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Zeroing In on Cities: The Politics of Aspiration and Delay in Net-Zero Emission Targets of Swedish Municipalities

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7.1 Introduction

Only by reducing global greenhouse gas (GHG) emissions to net zero by mid-century is there a likely scenario of achieving the Paris Agreement's goal of limiting global warming to 1.5°C (Allen et al., 2019). Consequently, decision-makers must rapidly set and implement net-zero emission targets. While national governments have been the primary target of research on net-zero emission targets (ECUI, 2020; Rogelj et al., 2015), there has been a surge in commitments by cities to achieve net-zero emissions (Hale et al., 2022). Sub-national authorities are crucial for limiting global warming to 1.5°C, and analysis by the United Nations suggests that cities account for around 70 percent of global GHG emissions (Bazaz et al., 2018; UN-Habitat, 2011). During the 2019 Climate Action Summit convened by the UN Secretary-General in New York, 10 regions and over 100 cities committed to net-zero emissions by 2050. Hence, cities and municipalities are key actors in the landscape of collaborative climate governance illustrated in Figure 2.1 in Chapter 2. A study by Black and colleagues (2021), for example, finds nearly 1,200 cities with net-zero emission targets. In this chapter, we evaluate whether Swedish municipalities are contributing to the national target of becoming fossil free by 2045 by voluntarily setting their own net-zero emission targets. We also examine whether such target setting actually generates action. On the one hand, net-zero emission targets demonstrate a discursive shift away from short-term and incremental mitigation measures toward long-term transformational change. The targets could provide a structure and normative framework for politicians and civil servants to mobilize action toward a common long-term goal, illustrating what Finnemore and Jurkovich (2020) call the "politics of aspiration." However, net-zero emission targets have also been criticized as a means of delaying or even deterring climate action, in particular the net prefix, which emphasizes the possibility to compensate and offset residual emissions after mitigation actions have

been taken (cf., McLaren et al., 2019). A more critical reading of net-zero emission targets suggests that they are an instrument for the "politics of delay" or a "climate delay discourse," in which lofty long-term goals replace immediate action, and negative emission technologies (e.g., carbon capture and storage) are seen as alternatives to, rather than complementing, GHG reduction (cf., Lamb et al., 2020). Sweden is an interesting case for studying municipal net-zero emission targets since the country has a history of a relatively ambitious national climate policy, as well as its current target to become a fossil-free welfare state by 2045 (see also Chapters 3 and 4). In 2017, the Swedish government adopted its Climate Policy Framework consisting of a Climate Act, climate targets, and the Swedish Climate Policy Council (SCPC) in order to achieve the long-term goal of having net-zero GHG emissions by 2045, thereby becoming a fossil-free welfare society (SEPA, 2019; see also Chapter 4). At the time of writing, the Swedish target is one of the most ambitious legally binding net-zero targets in the world (ECUI, 2020).

Another crucial question related to the research objectives of this book is to understand the role that national governments play in incentivizing local climate goals and actions. As outlined in Chapters 1 and 2, the state can choose to govern in different ways in order to pursue its interests, ranging from direct forms of delegation to indirect forms such as orchestration and capacity building. The Swedish political system and constitution provide a relatively high level of autonomy to municipalities to govern their geographical jurisdiction, while simultaneously fulfilling and contributing to the national goals and strategies set out to achieve such goals and strategies (see also Chapter 6). Consequently, the Swedish government is primarily engaged in capacity building and providing support to municipalities, rather than governing from the top down. For instance, it provides funding for municipalities to engage local energy and climate advisors to help citizens and local businesses. The national government also has a national subsidy program called the Climate Leap, which provides funding for projects such as charging stations for electric cars. This provides ambitious municipalities with the necessary leeway to formulate their own climate targets. Also, since 1977 and the aftermath of the first oil crisis in 1973 (see also Chapter 3), municipalities have been obliged to formulate an energy plan, which must be up to date and include a strategy for the supply, distribution, and use of energy. The plan must also include how its fulfillment affects the environment, health, and the management of resources. It is not a mandatory requirement to include climate targets in the energy plan, but it provides an excellent opportunity for municipalities to consider including them in local policy. By exploring how local governments set voluntary emission reduction targets, this chapter provides insights into whether the current model of voluntary bottom-up action from municipalities contributes to achieving the national target.

The chapter both maps and evaluates the *quantity* and *quality* of net-zero emission targets in Swedish municipalities, as well as how they relate to the national climate mitigation goals. An emerging body of literature developing evaluation criteria for net-zero emission targets for cities, regions, and companies sets the bar high. Targets should be immediately set; be detailed and time-bound, both for removing emissions and for offsetting residual emissions; be accompanied by baseline studies and impact assessments; cover all gases and sources; be jointly implemented by a broad set of stakeholders and respect equity concerns; and be regularly monitored and reported (Net Zero Climate, 2021; NewClimate Institute and Data-Driven EnviroLab, 2020). This chapter identifies 39 municipalities with net-zero emission targets of which only a few can be considered high-quality targets (see Chapter 2). There is significant heterogeneity in the definitions and scope of net-zero emission targets in terms of wording and precision; number and type of GHGs included; and inclusion or exclusion of economic sectors. Only a couple of municipalities have concrete plans or explicit views on how to address residual emissions. This mirrors current research on net-zero emission targets, which suggests that the operationalization of targets is "still in its infancy" (Hale et al., 2022; see also Shabb and McCormick, 2023). The analysis also identifies a small group of municipalities that demonstrate the possibility of setting highly ambitious and detailed net-zero emission targets, going further than the national government. The findings also confirm the results in Chapter 6, namely that a small number of municipalities have taken very ambitious and detailed goals, while most municipalities do not have or provide vague definitions of net-zero emission targets.

The chapter continues as follows: First, we describe the methods and materials used for exploring our research question. Second, we discuss the criteria for what makes a "good" net-zero emission target. Third, the results are presented and then discussed. Finally, the conclusions section sums up the results and discussion in relation to the research question.

7.2 Methods and Material

This chapter is based on novel data from a large-N cross-sectional comparison of municipal net-zero emission targets in Sweden. Qualitative data on GHG reduction targets in 290 Swedish municipalities was collected and coded. The coming section outlines how the data collection was made and coded, as well as some methodological caveats. Three criteria were used for identifying net-zero emission targets. First, the targets should be expressed as net-zero emissions, zero emissions, or climate or carbon neutral. We exclude vague terms such as near zero or decarbonization. A broad understanding of a target was used, including goals, visions, and

aspirations. The Swedish language does not differentiate between a goal and a target (see Morseletto et al., 2017, for a discussion about the difference between goal and target). Second, only economy-wide and long-term (beyond 2030) net-zero emission targets were included, excluding targets for individual sectors or municipal operations. Choosing economy-wide targets allowed us to zoom in on those municipalities that are particularly ambitious and that will have to deal with residual emissions. Third, targets needed to have been adopted and published in official documents, using April 1, 2020, as the cut-off date. We scanned the most recently available and currently applicable local and regional planning documents for GHG emission reduction targets. There is no national guideline regarding where reduction targets should be published, thereby rendering the material heterogenous. The net-zero emission targets were gathered from three types of planning documents: climate or environment strategies, energy plans, and general land use planning documents. The documents were collected using online public sources, primarily municipal websites. Those municipalities with net-zero emission targets were subsequently contacted to determine whether they had included net-zero emission targets in previous policy documents. We then employed a descriptive coding approach which "summarizes in a word or short phrase – most often as a noun – the basic topic of a passage of qualitative data" (Saldana, 2013, p. 88). The coding scheme was based on an operationalization of three aspects of net-zero emission targets: definition, scope, and residual emissions (see Section 7.3).

While efforts have been made to reduce biases and methodological caveats, we would like to mention three issues related to generalizability, reliability, and data coverage. First, the generalizability of the study results is uncertain. Since the study covers all municipalities in Sweden, we are fairly certain that the conclusions are true to Sweden. Understanding whether the insights are transferrable to other governance contexts requires more research, for instance whether the level of ambition of national targets, the degree of local autonomy, or economic structure of a country matter. Second, the reliability of the study could be challenged since the data was not coded by both researchers independently, making an intercoder reliability test unfeasible. However, the codebook was jointly developed by the coders. Prior to the coding, there was a pre-constructed consensus. Consequently, this type of test is not applicable to our data collection process. The research question and the nature of the material itself do not ask for or allow an inherently interpretive approach to data collection. Rather, the descriptive nature of our study, with the aim to capture if and how net-zero emission targets are described, meant that new codes only emerged when the material illustrated data that was not already represented in the codebook simply because some codes had not been previously encountered. Third, while every effort has been made to identify all municipalities with plans that describe net-zero emission targets in Sweden, it is possible that there

are other municipalities with energy plans that outline emission reduction targets. To ensure that we have all the latest documents, we have validated our list of documents against a survey by the Swedish National Board of Housing, Building and Planning in 2018 (Hållbarhet, 2020).

7.3 What Makes a Good Net-Zero Emissions Target?

Net-zero emission targets are a relatively recent phenomenon in international climate governance. The first major economies adopted long-term net-zero emission targets in 2019, with the UK and France taking the lead (Darby, 2019).[1] At the transnational and sub-national level, however, net-zero emission targets have a longer history with cities, regions, and companies aiming to become "climate (or carbon) neutral" (e.g., Worth, 2005). The climate neutral concept and campaign, in particular popularized by the Climate Neutral Network (CNN) during the late 1990s, spread the norm of net-zero emissions on a global scale (Worth, 2005, p. 4). In 2008, the United Nations Environment Program (UNEP) launched a multi-stakeholder initiative with the same name – the Climate Neutral Network (CN Net) – with the aim to "support the sharing of ideas and lessons learned on greenhouse gas emissions reductions or offsets that could help lead to zero net emissions."[2] In 2009, the United Nations Economic Commission for Europe (UNECE) launched a report focusing on cities, calling for climate neutrality to become "a new urban agenda," setting out a strategy in which "cities aim to move towards net-zero emissions of GHG by reducing GHG emissions as much as possible and by developing trade-off mechanisms to offset the remaining unavoidable emissions" (Golubchikov, 2011). The report also mentions cities with long-term climate-neutral targets (e.g., Stockholm and Copenhagen), suggesting that these cities were the first cities in the respective countries to adopt net-zero emission targets (see also Laine et al., 2017).

A growing number of reports and initiatives have tracked and suggested criteria for assessing the quality of net-zero emission targets in cities (see, for example, ECUI, 2020). UNECE, for example, has set out a "city roadmap to climate neutrality" consisting of 19 actions a city can take to become carbon neutral (Golubchikov, 2011, pp. 77–78). It makes recommendations such as setting up a policy unit that oversees the post-carbon transition, facilitates multi-stakeholder partnerships, and develops, implements, and monitors action plans. However, 10 years after the UNECE report, the Race to Zero campaign – initiated in the run-up to

[1] However, already in 2007, the Vatican announced that it intended to become the "world's first" carbon neutral state but faced problems realizing the promise when the company providing the offsets ran into financial problems (Rosenthal, 2007; Struck, 2010).
[2] CNN was dissolved in 2011.

the UNFCCC COP26 in Glasgow by the High-Level Champions for Climate Action – came up with four criteria for a "robust" target. The commitment must (1) be set at the highest level of authority, comprise an interim target, and cover all GHG emissions and emission scopes; (2) have a plan for implementation, prioritize emission reduction above carbon offsetting, and spell out how sinks would be used; (3) be followed by immediate and tangible action; and (4) be publicly reported and enable all actors to contribute (NewClimate Institute and Data-Driven EnviroLab, 2020).

The proposed criteria for evaluating the quality of net-zero emission targets are comprehensive but also problematic in the context of cities. Even in advanced industrialized countries, apart from large and wealthy cities, not many local authorities are likely to have the human, technical, and financial resources or know-how to develop, implement, and evaluate net-zero emission targets according to the criteria set by some analysts. There is also a timing issue. Political initiatives, from idea to implementation, particularly those initiatives that use participatory and multi-stakeholder approaches, are likely to need more time to build legitimacy and trust for large-scale transitions, which emphasize that target setting can be a highly political process in terms of formulation, stringency, and implementation (see, for example, Morseletto et al., 2017). This chapter employs a framework comprising relatively few criteria to study municipalities and focuses on three core features of net-zero emission targets: definitions (what counts as net-zero emission targets?); scope (what is included or excluded from net-zero emission targets?); and residual emissions (what should be done with GHG emissions that remain after mitigation actions have been taken?). We subsequently use these three categories to evaluate the net-zero emission targets in Swedish municipalities.

7.3.1 Definition

In the Paris Agreement, parties to the UNFCCC agreed to strive to limit global warming to 1.5°C compared to pre-industrial levels. This requires keeping emissions within the global carbon budget. The carbon budget comprises the net global anthropogenic carbon dioxide emissions that can be emitted for having a chance to limit global warming to a certain level. Simply reducing emissions to the lowest possible level will not be enough to stay within the carbon budget. In their 2019 special report on the 1.5°C target, the Intergovernmental Panel on Climate Change (IPCC) concluded that residual emissions (i.e., emissions that remain after carbon reduction measures have been implemented) will need to be addressed to achieve the Paris Agreement. "All pathways," the IPCC writes, "that limit global warming to 1.5°C with limited or no overshoot project the use of carbon dioxide removal (CDR) on the order of 100–1000 $Gtco_2$ over the 21st century" (IPCC, 2018; see also

IPCC, 2022). Thus, a future in which humans emit zero CO_2 emissions into the atmosphere is currently implausible; emissions from land use and cattle grazing, for example, will at best reduce in intensity but never be completely eliminated (Edenhofer, 2015; Rogelj et al., 2015). The IPCC even suggests that in most cases, net-negative emissions will be needed, alluding to a situation in which more emissions are removed from the atmosphere than are added to it (IPCC, 2018; IPCC, 2022).

The policy implication of the IPCC's conclusions is that limiting residual emissions must be part of any target to mitigate climate change if the Paris Agreement is to be achieved (Luderer et al., 2018). Accordingly, economy-wide targets aiming for low-carbon emissions, near-zero emissions, and zero emission targets are insufficient, and vague terms such as "low carbon transition" and "decarbonization" provide little insight into what the target setters have in mind beyond reducing emissions as far as possible (Buylova et al., 2021; Wimbadi and Djalante, 2020). Net-zero emission targets, however, acknowledge that residual emissions are inescapable. The prefix "net" in an emission target implies that for every ton of CO_2 emitted into the atmosphere by human activities, one ton must be removed (Rogelj et al., 2015, p. 3). Net zero could be used interchangeably with carbon neutrality (note: which, according to the IPCC, is different from climate neutrality, which considers the broader climate system). Even long-term carbon-positive targets are emerging, in which actors aim to remove more emissions from the atmosphere than they produce (SOU, 2020). Somewhat confusingly, carbon-positive targets can also be expressed as carbon-negative targets, that is, when more emissions are removed from than released into the atmosphere (Matthews and Caldeira, 2008). An actor can only achieve net-zero emission targets with so-called genuine negative emissions (BBSR and BBR, 2017), implementing carbon removal technologies or buying carbon credits on local, regional, or international markets.

7.3.2 Scope

In theory, a net-zero emissions target for a municipality should include all GHGs emitted within the geographical area of that municipality. In practice, however, there might be emissions that a goal setter perceives as being outside their purview and sphere of influence. For instance, should a municipality be responsible for cars, freight, or air traffic that pass through or over their territory? Should industries that are already covered by the EU Emissions Trading Scheme (EU ETS) be included? To answer these questions, a municipality needs to operationalize a net-zero emissions target and decide what gases to include and exclude. Such decisions have important ramifications for carbon accounting (e.g., delineating GHGs,

economic sectors, and geographical boundaries) and accountability (e.g., allocating responsibility for specific emissions) (Kennedy and Sgouridis, 2011). For carbon accounting, the decision on scope is of key importance. What gases, geographical entities, and economic sectors of the economy should be included? Net-zero emission targets may cover different types of GHG emissions. A CO_2 emitter would make a significant contribution to mitigating climate change when it sets a net-zero CO_2 emission target rather than a net-zero methane gas emission target (ECUI, 2020). Furthermore, the conceptual definition also suggested that net-zero emission targets may have different scopes of application, meaning that a net-zero emissions target does not automatically impose requirements on a specific set of actors to contribute toward it. Governments can choose to exclude certain industry sectors. This is often because these sectors are regulated and governed through other regional and/or international agreements (ECUI, 2020). Finally, net-zero emission targets have a temporal dimension as they can be shaped by different target and baseline years, which adds to the complexity of reaching a universal understanding of what a net-zero emissions goal should entail (Lützkendorf and Balouktsi, 2019).

7.3.3 Residual Emissions

The IPCC suggests that even if ambitious technical, political, social, cultural, or other measures are taken to reduce GHG emissions, residual emissions will still remain (Allen et al., 2019). This is where the "net" in net-zero comes in. Reaching a net-zero emissions target means dealing with those residual emissions using carbon offsetting, using carbon removal technologies, or, for instance, producing and selling excess renewable electricity. Offsetting emissions – that is, allowing organizations to invest in projects elsewhere to balance out their own emissions – is likely the most common and readily available measure for cities. Cities and other sub- and non-state actors such as companies are developing their own carbon offsetting schemes independently of regulations or international agreements and standards (Kollmuss et al., 2008; Lovell and Liverman, 2010). Carbon offsetting approaches, however, are under scrutiny since actors can transfer their burden to others, creating issues related to equity and justice. Carbon offsetting schemes are also being implemented on a local level, along with other inventive schemes which generate investments that allow cities to further mitigate and adapt to climate change.

In addition to carbon offsetting and the prominent use of natural carbon sinks (e.g., forests), carbon dioxide removal (CDR) technologies have received substantial attention (Tokimatsu et al., 2017; Boussemaere et al., 2019; Bui et al., 2018). These technologies capture CO_2 from production processes or extract GHGs from

the atmosphere and include different carbon capture and storage (CCS) methods including bioenergy CCS (BECCS) and direct air capture (DAC), to name a few. While some policymakers argue that CCS is most effective for achieving intermediate emission reduction targets, other policymakers implement them to achieve long-term net-zero emission targets (Geden et al., 2019). Nevertheless, CCS technologies depend on continuous assessments and investments in research and development (R&D) (Vallejo et al., 2021; Bui et al., 2018).

In sum, we look at three aspects of net-zero emission targets in Swedish municipalities: definition, scope, and residual emissions. The next section describes and discusses the results of the mapping across each of the aspects.

7.4 The Heterogenous Landscape of Net-Zero Emission Targets in Swedish Municipalities

The next section reports on the results of mapping net-zero emission targets in 290 Swedish municipalities. The first thing we noted when analyzing the results is that only a small minority of municipalities in Sweden – 39 out of 290 (13 percent) – had adopted net-zero emission targets at the time of the data collection. The targets are extremely heterogenous with a wide variety of sources (where we found them), time frame, definition, and scope. Only a small proportion of the 39 municipalities with net-zero emission targets actually discuss their residual emissions. We analyzed a total of 299 plans, comprising roughly one document per municipality. Over half of the plans have a dedicated climate focus, including 104 climate and energy plans, 35 climate plans, and 14 climate and environmental plans. The remaining 40 percent of plans comprise 39 energy plans, 51 environmental plans, and 70 spatial planning documents. Around 65 percent of the municipalities have plans that were adopted before the 21st Conference of Parties (COP21) in Paris in 2015 (see Figure 7.1). Thirty-two percent of the municipalities have plans published between 2016 and 2020, and 65 percent between 2011 and 2020.[3] One plan, for the municipality of Dorotea, dates back to 1990.

The plans span different time horizons. While the standard period of validity of the plans is four years – reflecting the political election cycle – other plans have a substantially longer time horizon. For example, Jönköping municipality's environmental plan has a 20-year time frame (2020–2040), and the municipality of Hudiksvall's energy and climate plan runs from 2017 to 2050. In the coming sections, we outline our findings in more detail.

[3] Note: For 16 plans, we have been unable to identify the adoption year.

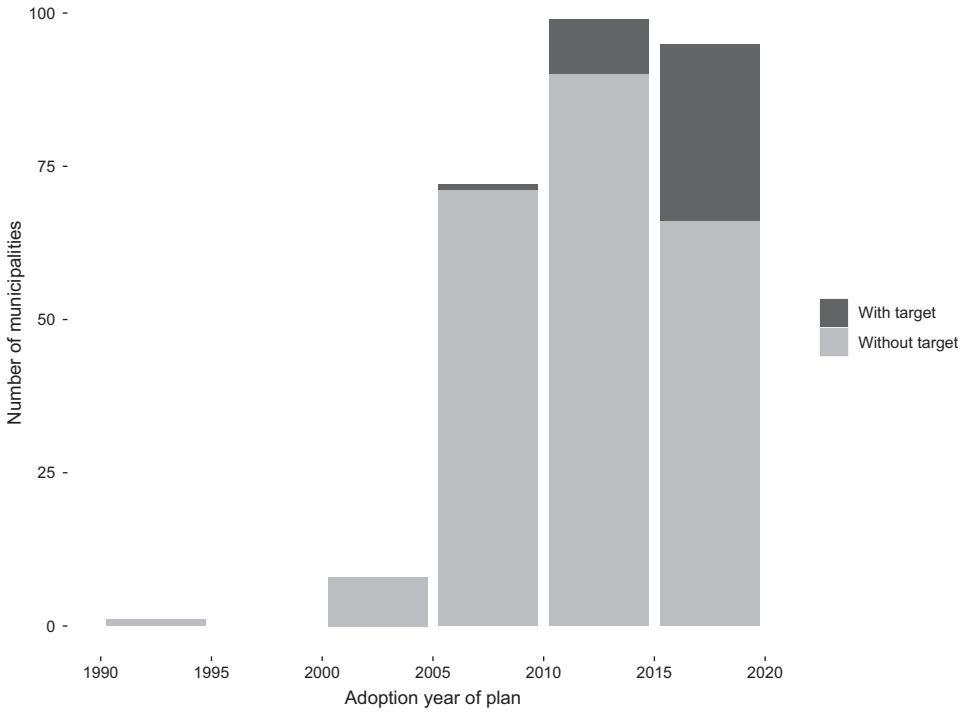

Figure 7.1 Adoption year for municipal plans

7.4.1 Definition

Few net-zero emission targets follow the same definition. The two most popular ways to describe a target are in terms of net-zero and climate-neutral, making up 75 percent of all targets, followed by negative emissions (14 percent) and zero emissions (11 percent).

Two municipalities use near-zero emissions in their target definitions, referring to a state in which emissions have been reduced by 80 to 90 percent. Västerås' municipality's target entails that in "2040, the collective GHG emissions per person shall be near zero," which diverges from net-zero as it excludes any acknowledgement of governing residual emissions. Another five municipalities commit to having "zero emissions." Trelleborg municipality states that "emissions shall be reduced in order to be zero by 2050," while Haparanda municipality raises the bar slightly with its aim to "reduce GHG emissions by 100 percent from a production and consumption perspective." All of these targets fail to address potential residual emissions and put the "net" in net-zero. In contrast, six municipalities aim to go beyond a state of net-zero emissions. Uppsala and Stockholm highlight their

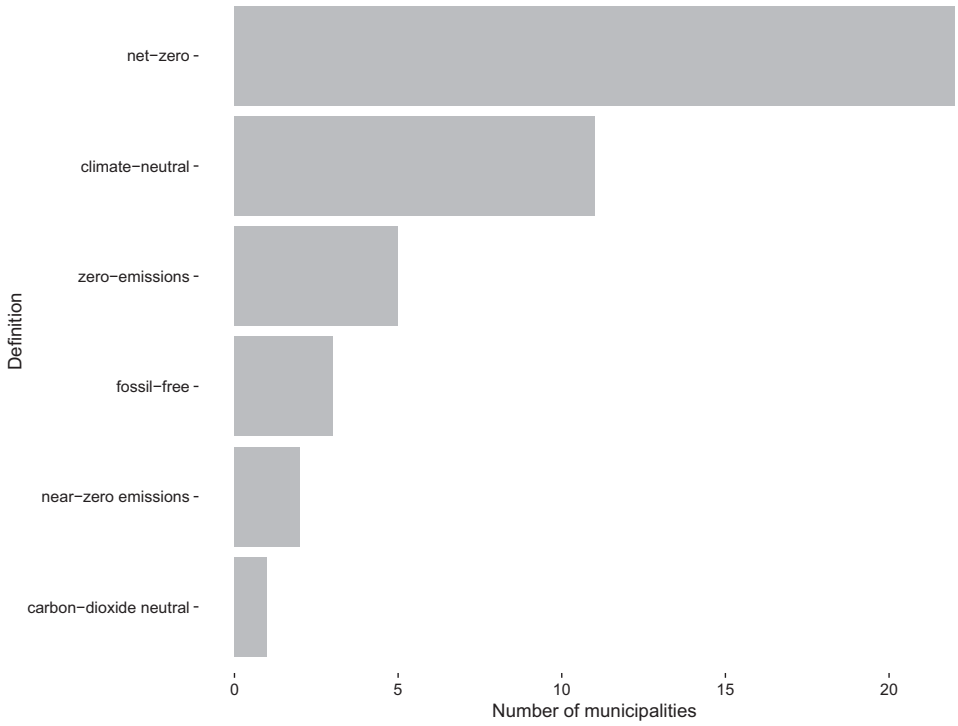

Figure 7.2 Definitions of net-zero emission targets used in municipal plans

ambition to become climate positive, meaning they will reduce their emissions beyond 100 percent. Kungsbacka municipality and three other municipalities express the same ambition in their targets but apply the term *negative emissions*. This differs from how negative emissions can be used to define how to reach net-zero emissions rather than go beyond zero emissions. For example, Örebro municipality emphasizes that negative emissions, equivalent to carbon storage in natural sinks, are a way to make up for unavoidable emissions from food production. Similarly, Kungsbacka municipality states that its net-zero emissions target corresponds to a state in which emissions are so low in all sectors that they can be compensated for through negative emissions. In addition, municipalities incorporate the terms *carbon-dioxide neutral* (one municipality) and *fossil-free* (three municipalities) in their net-zero emission targets. These terms refer to a reduction of CO_2 emissions that facilitates fulfillment of the national target to transform into a fossil-free welfare state and reduce the overall impact on the climate. However, they are mainly connected to the governance of energy and transport issues. Botkyrka municipality's goal is to be fossil-free by 2030 and climate neutral by 2045. This example highlights the distinction between the two terms and

simultaneously shows how fossil-free is a step toward becoming climate neutral rather than something equivalent. Municipalities with net-zero emission targets do not always refer to them as such (see Morsoletto and colleagues, 2017, for a discussion on what the meaning of a target is). The terminology used ranges from municipalities setting out a long-term vision (see, for example, Köping municipality) or target (in Swedish *målbild*, see, for example, Skövde municipality), to more commanding sentences such as *shall become*. Haninge municipality states that "by 2045 there will be no net emissions," and Kungsbacka municipality "shall have net-zero emissions by 2045 at the latest." Some municipalities also stated that reaching net-zero is their *goal image* or *vision* (Vallentuna), which in some municipalities are expressed as a long-term vision (Köping) and zero vision (*nollvision*, Härnösand). Climate neutral is presented as a state characterized by zero-net emissions, toward which a municipality contributes (Skövde) and steers (Nynäshamn) through their emissions reductions. Net-zero emission targets are also commonly aligned with the national climate goal (19 municipalities) rather than with the regional goal (six municipalities). For instance, Boden municipality states that the "municipality shall have zero net GHG emissions in accordance with the national target." Allowing municipalities to develop their own targets creates, perhaps unsurprisingly, a highly diverse set of definitions, concepts, and terminology.

7.4.2 Scope

While the previous section demonstrates that municipalities differ widely in how and where they describe their net-zero emissions target, we now look at which emissions municipalities are targeting. We ask: What is the scope of the net-zero emission targets in terms of time horizon, GHGs, and sectors? First, our results in Figure 7.3 illustrate that the target years for the municipalities' long-term net-zero emission targets vary significantly. Municipalities adopt target years ranging from 2035 to 2050, wherein most municipalities aspire to reach net-zero emissions by 2045 or 2050.

The majority of municipalities align their net-zero emission targets either with the current national climate target year of 2045 or the previous 2050 target. In fact, all but three of the 2050 targets are presented in planning documents published before the national target was changed to the current target, indicating that target updates are lagging behind. A baseline year is used by 15 municipalities and ranges from 1990, 1995 to the most recent, 2005. For example, this includes Boden, a small municipality with approximately 17,000 residents that aims to reduce its GHG emissions by 90 percent between 2005 and 2045 in order to then reach net-zero emissions.

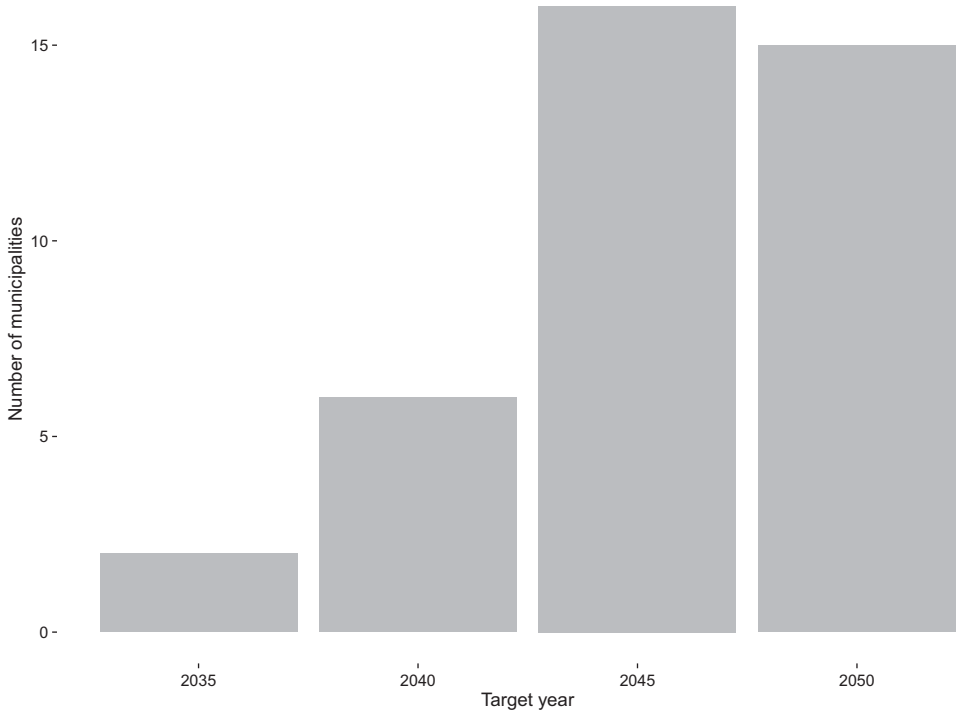

Figure 7.3 Target year for net-zero emission targets in Swedish municipalities

In terms of scope, that is, the emissions that are included in the target, most municipalities make a distinction between net-zero emission targets that apply to either municipal operations or the municipality as a geographical entity. Targets related to the former are often, relative to our definition of long-term net-zero emission targets, short-term targets as they aim to achieve fossil fuel independence, climate neutrality, or carbon neutrality by 2030. For example, Umeå municipality aims to have climate neutral municipal operations by 2025 while the whole municipality is expected to be climate neutral by 2040. Another notable trend concerns how most long-term net-zero emission targets include both CO_2 emissions and additional GHGs, simply described as GHG gases. However, relatively few municipalities specify exactly which GHG emissions their targets include or exclude. When and if they do, they either specify a number of gases, such as Stockholm listing carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), or refer to the definition used in the national climate target (e.g., Boden, Härnösand, and Umeå), which encompasses the same six GHGs as the Kyoto Protocol and the IPCC. Although these sub-state targets do not list specific GHG gases, they align with the language in the national and international agenda and established structure that describes how to calculate and reduce GHG emissions.

Existing operationalizations of municipal net-zero emission targets constitute a web of statements about whether emissions are either explicitly included or excluded depending on their origin. Starting with the former, two municipalities operationalize their inclusion in terms of sectors. For example, Lund municipality (situated in the southernmost part of Skåne) explicitly departs from the national approach by including operators that are part of the EU ETS that targets energy-intensive industries. Kungsbacka municipality states that "GHG emissions should be so low in all sectors that they can be covered by negative emissions." Västerås municipality states that, despite lacking the authority and power to manage emissions from certain sectors, these sectors are included in the operationalization of the target. In terms of excluded emissions, Västerås municipality's target excludes GHG emissions from renewable fuels. Lund's long-term net-zero emissions target excludes carbon dioxide sinks as measures that complement existing emissions and does not take into account emissions reductions produced outside the municipality. Luleå municipality aims to reduce CO_2 emissions by 100 percent by 2050 but excludes steel producer and heavy-emitter SSAB, likely because it is covered by the EU ETS.

Several municipalities explicitly state that they refrain from adopting consumption-based emission targets although they have been at the national level (see Chapter 4). While the capital, Stockholm, excludes emissions related to travel and the production of food, as well as other goods from outside of the municipality's geographical border. In its scope, Södertälje and Nynäshamn explicitly exclude emissions that occur outside of Swedish territorial borders. In contrast, seven municipalities take consumption-based emissions into account in their targets. While, for example, Sollentuna and Haparanda simply mention their adoption of a consumption perspective, Botkyrka municipality further specifies that "the target includes the indirect emissions of the municipality's inhabitants, companies, and other operations, meaning the GHG emissions generated by their purchase of goods and services." Similarly, Kungsbacka defines consumption-based emissions as emissions from "the things that the people who live and work in the municipality consume, no matter where in the world they were produced." What these examples have shown is that, despite the fact that two municipalities both seem to aspire to achieving climate neutrality by the same year, the scope of the target may differ quite considerably depending on the size of the consumption-based emissions. In its SWOT analysis, Vallentuna municipality states that "the municipality's jurisdictional power over issues concerning private consumption and the conditions of the business sector is limited."

7.4.3 Residual Emissions

Finally, after looking at the how, where, and what of net-zero emission targets in Swedish municipalities, we turn to the crucial question of what to do with those

emissions that cannot be mitigated, that is, residual emissions. Hence, we ask: To what extent do municipalities set up a strategy to manage potential residual emissions? Which practices are adopted to eliminate these residual emissions? Out of the 39 municipal long-term net-zero emission targets identified in this chapter, only six municipalities provided information about how they intend to deal with residual emissions after the implementation of mitigation measures. These municipalities are Gävle, Helsingborg, Hudiksvall, Härnösand, Stockholm, and Örebro.

Two main approaches to managing residual emissions have been identified in the municipal climate strategies: natural carbon sinks and carbon removal technologies. Gävle, Helsingborg, and Örebro state that compensating practices include natural carbon sinks (e.g., forest and land). Örebro explains that certain activities such as food production can never reach zero emissions, meaning that compensation through negative emissions is needed, for example through carbon storage in vegetation or underground.

All six acknowledge that they have included technological carbon removal methods in order to deal with residual emissions. The two most common approaches are CCS[4] and BECCS, wherein the latter is specifically implemented to capture carbon from the biofuel production process. While Gävle municipality only shows interest in using BECCS, Stockholm municipality highlights the potential of both methods. Hudiksvall municipality, on the other hand, describes its use of CCS as a measure to capture and store fossil carbon dioxide if no alternatives to manage residual emissions are provided. While some municipalities (e.g., Hudiksvall municipality) choose to only account for one method to eliminate residual emissions, municipalities such as Helsingborg describe multiple approaches which align with the national approach to dealing with residual emissions. In addition to offsetting residual emissions through the "uptake of carbon dioxide in forests and in the ground," the municipality will make use of BECCS technologies to capture and store emissions and also engage in emission reductions outside its borders. Similarly, Gävle municipality acknowledges the same carbon offsetting measures and how they form part of the national climate strategy. However, the extent to which the measures are adopted as a part of its climate neutrality strategy is unclear from the description. Nevertheless, the majority of municipalities fail to mention how residual emissions will be managed and measures are most often described in an informative way, for example in an appendix to the planning document.

[4] Note that CCS does not lead to negative emissions but reduces emissions at point sources.

7.5 A Motley Crew of Net-Zero Emission Targets: Politics of Aspiration or Delay?

The voluntary setting of net-zero emission targets leads to a wide variety of targets in terms of definition, scope, and how to deal with residual emissions. In this motley crew of targets, it is easy to find instances in which the politics of aspiration seem to be at play. Municipalities such as Stockholm, Sollentuna, and Örebro, which have detailed net-zero emission targets and, in some cases, also plan for dealing with residual emissions, appear to be structuring their future economies around long-term targets, setting out a vision that is supported by concrete steps to reach the end goal. Cities such as Helsingborg and Växjö, which also have net-zero emission targets, are using the targets to strengthen their profile as green and sustainable cities, which could be interpreted as a way to "affirm identities and values," as Finnemore and Jurkovich (2020, p. 759) put it, in line with the politics of aspiration. Heterogeneity is, in this case, not problematic, per se, as voluntary and bottom-up climate governance by local authorities has been described in terms of experimentation in which initiatives are designed without a common mold, leading to approaches that are based on local contexts and with the promise of scaling (Castán Broto and Bulkeley, 2013; Sabel and Victor, 2022; Ven et al., 2016). However, it does create challenges for those tasked with evaluating targets as they are described in various types of documents. The lack of standards for presentation, definitions, monitoring, and reporting makes it difficult to provide the necessary means to hold decision-makers accountable for reaching their net-zero emission targets. Moreover, very few municipalities explicitly align themselves with the national targets, and even when they do, it is challenging to understand exactly how they align themselves, except for in spirit. It demonstrates a problematic side of the politics of aspiration, as lofty long-term goals do not easily lend themselves to accountability mechanisms (Finnemore and Jurkovich, 2020, p. 765). The question of whether and to what extent the voluntary municipal targets support the national targets of a fossil-free welfare society by reducing emissions is currently impossible to answer without making broad assumptions about the nature of local economies and the type of targets. As Finnemore and Jurkovich (2020, p. 765) suggest, some action is better than no action:

> Effort and intent matter greatly in judgments of success or failure. Our judgments about people who aspire, work hard and make progress in the desired direction are very different from our judgments about people who do nothing or hypocritically work against stated goals. If the goal is lofty, some progress may be better than none and audiences or constituents judge accordingly.

From this perspective, the 39 municipalities with net-zero emission targets are better equipped to contribute to the national target than the 241 municipalities with no net-zero emission targets.

A bigger worry is the risk that long-term goals become a substitute for action or banking on carbon dioxide removal that has not been well developed (Buylova et al., 2021). Engaging in discussion about transformational change in order to solve problems can become a socially acceptable substitute for attempting to solve such problems (Finnemore and Jurkovich, 2020, p. 766). By adopting a bold net-zero emissions target, municipalities might brand themselves as "green" and create a sense that they are actually doing something to address climate change. However, as we have seen in some cases in the analysis above, if the scope in terms of gases and sectors is limited, then the target functions more as a smokescreen than as an instrument for transformational change. Such politics of delay should thus be countered by demanding that a broad range of municipalities takes on new net-zero emission targets.

The type of yardstick we use is also important. In order to understand what constitutes a "good" target, a municipality will need sufficient human, technical, and financial capacity to develop, implement, and evaluate a net-zero emissions target. For most Swedish municipalities, such resources are not available. The problem, as McCormick and colleagues write in the context of transformation to a low carbon and sustainable society, may be that "the current focus is on large, global cities with minimal attention on small cities, villages, and urban nodes" (McCormick et al., 2020). The heterogeneity and loftiness of many net-zero emission targets may discourage the casual observer and leave them wondering about the point of setting vague targets which are 30 years into the future. Perhaps the purpose of net-zero emission targets is not to provide detailed roadmaps but rather should be understood as the "politics of aspiration" (Finnemore and Jurkovich, 2020). Such politics "articulates goals, affirms identities and values" providing a structure for politicians and civil servants to work within. In this sense, net-zero emission targets become a way to mobilize action and facilitate collaboration around a common lofty goal. For example, ambitious net-zero emission targets of cities such as Helsingborg and Växjö help to distinguish some municipalities from others, affirming the identity of these cities as "green" pioneers in the battle against climate change. For a better understanding of the "politics of aspiration" behind net-zero emission targets, researchers could take a more qualitative approach, understanding what (if any) political, practical, and institutional consequences result from setting such targets.

The heterogeneity of net-zero emission targets makes it virtually impossible to quantify their impact on Swedish national emissions without making broad assumptions and aggregations. Whether we are to believe that this "let all flowers bloom" situation which currently characterizes the Swedish landscape of sub-national net-zero emission targets is beneficial for achieving a fossil-free welfare state by 2045 depends on how much emphasis should be placed on uniformity.

Several studies have lamented the heterogeneity of sub-national climate action from an analytical perspective (Hsu et al., 2019). However, with all the existing variations, what is it that characterizes "ambitious" net-zero emission targets? The devil is in the detail. Stockholm municipality, for example, aims to be climate positive by 2040. It describes an agenda for reducing emissions and for dealing with residual emissions using carbon removal technologies such as (BE)CCS. The neighboring municipality of Sollentuna also has a target not to "deplete planetary resources." The big difference, however, is that while the former municipality explicitly excludes consumption-based emissions, the latter presents a vision for how to include them. Given the significance of consumption-based emissions, the goal of Sollentuna municipality could be considered more ambitious. It should be noted that Stockholm municipality is considering actions to address consumption-based emissions in its plan. Also on a national level, Sweden is in the process of developing consumption-based approaches to target setting (SOU, 2022).

What, then, is the link between national authorities and local decision-makers? Local net-zero emission targets in Sweden are not the result of top-down policy-making. The national government is, however, not entirely absent from the process. By focusing on creating the conditions for municipalities to set and implement ambitious net-zero emission targets, the Swedish government is taking steps toward emulating the UNFCCC's "catalytic and facilitative" model in a national context (Chan et al., 2018; Hale, 2016). For instance, through national subsidy programs such as the Climate Leap, which was introduced in 2015 to support local and regional mitigation initiatives by, for example, municipalities,[5] the government promotes context-driven and local approaches, particularly for infrastructure investment. Moreover, the FFS (see Chapters 5 and 6) launched by the national government as an orchestration initiative to promote collaborative climate governance includes nearly 70 municipalities which have adopted climate goals and policies in line with the objectives of the initiative.[6] Beyond the state, of course, municipalities and regions are also engaging in a myriad of other cooperative initiatives focusing on inter alia mitigating climate change. Chapter 6 concluded that around 55 percent of all municipalities in Sweden participate in city networks, many of which are supported by the national government in one way or another.

Finally, we ask: Do local net-zero emission targets support the transition of Sweden becoming a fossil-free welfare state? There is little evidence in our data to suggest that municipalities are preparing for large-scale societal transformation on their own. Only a very few cities actually had net-zero emission targets at the time of the data collection and a fraction of those targets cover a substantial part of the local economy (e.g., by excluding large emitters) or adopting more

[5] www.naturvardsverket.se/bidrag/klimatklivet/. [6] Count date: 23 May 2022.

comprehensive approaches (e.g., consumption-based approaches). A very limited number (around 2 percent) of the Swedish municipalities we surveyed described how they intended to deal with residual emissions. We acknowledge, however, that the number of municipalities with net-zero emission targets is growing, albeit is a small number compared to the total number of municipalities in Sweden. The presence of national, regional, and local support in the shape of subsidies and networks suggests a promising turn toward enabling more and more municipalities to set and implement increasingly ambitious targets.

7.6 Conclusions

This chapter explored how Swedish municipalities contribute to the national target of becoming a fossil-free welfare state by setting voluntary net-zero emission targets. We asked whether the targets are examples of the politics of aspiration or delay and concluded that few targets are currently designed in such a way that the promises of aspirational politics could be confirmed. However, it would be premature to describe the efforts of municipalities with net-zero emission targets as merely the politics of delay. We analyzed the net-zero emission targets in terms of terminology, operationalization, scope, and residual emissions. Thirty-nine Swedish municipalities had adopted net-zero emission targets at the time of the data collection. There is a significant heterogeneity in terms of definition, scope (time horizon, gases included, and geographical area), as well as how to deal with residual emissions. Despite the heterogeneity, we noted some convergence toward net-zero emission targets defined in terms of net-zero or carbon neutrality, including GHG emissions produced in the geographical area of the municipality, with 2045 or 2050 as the target year and omitting any reference to residual emissions. The heterogeneity makes it difficult to quantitatively assess whether municipalities will reach their targets, as there are no specific long-term policies. The heterogeneity also renders a quantitative analysis of how municipalities contribute to the national climate goals difficult, without making broad assumptions and generalizations. Consequently, mechanisms for evaluating net-zero emission targets are needed to ensure that local decision-makers are held accountable and limit the risks associated with aspirational politics. The national government also plays a role by supporting local authorities in setting and implementing net-zero emission targets, both directly via subsidy schemes and indirectly by networks such as FFS (see Chapters 1, 4, and 7). Future research could focus on the interplay between municipalities and other levels of governance (e.g., regions and states); assess whether existing net-zero emission targets have generated additional emission reductions compared to municipalities without such targets; and explore the microfoundations of how net-zero emission targets are set, designed, and implemented.

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