFCCC, 2015) during the final phase of Sweden's policy process created pressure for increased ambition and the due date of the final proposal was extended to allow the committee more time to work. Shortly after, the secretariat provided updated scenarios aligned with 1.5°C pathways. Experts described the idea of temporary overshoot (meaning any rise above 1.5°C will be countered by future net-negative emissions) as already appearing “inevitable” at this point, even though overshoot is not explicitly mentioned in the Paris Agreement. This supports the claim by Reisinger and Geden (2023) that “overshoot was always part of the equation”.

The policy process at this point was in its final phase, where policymakers negotiated only with each other, without experts or stakeholders present. The updated scenarios calculated Sweden's residual emissions under a global contraction-convergence framework¹ at approximately 1 ton per capita by 2045, equating to roughly 11 Megatons total (Miljömålsberedningen, 2016a appendix 5). This matched the residual presented in the SEPA net-zero scenario when adjusted from 2050 to 2045. A secretariat member explained: “If you have that justice definition – that you should have one ton per capita and convergence sometime in the middle of the century, then it is consistent with 1.5-degree models. But if you instead have a historical emission starting point, then you might end up with the conclusion that we should do more.”

Despite this seeming awareness of justice implications of scenarios among the secretariat, other informants reported that time pressure and the mandate constraints prevented any substantive discussion of justice frameworks or carbon budgets. One expert stated: “I'm very certain that no one in the secretariat had either the time or the capacity to read studies on carbon budgets and modeling and then compare different justice theories. But they were forced to say they had, because they couldn't say they aren't taking their global responsibility.” This represents a significant normative choice embedded in technical calculations: justice was operationalized without accounting for historical emissions, and with the unquestioned assumption that overshoot was inevitable.

The Paris Agreement thus functioned simultaneously as pressure to deliver an ambitious target, and as legitimation for a residual level that appeared “Paris Agreement-aligned” but rested on unexamined assumptions about Sweden's fair share and the inevitability of overshoot requiring massive future negative emissions. All scenarios presented in the analyzed documents include a need for negative emissions in the latter half of the century.

3.2. Actor analysis

3.2.1. Two coalitions with divergent interests

The ambition of the committee was to achieve consensus around the new targets, and indeed there appears to have been no conflict over the need for separate targets. However, narratives of informants showed two groups of actors taking conflicting positions in defining the specific parameters of how and when to achieve net-zero. The central conflict was over the level of ambition in emissions reductions, and to what degree this ambition would threaten industrial competitiveness – a conflict that emerged in the second phase of the process. Opposing positions are evident both in expectations on the amount of removals and what supplementary measures were preferred. Both groups agreed fundamentally that Sweden should maintain a leadership position on climate – the disagreement was over how much that leadership position should be allowed to cost.

¹ Contraction-convergence means that all nations converge on equalized per-capita emissions while total global emissions contract over time.

The Industry-Business-Union (IBU) coalition, representing the major industries (forestry, paper-pulp, steel, and cement), the Confederation of Swedish Enterprise, and the largest unions, prioritized protecting industrial competitiveness and employment security. In a position paper published during the policy process (DN Debatt, 2015), this group advocated for targeting net-zero by the end of the century, though stakeholders later adjusted this to approximately 70% reductions by 2050 – matching the SEPA business-as-usual scenario, or the lower end of ambitions in the policy field. Many informants describe the steel and cement industries as the most skeptical to ambitious reductions due to claims of hard-to-abate fossil emissions.

One senior IBU representative described their concern as primarily economic rather than technical: “We looked at it more from a cost-perspective – it's not so much a technical issue. It's about what it costs to transition, and if there will be anything left if they force it too hard.” This coalition strongly favored international offsets as the most “cost-efficient” supplementary measure, showed skepticism toward increasing domestic LULUCF uptakes (pushing instead for including the substitution effects from a growing Swedish bioeconomy), and expressed wariness about industry bearing the full research and development costs for BECCS. A policymaker recalls that “their position was that protecting and maintaining the Swedish industrial base is good climate policy *per se*” – referring to the idea that Swedish industry was already relatively low in emissions.

The looser Environmentalist-Researcher (ER) coalition, made up of academics and environmental organizations, advocated much more rapid decarbonisation, describing their ultimate goal as “near zero by 2030” with carbon removal reserved only for “genuinely unavoidable” residuals. They preferred targets defined as “as close to zero as possible” rather than quantified percentages. An ER stakeholder explained the reasoning: “It would be better to say close to zero, instead of saying minus 85. If you say minus 85, then you give carte blanche to 15%. And it becomes a kind of fight about who gets to stay within those 15% and who must change.” This coalition favored LULUCF increases as the primary supplementary measure, viewed BECCS as a potentially interesting but uncertain technology, and opposed international offsets on both justice grounds and skepticism about offset availability by 2045 – reflecting a faith that all states would increase their mitigation efforts.

Party-political alignments aligned with the two stakeholder coalitions, the red-greens (Social Democrats, Greens, Left Party) generally supporting ER positions and the liberal-conservative opposition (Liberals, Centre, Moderates, Christian Democrats) aligned with IBU concerns. The IBU and right-wing policymakers described supplementary measures in terms of “flexibility mechanisms” to prevent excessive economic pressure on Swedish industry. Both the ER stakeholders and red-green policymakers framed rapid decarbonisation as economically rational when assessed through long-term cost-benefit analysis rather than short-term cost-efficiency metrics.

3.2.2. Separated targets unrelated to mitigation deterrence

No informants described separated targets as a mechanism to reduce mitigation deterrence risk or safeguard against supplementary measures failing to deliver. The ER coalition expressed concern that quantifying the residual could create a “license to delay” or “carte blanche” for heavy emitters, preferring instead to aim “as close to zero as possible.” They did not frame target separation as protective; their concern was with quantification leading to a predetermined residual, and a related struggle to protect certain assets by designating them as hard-to-abate.

The IBU coalition and right-wing policymakers advocated explicitly for quantified supplementary measures as a prerequisite for accepting ambitious reduction targets. One policymaker stated that a quantified level of supplementary measures “was what the right-wing needed to get” to agree to shifting the net-target date from 2050 to 2045. Industry representatives described the 15% as creating necessary “flexibility” to relieve pressure on their material interests and viewed it as a “good starting point” that would need expansion post-2045 given anticipated

needs for net-negative emissions.

Knowledge brokers from state agencies described their role as presenting scenarios consistent with Paris Agreement-aligned pathways, but did not report advocating for separated targets as a design principle to prevent fungibility of reductions and removals. They expressed pride in Sweden being the first nation to adopt formally separated targets but agreed that it came out of a political compromise rather than from any actor's deployment of separation as a protective principle.

3.3. Process analysis

3.3.1. The 85/15 split as political compromise

Negotiations of the final policy proposal happened in the final phase of the policy process, following the initial common knowledge construction and the series of roundtable debates in which actor coalitions formed. In this final phase, only policymakers and the secretariat participated – a move criticized by stakeholders but described by policymakers as necessary to reach consensus.

The 85% reduction and 15% supplementary measures targets for 2045 emerged from political negotiation rather than systematic analysis of hard-to-abate or socially necessary emissions, or achievable carbon removal volumes. The inclusion of a quantified percentage of supplementary measures is described as the key political concession that ensured consensus on 2045 as the year of net-zero. Even though they were described as necessary for achieving net-zero but dependent on long-term policy support in the scenarios, the percentage of supplementary measures was mobilized politically to provide the desired flexibility for the IBU group of stakeholders. Informants from the IBU group described a strong faith in supplementary measures to relieve pressure on the Swedish economy, with foreign carbon offsets being the most “sensible” option – “the goal must be to lessen emissions where it's cheapest to do so.”

The final percentages represented a compromise enabling both sides to claim victory. A red-green policymaker explained: “The original mission was to reduce our emissions until 2050, but we managed to push it to 2045. And since we got 2045, we had to agree to some supplementary measures”. A right-wing policymaker confirmed: “we needed to get some form of flexibility for industry”.

However, the two political blocs interpreted this compromise fundamentally differently. Red-green policymakers described 15% as “an absolute maximum” they expected never to use: “We were convinced that we would reach near zero emissions and that we would need hardly any of the supplementary. Besides, who would be left to sell those in 2045? Every state will need to use their own reductions”. Some right-wing policymakers viewed 15% as necessary, but potentially insufficient given anticipated post-2045 needs for negative emissions: “After 2045 we need to have negative emissions. So, setting a cap of 15% supplementary is pretty bad in that regard, because that only reaches that 2045 target. It doesn't reach what is needed after”.

One expert central to the process characterized the committee as “hardly knowing what we were talking about. We ended up with 15% left in 2045, and that needed to be handled somehow.” Another expert describes the compromise like this: “We didn't have any very deep discussions about those 15 %. It was more like ‘oops, we have 15 % left here’. There are some suggested measures – we'll pick those. And then we pushed it into the future”.

3.3.2. Fungibility in interim targets

The final policy proposal allows supplementary measures to make up 8% of the 2030 reduction targets and 2% of the 2040 target. This means a certain level of reductions on the path to 85% are directly replaceable by removals in the time before net-zero – only at that point do removals need to be separated. No stakeholders or policymakers could explain how the specific figures of 8% for 2030 and 2% for 2040 were determined. The ER coalition had explicitly opposed including supplementary measures in interim targets, wanting pure reduction requirements

with removals reserved only for a minimal residual at net-zero and post-2050 negative emissions – but policymakers who took part in the final negotiations report that the inclusion of flexibility in the interim targets was a final concession to the right-wing parties.

One secretariat member attributed the decreasing percentages to an artifact of modeling different baselines: the European Union ESR (Effort Sharing Regulation) sector (1990 baseline) and the ETS sector (2005 baseline) created different reduction pathways which, when combined to arrive at 15% in 2045, produced these “seemingly counterintuitive” interim percentages. The secretariat member characterized this as a “modeling fluke” rather than systematic analysis of either necessary residuals or achievable removal volumes at those interim dates. They recall presenting these modelling results to policymakers and questioning the apparent logic of declining removals, with 2% allowed in 2040 when the final target was expected to require 15% removals five years later. They further report that policymakers at that point “did not want any further negotiations”, and that the figures were thus included in the final proposals despite not corresponding to a projected ramp-up of supplementary measures.

This feature of the interim targets directly undermines the separation principle before 2045: for the entire period until the net-zero date, supplementary measures can be counted towards reductions targets, rather than as a separate removal category. Removed carbon and emissions reductions are thus fungible, meaning removals can be used to make up for reductions instead of being additional to them.

3.3.3. Unresolved conflicts embedded in target design

The formal consensus presented in the committee reports masked persistent fundamental disagreements. Despite the consensus in the committee, industry representatives subsequently criticized the final targets as insufficiently analyzed regarding impacts on competitiveness. Both political blocs and their aligned coalitions agreed to supplementary measures while holding incompatible understandings of their function and use. The compromise worked politically precisely because this ambiguity and “pushing the problem into the future”, as one expert said, allowed different actors to interpret the same target design as serving their divergent interests – maintenance of climate leadership for some, flexibility for cost-efficient compliance for others.

4. Discussion

This study set out to understand the conflicts present in the policy process that set the Swedish net-zero target, and to assess whether the Swedish separation of reduction and removal targets can safeguard against mitigation deterrence. Two aspects of the reconstructed policy process show why the separation cannot work as protection against deterrence in Sweden. First, state apparatuses structured the policy corridor in ways that made political choices on reductions and removals appear as technical or inevitable. Second, the political compromise used supplementary measures to displace rather than resolve fundamental conflicts between the competing social interests of rapid decarbonisation and competitiveness.

4.1. State apparatuses and the corridor of policy formation

The scenarios presented to the committee during the phase of establishing a common knowledge platform operated as state knowledge apparatuses – what HMPA theorises as contextual structures that shape and constrain the corridor in which policy is formed (Brand et al., 2022). Although appearing neutral, the options presented in the scenarios contained political-economic assumptions that were embedded into the structure of available choices. Establishing a 70–95% range of possibility for emissions reductions, with carbon removals and offsets as necessary components to enable net-zero, the scenarios and the knowledge brokers that presented them made this field of possibilities appear as a neutral space for deliberation, rather than a politically constructed corridor.

The power exerted by the state apparatus in forming that corridor remained unacknowledged by the interviewed policymakers. Experts and stakeholders describe scenarios as influential – as “drawing the boundaries of the discussion on the whiteboard” and knowledge brokers engaging in intentional “nudging.” In contrast, the policymakers describe their negotiations as “purely political” compromises – either unaware or unwilling to acknowledge that pre-structured constraints influenced their choices. One policymaker indicated that their negotiations were not based on any sectoral analyses of emissions reductions, but that those were “tacked on” in hindsight.

This power of the scenarios to define the policy corridor comes from their presentation as technically neutral. Scenarios can bypass complex political questions – what emissions will truly need to be residual? what levels of removal are feasible? what is a just Swedish contribution to climate mitigation? – turning them into calculations of cost-efficiency and feasibility that appear technical. Industrial competitiveness – “protecting Swedish industrial interests,” as a policymaker expressed it – was given pre-eminence in the process by appearing as an unquestionable baseline assumption in the policy being developed.

The baseline assumptions from which the policy process departed had embedded in them imperatives about economic growth, maintenance of Swedish industrial competitiveness, and projected increases in biomass extraction rates – but as these appeared axiomatic, discussions of alternatives became unviable from the get-go. Several experts and policymakers reported that carbon budgeting, discussing Swedish consumption-based emissions, or questioning assumptions about growth in energy demand and economic throughput, were all dismissed as “politically unviable” or ridiculed as attempts at “planned economy”, not even politically debatable but negated through institutional selectivities. This indicates how state structures privilege certain interests (industrial profitability) while excluding others (consumption-based emissions accounting, carbon budgeting) from legitimate consideration (Brand et al., 2022; Stützel, 2011).

Towards the end of the policy process, Sweden’s commitment to the 1.5°C ambitions of the Paris Agreement required a response from the Committee. The updated scenarios presented by knowledge brokers managed to present alignment to 1.5°C as a specific residual level for Sweden which contained uncontested justice implications (contraction-convergence without historical responsibility) and inevitabilities (overshoot requiring massive negative emissions after 2050) (Fanning and Hickel, 2023). Even though knowledge brokers report aligning these adjustments to the Paris Agreement – “if you would choose a historical starting point, it would look different” – both policymakers and other experts report that there was neither time nor capacity to investigate or challenge the normative choices embedded in the calculations that showed alignment of Swedish targets with the commitment to “equitable effort sharing” enshrined in the Paris Agreement (Dooley et al., 2021). The final compromise of 15% residuals aligned perfectly with a specific estimation of 1 Mt of emissions per capita in 2045 being a fair share – if overshoot and negative emissions are assumed as inevitable. The result was that policymakers could claim their compromise as “Paris Agreement aligned” and maintaining Swedish leadership on climate policy – but political judgement of what would be a fair-share residual for Sweden was disguised as technocratic fact.

This analysis of the contextual influences on the policy process shows how state knowledge apparatuses functioned to constrain the process through the scenarios they presented (Kannankulam and Georgi, 2014; Stützel, 2011). The inclusion of a quantified amount of removals in the net-zero target was set up from the start as an inevitable outcome – what needed to be negotiated was the point of separation.

4.2. Displacement as conflict management

Rather than safeguarding against deterrence, the separated net-target institutionalized a specific strategy for managing the conflicts that became apparent in the process: displacement in time and space

rather than transformation through structural change. In line with Carton’s (2019) analysis of spatiotemporal fixes in climate policy, supplementary measures enabled the apparent resolution of conflict through displacement. Since policymakers were unwilling or unable to tackle the questions of which emissions are socially necessary, and which industrial transformations will be necessary to reach near-zero emissions, the compromise pushed these questions temporally into the future (through BECCS promises and anticipated LULUCF increases) and spatially beyond Sweden’s borders (through international offsets).

As Carton argues, such fixes allow capital accumulation to continue by displacing fundamental contradictions rather than resolving them. The conflict displaced by supplementary measures reflects the contradiction in the material interests of actors prioritizing industrial competitiveness versus those prioritizing decarbonisation. The displacement is problematic for several reasons; it burdens future generations and communities outside Sweden with facing the consequences of the buried contradictions, it creates path dependencies that lock society into long-term dependence on carbon removals, and it forecloses the possibility of confronting structural questions of production, consumption, and distribution necessary for more socially just and ecologically sound futures.

The spatiotemporal fix worked differently for the two political blocs, with one side understanding the 15% as an “absolute maximum”, and the other seeing it as a minimum level of economic flexibility. Both interpretations enabled consensus while deferring the moment when these incompatible understandings would generate renewed conflict. A long-term policy which hides conflicting visions under an apparent consensus risks hampering the reflexivity of climate politics – the ability to adjust course as new science is produced, technological promises fail or succeed, and social and ecological problems and priorities change.

The mathematical structure of co-determining the targets (100–85=15) institutionalizes the displacement. Several policymakers directly describe that the removal target of 15% was what was “left over” after agreement was reached on the 85% reduction target. Unlike truly separated targets where reduction and removal levels are independently determined and non-fungible (Brad and Schneider, 2025; McLaren et al., 2019), Sweden’s target setting process thus defined the removal space as whatever could not be included in a politically acceptable reduction target. This failure to determine targets using separate frameworks makes the “separation” fundamentally hollow: the 15% doesn’t represent an assessment of necessary residuals or achievable removals but rather the economic flexibility that enabled agreement on 85% reductions by 2045. Truly separated targets would democratically establish reduction ambitions based on what is a necessary and equitable level of decarbonization, and removal targets based on what is sustainable and just for carbon management (Lamb et al., 2024; McLaren et al., 2019; Nawaz et al., 2025). The mathematical linkage means an 11Mt space for potential deferred mitigation became institutionalized by near-unanimous parliamentary approval – institutionalizing exactly the substitution that separation is meant to prevent.

The inclusion of an amount of fungibility of removals and reductions in the interim targets is a failure of a second key condition of effective target separation – non-fungibility. These fungible percentages were not designed to accommodate hard-to-abate emissions – those were never specified by the committee – but to provide economic flexibility. By the time the targets become “fully” separated in 2045, two decades of institutionalized fungibility will have shaped investment patterns, technological development, and political expectations.

The Swedish separation of targets represents “mitigation deterrence by design” (McLaren, 2020; Olsson et al., 2024) both because of the political co-determination of the targets, and because of their subsequent fungibility. These two aspects of the target separation both stem from the political use of carbon removal as an abstract solution to the conflict between industrial growth and decarbonisation. The IBU coalition’s explicit framing of supplementary measures as “flexibility mechanisms” shows this clearly – the flexibility provided is economic

relief: permission to delay industrial transformation by appealing to future technological solutions and spatial displacement.

5. Conclusion

Analysis of the policy process that resulted in the Swedish net-zero target reveals that formal target separation can fail to prevent mitigation deterrence when separation emerges from political compromise rather than principled design. The failure of separation as safeguard in Sweden reflects the hegemonic function of net-zero framings more broadly (Anderson, 2015; Markusson et al., 2018). By appearing to resolve conflicts between economic imperatives and decarbonisation, net-zero targets like Sweden's stabilize superficial political consensus while deferring structural transformations. Separated targets can serve this hegemonic function if the separation emerges from and institutionalizes conflict displacement rather than protecting against it.

5.1. Implications for target separation debates

The Swedish case contributes in three ways to debates about separated targets. First, co-determined targets undermine separation even when they are formally distinct. The mathematical linkage ($100-85=15$) centers policy negotiations on the split point rather than each component, making separation a site of compromise rather than a safeguard. Co-determined targets risk setting up a removal space that works as an economic flexibility for capital interests, rather than a reflexive estimation of necessary residuals and sustainable removals. The Swedish process foreshadowed the use of carbon removal as flexibility in the contemporary negotiations of the EU 2040 targets (Brad and Schneider, 2025).

Second, the case strengthens arguments about scenarios and models exerting structural power that shapes outcomes invisibly (Beck and Mahony, 2018; Beck and Oomen, 2021). The SEPA scenarios created a corridor of policy formation that appeared neutral but embedded prior settlements about growth, competitiveness, and cost-efficiency. Advocates of separated targets must attend to how modeling assumptions constrain what forms of separation are possible – i.e. if models and the assumptions hidden in them hinder rather than promote principled and reflexive assessment of consumption levels, capital accumulation, and growth trajectories.

Third, it shows that design principles alone are insufficient without critical attention to the policy processes that produce them. Scholars have rightly emphasized technical safeguards – ensuring removals do not substitute for reductions, distinguishing temporary from permanent storage, preventing fungibility (Lamb et al., 2024; McLaren et al., 2019). The Swedish case shows that apparent separation can be functionally undermined when the underlying policy process embeds ambiguity about what constitutes legitimate supplementary measures, what counts as hard-to-abate, and what equivalences exist between different removal types.

For separated targets to function as safeguards against mitigation deterrence, they must meet specific conditions: First, targets must be set on their own premises – removal targets cannot simply be what is left over at a point of politically viable reduction. Second, they must not be fungible with each other at any point. Third, both targets must build on reflexive assessment of reduction potentials and removal capacities based on social benefit rather than cost-efficiency, evaluation of justice outcomes of political choices, and approaches to target-setting that make visible the political choices currently obscured by technical discourse. This requires confronting deeper questions: What power relations would need to shift for assessment of removals and reductions to escape cost-efficiency metrics? What forms of democratic participation could challenge rather than legitimate predetermined boundaries?

In the spring of 2026, deterrence seems an increasingly likely outcome for Sweden, despite having had separate targets for removals and reductions for nine years – under current policies the Swedish 2045

target will be missed by 19 Mt (Naturvårdsverket, 2025). The flexibility of using CDR and offsets to meet interim targets is no longer optional but is indeed the only theoretically viable way to do so under current policies – whether or not it is practically achievable. Despite massive subsidies, BECCS is projected to deliver only 1.5 Mt per year by 2030, with international offsets (0.5 Mt) and wetlands (0.1 Mt) contributing minimally, and no significant increase expected by 2045 (Naturvårdsverket, 2025).

Political compromises that displace conflicts rather than confront contradictions are barriers to just futures. The Swedish case reveals target separation as necessary but insufficient for preventing mitigation deterrence on its own. Without addressing the structural contradictions between capital accumulation and decarbonization, separation serves as a legitimising fiction rather than a safeguard.

CRediT authorship contribution statement

Jonas Alleesson: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

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Data availability

The data that has been used is confidential.

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