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# Risking delay: the storylines of (bioenergy with) carbon capture and storage in Swedish parliamentary discourse

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Carbon Capture and Storage (CCS), along with Bioenergy with Carbon Capture and Storage (BECCS), feature heavily in climate mitigation scenarios. Nevertheless, the technologies remain controversial within the broader mitigation discourse, in part for their potential to excuse delay in more ambitious emissions reductions in the short term. Sweden has included BECCS and CCS as proposed “supplementary measures” to enable the country to meet its ambitious target of achieving net negative emissions by 2045. Hajer’s Argumentative Approach to Discourse Analysis is applied to Swedish parliamentary speeches, motions, and written questions and answers, to uncover the storylines and attendant assumptions constituting Swedish policy deliberation regarding CCS and BECCS. This study finds that by problematizing climate change as an issue of emissions, actors position CCS and BECCS within a dominant neoliberal discourse and characterize them as tools to facilitate a green transition centering on industrial and economic competitiveness. This discourse lacks detail, and risks delay by oversimplifying the needs and requirements for CCS and BECCS deployment. Meanwhile, a CCS-critical discourse acknowledges the need for negative emissions but challenges storylines portraying the technology as inexpensive or easy to deploy rapidly. If pursued, this discourse could serve to sharpen the debate about the technologies and bring planning in line with aspirations, helping to avert risks of delay.

## KEYWORDS

policy discourse analysis, carbon capture and sequestration, BECCS, neoliberalism, storylines, Sweden

## 1 Introduction

Fossil Carbon Capture and Storage (FCCS<sup>1</sup>) and Bioenergy with Carbon Capture and Storage (BECCS), among other Carbon Dioxide Removal (CDR) technologies, has featured in IPCC reports as increasingly necessary tools for both reducing CO<sub>2</sub> emissions and achieving negative CO<sub>2</sub> emissions by mid-century (Lecocq et al., 2022). BECCS has even been proposed as a technology which may accommodate “overshoot,” or exceeding internationally determined temperature targets and using CDR to remove emitted atmospheric CO<sub>2</sub> to return to below 2°C.

However, FCCS and BECCS have also been the subject of critique for their potentials to, among other concerns, cause conflicts over land and water use for biomass; excuse, prolong

1 For ease of reading, this article will refer to CCS (Carbon Capture and Storage), and will make the distinction between Fossil CCS (FCCS) and BECCS when needed.

or reinforce reliance on fossil fuels; and potentially lead to delaying ambitious climate action in the short term (Dooley and Kartha, 2017; Dooley et al., 2022; Markusson et al., 2018; Palmer and Carton, 2021; Shue, 2017; Smith, 2022). Underlying many critiques of FCCS and BECCS is a fundamental mistrust of neoliberal economic logics which, some scholars argue, are embedded in climate research and mitigation tools from the models that employ BECCS to reach desired temperature targets, to the negotiating tables at which climate policies are deliberated (c.f. Carton, 2021; Carton et al., 2020; Lund et al., 2023; McLaren and Markusson, 2020).

Critical research has argued that neoliberal economic assumptions have been dominant in shaping climate mitigation pathways, whether it be at the level of policy formulation (Ekberg et al., 2023; Ekberg and Pressfeldt, 2022; Fremstad and Paul, 2022; Scoones and Stirling, 2020), industry and stakeholder perspectives (Christiansen and Carton, 2021), or the science used to inform these positions (Lefstad et al., 2024). Some scholars go upstream from the technology itself, looking at problematizations and assumptions which lead policymakers to pursue certain mitigation pathways over others. McLaren and Carver (2023) compare “no-net-loss” biodiversity goals to net-zero and net-negative emissions targets to explore how neoliberal assumptions make “net” policies attractive politically but, they argue, require extensive oversimplification of complex systems to operationalize. In just transitions literature, Fernandes (2024) contends that narrowly problematizing the climate crisis as a function of carbon emissions leads to “carbon tunnel vision” which risks perpetuating extraction and carbon leakage. Going one step further, Stoddard et al. (2021), and Ekberg et al. (2023), among others, each point to the prevalence of the status quo and neoliberal logics as drivers of delay and obstruction of aggressive climate policy.

How mitigation pathways are engaged with discursively is instrumental in bringing about or stalling climate action. In their typology of discourses of delay, Lamb et al. (2020) identify ‘Surrender,’ ‘Redirect responsibility,’ ‘Push non-transformative solutions,’ and ‘Emphasize the downsides’ as four overarching discourses which *can* delay ambitious climate action. Overlapping with this typology is Mitigation Deterrence (MD), or ‘the prospect of reduced or delayed mitigation resulting from the introduction or consideration of another climate intervention’ (Markusson et al., 2018, p. 1). Where Lamb et al. (2020) does not assign political economic affiliation to the discourses reviewed, MD literature claims neoliberal economic logics as the driving force behind delay in favor of future mitigation technology (Markusson et al., 2024; Markusson et al., 2022; Markusson et al., 2018).

Sweden, however, presents a potential point of contention in the claim of neoliberalism as a cause of climate action delay. Sweden has both a long history of neoliberal assumptions baked into its climate policy in the form of ecomodernism (Anshelm, 2012; Anshelm and Hultman, 2015; Ekberg and Pressfeldt, 2022), and has nevertheless managed to both set and exceeded ambitious emissions reductions targets between 1990 and 2010 (Zannakis, 2015).

The country has also indicated interest in pursuing FCCS and BECCS, and has included the technologies in its proposed climate mitigation strategy, proposing to employ them among a handful of “supplementary measures” to contribute to the nation’s goal of achieving net negative emissions by 2045 (SOU, 2020, p. 4). This has garnered academic interest, with researchers inquiring into policy instruments (Fridahl et al., 2020a; Lundberg and Fridahl, 2022; Olsson

et al., 2024), public opinion (Bellamy et al., 2021; Bellamy et al., 2019), and industry attitudes (Bellamy et al., 2021; Rodriguez et al., 2021).

Sweden is, therefore, an important and salient case study in the impacts of neoliberal storylines on climate policy, and the role of FCCS and BECCS in these discourses. Findings in the Swedish case may prove informative for other nations and unions deciding how carbon mitigation technologies will be incorporated into their climate strategies. This article contributes to the literature by putting the broader research on climate delay in conversation with MD literature by asking the following questions: (1) How do the speakers in the Swedish Parliament construct the ‘problem’ of climate change? (2) What storylines are used in the Parliament to argue for/against CCS in Swedish climate policy, and (3) How might these storylines risk delaying action on more aggressive emissions reductions in the short term?

To trace and interpret the storylines at play in the Swedish Parliament, this study employs Hajer’s Argumentative Approach to Discourse Analysis to analyze parliamentary speeches, motions, and written questions and answers in Sweden between September 2018 and December 2023. This article identifies the Parliament as a “site of argumentation” (Hajer, 2006, p. 73), where storylines can be deployed and arguments can be positioned in what Hajer refers to as the “struggle for discursive hegemony” (Hajer, 1995, p. 65). The parliament was chosen as a site for discursive inquiry due to the array of actors from different political standpoints, each with the ability to employ storylines that either challenge or reinforce current dominant policy discourse.

## 1.1 Neoliberalism and climate policy

In an effort to find explanations to the slow and often insufficient climate action on the part of policymakers, extensive research has been conducted on climate denial and delay (Ekberg et al., 2023; Ekberg and Pressfeldt, 2022; Lamb et al., 2020; Norgaard, 2011; Stoddard et al., 2021). Still others have found a link between CDR and the potential for delaying or curtailing emissions reductions in the short term in favor of CO<sub>2</sub> removals in the second half of this century (Carton, 2019; Carton et al., 2023; Markusson et al., 2018; McLaren, 2020; McLaren et al., 2021). A cross-cutting theme in these areas of research is the detrimental impact neoliberal economic assumptions and discourses have on implementing ambitious climate policy.

Different authors have relied on different variations on the theme of neoliberal and neoclassical economic values, norms and assumptions to attempt to illuminate the impacts of these ideas on climate policy. Keen (2020), for example, lays out what he calls the “appallingly bad neoclassical economics” underpinning climate modelling. Hajer (1995) explains how ecomodernism effected the discourse about acid rain in the UK and the Netherlands.

Ecomodernism, by Hajer’s definition, recognizes that environmental challenges are structural in nature, but holds that existing institutions and structures are equipped to successfully address those challenges. Key tenants across definitions of ecomodernism are faith in human ingenuity and a belief in economic growth as a precondition for societal well-being (c.f. Shellenberger and Nordhaus, 2009; Terzi, 2022).

Ekberg and Pressfeldt (2022) provide a broad definition of ‘neoliberalism’ to cover the range of ideas and values injected into the

Swedish climate discourse in the 1980s by conservative think tanks. This definition of neoliberalism, they say, includes three pillars: (1) the belief that markets are the most efficient purveyors of knowledge; (2) that “competitive marketplaces... and price signals” should be cornerstones of “all governmental action;” and (3) that “all of humanity’s problems” can be solved through humanity’s capacity for creative problem-solving (p. 629).

Finally, authors like Sapinski (2016) and Buller (2022) rely on “Climate Capitalism” and “Green Capitalism” respectively to outline the ways through which neoliberal approaches to economics and ecomodernist perspectives on the relationship between government, the economy, and the environment work together to, in Buller’s words, “preserve existing capitalist systems and relations in response to [climate change], and ... ensur[e] new domains for accumulation in the transition to a decarbonized and ecologically sustainable economy” (p. 12).

## 1.2 Swedish climate policy and discourse

Sweden is no stranger to neoliberal and ecomodern influence into its climate policy. Ekberg and Pressfeldt (2022) detail how conservative think tanks successfully injected the climate discourse with doubt and denial in the 1980s, which later gave way to a discourse prioritizing the balancing of economic growth with ecological considerations. Positioning itself as an international climate leader became a major discursive storyline, as Sweden’s early decarbonization and implementation of a carbon tax put it ahead of other nations’ climate transition (Sarasini, 2009). However, warnings of carbon leakage and the damage such developments could incur on the Swedish economy had a muting effect on climate ambition as early as the 1990’s (Sarasini, 2009). In the early 2000’s, a discourse of what Anshelm (2012) calls “industrial fatalism” took hold, claiming that climate change posed catastrophic risks to life and economy, and—crucially—intensified economic and industrial development were the lynchpins to overcoming the challenge.

But the ecomodernist discourse did not prevent Sweden from becoming a climate policy leader. Having dramatically reduced the use of fossil fuels in the heating and energy sectors as of the 1990’s (Naturvårdsverket, 2024), in part due to its development of centralized district heat and power centers fueled by waste streams from the pulp and paper industries, Sweden’s remaining largest domestic emitting sectors are road transport, manufacturing, and agriculture (Naturvårdsverket, 2024). To address these remaining high-emissions sectors, Sweden passed the Climate Law in 2017, comprised of a policy framework, stepwise emissions reductions targets, and the regular submission and review of national climate action plans. This system provides important guardrails constraining current and future governments’ approaches to climate action, such as establishing the separation of emissions reductions and removals, and stipulating that only 15% (or 10.7MtCO<sub>2</sub>e) of domestic emissions can be compensated for through novel carbon dioxide removal technologies like BECCS. The country has pursued a reverse auction financing project, for which researchers have advocated (Lundberg and Fridahl, 2022), with the first application period having taken place in the autumn of 2024.

Although most of the major political parties in Sweden have historically accepted the reality of climate change, the rising popularity

of the Sweden Democrats, a right-wing, populist party, has been accompanied by an increase of climate-skeptical and -denialist discourse in Swedish politics since their admittance into the Parliament in 2010 (Painter et al., 2023; Vowles and Hultman, 2021).

As of September 2024, the Moderate-led populist government elected in 2022, which governs with the support of the Sweden Democrats, has dismantled many transport-sector policy instruments, such as ending tax incentives for electric vehicles (so-called Bonus Malus), reducing the mandatory levels of biofuel additive in gasoline (Reduktionsplikt), later raising it and instead reducing taxes on gasoline at the pump. In November 2023, the Climate Policy Council issued a strongly worded report reprimanding the government for policies which appeared to deliberately threaten Sweden’s ability to meet its emissions reductions target (Klimatpolitiska Rådet, 2024). By the autumn of 2024, though the government appeared to be adjusting course to meet EU emissions targets for 2030, some experts believe the national targets remain elusive with the current policies (Lindvall and Winberg, 2024). There is, therefore, evidence both supporting and belying claims of Sweden’s ecomodernist climate leadership.

Scholarship has described Swedish climate policy as both neoliberal and ecomodernist. Sweden has long been considered a highly ecomodernized society, though the results of this ecomodernization and dedication to sustainable development have been uneven (Lidskog and Elander, 2012; Vail, 2008). However, at its core, ecomodernism is grounded in neoliberal assumptions. Therefore, this study refers to the neoliberal assumptions which are active in Swedish parliamentary CCS policy discourse, and their potential for delay of ambitious climate policy at the Parliamentary level. This is in line with Ekberg and Pressfeldt (2022) and their choice to focus on the broader category of neoliberalism in their historical account of Swedish climate policy discourse.

## 2 Theory: the argumentative approach to discourse analysis

To trace and interpret the storylines at play in the Swedish Parliament, this study employs Hajer’s Argumentative Approach to Discourse Analysis to analyze parliamentary speeches, motions, and written questions and answers in Sweden between September 2018 and December 2023. This article identifies Parliamentary debates as a “site of argumentation” (Hajer, 2006, p. 73), where storylines can be deployed and arguments can be positioned.

Hajer’s approach relies on the identification of storylines, which he defines as, “a generative sort of narrative that allows actors to draw upon various discursive categories to give meaning to specific physical or social phenomena” (1995, p. 56). Storylines are the tools with which actors “struggle” to “secure support for their definition of reality” (Hajer, 1995, p. 59). Storylines are employed to position both the speakers and other actors within the discourse, to establish credibility, and to create meaning across disparate realms of knowledge. Moreover, storylines function to condense information from various discourses into a manageable package—a process which can exclude nuance, but also create opportunities for political agreement and coalition-building (Hajer, 2006).

Storylines are a means of expressing ideas, hopes, or expectations for a future yet undefined. They rely on metaphor and adage to create a consistent and common language through which these ideas can

be easily consumed and rearticulated by others. Storylines are shaped by the actors who participate in their use, as well as by the institutions and structures which provide the knowledge and values necessary for the storylines to have meaning. In the context of policy discourse, storylines can be a means of expressing visions of the kind of country a nation aspires to be and provide a common language through which policy proposals can be articulated and debated.

Discourses are constituted by storylines and how they are brought together. Hajer employs a broad definition of “discourses” including ensembles of “ideas, concepts, and practices” which are constructed by certain acts and through which “meaning is given,” (Hajer, 1995, p. 60). Storylines are woven together by actors in a variety of discursive spaces to create one common discourse, all while struggling against competing discourses for hegemony. By this definition of ‘discourse,’ which has its roots in the Foucauldian tradition of discourse analysis, even neoliberalism can be thought of as a discourse, both creating meaning and material outcomes (Springer, 2012).

As (Bäckstrand and Lövbrand, 2019) highlight, Foucauldian discourse analysis methodologies are most useful in their capacity to bring forward what appears to be unremarkable in discourses, making evident as contingent and political what may otherwise might seem “just the way it is.” The work in this article is done in this tradition, and as such relies on heuristics and interpretation to uncover the work done by dominant discourses to create or maintain climate mitigation futures.

### 3 Method

The start date for data collection was selected to coincide with the Swedish Parliamentary fiscal calendar, which begins in September of each year. September 2018 was a national election month taking place in the first year after the Swedish Climate Framework was enacted. This election resulted in a center-left government. Another election was held in September 2022, bringing in a new, populist, government. This time frame was therefore selected due to both its salience in relation to the enactment of the Swedish Climate Framework in January 2018, the coverage of one full government from 2018 to 2022, and the first year of a new government from 2022 to 2023.

The methods for this study are comprised of iterative process of data collection, coding, and analysis. The first phase of data collection began in March 2023 with a search on the Swedish Parliament’s database for all debate transcripts including the terms “bio-CCS” [BECCS] and “CCS” between the parliamentary period beginning on 01 September 2018 up to March 6, 2023, which resulted in 78 speeches. The material was imported into NVivo software and inductively coded. This software allowed for a high number of codes, which could later be reviewed to uncover themes, narratives and keywords which would come to constitute preliminary storylines (Hajer, 2006). During the initial coding round, descriptive codes were used to provide a preliminary understanding of how CCS and BECCS were being used in speeches (Saldaña, 2013). As themes began to take shape, the codes were nested under parent codes indicating themes like “policy recommendations,” and “business and industry.”

A second phase of data collection was undertaken, expanding the search terms to include “minusutsläpp,” [negative emissions], and extending the search through 31 December, 2023, and the process of descriptive coding was repeated for all material from both phases to ensure consistency in coding.

After the second coding phase was complete, a third search was conducted further expanding the parameters to include debate transcripts, motions, and written questions and answers from 01 September 2018 to 31 December, 2023. In this final search, the terms were also expanded to include “avskiljning av koldioxid” [carbon capture], and “koldioxidavskiljning” [carbon capture]. After removing documents and speeches which were unrelated due to similar terms being used in other discourses, the material from the final search was imported into the NVivo software where it underwent descriptive coding. With each phase of coding, all material was reviewed for new codes, and parent code categories were readjusted to both accommodate new codes and sort out infrequent ones. Analysis began after the final phase of coding was complete, and comprised of looking for repeated ideas and phrases which could constitute storylines. Similarities and differences between how these potential storylines were engaged with by different actors were noted, as well as, as well as how actors positioned themselves and others within the discourse (Hajer, 1995). Neoliberal storylines were identified during analysis using criteria laid out in previous literature, including favorable portrayals of: market-based solutions, technological solutions, increased economic competitiveness, cost-efficiency, and economic growth; and negative portrayals of government intervention, regulation, and bureaucracy (Ekberg and Pressfeldt, 2022; Springer, 2012). Coded material favorably displaying identified neoliberal characteristics was collected and interpreted as storylines (see Figure 1). Consideration was given to the party affiliation of the speaker in determining whether an excerpt could be interpreted as neoliberal, however it was not taken for granted that a speaker’s party affiliation would be determinative of neoliberal storyline participation.

The final scope of the material collected included 125 Parliamentary speeches over the course of 52 Parliamentary sessions, 62 motions, 6 written questions, and 8 written answers.

In the citations provided, the speakers are referred to by a code. An asterisk (\*) indicates a motion cosigned by several MPs with the named MP being the lead author. A cross (†) indicates a written question. In the citations, the speaker codes are followed by the document number assigned by the Parliament. A list of these codes, with speaker/lead author surname and party affiliations, along with a list of all cited materials can be found in Supplementary materials Appendix A.1. All collected materials can be found in Supplementary materials Appendix A.2.

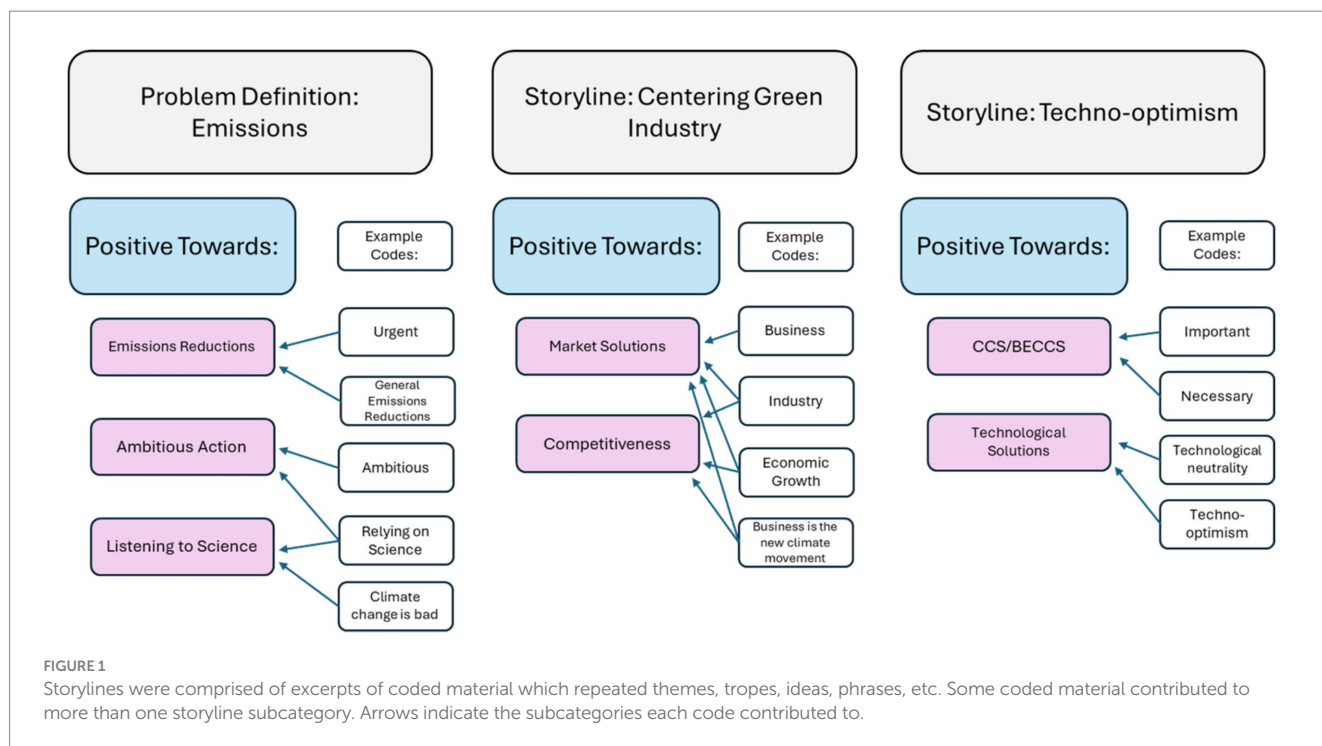
## 4 Findings

### 4.1 Storyline: emissions reductions as ‘the problem’

Overwhelmingly, the actors engaged in the Swedish climate policy discourse directly couple greenhouse gas (GHG) emissions and climate change, with an apparent focus on CO<sub>2</sub> emissions and atmospheric levels. This storyline is marked by actors emphasizing the devastation climate change can and will visit on Sweden and the world, and calling for immediate, rapid, and “ambitious” action.

*“It’s serious now. The climate crisis is ongoing. Our policy instruments must be tightened, not abandoned. The climate goals*





*need to become more ambitious, not watered down. The climate must be prioritized.”—(MP16\*, 2022/23:998)*

The call for emissions reductions is near ubiquitous across parties. Actors argue for responses to climate change centering emissions reductions and removals, with a particular focus on transport and industrial emissions, and often raising the need for international cooperation. The call for sharpened targets for emissions reductions, as well as the need for emissions removals, is often coupled with a reminder that economic growth is a prerequisite for achieving climate targets.

*“If we are to manage to solve humanity’s existential question in our time, a climate policy that ensures that all powers are pulling in the same direction is necessary. This means crystal-clear frameworks to reduce emissions in solidarity, and it means that policy, commerce, the academy and civil society link arms.”—(MP1, 2020/21:156)*

*“[T]he utmost goal for our climate policy must be global emissions reductions to hold the temperature increase well under two degrees [...] Within the framework for this, we in Sweden must show leadership to reach our own national goals in a way that unites climate with economic growth and prosperity, because it is in this way that we inspire other countries to follow us.”—(MP10, 2021/22:45)*

Such problematizations of climate change serve to normalize solutions which address the specific problem of atmospheric emissions, both in the form of reducing emissions and removing already emitted GHGs through negative emissions strategies.

Several parties focus on Sweden’s national emissions in proportion to global overall emissions as a way of emphasizing the need for international cooperation:

*“We know that Sweden accounts for 1 per thousand of the global emissions. If Sweden became emission neutral today, it would take*

*eight weeks for the rest of the world to compensate for our zero emissions with their increased emissions.”—(MP11, 2019/20: 52)*

This argument is used to promote international and global cooperation on climate initiatives. It also serves as a justification to prioritize so-called “efficient” climate strategies which would not have deleterious impacts on the competitiveness of the country’s industry, and in some cases to argue that one of Sweden’s greatest climate contributions should be increasing exports of low-carbon products. By constructing climate change as a problem of emissions, and situating Sweden’s relatively low domestic contribution to global emissions rates, this storyline elevates Sweden as a country which has already largely resolved its emissions issue, and gives it permission to either continue its emissions or excuse a slowed transition to net zero.

Some actors, particularly on the political right, take the opportunity to portray alternative constructions of the climate change problem as dramatic and hysterical, calling for “efficient” responses rather than what they consider the expensive and “symbolic” approaches usually proposed by the left and center-left. Ultimately, these “efficient” approaches focus government funds on technological development abroad, and greater investments in nuclear power and CCS (MP16, 2022/23:43).

## 4.2 Storyline: centering green industry

In the discourse, FCCS is tightly linked to industry and the growth of the industrial sector. This storyline represents Sweden’s business and industry as both as the cause of up to a third of annual domestic CO<sub>2</sub> emissions and as drivers of the country’s climate mitigation strategy:

*“We are going to build Sweden into a climate smart society. Let us do this here and now! We also see that the jobs of the future are here. Fantastic job growth is already ongoing in branches like*

batteries, biofuel, climate technology, CCS and fossil-free steel.”—(MP14, 2020/21:41)

Several parties couple CCS usage with Sweden’s international competitiveness in certain industries, even claiming that increased growth in the Swedish industrial and manufacturing sectors will reduce emissions globally as they outcompete “dirtier” goods produced elsewhere. Actors also express that the competitiveness of Swedish industry should be weighed heavily against the possibility for the increase of emissions elsewhere due to the imposition of more stringent emissions policies domestically. This storyline dovetails with other narratives of “carbon leakage,” or the contention that stringent national emissions requirements will cause high-emitting industries to relocate to less regulated markets (Sarasin, 2009):

*“Industry represents about a third of Swedish territorial emissions. At the same time, our industry is on the absolute forefront when it comes to producing in a climate-smart way. The solution is, therefore, not that we should shut down our industry, for the truth is that for every ton of steel, paper pulp and other products which Sweden exports, we also export reduced emissions. Sweden is frankly so much better than other countries at producing climate smart products. CCS is an important part in how we will be able to further reduce industry’s emissions.”—(MP12, 2018/19:62)*

“Leakage” and unbalanced international competitiveness due to restrictive emissions regulations are proposed to be solved through CCS and through carbon pricing policies set at the EU level.

Industry is expected to reduce its emissions—usually through hydrogen, in the case of steel, or CCS in the case of cement—and government intervention into the market to maintain the competitiveness of Swedish industry internationally is taken as a given. Likewise, although industries which have the potential for CCS installations are highlighted, some parties take a broader perspective on the definition of residual emissions, contending that negative emissions should be used both to compensate for increased emissions for energy production, and to offset aviation emissions:

*“In order to offset aviation’s emissions, it is urgent to start with negative emissions on a large scale. The high-altitude effect still needs to be compensated even when fossil-free fuels replace today’s fossil fuels.”—(MP8\*, 2020/21:3679)*

Although the term ‘negative emissions’ in this context can be understood to include more conventional CDR techniques like afforestation or rewetting peat bogs, the nod to the need at a “large scale” implies the necessity of novel CDR technologies like BECCS.

Speakers in favor of CCS, particularly on the center-right of the political spectrum, regularly bring up a particular cement factory as an example of an industrial installation which would require FCCS to mitigate its emissions. This is unsurprising, as CO<sub>2</sub> is an unavoidable byproduct of cement production. Chemical refineries were another, less frequent, example of when and how FCCS could be useful. BECCS, meanwhile, is most often raised as a possibility at combined heat and power plants relying on biomass. However, rather than suggesting examples of when and where BECCS would be most beneficial, as they do with FCCS and hydrogen, many actors instead simply describe in basic terms *how* the technology functions,

and thus how it would contribute to Sweden reaching its emissions targets:

*“When you burn bioenergy from wood and forests, CO<sub>2</sub> is released which the trees had previously captured. Today, it just goes back to the atmosphere. Instead, through using new green technology for capturing this natural CO<sub>2</sub>, and storing it in naturally tight spaces, for example where there previously was natural gas, you can reduce the amount of CO<sub>2</sub> in the atmosphere. Then ‘negative emissions’ occur.”—(MP2\*, 2018/19:2610)*

Taken together, the focus on the types of facilities which would benefit from CCS and the emphasis on *how* the technology works rather than the politically constituted issue of to what extent it *should* be used or specific infrastructural demands of rolling out such technologies, can be understood to normalize assumptions about the importance of maintaining industrial outputs and limiting climate mitigation’s disruption of Swedish production.

Several motions indicate a desire for the government to develop funding strategies for CCS and BECCS. Some of the more targeted motions include calls for “at least 25% of the EU’s innovation fund should be earmarked for negative emission technology,” and “a pricing of negative emissions at EU level and review of the possibilities of introducing a bonus system for negative emissions within the EU ETS” (MP3\*, 2021/22:3684). These proposals situate the need for negative emissions technology financing within the EU and EU ETS, which calls for policy frameworks but relatively low levels of state intervention and funding.

Other motions envision state funding with little prolonged control, proposing “that the state should increase the pace of the transition through early support and that the market then best organizes the transition without the state’s interference” (MP8\*, 2021/22:4199). With decidedly less specificity, the Moderate party proposes, “[the government] give[s] the Energy Agency the task of developing a financing model for CCS and BECCS,” (MP10\*, 2020/21:3349; MP13\*, 2020/21:3368) and, later, “get a financing model for both CCS and BECCS in place as soon as possible” (MP13\*, 2021/22:4030; MP10\*, 2021/22:3436).

The overall lack of specific and actionable policy proposals across the material could be read as a “just get it done” attitude, especially in light of industry’s perception of a lack of policy leadership for CCS at this same time (Rodríguez et al., 2021), and many speakers’ protestations that CCS policy is urgently needed (see Appendix B).

Finally, some speakers acknowledge industry’s growing frustration with the lack of policy leadership displayed by the government and parliament. This is expressed either through vague remarks such as, “It is unclear what requirements Sweden will place on CCS technology. So far, the Swedish authorities have kept a low profile and the cement industry points out that time is short,” (MP4\*, 2020/21:2940) or through explicit policy proposals like the reduction of an energy tax for energy used to operate BECCS (MP3†, 2022/23:61). Despite acknowledging the frustration, no changes in the depth or specificity of the discourse were noted to have occurred.

### 4.3 Storyline: techno-optimism

A firm belief in the efficiency and promise of technological solutions to the problem of emissions is present to some degree in most of the parties’ speeches and motions reviewed in this study. This

techno-optimism extends far beyond CCS, as speakers speak both generally and specifically about technological advancements that will, they claim, greenify the Swedish business, industrial, and transportation sectors. Perhaps the most often-mentioned is the fossil-free steel being developed in the north of Sweden through the use of hydrogen. This technology is frequently mentioned directly before CCS as a way of juxtaposing opportunities for industrial production which could and could not be made carbon-free.

Speakers from all parties but the Sweden Democrats at some point characterize either CCS or BECCS as “important” or “necessary” (see Appendix B). Speakers distancing themselves from the dominant discourse tend to accompany these statements with clarifications or conditions, which will be explored in more detail below. Several examples were found of speakers engaging in the dominant neoliberal discourse clarifying that emissions reductions were also necessary.

In addition to possibilities for decarbonizing so-called “base industrial” production, either through hydrogen or CCS, the electrification of the vehicle fleet and the need for massive expansion of the charging infrastructure are often raised. Some Liberal party speakers are bullish on aviation electrification or decarbonization, but also tied CDR to aviation, contending that negative emissions could be used to compensate for the high-altitude effect of aviation (MP9, 2019/20:132).

Not all speakers explicitly identify as techno-optimists—though speakers in the Christian Democrat (MP5, 2019/20:52, 2019/20:135, 2020/21:54), Liberal (MP9, 2021/22:91), and Moderate (MP11, 2019/20:52; MP10, 2020/21:88) parties do. The Social Democrats, which was the leading party in government between 2018 and 2022, recounts lists of government investments in a variety of technologies and innovation funds like the Climate Leap and Industrial Leap funds. This strategy puts less focus on CCS as a preferred mitigation technology, instead allowing it to exist as one of many potential tools among both novel and conventional emissions reduction and removal tools:

*“We invested in The Climate Leap Fund, The Industrial Leap Fund, BECCS, biogas support, wetlands support, climate car bonus, charging towers, and the mixing in of renewable fuel at the pump. We invested in railways and also in night trains to Jämtland, and much more. This is how we create the jobs of the future.”—(MP15, 2022/23:43)*

Though not centering CCS specifically, this approach nevertheless both supports the industrial transition as a primary objective in the green transition and implies a techno-optimistic leaning, as the majority of the measures listed rely on technological innovation.

#### 4.4 Nascent critical discourse: giving voice to uncertainty

In addition to the dominant neoliberal storylines studied here, an emergent critical discourse was present, articulated most often by the Green and Left parties.

In perhaps the most negative statement about BECCS found in the studied material, one Green Party motion states:

*“There is great uncertainty about how and on what scale the CCS technologies will be able to generate negative emissions. BECCS on a large scale risks threatening food production and biodiversity. Negative emissions must never be used as an excuse for the continued use of fossil fuels.”—(MP6\*, 2022/23:2175)*

Preceding this statement is a description of the benefits of so-called ‘nature-based solutions,’ and directly following this quotation is a paragraph balancing both the use of BECCS as a potential vehicle for negative emissions and a portfolio of ‘nature-based’ carbon sinks.

The quote cited above is an example of a speaker attempting to set explicit limits on the terms of CCS usage in Sweden, something the neoliberal discourse avoids. While there is discussion of becoming “fossil free” or breaking the country’s reliance on fossil fuels within the neoliberal discourse, CCS and the kinds of fuels being used at such facilities is not foregrounded.

The examples found within the studied material indicate that insofar as a critical discourse is being cultivated by some speakers, it is done outside of CCS storylines. The above example, where BECCS is placed alongside ‘nature-based’ carbon sinks, is rare. While several speakers, particularly those to the left and center-left on the political spectrum, take up issues of biodiversity, afforestation, protecting old-growth forests, sustainable agriculture, etc., these issues are almost always raised in separate motions or speeches, or in different sections of motions or speeches, such that the two discourses rarely overlap.

The result of this separation of discourses in this study is that much of the critical storylines are made invisible when focusing on FCCS and BECCS. The quote above notwithstanding, the majority of the discourse which does include both natural carbon sinks and CCS does not question the value or necessity of CCS in the Swedish policy context. Moreover, issues pertaining to sustainable biomass harvesting for BECCS installations are rarely raised, thus rendering the potential contradiction between future biomass availability and expanded use of BECCS underexplored.

The Left Party was most consistent in its articulation of a critical position on CCS. This was often done in response to speeches from other speakers, with the effect of undermining the first speaker’s credibility on the technology and positioning the critical discourse as more credible (Hajer, 1995, p. 59):

*“Because the Moderates are fans of getting quick and efficient climate policy, I would like to know what the Moderates’ plans are for the large investments for carbon capture. In the Moderates’ plan, when can CO<sub>2</sub> begin to be captured within the framework of the capture plan they want to invest in? We all know that it is a technology that doesn’t exist or work yet. Many also believe that it can take a very long time before we can get any use of any carbon capture.”—(MP7, 2021/22:42)*

However, despite being the most openly critical voice towards CCS plans, the Left party’s participation in the discourse was also among the lowest, making expressions of this more critical discourse much rarer than the storylines comprising the neoliberal discourse discussed above.

## 5 Discussion

The storylines uncovered in this research are consistent with findings in the literature regarding neoliberal climate policy discourse in Sweden. The storylines used in favor of CCS did not become more nuanced or complex over time, however there is an overall spike in the quantity of motions mentioning CCS in the fiscal year 2021/22, which coincides with the election run-up. 2020 sees the most speeches given mentioning the keywords identified, followed by 2022. This may be in part due to a push for green economic recovery instruments after COVID, as well as the publishing of the first Climate Action Plan—a



component of the 2018 Swedish Climate Law—as a Proposition by the government to the Parliament in December 2019, which made it a topic of debate the following year.

The storylines used to describe CCS include a broad discursive agreement on the “problem” of climate change being primarily one of GHG emissions; the growth of industry as the preferred approach to addressing both territorial and global emissions; and a degree of techno-optimism amongst some speakers which were dismissive of demand-side lifestyle changes. These storylines turn the multifaceted issue of climate change into a quantitative and measurable problem, aligning it with problem conceptualization frameworks preferred by neoliberal economics (McLaren and Carver, 2023). They also engage in the neoliberal and ecomodernist traditions of relying on technological solutions and human ingenuity to resolve said quantified problems. Finally, they explicitly position economic growth as a non-negotiable aspect of any green transition.

## 5.1 Constructing the ‘problem’ of climate change

Hajer (1995) contends that poststructuralist environmental discourse analysis aims to understand how and why certain environmental problems become “dominant” and “authoritative,” and argues this is achieved by analyzing “how certain problems are represented” (p. 44). It is, therefore, prudent to begin the analysis of storylines in the Swedish Parliament with an eye to understanding how the actors in that space represent and conceive of the ‘problems’ of climate change and its mitigation.

The speakers included in this study construct and define the problem of climate change as one of atmospheric carbon emissions. The rate of emission and their longevity in the atmosphere are the central problem identified in the material and are frequently characterized as an existential issue. Emissions are represented in the context of continuing to foster lively and internationally competitive industrial and business sectors. As such, the speeches covered several potential and ongoing mitigation measures spanning both emissions reductions and removals, with emphasis placed on insulating high-emitting sectors from alternative decarbonization policies which would negatively impact their competitiveness.

Focusing on quantifiable targets like CO<sub>2</sub> emissions and reductions, facilitates policies like net-zero and net-negative emissions, which McLaren and Carver (2023) argue are preferred by neoliberal economics precisely for their simplification and quantification. This narrow and quantifiable problem definition, presented as normative and unremarkable by the neoliberal discourse in which the storyline is used, allows for equally narrow and targeted solutions (Markusson et al., 2022). The proposed solutions are designed to cause minimal disruption to current modes of production (Buller, 2022). Technological solutions are seen as ideal because they are minimally disruptive, can be integrated into existing value chains, and allow the public to maintain their high standard of living, which was an explicit goal of some of the speakers included in the material. Such solutions, however, rely on the country’s ability to decouple emissions from economic growth, which many researchers contend may be difficult if not impossible to achieve absolutely and permanently (Jiborn et al., 2018; Parrique et al., 2019).

The problem as understood within the discourse places the highest priority on reducing and removing mostly industrial CO<sub>2</sub> emissions. CCS fulfills the brief, being a technology which promises

to reduce or remove emissions while allowing industry not only to proceed but to grow. The problem definition, and its alignment with neoliberal imperatives of quantification, simplification, and minimized economic disruption, create a foundation for the dominant storylines: prioritizing industry, and techno-optimism. In the Swedish context, the ‘problem’ of emissions can be addressed through centering industry, as industry stands for around a third of the remaining domestic CO<sub>2</sub> emissions. Techno-optimism presents CCS as technological solutions to emissions reductions and removals which do not threaten Swedish competitiveness.

## 5.2 The storylines for/against CCS in Swedish climate policy

In addition to the storyline problematizing climate change as a question of emissions, two storylines are found to be dominant in the Swedish Parliamentary CCS discourse: one promoting green growth by centering industry, and the other focusing on techno-optimism. In addition to the dominant discourse and storylines, there exists some evidence of a critical discourse which expresses skepticism about BECCS and CCS.

Markusson et al. (2022) contend that negative emissions technologies are a tool for net-zero policies which are developed in line with neoliberal prerogatives of capital accumulation and serve to displace urgency for emissions reductions in the short term to meet those ends. The storylines found to be predominant in this study support this thesis. The narrowed problem delineation which aligns with green capitalism creates a runway to solutions like CCS and BECCS as two unavoidable solutions. Since the competitiveness of industry is taken as a given, only solutions which fulfill that condition can be considered viable, a closing down of potential pathways to fit a tight, neoliberal idea of progress (Stoddard et al., 2021). Such pathways must be supply-side driven, maintain or increase production, and should be tailored to prevent carbon leakage abroad. The main objective is “preserving the architecture and arrangements of wealth and power that define contemporary capitalism; and [...] the identification and construction of new sites for accumulation” (Buller, 2022, p. 32).

These storylines present challenges to implementation. Financing CCS installations is expensive, and bringing in private financing through the voluntary carbon market could negatively impact carbon markets and potentially lead to higher levels of residual emissions (Dufour et al., 2024). Public financing is thus considered the most secure mode of investment but is at odds with market-based solutions generally promoted by neoliberalism. While neoliberal tendencies towards market solutions have not precluded government financing of Swedish BECCS projects, they might hinder rapid and ample financing. Swedish FCCS installations, meanwhile, cannot be subsidized under the reverse auctions program, leaving those actors to rely on carbon markets to make carbon capture economically feasible. However, a reliance on carbon pricing might cause companies to delay investment until prices are sufficiently high and even then have been deemed by some researchers to be insufficient (Bellamy et al., 2021). Transport and storage likewise require extensive government intervention and oversight that could be considered excessive and wasteful in neoliberal storylines. Tracking emissions reductions and removals over time will require oversight (Buck, 2021) which, when conceptualized within a neoliberal discourse, could risk privatization or eventual deregulation.



On the other hand, the CCS-critical discourse presented the beginnings of storylines which may be useful in setting expectations for the implementation and use of the technologies in question. These storylines included acknowledging the need for technologies like BECCS while pushing back on claims that they are the most cost-effective option or that they can be rapidly rolled out. They also recognized the potential detrimental effects that BECCS could have on biodiversity in Swedish forests, indicating a desire for limits on the extent of its use. Balancing the benefits of technologies with their potential drawbacks and impacts introduces alternative ways to deploy them outside of a good/bad, all or nothing binary (Paulson, 2021). Moreover, injecting the debate with critical discourse can create space for inclusion of other considerations such as restorative and distributive justice, and alternative metrics of progress, and can make the debate around CCS deployment accessible to community stakeholders and societal actors (Christiansen and Carton, 2021; McLaren, 2021).

### 5.3 The potential for risk of delaying action on climate mitigation

That the logics underpinning the dominant CCS discourse in Sweden are neoliberal may be instrumental understanding the risk of delay of ambitious climate action. Implicit qualities of the studied discourse such as a reliance on market-based solutions and technoptimism, may be opening Sweden up for a risk of delay.

The engagement in the same storylines across the political spectrum results in a disappearing of important logistical questions. For example, the making-invisible of debate-worthy contradictions between policy objectives like sustainable forests and increased bioenergy demand normalizes neoliberal assumptions about the relationship between natural abundance and technological innovation. Fundamentally, the lack of depth of the storylines found in the discourse may indicate a lack of debate at the national policymaking level regarding the infrastructure and planning required to develop CCS within the nationally proposed time frame. Though government assistance through the form of reverse auctions may provide necessary support for private actors to begin construction of BECCS facilities, there still remains a gap in the discourse regarding these infrastructural questions which may cause delay in construction or implementation in the coming years (Rodriguez, 2024).

In the material, the efficacy of proposed emissions mitigation and removal policies are debated through reports by the Climate Policy Council (klimatpolitiskarådet), the Swedish Nature Conservancy (Naturvårdsverket), the National Institute of Economic Research (Konjunkturinstitutet), and the National Audit Office (Revisionen). Yet the debates using these institutions' reports remain surface-level, functioning to position actors within the discourse (Hajer, 1995) rather than using the findings to advance discussions on implementing CCS technologies. This superficial debate could potentially be an indicator that the technology is something of a place-holder: laden with expectations and assumptions which allow the nation's climate policy to work on paper, but not yet understood to require legislative intervention. Geden (2016) finds that vague terminology can be counterproductive to setting and achieving ambitious climate targets. In this context, lumping conventional and novel CDR technologies together under the mantle of "negative emissions" and likewise discursively tying negative emissions to CCS

creates a vague picture of the pathways to net-negative emissions by 2045 at a time when clear and specific pathways are needed for private actors to make investment decisions (Rodriguez et al., 2021). The enthusiastic support of CDR and CCS can, as von Rothkirch et al. (2024) highlight, be a double-edged sword: both bringing actors on board with CDR but also failing to address important questions as to its use which might result in delay of other measures or fail to take into account possible alternatives should CDR and CCS fail to materialize in time.

It is in this way that the storylines observed appear to represent a risk for MD. While not always intentional, MD can occur in the event a technology does not operate as expected, or if entities relying on that technology fail to produce requisite emissions reductions (McLaren, 2020; Olsson et al., 2024). The dominant position of neoliberal storylines in the Swedish Parliamentary discourse, as well as the largely surface-level state of the CCS debate, aligns with Markusson et al.'s (2018) argument that BECCS and other negative emissions technologies are a tool for the spatio-temporal fixing of the climate problem favored by a fossil capitalist system which seeks to extend its viability as long as possible. BECCS and CCS as potential emissions mitigation and removal technologies are themselves not the problem; rather the problem is that they are situated in a discourse which relies so heavily on the market for climate transition that the government risks losing opportunities to drive ambitious climate policy.

It is important to point out that Sweden is still doing plenty right. It has created separate targets for emissions reductions and removals, which McLaren et al. (2019) advocate as a stopgap to mitigation deterrence and others such as Fridahl et al. (2020b) consider a precondition for effective removals policymaking. It has set limits to the amount of emissions that can be removed via CDR, which should prevent a ratcheting-up of reliance on BECCS to compensate for a failure to meet reductions targets. And although the discourse reviewed in this study does not always reflect a similar rigor, strategic plans differentiate between technologies which remove CO<sub>2</sub> and those which prevent its emission, which as a matter of discourse is important in preventing conflation between the technologies. Should Sweden fail to meet its targets for reducing emissions and reaching net zero, the lack of a timely, complex, and nuanced Parliamentary debate which capitalizes on the unique power of the state to drive the implementation of CCS and BECCS, among other emissions mitigations technologies, could be part of its undoing.

The CCS and BECCS-critical discourse may be an important tool in preventing delay of other mitigation measures. The benefit presented by storylines which represent critical and skeptical perspectives on the technologies lies in their ability to both expand the scope of the discourse, and to challenge assumptions about the ease, generalizability, and utility of CCS and BECCS as solutions to the country's remaining emissions. Rather than being used to allow great to be the enemy of good, as the saying goes, a robust and thoughtful critical debate which "embraces uncertainty," and is prepared to take up questions including the potential for mitigation deterrence born by such technologies, can lay the groundwork for more nuanced and robust climate policy (Scoones and Stirling, 2020; Stirling, 2010; Thompson, 2022). Research is ongoing into how alternative imagined futures can be shaped through discourse, praxis, and models (cf. Celemajer et al., 2024; Christiansen and Carton, 2021; Diezmartinez et al., 2025; Fritz et al., 2024). Nevertheless, much research is still needed to empirically trace the impacts of alternative discourses and storylines on climate policy.

## 6 Conclusion

Although CCS and BECCS are considered important technologies to bring countries in alignment with net-zero and net-negative emissions targets, they remain controversial in part for their ability to extend the extraction and combustion of fossil fuels. Critical researchers have tied these technologies to so-called “discourses of delay” (Lamb et al., 2020) and risks of mitigation deterrence (Markusson et al., 2018), and pinpointed neoliberal assumptions in the discourse both for the promotion of techno-fixes like CCS and BECCS in policy spaces (Stoddard et al., 2021).

This study identifies the Swedish Parliament as a site of argumentation for FCCS and BECCS as climate mitigation technologies and uncovers storylines coupling neoliberal assumptions with the technologies. It finds that these storylines comprise an emissions discourse which is both adamant that emissions must be reduced yet lack specificity in how proposed technologies and measures should be brought about. The storylines problematize climate change as an issue of emissions, center industrial competitiveness as a key consideration in climate policy, and promote technological solutions to address emissions without negatively impacting industry.

Taken together, the lack of specificity found in the discourse and the confidence in the success of these technologies constitute a risk of delaying more ambitious action to reduce emissions in the short term.

In addition to these neoliberal storylines, some actors in the Parliament are engaging to a limited degree with a discourse which is more skeptical of relying heavily technological solutions. This discourse may be instrumental in broadening and sharpening the Parliamentary discussion surrounding actions the government can support to reduce emissions in line with the climate targets, and assist to outline with more clarity the pathway to FCCS and BECCS implementation. Though the discourse concerning FCCS and BECCS comprises two pieces to the emissions reductions and mitigation puzzle, the candor and clarity with which it is taken up may be instrumental in helping Sweden reach its targets.

## Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

## Author contributions

AA-I: Conceptualization, Investigation, Writing – original draft, Writing – review & editing.

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fclim.2024.1514753/full#supplementary-material>

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