# A Holistic Approach to Climate Policy Evaluation: Assessing the Programmatic, Process, and Political Success of the SDE(+) Policy in the Netherlands

Author: Jari van den Broek, 4932749
TU Delft, Engineering and Policy Analysis
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Committee Chair: Dr. Trivik Verma
Committee: Dr. Nihit Goyal
Committee: PhD candidate Stephan Huber

# Abstract

The climate policy domain is critical in addressing the multifaceted challenges posed by environmental degradation, socio-economic factors, and political dynamics. This thesis examines the Stimulering Duurzame Energieproductie (SDE(+)) policy in the Netherlands, evaluating its programmatic, process, and political success using an integrated framework combining dimensions of policy success and criteria for climate policy evaluation. Employing a qualitative research design, the study incorporates structured content analysis, stakeholder interviews, and secondary data analysis to provide a nuanced assessment.

The findings indicate that the policy's success has improved from the transition to and during the SDE+, showing both resilient and conflicted success. While the SDE+ policy has significantly boosted renewable energy production, particularly in solar PV and onshore wind, it has not achieved the 2020 targets and challenges like grid capacity strain and socio-economic inequalities remain. The evaluation highlights the need for a more equitable distribution of burdens and benefits and internalising external costs such as net congestion into the competitive subsidy allocation process.

This comprehensive analysis contributes valuable insights into climate policy effectiveness, supporting the development of more resilient and equitable renewable energy policies in line with international climate targets. Using a new climate-specific evaluation framework, this thesis provides a holistic and nuanced evaluation of the SDE(+) case study, demonstrating its applicability to climate policy. The study underscores the importance of integrating multiple dimensions of policy success to address the complex challenges of climate governance.

# Glossary

Abbreviations

| | |
|---|---|
| **ACM** | Autoriteit Consument & Markt (Authority for Consumers & Markets) |
| **CBS** | Centraal Bureau voor de Statistiek ( Central Bureau of Statistics Netherlands) |
| **FiT** | Feed-in Tariff |
| **GHG** | Greenhouse Gas |
| **IEA** | International Energy Agency |
| **MEP** | Milieu-kwaliteit Elektriciteitsproductie (Environmental Quality of Electricity Production) |
| **PBL** | Planbureau voor de Leefomgeving (Netherlands Environmental Assessment Agency) |
| **PV** | Photovoltaic |
| **RVO** | Rijksdienst voor Ondernemend Nederland (Netherlands Enterprise Agency) |
| **SDE(+)** | Stimulering Duurzame Energieproductie (Incentive for Sustainable Energy Production) |
| **CSAF** | Criteria Success Assessment Framework |

Dutch Terms

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|---|---|
| **Stimulering Duurzame Energieproductie** | Incentive for Sustainable Energy Production, name of the case study policy |
| **Salderingsregeling** | Name of a Dutch net metering scheme |

# 1. Introduction

Climate policy represents a critical and rapidly evolving area within public policymaking, marked by the complex interactions among environmental science, socio-economic dynamics, and political demands. Addressing the urgent challenges posed by climate change necessitates policies that effectively balance the imperative to reduce greenhouse gas emissions with the socio-economic consequences for communities and industries (Jordan & Huitema, 2014b; Howlett, 2012). The development and implementation of robust climate policies are essential for mitigating adverse environmental impacts, promoting sustainable development, and strengthening societal resilience (Cairney, 2016; Fischer, 2003).

However, what constitutes an effective policy is not always straightforward, as the impacts of climate policy are manifold, affecting environmental, economic, and social spheres (Cairney, 2016; Hoogland et al., 2021). Policy evaluations are used to assess policy effectiveness and determine how successful a policy has been (Bovens, 't Hart, & Kuipers, 2008). These evaluations provide critical insights into whether the policies are meeting their intended goals and delivering the expected benefits to society (Vedung, 1997). Evaluating climate policies is particularly important due to their dynamic and vital nature, necessitating frequent adaptations to meet set international climate targets, such as those set in the Paris Climate Accord (Jordan & Huitema, 2014b; Meadowcroft, 2009).

Policy evaluations traditionally focus on assessing whether programmatic goals are met, often using quantitative measures such as cost-effectiveness, efficiency, and immediate outputs (Carter, 2018; Vedung, 1997). This approach, while useful, provides a limited view of a policy's overall impact and success (Sanderson, 2000). Programmatic evaluations are typically straightforward, relying on data that can be easily quantified and compared against benchmarks. However, by concentrating solely on direct outcomes, traditional evaluations tend to overlook broader socio-economic and political implications, as well as the complexities and dynamic interactions within the policy environment (Bovens et al., 2001; Howlett & Rayner, 2007; Weiss, 1999). For example, a policy that appears successful based on immediate outputs might actually exacerbate socio-economic inequalities or create environmental degradation in the long run (Fischer, 2003; Sanderson, 2000; Vedung, 1997). This narrow focus on immediate, measurable outcomes neglects the broader and often more complex aspects of policy impacts, such as procedural fairness, stakeholder engagement, and political legitimacy (Howlett, 2012; Cairney, 2016). To address the limitations of traditional policy evaluations, it is helpful to first define what constitutes policy success. This definition can then guide evaluations to ensure they measure the policy's multifaceted impacts and outcomes.

Policy success is a multifaceted concept that encompasses the achievement of intended objectives, the efficient use of resources, the satisfaction of stakeholders involved, and the equitable distribution of burdens and benefits (McConnell, 2010; Howlett, 2012). It involves evaluating whether a policy has effectively addressed the problem it was designed to solve, met its goals, and delivered benefits to its target population (Bovens & 't Hart, 1996; Sabatier &

Weible, 2014). Successful policies are those that not only achieve their primary objectives but do so in a manner that is cost-effective, sustainable, and beneficial to the community at large (Head & Alford, 2015; Weiss, 1999).

However, measuring policy success is inherently challenging, especially in complex policy areas, such as climate policy, where outcomes are influenced by myriad factors, including socioeconomic conditions, political dynamics, and external events (Huitema et al., 2011; Jordan & Huitema, 2014b). The complexity and interconnectedness of these factors often result in ambiguous and contested interpretations of success, making it difficult to ascertain the true impact and effectiveness of a policy (Jordan & Huitema, 2014b; Cairney, 2016). For instance, a policy may achieve its immediate goals but fail to account for long-term sustainability or unintended side effects, thereby complicating the assessment of its overall success (Weiss, 1999; Sanderson, 2000).

To address these challenges in evaluating the multifaceted impacts of policies to assess policy success, scholars have increasingly called for more holistic evaluation approaches that provide a broader picture of policy success by including additional dimensions (Huitema et al., 2011; Fischer, 2003; Sanderson, 2000).

The shift from programmatic to holistic evaluations is driven by the recognition that effective policymaking must consider long-term impacts and the interplay between different policy domains and stakeholders (Fischer, 2003; Jordan & Huitema, 2014a). Holistic evaluations provide a comprehensive understanding of policy impacts by incorporating various dimensions such as social equity, political legitimacy, and procedural fairness, which enables policymakers to address weaknesses and unintended consequences more effectively (Huitema et al., 2011; Fischer, 2003; Howlett & Rayner, 2007). These evaluations promote greater accountability and transparency by considering a wider range of impacts and stakeholder perspectives, making them well-suited for addressing the multifaceted challenges of modern governance, especially in complex areas like climate policy (Cairney, 2016; Howlett, 2012; Head & Alford, 2015; O’Flynn, 2015). Additionally, they enhance learning and adaptation within policy processes, leading to more resilient and effective policies (Howlett, 2012).

Moving towards holistic evaluations presents its own set of challenges. These include the difficulty of capturing qualitative aspects of policy impacts, the need for multi-dimensional assessment frameworks, and the complexities involved in integrating diverse stakeholder perspectives (McConnell, 2010; Howlett, 2012; Bryman, 2016). Holistic evaluations require comprehensive data collection and analysis methods that can accommodate the varied and often subjective nature of different success dimensions (Weiss, 1999; Fischer, 2003). Additionally, the broader scope of holistic evaluations can lead to challenges in achieving consensus among stakeholders with differing priorities and perspectives (Sanderson, 2000; Checkland et al., 2021).

One of the primary challenges is the integration of qualitative and quantitative data to provide a comprehensive assessment of policy impacts (Cairney, 2016; Fischer, 2003). Qualitative data, which often include stakeholder interviews and case studies, can provide deep insights into the contextual and process-related aspects of policy implementation but can be difficult to standardise and compare. Quantitative data, while easier to measure and compare, may fail to capture the nuanced impacts of policies (Weiss, 1999; Head & Alford, 2015). This integration requires sophisticated methodologies to ensure that evaluations are both thorough and balanced (Creswell & Plano Clark, 2017).

Another challenge is the development of multi-dimensional frameworks that can address the various aspects of policy success, such as social equity, environmental sustainability, economic efficiency, and political legitimacy (Huitema et al., 2011; Howlett & Rayner, 2007). The complexity and interconnectedness of multiple evaluation dimensions require a systematic approach to ensure that all relevant factors are considered (Cairney, 2016; Head & Alford, 2015; Fischer, 2003; Howlett & Rayner, 2007). Such an evaluation framework not only aids in capturing the multifaceted nature of policy outcomes but also ensures that evaluations are consistent, transparent, and replicable, which are essential for building public trust and achieving long-term policy success (Weiss, 1999; Sanderson, 2000; Cairney, 2016; Checkland et al., 2021). By systematically addressing these aspects, a framework can help in identifying and mitigating potential conflicts and trade-offs between different policy goals, thereby enhancing the coherence and alignment of policy interventions (Fischer, 2003; Howlett & Rayner, 2007). This comprehensive approach is crucial for a nuanced understanding of policy success, as it accommodates the varied and often subjective nature of different evaluation dimensions (Huitema et al., 2011; Head & Alford, 2015). Without a structured approach, evaluations risk becoming fragmented and inconsistent, making it difficult to draw meaningful conclusions and provide actionable recommendations (Fischer, 2003; Jordan & Huitema, 2014a). Therefore, scholars have begun to put forward frameworks to assess policy success.

## 1.1 A Comprehensive Framework for Assessing Policy Success

McConnell's (2010) framework for policy success offers a comprehensive structure for evaluating the multifaceted nature of policies by exploring three critical dimensions: programmatic, process, and political success. Programmatic success focuses on achieving specific objectives and desired outcomes, ensuring the policy effectively addresses targeted issues. Process success examines the procedural aspects of policymaking, including adherence to legal standards, building sustainable coalitions, and incorporating innovative practices. Political success evaluates the policy's impact on the broader political landscape, including its benefits to the government, its ability to sustain political support, and its contribution to the broader agenda of the policymakers (McConnell, 2010; Jordan & Huitema, 2014a).

This comprehensive framework enhances policy evaluation by providing a balanced assessment across different areas, crucial for informed decision-making and policy improvement (Sanderson, 2000). Its flexibility allows adaptation to various policy contexts and domains, making it a versatile tool for evaluating diverse types of policies (Howlett & Rayner, 2007). By incorporating both qualitative and quantitative measures, McConnell's framework facilitates rigorous and nuanced assessments, allowing more informed and effective policymaking (Cairney, 2016; Fischer, 2003; Bovens et al., 2008).

Unlike other frameworks that may focus solely on outputs or specific aspects of policy implementation, McConnell’s approach integrates a broader spectrum of evaluation criteria, providing a more holistic understanding of policy impacts (McConnell, 2010; Jordan & Huitema, 2014a). For instance, Vedung's (1997) emphasis on program evaluation and Weiss’s (1999) theory-based evaluation offer valuable insights but often lack the integration of process and political dimensions (Vedung, 1997; Weiss, 1999). Similarly, frameworks such as Bovens, 't Hart, and Peters (2001) focus heavily on governance aspects but do not fully encompass the multi-dimensional success that McConnell's framework offers (Bovens et al., 2001). By ensuring that evaluations consider the effectiveness of policy delivery, the quality of the policy-making process, and the political sustainability of the policy, McConnell’s framework addresses these gaps and captures the full spectrum of policy impacts (McConnell, 2010).

Climate policy, given its complexity and dynamic nature, requires an evaluation approach that can account for its multifaceted impacts. While McConnell’s (2010) framework provides a robust and broad framework for evaluating policy success, it lacks the specificity needed to effectively address the unique challenges of climate policy. The climate policy domain demands that policies be increasingly adaptable, both programmatically and in terms of process to maintain effectiveness (Jordan & Huitema, 2014a). Stakeholder participation is considered crucial for achieving the energy transition, and incorporating innovative processes and applications is essential in the fast-paced area of climate policy (Meadowcroft, 2009; Jänicke & Quitzow, 2017). These climate-specific aspects are currently not assessed in the broad and robust framework provided by McConnell (2010). Therefore, the inclusion of climate-specific criteria would enhance the framework's applicability to climate policies. Huitema et al. (2011) conducted a meta-analysis of 259 evaluations of climate policy, identifying the most important criteria used for evaluating climate policy. These criteria include goal attainment, cost-effectiveness, efficiency, fairness, legal acceptability, stakeholder participation, and adaptability. By integrating these criteria into McConnell's (2010) framework, evaluators can ensure a more comprehensive and nuanced assessment of climate policies, addressing both immediate outputs and broader socio-political impacts

## 1.2 Evaluating the SDE(+) Policy Using McConnell’s Framework

Integrating McConnell’s (2010) framework with the criteria proposed by Huitema et al. (2011) enhances the evaluation of climate policies by combining a comprehensive theoretical model with practical, specific benchmarks. This synthesis allows for a detailed assessment across programmatic, process, and political dimensions, addressing immediate outputs and broader sociopolitical impacts (McConnell, 2010; Huitema et al., 2011).This combined approach addresses the shortcomings of existing frameworks that often fail to integrate the procedural and political dimensions crucial for holistic policy evaluation and increases applicability to climate policy (Vedung, 1997; Weiss, 1999; Bovens et al., 2001).

Feed-in Tariff (FiT) policies are core climate policies used to increase the share of renewable energy in the energy mix. A FiT policy guarantees a fixed payment to renewable energy producers for the electricity they generate, typically over a long-term contract, ensuring a stable and predictable revenue stream. The evaluation of FiT policies has been robust in certain areas yet reveals a significant knowledge gap in others. Current research has concentrated on the programmatic success of these policies—assessing their direct impacts on renewable energy outputs such as photovoltaic installations (Couture et al., 2010; Mendonça, 2007). However, there is a notable scarcity of comprehensive analyses that move beyond assessing only the programmatic success to take a more holistic overview of the policies' success (Mitchell et al., 2006; Rickerson et al., 2007). Adopting the holistic framework developed through the integration of McConnell's (2010) dimensions of success with the supportive criteria of Huitema et al. (2011) can effectively address this gap in the current literature (Toke & Lauber, 2007; Del Rio & Gual, 2007). This comprehensive approach facilitates a more detailed and reflective evaluation of FiT policies, capturing their broader impacts and ensuring a more nuanced understanding of policy effectiveness in climate policy's dynamic and complex field (Johnstone et al., 2010).

To illustrate the practical application of this integrated framework, this thesis examines the Stimulering Duurzame Energieproductie (SDE+) policy in the Netherlands. While fundamentally a Feed-in Tariff (FiT) scheme designed to enhance renewable energy production, the SDE+ includes additional policy mechanisms to address the specific needs and challenges of the Dutch energy transition and financial sustainability of FiTs (CE Delft, 2016). These mechanisms include competitive bidding processes and tiered subsidies, which are implemented to ensure that financial support is allocated to the most cost-effective and impactful renewable energy projects. The integration of these elements aims to increase policy efficiency and stability, addressing issues such as grid capacity strain and socio-economic inequalities that simpler FiT schemes may not effectively manage (CE Delft, 2016; IEA, 2020a).

The SDE(+) policy has achieved considerable success in increasing the share of renewable energy, particularly from solar PV and onshore wind, reaching the highest solar PV per capita in Europe (CBS, 2024c, Statista, 2024; CE Delft, 2016). However, it has also faced significant challenges. The Netherlands failed to meet its 2020 renewable energy targets, achieving only 11.1% renewable energy instead of the planned 14% (CBS, 2021). Additionally, issues like grid capacity strain and socio-economic inequalities resulting from policy mechanisms like the 'salderingsregeling' have highlighted areas needing improvement (Ministry of Economic Affairs and Climate Policy, 2020; ACM, 2023).

Moreover, the SDE+'s positioning as a core policy in the Dutch energy transition, supporting a significant share of the total renewable energy production, makes it even more interesting to evaluate and sets it apart from other FiTs in Europe (CE Delft, 2016; RVO, 2020). Its continuation from the SDE+ into the SDE++ scheme, where subsidy amounts have been stably increasing, further distinguishes it from FiTs in other countries such as Spain and the UK (Lockwood, 2013;del Río & Mir-Artigues, 2014;). This stability and growth in subsidies demonstrate the Dutch government's commitment to renewable energy and provide a robust model for other nations aiming to enhance their renewable energy frameworks (IEA, 2020a).

However, while the SDE(+) policy's programmatic success—such as increasing renewable energy output—has been the focus of most evaluations, there remains a significant gap in understanding the policy’s effectiveness across other critical dimensions. Specifically, current research often neglects the process and political aspects that are essential for a holistic evaluation of the policy’s success. This gap is particularly evident in the lack of comprehensive analyses that examine how the policy’s implementation processes and its political sustainability contribute to its overall effectiveness.

To evaluate the success of a policy such as the SDE(+), a multidimensional approach is essential, as it addresses the various facets of policy implementation, effectiveness, and impact (Huitema et al., 2011; McConnell, 2010). A single-dimensional assessment would fall short in capturing the intricate interplay between the policy's goals, implementation processes, and the broader political context (Howlett & Rayner, 2007). By examining the policy through the combination of Huitema et al.’s (2011) criteria for evaluating climate policy and McConnell's (2010) three dimensions of success—programmatic, process, and political—a comprehensive picture can be obtained that not only reflects the climate policy's direct outcomes but also its procedural integrity and political viability (Vedung, 1997; Bovens & 't Hart, 1996). Through the synthesis of the individual evaluations of success in the programmatic, process, and political dimensions, a total evaluation of the success of the SDE(+) can be assessed (Jänicke & Quitzow, 2017).

The knowledge gap addressed by this thesis lies in this absence of a multidimensional evaluation framework applied to the SDE(+) policy. Understanding the full spectrum of a policy’s impact requires an evaluation that considers not only programmatic outcomes but also the effectiveness of the policy process and its political implications. By integrating McConnell’s (2010) framework with climate-specific criteria, this study aims to fill this gap and provide a more nuanced and complete assessment of the SDE(+) policy.

This thesis critically examines the success of the Netherlands' Stimulering Duurzame Energieproductie (SDE(+)) policy, focusing on its process, programmatic, and political dimensions. The study aims to provide an in-depth understanding of the policy's performance within these three critical areas. Therefore, the main research question guiding this thesis is formulated as follows:

**Main Research Question:** *To what extent has the SDE(+) policy been successful in terms of its process, programmatic, and political perspectives?*

By addressing this question, the research will provide a detailed and nuanced assessment of the SDE(+) policy, highlighting its strengths and identifying areas for improvement. This comprehensive evaluation will contribute valuable insights to the field of climate policy and support the development of more effective and equitable renewable energy policies.

To address the main research question, this thesis employs a robust qualitative research design that includes structured content analysis, stakeholder interviews, and secondary data analysis. The framework applied combines criteria from Huitema et al. (2011) and McConnell (2010), organized into Criteria Success Assessment Frameworks that describe each criterion on a scale from total success to total failure. The Criteria Success Assessment Framework is a tool used to systematically evaluate the success of each criterion within the SDE(+) policy, providing a structured method to assess programmatic, process, and political outcomes. The research focuses on evaluating the SDE(+) policy’s programmatic, process, and political dimensions using these well-defined criteria to ensure an evidence-based and nuanced assessment of the policy's performance and impact.

The data collection process involved extensive searches using Google, NexisUni, and the Dutch government website (Rijksoverheid) to gather relevant articles and documents. The search covered different periods, ensuring a comprehensive collection of data on the SDE and SDE+ policies. In total, 65 data sources were selected for content analysis, categorized as follows: 36 news articles, 16 government reports, 8 government-affiliated reports (reports from organizations in association with the government), and 5 independent reports. This diverse and comprehensive dataset forms the basis for a detailed evaluation of the policy’s success.

The content analysis process involves several systematic steps. Each data source is analysed, and information related to predefined criteria is extracted and documented. The information is then categorised, summarised, and evaluated using the Criteria Success Assessment Frameworks' definitions, resulting in an initial assessment of success for each criterion. To ensure thoroughness, the data is restructured and subjected to analysis, considering the frequency and impact of arguments. This structured approach allows for a detailed and balanced evaluation of the SDE(+) policy’s programmatic, process, and political dimensions. The final assessments will be synthesized to answer the main research question, offering a holistic understanding of the policy’s effectiveness and areas for improvement.

This thesis is structured as follows: *Chapter 2* presents a conceptual framework for evaluating policy success, detailing McConnell’s (2010) dimensions of success and Huitema et al.'s (2011) criteria for climate policy evaluation. *Chapter 3* provides an in-depth background of the SDE(+) policy in the Netherlands, applying the integrated evaluation framework to assess its effectiveness. *Chapter 4* outlines this study's research design, methods, and data collection strategies. *Chapter 5* presents the evaluation results for each dimension, offering a detailed analysis of the policy's performance. *Chapter 6* concludes the thesis by synthesising the findings, discussing their implications for policymaking, and offering recommendations for future research and policy development.

# 2. Theoretical Framework

Policy success is traditionally evaluated by whether programmatic goals are met. Yet, the outcomes of a policy encompass more than just these objectives. Policy impacts often reside in ambiguous "grey areas" between success and failure, requiring both factual assessment and subjective interpretation (Bovens and 't Hart 1996). Recognising this complexity, the policy studies field offers an analysis through three key dimensions. In this approach, a policy's success is determined by three dimensions: programmatic success, process success, and political success. According to McConnell (2010), the outcomes across these dimensions span a spectrum from success to failure, including varied states like resilient success, conflicted success, precarious success, and failure. This approach not only structures policy assessment more comprehensively but also openly addresses the subjective nature of policy evaluation.

Programmatic success involves the effective execution of policy objectives, where outcomes align with initial goals, the intended beneficiaries are reached, criteria specific to the policy domain are met, and opposition is minimal (McConnell, 2010). This form of success hinges on addressing the "correct" problem with appropriate policy measures. Indicators include meeting the policy domain's criteria, delivering intended benefits to the target group, achieving desired outcomes, and facing limited resistance. The criteria for what constitutes programmatic success can vary significantly depending on the policy area; for example, economic efficiency is vital for public budgeting reforms, while secrecy is paramount in national security policies (McConnell, 2010).

Process success, according to McConnell (2010), entails achieving policy goals and maintaining legitimacy through legal and standard procedures, forming sustainable coalitions, symbolizing innovation, and encountering minimal opposition. This encompasses both the formulation and implementation stages of policy. Key measures of process success include the preservation of government policy goals and instruments, legitimizing policies through accepted procedures, building durable coalitions of support, and fostering innovation. Success in this context is gauged by the ability to pass legislation or make decisions that are perceived as legitimate, supported, and innovative, without facing significant opposition (McConnell, 2010).

Political success pertains to the advantages a policy confers on the government or political leaders responsible for its implementation (McConnell, 2010). This includes improving electoral prospects, enhancing reputations, controlling the policy agenda, facilitating governance, upholding the government's broader values, and encountering minimal opposition to these political benefits. The political dimension highlights that political outcomes are crucial in determining a policy's overall success. Even policies with limited impact on programmatic and process levels can yield significant political benefits and thus be deemed successful (Bovens et al., 2001). Success is assessed by the policy's contribution to political objectives, support for the government's broader agenda, and the level of opposition faced (McConnell, 2010).

McConnell's (2010) framework for evaluating policy outcomes recognises a spectrum from complete success to outright failure, with various intermediate states. At one end, Policy

Success is characterised by achieving policy goals with widespread support and minimal opposition. Moving along the spectrum, Resilient Success involves policies that achieve their goals broadly but face some opposition or require minor modifications. Conflicted Success represents policies that partially achieve their goals but encounter significant opposition and controversy. Precarious Success is marked by limited achievements overshadowed by substantial opposition and controversy. At the far end, Policy Failure occurs when policies fail to achieve their goals and face overwhelming opposition. Each dimension has a separate table for which the levels of success and their respective descriptions are given to help evaluate and place them at a certain level of success. McConnell (2010) provides these tables, which are found in *Appendix A.*

McConnell's (2010) framework has proven instrumental in evaluating policy success across various studies, each adapting it to different contexts. Newman and Head (2015) applied the framework to analyse the effectiveness of Europe's flood emergency management systems, assessing successes and pinpointing failures across programmatic, process, and political dimensions. Similarly, Peckham (2021) utilised the framework to investigate the implementation support programs for the Care Act 2014 in England, revealing the complex dynamics between policy design, stakeholder engagement, and multi-level governance challenges. In another application, Grace et al. (2017) focused on Australia's national mental health strategy, using McConnell’s framework to evaluate the effectiveness of various policy levers, such as organisation and finance, based on government evaluations. Meanwhile, Reslow (2017) assessed the EU's external migration policy, particularly Mobility Partnerships, to determine their success in meeting objectives, gaining support, enhancing the EU’s reputation, and cost-effectiveness. The common thread across these studies is the critical need for comprehensive and adaptable methodologies to navigate the intricate governance structures and policy dynamics underpinned by a mix of qualitative and case-study approaches. However, each confronts the limitation of contextual specificity, illustrating the difficulty in generalising findings or measuring policy impacts definitively across different policy environments.

McConnell’s (2010) framework also finds usage in climate policy evaluations. Checkland et al. (2021) address governance challenges in climate change adaptation policies, advocating for a broader evaluation that incorporates both governance dimensions and institutional variables. Their research proposes expanding McConnell's (2010) framework beyond traditional models to emphasise the crucial role of governance structures in policymaking and implementation. This approach promotes a more comprehensive understanding of policy success, integrating institutional and governance factors to enhance policy evaluations.

The limitations of McConnell’s (2010) framework often revolve around its broad applicability, which can sometimes lack specificity when applied to particular policy areas. For instance, the framework's general nature makes it challenging to operationalise concepts for measurement in specialised domains like climate policy. This limitation becomes evident in various studies that attempt to apply the framework to specific contexts. For example, Newman and Head (2015) found that while the framework was useful for assessing Europe’s flood emergency management systems, it needed additional criteria to fully capture the unique aspects of disaster response policies. Similarly, Peckham (2021) highlighted the framework's need for adaptation when evaluating the Care Act 2014 in England, suggesting that context-specific criteria are crucial for comprehensive evaluation.

To address these limitations, integrating additional theoretical frameworks can enhance McConnell's (2010) model for evaluating specific policies. Checkland et al. (2021) suggests expanding McConnell's framework by including governance and institutional variables to assess climate change adaptation policies. These adaptations provide a more comprehensive understanding of policy success, incorporating both traditional policy evaluation criteria and additional dimensions that capture the complexity of specific policy areas. By adding Huitema et al's (2011) criteria to McConnell's (2010) framework this thesis aims to overcome the lack of specificity in McConnell's framework, offering a more comprehensive evaluation of climate policies.

## 2.1 Criteria for evaluating climate policy

Climate policy is a vital and rapidly evolving domain within public policymaking, characterized by its complex interplay between environmental science, socio-economic factors, and political imperatives (Meadowcroft, 2009; Jänicke & Quitzow, 2017). As climate change poses unprecedented challenges globally, effective climate policies are essential to mitigate its impacts and adapt to its consequences (European Commission, 2022). The importance of evaluating climate policies stems from the need to ensure they achieve their intended goals, are efficiently implemented, and equitably benefit all societal groups (Huitema et al., 2011). A more holistic evaluation approach is necessary to provide a more thorough and nuanced assessment of climate policies. McConnell's framework offers a robust structure with its three dimensions of success and interpretable concepts of success (McConnell, 2010).

Climate policy, given its complexity and dynamic nature, requires an evaluation approach that can account for its multifaceted impacts (Jänicke & Quitzow, 2017). While McConnell's (2010) framework provides a robust and broad framework for evaluating policy success, it lacks the specificity needed to effectively address the unique challenges of climate policy. Works by Goyal (2021) and Checkland et al. (2021) also use additional frameworks in combination with McConnell's (2010) framework. The climate policy domain demands that policies be increasingly adaptable, both programmatically and in terms of process to maintain effectiveness (Jordan & Huitema, 2014a). Stakeholder participation is considered crucial for achieving the energy transition, and incorporating innovative processes and applications is essential in the fast-paced area of climate policy (Meadowcroft, 2009). These climate-specific aspects are currently not assessed in the broad and robust framework provided by McConnell (2010). Therefore, the inclusion of climate-specific criteria would enhance the framework's applicability to climate policies (Huitema et al., 2011).

A comprehensive framework for evaluating climate policies is laid out by Huitema et al. (2011), which identifies the most used criteria in climate policy evaluations. Their research systematically catalogues emerging evaluation practices across various European nations, emphasizing the need for evaluation practices to embrace the inherent complexity of climate policy, incorporate reflexivity by questioning official policy goals, and enhance participatory approaches. The meta-analysis conducted by Huitema et al. (2011) included 259 evaluations and highlighted several key criteria utilised in assessing European climate policies.

Huitema et al. (2011) outline several criteria crucial for evaluating climate policy, including effectiveness, efficiency, cost-effectiveness, fairness, legal acceptability, and coordination with other policies. Effectiveness measures whether policy goals have been achieved and if these achievements can be attributed to the policy. Efficiency evaluates whether the policy achieves its goals with the optimal use of resources. Cost-effectiveness assesses the benefits delivered per unit of expenditure. Fairness examines the equitable distribution of policy impacts among different societal groups. Legal acceptability ensures compliance with existing legal frameworks, and coordination with other policies checks how well the evaluated policies integrate with existing ones (Huitema et al., 2011). The evaluation criteria that are most used for climate policy and their leading questions are described in *Table 1*.

Moreover, Huitema et al. (2011) advocate for the integration of additional criteria, such as stakeholder involvement, reflexivity, and adaptability. Stakeholder involvement ensures a comprehensive array of perspectives, augmenting the legitimacy and applicability of the evaluations. Reflexivity involves critically examining the underlying assumptions, goals, and methodologies of existing policies. Adaptability is necessary for policies to evolve in response to new insights and changing environmental conditions, ensuring long-term effectiveness in climate governance (Huitema et al., 2011).

These criteria, when integrated into McConnell's (2010) framework, can provide a more holistic and comprehensive evaluation of climate policies, addressing both immediate outputs and deeper evaluative dimensions crucial for sustainable and effective policy outcomes.

| **Criterion** | **Leading questions, examples** |
|---|---|
| Goal attainment and effectiveness | Whether policy goals have been achieved and whether this can be attributed to the policy. |
| Cost-effectiveness | How much of a given benefit is delivered per unit of expenditure, expressed as the net benefit or cost per unit of effectiveness? (e.g., tons of carbon mitigated or number of vulnerable people protected) |
| Efficiency | Have the right goals been formulated, should certain emission reductions be achieved by one sector or another, or do the benefits of reduced emissions outweigh costs incurred? |

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|---|---|
| Fairness | Relates to issues of equity, including the question whether 'windfall profits' (unfair competitive advantages) have arisen because of climate policies (e.g., emissions trading creates a profit potential for those with many emission credits, i.e., the bigger polluters) |
| Legitimacy | Does the public accept the policies, does the policy meet criteria of democratic accountability such as transparency? |
| Coordination | Is the policy well-coordinated with existing other policies? |
| Legal acceptability | Are policies in accordance with legal principles? |

**Table 1:** Most used criteria for evaluating climate policy by Huitema et al. (2011)

The evaluation criteria outlined by Huitema et al. (2011) are pivotal for assessing the efficacy and comprehensiveness of climate policies. However, the usage of these criteria in various research studies often reveals a constrained application. According to the research, most climate policy evaluations tend to employ only a limited set of criteria and methodologies (Huitema et al., 2011). This prevalent approach indicates a relatively low degree of reflexivity within these evaluations, suggesting that evaluators may not be fully engaging with the complexities of the potential unintended consequences of the policies under review (Vedung, 1997; Meadowcroft, 2009).

In broader academic research, this tendency manifests as evaluations that primarily emphasise direct outputs like effectiveness or cost-efficiency (Cairney, 2016). These evaluations often overlook deeper evaluative dimensions such as fairness, which considers the equitable distribution of policy impacts among different societal groups, or legal acceptability, which assesses compliance with existing legal frameworks (Fischer, 2003; Jänicke & Quitzow, 2017). Furthermore, the coordination of evaluated policies with existing policies is rarely scrutinised, which is crucial for ensuring holistic and integrated policymaking (Jordan & Huitema, 2014a).

This constrained methodological scope in evaluating climate policies not only reflects a gap between evaluation practice and the theoretical ideal of encompassing complexity, reflexivity, and participation but also suggests a missed opportunity for deeper learning and policy innovation. The limited use of diverse evaluation criteria can result in a lack of comprehensive understanding of how policies perform in real-world settings, including how they interact with other policies and their broader socio-economic impacts (Howlett & Rayner, 2007; Sabatier & Weible, 2014).

The criteria outlined by Huitema et al. (2011) for evaluating climate policy provide a structured approach to assess various aspects of climate policy implementation and impact. These criteria are instrumental in determining how well a policy is designed and executed and how it interacts with existing frameworks and stakeholder expectations. However, while these criteria are effective in aiding assessment of the operational and immediate relational aspects of a policy, they do not, on their own, conclusively indicate whether a policy is successful. This is because success in policy terms often transcends operational metrics to include broader, long-term goals such as sustainable development, a significant reduction in carbon emissions, and substantial societal shifts towards climate-resilient behaviours. Success can also be context-dependent, varying according to local environmental, economic, and social conditions, which may not be fully captured by the evaluation criteria. Therefore, while these criteria are valuable for a detailed assessment of specific climate policy facets, additional analysis and broader contextual understanding are necessary to truly gauge overall policy success.

## 2.2 Connecting Climate Evaluation Criteria to Policy Success

Incorporating the criteria outlined by Huitema et al. (2011) into McConnell's (2010) framework significantly enhances applicability of McConnell's framework to climate policies, enabling a comprehensive evaluation that captures their complexity. The criteria serve to support and adapt McConnell's (2010) framework specifically for climate policy evaluations. Evaluation theory highlights the importance of utilising multiple criteria and diverse methods to fully reflect the complexities involved (Huitema et al., 2011). This synthesis offers a structured method to operationalize McConnell's (2010) dimensions, ensuring a comprehensive, measurable, and nuanced evaluation of climate policy outcomes, implementation processes, and political acceptability. This approach not only strengthens the application of McConnell's (2010) framework but also ensures that the unique aspects of climate policy are adequately addressed.

While Huitema et al. (2011) outline various criteria for evaluating climate policy, not all of these criteria are directly related to each dimension of success as described by McConnell. For instance, criteria such as legal acceptability and coordination with other policies are more relevant to process success, while fairness may significantly impact all dimensions. To create a more structured and practical framework, these criteria will be mapped onto McConnell's (2010) existing dimensions of success—programmatic, process, and political success.

The selected criteria are those with the most evident and substantial impact on each specific dimension of success. This mapping facilitates the operationalization of policy success concepts, providing clear criteria for evaluation. While this approach may slightly oversimplify the complexities inherent in policy evaluations, it serves as a foundational tool for a comprehensive assessment. The full table of the mapping of Huitema's (2011) criteria for evaluating climate policy onto the dimensions of success can be found in *Appendix B*.

The following sections will delve into how these criteria align with each dimension of success, starting with programmatic success, followed by process success, and finally, political success.

### 2.2.1 Programmatic success

Programmatic success, as defined by McConnell (2010), focuses on the successful implementation of a policy in line with its objectives, achieving desired outcomes, benefiting the target group, meeting specific policy domain criteria, and minimizing opposition. The following key criteria from McConnell's framework have been selected to evaluate programmatic success:

**Meeting Specific Criteria of the Policy Domain:** According to McConnell (2010), policies should address the "right" problems through measures that are effectively aligned with the key issues within the policy domain. This criterion ensures that the policy's actions are relevant and targeted toward the most pressing challenges.

**Delivering Benefits to the Target Group:** The policy must provide tangible benefits to its intended beneficiaries. This includes measuring the positive impacts on the target population and ensuring that the policy effectively meets their needs.

**Achieving Intended Outcomes:** Policies should meet their stated goals and produce measurable results. This requires setting clear objectives and systematically tracking progress towards these goals.

**Implementing Policy in Line with Objectives:** Policies must be executed in a manner that adheres closely to the predefined objectives. This involves minimizing deviations and ensuring that any minor adjustments do not detract from the overall goals

**Minimal Opposition:** McConnell (2010) considers minimal opposition as an indicator of policy success, where a successful policy encounters little resistance and garners broad support.

To enhance the evaluation framework, the following criteria from Huitema et al. (2011) have also been included:

**Efficiency:** Efficiency relates to the benefits delivered per unit of expenditure, such as the net benefit or cost per unit of effectiveness (e.g., tons of carbon emissions mitigated or an increase in solar photovoltaic capacity). This criterion helps gauge how resources are utilized relative to the gains they produce. It ensures that the policy not only achieves its goals but does so in a manner that optimally uses resources, thereby supporting the overall strategic objectives of the climate policy.

**Programmatic Fairness:** Programmatic fairness addresses broader impacts beyond goal attainment, encompassing the equitable distribution of economic benefits and burdens. Including programmatic fairness enriches the evaluation of programmatic success by considering the broader economic impacts, ensuring that economic benefits and burdens are equitably distributed among different societal groups.

**Programmatic Adaptability:** Programmatic adaptability highlights the inherent complexities in climate policies, emphasizing the need for policies to be flexible and responsive to different future scenarios. This criterion ensures that policies are designed to be robust, allowing them to perform effectively under various conditions in the dynamic field of climate policies.

Through the process of developing a comprehensive framework, it was necessary to integrate and streamline some of the criteria initially derived from McConnell (2010) and Huitema et al. (2011). For example, **Achievement of Policy Goals** integrates McConnell's focus on achieving intended outcomes with the notion of delivering tangible benefits to the target group. This integration was essential for providing a holistic assessment of the policy's effectiveness, ensuring that both goal achievement and benefit delivery are evaluated together to avoid redundant assessments.

The **Efficiency** criterion was adapted to explicitly include cost-effectiveness, as emphasized by Huitema et al. In climate policy, efficiency is closely linked to cost-effectiveness, particularly in terms of the amount of renewable energy generated or greenhouse gas (GHG) emissions reduced per financial investment. This approach ensures that the policy's success is not only measured by its outcomes but also by the efficiency with which resources are used to achieve these outcomes, making cost-effectiveness an integral part of the efficiency criterion rather than a separate measure.

The criterion of **Minimal Opposition**, as discussed by McConnell (2010), is not assessed independently in this framework. Instead, it is reflected within **Achievement of Policy Goals** and **Efficiency**. Significant opposition to a policy is expected to manifest in the difficulty of achieving goals and the reduction of efficiency. By incorporating opposition within these criteria, the framework allows for a more comprehensive evaluation of the policy's success without the need for separate consideration of opposition.

The **Programmatic Adaptability** criterion is a specific adaptation of Huitema et al.'s broader concept of adaptability, tailored to the context of climate policy. In this research, adaptability is split into **Programmatic Adaptability** and **Process Adaptability**. **Programmatic Adaptability** refers to the policy's capacity to adjust its core programmatic elements—such as goals, targets, and implementation strategies—in response to technological advances, market shifts, and environmental changes. In contrast, **Process Adaptability** pertains to the flexibility of the policy's procedural aspects, such as governance structures and decision-making processes. This distinction is crucial in climate policy, where both the substance of the policy and the processes by which it is implemented must be able to evolve to remain effective.

While **Programmatic Fairness** focuses on the fair distribution of economic benefits and burdens, ensuring that the policy's outcomes are socially just, **Political Fairness** involves a broader concept of fairness. Political fairness includes programmatic fairness but also considers factors like stakeholder involvement and equitable processes in decision-making, which can impact the policy's political dimensions.

The synthesised list of criteria for assessing the programmatic success of climate policy can be found in *Table 2*.

| Criteria | Description |
|---|---|
| Achievement of Policy Goals | Evaluates whether the policy met its stated objectives and delivered measurable benefits to the intended beneficiaries, with the effects of any significant opposition reflected in the ability to achieve these goals. |
| Programmatic Fairness | Assesses the equity of the policy's outcomes, focusing on the fair distribution of economic benefits and burdens among different societal groups, ensuring that the policy contributes to social justice. |
| Programmatic Adaptability | Evaluates the policy's flexibility and capacity to adapt its programmatic elements—such as goals and implementation strategies—to technological, market, and environmental changes, ensuring long-term effectiveness. |
| Efficiency | Assesses the policy's cost-effectiveness and resource efficiency, particularly in terms of the increase in renewable energy production or decrease in GHG emissions per unit of investment, with the impact of any opposition reflected in reduced efficiency. |
| Meets Policy Domain Criteria | Ensures that the policy addresses the most critical and relevant issues within its specific domain, particularly in the context of dynamic climate challenges, aligning with strategic environmental goals. |

**Table 2:** Synthesised list of criteria for programmatic success

### 2.2.2 Process success

Assessing process success is crucial in climate policy, as it revolves around the design, formulation, and implementation of policy measures. This dimension, as defined by McConnell (2010), involves achieving and maintaining policy goals and legitimacy through legal and standard procedures, building sustainable coalitions, symbolizing innovation, and facing minimal opposition.

**Preserving Policy Goals and Instruments:** The policy should maintain its core goals and instruments throughout its implementation. This means that the original objectives and tools designed to achieve them should remain intact and effective.

**Conferring Legitimacy:** Policies should be developed and implemented through legitimate means that are widely accepted. Legitimacy is achieved through adherence to legal standards, transparency, and fairness in the policy-making process.

**Building Sustainable Coalitions:** Successful policies need the support of sustainable coalitions. This includes fostering alliances and partnerships that can provide ongoing support and resources for the policy.

**Symbolizing Innovation:** Policies should symbolize progress and innovation. This involves adopting new and effective approaches to policy challenges and being seen as forward-thinking and adaptive.

**Minimal Opposition:** According to McConnell (2010), a successful policy should face minimal opposition. This criterion refers to the degree of resistance or support that the policy encounters during its implementation.

To enhance the evaluation of process success, the following criteria from Huitema et al. (2011) will also be incorporated:

**Normative Compliance:** Normative compliance integrates the criteria of legitimacy and legal acceptability, ensuring that the design and implementation of policies are both democratically sound and legally robust. Legitimacy focuses on public acceptance and adherence to principles like transparency, which are critical for policy effectiveness and public support. Legal acceptability emphasizes compliance with legal standards, vital for avoiding legal disputes that could undermine policy implementation. Normative compliance thus provides a comprehensive measure for evaluating the ethical and legal standards of policies, ensuring they are constructed and perceived as both rightful and authoritative.

**Coordination:** Coordination is a critical criterion in evaluating process success, emphasizing the integration of new policies with pre-existing ones. Effective coordination ensures that policies are not developed in isolation but are harmoniously aligned with other initiatives, enhancing their collective efficacy and impact.

**Stakeholder Participation:** Stakeholder participation is essential for reducing opposition, increasing policy legitimacy, and developing effective policies. Including stakeholders in the formulation and implementation phases enhances the policy itself and ensures that diverse perspectives are considered, making it more robust and widely accepted. Stakeholder participation can be considered the fairness variant of the process dimension, as it measures whether there is equal opportunity for all relevant stakeholders to participate in the policy process. This criterion also assesses whether the needs and wants of different stakeholders are adequately considered and included in the policy's design and implementation. By ensuring that the policy process is inclusive and equitable, stakeholder participation contributes to the overall legitimacy and effectiveness of the policy.

**Process Adaptability:** Process adaptability emphasizes the flexibility of policy formulation and implementation to incorporate new insights and stakeholder inputs. This concept focuses on the policy processes' ability to evolve in response to emerging data, changing conditions, and the diverse perspectives of stakeholders involved. By ensuring that policy processes are not rigid but capable of integrating new information and adapting to changing circumstances, process adaptability enhances the effectiveness and relevance of the policy-making process. During the design phase, it involves open mechanisms for continuous stakeholder feedback, allowing policies to be refined and redirected as needed. Similarly, during implementation, it ensures that the policy processes can be adjusted to overcome unforeseen challenges or to better align with evolving objectives. This adaptability is crucial for maintaining the policy's efficacy over time and ensuring it remains responsive to the needs and conditions it aims to address.

To create a coherent and comprehensive framework for assessing process success in climate policy, it was necessary to integrate and streamline certain criteria from McConnell (2010) and Huitema et al. (2011). For instance, **Normative Compliance** was integrated to replace McConnell's **Conferring Legitimacy** criterion. This integration was necessary because both criteria address the legitimacy and legal acceptability of the policy process. By combining these aspects, the framework provides a more holistic and robust evaluation of the policy's legal and ethical soundness, ensuring that legitimacy is considered alongside legal standards.

Similarly, **Building Sustainable Coalitions** from McConnell (2010) was substituted by **Stakeholder Participation** from Huitema et al. (2011), as both criteria focus on the involvement and support of stakeholders. However, **Stakeholder Participation** offers a broader view, encompassing not only the formation of coalitions but also the active involvement of diverse stakeholders throughout the policy process. This criterion is particularly important as it serves as the fairness variant within the process dimension, measuring whether there is equal opportunity for all relevant stakeholders to participate and whether their needs and perspectives are considered and included. This inclusion enriches the framework by emphasizing the importance of inclusivity and equity in the policy-making process, which is essential for enhancing legitimacy and ensuring that the policy is robust and widely accepted.

As with the programmatic dimension, the criterion of **Minimal Opposition** is not assessed independently in the process dimension. Instead, it is reflected within the criteria of **Preserving Policy Goals and Instruments** and **Normative Compliance**. If significant opposition arises, it is likely to manifest in challenges to the preservation of policy goals or in the questioning of the policy's legitimacy and legal standing. By incorporating opposition within these criteria, the framework ensures that resistance to the policy is adequately captured without requiring a separate assessment.

The concept of adaptability is specifically tailored in this framework to distinguish between **Programmatic Adaptability** and **Process Adaptability**. **Process Adaptability** focuses on the flexibility of the policy-making process itself, ensuring that the processes by which policies are formulated and implemented can evolve in response to new information, changing conditions, and stakeholder feedback. This adaptability is crucial for maintaining the relevance and effectiveness of the policy process over time, particularly in the dynamic field of climate policy.

The synthesised list of criteria for assessing the process success of climate policy can be found in *Table 3*.

| Criteria | Description |
|---|---|
| Preserving Policy Goals and Instruments | Evaluates the policy’s ability to maintain its core goals and instruments throughout implementation, ensuring that the original objectives and tools remain intact and effective. |
| Normative Compliance | Assesses the policy’s adherence to legitimacy and legal standards, ensuring it is both democratically sound and legally robust, thus avoiding legal disputes and gaining public acceptance. |
| Symbolising Innovation | Evaluates the policy’s ability to symbolize progress and innovation by adopting new and effective approaches to policy challenges, maintaining its relevance and public support. |
| Coordination | Examines the integration of new policies with pre-existing ones, ensuring that they are harmoniously aligned to enhance collective efficacy and impact. |
| Stakeholder Participation | Assesses the involvement of stakeholders in the policy process, ensuring inclusivity, equity, and support. Measures whether there is equal opportunity for participation and whether diverse stakeholder needs and wants are incorporated into the policy. |
| Process Adaptability | Evaluates the flexibility of the policy-making process, ensuring it can adapt to new insights, changing conditions, and stakeholder inputs to maintain effectiveness and relevance over time. |

**Table 3:** Synthesised list of criteria for process success

### 2.2.3 Political success

Evaluating the political success of climate policies hinges on criteria such as legitimacy and fairness, both of which significantly influence public support and the sustainability of policy initiatives. In McConnell's (2010) framework, political success pertains to a policy's benefits to the government, leaders, or political entities responsible for its implementation. This includes enhancing electoral prospects, controlling the policy agenda, and sustaining government values.

**Enhancing Electoral Prospects:** The policy should enhance the electoral prospects and reputation of the government and leaders. This includes gaining voter support and positively impacting public perception of the political entities involved.

**Controlling the Policy Agenda:** According to McConnell (2010), controlling the policy agenda is a key aspect of political success. This criterion involves the ability of a policy to help set the government’s priorities and ease the business of governing. By controlling the policy agenda, a government can ensure that its broader goals are pursued and that the implementation of the policy aligns with these strategic objectives. Effective control of the policy agenda also helps in minimizing distractions and managing opposition by keeping the government's focus on its key priorities.

**Sustaining Government Values:** Policies should sustain the broad values and direction of the government. This criterion focuses on maintaining consistency with the government's overarching principles and long-term vision. By ensuring that policies are aligned with the government's values, the policy reinforces the government's identity and long-term strategic goals.

To enhance the evaluation of political success, the following criterion from Huitema et al. (2011) will also be incorporated:

**Political Fairness:** Political fairness is an essential criterion for political success, significantly influencing how policies are received by the public and politicians. This broad interpretation of fairness encompasses a range of equity issues, integrating aspects from both the programmatic and process dimensions of policy evaluation. It scrutinizes the distribution of benefits and burdens resulting from policy decisions, including economic equity and stakeholder involvement. For instance, it critically assesses scenarios such as windfall profits from emissions trading to determine whether these profits confer unfair competitive advantages. By incorporating diverse equity-related issues that arise during the policy formulation and implementation phases, this expanded view of fairness ensures that policies address potential inequities comprehensively. This is crucial because any form of perceived unfairness can catalyse political opposition, impacting the political success of a policy.

**Normative Compliance:** Normative compliance, introduced in the process dimension, is also relevant to political success. This criterion ensures that policies adhere to legal frameworks and societal values, which are critical for gaining and maintaining public and political support. Normative compliance not only safeguards the legal integrity of the policy but also reinforces its alignment with societal norms and expectations, thereby enhancing its legitimacy and acceptance in the political arena.

The integration of McConnell's and Huitema et al.'s frameworks into a comprehensive evaluation of political success required careful consideration of overlapping and complementary aspects. For instance, **Political Fairness** was integrated as a key criterion to broaden the focus of fairness beyond programmatic and process dimensions. In the political dimension, fairness is not only about the distribution of economic benefits and burdens but also about ensuring that the policy-making process is inclusive and equitable. This integration is crucial because perceptions of fairness or unfairness can significantly influence political support or opposition, which directly affects a policy's political success.

**Normative Compliance Across Dimensions:** The inclusion of **Normative Compliance** in the political dimension underscores its importance in maintaining the legal and societal legitimacy of the policy. By ensuring that the policy adheres to established legal frameworks and societal values, normative compliance plays a vital role in sustaining public and political support. This criterion is applied across both process and political dimensions, reflecting its critical role in reinforcing the policy's alignment with broader legal and societal expectations.

**Handling Minimal Opposition:** The criterion of **Minimal Opposition** is not assessed independently but is reflected within the criteria of **Enhancing Electoral Prospects** and **Controlling the Policy Agenda**. If significant opposition arises, it is likely to affect the government's electoral prospects and its ability to control the policy agenda effectively. By embedding opposition within these criteria, the framework ensures that resistance is adequately captured without requiring a separate assessment. This approach allows for a more integrated evaluation of political success, where the level of opposition is seen as a factor influencing other key political outcomes.

The synthesized list of criteria for assessing the political success of climate policy can be found in *Table 4*.

| Criteria | Description |
|---|---|
| Enhancing Electoral Prospects | Evaluates the policy’s impact on the political standing of the government and leaders, focusing on its ability to gain voter support and positively influence public perception. |
| Controlling the Policy Agenda | Assesses the policy’s role in helping the government set and prioritize its strategic objectives, ensuring that key issues are addressed effectively while minimizing distractions and managing potential opposition. |
| Sustaining Government Values | Examines the policy’s consistency with the government’s core principles and long-term vision, ensuring continuity in governance direction and adherence to foundational values. |
| Normative Compliance | Ensures that policies adhere to legal frameworks and societal values, maintaining legitimacy and public acceptance by being both legally robust and democratically sound. |
| Political Fairness | Scrutinizes the distribution of benefits and burdens to ensure equity and justice, addressing potential inequities that could lead to political opposition. |

**Table 4:** Synthesised list of criteria for political success

# 3. Sustainable policies

Climate policy is inherently complex and dynamic, shaped by the multifaceted interplay of environmental, economic, and social factors (Meadowcroft, 2009; Jänicke & Quitzow, 2017). This complexity is further magnified by technological advances, diverse stakeholder interests, and unpredictable environmental shifts. Evaluating these policies is crucial, not only due to their complexity but also because of their central role in achieving renewable energy targets. Many countries are currently not on track to meet the ambitious 2030 and 2050 renewable energy goals, highlighting the need for more effective policy frameworks (European Commission, 2022; CBS, 2024c).

In the face of escalating global challenges such as climate change, diminishing natural resources, and increasing energy demands, sustainable policies have become imperative (European Commission, 2022). These policies are designed to address critical environmental issues while promoting sustainable development (Meadowcroft, 2009). Governments and organisations implement these policies to mitigate adverse environmental impacts, enhance energy security, and stimulate economic growth through sustainable practices (Jänicke & Quitzow, 2017). The urgency for these policies stems from the need to transition towards low-carbon economies, reduce greenhouse gas emissions, and foster resilience against environmental vulnerabilities.

To combat climate change and reduce dependency on fossil fuels, a variety of policies have been implemented globally to increase the share of renewable energy (Meadowcroft, 2009; European Commission, 2022). These include renewable portfolio standards, tax incentives, and subsidies that encourage the development and adoption of renewable energy technologies (PBL, 2020). Among these, Feed-in Tariff (FiT) policies stand out due to their widespread adoption and effectiveness (Couture et al., 2010; Mendonça, 2007; Jacobs, 2012). FiTs guarantee a fixed, premium rate for renewable energy producers for the electricity they generate, fed back into the national grid, promoting investment in renewable energy technologies, and accelerating the shift towards a sustainable energy future (RVO, 2020; IEA, 2020a).

Feed-in Tariff (FiT) policies have been embraced globally as strategic tools to promote renewable energy. In Asia, countries like Japan and China have implemented FiTs to drive substantial growth in their solar and wind sectors, achieving remarkable increases in renewable energy capacity (Energy Monitor, 2023; ILO, 2024). India has also adopted FiT policies, specifically targeting solar energy to capitalize on its abundant sunlight while encouraging local manufacturing and technology transfer (UNEP, 2023).

In Africa, countries such as South Africa and Kenya have introduced FiTs to unlock the potential of renewable resources, enhancing energy security and supporting economic development in rural areas (Reuters, 2010; UNFCCC, 2023). South Africa’s FiT program has been crucial in developing its photovoltaic and wind projects, while Kenya’s scheme supports a range of renewable sources, including geothermal and biomass (ResearchGate, 2023; CSIS, 2024).

Feed-in Tariff (FiT) policies have significantly shaped the energy landscapes across Europe, with varying degrees of success and challenges. Germany's Energiewende initiative, which includes a robust FiT component, has notably increased renewable energy capacity and fostered technological innovation, though it has faced high costs and grid infrastructure issues (Agora Energiewende, 2018; Lauber & Mez, 2006). Spain initially experienced rapid renewable energy growth under FiT policies but later faced financial sustainability issues, leading to market distortions (del Río & Mir-Artigues, 2014). The UK saw significant growth in small-scale renewable installations but had to frequently adjust tariff rates due to financial sustainability concerns (Couture et al., 2010; Lockwood, 2013). FiTs have facilitated a comprehensive mix of solar and wind energy projects in the Netherlands, aligning with the country's ambitious renewable energy goals (RVO, 2020).

Feed-in Tariff (FiT) policies have been reviewed across various landscapes for their pivotal role in promoting renewable energy. Evaluations of these policies encompass a broad spectrum of criteria, including policy design, systemic resilience, quantitative effectiveness, market integration, and financial support measures. These evaluations highlight how well-crafted policy design is crucial for the successful adoption and implementation of renewable energy technologies, as seen in the analysis by Jacobs (2012) and Couture et al. (2010).

Quantitative assessments, such as those by Kim and Lee (2012), provide valuable data on the optimization of FiT policies, particularly focusing on cost-effectiveness and investor responses. Market integration studies, like those by Ringel (2006), examine the ecological and economic impacts of renewable policies, highlighting the significant role of FiTs in enhancing renewable energy uptake in various regions. Additionally, comparative analyses of financial support mechanisms by Haas et al. (2011) demonstrate the effectiveness of specific incentives in scaling up renewable energy deployment efficiently.

The evaluation of Feed-in Tariff (FiT) policies has been robust in certain areas yet reveals a significant knowledge gap in others. Current research, as explored by authors like Jacobs (2012), Ringel (2006), and Mendonça (2007), has largely concentrated on the programmatic success of these policies—assessing their direct impacts on renewable energy outputs such as photovoltaic installations. However, there is a notable scarcity of comprehensive analyses that move beyond assessing only the programmatic success to take a more holistic overview of the policies' success.

This oversight is significant as it neglects the nuanced aspects of policy success, such as process and political dimensions, which are crucial for fully understanding policy effectiveness. Holistic evaluation, as advocated by scholars such as Sovacool (2009) and Laes, Gorissen, and Nevens (2014), extends beyond immediate outcomes to encompass socio-economic and political implications. By adopting the holistic framework developed through the integration of McConnell's (2010) dimensions of success with the supportive criteria of Huitema et al. (2011), this gap in the current literature can be effectively addressed. This comprehensive approach facilitates a more detailed and reflective evaluation of Feed-in Tariff policies, capturing their broader impacts and ensuring a more nuanced understanding of policy effectiveness in the dynamic and complex field of climate policy.

To illustrate the practical application of this integrated framework, the following section presents a policy background of the Netherlands' Stimulering Duurzame Energieproductie (SDE(+)) policy. This analysis will utilize McConnell’s (2010) framework, combined with Huitema et al.'s (2011) criteria, to thoroughly assess the policy's effectiveness across programmatic, process, and political dimensions.

The Netherlands' Stimulering Duurzame Energieproductie (SDE(+)) policy represents a targeted adaptation of Feed-in Tariff (FiT) schemes specifically designed to bolster the country’s renewable energy infrastructure (RVO, 2020). The Netherlands provides an exemplary case study due to its advanced and progressive approach to renewable energy policies, as well as its commitment to reducing carbon emissions and fostering sustainable energy production (Rijksoverheid, n.d.; CBS, 2024c). This policy is particularly suitable for examining the holistic success of FiT policies through the lenses of programmatic, process, and political dimensions, as it embodies the complexity and multifaceted nature of climate policy described earlier.

## 3.1 Policy Background of the SDE(+) in the Netherlands

The Netherlands has embarked on an ambitious energy transition aimed at reducing carbon emissions and increasing the share of renewable energy in its overall energy mix (Rijksoverheid, n.d). Over the past few decades, this transition has been driven by both internal and external factors, including the need to mitigate climate change, comply with international agreements, and reduce dependence on fossil fuels (Rijksoverheid, n.d). The Dutch government has responded to these challenges by implementing a series of progressive climate policies, including the Stimulering Duurzame Energieproductie (SDE(+)) scheme, which incentivizes renewable energy production (RVO, 2024).

The energy transition in the Netherlands has seen significant development, particularly in the last two decades. Initially reliant on natural gas and other fossil fuels, the country has progressively shifted towards renewable energy sources such as wind, solar, and biomass (CBS, 2024b). This shift has been motivated by a combination of environmental concerns, economic opportunities in the green energy sector, and regulatory pressures from the European Union, which mandates member states to achieve specific renewable energy targets (European Commission, n.d.; EU Monitor, n.d.).

Despite these efforts, the transition faces several challenges that make it an ideal case study for evaluating climate policies. Nowadays, the Netherlands boasts the highest solar PV capacity per capita in Europe (Statista, 2024). This growth has led to issues such as grid capacity strain and inefficiencies (RVO, 2022b; IEA, 2020a). Additionally, policies like the net metering scheme called 'salderingsregeling' have unintentionally exacerbated energy costs for non-panel owners, raising concerns of inequality (ACM, 2023). Despite progress, the Netherlands did not meet its 2020 sustainable energy target, only achieving 11.1% instead of the planned 14% (CBS, 2021). This gap necessitated purchasing renewable energy credits from other countries to meet compliance obligations (NOS, 2020). Additionally, there are socio-political challenges, including public acceptance of new technologies and the distribution of costs and benefits among different societal groups (ACM, 2023; IEA, 2020a; Hoogland et al., 2021).

### 3.1.1 Initial FiT Policies in the Netherlands

The Dutch MEP (Milieu-kwaliteit Elektriciteitsproductie) policy, introduced in July 2003, aimed to boost sustainable electricity production through a structured subsidy framework. Funded by a levy on consumer energy bills, the program initially charged households €52 in 2004, rising to €56 in 2005, with a planned increase to €100 per electricity connection by 2006. Despite these measures, funding proved insufficient as the volume of valid subsidy applications exceeded available revenues (Algemene Rekenkamer, 2007).

The MEP was the first Feed-in Tariff (FiT) policy in the Netherlands aimed at increasing the share of renewable energy. It primarily supported renewable energy sources such as biomass, solar, wind, and hydropower by providing fixed amounts per kWh to offset the unprofitable cost of producing sustainable electricity compared to conventional sources. Various categories of energy production installations received different subsidies based on their operational characteristics and output capacities (Algemene Rekenkamer, 2007).

The MEP faced significant challenges that hindered its effectiveness as a sustainable energy subsidy policy. Firstly, the funding mechanism, which depended on a levy on consumer energy bills, proved unsustainable as the volume of subsidy applications consistently surpassed available funds. This shortfall often left many viable renewable energy projects without necessary financial support (Algemene Rekenkamer, 2007). Secondly, the policy's design lacked flexibility, particularly in responding to fluctuating biomass energy prices, which could lead to either underfunding or overcompensation (Algemene Rekenkamer, 2007). Additionally, the termination of new subsidies in August 2006 due to budgetary unmanageability and the early achievement of the 2010 European Union target of 9% renewable electricity led to uncertainty and disillusionment among renewable energy investors and producers (Algemene Rekenkamer, 2007).

The MEP replaced the ecotax exemption system, which had the disadvantage of stimulating the use of existing production capacity abroad rather than new domestic capacity. This change aimed to rectify the shortcomings of the ecotax system and provide a more reliable incentive for domestic renewable energy production (Algemene Rekenkamer, 2007). The initial funding mechanism created an open-ended scheme without a budget cap, leading to financial unmanageability and necessitating the integration of the scheme into the national budget (Algemene Rekenkamer, 2007).

The MEP scheme also suffered from a lack of adequate oversight and management by the Ministry of Economic Affairs. The decision to fund the scheme outside the national budget resulted in insufficient monitoring and financial control, contributing to the scheme's budgetary problems (Algemene Rekenkamer, 2007). The reliance on biomass for a significant portion of renewable electricity raised concerns about sustainability, including uncertainties about the long-term availability and environmental impact of biomass (Algemene Rekenkamer, 2007).

These factors, combined with the termination of new subsidies in 2006, created uncertainty for renewable energy investors and producers, affecting their long-term planning and confidence in the subsidy system (Algemene Rekenkamer, 2007).To overcome these limitations, a more adaptable and financially sustainable approach was needed.

### 3.1.2 Stimulering Duurzame Energie

The SDE (Stimulering Duurzame Energieproductie) was introduced by the Dutch government as a successor to the MEP scheme, aiming to address several of its predecessor's limitations while advancing towards a 25% $CO_2$ reduction and 14% renewable energy by 2020 (Rijksoverheid, n.d.; CBS, 2022; CBS, 2021).

The SDE scheme aimed to promote the production of renewable energy in the Netherlands. The primary goal was to increase the share of renewable energy in the national energy mix to meet European targets for sustainable energy (Ministry of Economic Affairs, Agriculture, and Innovation, 2011). Designed as a modified feed-in tariff, the SDE provided direct government financing to cover the "unprofitable top" of renewable energy projects, ensuring that investments in renewable technologies became economically viable (ECN, 2008). The scheme allowed for varied subsidy rates based on fossil fuel prices, enhancing its adaptability to market conditions, a significant step forward from the static subsidies of the MEP.

The SDE scheme operated by offering financial support to various renewable energy technologies, including wind, solar, biomass, and geothermal energy. These subsidies were calculated based on the difference between the cost of producing renewable energy and the market price of conventional energy. This approach was designed to bridge the financial gap, making renewable energy projects attractive to investors, and accelerating their deployment (Ministry of Economic Affairs, 2008).

The total annual budget was distributed among various renewable energy technologies to ensure a balanced and cost-effective promotion of sustainable energy.

**Wind on Land**: The SDE aimed to increase the installed capacity of onshore wind energy from 1500 MW to 4000 MW by providing an annual budget of approximately €119 million. This budget was intended to support new installations, address challenges related to landscape integration, and improve societal acceptance (Ministry of Economic Affairs, Agriculture, and Innovation, 2011).

**Wind on Sea**: Offshore wind energy had a target of reaching 6000 MW by 2020. The annual budget allocation for offshore wind was substantial, recognizing the high initial costs and long-term benefits of this technology (Ministry of Economic Affairs, Agriculture, and Innovation, 2010).

**Biomass**: Biomass energy covered a broad range of applications, including electricity generation, green gas production, and biofuels for transportation. The SDE allocated specific budgets for each biomass application to ensure sustainable and efficient use of biomass resources. For instance, green gas production was supported with a budget that reflected the cost of upgrading biogas to natural gas quality (ECN, 2008).

**Solar (PV)**: The promotion of solar photovoltaic (PV) systems was also a key component of the SDE. Specific allocations were made to support the installation of distributed solar energy systems on residential and commercial buildings. The budget for solar PV aimed to reduce the cost barrier and encourage widespread adoption of solar technology (Ministry of Economic Affairs, 2008).

Each technology under the SDE had a predefined budget limit to prevent over-subsidization and ensure that funds were used effectively. The budget for onshore wind energy was capped at €119 million per year. Similarly, biomass and solar PV technologies had their own budget caps, reflecting their specific cost structures and expected contributions to the renewable energy targets (Ministry of Economic Affairs, Agriculture, and Innovation, 2011).

Several challenges and shortfalls were identified in the SDE mechanisms, which highlighted the need for further refinement and improvement:

**Budget Constraints**: One of the main challenges was that the allocated budgets often ran out quickly due to high demand. This led to intense competition among applicants and sometimes prevented effective utilization of available funds. Projects that could have significantly contributed to renewable energy production were sometimes left unfunded due to budget limitations (Ministry of Economic Affairs, Agriculture, and Innovation, 2011).

**Technological Maturity**: Not all renewable energy technologies were equally mature, which impacted their ability to compete for subsidies within the set budget limits. Innovative but expensive technologies often struggled to secure funding, leading to underutilization of funds earmarked for promoting technological advancements (Ministry of Economic Affairs, Agriculture, and Innovation, 2011).

**Administrative Complexity**: The application and approval process for SDE subsidies was complex and time-consuming. This administrative burden deterred some potential applicants from participating, particularly smaller projects or those led by less experienced developers (Ministry of Economic Affairs, Agriculture, and Innovation, 2010).

### 3.1.3 Stimulering Duurzame Energie Plus (SDE+)

The SDE+ (Stimulering Duurzame Energieproductie Plus) scheme was introduced in 2011 as an enhancement to the original SDE program. The goal was to address the challenges and shortcomings identified in the initial SDE scheme, such as budget constraints, technological maturity, and administrative complexity (Ministry of Economic Affairs, Agriculture, and Innovation, 2011). Several concrete policy adaptations were made to improve efficiency and address the SDE's challenges.

**Subsidy Allocation:** A significant improvement in the SDE+ scheme was the introduction of a single, integrated budget for all technologies, replacing the previous separate budgets per technology. The total requested budget often exceeded the available budget, indicating high interest and competition. For example, in 2015, the total requested budget was €7.7 billion, while the available budget was €3.5 billion.

**Eligible Technologies:** The SDE+ expanded the range of eligible technologies to include not only electricity and gas from renewable sources but also renewable heat production, such as geothermal and solar thermal energy (CE Delft, 2016). This broadened scope allowed for a more comprehensive approach to sustainable energy production. Initially, the scheme supported categories like wind on land, biomass digestion, biomass combustion and gasification, waste incineration, energy from water, and solar PV.

**Competitive and Frequent Subsidy Rounds:** The SDE+ scheme introduced competitive and frequent subsidy rounds, where projects could apply for subsidies in phases. Each phase had an increasing subsidy amount, incentivizing projects to apply early at lower subsidy rates. In 2012, subsidy rates ranged from €0.03/kWh in the first phase to €0.15/kWh in the final phase (CE Delft, 2016).

**Introduction of the Free Category:** A notable feature of the SDE+ was the introduction of the "vrije categorie" (free category), allowing project developers to submit applications at a lower subsidy rate than the established base amount. The free category was particularly popular, with 50 to 90% of the projects submitted under this scheme, resulting in a savings of approximately €300 million.

**Focus Shift from Small-Scale to Large-Scale Projects**: Initially, the SDE focused on various project sizes, including personal solar PV installations. Larger projects, such as wind farms and extensive solar fields, became more prominent in subsidy allocations (Hoogland et al., 2021).

In 2014, the requirement for feasibility studies was introduced to reduce the non-realisation rates of projects awarded subsidies under the SDE+ scheme. The feasibility studies were mandated for larger projects with a capacity greater than 0.5 MW. These studies aimed to ensure that projects were thoroughly planned and viable before receiving subsidies, thereby reducing the likelihood of project cancellations (Hoogland et al., 2021).

Building on the success of the SDE+ policy, the Netherlands introduced the SDE++ as an expansion to address broader environmental and economic challenges while promoting energy independence. This evolution reflects awareness of evolving EU regulatory pressures, including the European Union's REPowerEU’s goal to accelerate Europe's independence from Russian fossil fuels (European Commission, 2022; Liutak et al., 2021). The urgency of this goal adds to the necessity for enhanced sustainability in energy production and the effective implementation of domestic policies like the SDE series.

The timelines in *Figures 1* and *2* below show the budgets and events during the period of 2003-2020 (RVO, 2024;.Ministry of Economic Affairs and Climate, n.d.) *Table 5* underneath them describes the changes made during the period of 2003-2020. For the period of 2003-2005 no exact budgets could be found since there was no limit at the time. However, Algemene Rekenkamer (2007) finds that between 2003 and 2006 the allocated budget was 1.456 billion euro.

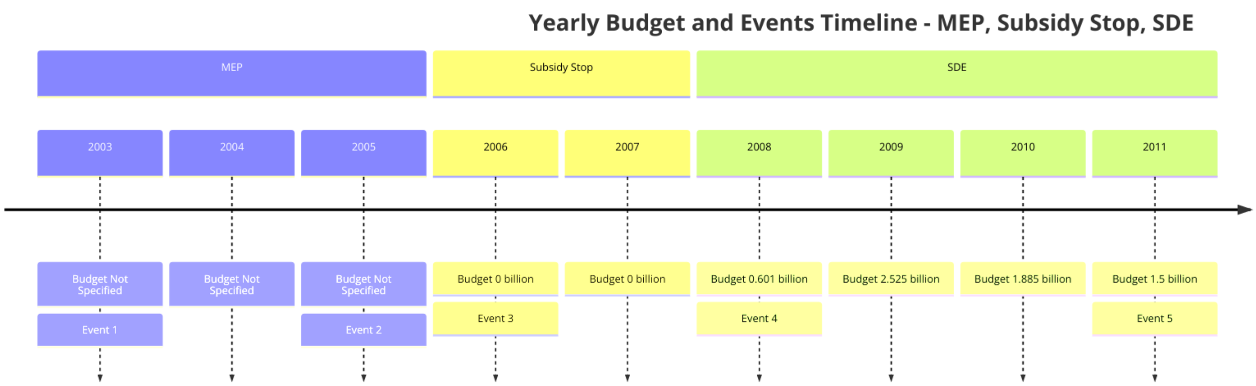


**Figure 1:** Yearly budget and Event timeline 2003 - 2011

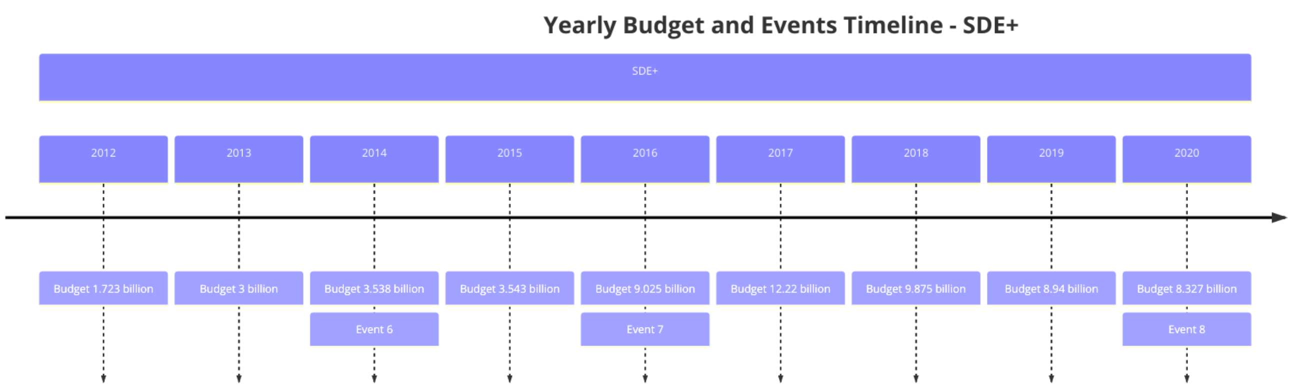


**Figure 2:** Yearly budget and Event timeline 2012 – 2020

| Event | Year | Description |
|---|---|---|
| 1 | 2003 | **Introduction MEP**: The MEP (Milieukwaliteit Elektriciteitsproductie) scheme was introduced to support the production of renewable electricity through fixed subsidies, financed by a levy on consumer energy bills. |
| 2 | 2005 | **Minister Brinkhorst freezes the MEP for the rest of the year**: Due to financial constraints and over-subscription, Minister Brinkhorst decided to freeze the MEP subsidies for the remainder of the year. |
| 3 | 2006 | **Minister Wijn sets the MEP budget to 0**: The MEP budget was set to zero by Minister Wijn, effectively halting the scheme as the focus shifted towards a more sustainable subsidy approach. |
| 4 | 2008 | **Introduction SDE**: The SDE (Stimulering Duurzame Energieproductie) scheme was introduced to replace the MEP, providing direct government financing and a modified feed-in tariff mechanism to support renewable energy projects. |
| | | **Introduction of Technology-Specific Budget Caps**: Budget caps were implemented for different renewable energy categories to manage limited resources. |
| | | **Introduction of Tendering Process**: The SDE introduced a competitive tendering process to allocate subsidies to the most cost-effective projects. |
| 5 | 2011 | **Introduction SDE+**: The SDE+ scheme replaced the original SDE, focusing on economic efficiency, and expanded to include a broader range of technologies. |
| | | **Introduction of Phased Bidding Rounds**: The SDE+ introduced phased bidding rounds to encourage cost-efficient projects to apply earlier. |
| | | **Expansion to Include Renewable Heat and Gas**: The SDE+ expanded to support renewable heat production and green gas technologies. |
| | | **Introduction of the Free Category**: The SDE+ introduced the "vrije categorie" (free category), allowing project developers to submit applications at a lower subsidy rate than the established base amount, encouraging cost reductions and innovation. |
| | | **Focus on Large-Scale Projects**: The SDE+ began prioritizing larger, more impactful renewable energy projects over smaller individual installations to accelerate the growth of renewable energy production. |

| | | |
|---|---|---|
| 6 | 2014 | **Introduction of Feasibility Study Requirement**: Feasibility studies became mandatory for projects larger than 0.5 MW to ensure better project planning and reduce cancellations. |
| **7** | 2016 | **Introduction of Two Application Rounds per Year**: Starting in 2016, the SDE+ allowed for two application rounds each year instead of one, providing more opportunities for project developers to apply for subsidies. |
| **8** | 2020 | **Introduction SDE++**: The SDE++ scheme replaced the SDE+, expanding its scope to include $CO_2$ reduction technologies, such as carbon capture and storage (CCS) and industrial electrification. |

**Table 5:** Event descriptions from the timeline 2003-2020

# 4: Research Design, Methods, and Data Collection

## 4.1 Research Design

This thesis will apply the synthesised framework of McConnell (2010) and Huitema et al. (2011) to assess the programmatic, process, and political dimensions of the SDE(+) policy in the Netherlands. To achieve this, the study will adopt a qualitative approach and conduct a structured content analysis of various data sources, including policy documents, stakeholder interviews, and secondary data from existing quantitative studies.

Qualitative research is crucial when applying the synthesised framework of McConnell (2010) and Huitema et al. (2011) to evaluate the SDE(+) policy. This approach allows for a comprehensive examination of the multifaceted dimensions of policy success, capturing the complexities that quantitative methods alone might overlook. Qualitative research is particularly important for criteria that require in-depth interpretation and contextual understanding, such as stakeholder engagement, procedural fairness, and political legitimacy (Howlett et al., 2015).

The emphasis on qualitative methodologies in this research aligns with the perspectives of Flick (2018), who emphasizes the role of qualitative research in understanding complex, context-dependent phenomena. This approach is further endorsed by Patton (2015), who argues that qualitative methods are essential for understanding the context and nuances that quantitative data might miss. By combining qualitative methods with an analysis of secondary quantitative data, this study leverages the strengths of both approaches. This methodological synergy ensures a robust evaluation of the SDE+ policy, allowing for a nuanced understanding of its programmatic, process, and political dimensions.

Interviews with key stakeholders were planned to enrich the qualitative analysis, aiming to provide valuable insights into the perspectives and experiences of those directly involved with or affected by the SDE+ policy, including policymakers, industry experts, and representatives from non-governmental organisations. Engaging with a diverse range of interviewees was expected to capture a comprehensive view of the policy’s effectiveness, legitimacy, and impact across different sectors, thereby enriching the study and increasing its quality.

The research will critically engage with existing empirical studies and quantitative data analyses conducted by others, focusing on renewable energy production statistics and emissions reduction figures. This indirect engagement with quantitative data, as advocated by Kothari (2004) for its significance in policy research, leverages authoritative sources such as government and agency reports. These secondary data sources will be instrumental in evaluating the programmatic success of the SDE+ policy, which is in line with Flick's (2018) recommendations for integrating diverse data types to enhance research depth and validity.

The Criteria Success Assessment Frameworks (CSAF) are derived from the original tables constructed by McConnell (2010) and have been specifically adapted to climate policy. The criteria used in these tables are from the synthesised list of criteria mentioned in the conceptualization in *Chapter 2.2*. The newly added criteria from Huitema et al. (2011) have been integrated into the existing table in a similar format to the original. Subsequently, the table descriptions for success were adapted to be more specifically geared toward assessing the SDE(+) policy instead of general climate policies. *Table 6* below contains the Criteria Success Assessment Framework for programmatic success and all tables can be found in *Appendix C*.

| **Criteria** | **Program Success** | **Resilient Success** | **Conflicted Success** | **Precarious Success** | **Program Failure** |
|---|---|---|---|---|---|
| Achievement of Policy Goals | SDE renewable energy targets fully achieved, ensuring complete alignment with SDE objectives. | Most SDE renewable energy targets achieved with minor shortfalls, overall success intact. | Some SDE renewable energy targets achieved, significant shortfalls create concern. | Few SDE renewable energy targets achieved, major shortfalls significantly impact success. | SDE renewable energy targets not achieved, leading to a failure to advance SDE objectives. |
| Efficiency | Highly cost-effective SDE implementation, minimal waste, high returns on investment. | Generally cost-effective SDE implementation, minor inefficiencies present. | Noticeable inefficiencies in SDE implementation, moderate costs reduce overall cost-effectiveness. | Major inefficiencies in SDE implementation, high costs, program expensive and less justifiable. | Highly inefficient SDE implementation, extremely high costs, poor justification for resource use. |
| Programmatic Fairness | Benefits equitably distributed among all SDE stakeholders. | Mostly equitable distribution among SDE stakeholders, minor exclusions, fairness generally perceived. | Uneven distribution among SDE stakeholders, significant dissatisfaction among some stakeholders. | Significant inequity in SDE, major exclusions, widespread perceptions of unfairness. | Highly inequitable SDE distribution, widespread exclusions, program perceived as unfair. |
| Programmatic Adaptability | Highly adaptable to technological and policy changes, ensuring SDE relevance and effectiveness. | Adaptable to changes with some adjustments needed, maintaining SDE effectiveness. | Limited adaptability in SDE, significant rigidity hampers relevance. | Very rigid SDE program, struggles to adapt significantly, potential obsolescence. | Cannot adapt, completely rigid SDE program, resulting in obsolescence and failure to stay relevant. |

| | | | | | |
|---|---|---|---|---|---|
| Meets Policy Domain Criteria | Fully meets all SDE policy domain criteria, ensuring comprehensive success. | Meets most SDE policy domain criteria with minor issues. | Partially meets SDE policy domain criteria, significant gaps reduce effectiveness. | Meets few SDE policy domain criteria, major gaps severely hinder effectiveness. | Does not meet SDE policy domain criteria, resulting in ineffective implementation and lack of success. |

**Table 6:** Criteria Success Assessment Framework for programmatic success

### 4.1.1 Search strategy

All search queries for data collection were conducted between June 6th and June 20th, utilizing two search engines: Google and NexisUni, alongside the Dutch government website, Rijksoverheid. The aim was to capture a broad range of sources to gain insights into the evaluations and workings of the SDE and SDE+ policies during their respective periods and subsequent evaluations. A key objective of this strategy was to gather information from different times within the policy lifecycle—during its implementation, throughout its operational period, and after its conclusion—to provide a comprehensive assessment of the policy's success.

**Google Searches:**

Google searches were conducted across two distinct time periods: 2008-2011, corresponding to the initial implementation phase of the SDE policy, and 2012-2020, covering the SDE+ period and ongoing evaluations, and now, covering ex-post evaluations and views. This temporal segmentation was essential to ensure that data reflected both the early stages and the later impacts of the policies. The keywords used were carefully selected to capture a broad and relevant range of data:

- "Stimulering Duurzame Energie"
- "SDE policy evaluation"
- "Stimulering Duurzame Energie evaluatie" (Stimulering Duurzame Energie evaluation)
- "Hernieuwbare Energie Nederland" (Renewable energy Netherlands)
- "Kritiek op SDE" (Critiques on SDE)
- "Nieuws artikelen Stimulering Duurzame Energie (SDE)" (News articles Stimulering Duurzame Energie (SDE))

From the search results, data sources were selected based on the following criteria:

- **Relevance to Research Questions**: Sources needed to directly address the research objectives, particularly regarding the evaluation of the SDE(+) policy's success across programmatic, process, and political dimensions.
- **Credibility**: Preference was given to sources from established and reputable publications, government bodies, and recognized industry experts.
- **Data Quality**: The content had to be supported by solid evidence and free from speculative opinions.

- **Temporal Relevance**: Sources were chosen to represent the entire duration of the policy's lifecycle, ensuring a balanced view of its impact over time.

Data sources with a clear link to the SDE(+) were selected from the first two pages of search results, contributing to a total of 40 data sources. News articles were predominantly selected from larger, reputable outlets and specialized outlets focusing on climate or energy transition to ensure reliability and relevance to the policy's success.

**NexisUni Searches:**

On NexisUni, which primarily covers news articles, the search query "SDE OR Stimulering Duurzame Energie" yielded 870 initial results. The following criteria were applied to narrow these down to 10 relevant data sources:

- **Relevance**: Only news articles that provided substantive insights into the SDE(+) policy, particularly those that discussed policy evaluation, implementation challenges, or political debates related to the policy, were selected. Articles that merely reported on the achievement of new infrastructures without analyzing their connection to the policy's success were excluded.
- **Source Credibility**: Preference was given to articles from reputable news outlets, especially those with a focus on climate and energy transition, to ensure that the selected sources were reliable and relevant.
- **Data Scope**: The selection aimed to cover different phases of the policy's lifecycle, ensuring a broad temporal perspective and capturing ongoing developments in the policy's implementation and impact.

**Rijksoverheid Website:**

Searches on the Dutch government website, Rijksoverheid, and its archive were conducted using the query "Stimulering Duurzame Energieproductie OR SDE". This search yielded 135 results on the regular website and 737 results on the web archive. From these, 15 documents were selected based on the following criteria:

- **Coverage Across Time**: The search strategy explicitly aimed to include reports from the start, middle, and end of the policy's duration to provide a comprehensive view of its evolution and impact. Care was taken to avoid selecting multiple reports from the same year to ensure a broad temporal distribution.
- **Official Status**: Only official government documents were selected to ensure the data was authoritative and aligned with national standards.
- **Direct Relevance**: Documents needed to explicitly focus on the SDE(+) policy or its impact, ensuring their relevance to the content analysis.

**Independent Reports and Programmatic Evaluations:**

For independent reports and programmatic evaluations, the most up-to-date reports available were chosen to ensure that the analysis reflected the latest findings and assessments of the

SDE(+) policy. For example, the 2020 report from the International Energy Agency (IEA) was selected for its comprehensive and current evaluation of the policy's programmatic success.

**Final Data Source Categorization:**

In total, 65 data sources were selected for the content analysis, categorized as follows:

- 36 news articles
- 16 government reports
- 8 government-affiliated reports (reports from organizations in association with the government)
- 5 independent reports

These sources were systematically chosen based on their relevance, credibility, temporal coverage, and contribution to answering the research questions. This approach enhances the transparency and rigor of the study, ensuring that the findings are built on a foundation of credible data.

### 4.1.2 Structured analysis approach

The content analysis process involved systematically evaluating each data source against predefined criteria from the Criteria Success Assessment Framework, which include detailed descriptions for each level of success per criterion. The data analysis process is also visualised in *Figures 3-6*.

1. **Initial Data Source Analysis:**
    - Each data source was analysed to extract information directly or indirectly related to the criteria from the framework, defined through the synthesis of McConnell (2010) and Huitema et al. (2011).
    - Relevant information was documented in a list format, where each individual data source would contain all criteria and the relevant direct and indirect information that impacts each individual criterion.
2. **Initial Assessment of Success:**
    - An initial assessment was conducted for each criterion based on the extracted information. Positive and achievement-related information for a criterion was given a preliminary evaluation of resilient or success, according to the SuccessTables definitions. Conversely, information on criteria highlighting challenges and negative points was initially evaluated as precarious or total failure.
    - For sources containing both positive and negative information regarding a criterion, a more nuanced initial assessment was made, categorizing the success level as resilient, conflicted, or precarious.
3. **Repeating the Process:**
    - This process was repeated for all criteria within each data source, ensuring comprehensive coverage and initial assessments for each criterion.

4. **Restructuring Information:**
    - The information was then restructured into separate documents for each criterion. For example, all information related to the criterion "Achievement of Policy Goals" from all data sources was consolidated into one document for further analysis.
    - Within these criterion-specific documents, information was further organized based on the initial evaluations of success. Information categorized as resilient was grouped together, as was information categorized as precarious, and so on.
5. **Detailed Analysis:**
    - A detailed analysis was conducted on these restructured documents to evaluate the different arguments, the frequency of their occurrence, and the extent of their impact.
    - This thorough examination aimed to create a comprehensive and nuanced view of the successes and challenges associated with each criterion.
6. **Final Evaluation:**
    - The main arguments and evidence supporting the assessments were documented to provide clear justification for the final success levels assigned.
    - Based on this detailed analysis, each criterion was reassessed using the SuccessTables' definitions to determine the overall success level for that criterion. These evaluations will be presented in Chapter 5.
7. **Aggregating Criteria Evaluations:**
    - The individual assessments for each criterion were then combined to evaluate the success of each of the three dimensions (programmatic, process, and political) of success.
    - Using McConnell's (2010) definitions of success, an overall evaluation was determined for each dimension.
8. **Synthesizing the Overall Success:**
    - Finally, the evaluations and main arguments for the three dimensions were synthesized to answer the main research question.
    - This comprehensive synthesis provided a holistic evaluation of the SDE(+) policy, integrating detailed insights from the content analysis to determine the policy's overall success.

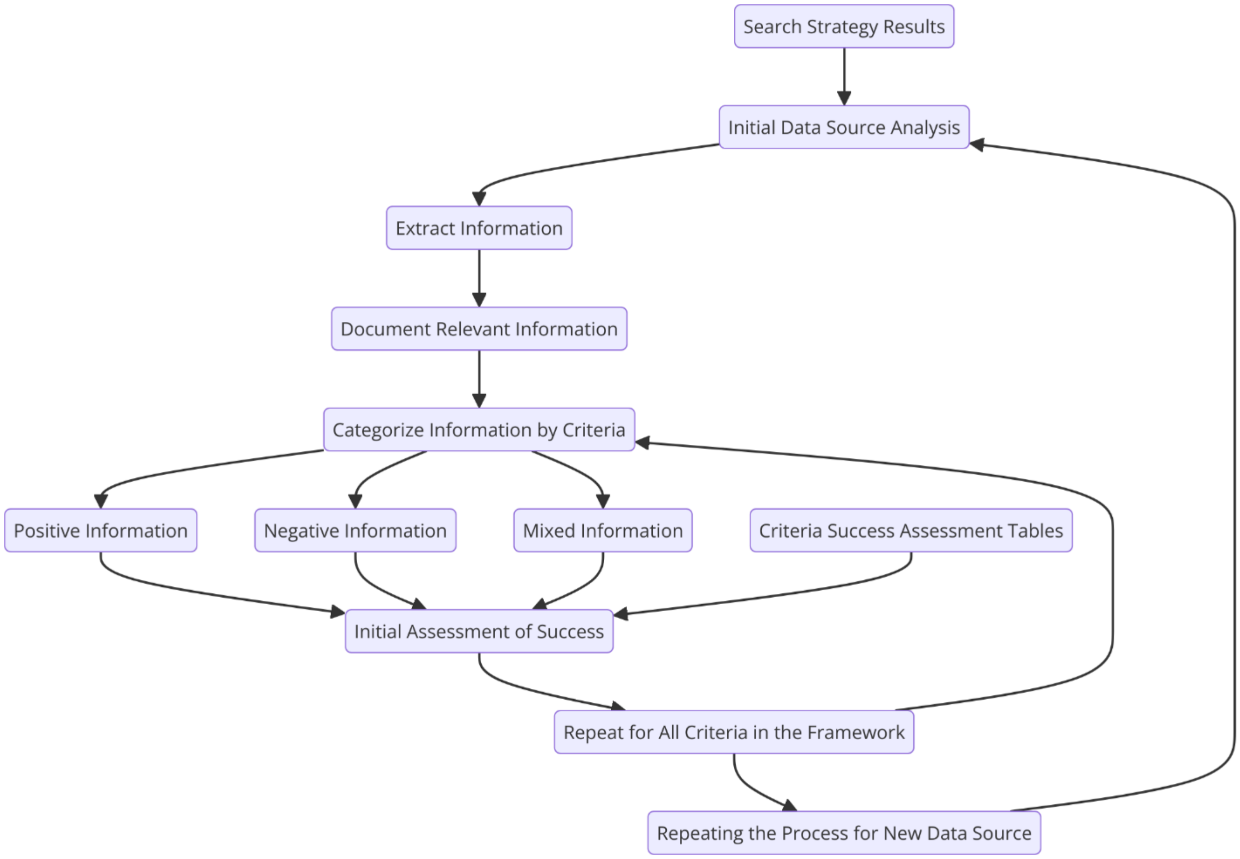


**Figure 3:** Steps 1-3 from the data analysis process

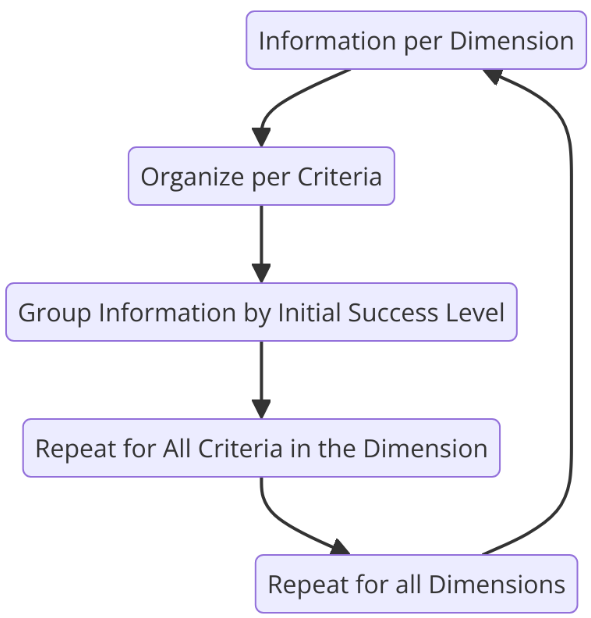


**Figure 4:** Step 4 from the data analysis process

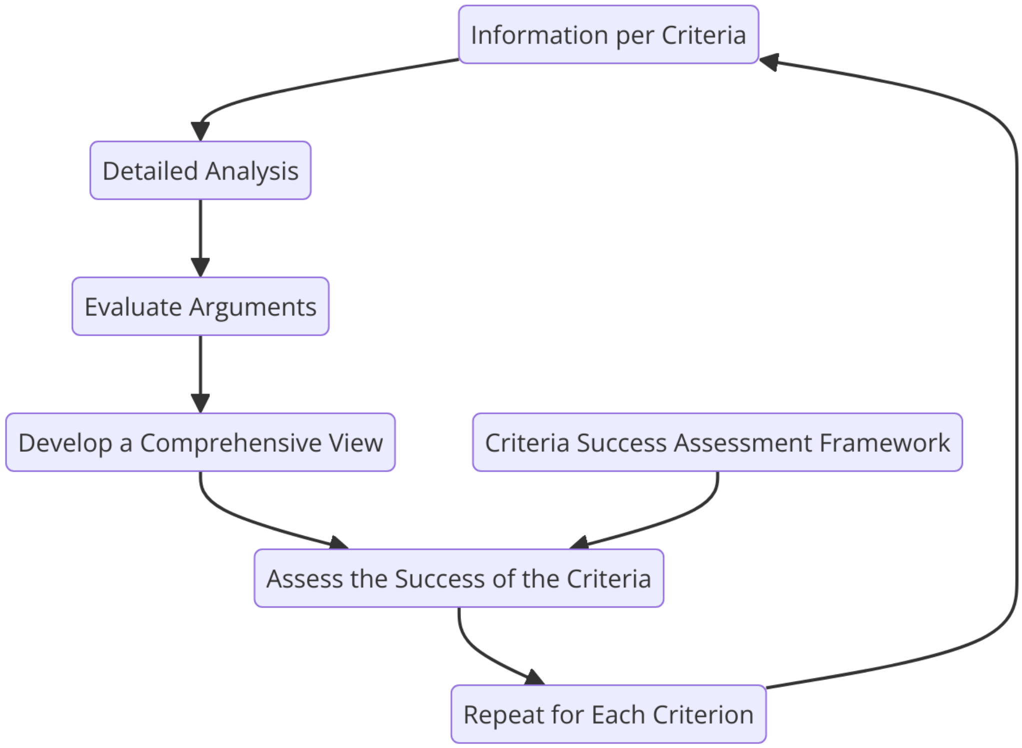


**Figure 5:** Steps 5-6 from the data analysis process

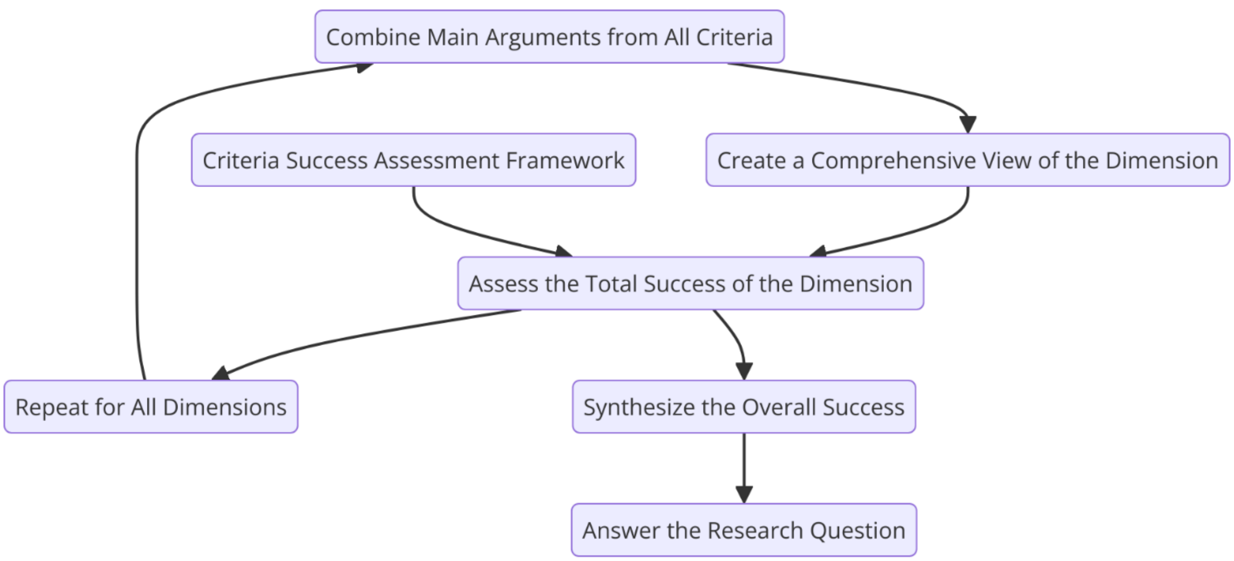


**Figure 6:** Steps 6-8 from the data analysis process

### 4.1.3 Interviews

Between June 3rd and June 17th, a total of 15 interview requests were sent out. The distribution of stakeholders was as follows: 5 to grid operation-related stakeholders, such as TenneT and Alliander, 4 to independent climate policy assessment stakeholders, such as CE Delft, Trinomics, and the International Energy Agency, and 6 to governmental stakeholders, including the Ministry of Economic Affairs, the PBL, and Rijksoverheid. Unfortunately, due to the timing of the research during the summer vacation and denials from all governmental stakeholders and grid operators, the thesis will use the information from 4 interviewees from independent policy assessment agencies as a complementary component to the larger qualitative analysis, adding nuanced perspectives and addressing specific gaps.

The interviews were semi-structured, allowing for in-depth exploration of specific themes while providing the flexibility to address emerging topics relevant to the study. This method aligns with Kvale and Brinkmann's (2009) emphasis on the importance of obtaining rich, qualitative data through open-ended questioning, enabling a deeper understanding of the complex interactions and outcomes associated with the SDE+ policy.

The interviews will be transcribed using Microsoft Teams, ensuring accuracy and completeness. Once transcriptions are obtained, the following steps will be taken:

1. **Marking and Noting Answers:** Questions in the transcriptions will be marked, and the answers will be noted per question. Additionally, any interesting or relevant statements made by the interviewees will be marked and noted for further analysis.
2. **Summarizing into Main Points and Topics:** The answers will be summarized into main points and topics. This summarisation process aligns with the data management plan for the thesis, ensuring the anonymity of the interviewees while retaining useful information that can be interpreted. The names and occupations of the interviewees will be anonymised in accordance with the plan approved by the Ethics Committee.
3. **Integration with Other Data Sources:** The summarised interview information will then undergo the same process as other data sources. This involves connecting the information to the predefined criteria and assessing the initial evaluation of success for each criterion based on the interview data.

4. **Comprehensive Evaluation:** This interview data will be integrated with all other information on the criteria to provide a more nuanced and comprehensive view of the criteria's achievements, challenges, and overall success. By adding insights from the interviews, the evaluation will be enriched, capturing diverse perspectives and deeper contextual understanding.

To enrich the qualitative analysis and fill knowledge gaps from the data analysis, interviews were conducted with key stakeholders, specifically focusing on independent policy assessment experts.These individuals were selected due to their experience and insights into the SDE(+) policy’s implementation, impact, policy climate and challenges.

The interviews primarily served to supplement and validate the findings from the comprehensive data analysis. By providing additional context and nuanced interpretations of the policy's effects, the interviews helped to increase the understanding of the SDE+ policy and its place within the Dutch climate context. The interviews offered detailed explanations and interpretations that enhanced the understanding of specific aspects observed in the data analysis results, adding depth to the evaluation of the policy's success across all dimensions.

## 4.2 Methods and Data Sources

In this research, a combination of government reports, independent assessment reports, stakeholder interviews, and selected news articles were used as primary data sources to ensure a comprehensive evaluation of the SDE(+) policy. Reports, such as those from Dutch agencies and international organizations like the International Energy Agency (IEA), provided authoritative data on policy implementation and outcomes. Independent assessment reports, including those from CE Delft and other expert bodies, are crucial in assessing the programmatic and process dimensions of the policy, offering objective evaluations and critical insights into the policy's effectiveness, processes and impact.

The interviews primarily served to supplement and validate the findings from the comprehensive data analysis. By providing additional context and nuanced interpretations of the policy's effects, the interviews helped to increase the understanding of the SDE+ policy and its place within the Dutch climate context. Additionally, news articles were included to capture real-time reactions and developments related to the SDE(+) policy, especially aiding in capturing political debates and assessing the political dimension. These articles were chosen for their direct relevance to the policy and credibility, helping to provide a deeper understanding of the political discourse surrounding the SDE(+) and its impact on the policy’s success.

Certain types of data sources were deliberately excluded from this analysis to maintain the scholarly rigor of the study. These excluded sources include online forums, blogs, and non-peer-reviewed articles, which typically lack the credibility and rigorous data validation necessary for academic research. While news articles were included, only those with a clear and direct link to the SDE(+) policy were selected, avoiding sources that were speculative, biased, or lacked substantial evidence. This approach ensures that the conclusions drawn in this research are based on reliable, evidence-based information.

### 4.2.1 Operationalisation of Programmatic Success Criteria

Programmatic success, as defined by McConnell (2010), focuses on the effective implementation of policy, the achievement of intended outcomes, and the overall benefit to the target group. To comprehensively evaluate the programmatic success of the SDE+ policy, this study operationalizes key criteria, ensuring an evidence-based assessment that reflects both current performance and future viability. The criteria, descriptions, KPI's and data sources for the programmatic dimension can be found in *Table 7* below.

| Criteria | Description | KPI | Data sources |
|---|---|---|---|
| Achievement of Policy Goals | This combined criterion assesses whether the SDE+ policy achieves its intended objectives, providing tangible benefits to the intended beneficiaries. This encompasses both the direct outputs and the broader impacts on renewable energy targets. | Increase in renewable energy capacity (e.g., MW installed), reduction in $CO_2$ emissions (e.g., tons mitigated). Percentage of renewable energy consumption achieved. | Government and EU monitoring reports, third-party evaluations |
| Efficiency | Efficiency assesses the economic efficiency of the SDE+ policy by analyzing the cost-effectiveness of the subsidies provided. | Cost per megawatt-hour (MWh) of renewable energy generated, cost per ton of $CO_2$ reduced | Government financial reports, independent policy assessments. |
| Programmatic Fairness | This criterion examines the equitable distribution of the policy's economic benefits and burdens across different societal groups. | Distribution of economic benefits and subsidies among various demographic groups and regions. | Impact assessments, interviews with stakeholders, news articles, independent policy assessments |
| Programmatic Adaptability | This criterion evaluates the policy's ability to adjust to new environmental, technological, or social insights, ensuring long-term relevance. | Frequency and nature of policy updates and revisions | Independent policy assessments, stakeholder feedback interviews, government reports |
| Meeting Domain Specific Criteria | This criterion evaluates whether the policy meets the criteria for the climate policy area | Alignment with sector-specific standards and regulations, effectiveness in targeting priority areas within renewable energy and contribution to broader climate and energy objectives. | Independent policy assessments, stakeholder feedback interviews, government reports |

**Table 7:** Operationalisation of the programmatic dimension criteria

### 4.2.2 Operationalisation of Process Success Criteria

Process success, as defined by McConnell (2010), evaluates the formulation, implementation, and management of policy, ensuring that it is legitimate, well-coordinated, and adaptable. To assess the process success of the SDE+ policy, this study operationalizes several key criteria that reflect the dynamic and comprehensive nature of policy implementation. The criteria, descriptions, KPI's and data sources for the process dimension can be found in *Table 8 below.*

| Criteria | Description | KPI | Data sources |
|---|---|---|---|
| Preserving Policy Goals and Instruments | This criterion evaluates the extent to which the SDE+ policy's goals and instruments are maintained and effectively implemented. | Continuity and preservation of SDE+ policy goals and instruments. | Independent policy assessments, stakeholder feedback interviews, government reports |
| Normative Compliance | This criterion ensures that the policy adheres to legal and ethical standards throughout its formulation and implementation. | Compliance with legal standards and ethical norms in the implementation of SDE(+). | News articles, government reports, independent policy assessments |
| Symbolising Innovation | This criterion evaluates the extent to which the policy adopts new and effective approaches, symbolizing progress and innovation in renewable energy production and policy implementation. | Number and impact of innovative approaches adopted in policy measures. | Policy documents, news articles, interviews, independent policy assessments |
| Coordination | This criterion assesses the policy's integration with other governmental and non-governmental initiatives to enhance effectiveness and avoid conflicts. | Number and effectiveness of collaborations with other policies and initiatives. | Policy documents, interviews, independent policy assessments |
| Stakeholder participation | This criterion evaluates the inclusiveness of the policy process by examining the extent and quality of engagement | Level, quality and frequency of stakeholder engagement activities | Interviews, independent policy assessments, news articles, |

| | | | |
|---|---|---|---|
| | activities involving diverse groups. | | government reports |
| Process Adaptability | This criterion assesses the policy's capability to evolve in response to new information or changing circumstances. | Frequency and impact of adjustments to the SDE(+) policy processes. | Interviews, independent policy assessments, news articles, government reports |

**Table 8:** Operationalisation of the process dimension criteria

### 4.2.3 Operationalisation of Political Success Criteria

Political success, as defined by McConnell (2010), assesses the extent to which a policy benefits the government or political entities, enhances public support, and maintains political stability. To evaluate the political success of the SDE+ policy, this study operationalises key criteria that reflect its impact on the political landscape and stakeholder perceptions. The criteria, descriptions, KPI's and data sources for the process dimension can be found in *Table 9* below.

| **Criteria** | **Description** | **KPI** | **Data sources** |
|---|---|---|---|
| Enhancing Electoral Prospects | This criterion measures the impact of the SDE+ policy on the electoral prospects and reputation of the government and leaders. | Changes in public approval ratings and electoral outcomes | News articles, independent policy assessments |
| Controlling the Policy Agenda | This criterion evaluates the policy's effectiveness in controlling the policy agenda and easing governance. | Influence on the broader energy policy agenda and governance effectiveness. | Policy documents, news articles |
| Sustaining Government Values | This criterion evaluates the policy's alignment with the Dutch government's overarching principles and long-term vision for sustainable energy and emission reduction. | Consistency with government principles and long-term vision in policy measures. | Government reports, news articles, independent policy assessments |

| | | | |
|---|---|---|---|
| Normative Compliance | This criterion evaluates the adherence of the SDE+ policy to legal norms and standards, ensuring its legitimacy and enforceability. | Compliance with legal standards and ethical norms of the SDE(+). | News articles, government reports, independent policy assessments |
| Political Fairness | This criterion examines the equitable distribution of benefits and burdens of the SDE+ policy among various stakeholders. | Perception of fairness in the distribution of SDE+ policy benefits and burdens among different social, economic, and regional groups. | Interviews, independent policy assessments, news articles, government reports |

**Table 9:** Operationalisation of the political dimension criteria

To systematically analyse and interpret the data, this study applies two things to aid a rigorous and comprehensive evaluation of the SDE+ policy's success according to McConnell's (2010) success-to-failure spectrum. This involves defining each unique level of success and effectively judging the impact of various arguments.

**Definitions of Success Levels:** The Criteria Success Assessment Frameworks provide detailed descriptions for each level of success, allowing for an intuitive allocation of success based on the analysis of arguments related to each criterion. McConnell's (2010) clear concepts of the success-to-failure spectrum facilitate this intuitive allocation once a comprehensive view of a criterion is created through the structured analysis mentioned above. The definitions are as follows:

- **Total Success:** This level indicates that the policy has fully achieved its intended goals, with no significant challenges or failures. The policy provides maximum benefit to the target group and aligns perfectly with sector-specific standards and broader policy objectives.
- **Resilient Success:** At this level, the policy has largely achieved its goals and provided substantial benefits, though it has encountered some minor challenges that do not significantly undermine its overall effectiveness. These challenges are effectively managed without compromising the primary objectives of the policy.
- **Conflicted Success:** This level reflects a scenario where the policy has achieved its goals to a reasonable extent but faces significant challenges that partially undermine its effectiveness. The evaluation shows a mix of positive outcomes and notable issues, leading to a balanced yet mixed assessment.
- **Precarious Success:** Here, the policy has met some of its objectives but is overshadowed by substantial challenges and failures. While there are some positive outcomes, the negative aspects considerably undermine the overall success of the policy.

- **Total Failure:** This level indicates that the policy has failed to achieve its intended goals, with significant challenges and failures entirely negating any potential benefits. The policy does not align with its objectives and is detrimental to the target group and broader policy goals.

These definitions allow for a structured and intuitive assessment of each criterion, ensuring that the final success level reflects the overall impact of the policy.

**Judging the Impact of Arguments:** To better assess the impact of challenges and achievements, the analysis uses benchmarks for comparison. This approach ensures a more objective evaluation of the policy's success in meeting its goals.

For example, in evaluating the Achievement of Policy Goals, which aims to assess whether the SDE(+) has achieved its intended objectives and provided tangible benefits, benchmarks include the percentage of renewable energy the policy set out to achieve. Specifically, the target is 14% renewable energy by 2020 (CBS, 2021). Additionally, comparisons can be made with the renewable energy shares of similar countries within the European Union to gauge relative success.

For criteria requiring more qualitative data, such as Fairness, Sustainment of Government Values, and Stakeholder Participation, the thesis employs benchmarks such as the principles of good governance outlined by the Dutch government, such as fairness and equity. Furthermore, results from other evaluation reports that have analysed stakeholder engagement and feedback provide valuable insights into the overall performance of the criteria, providing a base for the assessment of success.

By comparing results against such benchmarks and utilizing McConnell's (2010) clear and intuitive concepts of success, the study can evaluate the success of both individual criteria and the broader dimensions. This approach ensures that the assessments are grounded in concrete, comparable standards, facilitating a balanced evaluation of the SDE(+) policy's success.

# 5. Results

This chapter evaluates the success of the SDE(+) policy across three dimensions: programmatic, process, and political. Drawing on a total of 65 sources, including government reports, third-party evaluations, and news articles, each dimension will be thoroughly analysed. The programmatic dimension assesses the achievement of policy goals, efficiency, fairness, and adaptability. The process dimension examines the preservation of policy goals, normative compliance, innovation, coordination, stakeholder participation, and adaptability. The political dimension evaluates political fairness, control of the policy agenda, electoral prospects, normative compliance, and sustainment of government values. The evaluations for each criterion will determine the overall success of each dimension, which collectively will be used to assess the total success of the SDE and SDE+ policies.

## 5.1 Programmatic Dimension

### 5.1.1 Achievement of Policy Goals

The achievement of policy goals in the context of the SDE and SDE+ schemes involves meeting targets for renewable energy production, effectively integrating these resources into the energy grid, reducing greenhouse gas emissions, and ensuring a sustainable energy supply.

Initially, the SDE scheme's success was underwhelming due to challenges in distributing subsidies and the low subsidies provided (Ministry of Economic Affairs, Agriculture, and Innovation, 2011). The initial program and limited funding led to inefficiencies and dissatisfaction among stakeholders and prevented significant advancements in renewable energy projects, resulting in only moderate increases in renewable energy production (Algemene Rekenkamer, 2015, CBS, 2021; BNNVARA, 2012).

The introduction of the SDE+ policy improved subsidy distribution but still provided insufficient amounts, maintaining a precarious level of success (Hoogland et al., 2021; IEA, 2020b; De Zeeuw, 2014). Despite addressing some subsidy allocation issues, the financial support was insufficient to significantly boost renewable energy projects, only achieving 1.2% growth between 2012 and 2016 (PBL, 2020; CBS, 2021).

The projects under the SDE+ scheme achieved a capacity of 34,283 MWh, with a subsidy allocation exceeding €57 billion in 2020 (ABN AMRO, 2023). The SDE+ scheme has been instrumental in progressing towards renewable energy goals, with around 720 petajoules (PJ) of renewable energy production and 33% of total renewable energy production directly supported by the SDE+ (RVO, 2020; Hoogland et al., 2021). The significant increase in solar energy consumption by 47% and wind energy by 29% in 2020 (CBS, 2021) further underscored this progress and the Netherlands' commitment to solar and wind energy in particular. In addition, many projects are still in progress, indicating potential for further impact (CE Delft, 2016). The combination of a net metering scheme, the salderingsregeling, and the SDE scheme skyrocketed the adoption of residential solar PV, reaching a milestone of 1.5 million homes in the Netherlands with solar panels and the highest solar PV per capita in Europe (ACM, 2023; IEA, 2020a; Statista, 2024).

Although the SDE+ scheme directly contributed to increasing renewable energy production by 20 TWh in 2020, the total renewable energy production constituted only 11.1% of total energy use, missing the national target of 14% for 2020 (Hoogland et al., 2021; CBS, 2021). Compared to the rest of the European Union, the Netherlands ranks very low, with only four countries ranking lower (CBS, 2024c). In 2017, the Netherlands had a renewable energy share of 6.5 percent, compared to the EU average of 18.4 percent. By 2022, the Netherlands' share had increased to 15 percent, while the EU average was 23 percent. This demonstrates that although the Netherlands' share of renewable energy has been growing faster than the EU average, it is still starting from a much lower baseline, highlighting both progress and the need for continued effort (CBS, 2024c; FluxEnergie, 2017b).

Despite significant improvements in achieving renewable goals throughout the SDE and SDE+ policies, external challenges, and the failure to meet the 2020 goals hamper any high evaluation of success. Issues such as net congestion and a shortage of technical personnel, which hindered the integration of new renewable energy installations into the grid (RVO, 2022a; AD, 2018), and the impacts of the COVID-19 pandemic, which caused delays in project implementations (Wiebes, 2020a), highlight the persistent obstacles faced. The introduction of the free category in the SDE+ has improved efficiency but also posed challenges for project feasibility. With a 38% non-realization rate compared to 16% in the regular category, a significant portion of the allocated yearly budget is tied up for the year, slowing down the pace of the energy transition and the achievement of policy goals (CE Delft, 2016; Algemene Rekenkamer, 2015). External influences, such as the availability of cheap coal has made renewable energy less attractive, decreasing stimulus in achieving sustainable energy goals (NOS, 2015). Moreover, frequent changes in subsidy schemes created uncertainty among investors, leading to a stop-start dynamic that hindered sustained progress (van der Werf, 2010).

Initially, the SDE policy encountered significant challenges, particularly in terms of subsidy distribution and funding. These issues led to only moderate increases in renewable energy production, resulting in stakeholder dissatisfaction. According to the Criteria Success Assessment Framework (CSAF) presented in *Appendix C*, this situation aligns with **precarious success**, where few renewable energy targets are achieved, and major shortfalls significantly impact overall success. With the transition to SDE+, there was a notable improvement in the allocation process, significantly increasing solar and wind energy consumption. However, despite these enhancements, the policy still fell short of meeting national renewable energy targets, which corresponds with **conflicted success** in the CSAF, where some targets are achieved, but significant shortfalls create concern. Therefore, the evaluation of the SDE+ policy's achievement of policy goals reflects a transition from **precarious** to **conflicted success**, acknowledging the progress made alongside the persistent challenges.

### 5.1.2 Programmatic Adaptability

Programmatic adaptability refers to the policy's ability to adjust to changing market conditions, technological advancements, and evolving policy landscapes. This adaptability is crucial for maintaining the relevance and effectiveness of the SDE and SDE+ schemes in promoting renewable energy and reducing $CO_2$emissions.

Significant achievements include the transition from SDE to SDE+, broadening the scope to include a wider range of renewable energy technologies and shifting focus to larger projects instead of personal solar PV (PBL, 2020; Hoogland et al., 2021). The SDE+ has demonstrated considerable adaptability by changing the subsidy allocation to competitive bidding (CE Delft, 201616; RVO, 2024). This change allowed for a more flexible and efficient allocation of funds, ensuring that subsidies were directed towards the most cost-effective projects, regardless of technology. Adjustments based on market conditions and phased introductions have allowed the SDE+ to remain flexible and responsive, dynamically adjusting subsidy levels to manage budgets and more effectively respond to technology and market changes (CE Delft SEO, 2016; PBL, 2015). During the later stages of the SDE+ policy, the subsidy amounts increased significantly from €1.7 billion in 2012 to €12 billion in 2017, reflecting the adaptability of the program to the increased focus on achieving climate goals (IEA, 2020b; Rijksoverheid, n.d.; Ministry of Economic Affairs, 2018). Additionally, the schemes' shift from promoting renewable energy production to focusing on $CO_2$ reduction aligns with broader European climate goals and demonstrates a dynamic policy framework (ABN AMRO, 2023; Ministry of Economic Affairs and Climate Policy, 2019a; European Parliament, 2023). The program demonstrates adaptability to external impacts, such as the COVID-19 pandemic and network capacity issues, by allowing projects to apply for one-year extensions (Wiebes, 2020a; Franeker Courant, 2021).

However, significant challenges remain. The failure to meet the 14% renewable energy target by 2020 and the high cost of green energy in the Netherlands compared to other European countries, underscore the schemes' limitations in adapting effectively to dynamic market conditions and achieving energy targets (CBS, 2021; IEA, 2020a; NOS, 2018; IRENA, 2020). Although subsidy amounts increased significantly from 2008 to 2020 and this increase was reflected in the rising share of renewable energy during this period (Ministry of Economic Affairs and Climate Policy, 2018; CBS, 2021), the policy adaptations were not implemented swiftly enough to reach the 2020 target. The National Energy Outlook 2015 report emphasizes the need for new policy impulses to ensure long-term sustainability, highlighting the program's struggle to adapt to evolving needs (PBL, 2015). Although the program attempts to adapt by updating subsidy criteria and including new categories, significant delays and unclear support for innovation persist (Weissink, 2015; CE Delft, 2016; Algemene Rekenkamer, 2015).

Additionally, the reaction to congestion in the energy grid, exacerbated by the increase in renewable energy production, was far too slow, further limiting the schemes' effectiveness (RVO, 2022b; TenneT, n.d.). The impact of net congestion is becoming a large issue, with the number complaints on net congestion rising for the 4th year in a row in 2021 (Schellevis, 2021; RVO, 2022a). The combination of net metering and subsidies on personal solar PV in residential areas has caused a significant increase in renewable energy production (ACM, 2023). However, it has also congested the electricity grid, hindering the connection of other, potentially more efficient technologies (Interviewee 4, 2024; Interviewee 1, 2024). Net congestion could impact 1.5 million users by 2030, prompting urgent measures from the government and grid operators to expand the low-voltage network (Hadden, 2024; Rijksoverheid, 2024). Additionally, delays in new large-scale energy projects due to grid congestion further hinder the energy transition (Rabobank, 2024). However, despite challenges with grid congestion, the SDE+ has mostly supported renewable electricity. Renewable heat lags behind renewable electricity, making up less than 1% of total energy consumption and around 1/8th of renewable electricity production in 2022, despite heat consumption being over 1/3rd of electricity consumption (Van der Scheer, 2011; CBS, 2024a; CBS, 2024b; Team Stadszaken). This mismatch between renewable energy production and consumption combined with the infrastructural issues related to renewable electricity shows a clear sign of a lack of programmatic adaptability in responding to evolving challenges and energy consumption (Interviewee 4, 2024).

The programmatic adaptability of the SDE and SDE+ schemes illustrates both significant strengths and notable weaknesses. The transition from SDE to SDE+, the expansion of eligible renewable energy technologies, and the introduction of competitive bidding for subsidy allocation represent significant achievements that demonstrate the policy’s ability to adapt. However, the failure to meet the 2020 renewable energy target and the slow response to emerging issues such as grid congestion reveal limitations in the policy’s adaptability. In the CSAF, **conflicted success** involves limited adaptability with significant rigidity that hampers the program’s relevance. Thus, the programmatic adaptability of the SDE and SDE+ schemes is best described as **conflicted success**, reflecting both the policy’s successes and its ongoing challenges in adapting to market and infrastructural conditions.

### 5.1.3 Efficiency

Efficiency in the context of the SDE and SDE+ schemes refers to maximising the output of renewable energy while minimising costs and administrative burdens. This is crucial for ensuring that the subsidies provided lead to significant and cost-effective advancements in renewable energy production.

The SDE scheme aimed to promote renewable energy production by providing subsidies to cover the unprofitable top of these projects (ECN, 2008). However, the SDE faced significant challenges, including a static budget per technology, which often led to the exhaustion of budgets for some technologies while leaving others underfunded (Ministry of Economic Affairs, Agriculture , and Innovation, 2011). This rigidity limited the scheme's ability to adapt to market conditions and efficiently allocate resources.

The inefficiencies of the SDE were significantly improved with the introduction of the SDE+. The largest contributor to this improvement is the more efficient allocation of the budget from the SDE to the SDE+ scheme, which introduced a competitive bidding process that allocates subsidies to the most cost-effective projects, resulting in substantial savings and increased subsidy allocations compared to fixed subsidy systems (CE Delft, 2016). Efficiency indicators show a minimal 11% cost saving per produced kWh from 2011-2015, attributed to the phased subsidy application process and competitive pricing mechanisms (CE Delft, 2016). This phased approach was further refined in 2016 to include smaller incremental units (€0.001/kWh), enhancing the granularity of the subsidy allocation process, and encouraging early, competitive bids, thereby increasing efficiency (CE Delft, 2016). The SDE+ scheme has maintained a relatively low subsidy intensity compared to countries like Germany and the UK, indicating a higher level of efficiency (Interviewee 2, 2024). The SDE+'s mechanism to allow bids in the free category has led to significant cost savings, showcasing effective cost management (Hoogland et al., 2021). By permitting developers to submit bids below the standard subsidy rates, the free category incentivizes lower-cost renewable energy production. This competitive element drives innovation and cost reduction, further enhancing the overall efficiency and effectiveness of the SDE+ scheme.

In 2014, a significant policy change required applicants to submit feasibility plans before project approval, reducing the risk of incomplete projects after funding allocation (Ministry of Economic Affairs and Climate Policy, 2018). These mandatory feasibility studies have improved project completion rates, addressing the issue of non-realisation, which was particularly significant in the free category, increasing the efficiency of the SDE+ (38% non-realization rate compared to 16% in regular categories) (CE Delft, 2016). Annual adjustments of subsidy amounts based on market values have further ensured efficient allocation of funds (PBL, 2015). The administrative burdens of the SDE+ scheme are estimated to be less than 1% of the total expected cash expenditures, amounting to €305 million from 2011 to 2020, or €30.5 million per year (Hoogland et al., 2021). According to a survey, 86% of applicants find the administrative time commitment reasonable or even limited compared to the potential benefits of the subsidy (CE Delft, 2016); Hoogland et al., 2021).

Despite these improvements, the efficiency of the SDE+ is hampered by administrative burdens, such as complex application procedures and the feasibility plans introduced in 2014, which strain some applicants, particularly smaller businesses, and individual project developers, leading to inefficiencies (ABN AMRO, 2023). Net congestion is a significant barrier preventing the connection of newly realised solar and wind installations, which negatively impacts the efficiency of the SDE+ scheme, at least in the short term (RVO, 2022b). Including the external costs from net congestion into the efficiency of the SDE(+) scheme in ex-post evaluation could negatively affect the overall efficiency that has currently been observed (Hoogland et al., 2021; Interviewee 4, 2024).

The high cost of green energy in the Netherlands compared to other European countries signals a lack of efficiency in the SDE+ (NOS, 2018). Additionally, the "gold rush" mentality in solar park development has led to inflated land prices, which translates into the increased amount of subsidy necessary, and potential inefficiencies in subsidy allocation suggest it also faces sustainability challenges (CE Delft, 2016; van Dongen, 2018). Despite improvements in subsidy allocation from the SDE to the SDE+ scheme, the transparency and effectiveness of the process are criticised, raising concerns about the efficient use of funds to achieve renewable energy outcomes (Algemene Rekenkamer, 2015). Concerns about potential over-winnings in solar PV projects also suggest areas for improvement in subsidy allocation to prevent excessive profits, as average subsidy intensity increased from €24/MWh in 2011 to €43/MWh in 2020 (Hoogland et al., 2021).

The efficiency of the SDE policy was initially hampered by static budgets assigned to specific technologies, leading to inefficiencies such as budget exhaustion in certain areas and underfunding in others. This situation aligns with the **conflicted success** category in the CSAF, where noticeable inefficiencies in implementation and moderate costs reduce overall cost-effectiveness. The SDE+ addressed these inefficiencies through the introduction of competitive bidding and phased subsidy applications, which allowed for more flexible and cost-effective allocation of funds. These improvements in efficiency correspond to **resilient success** in the CSAF, where implementation is generally cost-effective with only minor inefficiencies present. Therefore, the evaluation of efficiency reflects a progression from **conflicted success** in the SDE scheme to **resilient success** in the SDE+, recognizing the policy's enhanced cost-effectiveness.

### 5.1.4 Programmatic Fairness

Programmatic fairness refers to the equitable distribution of economic benefits and burdens of the SDE and SDE+ schemes. This criterion evaluates how well the schemes ensure fair treatment across different stakeholders, including the distribution of subsidies and the impacts on various income groups and regions.

The SDE+ aims to distribute subsidies to projects that achieve the most $CO_2$ reduction or renewable energy production per euro invested (Rijksoverheid, 2024; RVO, 2020). The technology-neutral competitive bidding process, which ensures funding goes to the most cost-effective projects, enhances the fairness of resource allocation (Ministry of Economic Affairs and Climate Policy, 2018). Additionally, the integration of innovative technologies, such as advanced biofuels and geothermal energy, into the subsidy framework reflects the schemes' commitment to promoting a diverse and fair energy mix, supporting a broader range of stakeholders and energy solutions (RVO, 2021).

However, considerable challenges remain. High administrative burdens can lead to inefficiencies and delays in fair resource allocation (ABN AMRO, 2023). The retrospective subsidy determination process, where subsidies are calculated based on actual energy production after project completion, creates financial uncertainty and delays in payment, further impacting projects' ability to secure initial funding and affecting fair resource distribution (ABN AMRO, 2023; CE Delft, 2016). This leads to an unfair situation where stakeholders with fewer initial resources cannot afford to develop renewable energy projects, even if the project is viable, while stakeholders with sufficient funds can, thus negatively impacting programmatic fairness. While the SDE+ program aims to be fair and accessible, there are challenges in ensuring equitable distribution of funds. "Subsidies are accessible to various sizes of enterprises, but balancing regional allocation remains a challenge" (RVO, 2018). However, that is not the only problem with fair distribution. The exclusion of certain sectors and projects from the SDE(+) and high land rents for solar parks, driven by SDE+ subsidies, disproportionately benefitting landowners and detracting from agricultural productivity raises questions about equitable access and benefits (Nieuwe Oogst, 2021; Grol, 2020; van Dongen, 2018). Additionally, a government report notes, “efforts to streamline application processes and improve transparency are ongoing, but challenges remain” (Rijksoverheid, 2016).

Furthermore, the National Energy Outlook 2015 report points out the disparity in policy effectiveness, noting that while efforts to make electricity greener are ongoing, other areas like transport and heating lag behind, leading to an uneven societal impact and raising questions about the fairness of the SDE policy in allocating subsidies (PBL, 2015; Ekker, 2017). The share of renewable electricity is expected to increase from 18% in 2019 to 75% in 2030 (PBL, 2020), however, the overall renewable energy share only reaches 25%, highlighting disparities in sectoral contributions. The technology-neutral nature of SDE+ promotes competition but might inadvertently favour more established technologies (CE Delft, 2016). The evaluation reveals a disparity in the allocation of SDE+ funds, with a significant preference towards solar PV and wind on land projects, while other technologies like biomass and geothermal have seen reduced shares. This imbalance suggests that the program may not be equally accessible or beneficial to all types of renewable energy projects, potentially undermining the fairness of the scheme (Hoogland et al., 2021).

The salderingsregeling, which benefits homeowners with solar panels, often leads to regressive redistribution effects, disproportionately favouring higher-income households able to afford the initial investment. (ACM, 2023). Lower-income households often pay more for electricity due to costs associated with energy fed back into the grid by solar panel owners, a situation exacerbated by external influences, such as the increased energy prices caused by the Russia-Ukraine war (NOS, 2018; European Council, 2024). Grid management challenges and slow responses further exacerbate inequities, leading to delays and disadvantages for businesses and municipalities unable to connect new projects (RVO, 2022). These issues underscore systemic problems in ensuring fair distribution of economic benefits and burdens, highlighting the need for continuous efforts to enhance fairness and achieve comprehensive success in the long term (PBL, 2020; CEER, 2023; Engwerda, 2021).

The SDE and SDE+ schemes were designed with the goal of achieving programmatic fairness through equitable distribution of subsidies. However, the SDE initially faced challenges, such as static budgets and technology-specific allocations, which favored established technologies and created perceptions of inequity. The SDE+ sought to address these challenges by introducing a technology-neutral competitive bidding process, which improved fairness to some extent. However, issues such as administrative burdens, retrospective subsidy determinations, and the disproportionate impact of net metering on lower-income households continued to pose significant fairness concerns. These ongoing challenges, which align with **precarious success** in the CSAF, reflect a policy that achieves limited fairness while facing significant opposition and inequities. Thus, the programmatic fairness of the SDE and SDE+ schemes can be characterised as **precarious success**, acknowledging both the improvements made and the persistent challenges in ensuring equitable outcomes.

### 5.1.5 Meeting Domain Specific Criteria

Meeting domain-specific criteria involves assessing how well the SDE and SDE+ schemes align with and fulfil broader climate policy goals, both at the national and European levels. This includes integration with the EU Emissions Trading System (EU-ETS), adherence to national climate agreements, and contributions to renewable energy targets and $CO_2$ reduction efforts. The dynamic area of climate policy is characterised by rapid technological advancements, evolving regulatory frameworks, and shifting market conditions, requiring continuous adaptation and proactive policy measures to stay aligned with ambitious climate goals.

Initially, the policies were rigid, with static budget for technologies and insufficient investment, which hindered their effectiveness and adaptability (Algemene Rekenkamer, 2015). Over time, however, significant improvements have been made. By aligning more closely with both Dutch and European policy goals, such as the EU Emissions Trading System (EU-ETS), the European Green Deal, and the Dutch Climate Agreement, the schemes have become more effective in promoting $CO_2$ reduction and increasing renewable energy shares (ABN AMRO, 2023; Wiebes, 2020b; IEA, 2020a; Klimaatakkoord, n.d.). The competitive bidding process for subsidies maximised $CO_2$ reduction per euro invested (Ministry of Economic Affairs and Climate Policy, 2018; RVO, 2022; IEA, 2020a). Switching to a single, flexible budget improved resource allocation towards high-impact projects (PBL, 2020). The increase in budget allocation over the period of the SDE(+) increasingly aligns the pace of the renewable energy transition with EU renewable energy and GHG targets.

The climate policy domain is heavily influenced by decisions at the EU level, which need to be translated into national policies (European Commission, n.d.; EU Monitor, n.d.). The SDE and SDE+ schemes have increasingly aligned with the direction set by the EU, thereby adhering more adaptively to the domain-specific criteria. In the final years of the SDE+ and with the introduction of the SDE++, policies have been adapted more rapidly and effectively, demonstrating a significant improvement in meeting the complexity and rapidly changing dynamics of climate policy (Hoogland et al., 2021; Hoogland et al., 2019).

However, challenges such as administrative burdens, grid congestion, and equitable distribution of subsidies and burdens have become more pronounced, placing pressure on the current and potential future success of these schemes. Increasing difficulty in connecting new projects to the electricity grid and a mismatch between electricity production and renewable heat production further outline issues. Perceived inequalities in subsidy distribution and access to resources can undermine support and participation, leading to opposition and inefficiencies. These pronounced challenges might significantly reduce the evaluation of success in the future (CE Delft 2016; ACM, 2023; IEA, 2020a). Addressing these systemic issues is crucial for the SDE schemes to meet ambitious climate targets.

The SDE scheme initially struggled with rigid budgets and insufficient investment, which hindered its ability to meet broader climate policy goals effectively. This situation aligns with **conflicted success** as per the CSAF, where the policy partially meets domain-specific criteria but has significant gaps that reduce its effectiveness. Over time, significant improvements were made, particularly with the SDE+ aligning more closely with Dutch and European climate policies. The introduction of competitive bidding and a flexible budget enhanced the policy's ability to reduce $CO_2$ emissions and increase renewable energy production. These developments suggest a shift towards **resilient success**, where the policy meets most domain-specific criteria with minor issues. However, persistent issues such as equity concerns, the mismatch between energy production and consumption, and grid capacity challenges indicate that the policy may still face significant gaps. Therefore, while the SDE and SDE+ schemes have evolved towards **resilient success** in meeting domain-specific climate policy criteria, their future success remains at risk due to these ongoing challenges.

### 5.1.6 Evaluation of Programmatic success

To evaluate the programmatic success of the SDE(+), insights from the criteria will be combined to form a nuanced assessment.

The competitive bidding process and free category introduced by the SDE+ scheme marked a significant enhancement in efficiency and adaptability. This innovation facilitated cost-effective subsidy allocation and achieving 33% of the Netherlands' total renewable energy production directly supported by the SDE (ABN AMRO, 2023; RVO, 2020; Hoogland et al., 2021). Additionally, aligning the schemes with European climate policies improved their policy relevance and impact (PBL, 2020; Hoogland et al., 2021; ABN AMRO, 2023). These measures ensured that the schemes could adapt to changing market conditions, technological advancements, and domain specific criteria, maintaining their effectiveness over time.

The SDE+ also broadened its scope to include a wider range of renewable energy technologies, reflecting a commitment to promoting a diverse and fair energy mix (PBL, 2020; Hoogland et al., 2021). The integration of innovative technologies like advanced biofuels and geothermal energy into the subsidy framework supported a broader range of stakeholders and energy solutions (RVO, 2021). The comprehensive support for renewable energy production contributed to the SDE(+) highlights the crucial role of these policies in driving the Dutch energy transition.

However, the schemes encountered significant hurdles in fairness and grid integration. Administrative burdens combined with financial uncertainties, and grid congestion caused delays and inefficiencies in resource allocation, affecting both efficiency and fairness (ABN AMRO, 2023; RVO, 2022; ABM AMRO, 2023; CE Delft, 2016). These challenges highlighted the schemes' limitations in ensuring equitable distribution of subsidies and access to resources. Moreover, the disparity between renewable electricity and heat production due to potential subsidy allocation bias emphasized the schemes' limitations in meeting diverse renewable energy needs, impacting their adaptability to comprehensive energy goals (Van der Scheer, 2011; CBS, 2024a; CBS, 2024b).

The failure to achieve the 2020 renewable energy target of 14%, reaching only 11.1% of total energy use, underscores ongoing systemic issues (Hoogland et al., 2021). Increased non-realisation of projects due to the introduction of the free category hinders the achievement of renewable goals and efficiency gains. Perceived inequities and the regressive effects of policies like the salderingsregeling further complicate the assessment of programmatic fairness and effectiveness (ACM, 2023). Additionally, net congestion has become a critical barrier, preventing the connection of new renewable energy technologies to the grid, which threatens future progress and the ability to integrate innovative solutions (RVO, 2022). Addressing these systemic issues is crucial to ensure continued progress towards ambitious climate goals and to enhance the overall impact of the schemes.

In summary, the SDE and SDE+ schemes have demonstrated significant advancements and resilience, including improved efficiency, better policy alignment, and a broader scope of supported technologies. However, their overall success is **conflicted** due to enduring challenges in efficiency, fairness, and adaptability. Addressing these systemic issues, particularly those related to grid integration and equity, is essential to enhance their long-term effectiveness and equity.

| **Criteria** | **Evaluation of Success** | **Main Arguments** |
|---|---|---|
| Achievement of Policy Goals | Precarious to conflicted success | Initial underperformance due to low subsidies and administrative challenges. SDE+ improved allocation but missed the 2020 target of 14% renewable energy, achieving only 11.1%. External challenges like net congestion, personnel shortages, non-realisation, and the COVID-19 pandemic hindered progress. |
| Programmatic Adaptability | Conflicted success | Transition from SDE to SDE+ demonstrated adaptability with a broader scope and competitive bidding. Despite these improvements, failure to meet the 2020 target and slow response to grid congestion issues highlighted limitations in adapting to market conditions and infrastructural challenges. |
| Efficiency | Conflicted to resilient success | SDE+ improved efficiency through competitive bidding, the free category, phased subsidy applications, and feasibility requirements, leading to better budget utilization and cost savings. However, administrative burdens, overestimations in the free category, and net congestion hindered efficient realisation of projects. |

| | | |
|---|---|---|
| Programmatic Fairness | Precarious success | Policy aimed for fairness through competitive bidding and technology-neutral allocation. Administrative burdens, financial uncertainties, and inequitable benefits and burdens distribution (incomes, technologies, regions) created significant fairness issues. |
| Meeting Domain Specific Criteria | Conflicted to resilient Success | Policy aligned increasingly well with national and European climate goals, adopting competitive bidding and flexible budgeting to maximize $CO_2$ reduction. Ongoing equity issues and grid capacity challenges could threaten future success in meeting domain-specific criteria. |

**Table 10:** Evaluations of success for the criteria in the programmatic dimension

## 5.2 Process Dimension

### 5.2.1 Preserving Policy Goals and Instruments

Preserving policy goals and instruments refers to maintaining the original objectives and mechanisms of the SDE and SDE+ schemes, ensuring they stay focused on promoting renewable energy and reducing $CO_2$ emissions. This criterion evaluates the schemes' ability to adapt to evolving policy requirements while staying aligned with their foundational goals.

These schemes have effectively integrated with both national and European climate policies (Wiebes, 2020b, IEA, 2020a). Effective implementation of renewable energy projects has led to a significant increase in renewable energy consumption (CBS, 2021; Hoogland et al., 2021), and the continuous adaptations and substantial investments over the last decade showcase the schemes' resilience in preserving policy goals (IEA, 2020a). The competitive bidding process has ensured that cost-effective projects receive funding, promoting efficient use of resources (Ministry of Economic Affairs and Climate Policy, 2018; CE Delft, 2016).

Moreover, the SDE+ program's substantial investments and project approvals underscore its success in preserving policy goals for renewable energy growth. The phased approach to budget allocation fosters healthy competition, pushing the sector to find cost-effective solutions and improving overall project quality (CE Delft, 2016). Additionally, profitability analyses indicate that while 95% of projects need SDE+ subsidies to achieve required returns, only a small fraction (5-15%) might be considered free riders (CE Delft, 2016). The core mechanisms of the SDE+ were mostly left unchanged in the transition to the SDE++, indicating that the policy was successful in preserving its goals and instruments (Hoogland et al., 2019).

However, in pursuing their goals, the SDE and SDE+ schemes have encountered several issues. The commitment to preserving policy goals and instruments has led to significant lock-in effects, where long-term investments in existing technologies prevent the adoption of newer, potentially more efficient ones. The rapid increase in personal solar-PV installations, driven by renewable energy policies, has exacerbated grid congestion, making it difficult for future technologies to connect to the grid (Interviewee 1, 2024; TenneT, n.d.). Net congestion is a significant barrier preventing the connection of new solar and wind installations, negatively impacting the future achievement of policy goals and instruments (RVO, 2022; RVO, 2022a; 2022b).

Challenges in managing high demand and ensuring land use efficiency further indicate areas where the program could improve (van Dongen, 2018). The initial costs and uncertainty in budget allocation disproportionately impact parties with fewer resources (ABM AMRO, 2023). However, stakeholders find the budget-focused rollout of technologies necessary and sometimes desirable despite added uncertainty about budget allocation. The decision to apply and the timing of applications are significantly affected by knowledge of the available budget, highlighting the importance of transparent budget information (CE Delft, 2016).

The SDE and SDE+ schemes have effectively promoted renewable energy and reduced $CO_2$ emissions, aligning with national and European policies (Wiebes, 2020b; IEA, 2020a). Continuous adaptations and investments have increased renewable energy consumption (CBS, 2021; Hoogland et al., 2021). Despite challenges like grid congestion and lock-in effects, the schemes' core mechanisms were retained in the transition to SDE++, demonstrating **resilient success** in preserving policy goals (Hoogland et al., 2019). According to the CSAF, resilient success is characterized by the preservation of goals with minor adjustments, which is consistent with the ongoing retention and adaptation of core mechanisms despite facing some challenges.

### 5.2.2 Coordination

Coordination within the SDE and SDE+ schemes involves effective collaboration among various stakeholders, including grid operators, local governments, industry, and research institutions, as well as coordination between different policies. This criterion evaluates the schemes' ability to ensure seamless integration of renewable energy projects, manage administrative processes, and align with broader policy frameworks. The success of coordination in the SDE and SDE+ schemes has been evaluated as a conflicted success.

The involvement of expert advisory bodies and stakeholder consultations enhances the scheme's robustness (RVO, 2018; IEA, 2020a). Coordination with other government initiatives, such as the ISDE and wind energy tenders, further strengthens its impact (Ministry of Economic Affairs and Climate Policy, 2015). Additionally, the National Energy Outlook 2015 states, "there has been significant collaboration between government agencies and the private sector to streamline processes" (PBL, 2015).

The SDE and SDE+ schemes have demonstrated collaboration with grid operators and local governments, pivotal in managing project applications and ensuring grid feasibility (RVO, 2022). Integration with broader climate policies, such as the EU Emissions Trading System (EU-ETS) and the European Green Deal, has facilitated a coherent policy framework aligning with national and European objectives (ABN AMRO, 2023; IEA, 2020). Coordination with EU bodies has been crucial for policy alignment and compliance (Rijksoverheid, 2014). The schemes align well with the new European REPowerEU Plan, which aims to reduce dependence on Russian gas and accelerate the clean energy transition, further enhancing the relevance and effectiveness of the SDE initiatives (European Commission, 2022).

However, coordination within these schemes has faced significant challenges. The interplay between the SDE and net metering policies, while beneficial for solar-PV adoption, has caused grid congestion and economic inequality, as lower-income households bear higher energy costs due to the benefits accrued to solar panel owners (IEA, 2020a; Schellevis, 2021; ACM, 2023). The rapid increase in renewable energy projects has exacerbated grid congestion issues, highlighting the need for improved regulatory processes and stakeholder coordination (Schellevis, 2021; TenneT, n.d.; RVO, 2022a). Additionally, the report by Wiebes (2020b) identifies ongoing challenges in achieving seamless collaboration, noting that both market participants and the House of representatives have expressed concerns about the transparency of the grid operator's decision-making process for allocating transport capacity.

In conclusion, while the SDE and SDE+ schemes have significantly contributed to renewable energy growth through effective policy coordination, addressing the issues of grid congestion, economic inequality, and transparency in decision-making processes is essential for resolving the conflicts within their success and ensuring future sustainability. Despite these challenges, the schemes have shown a capacity for continuous adaptation and alignment with dynamic climate policy environments. However, the ongoing issues of grid congestion, economic inequality, and transparency in decision-making processes underscore the **conflicted success** of their coordination efforts (IEA, 2020). The CSAF defines conflicted success as coordination that is present but problematic, with significant challenges arising, which accurately reflects the situation described.

### 5.2.3 Stakeholder Participation

Stakeholder participation within the SDE and SDE+ schemes involves engaging various groups, local communities, industry associations, research institutions, and government agencies. This criterion evaluates the schemes' ability to foster inclusive participation, gather diverse perspectives, and ensure effective policy implementation.

"Coordination between government agencies and stakeholders is key to the success of the SDE+ scheme" (Ministry of Economic Affairs and Climate Policy, 2015). This highlights the ongoing importance of effective stakeholder collaboration in achieving the schemes' objectives and the potential impact of success in coordination on the overall success of the SDE (IEA, 2020a).

The Dutch Ministry of Economic Affairs has partnered with agencies such as PBL to produce evaluations of the energy sector and transition to gain new insights and create faster policy adaptations (PBL, n.d.; Hoogland et al, 2021). Collaboration with multiple companies and institutions that provided their data and knowledge of the field further strengthens the program's responsiveness to industry needs (IEA, 2020a; ACM, 2023). The schemes have demonstrated a robust and inclusive approach to stakeholder participation. Significant SME participation and active involvement from local communities have been key strengths, fostering broad support for renewable energy projects (ABN AMRO, 2023). Homeowners and small businesses have also been highly engaged, especially in combination with the net metering scheme (ACM, 2023; IEA, 2020a). Furthermore, regular consultations, surveys, and focus groups with industry associations, environmental groups, and research institutions have been integral in gathering feedback and effective and swift policy adaptations (Hoogland et al., 2021; CE Delft, 2016).

The development of the Dutch Climate Agreement involved extensive stakeholder participation, engaging over 100 stakeholders from various sectors and incorporating public consultation opportunities, ensuring diverse perspectives were considered (International Energy Agency, 2020; Klimaatakkoord, n.d.). While not directly related to the SDE, the Dutch Climate Agreement has had a profound impact on the SDE, shaping it into a more comprehensive and strategically aligned instrument for achieving national climate goals.

The requirement for a transport indication from grid operators, ensuring projects are only approved in areas with sufficient grid capacity, was introduced to mitigate the risk of congestion, reflecting a coordinated effort between policymakers and grid operators to enhance transparency and efficiency (Ministry of Economic Affairs and Climate Policy, 2020). While this is an indication of increased stakeholder participation, the problem of net congestion itself can partially be attributed to a lack of coordination before the problem reached its current magnitude. Thus, it reflects a failure in stakeholder coordination to design pre-emptive measures and increased coordination and investment in the current situation.

Despite the successes, the schemes have faced challenges impacting their success in stakeholder participation. Administrative burdens, regulatory hurdles, and competitive nature of the SDE+ scheme make it difficult for smaller projects and less well-resourced stakeholders to engage effectively (ABN AMRO, 2023; CE Delft, 2016). While there is significant participation from various groups, the mechanisms for stakeholder engagement have sometimes been criticized for lacking transparency or inclusiveness, particularly in evaluations conducted in recent years (Hoogland et al., 2021; IEA, 2020a). The rapid increase in renewable energy projects has also led to conflicts regarding land use for solar parks. This underscores the need for better coordination and participation to ensure broad-based support and effective stakeholder engagement (NRC, 2017). Economic barriers, such as the high initial costs of renewable energy technologies and public opposition, including resistance to infrastructure projects like wind farms and grid expansions, have signalled a need for increased stakeholder participation in an effort to increase support (Hannibal, 2018; Van der Horst, 2018).

The SDE and SDE+ schemes have successfully engaged SMEs, local communities, and homeowners, fostering broad support for renewable energy projects, and enabling effective policy adaptations (ABN AMRO, 2023; ACM, 2023). Regular consultations with industry associations, environmental groups, and research institutions have enhanced responsiveness and adaptability (Hoogland et al., 2021; CE Delft, 2016). The Dutch Climate Agreement's extensive stakeholder participation further influenced the SDE schemes (IEA, 2020a). However, a lack of stakeholder coordination to prevent net congestions, resistance to renewable energy projects, and criticisms on lacking transparency reflect challenges. Overall, the success of stakeholder participation can be considered a **resilient success**. The CSAF describes resilient success in stakeholder participation as generally inclusive with minor gaps, which aligns with the broad engagement and minor challenges noted.

### 5.2.4 Process Adaptability

Process adaptability within the SDE and SDE+ schemes involves the ability to adjust policy processes and respond to changing market conditions, technological advancements, and evolving regulatory landscapes. This criterion evaluates the schemes' flexibility and responsiveness to ensure the continuous effectiveness of renewable energy policies.

Initially, the SDE scheme faced significant challenges due to rigid budget allocations for each technology category. Categories like solar panels and biomass quickly exhausted their budgets annually, while others like onshore wind had unused funds, leading to inefficient budget utilization (Beon, 2011; Algemene Rekenkamer, 2015). Additionally, subsidies were available to individuals, who often withdrew their applications post-approval, resulting in unspent budget allocations (WBSO.biz, 2010). This inflexible approach meant the total budget was never fully utilized despite sufficient market demand (Algemene Rekenkamer, 2015).

The introduction of the SDE+ scheme in 2012 marked a significant improvement in process adaptability by implementing a more flexible budgeting approach with a combined budget for all categories, awarding subsidies in rounds to better allocate funds based on demand (CE Delft, 2016; Algemene Rekenkamer, 2015). The yearly evaluation of the budget available through the subsidy scheme ensures better financial planning and resource allocation (RVO, 2020; Rijksoverheid, n.d.). Additionally, the range of technologies eligible for subsidies under the SDE+ scheme was expanded, demonstrating the scheme's adaptability (Hoogland et al., 2021; IEA, 2020a).

From 2014 onwards, the process was adapted, and applicants were required to provide a statement of feasibility (Ministry of Economic Affairs and Climate Policy, 2018). This was especially significant in the free category, where non-realisation rates were triple that of the regular category (CE Delft, 2016). Annual and quadrennial evaluations provide detailed insights into the clean energy transition (PBL, 2020; 2015; 2014, IEA, 2020a). These evaluations enable quicker and more accurate policy adjustments based on the latest data and projections, keeping policies aligned with market conditions and technological advancements. The National Energy Outlook 2015 mentions, "the scheme has been flexible in adjusting its processes based on stakeholder feedback and market changes" (PBL, 2015).

Despite these advancements, the schemes still face challenges. The SDE process favours certain technologies, such as solar and wind, in subsidy allocation, even if they might not be the most cost-effective. The process of subsidy allocation and eligibility for subsidies is inflexible, heavily favouring existing and proven technologies over new and innovative ones that might prove to be more cost-efficient and diversify the energy mix in the Netherlands (IEA, 2020a; Hoogland et al., 2021). The subsidy allocation process also fails to capture external costs related to renewable energy projects, such as net congestion, highlighting areas for improvement (Hoogland et al., 2021; Interviewee 4, 2024). Regulatory barriers, such as complex permitting processes and stringent environmental regulations, negatively impact the process by slowing down project approvals and increasing compliance costs, thereby hindering timely and cost-effective project implementation (Hannibal, 2018; Hoogland et al., 2021).

The competitive nature of the SDE+ scheme might inadvertently create challenges (CE Delft, 2016). The competition between technologies can lead to problems where significant time and resources are invested in preparing subsidy applications that may ultimately not be approved. This disproportionate investment burden is particularly challenging for smaller projects, necessitating careful consideration of how to balance competition with support for diverse project sizes in the allocation process.

Initially, rigid budget allocations and high withdrawal rates led to inefficiencies (Beon, 2011; WBSO.biz, 2010). The SDE+ improved flexibility with a combined budget and expanded eligible technologies (RVO, 2020; CE Delft, 2016). Requiring feasibility statements since 2014 has enhanced project realization (Ministry of Economic Affairs and Climate Policy, 2018). Despite favouring established technologies and the inability to incorporate external costs (IEA, 2020a; Hoogland et al., 2021), the schemes' process adaptability reflects a **resilient success** evaluation due to the significant improvements and adaptations made over the course of the SDE scheme. The CSAF defines resilient success in process adaptability as the ability to adapt with some limitations, which matches the significant improvements made despite the mentioned limitations.

### 5.2.5 Symbolising Innovation

Symbolising innovation within the SDE and SDE+ schemes involves showcasing significant advancements in renewable energy technology and policy design. This criterion evaluates the schemes' ability to foster technological innovation, adopt new approaches, and integrate advanced practices to meet current and future energy needs.

These schemes represent innovation by introducing numerous transformative changes, such as shifting from biomass to wind and solar energy and implementing more technology-neutral allocation approaches and competitive bidding processes (ABN AMRO, 2023; Hoogland et al., 2021; CE Delft, 2016). The broader range of eligible technologies from the SDE to the SDE+ schemes, including wind, solar, geothermal, and hydroelectric power, encouraged a comprehensive approach to renewable energy production.

Several concrete initiatives driven by the SDE and SDE+ schemes reflect their innovative capacity. These include promoting energy storage solutions, integrating flexible energy consumption practices, and developing smart grids, which enhance overall grid efficiency (RVO, 2022b). The schemes' combination with the salderingsregeling promoted personal solar-PV systems, allowing individual households to contribute to the renewable energy grid and decentralizing energy production (RVO, 2022b). The transition from the SDE to the SDE+ scheme marked a significant shift from individual subsidies to larger-scale projects, leading to economies of scale and enhancing the efficiency and effectiveness of renewable energy production (IEA, 2020a). Incorporating data-driven adjustments based on annual National Energy Outlook reports by PBL ensured the schemes' relevance and effectiveness through informed decision-making (PBL, 2020). These innovative approaches have ultimately promoted larger, more technologically advanced renewable energy projects with a greater potential to meet national energy goals and reduce carbon emissions (CE Delft, 2016). The National Energy Outlook 2015 states, "the scheme has introduced cutting-edge renewable technologies and supported numerous pilot projects" (PBL, 2015). While initial innovations like the salderingsregeling for solar panels require updates to maintain effectiveness (ACM, 2023), the ongoing development of pilot and demonstration projects underscores the schemes' role in promoting technological and sustainable advancements.

The SDE and SDE+ schemes symbolize innovation by shifting from biomass to wind and solar energy and adopting technology-neutral allocation (ABN AMRO, 2023; Hoogland et al., 2021). They expanded to include a broader range of technologies and $CO_2$ reduction solutions, promoting advanced renewable practices (IEA, 2020a). Initiatives like energy storage, smart grids, and decentralized solar-PV systems highlight their innovative capacity (RVO, 2022b). Despite a lack of innovative solutions to challenges like grid congestion and high energy costs, continuous improvements and stakeholder engagement have increased the innovative edge of the SDE schemes, exemplifying **resilient success** (NOS, 2018; Schellevis, 2021). The CSAF describes resilient success in symbolizing innovation as adopting some innovative and effective approaches with limited exceptions, which aligns with the achievements and remaining challenges described.

### 5.2.6 Normative Compliance

The criterion of normative compliance examines the SDE and SDE+ schemes' adherence to legal standards and societal values. This evaluation assesses the legitimacy of the schemes, their transparency, and compliance with regulatory requirements. It considers how well these schemes conform to established legal frameworks and societal norms, ensuring that they are perceived as rightful and authoritative by the public and stakeholders.

The SDE schemes reflect significant achievements in normative compliance by increasingly aligning with EU-ETS regulations and Dutch climate policies (ABN AMRO, 2023; Klimaatakkoord, n.d.). Additionally, the SDE+ scheme incorporates transparent and accountable processes, enhancing fairness in subsidy allocation and regular evaluations to maintain compliance (CE Delft, 2016). These schemes adhere to stringent regulatory requirements and ensure that projects meet technical, financial, and regulatory standards, which are essential for maintaining process integrity (RVO, 2020). Regular evaluations and adjustments based on stakeholder feedback and expert consultations further reinforce this commitment to normative compliance (CE Delft, 2016). The adherence to transparency and accountability norms, combined with regular adjustments based on expert advice and stakeholder consultation, further reinforces the success of the SDE+ scheme (Hoogland et al., 2021).

Despite these achievements, several challenges complicate normative compliance. A significant issue is grid capacity and cost distribution problems, which undermine the long-term sustainability of current regulations (ACM, 2023; Hoogland et al., 2021). The SDE schemes also show mixed success in meeting normative standards due to criticism over environmental impacts and economic burdens. For instance, the sustainability and costs of biomass energy have been criticized, along with the high costs of Dutch green energy, poor international climate rankings and non-achievement of the 2020 goals (BNNVARA, 2012; NOS, 2016; CBS, 2021; 2016a; 2016c). Infrastructure challenges, particularly in electricity grid capacity, pose additional barriers to achieving full normative compliance, necessitating significant investments for upgrades to meet regulatory standards (RVO, 2022a; 2022b).

In conclusion, the SDE schemes' processes reflect significant achievements in normative compliance by aligning with EU-ETS regulations and Dutch climate policies (ABN AMRO, 2023; Klimaatakkoord, n.d.). The SDE+ scheme enhances transparency and accountability in subsidy allocation and undergoes regular evaluations to maintain compliance (CE Delft, 2016). These schemes meet stringent regulatory requirements, ensuring projects adhere to technical, financial, and regulatory standards, which is crucial for process integrity (RVO, 2020). Despite challenges such as grid capacity issues, economic burdens, and environmental criticisms, the strong adherence to legal and ethical standards within the process dimensions underscores a **resilient success** in normative compliance. The CSAF defines resilient success as maintaining overall support with minor challenges, which fits the situation of strong compliance with some ongoing challenges.

### 5.2.7 Evaluation of Process success

The SDE and SDE+ schemes have successfully aligned with national and European climate policies, significantly increasing renewable energy consumption, and enhancing policy coordination, process adaptability and normative compliance (Wiebes, 2020b; IEA, 2020a; CBS, 2021; Klimaatakkoord, n.d.). Coordination with EU initiatives further strengthens policy compliance (IEA, 2020a). Robust stakeholder engagement has fostered broad support for renewable energy projects (ABN AMRO, 2023). Regular consultations with industry associations and research institutions have enhanced policy adaptability and stakeholder engagement (Hoogland et al., 2021; CE Delft, 2016). However, rapid growth in renewable projects in combination with limited policy adaptations, has caused significant grid congestion, hindering the connections of new renewable energy projects and slowing the achievement of renewable energy goals (RVO, 2022a; 2022b; Schellevis, 2021). The lack of consideration in the subsidy allocation process for external costs related to the projects highlight inefficiencies in the competitive subsidy allocation (Hoogland et al., 2021). Administrative burdens, regulatory hurdles, and uncertainty of subsidy allocation make it more difficult for smaller projects to engage effectively, further challenging stakeholder participation and coordination.

The SDE+ scheme has improved process adaptability through flexible budgeting and expanded eligible technologies, with annual evaluations enabling timely policy adjustments (RVO, 2020; CBS, 2021; PBL, 2020; 2015; 2014). The schemes have maintained strong regulatory adherence, ensuring projects meet technical, financial, and regulatory standards, with regular evaluations and stakeholder feedback reinforcing this commitment (RVO, 2020; CE Delft, 2016; Hoogland et al., 2021). However, the schemes subsidy allocation process tends to favour established technologies, such as solar and wind, even if they are not the most cost-effective, and complex permitting processes slow down project approvals (IEA, 2020a; Hoogland et al., 2021). Opposition from grid capacity issues, economic burdens on consumers, and political resistance to biomass subsidies further complicates implementation and necessitates more responsive policy frameworks (Schellevis, 2021; CE Delft, 2016; NEMO Kennislink, 2015; NOS, 2016).

In summary, the SDE and SDE+ schemes have demonstrated process success by aligning with national and European climate policies, fostering stakeholder engagement, showing process adaptability, and maintaining normative compliance. These achievements have significantly contributed to renewable energy growth and $CO_2$ reduction. However, challenges such as grid congestion, administrative burdens, allocation bias, and unincorporated external costs highlight the need for further enhancements. Despite these challenges, the schemes' ability to increasingly adapt and align with dynamic climate policy environments underscores their resilience, supporting an overall evaluation of **resilient success** of the process dimension.

| **Criteria** | **Evaluation of Success** | **Main Arguments** |
|---|---|---|
| Preserving Policy Goals and Instruments | Resilient Success | Policy maintained core goals, even with the introduction of the SDE++, and adapted to align with broader climate policies. Significant investments and project approvals underscored success, but grid congestion and lock-in effects posed obstacles. |
| Coordination | Conflicted Success | Effective stakeholder engagement and policy integration with national and EU initiatives were noted. Grid congestion, economic inequality, and transparency issues in decision-making processes created coordination challenges. |
| Stakeholder Participation | Resilient Success | Robust participation from SMEs, local communities, and industry associations fostered broad support and policy adaptability. SDE goals guided by the Dutch Climate Agreement included extensive stakeholder participation. Net congestion and uncertainty issues limit stakeholder participation. |

| | | |
|---|---|---|
| Process Adaptability | Resilient Success | SDE+ demonstrated adaptability with flexible budgeting, expanded eligible technologies, and annual evaluations for timely policy adjustments. Favouring established technologies, regulatory barriers, and omitting external effects in subsidy allocation limited comprehensive adaptability. |
| Symbolising Innovation | Resilient Success | Policy introduced significant innovations like competitive bidding and technology-neutral approaches, promoting a diverse energy mix and larger renewable energy projects. Despite challenges like grid congestion, continuous improvements maintained its innovative edge. |
| Normative Compliance | Resilient Success | Policy adhered to regulatory requirements and maintained legal and ethical standards. Alignment with national and EU climate policies and transparent subsidy allocation processes reinforced normative compliance. Equity issues pose challenges to normative compliance. |

**Table 11:** Evaluations of success for the criteria in the process dimension

## 5.3 Political Dimension

### 5.3.1 Enhancing Electoral Prospects

The criterion of enhancing electoral prospects examines the extent to which the SDE and SDE+ schemes have influenced the political landscape by aligning with public sentiment and ambitious climate goals. This evaluation focuses on how these schemes have garnered public and political support, contributed to the reputation of political parties advocating these policies, and impacted electoral outcomes.

The SDE and SDE+ schemes have demonstrated notable success in enhancing electoral prospects due to their alignment with public sentiment and ambitious climate goals. The schemes have garnered broad public support for renewable energy projects, boosting electoral support for parties advocating these policies (ABN AMRO, 2023). The ambitious goals set by the schemes, such as the renewable energy and GHG targets for 2020, 2030 and 2050, have demonstrated a commitment to sustainability, further enhancing the electoral prospects of supporting political parties (IEA, 2020a). The visible impact on renewable energy adoption, including significant progress in capacity and compliance with EU targets, underscores the schemes' success in aligning with public and political priorities (CBS, 2024c; European Commission, n.d.). The introduction of technology-neutral approaches and competitive bidding processes also highlights the innovative aspects that resonate well with the electorate (Hoogland et al., 2021). Public approval ratings for renewable energy policies have been high, partly due to the success of the SDE+ scheme (PBL, 2015). Additionally, a review of Dutch energy policies highlights strong political endorsements for the schemes, indicating expected success in enhancing electoral prospects (Rijksoverheid, 2014). Government initiatives to increase renewable energy have positive political implications, further enhancing the SDE+ scheme's political prospects (Ministry of Economic Affairs and Climate Policy, 2015). The initial subsidising of solar panels and active participation of and measures to involve large groups of stakeholders have increased support for climate policy and improved the government's image (Huitema et al., 2011; Meadowcroft, 2009; IEA, 2020a).

However, the schemes have faced significant criticisms that temper their overall impact on electoral prospects. The initial promotion of solar panels through the salderingsregeling was innovative, but has now become a contentious issue, with current inefficiencies and inequitable distribution of economic benefits and burdens leading to political criticism and public dissatisfaction (ACM, 2023). The ongoing debates about phasing out the salderingsregeling in the Dutch Parliament further exacerbate these issues, impacting public perception and political viability (Parool, 2023). Perceived inequalities due to administrative burdens and regulatory hurdles, particularly affecting smaller projects and less well-resourced stakeholders, could negatively influence public opinion of the policy and reduce electoral prospects (CE Delft, 2016; ABN AMRO, 2023). Additionally, resulting issues from the SDE, such as grid congestion problems due to the rapid increase in renewable energy projects, have highlighted infrastructural inadequacies, negatively affecting public confidence in governmental policy (RVO, 2022a; 2022b). The Netherlands did not reach its goal of 14% renewable energy in 2020, reaching only 11.1%, which negatively reflects on the government's ability to reach set goals (CBS, 2021). Public dissatisfaction with the high costs of the energy transition and energy in general and the Netherlands' poor performance in European climate rankings further complicate the program's influence on electoral prospects (van Engen, 2020; van der Horst, 2018; Trouw, 2015; Visser, 2016; CBS, 2016c).

These factors collectively indicate that while the SDE and SDE+ schemes have made substantial progress, gained significant public support, and provided tangible results, the criticisms and challenges they face render their success in enhancing electoral prospects **conflicted**. According to the CSAF, conflicted success in enhancing electoral prospects occurs when some political support is gained, but significant opposition affects the reputation. The combination of political opposition to subsidy mechanisms, public dissatisfaction with energy costs, and infrastructural challenges reflects these mixed outcomes in the political landscape of the Netherlands. Thus, the evaluation aligns with **conflicted success**, where the schemes contribute to electoral support, but substantial challenges and reputational risks persist.

### 5.3.2 Controlling the Policy Agenda

This criterion evaluates the effectiveness of the SDE and SDE+ schemes in shaping and directing the broader energy policy agenda. This criterion assesses the schemes' influence on policy formulation, their integration with national and EU directives, and their role in easing the governance process.

The SDE and SDE+ schemes have been increasingly successful in controlling the policy agenda by aligning with national and EU climate policies and setting clear targets for renewable energy production and GHG reduction by 2030 and 2050. The Netherlands is obligated to implement broader European climate targets and agreements into national policies, and the SDE+ policy is at the core of achieving these renewable energy targets (EU Monitor, n.d.; Hoogland et al., 2021; RVO, 2024). The policy shows strong alignment with EU directives and national renewable energy targets, which significantly shapes the policy agenda by ensuring compliance with these mandates. These schemes have reinforced the importance of renewable energy and emissions reduction in Dutch energy policy, significantly shaping the policy agenda (ABN AMRO, 2023; IEA, 2020a). Moreover, the regular updates and expansions to these schemes reflect their central role in the renewable energy strategy and their capacity to adapt to new challenges, further cementing their position in the policy agenda (RVO, 2024; Hoogland et al., 2021).

The introduction of the SDE++ where the core values and mechanisms of the policy are still in place illustrates significant control over the policy agenda. The schemes' influence on the development of successor programs like the SDE++ and their integration with other climate policies underscores their significant role in policy direction and broader climate strategies (Hoogland et al., 2021; PBL, 2020; Hoogland et al., 2019). The SDE+ scheme has played a significant role in shaping the renewable energy policy agenda, as the National Energy Outlook 2015 states, "the scheme has been instrumental in setting ambitious renewable energy targets and priorities" (PBL, 2015). Furthermore, a government report notes, "the SDE+ has influenced both national and EU energy policies, contributing to long-term strategic planning" (Rijksoverheid, 2014). In recent years, the increase in renewable energy has been outpacing the European average, indicating successful policy even while starting from a lower baseline (CBS, 2024c). This alignment with national and EU policies and its influence on energy policy discussions demonstrate its role in controlling the policy agenda. The continuous support for renewable energy technologies and the alignment with broader EU policies have ensured that these schemes remain central to the Dutch government's strategic energy and climate goals, highlighting their success in controlling the policy agenda (PBL, 2020; Hoogland et al., 2021).

However, the schemes have faced significant challenges that highlight a conflicted success in controlling the policy agenda. Grid congestion and the high costs of green energy have created obstacles that impact the schemes' effectiveness on the control of the policy agenda (RVO, 2022b; CE Delft, 2016; NOS, 2017; 2018). Political opposition to specific subsidy mechanisms, such as those for biomass, and public dissatisfaction with high energy costs further complicate the schemes' influence on the control of policy agenda (NOS, 2016). Additionally, public dissatisfaction due to the slow progress in renewable energy adoption and the Netherlands' poor performance in climate rankings has further complicated the schemes' influence on the policy agenda (NEMO Kennislink, 2015; NRC, 2017; CBS, 2016a; 2016b; FluxEnergie; 2017a).

The SDE and SDE+ schemes have demonstrated substantial achievements in aligning national policies with EU climate directives, setting clear renewable energy and GHG reduction targets for 2030 and 2050. Despite these successes, challenges such as grid congestion, high costs of green energy, and political opposition have created obstacles. However, the schemes' influence on successor programs like the SDE++ and their significant role in national and broader climate strategies highlight their resilience and effectiveness. Given the schemes' relative stability and effectiveness compared to other countries, such as Spain and the UK, the evaluation of the control of the policy agenda can be considered **resilient success**, where the policy agenda is controlled despite minor difficulties, maintaining governance effectiveness.

### 5.3.3 Political Fairness

The criterion of political fairness assesses the equity of the SDE and SDE+ schemes in distributing benefits and burdens across different societal groups. This evaluation examines how fairly the schemes have impacted and facilitated various stakeholders.

These schemes have demonstrated a commitment to transparency and equity in subsidy allocation, ensuring a level playing field for various renewable energy technologies and preventing favouritism (Hoogland et al., 2021; ABN AMRO, 2023). The inclusive approach to developing the Climate Agreement, which involved over 100 stakeholders and influences the SDEs goals, underscores the schemes' efforts to balance diverse political interests and promote fair distribution of benefits (IEA, 2020a; Klimaatakkoord, n.d.). Additionally, the alignment of these schemes with national and EU climate policies supports broader political and environmental goals, reinforcing their credibility in the political landscape (PBL, 2020). The technology-neutral nature of SDE+ promotes competition and fairness in subsidy allocation, which has been acknowledged as a key factor in its success (CE Delft, 2016). Furthermore, the schemes' success in driving renewable energy projects has strengthened the ruling parties' position by showcasing their ability to achieve tangible environmental and economic benefits, thus enhancing their political support, and demonstrating effective governance (PBL, 2015; CBS, 2024c).

However, significant challenges persist that temper the overall success. The salderingsregeling has resulted in an inequitable distribution of costs, disproportionately benefiting higher-income homeowners, and creating political tension (ACM, 2023). Administrative burdens and regulatory complexities have created barriers for smaller projects and less well-resourced stakeholders, raising political concerns about inclusivity and fairness (CE Delft, 2016). Moreover, public dissatisfaction with high energy costs and the economic burden on lower-income households have led to political backlash and complicated the perception of fairness (NOS, 2018; NRC, 2017). Despite continuous efforts to address these issues through policy adjustments and stakeholder consultations, the mixed outcomes indicate a conflicted success in achieving political fairness. The National Energy Outlook 2015 report points out that while there are efforts to make electricity greener, other areas like transport and heating lag behind, leading to an uneven societal impact (PBL, 2015; Ekker, 2017). Additionally, perceived unfairness in subsidy distribution, as noted in reports highlighting high land rents primarily benefiting landowners and disparities in network readiness affecting renewable energy integration, suggests mixed outcomes in terms of equitable benefit distribution and political fairness (van der Scheer, 2011; Weissink, 2015; van der Meulen, 2010).

The SDE and SDE+ schemes have promoted transparency and equity in subsidy allocation, fostering competition and supporting diverse technologies. However, issues like the inequitable distribution of costs through the salderingsregeling and administrative burdens have created political tensions and public dissatisfaction. The CSAF defines **conflicted success** in political fairness as achieving some fairness but with significant opposition arising due to perceived inequities. These mixed outcomes suggest that while the schemes achieve some fairness, the presence of significant opposition due to these perceived inequities results in a **conflicted success** in terms of political fairness.

### 5.3.4 Sustaining Government Values

Sustaining government values evaluates how well the SDE and SDE+ schemes align with and support the Dutch government's overarching principles and long-term vision for sustainable energy and emission reduction. This criterion focuses on the consistency of these schemes with government values, their contribution to achieving climate goals, and their alignment with broader policy objectives.

The SDE+ policy demonstrates a robust alignment with the Dutch government's long-term vision for sustainable energy and emission reduction. It effectively supports national climate goals by promoting the adoption of renewable energy sources, thereby contributing significantly to the country's environmental sustainability targets. Reports highlight the policy's role in stimulating clean investments and achieving substantial progress towards renewable energy goals (ABN AMRO, 2023; CBS, 2021;2024c). Additionally, the SDE+ policy fosters economic growth through the development of renewable energy industries and supports innovation within the energy sector. This is evident in findings that emphasize the policy's encouragement of new technologies and approaches, and reports on the competitive processes that drive innovation (International Energy Agency, 2020; RVO, 2018). Furthermore, the policy ensures compliance with EU renewable energy and emission reduction targets (Rijksoverheid, n.d.; European Commission, n.d.). The scheme's alignment with government values and long-term vision is robust, as highlighted by the statement, "These subsidy schemes are appropriate and popular to stimulate and incentivize corresponding clean investments," indicating strong alignment with governmental priorities. The significant budget allocations and positive outcomes illustrate strong government commitment and leadership (Ministry of Economic Affairs and Climate Policy, 2018). Overall, the SDE+ policy's alignment with national and international sustainability goals underscores its strategic importance and success in sustaining government values.

Despite its initial alignment with government values discussed in the first paragraph, this does not describe the full extent of government values. When the effects of the SDE+ policy are compared with the Dutch principles of good governance, several conflicts arise (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2009). Reports indicate that while the policy aligns with the Dutch government's vision for renewable energy adoption, it requires updates to address current challenges and remain effective (ACM, 2023). The principle of legitimacy is also at stake, with high costs and political opposition to certain subsidies, such as biomass, undermining public support and hindering progress (NOS, 2016; Ecofys, Natuur & Milieu, 2012). Furthermore, the value of integrity and transparency is challenged by public dissatisfaction with high energy costs and the economic burden on lower-income households, leading to political backlash and a perception of unfairness (NOS, 2018; NRC, 2017). Importantly, the inequitable distribution of benefits and burdens, where higher-income homeowners benefit more from subsidies like the salderingsregeling, goes against the principle of fairness and equity, exacerbating social and political tensions (ACM, 2023).

The SDE and SDE+ schemes align well with the Dutch government's long-term vision for sustainable energy and emission reduction, promoting renewable energy adoption and economic growth through clean investments and innovation. However, issues such as high costs, political opposition to certain subsidies, and the inequitable distribution of benefits undermine public support and challenge principles of legitimacy, integrity, and fairness. According to the CSAF, **conflicted success** in sustaining government values involves maintaining some consistency with government principles but with significant conflicts. Therefore, while these schemes maintain some consistency with the Dutch government's principles and long-term vision, significant conflicts due to perceived inequities and governance challenges reflect a **conflicted success** in sustaining government values.

### 5.3.5 Normative Compliance

The criterion of normative compliance examines the SDE and SDE+ schemes' adherence to legal standards and societal values. This evaluation assesses the legitimacy of the schemes, their transparency, and compliance with regulatory requirements. It considers how well these schemes conform to established legal frameworks and societal norms, ensuring that they are perceived as rightful and authoritative by the public and stakeholders.

The SDE and SDE+ schemes have shown resilient success in normative compliance within the political dimension by consistently aligning with national and EU regulations, ensuring transparency, and upholding ethical standards. These schemes have robustly complied with the EU Emissions Trading System (EU-ETS) and Dutch climate policies, thereby enhancing their political viability and securing support from both domestic and international stakeholders (ABN AMRO, 2023). The alignment with key EU directives such as the Clean Energy Package and the Renewable Energy Directive underscores the schemes' strong normative framework, reinforcing the Netherlands' commitment to broader climate goals (International Energy Agency, 2020). Additionally, the schemes have facilitated significant investments in renewable energy infrastructure, promoting economic growth and innovation. The commitment to transparency in subsidy allocation and the incorporation of regular evaluations and stakeholder feedback further bolster the schemes' political credibility and effectiveness (CE Delft, 2016).

Despite these achievements, significant challenges persist that temper the overall success of the SDE and SDE+ schemes in normative compliance. Grid capacity constraints and the uneven distribution of costs due to the salderingsregeling have raised concerns about long-term sustainability and equity (ACM, 2023). Administrative burdens and regulatory complexities have created barriers for smaller projects and less well-resourced stakeholders, complicating the normative landscape (CE Delft, 2016). Additionally, the high costs associated with renewable energy projects and public dissatisfaction with energy prices have led to political opposition and undermined public support for certain subsidy mechanisms, such as biomass (NOS, 2018; NRC, 2017). The benefits of renewable energy subsidies have not been evenly distributed, with higher-income households gaining more advantages, exacerbating social and political tensions (Hoogland et al., 2021). Current debates highlight potential ethical violations due to the inequitable distribution of economic benefits from the salderingsregeling and political opposition to its phasing out, reflecting harshly on the political dimension as it impacts opposition and ease of governing (Parool, 2023).

The SDE and SDE+ schemes have demonstrated significant achievements in aligning with national and EU regulations, promoting transparency, and fostering investments in renewable energy. However, challenges such as grid capacity constraints, inequitable cost distribution, and public dissatisfaction with high energy prices temper this success. According to the CSAF, **conflicted success** in normative compliance is characterized by meeting some standards but with significant compliance issues leading to controversy. The ongoing issues, particularly concerns surrounding the salderingsregeling, highlight a **conflicted success** in normative compliance within the political dimension, impacting both political support and governance.

### 5.3.6 Evaluation of Political success

The SDE and SDE+ schemes have significantly boosted political support due to their alignment with public sentiment and ambitious climate goals. These schemes have garnered broad public support for renewable energy projects, enhancing the electoral prospects for parties advocating these policies (ABN AMRO, 2023). The ambitious GHG reduction targets for 2030 and 2050 demonstrate a commitment to sustainability, further solidifying political backing (International Energy Agency, 2020). Additionally, the schemes have influenced policy direction, exemplified by the development of the SDE++ program and integration with other climate policies, highlighting their role in shaping the policy agenda (Hoogland et al., 2021; PBL, 2020). However, the schemes face criticisms such as inefficiencies in the salderingsregeling, high costs, and grid congestion, which temper their overall impact on electoral prospects (ACM, 2023; NOS, 2018; RVO, 2022a). Public dissatisfaction with the Netherlands' failure to meet renewable energy targets and high energy costs further complicates the schemes' influence on the policy agenda and electoral success (CBS, 2021; van Engen, 2020).

The SDE and SDE+ schemes exhibit a conflicted success in political fairness and normative compliance. They have demonstrated a commitment to transparency and equity in subsidy allocation, promoting competition and fairness (Hoogland et al., 2021; ABN AMRO, 2023). The inclusive approach in developing the Climate Agreement underscores efforts to balance diverse political interests and promote fair distribution of benefits (International Energy Agency, 2020). The schemes' alignment with national and EU climate policies supports broader political and environmental goals, reinforcing their credibility (PBL, 2020). However, the salderingsregeling has resulted in an inequitable distribution of costs, benefiting higher-income homeowners, and creating political tension (ACM, 2023). High administrative burdens and regulatory complexities create barriers for smaller projects and less well-resourced stakeholders, raising concerns about inclusivity and fairness (CE Delft, 2016). Public dissatisfaction with high energy costs and the economic burden on lower-income households have led to political backlash, complicating perceptions of fairness and normative compliance (NOS, 2018; NRC, 2017).

The SDE+ policy aligns robustly with the Dutch government's long-term vision for sustainable energy and emission reduction, promoting renewable energy adoption and economic growth through the development of renewable energy industries (Rijksoverheid, n.d.; Hoogland et al., 2021). The policy's encouragement of new technologies and competitive processes drives innovation and compliance with EU renewable energy targets (International Energy Agency, 2020; RVO, 2018). However, challenges such as high administrative burdens and regulatory complexities create barriers for smaller projects, impacting the value of participation and inclusivity (CE Delft, 2016). The high costs of green energy and political opposition to certain subsidies, such as biomass, undermine public support and complicate the principle of legitimacy (NOS, 2016; Ecofys, Natuur & Milieu, 2012). Public dissatisfaction with high energy costs and inequitable benefit distribution further challenge the principles of fairness and equity, exacerbating social and political tensions (ACM, 2023; NOS, 2018; NRC, 2017). Additionally, significant opposition has arisen due to grid capacity constraints, congestion issues, and the phase-out of the net metering arrangement, which hinders efficient renewable energy integration and sparks public and political resistance (ACM, 2023; NOS, 2018).

The SDE and SDE+ schemes have demonstrated significant achievements in enhancing electoral prospects, controlling the policy agenda, ensuring political fairness, sustaining government values, and maintaining normative compliance. These successes have contributed to renewable energy growth and political support for sustainability initiatives. However, challenges such as grid congestion, administrative burdens, inequalities, and public dissatisfaction with energy costs highlight shortcomings. The increasing political opposition, failure to meet the 2020 renewable energy target, and complexities in equitable distribution of benefits and burdens lead to a **conflicted** success evaluation. While the schemes' alignment with national and EU climate policies and their ability to adapt to dynamic political environments are commendable, the cumulative challenges suggest that the political dimension's success is more accurately characterised as conflicted rather than resilient.

| **Criteria** | **Evaluation of Success** | **Main Arguments** |
|---|---|---|
| Enhancing Electoral Prospects | Conflicted Success | Policy aligned with public sentiment and climate goals, gaining broad support, and boosting political backing. Inefficiencies, high costs, and unmet targets tempered the overall impact on electoral prospects. |
| Controlling the Policy Agenda | Resilient Success | Policy strongly influenced national and EU climate policies, shaping the renewable energy agenda, and maintaining centrality in strategic energy goals. Economic barriers and political opposition presented significant challenges. |

| | | |
|---|---|---|
| Political Fairness | Conflicted Success | Policy ensured transparency and equity in subsidy allocation, promoting fairness. Salderingsregeling's regressive effects, high administrative burdens, and public dissatisfaction with high energy costs highlighted fairness issues. |
| Sustaining Government Values | Conflicted Success | Policy aligned with the government's vision for sustainable energy and emission reduction, supporting economic growth and innovation. Regulatory and infrastructural hurdles to participation and public dissatisfaction with energy costs challenged the principles of good governance. |
| Normative Compliance | Conflicted Success | Policy complied with national and EU regulations, promoting transparency and ethical standards. Issues like grid capacity constraints and uneven cost distribution due to salderingsregeling raised concerns about long-term sustainability and equity. |

**Table 12:** Evaluations of success for the criteria in the political dimension

## 5.4 Insights and Implications

This chapter seeks to connect the findings from the previous sections with the broader societal objectives that underpin this research. While the SDE(+) policy has been evaluated through programmatic, process, and political lenses, its ultimate success is determined by how well it advances key societal goals such as sustainable energy production, equity, and climate resilience.

Building on the evaluations, which highlighted both significant contributions and key challenges—such as unmet renewable energy targets, grid capacity issues, and socio-economic inequalities—this chapter will analyse how these outcomes align with the overarching goals of the policy. By bridging the gap between specific results and their broader societal implications, we aim to provide a deeper understanding of the policy's overall impact. This analysis will also offer insights into how these findings can inform the development of more effective and equitable climate policies in the future.

## 5.4.1 Linking Findings to Societal Value

### 5.4.1.1 Impact on Renewable Energy Goals

One of the primary objectives of the SDE(+) policy was to significantly contribute to the Netherlands' renewable energy targets, thereby advancing the country's overall climate goals. The programmatic evaluation revealed a conflicted success in achieving these goals, reflecting both significant advancements and notable shortcomings. The policy has catalysed substantial growth in renewable energy capacity, particularly in solar photovoltaic (PV) and wind energy sectors, and developing into a resilient success in efficiency through the introduction of competitive bidding and phased subsidy applications. This has positioned the Netherlands as a leader in solar PV per capita in Europe, underscoring the policy's effectiveness in promoting specific renewable technologies and achieving resilient success in meeting domain-specific criteria.

However, despite these achievements, the policy fell short of the 2020 renewable energy targets, achieving only 11.1% renewable energy in the overall energy mix against the planned 14%. This shortfall aligns with the precarious to conflicted success in the achievement of policy goals, highlighting the complexity of scaling up renewable energy infrastructure at the pace required to meet ambitious climate targets. While the Netherlands eventually met the renewable energy targets of 2021 and 2023, the ongoing challenges, such as project delays, grid capacity bottlenecks, and underestimation of infrastructural demands, underscore the conflicted success in programmatic adaptability. These issues point to limitations in the policy's design, which did not fully account for the infrastructural and logistical challenges inherent in the energy transition, particularly in a highly developed and densely populated country like the Netherlands.

Moreover, the focus on increasing renewable electricity production, while essential, has inadvertently created a significant mismatch between electricity and heat production and consumption. Current technologies and policies, including the SDE(+), are heavily skewed towards the rapid expansion of renewable electricity, leaving the growth in renewable heat production lagging behind, indicating challenges in achieving programmatic fairness and adaptability. This imbalance is particularly concerning given the persistent issues with grid congestion, which already limits the integration of renewable electricity into the grid and threatens the efficiency gains associated with the policy. If this trend continues, the Netherlands risks exacerbating the disparity between renewable electricity and heat, potentially undermining the holistic approach required to meet climate goals, as heat represents a significant portion of the energy demand. The projections indicating that by 2030, a high percentage of electricity will be sourced from renewables while the share of renewable heat remains disproportionately low further highlight this issue.

These findings suggest that while the SDE(+) policy has made significant strides in increasing renewable energy production, its impact on the broader societal goal of a sustainable energy transition remains conflicted.

#### 5.4.1.2 Equity and Fairness in Policy Outcomes

Another critical societal objective that the SDE(+) policy aimed to address is the equitable distribution of benefits and burdens associated with the energy transition. The evaluations of the policy's programmatic, process, and political dimensions reveal significant disparities in how these benefits and burdens are shared across different societal groups, contributing to a precarious success in programmatic fairness and conflicted success in political fairness.

The net metering scheme ('salderingsregeling'), embedded in combination with the SDE(+) policy, has been particularly successful in incentivizing the adoption of solar PV systems among households, which reflects a resilient success in promoting renewable energy technologies. However, this success has been unevenly distributed, with wealthier households—who have the financial means to invest in solar panels—reaping the most benefits. This scenario underscores the precarious success in programmatic fairness, where lower-income households are less able to participate in and benefit from the renewable energy incentives while still bearing the costs through their energy bills. The inequities are further exacerbated as the subsidy application process places higher economic burdens on less resourceful stakeholders. The exceptionally high costs of green energy in the Netherlands, compounded by external factors such as the cut-off from Russian gas, have significantly increased overall energy prices, intensifying the financial pressure on lower-income households, and leading to conflicted political success.

This inequity raises important concerns about the societal impact of the policy, particularly regarding its success in ensuring a fair and inclusive energy transition. While the policy has indeed contributed to a substantial increase in renewable energy production, it has also unintentionally widened socio-economic disparities, contradicting the societal goal of equity that is central to the energy transition, as reflected in the evaluations of programmatic and political fairness.

#### 5.4.1.3 Long-term Sustainability and Resilience

The long-term sustainability and resilience of the SDE(+) policy are crucial to its enduring success and societal impact. The evaluations, particularly in the process and political dimensions, reveal a combination of resilient and conflicted successes, which collectively shape the policy's potential for sustainability.

One of the strongest arguments supporting the policy’s long-term sustainability is its adaptability and continued existence, as highlighted by the resilient success in process adaptability, preserving policy goals and instruments, and control of policy agenda. The SDE(+) policy has shown a consistent ability to adjust subsidy levels in response to market conditions, technological advancements, and shifting renewable energy targets. The transitions from SDE to SDE+ and subsequently to SDE++ reflect a concerted effort to enhance the policy's alignment with national and EU directives and goals. This flexibility has been instrumental in maintaining the policy’s relevance and effectiveness over time. The policy's frequent evaluations by independent parties, and the subsequent incorporation of their advice into new adaptations, further reflect resilient stakeholder participation by ensuring that it remains responsive to emerging challenges. These factors collectively support the argument that the SDE(+) policy is increasingly well-positioned to sustain its impact over the long term.

However, significant challenges identified in the evaluations cast doubt on the policy’s long-term resilience, particularly concerning grid capacity and stakeholder engagement. The strain on the grid, exacerbated by the rapid expansion of renewable energy installations, highlights a conflicted success in meeting domain-specific criteria and presents a serious risk to the continuity and reliability of the energy supply. This bottleneck limits the integration of current and future renewable energy technologies, which could severely impede the energy transition and undermine the policy's long-term sustainability by the conflicted success in achieving renewable energy targets. This challenge emphasizes the need for a more integrated approach to policy design—one that accounts for the infrastructural and logistical demands of a large-scale renewable energy transition. Additionally, gaps in stakeholder engagement, particularly with local communities affected by renewable energy projects, do challenge the policy's resilience.

Politically, while the SDE(+) policy has maintained broad government support—evidenced by a resilient success in controlling the policy agenda—ongoing public debates about the fairness of the energy transition, distributional impacts, and the high costs of green energy in the Netherlands highlight areas of concern. These issues reflect a conflicted success in sustaining government values and political fairness, suggesting that the policy’s long-term political backing may be at risk unless these concerns are adequately addressed. Transparent and inclusive policymaking processes are essential to securing the long-term sustainability and resilience of the SDE(+) policy, ensuring that it continues to contribute effectively to the Netherlands' climate goals.

#### 5.4.1.4 Broader Implications for Policy Design

The evaluation of the SDE(+) policy reveals several critical implications for the design of future climate policies, emphasizing the need for a more integrated and equitable approach. The challenges identified in the programmatic, process, and political dimensions underscore the importance of designing policies that can effectively navigate the complexities of a large-scale energy transition while remaining aligned with societal goals.

Addressing equity from the outset is crucial for future policy design, particularly given the precarious success observed in programmatic and conflicted success in political fairness. Ensuring that all societal groups, including economically disadvantaged populations, can participate in and benefit from renewable energy initiatives is essential. This could involve targeted financial support, community-based renewable energy projects designed to redistribute benefits more equitably and removing the net metering scheme. These measures are critical to avoiding the socio-economic disparities that have emerged under the SDE(+) policy and are necessary for fostering a truly inclusive energy transition.

The mismatch between renewable electricity and heat production presents both a challenge and an opportunity. The conflicted success in meeting domain-specific criteria, particularly with regard to grid capacity, highlights the need for a more strategic approach to balancing different energy sectors. Focusing on increasing renewable heat production, while gradually addressing grid congestion, offers a pathway to advancing the energy transition without exacerbating existing infrastructural constraints. This dual approach could create a more balanced and resilient energy system, ensuring that progress in one area does not undermine the broader climate goals.

Finally, achieving long-term sustainability and resilience necessitates a holistic and integrated policy framework. The evaluations underscore resilient successes in areas like process adaptability, yet they also reveal persistent challenges, particularly in grid congestion and fairness. To move towards a more balanced and sustainable energy mix, it is crucial to incorporate external costs into the subsidy allocation process and accurately account for the infrastructural demands of renewable energy projects. By addressing these inefficiencies, future policies can be better aligned with the Netherlands' ambitious climate goals, ensuring they are both equitable and effective in driving the energy transition forward.

### 5.4.2 Interactions of the Policy Success Framework

The success of the SDE(+) policy, like any complex climate policy, cannot be fully understood by looking at individual dimensions—programmatic, process, or political—in isolation. Instead, the true measure of its effectiveness and societal impact emerges from the interplay between these dimensions. By examining how these elements interact and reinforce or undermine each other, we gain a more nuanced understanding of the policy's overall success and can draw conclusions for the design of future climate policies.

#### 5.4.2.1 Interrelation of Dimensions

The SDE(+) policy's achievements in renewable energy production—a key aspect of its programmatic success—are closely linked to the robustness of the processes that underlie its implementation. For instance, while the policy succeeded in significantly boosting solar photovoltaic (PV) and onshore wind capacities, this success is contingent upon effective subsidy allocation processes, coordination, stakeholder engagement, and adaptive governance. The challenges faced in grid capacity management and the socio-economic inequalities exacerbated by the net metering scheme underscore the critical importance of a strong process dimension. These process-related issues directly influence the policy's ability to meet its renewable energy targets, demonstrating that even well-designed programmatic goals can be undermined by weaknesses in implementation processes. The grid capacity issues also reflect how current programmatic success might impede future programmatic success, since current grid issues related to new renewable energy infrastructure impede the connection of future renewable energy infrastructures.

A well-designed process dimension can still lead to failure in the programmatic dimension, this is especially true when the subsidy amount is simply too low or when equity issues outweigh the positive effect of the policy. Another important fact is the delay between improvements in the policy process and subsidy amounts and programmatic results. Since projects have to be realised 10 years after the allocation of the subsidy, it takes a while before the impact of changes becomes visible in the programmatic results. This is reflected in the explosive increase in subsidy allocation in 2016 only showing similar large increases in renewable energy share around 2020. This indicates the importance of frequent and early evaluations of resource allocation and renewable energy and GHG targets to ensure compliance with such targets.

Shortfalls in either the process or programmatic dimension are linked to the political opposition that the government may face. The inability to meet programmatic goals of 2020 have reflected poorly on the government and inequality issues caused by the combination of SDE and net metering have spurred multiple political debates on the subject. External challenges such a grid capacity issues have caused backlash from political parties and have caused tensions between grid operators and the government. High energy costs, partly caused by the high costs of green energy, have caused significant political and public backlash, especially during the explosive rise of costs after the cut-off from Russian gas.

The political sustainability of the SDE(+) policy is closely tied to the success of its process management, where stakeholder engagement, coordination, adaptability, and normative compliance play critical roles. Effective inclusion of diverse stakeholders has fostered broad support, reinforcing its political legitimacy. Normative compliance, which involves adherence to legal standards and societal norms, is a key factor in both the process and political dimensions. When the policy processes are transparent, equitable, and legally sound, they build public trust and political support. However, challenges like grid congestion, inequitable benefit distribution, and poor coordination between national and regional governments have exposed process failures, sparking public debates and undermining political trust. These shortcomings directly impact the policy’s political success, demonstrating that success in the process dimension, is crucial for maintaining public confidence and ensuring the long-term political viability of the SDE(+) policy.

Furthermore, the political backing that the SDE(+) policy has enjoyed, reflected in its continuation and expansion into the SDE++ scheme, plays a crucial role in sustaining its process and programmatic success. Political support ensures that the policy receives the necessary resources and legislative attention to meet its goals. However, this support is conditional on the policy’s ability to deliver tangible results—such as increases in renewable energy production—while also addressing emerging challenges like public opposition and infrastructure bottlenecks. This dynamic illustrates the reciprocal relationship between political success and the process and programmatic success, where each dimension reinforces or potentially undermines the other.

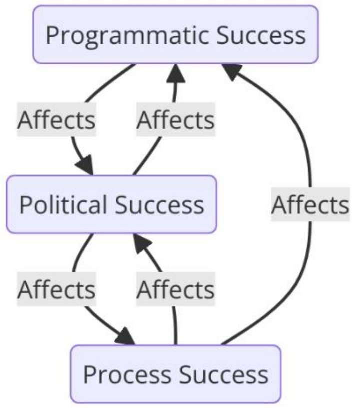

**Figure 7:** Interconnections of the three dimensions

*Figure 7* shows how the connections of the dimensions could be visualised:

- Programmatic success affects political success since programmatic challenges such as not making renewable energy targets and fairness issues negatively impact the political dimension by increasing political opposition and decreasing public and political support. Programmatic achievements which align with sustainable goals enhance governments reputation.
- Process success affects political success since stakeholder engagement and normative compliance issues negatively impact political success.
- Process success affects programmatic success, since a good process is necessary to reach programmatic success. However, a well-designed process success can still lead to programmatic failure.
- Political success affects programmatic success since political support is necessary to give the SDE(+) subsidy sufficient funding and resources to reach the climate goals and achieve programmatic success.
- Political success affects process success. Since political support is necessary to continue adapting the SDE while continuing its core values. This is reflected by how the SDE has evolved to the SDE+ and later to the SDE++.

There is also a case to be made for adding a connection between the programmatic dimension and the process dimension. Failures in the programmatic dimension could incentivise changes in the process dimension. However, this study has not found any direct effect from the success of the programmatic dimension to the success of the process dimension and has therefore excluded the connection.

#### 5.4.2.2 Implications for Policy Design

The interconnectedness of the process, programmatic, and political dimensions in the SDE(+) policy significantly complicates the policy's design and implementation. The success or failure in one dimension does not occur in isolation; it invariably impacts the others. For instance, grid capacity issues, which arise from the programmatic success of rapidly expanding renewable energy production, have created delays and inequities that ripple through the process and political dimensions. These challenges highlight that effective policy design must account for the multifaceted nature of success across all dimensions. Addressing grid congestion requires not only technical solutions but also policy adjustments, illustrating how deeply interwoven these dimensions are.

This interdependence increases the complexity of policy success, as it means that shortcomings in one area can jeopardize the entire policy's effectiveness. The SDE(+) policy, situated as a core element of the Dutch climate transition, cannot afford to be treated as a token policy that achieves political success at the expense of programmatic or process failures. The Netherlands' commitment to internationally set climate goals demands that the SDE(+) policy delivers on all fronts—meeting its renewable energy targets while ensuring fair and effective processes. The interconnected dimensions mean that a failure to achieve programmatic or process success would not only undermine political support but also threaten the Netherlands' ability to meet its climate obligations on the international stage.

Given this complex interdependence, the implications for policy design are significant. The SDE(+) policy must be (re)designed with a holistic approach that integrates considerations across all dimensions. This means creating adaptable frameworks that allow for ongoing stakeholder engagement, equitable distribution of resources, and the anticipation of challenges such as grid capacity constraints. By embedding these elements into the policy design from the outset, the SDE(+) policy can better navigate the interrelated challenges of the energy transition, ensuring that it remains robust and effective in achieving its long-term objectives.

# 6. Conclusion and Discussion

In *Chapter 2*, the foundation for evaluating the SDE(+) policy was established by introducing McConnell's (2010) dimensions of policy success: programmatic, process, and political success. These dimensions offer a comprehensive framework for assessing policy performance, extending beyond traditional evaluations that focus primarily on immediate outputs. By incorporating criteria from Huitema et al. (2011), this framework was further refined to address the specific challenges of climate policy, enabling a thorough evaluation of both the direct outcomes and the broader socio-economic and political impacts of the SDE+ policy.

*Chapter 3* provided a policy background of the SDE(+) policy, detailing its objectives, implementation strategy, and the broader context of the Dutch government's energy transition goals. *Chapter 4* described the qualitative research design and methodologies used to evaluate the SDE(+) policy, with a specific adaptation of the theoretical framework to suit the policy's unique aspects. The evaluation results, presented in *Chapter 5*, were based on an analysis of 65 data sources and were structured around McConnell’s (2010) dimensions of success, providing an integrated assessment of the policy's overall performance.

This thesis critically examines the success of the Netherlands' Stimulering Duurzame Energieproductie (SDE(+)) policy, focusing on its process, programmatic, and political dimensions. The study aims to provide an in-depth understanding of the policy's performance within these three critical areas. Therefore, the main research question guiding this thesis is formulated as follows:

*To what extent has the SDE(+) policy been successful in terms of its process, programmatic, and political perspectives?*

**Answer to the main research question**

The SDE(+)'s programmatic success is **conflicted**, with improvements in efficiency, renewable energy production, and increasingly addressing the complexities of climate policy, but unmet renewable energy share targets and unequal outcomes. The SDE(+)'s process success is **resilient** in maintaining the governments core policy goals and instruments and reflects sustained improvement in adaptability, participation and innovation while experiencing shortfalls in the subsidy allocation process and management of infrastructural capacity. Politically the SDE(+)'s success is **conflicted**, with broad political support for sustainable policies and strong alignment with EU directives, but negatively affected by ongoing issues with fairness, public dissatisfaction with high costs and unmet renewable energy targets.

**Programmatic Dimension**

The programmatic success of the SDE+ policy is **conflicted**, marked by significant advancements in efficiency and meeting domain-specific criteria, yet also plagued by substantial challenges in fairness, adaptability, and goal achievement. The policy has been successful in significantly increasing renewable energy production, particularly by achieving 33% of the

Netherlands' renewable energy output through cost-effective subsidy allocation. The inclusion of diverse technologies such as advanced biofuels and geothermal energy demonstrates some adaptability and a commitment to a fair energy mix. However, the failure to meet the 2020 renewable energy target—achieving only 11.1% instead of the aimed 14%—underscores ongoing systemic issues that hinder the policy's effectiveness. These issues, including grid congestion and inequities in policy outcomes, have highlighted the need for more robust strategic planning and a more integrated approach to achieving renewable energy goals.

**Process Dimension**

The SDE+ policy has mostly demonstrated **resilient** process success, such as through its adaptability, reflected in its flexible budgeting and annual evaluations, which allowed for timely policy adjustments, and a number of direct policy adaptations. The policy's alignment with dynamic climate policy environments and strong stakeholder engagement efforts underscores its resilient success in the process dimension. However, challenges remain in managing the rapid expansion of renewable energy projects, which has led to grid congestion and highlighted inefficiencies in process management, such as high administrative burdens. These issues, particularly the need to better manage the integration of new renewable energy projects into the grid, suggest that while the process dimension has shown resilience, there is still significant room for improvement in enhancing the efficiency and effectiveness of policy implementation.

**Political Dimension**

The political success of the SDE+ policy is **conflicted**, characterised by its alignment with national and European climate policies, which has garnered broad political support within the Netherlands. This alignment has ensured the policy's continuation and adaptation over time, maintaining its relevance in the broader climate strategy. However, the policy has faced significant political challenges, particularly in terms of public perception and support. Criticisms of inefficiencies, high costs, unmet renewable energy targets, and grid congestion have tempered its political impact. Public dissatisfaction, especially related to the inequitable effects of the salderingsregeling and the high energy costs borne by lower-income households, has led to increased political scrutiny. These issues have complicated the policy's perceived fairness and normative compliance, suggesting that while the policy remains politically significant, its broader political success is more nuanced and contested.

## 6.1 Comparison to existing literature

### 6.1.1 Academic Literature

The findings of this evaluation align with and expand upon existing academic studies on policy evaluation and renewable energy policies. McConnell's dimensions of policy success—programmatic, process, and political—have been widely used to assess various policy outcomes, providing a comprehensive framework that moves beyond traditional evaluations focusing solely on immediate outputs (McConnell, 2010). This study's holistic approach, particularly when integrated with Huitema et al.'s (2011) criteria for evaluating climate policy, demonstrates the utility of combining these frameworks to capture the multifaceted impacts of climate policies like the SDE(+). Notably, the SDE(+) policy's evaluations across these dimensions highlight the strengths and limitations of the policy in practice, revealing both resilient successes and conflicted areas, which are critical for understanding the broader implications for policy design.

This study, in evaluating the SDE(+) policy using McConnell's (2010) framework, underscores the significance of programmatic adaptability, goal achievement, process adaptability, coordination, stakeholder engagement, and fairness as pivotal criteria for overall policy success. Newman and Head (2015), in their evaluation of Europe's flood emergency management systems, also applied McConnell's framework but emphasized political alignment and operational coordination as primary success determinants. They highlighted the essential role of effective political leadership and rapid resource mobilization in crisis management, linking strong coordination across government levels to programmatic success. While both studies recognise the interconnectedness of dimensions and the potential for political and process weaknesses to undermine programmatic outcomes, the SDE(+) evaluation takes a long-term perspective, focusing on how adaptability and coordination over time influence goal achievement and fairness.

Similarly, Peckham's (2021) study of the Care Act 2014 in England, using McConnell's (2010) framework, emphasised stakeholder engagement and multi-level governance. Both Peckham and this study recognize the importance of stakeholder participation and the complexities of intergovernmental coordination. However, this study extends Peckham's analysis by emphasizing fairness and adaptability in the dimensions, particularly in the context of renewable energy policies. Peckham's focus on governance structures and stakeholder relationships contrasts with this study's focus on how inequitable subsidy distribution and adaptive process management are crucial for the success of the SDE(+) policy.

Grace et al. (2017) evaluated Australia's national mental health strategy with McConnell's (2010) framework, emphasizing organizational and financial policy levers for maintaining stakeholder support and effective resource allocation. Both studies underscore the critical role of stakeholder engagement and process adaptability, but while Grace et al. focused on internal organizational and financial dynamics, this study emphasizes external socio-political factors and fairness issues, highlighting their impact on success and overall policy effectiveness. This broader focus on external challenges, such as grid capacity and socio-economic inequalities, provides a more comprehensive analysis of the factors shaping long-term policy success.

The findings corroborate studies highlighting the importance of efficient subsidy allocation mechanisms in promoting renewable energy production. The competitive bidding process of the SDE+ policy, which achieved significant increases in renewable energy output, mirrors findings in the literature that emphasize the role of market-based approaches in enhancing policy efficiency (Fischer, 2003; Howlett, 2012; Lauber & Mez, 2006). These approaches help ensure that subsidies are allocated to the most cost-effective projects, thereby maximizing the impact of public funds, and promoting innovation within the renewable energy sector. Without such competitive market mechanisms, renewable energy subsidies can quickly become unsustainable, leading to issues like inflated costs and inefficient resource allocation (Couture et al., 2010; del Río & Mir-Artigues, 2014). These challenges are evident in the SDE(+) policy's struggles with grid congestion and fairness, highlighting that while market efficiency is crucial, it must be balanced with infrastructure and equity considerations to ensure long-term sustainability (Haas et al., 2011).

The robust stakeholder engagement and policy adaptability observed in the SDE+ policy align with existing research that underscores the critical role of stakeholder participation and flexible policy design in achieving process success (Huitema et al., 2011; Lafferty & Hovden, 2003). This study's findings, particularly from Chapter 5.4, emphasize that regular consultations with industry associations, research institutions, and local communities facilitated broad-based support for renewable energy projects. These consultations are essential for the acceptance and successful implementation of such projects, as evidenced by the strong backing for SDE+ initiatives (Hoogland et al., 2021). The policy’s ability to adapt through flexible budgeting and the inclusion of diverse renewable technologies highlights its resilient process success, particularly in its responsiveness to stakeholder feedback and technological advancements (Wiebes, 2020; IEA, 2020a). However, the challenges of managing rapid growth and grid congestion underscore the importance of integrating infrastructure readiness into the policy design, a lesson that is critical for future policy frameworks.

The political support garnered by the SDE+ policy through its alignment with ambitious climate goals and public sentiment is well-documented in the literature. Studies have shown that policies aligning with broader socio-political objectives tend to enjoy greater political backing and public acceptance (Jordan & Huitema, 2014a; Hoogland et al., 2021; Wolsink, 2012). However, this evaluation also highlights that the equity challenges, high costs, and failure to meet renewable energy targets significantly impact the policy's political dimension. Equity issues, such as the disproportionate benefits to wealthier households from policies like the salderingsregeling, undermine public trust and create socio-political tensions (Sovacool, 2009; Lockwood, 2013). High costs associated with renewable energy subsidies can lead to public and political backlash, as financial burdens on governments and taxpayers become unsustainable (Haas et al., 2011; del Río & Mir-Artigues, 2014). Additionally, failing to meet targets, such as the 2020 renewable energy goal, erodes political credibility and support, illustrating a gap between policy ambitions and actual outcomes (Lachapelle & Paterson, 2013; van der Waal et al., 2017). These findings suggest that while political alignment is necessary, it must be coupled with robust programmatic and process success to maintain long-term political viability.

In comparison with other evaluations of the SDE(+) policy, this study provides a more nuanced analysis by integrating the McConnell framework with climate-specific criteria. Other studies, such as those by Hoogland et al. (2021) and the IEA (2020a), have recognized the policy’s contributions to renewable energy growth but have not fully explored the interconnected challenges across the different dimensions of success. This study’s approach highlights that while the SDE(+) policy has achieved significant outcomes, the broader success is conflicted, particularly due to the challenges in equity, infrastructure readiness, and stakeholder engagement. By offering a comprehensive evaluation across the programmatic, process, and political dimensions, this study contributes to a deeper understanding of the SDE(+) policy's strengths and limitations, providing critical insights for future policy design.

### 6.1.2 International comparisons

The practical outcomes observed in the SDE+ policy can be contrasted with similar renewable energy policies in Germany, Spain, and the UK, all of which have implemented Feed-in Tariff (FiT) policies aimed at increasing the share of renewable energy and reducing $CO_2$ emissions. Germany's Energiewende initiative, which includes a strong FiT component, has achieved significant success in increasing renewable energy capacity and fostering technological innovation (Agora Energiewende, 2018; Lauber & Mez, 2006). However, Germany has faced challenges related to high costs and grid infrastructure, similar to the administrative burdens and grid congestion issues observed in the SDE+ policy (Lindlein & Mostert, 2005; Huber et al., 2011). Spain's FiT policy initially spurred rapid renewable energy growth but was later scaled back due to financial sustainability issues, leading to market distortions and a bubble in the solar PV sector (del Río & Mir-Artigues, 2014). The SDE+ policy, with its competitive bidding process, has avoided such extreme market distortions by ensuring subsidies are allocated to cost-effective projects, thereby enhancing policy efficiency (Haas et al., 2011).

The UK's FiT scheme also experienced significant growth, particularly in small-scale renewable energy installations, but faced financial sustainability challenges, resulting in frequent adjustments to the tariff rates to control costs (Couture et al., 2010; Lockwood, 2013). The SDE+ policy's competitive market approach has provided a more stable and predictable subsidy environment, reducing the financial burden on the government and taxpayers compared to the UK's experience (Mitchell et al., 2006).

In terms of equity, the SDE+ policy has encountered similar issues to those in Germany and the UK, where subsidies have disproportionately benefited wealthier households able to invest in renewable technologies (Sovacool, 2009; Lockwood, 2013). However, the SDE+ policy's inclusion of a wider range of renewable technologies, such as advanced biofuels and geothermal energy, reflects a more diversified approach compared to Spain's heavy reliance on solar PV, which led to market saturation and financial instability (del Río & Mir-Artigues, 2014; Mir-Artigues & del Río, 2016).

Overall, while the SDE+ policy has demonstrated greater efficiency and stability in subsidy allocation through competitive bidding, it shares common challenges with FiT policies in Germany, Spain, and the UK, particularly regarding equity and infrastructure. Addressing these issues will be crucial for enhancing the long-term sustainability and fairness of the Dutch renewable energy transition.

The issue of grid congestion noted in the SDE+ policy evaluation is a common theme in renewable energy policy literature. Regions with high renewable energy penetration, such as Germany and Denmark, have similarly struggled with grid integration challenges. In Germany, the rapid expansion of wind power has led to significant grid congestion, necessitating substantial investments in grid infrastructure and management systems (Agora Energiewende, 2018; Huber et al., 2011). Denmark's high wind energy penetration has similarly required proactive grid management and infrastructure upgrades to handle fluctuations and prevent congestion (Energinet, 2019). However, the grid congestion issues in the Netherlands are particularly severe. The country's high population density and rapid adoption of renewable energy technologies have exacerbated grid congestion, leading to significant delays and additional costs for integrating new projects (RVO, 2022b; Hoogland et al., 2021). It is projected that by 2030, grid congestion in the Netherlands could affect 1.5 million people, highlighting the urgency of addressing this issue (Hadden, 2024). Academic literature underscores that without substantial investments in grid infrastructure and smarter grid management solutions, the adoption of renewable energy will continue to face significant hurdles (Jansen et al., 2020; Fraunhofer Institute for Systems and Innovation Research ISI, 2021).

### 6.1.3 Reflection on the Framework utility

One of the primary contributions of this study is the development of a climate-specific holistic evaluation framework, which builds on McConnell's dimensions of policy success—programmatic, process, and political (McConnell, 2010). This framework was further enhanced by integrating criteria from Huitema et al. (2011) that are essential for evaluating the success of climate policies, particularly in terms of adaptability, stakeholder participation, and coordination. The framework's application to the SDE+ policy has demonstrated its utility in providing a comprehensive and nuanced assessment of the policy's performance, capturing not only its direct outcomes but also its broader socio-economic and political impacts.

The framework was effectively applied to the SDE+ policy, proving to be a fitting tool for evaluating climate policies within the Dutch context. Huitema's (2011) criteria were especially useful in adapting McConnell's (2010) framework to address climate-specific challenges, particularly in the process dimension, where the inclusion of adaptability and stakeholder participation allowed for a more detailed examination of the policy's implementation and coordination across various organizations and policies.

While the framework succeeded in offering a holistic view of the SDE+ policy's success, some limitations were identified. The interconnectedness of the dimensions often led to overlap in the criteria, making certain achievements and challenges appear in multiple areas of the evaluation. For instance, grid congestion emerged as a significant issue that impacted various criteria across different dimensions, highlighting the challenge of disentangling the effects within a highly interconnected policy environment.

Moreover, the evaluation of the programmatic dimension was relatively straightforward compared to the process and political dimensions, which required more qualitative analysis and offered fewer concrete benchmarks. This introduces complexity and potential researcher bias into the evaluation, particularly in defining and categorizing levels of success. However, the strong definitions provided for each criterion helped mitigate this issue, making the framework more intuitive and applicable.

Reflecting on the framework's practical utility, it effectively measured what it was designed to measure, with Huitema's criteria proving highly relevant in the climate policy context. However, the inclusion of numerous criteria may have led to redundant evaluations, given the interconnected nature of the dimensions. Future research could benefit from refining the framework by reducing the number of criteria, thereby minimizing overlap, and enhancing the independence of each dimension's evaluation. Despite this, the inclusion of criteria such as adaptability from Huitema et al. remains crucial for capturing the dynamic nature of climate policies.

In conclusion, while the framework developed in this study offers a comprehensive tool for evaluating climate policies, future adaptations should consider streamlining the criteria to reduce redundancy and improve clarity. This would help maintain the framework's holistic and nuanced approach while addressing some of the challenges observed in this study. Future research should continue to refine this framework to ensure it remains a robust and adaptable tool for policy evaluation in the ever-evolving landscape of climate governance

### 6.1.4 Contributions to the Dutch context

The programmatic success of the SDE(+) policy highlights both significant achievements and critical areas for improvement, offering valuable insights for the Dutch energy transition. The substantial increase in renewable energy production and comparatively low subsidy amounts in comparison to other EU countries, particularly through solar PV and wind projects, underscores the effectiveness of the policy's design in driving forward the Netherlands' climate goals (Hoogland et al., 2021; Wiebes, 2020). However, the challenges in meeting the 2020 renewable energy targets, balancing infrastructural capacity with electricity production and equal distributions of benefits and burdens reflect the need for ongoing improvement (RVO, 2022a; Hoogland et al., 2021). Grid congestion, in particular, poses a severe challenge in the Netherlands, with projections indicating that by 2030, grid congestion could affect 1.5 million people, underscoring the urgent need for targeted infrastructure investments and policy adjustments to manage congestion effectively. These findings suggest that while the SDE(+) policy has made commendable strides, future Dutch climate policies must prioritize infrastructure development, streamline administrative processes, and observe inequalities to ensure that programmatic goals are not only ambitious but also achievable and fair.

The inclusion of the process dimension in evaluating the SDE(+) policy has provided critical insights into the Dutch energy transition, highlighting the importance of adaptability, coordination, and stakeholder engagement in achieving policy success. The policy's ability to preserve its core goals while adapting to evolving market conditions demonstrates a resilient success that has been crucial for maintaining alignment with national and European climate objectives (Wiebes, 2020b; IEA, 2020a). However, challenges such as grid congestion, administrative burdens, and inequities in stakeholder participation reveal significant areas where process improvements are necessary (Schellevis, 2021; RVO, 2022a; ABN AMRO, 2023; CE Delft, 2016). These findings underscore the need for Dutch policymakers to focus on enhancing coordination between stakeholders and modifying administrative processes to ensure broader and more equitable participation in future renewable energy policies. By integrating the process dimension, this research has shown that success in the Dutch energy transition is not solely dependent on programmatic outcomes but also on the effectiveness of the processes that support and sustain these outcomes, emphasizing the need for a holistic approach in policy design and implementation (Hoogland et al., 2021; CE Delft, 2016).

The evaluation of the political dimension of the SDE(+) policy highlights its significant role in shaping the Dutch renewable energy agenda. The policy's alignment with public sentiment and climate goals has bolstered political support, particularly by enhancing electoral prospects for parties advocating these initiatives (ABN AMRO, 2023; IEA, 2020). However, the conflicted success in this criterion—due to public dissatisfaction with the salderingsregeling, unmet renewable energy targets, and high energy costs—signals the need for more equitable and transparent policy design to maintain political backing (ACM, 2023; CBS, 2021). The evaluation of the policy’s ability to control the agenda underscores its centrality in Dutch climate strategy, but challenges like grid congestion and opposition to certain subsidies highlight the complexities of maintaining its influence (RVO, 2022b; CE Delft, 2016). The conflicted success in political fairness, particularly regarding the inequitable distribution of benefits, suggests that future policies must prioritize inclusivity to sustain political legitimacy and public trust (Hoogland et al., 2021). By addressing these issues, the evaluations of the political criteria offer crucial insights for refining Dutch renewable energy policies, ensuring they remain effective and politically sustainable.

The integration of these findings across the programmatic, process, and political dimensions provides a comprehensive understanding of the SDE(+) policy's strengths and weaknesses, offering critical lessons for the Dutch energy transition. The interconnectedness of these dimensions suggests that future climate policies in the Netherlands must be designed with a holistic approach that considers the interdependencies between programmatic outcomes, process management, and political sustainability. The results of this study emphasise the importance of adaptable frameworks, robust stakeholder engagement, and a focus on equity as essential components of successful climate policies. By addressing these areas, Dutch policymakers can develop more resilient and effective policies that not only meet climate targets but also foster public trust and political support. The nuanced evaluation presented in this study contributes to the ongoing discourse on renewable energy policy in the Netherlands, providing actionable insights that can guide the design of future policies in this critical area.

## 6.2 Limitations of Research Design

Despite its strengths, the research design also has several weaknesses. One significant limitation is the reliance on a qualitative approach, which, while providing depth, may introduce subjectivity and limit the generalizability of the findings. The lack of primary quantitative data collection may reduce the robustness of the results, as quantitative methods could have provided additional rigor and verification of the qualitative findings (Creswell & Poth, 2017; Maxwell, 2013). Additionally, the study depended heavily on the availability and reliability of existing quantitative analyses and secondary data sources. Potential biases and inaccuracies in these sources could affect the study's conclusions (Smith, 2011; Bryman, 2016).

The limited number of interviews, particularly the lack of interviewees from the Ministry and politicians, made it harder to assess the true political success of the SDE+ policy. More extensive interviews with key stakeholders would have enriched the evaluation by offering deeper insights into the political dynamics and stakeholder perspectives (Patton, 2002). Furthermore, the evaluation covers the period between 2008 and 2020, which may not fully reflect the long-term impacts of recent policy adaptations. The significant delay between subsidy allocation and project realization means that some positive effects of the latest changes might not be fully visible yet (Hoogland et al., 2021; CBS, 2024a).

Given the qualitative nature of the study and the limited number of interviews, there is a potential bias in interpreting the results. The researcher's perspective and the selection of sources could have influenced the findings, highlighting the importance of triangulating data and incorporating a diverse range of perspectives to mitigate this bias (Denzin & Lincoln, 2018; Stake, 1995). Furthermore, some of the challenges faced by the SDE(+) policy, such as administrative burdens, grid congestion, and equity issues, negatively affect multiple criteria used in the evaluation. This could create a more negative image of the policy than might be warranted.

## 6.3 Implications of the Findings

The evaluation of the Stimulering Duurzame Energieproductie (SDE(+)) policy through the combined framework highlights a complex landscape of successes and challenges that have evolved over time. As the SDE policy has matured, certain criteria, such as adaptability and the achievement of renewable energy targets, have shown marked improvement. This is evident in the increasing capacity of renewable energy, particularly in solar PV and onshore wind, which aligns with the policy's overarching goals (CE Delft, 2016; IEA, 2020a). However, this growth has also exposed critical issues that need more focused attention.

Over time, the SDE(+) policy has demonstrated growing success in several key areas. The policy's adaptability has improved, allowing it to respond more effectively to the changing technological and market conditions (Ministry of Economic Affairs and Climate Policy, 2020). Additionally, the achievement of renewable energy targets, though still falling short of some goals, has progressed, reflecting the policy's evolving effectiveness (CBS, 2021). Despite these advancements, the programmatic dimension reveals precarious success in areas such as equality. The uneven distribution of benefits, particularly the socio-economic disparities exacerbated by policies like the 'salderingsregeling,' underscores the need for a stronger focus on equity (ACM, 2023). This precarious success indicates that while the SDE(+) policy has facilitated significant growth in renewable energy, it has not equally benefited all segments of society, highlighting a crucial area for improvement.

Moreover, the rapid expansion of renewable energy has brought to light external factors that were not fully considered in the original policy design. One such factor is grid constraints, which have become increasingly problematic as the share of renewable energy in the grid grows (IEA, 2020a). The need to internalize external costs, such as net congestion, into the competitive subsidy allocation process is critical for ensuring the long-term sustainability of the energy transition (Interviewee 4, 2024). This approach, which is being gradually addressed under the SDE++, points to the necessity of a more holistic view that integrates these externalities into the policy framework from the outset (Ministry of Economic Affairs and Climate Policy, 2020).

The challenges identified in one dimension or criterion often have repercussions in others, underscoring the interconnectedness of policy dimensions. For instance, the precarious success in programmatic equality is not isolated; it impacts the political dimension by potentially eroding public support, and it affects the process dimension by complicating stakeholder engagement and coalition-building (Bovens et al., 2001; McConnell, 2010). This interconnectedness demonstrates the necessity of assessing climate policy holistically to capture the true impact and success of the policy. The current success of the SDE(+) policy—characterized by conflicted success in the programmatic dimension, resilient success in the process dimension, and conflicted success in the political dimension—highlights distinct areas for improvement. Many of these challenges, such as ensuring equitable distribution of benefits and managing externalities like grid constraints, remain pertinent as the Netherlands transitions to SDE++ (CE Delft, 2016; IEA, 2020a).

The transition to SDE++ represents a significant evolution in Dutch climate policy by expanding its focus beyond increasing renewable electricity to include a broader range of technologies aimed at reducing greenhouse gas emissions across multiple sectors (Ministry of Economic Affairs and Climate Policy, 2020). This shift is expected to positively impact the programmatic success of the policy by aligning more closely with broader climate goals. However, the delay in reforming the salderingsregeling—which continues to disproportionately benefit higher-income households—negatively impacts programmatic fairness. As political debates stall the phase-out of net metering (Parool, 2023), existing inequities are likely to worsen, further disadvantaging lower-income households and undermining the inclusivity of the energy transition.

Furthermore, grid congestion remains a critical challenge, with ongoing investments by TenneT currently amounting to 111 billion euro aiming to double grid capacity and alleviate these issues (TenneT, n.d.). While these efforts are expected to improve the adaptability and programmatic success of SDE++, they will take time, and grid constraints could continue to hinder the connection of new renewable projects in the short term. This delay negatively affects the process success of the policy by creating bottlenecks that frustrate stakeholders and slow the energy transition. Temporary measures like flexible grid use may help, but the long-term success of SDE++ will depend on effectively addressing these infrastructure challenges to avoid undermining public confidence and the overall political success of the policy.

REPowerEU aims to reduce reliance on fossil fuels, particularly those imported from outside the EU, by rapidly scaling up renewable energy production, improving energy efficiency, and diversifying energy supplies (European Commission, 2022). For the SDE++ policy, REPowerEU amplifies the urgency and scope of its objectives. The initiative aligns well with the expanded focus of SDE++, which now includes technologies that reduce GHG emissions across multiple sectors. REPowerEU increases the urgency of addressing the criteria where the SDE(+) policy underperformed, particularly in terms of equality and coordination with other policies. The results of this research highlighted significant shortcomings in programmatic fairness, with socio-economic disparities exacerbated by policies like the salderingsregeling. Moreover, the lack of coordination between renewable energy expansion and grid infrastructure development created significant bottlenecks. Under the heightened expectations of REPowerEU, it is crucial that SDE++ not only expands its scope but also rectifies these weaknesses. Failing to do so risks perpetuating the inequities and inefficiencies identified in the SDE(+), potentially undermining both the political sustainability of the policy and the broader EU energy transition goals. Addressing these issues with targeted measures and better policy integration will be essential for ensuring that SDE++ can effectively contribute to the REPowerEU objectives.

The SDE and SDE+ schemes have laid the groundwork for the Netherlands' renewable energy transition, marking the initial steps in a long-term effort to increase the share of renewable energy and reduce greenhouse gas emissions. However, as the nation looks toward the ambitious climate goals set for 2030 and beyond, it is clear that these early policies, while foundational, must evolve and expand to meet the increasingly complex demands of the energy transition. The transition from SDE+ to SDE++ reflects this evolution, broadening the scope of the policy to address a wider array of emissions across multiple sectors. Yet, as this thesis has shown, success in climate policy cannot be measured solely by technological or quantitative advancements. The deeper challenges of equity, coordination, and adaptability remain, and these must be addressed with the same rigor as the push for more renewable energy.

In the dynamic and vital area of climate policy, comprehensive and frequent evaluations are not just beneficial but essential. The findings of this thesis underscore the importance of moving beyond programmatic evaluations that focus solely on outputs, toward holistic assessments that consider the broader socio-economic and infrastructural impacts of climate policies. Such evaluations are crucial for identifying and addressing the multifaceted challenges and inefficiencies that can undermine the success of policies like SDE++. For instance, the inequities highlighted by the *salderingsregeling* and the coordination issues with grid infrastructure are not merely peripheral concerns—they are central to the policy's overall success and its ability to deliver on its promises. By actively refining and improving these aspects, the Netherlands can ensure that its energy transition is not only effective in reducing emissions but also equitable and inclusive, balancing environmental imperatives with social justice.

Ultimately, the ability to measure and understand the true success of climate policies will depend on adopting a holistic approach that integrates programmatic achievements with a deep understanding of social, economic, political, process, and infrastructural dynamics. As the Netherlands continues to pursue its climate goals, the lessons learned from the SDE and SDE+ schemes should inform future policy development. By embracing a broader perspective that goes beyond numerical targets, the Netherlands can ensure that its energy transition not only meets its environmental objectives but also supports a just and equitable transformation that benefits all members of society.

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# Appendix A

| Process Success | Resilient Success | Conflicted Success | Precarious Success | Process Failure |
|---|---|---|---|---|
| **Preserving government policy goals and instruments.** | Policy goals and instruments preserved, despite minor refinements. | Preferred goals and instruments proving controversial and difficult to preserve. Some revisions needed. | Government's goals and preferred policy instruments hang in the balance. | Termination of government policy goals and instruments. |
| **Conferring legitimacy on the policy.** | Some challenges to legitimacy but of little or no lasting significance. | Difficult and contested issues surrounding policy legitimacy, with some potential to taint the policy in the long-term. | Serious and potentially fatal damage to policy legitimacy. | Irrecoverable damage to policy legitimacy. |
| **Building a sustainable coalition.** | Coalition intact, despite some signs of disagreement. | Coalition intact, although strong signs of disagreement and some potential for fragmentation. | Coalition on the brink of falling apart. | Inability to produce a sustainable coalition. |

| | | | | |
|---|---|---|---|---|
| **Symbolizing innovation and influence.** | Not groundbreaking in innovation or influence, but still symbolically progressive. | Neither innovative nor outmoded, leading at times to criticisms from both progressive and conservatives. | Appearance of being out of touch with viable, alternative solutions. | Symbolizing outmoded, insular or bizarre ideas, seemingly oblivious to how other jurisdictions are dealing with similar issues. |
| **Opposition to process.** | Opposition to process is virtually non-existent and/or support is virtually universal. | Opposition to process is stronger than anticipated, but outweighed by equal support. | Opposition to process and support are equally balanced. | Opposition to process outweighs small levels of support. |

**Table A.1:** McConnell's (2010) success-to-failure spectrum for the process dimension

| Program Success | Resilient Success | Conflicted Success | Precarious Success | Program Failure |
|---|---|---|---|---|
| **Implementation in line with objectives.** | Implementation objectives broadly achieved, despite minor refinements or deviations. | Mixed results, with some success, but accompanied by unexpected and controversial problems. | Minor progress towards implementation as intended, but beset by chronic failures, proving highly controversial and very difficult to defend. | Implementation fails to be executed in line with objectives. |

| | | | | |
|---|---|---|---|---|
| **Achievement of desired outcomes.** | Outcomes broadly achieved, despite some shortfalls. | Some success, but the partial achievement of intended outcomes is counterbalanced by unwanted results, generating substantial controversy. | Some small outcomes achieved as intended, but overwhelmed by controversial and high profile instances or failure to produce outcomes. | Failure to achieve desired outcomes. |
| **Creating benefit for a target group.** | A few shortfalls and possibly some anomalous cases, but intended target group broadly benefits. | Partial benefits realized, but not as widespread or deep as intended. | Small benefits are accompanied and overshadowed by damage to the very group that was meant to benefit. Also likely to generate high profile stories of unfairness and suffering. | Damaging a particular target group. |
| **Meets policy domain criteria.** | Not quite the outcome desired, but close enough to lay strong claim to fulfilling the criteria. | Partial achievement of goals, but accompanied by failures to achieve, with possibility of high profile examples e.g. ongoing wastage when the criterion is efficiency. | A few minor successes, but plagued by unwanted media attention, e.g. examples of wastage when the criterion is efficiency. | Clear inability to meet the criteria. |

| | | | | |
|---|---|---|---|---|
| **Opposition to program aims, values, and means of achieving them.** | Opposition to program aims, values, and means of achieving them is virtually non-existent, and/or support is virtually universal. | Opposition to program aims, values, and means of achieving them is stronger than anticipated, but outweighed by support. | Opposition to program aims, values, and means of achieving them is equally balanced with support for same. | Opposition to program aims, values, and means of achieving them outweighs small levels of support. |

**Table A.2:** McConnell's (2010) success-to-failure spectrum for the programmatic dimension

| **Political Success** | **Resilient Success** | **Conflicted Success** | **Precarious Success** | **Political Failure** |
|---|---|---|---|---|
| **Enhancing electoral prospects or reputation of governments and leaders.** | Favourable to electoral prospects and reputation enhancement, with only minor setbacks. | Policy obtains strong support and opposition, working for and against electoral prospects and reputation in fairly equal measure. | Despite small signs of benefit, policy proves an overall electoral and reputational liability. | Damaging to the electoral prospects or reputation of governments and leaders, with no redeeming political benefit. |
| **Controlling policy agenda and easing the business of governing.** | Despite some difficulties in agenda management, capacity to govern is unperturbed. | Policy proving controversial and taking up more political time and resources in its defence than was expected. | Clear signs that the agenda and business of government is struggling to suppress a politically difficult issue. | Policy failings are so high and persistent on the agenda, that it is damaging government's capacity to govern. |
| **Sustaining the broad values and direction of government.** | Some refinements needed but broad trajectory unimpeded. | Direction of government very broadly in line with goals, but clear signs that the policy has promoted some rethinking, especially behind the scenes. | Entire trajectory of government is being compromised. | Irrevocably damaging to the broad values and direction of government. |

| | | | | |
|---|---|---|---|---|
| **Opposition to political benefits for government.** | Opposition to political benefits for government is virtually non-existent and/or support is virtually universal. | Opposition to political benefits for government is stronger than anticipated, but outweighed by support for same. | Opposition to political benefits for government is equally balanced with support for same. | Opposition to political benefits for government outweighs small levels of support. |

**Table A.3:** McConnell's (2010) success-to-failure spectrum for the programmatic dimension

# Appendix B

| Criteria | Description |
| --- | --- |
| Achievement of Policy Goals | Achieving intended objectives and outcomes, providing tangible benefits to the intended beneficiaries. |
| Programmatic Fairness | Equitable distribution of economic benefits and burdens |
| Programmatic Adaptability | Ensuring policies are flexible and responsive to technological and policy changes |
| Efficiency | Economic efficiency by analysing benefits per unit of expenditure (cost-effectiveness) |
| Meets Policy Domain Criteria | Meeting domain specific criteria to address the ‘’right’’ issues |

**Table B.1:** Mapping of Huitema et al.’s (2011) criteria for evaluating climate policy to McConnell’s (2010) dimension of programmatic success

| Criteria | Description |
| --- | --- |
| Preserving Policy Goals and Instruments | Maintaining core goals and instruments throughout implementation |
| Normative Compliance | Developing and implementing policies through legitimate and widely accepted means |
| Symbolising Innovation | Adopting new and effective approaches, symbolizing progress and innovation |
| Coordination | Integrating new policies with pre-existing ones for collective efficacy |
| Stakeholder Participation | Involving stakeholders in policymaking to enhance legitimacy and uphold coalitions |
| Process Adaptability | Ensuring policy processes can adapt to new insights and stakeholder inputs |

**Table B.2:** Mapping of Huitema et al.’s (2011) criteria for evaluating climate policy to McConnell’s (2010) dimension of process success

| Criteria | Description |
| --- | --- |
| Enhancing Electoral Prospects | Enhancing the electoral prospects and reputation of the government and leaders |
| Controlling the Policy Agenda | Helping to control the policy agenda and easing the business of governing |

| | |
|---|---|
| Sustaining Government Values | Maintaining consistency with the government's overarching principles and long-term vision |
| Normative Compliance | Ensuring policies adhere to legal frameworks and societal values |
| Political Fairness | Scrutinizing the distribution of benefits and burdens to ensure equity and justice |

**Table B.3:** Mapping of Huitema et al.'s (2011) criteria for evaluating climate policy to McConnell's (2010) dimension of political success

# Appendix C

| Criteria | Political Success | Resilient Success | Conflicted Success | Precarious Success | Political Failure |
|---|---|---|---|---|---|
| Enhancing Electoral Prospects | Strongly enhances electoral prospects and reputation of the government and leaders through SDE. | Enhances electoral prospects with minor setbacks, overall reputation positive. | Gains some political support through SDE but significant opposition affects reputation. | Provides some electoral benefit through SDE but overshadowed by controversy and reputational risks. | Damages electoral prospects and reputation through SDE, leading to loss of political support. |
| Controlling Policy Agenda | Effectively controls the policy agenda through SDE, significantly easing the business of governing. | Controls the policy agenda through SDE despite minor difficulties, maintaining governance effectiveness. | Manages to control the policy agenda through SDE but faces significant controversy and resource strain. | Struggles to control the policy agenda through SDE, business of governing compromised. | Fails to control the policy agenda through SDE, severely damaging capacity to govern. |
| Political Fairness | Demonstrates exceptional fairness in SDE, leading to widespread public support and minimal opposition. | Ensures fairness in SDE with minor criticisms, overall public perception positive. | Achieves some fairness in SDE, but significant opposition arises due to perceived inequities. | Shows limited fairness in SDE, resulting in substantial public opposition and controversy. | Fails to demonstrate fairness in SDE, causing widespread opposition and undermining public trust. |
| Normative Compliance | Fully complies with legal and ethical standards in SDE, enhancing political viability and support. | Adheres to standards in SDE with minor issues, overall public support intact. | Meets some standards in SDE but significant compliance issues lead to controversy. | Demonstrates limited compliance in SDE, substantial public opposition and legal challenges present. | Fails to comply with standards in SDE, causing widespread opposition and undermining legitimacy. |
| Sustaining Government Values | Fully maintains consistency with the Dutch government's principles and long-term vision for sustainable energy and emission reduction | Mostly maintains consistency with the Dutch government's principles and long-term vision for sustainable energy and emission reduction | Maintains some consistency with the Dutch government's principles and long-term vision for sustainable energy and emission reduction | Maintains minimal consistency with the Dutch government's principles and long-term vision for sustainable energy and emission reduction | Fails to maintain consistency with the Dutch government's principles and long-term vision for sustainable energy and emission reduction |

**Table C.1:** Criteria Success Assessment Framework for political success of the SDE

| Criteria | Process Success | Resilient Success | Conflicted Success | Precarious Success | Process Failure |
|---|---|---|---|---|---|
| Preserving SDE Goals | SDE goals and instruments fully preserved and implemented effectively. | SDE goals and instruments preserved with minor adjustments. | SDE goals and instruments preserved but surrounded by controversy. | SDE goals and instruments implemented but highly controversial. | Termination or failure to implement SDE goals and instruments. |
| Normative Compliance | Full legal and legitimate compliance for SDE, widely accepted and respected by stakeholders. | Minor challenges to SDE compliance, overall support maintained. | Significant challenges to SDE compliance, contested issues present. | Serious challenges to SDE compliance, substantial damage to support. | Irrecoverable damage to SDE compliance, complete loss of support. |
| Coordination | Effective coordination with other policies, ensuring seamless integration for SDE. | Coordination mostly effective with minor issues. | Coordination present but problematic, significant challenges arise. | Coordination efforts weak and inconsistent, major conflicts present. | Complete failure in SDE coordination, leading to disjointed policy environment. |
| Stakeholder Participation | Extensive stakeholder participation in SDE, ensuring high levels of acceptance and robustness. | Stakeholder participation in SDE generally inclusive with minor gaps. | Stakeholder participation in SDE limited, significant challenges and potential opposition present. | Stakeholder participation in SDE minimal and ineffective, leading to major opposition. | Complete failure in involving SDE stakeholders, resulting in widespread opposition. |
| Process Adaptability | Highly adaptable SDE process, ensuring continuous improvement through emerging insights. | SDE process adaptable with minor limitations. | SDE process shows some adaptability but constrained by significant limitations. | SDE process adaptability minimal, causing major delays and resistance to change. | Complete rigidity in SDE process, leading to outdated and ineffective policies. |
| Symbolising Innovation | Adopts innovative and highly effective approaches to renewable energy production and | Adopts some innovative and effective approaches to renewable energy production and policy implementation | Adopts few innovative approaches with limited effectiveness in renewable energy production and | Adopts very few innovative approaches with minimal effectiveness in renewable energy production and | Fails to adopt innovative and effective approaches to renewable energy production and policy implementation |

| | | | | | |
|---|---|---|---|---|---|
| | policy implementation | | policy implementation | policy implementation | |

**Table C.2:** Criteria Success Assessment Framework for process success of the SDE

| Criteria | Program Success | Resilient Success | Conflicted Success | Precarious Success | Program Failure |
|---|---|---|---|---|---|
| Achievement of Policy Goals | SDE renewable energy targets fully achieved, ensuring complete alignment with SDE objectives. | Most SDE renewable energy targets achieved with minor shortfalls, overall success intact. | Some SDE renewable energy targets achieved, significant shortfalls create concern. | Few SDE renewable energy targets achieved, major shortfalls significantly impact success. | SDE renewable energy targets not achieved, leading to a failure to advance SDE objectives. |
| Efficiency | Highly cost-effective SDE implementation, minimal waste, high returns on investment. | Generally cost-effective SDE implementation, minor inefficiencies present. | Noticeable inefficiencies in SDE implementation, moderate costs reduce overall cost-effectiveness. | Major inefficiencies in SDE implementation, high costs, program expensive and less justifiable. | Highly inefficient SDE implementation, extremely high costs, poor justification for resource use. |
| Programmatic Fairness | Benefits equitably distributed among all SDE stakeholders. | Mostly equitable distribution among SDE stakeholders, minor exclusions, fairness generally perceived. | Uneven distribution among SDE stakeholders, significant dissatisfaction among some stakeholders. | Significant inequity in SDE, major exclusions, widespread perceptions of unfairness. | Highly inequitable SDE distribution, widespread exclusions, program perceived as unfair. |
| Programmatic Adaptability | Highly adaptable to technological and policy changes, ensuring SDE relevance and effectiveness. | Adaptable to changes with some adjustments needed, maintaining SDE effectiveness. | Limited adaptability in SDE, significant rigidity hampers relevance. | Very rigid SDE program, struggles to adapt significantly, potential obsolescence. | Cannot adapt, completely rigid SDE program, resulting in obsolescence and failure to stay relevant. |
| Meets Policy Domain Criteria | Fully meets all SDE policy domain criteria, ensuring comprehensive success. | Meets most SDE policy domain criteria with minor issues. | Partially meets SDE policy domain criteria, significant gaps reduce effectiveness. | Meets few SDE policy domain criteria, major gaps severely hinder effectiveness. | Does not meet SDE policy domain criteria, resulting in ineffective implementation and lack of success. |

**Table C.3:** Criteria Success Assessment Framework for programmatic success of the SDE