Municipal climate action managers: Effectiveness in funding acquisition and GHG mitigation

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Abstract

Germany has approximately 11,000 municipalities which can make a significant contribution towards achieving climate targets. The Local Authorities Funding Guideline (LAG) of the German National Climate Initiative (NCI) has supported municipalities in designing and implementing climate action since 2008.

One of the funding components of the LAG is the funding of a position for climate action management (CAM). Since 2008, more than 800 climate action managers have been funded. The positions are funded for three years and can be renewed for a further two years. Often the positions are made permanent and firmly anchored in the administration after the funding period ends.

The tasks of the climate action managers are very diverse. Their main task is to implement investments in energy efficiency and climate action measures. They often apply for further funding for this purpose or advise and support others in the application process. However, measuring their impact presents a challenge. Determining the impact of a policy instrument such as the funding of a climate action staff position is essential, on the one hand to be able to justify the expenditure of funding, and on the other hand to create a knowledge base for the continuation and further development of the instrument. This study contributes towards such an impact analysis.

The aim of the study is to analyse the effect of the work of the climate action managers on the call for funding and to quantify the greenhouse gas reductions achieved through the implementation of funded climate action measures. The analysis was carried out as a comparison group analysis: The acquisition of subsidies in municipalities with climate action managers is compared to that in municipalities without. The associated greenhouse gas reductions are quantified. Data from 11 funding programmes were evaluated.

In addition, in the group of cities with CAM, funding calls before the introduction of CAM were compared with funding calls after the introduction of CAM. Both comparisons were made for small and medium-sized municipalities.

The results show that more funded climate action measures are implemented in municipalities with CAM than in municipalities without. The funding volume with CAM is also significantly higher than without, and greenhouse gas reductions are correspondingly higher. With the results presented here, the impact of municipal climate action managers on the reduction of greenhouse gas emissions in municipalities can be proven. For municipalities with CAM, it can also be shown that more projects are implemented after the establishment of CAM than in the years before the climate action manager was hired.

The survey results can be used to demonstrate the importance of climate action managers for municipal climate action and for the implementation of climate protection measures. The aim should therefore be to increase the number of municipalities with climate action managers.

Introduction

Since 2008, the Federal Government has been funding climate protection projects throughout Germany through the National Climate Protection Initiative (NCI). Between 2008 and the end of 2021, more than 39,800 projects with a funding volume of around 1.35 billion euros were supported (BMU 2022).

One of the funding guidelines within the NCI is the Local Authorities' Funding Guideline (LAG). The LAG promotes climate protection measures by municipalities and other regional actors, such as religious communities with corporate status and universities. Since the beginning of the NCI, staff positions for climate action management, so-called climate action managers (CAMs), have been eligible for funding through the LAG. The prerequisite is that the municipality or the other actor has its own climate action plan in which measures for implementation are listed. The plan may not be older than three years. The main task of the climate action manager is the implementation of climate protection measures from the climate action plan.

Around 800 positions for climate action managers have been approved until mid-2020. The most important recipient groups are municipalities with just under 600 and districts with just under 160 funded positions. As a rule, one staff position or less, e.g., half a position, is funded.

While the main task of the climate action managers is the implementation of measures from the climate action plan, the reported range of tasks is municipality-specific and very diverse. For example, a great deal of public relations and networking work is carried out both within and outside the municipal administration. One task that is very often carried out by climate action managers is the acquisition of funding for the implementation of climate action measures (Kenkmann et al. 2021a, Kenkmann et al. 2021b, Kenkmann et al. 2021c).

The effect of the funding via the LAG is regularly reviewed. During the evaluations of the LAG, an impact assessment for the work of the CAM has already been carried out several times. As a rule, qualitative aspects, such as the contribution of the managers to "energy transformation" (Öko-Institut et al. 2017, Kenkmann et al. 2019, Kenkmann et al. 2021), were examined. A quantification of the impacts, also regarding the greenhouse gas (GHG) reductions triggered, is much more difficult. Until now the data on the initiated reductions given in the evaluations (Öko-Institut et al. 2017, Kenkmann et al. 2019, Kenkmann et al. 2021) are based exclusively on the information provided by the municipalities themselves; it is not possible to verify these numbers by the evaluation.

The aim of this study was to contribute to the impact analysis of the work of the CAMs. The focus was put on managers in municipalities; other local actors such as universities and churches were not considered. For this purpose, one important aspect of the CAM's work was selected: the acquisition of funding for the implementation of climate action measures. It is known from previous studies (Kenkmann et al. 2021) that municipalities are often overwhelmed by the multitude of funding programmes for climate action, which usually have different conditions and prerequisites. Especially in smaller municipalities there is often no staff available to acquire funding for the implementation of measures and to take over the reporting. Kenkmann et al. (2021) showed that municipalities with CAM are more often aware of and use support programmes than municipalities without CAM.

The hypothesis for our analysis was that there are differences in the funding statistics between municipalities with and without climate action managers. To prove this hypothesis, funding statistics were analysed in detail and compared on the basis of defined indicators.

In the paper we first explain the methodology used before presenting and discussing the main results and drawing conclusions.

Methods

The analysis was carried out as a comparison group analysis and, in addition, as a before-and-after comparison: The call for funding of cities and municipalities with CAM is compared to the call for funding of cities and municipalities without CAM. In addition, a comparison of the call for funding before hiring the climate action manager with the activities after hiring the climate action manager is carried out for municipalities with CAM.

The analysis consisted of the following steps: (i) selection of the comparison groups, (ii) collecting funding statistics for appropriate funding programmes, (iii) defining indicators for the comparison and (iv) conducting the comparison itself. These steps are described below.

SELECTION OF THE COMPARISON GROUPS

The analysis was designed as a comparison group analysis. Two comparison groups were formed for this purpose:

- Group 1: Cities and municipalities with active, originally funded climate action management, and
- Group 2: Cities and municipalities without climate action management.

The selection of the municipalities for the comparison groups was based on a set of predefined criteria and indicators. These are presented in Table 1. All of the approx. 11,000 German municipalities were characterised and filtered using these criteria.

For Group 1, the cities and municipalities were selected which, according to the funding database, have a funded position for CAM or whose first position for CAM was approved between 2008 and 2017 and which still have a CAM, possibly not funded. This description applied to 298 municipalities.

On the one hand, municipalities in group 2 should not have a CAM, but on the other hand they should be active in climate protection and already implement measures. This indicator was added to prevent a distortion of the results by comparing municipalities with climate protection activities with municipalities without any climate protection activities and no interest in climate protection at all. It was ensured by only selecting municipalities without a funded or unfunded climate action manager, but which had already implemented projects via the NCI. These municipalities were also not supposed to have structures comparable to the CAM and therefore not participate in the European Energy Award[1] and not be organised in the Climate Alliance[2]. This applied to 2,412 German municipalities.

Stratified random samples were drawn from these two populations. A sample size of 80 municipalities with CAM and 20 municipalities without CAM had been determined beforehand. For the characteristics federal state, growth tendency and indebtedness, an equal distribution of the characteristics was

1. The European Energy Award is an international quality management and certification instrument for municipal climate protection. https://www.european-energy-award.de/

2. The Climate Alliance is the largest European network of cities dedicated to climate protection. https://www.klimabuendnis.org/home.html

Table 1. Indicators and data basis for the selection of the comparison groups.

Criterion	Indicator	Data source
Location	Federal state	Statistische Bundesamt (2019)
Activity in climate protection	Climate action management in place	Funding database of the LAG Internet search*
	Participant at the European Energy Award (EEA)	https://www.european-energy-award.de/
	Member of the Climate Alliance	https://www.klima-buendnis.org
	Project other than CAM funded via NCI	Funding database of the NCI
Size	Population 2017	Statistisches Bundesamt (2018)
Growth tendency	Relative population development between 2000 and 2017	Population in 2000 and 2017 (according to Statistisches Bundesamt (2001) and Statistisches Bundesamt (2018)
Financial strength of the municipality	Indebtedness	Statistical Offices of the Federation and the Federal States (2018)
Socio-demographic characteristics	Share of population > 65 years	Statistische Bundesamt, (2019)

** Municipalities with unfunded climate action management were also considered.*

made. Also, a wide range of the proportion of people over 65 years was covered.

The comparison groups could be chosen in such a way that they are comparable regarding all criteria. One exception is the size of the municipalities: since there have been only three cities in Germany with more than 100,000 inhabitants without CAM by the time of the analyses and the sample would thus be too small, large cities are excluded from the comparison of the groups in the following. Therefore, 55 municipalities, 34 of which are small (up to 20,000 inhabitants[3]) and 21 medium-sized (20,000 to 100,000 inhabitants), are selected for Group 1, and 18 municipalities, 12 of which are small and 6 medium-sized, are selected for Group 2.

SELECTION OF FUNDING PROGRAMMES

The aim was to compare the call for funding according to defined indicators (see below) in selected funding programmes by the two groups. For this purpose, it was necessary that funding data are available. This severely limited the selection. In the end, it was possible to collect and evaluate data for eleven funding programmes with regard to the number of funding applications approved and the funding spent for the municipalities in the comparison groups.

Table 2 provides an overview of the selected funding programmes and the data sources that were available to estimate the funding efficiency. The source of the funding data is the federal government's funding database[4], except from the last programme in the table. There it is the Federal Institute of Economics and Export Control (BAFA, not published).

DEFINING INDICATORS AND EVALUATING THE DATA

The impact of municipal CAM on the following indicators was analysed for the municipalities in the two groups:

- Number of funded projects implemented,
- Funding volume of the implemented funded projects,
- Average funding volume per project
- GHG reductions through the implemented funded projects

The period under consideration ranges from 01.01.2008 to 30.06.2020. The funding data retrieved included the year of project start, total volume, funding volume, and recipient group. The funding volume of a project was attributed to the year of the project start and not distributed over the project duration.

To determine the GHG reduction effect of the funded projects the funding efficiency of the programme was used. Existing evaluations of the funding programmes were evaluated (for sources see Table 2) and the value for GHG reduction per funding euro ("funding efficiency") was extracted. The funding efficiencies determined in the evaluations were used to quantify the reductions by multiplying the funding volumes by the funding efficiency. The funding efficiency of one specific programme usually changes between several years or evaluation periods. It should be noted that no direct reductions are achieved through some of the funding programmes, as these fund rather strategic measures. No reduction can then be shown for these funding programmes. The "LAG strategic" funding programme includes both measures with direct emission reductions, e.g., "energy saving models", and measures without direct emission reductions, e.g., "preparation of climate action concepts". The type of project was considered when calculating the reduction effect.

COMPARISON OF ACTIVITIES BEFORE AND AFTER CAM WERE HIRED USING "MUNICIPAL YEARS"

In the cities and municipalities with a CAM, the use of funding programmes before and after the start of the CAM is compared. Due to the different starting years of the CAM, the duration of the periods with or without CAM differs significantly be-

3. The size classes are based on the defined city and municipality types in Germany, available at: https://www.bbsr.bund.de/BBSR/DE/forschung/raumbeobachtung/Raumabgrenzungen/deutschland/gemeinden/StadtGemeindetyp/StadtGemeindetyp.html

4. https://foerderportal.bund.defoekat/jsp/SucheAction.do?actionMode=searchmask visited November–December 2021.

Table 2. Selected funding programmes.

Funding programme	Duration	Source of the funding efficiency used for this analysis
Local Authorities funding Guideline investive projects (LAG investment)	since 2008 ongoing	Kenkmann et al (2017), Kenkmann et al (2019), Kenkmann et al (2021)
Local Authorities funding Guideline strategic projects (LAG strategic)	since 2008 ongoing	Kenkmann et al (2017), Kenkmann et al (2019), Kenkmann et al (2021)
Municipal networks (energy efficiency and resource efficiency networks)	2015-2019	Paar et al (2021)
Climate protection in everyday life	since 2016 ongoing	No evaluation; not considered in GHG mitigation
Local climate protection model projects	2016-2020	Pröpper/Wohlfahrt (2021)
Short distances for climate protection	2016-2019	Jessing et al (2021)
Climate protection through cycling	since 2016 ongoing	Paar et al (2021)
Procurement of electric buses in public transport*	since 2018 ongoing (hybrid bus funding since 2009)	Motschall (2019) Öko-Institut/Fraunhofer ISI (2020)
Electromobility	since 2015 ongoing (Predecessor funding guideline since 2010)	No evaluation of the guideline, therefore using of the funding efficiency of electromobility measures within the LAG (Kenkmann 2021)
Publicly accessible charging infrastructure for electric vehicles in Germany	since 2017 ongoing	Öko & ISI (2020)
Market incentive programme for the promotion of renewable energies in the heating market (MIP)	since 2008 ongoing	Ongoing evaluations of the MIP: Fichtner et al. (2019), Stuible et al. (2016, 2018) Langniß et al. (2010)
Federal funding for energy consulting for non-residential buildings of municipalities and non-profit organisations	since 2016 ongoing	PricewaterhouseCoopers (2018)

tween the municipalities. Therefore, a key figure is introduced to harmonise the figures: the "municipal years". This indicator corresponds to the sum of all years in the municipalities of a comparison group with or without CAM. Due to the different starting years of the CAM, the duration of the periods with or without CAM differs significantly between the municipalities.

A summation of all funding projects and volumes before and after the start of the CAM, as well as the formation of year-specific indicators, without using "municipal years" does not take into account the changing number of municipalities before and after the start of the CAM. Using "municipal years" makes it possible to compare these two periods, taking into account the different lengths of time with and without CAM in the individual municipalities. The start year of the CAM (year 0) is shown as well.

Results

Figure 1 compares the number of projects, funding volumes and GHG emissions in the two groups for the two size classes. Municipalities with CAM perform better in both size classes than municipalities without CAM in all the indicators examined. In Group 1, with CAM, more funded projects are implemented, and more funding is used. The funding volume per project is significantly higher in Group 1 than in Group 2 and higher GHG reductions are achieved.

Specifically, in small municipalities in Group 1, twice as many projects are funded and 5 times as much funding is accessed as in municipalities in Group 2 of the same size. In the medium-sized municipalities, the differences between the two groups are smaller: the number of funded projects almost stays the same, but the volume of funds rises by factor 4. The volume of funded projects is on average 2 times higher in small municipalities with CAM than in small municipalities without CAM. The difference is even greater in medium-sized municipalities: projects in municipalities with CAM are on average 3 times larger in Group 1 than in Group 2.

The mean GHG emissions achieved are even 9 times higher in the small municipalities in Group 1 than in group 2; in the medium-sized cities, they are almost 3 times larger in Group 1 than in group 2. A comparison of the small and medium-sized municipalities also shows that the values for the indicators increase with the size of the municipality.

There are large differences in the factors, even within a size class. This is because a) the volumes of funded projects vary, b) the funding programmes in which projects are implemented change, c) the funding efficiencies between funding programmes vary and d) the funding efficiencies for a funding programme also change over time. The individual funding programmes have different funding efficiencies, i.e., different levels of reduction per funding euro invested. The level of funding efficiency also depends on the year of implementation, as the funding objects and conditions change over time.

In order to further analyse the impact of CAM in the municipalities, the start years of the approved projects were put in relation to the start year of the funded CAM. Only three of the 11 funding programmes are considered, namely those that could be applied for consistently throughout the entire period under review: "LAG investment" and "LAG strategic" as well as

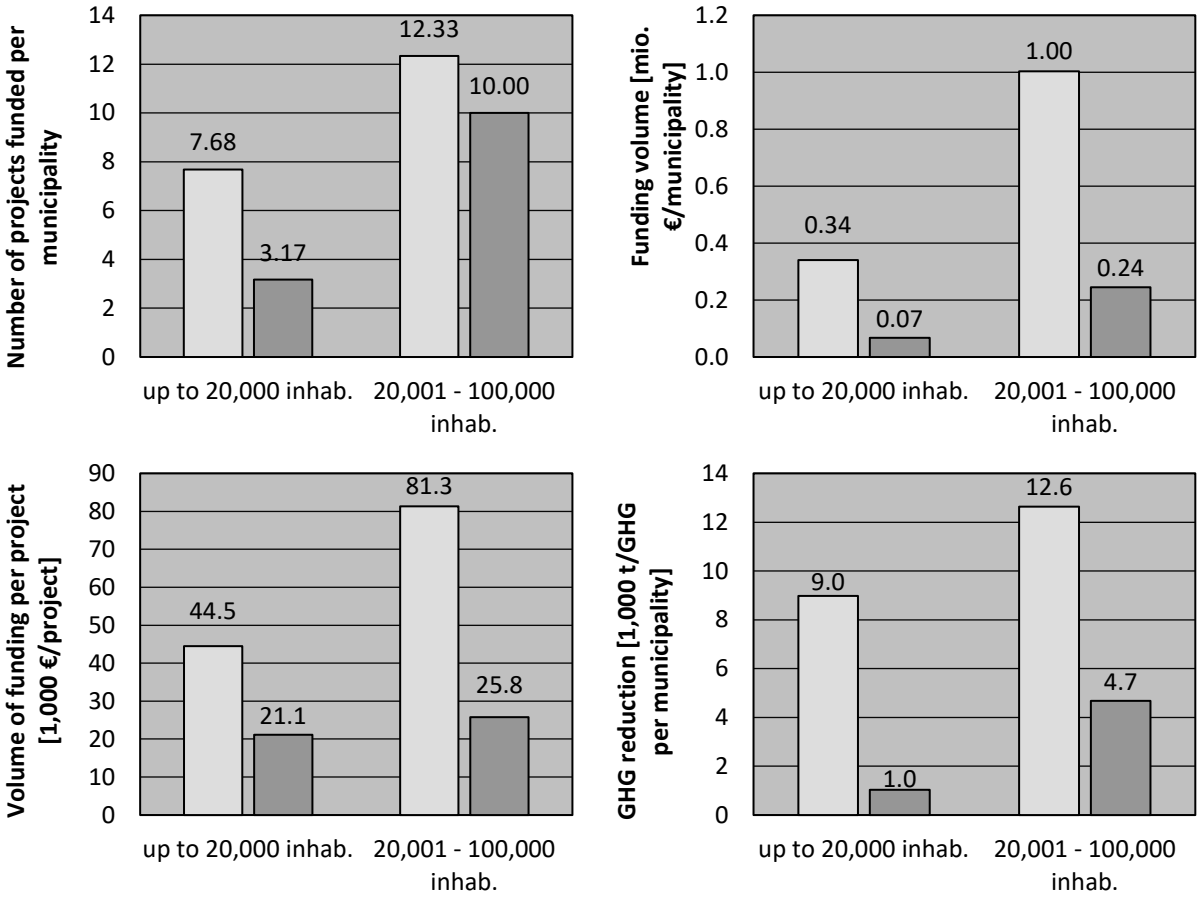

Figure 1. Average number (top left) and average volume (top right) of projects per municipality as well as average funding volume per funded project (bottom left) and average GHG reduction by size class; Comparison of municipalities with CAM (Group 1) and cities without CAM (group 2).

the "Market Incentive Programme (MIP)". Depending on the start of the CAM, projects may have been started up to 12 years before or after the start of the CAM. The projects before and after the start and in the start year of the CAM are considered cumulatively. For this purpose, the approved projects and their volumes are placed in relation to the cumulative years of all municipalities of a size class in the respective periods under consideration ("municipal years").

Figures 2, 3, and 4 show the number of funded projects, the funding volume and the GHG reduction for small (left) and medium-sized (right) municipalities in the three selected funding programmes before and after the start and in the year of the start of the CAM in relation to the "municipal years". In both size categories, the number of projects increases significantly with the hiring of the climate action manager, in the small (+57%) even more than in the medium-sized (+48%). While in the medium-sized cities the number of projects decreases in the year of recruitment, this is not the case in the small municipalities - there the number even increases slightly.

The funding volume in small municipalities increases much more strongly than the number of projects, by almost 200%. In the year in which the CAM is recruited, it drops slightly. In the medium-sized cities we see a different development: there, the funding volume is already much higher before the CAM is recruited than in the small ones and does not increase further with the recruitment. On the contrary: the funding volume per "municipal year" declines slightly (-5%) after the CAM is hired. The decline in the year of hiring is more pronounced than in the small municipalities.

The development of GHG reduction again shows a different picture: it increases particularly clearly by a factor of 9 in the small municipalities with CAM. The figure shows that the reduction from the "LAG investment" measures increases by more than double, and the strong reduction is mainly due to the increase in reductions from "LAG strategic"-projects. Obviously, not only is the number and volume of projects implemented in this funding programme increasing, but the type of projects implemented is also changing. More strategic measures are now being implemented, through which, according to the evaluation, reductions are achieved. This effect can also be seen in the medium-sized cities. Here, too, the GHG reduction per "municipal year" increases significantly, albeit less strongly than in the small municipalities. The GHG reduction effect through the "LAG investment", on the other hand, is hardly influenced by the CAM in the medium-sized municipalities. The GHG reduction effect of the "Market Incentive Programme" is negligible in small and medium-sized municipalities.

Figure 5 shows an example of the development of GHG reductions comparing groups 1 and 2 for the small municipalities over time and broken down by support programme. It can be seen that the annual amount of GHG reduction in

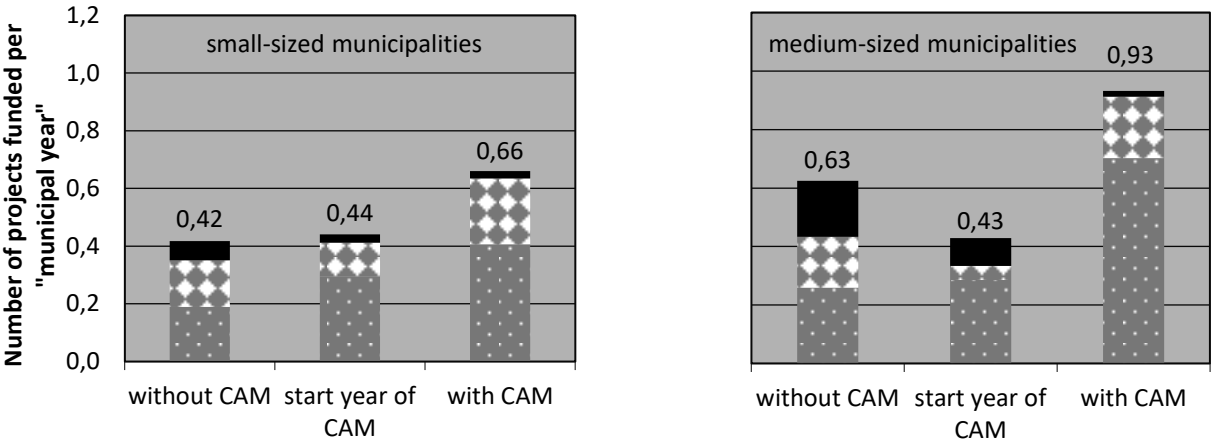

Figure 2. Number of projects per "municipal year" in three funding programmes before and after, as well as in the start year of climate action management in Group 1 (with CAM).

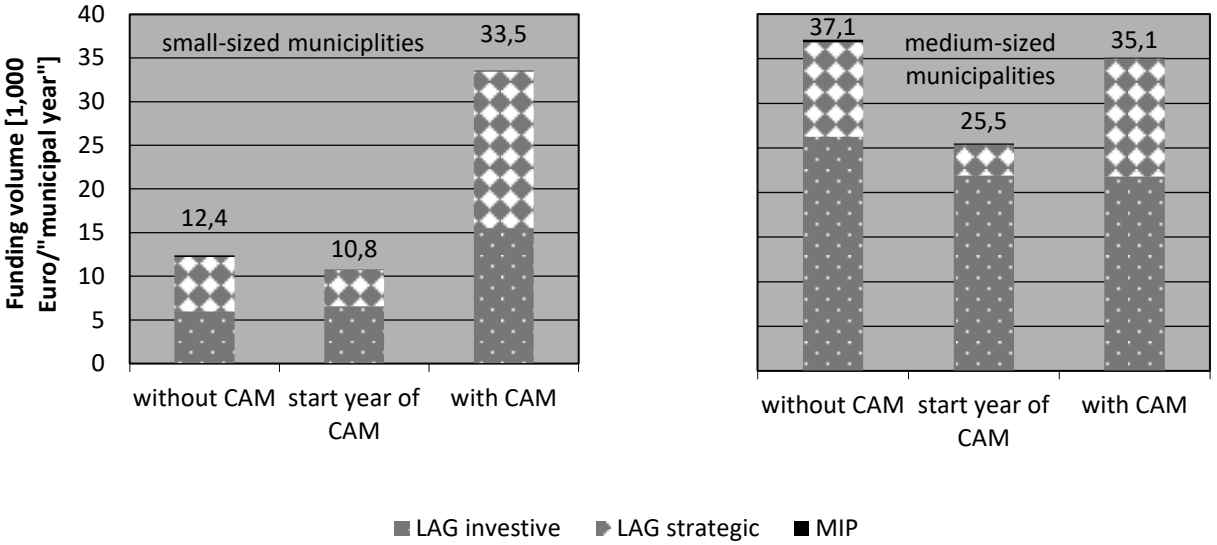

Figure 3. Funding volume per "municipal year" for three funding programmes before and after, as well as in the start year of climate action management in Group 1 (with CAM).

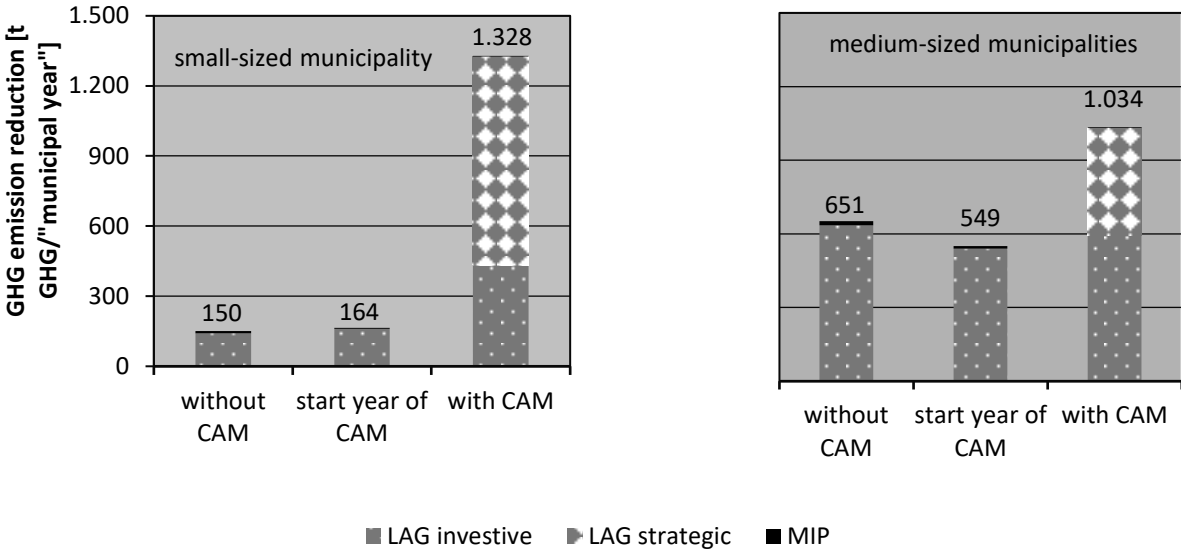

Figure 4. GHG emission reduction over the effective period per "municipal year" in three funding programmes before and after, as well as in the start year of climate action management in Group 1 (with CAM).

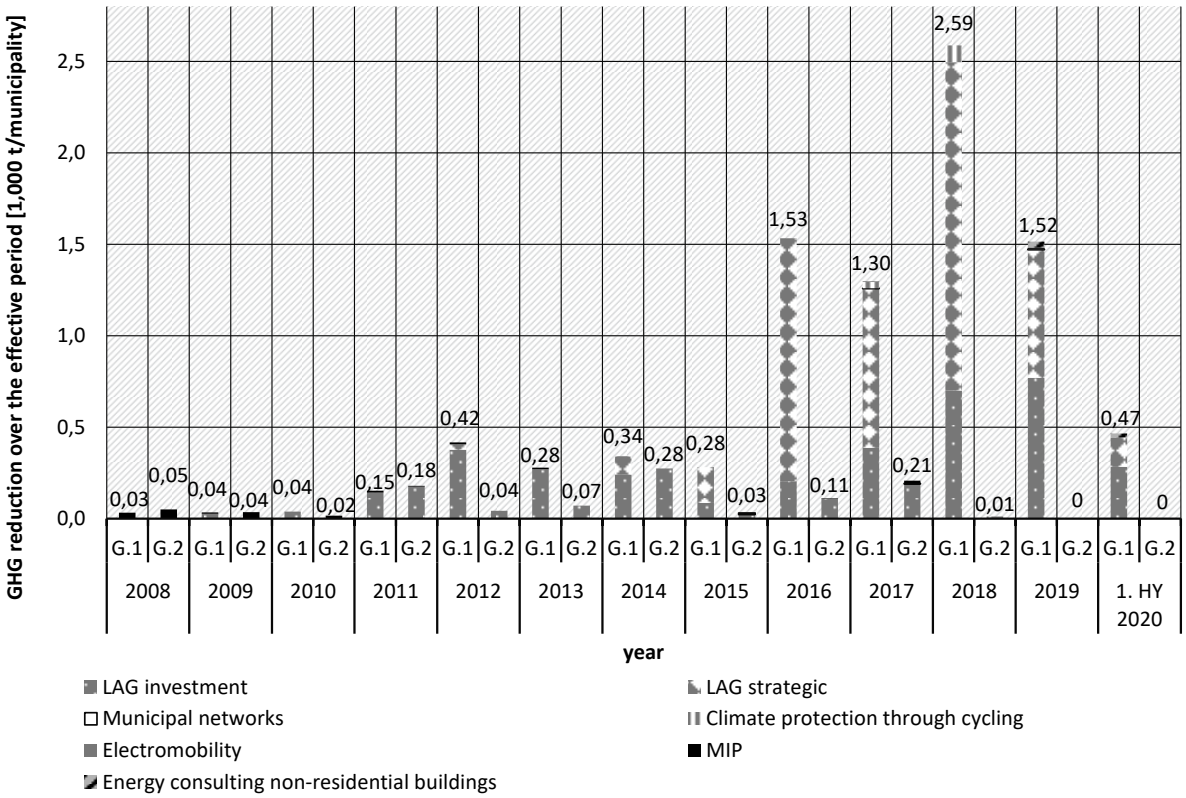

Figure 5. GHG emission reduction per municipality of the size class "small" over the effective period in comparison with municipalities with (Group 1; n=34) and without climate protection management (Group 2; n=12). Shown are reductions of the projects funded in the respective year.

Group 1 is higher than in group 2 in almost every year and increases significantly from 2016 onwards. Most of the reduction comes from the LAG strategic and LAG investment programmes, which are the most important funding programmes for small municipalities. It also shows that of the 11 funding programmes examined, only seven are used in this subgroup. The municipalities in Group 1 use a larger selection of funding programmes than those in Group 2. These results also apply to the medium-sized municipalities. Smaller municipalities, however, use a smaller range of funding programmes.

Discussion

The analyses carried out have shown that a staff position for climate action management (CAM) put cities and municipalities in a stronger position to apply for funding and implement climate protection projects and ultimately reduce GHG emissions. The CAM has also a particular influence on the size of the projects: Cities and municipalities of both size classes with CAM apply for larger projects than cities and municipalities without CAM. Here, the CAM seems to be necessary to manage the implementation of large projects. Smaller municipalities in particular seem to be increasingly enabled by the CAM to tackle larger strategic projects. But the number and volume of investment projects is also rising sharply.

Another result of the analyses is that with increasing size of a city or municipality, the number of implemented projects, and the volume of subsidies called up as well as the amount of GHG reductions achieved typically increases. On the one hand, this is certainly an expression of the fact that there is greater reduction potential in larger municipalities than in smaller ones. At the same time, it is an indication that larger administrations are more capable of applying for and implementing larger projects, and that larger budgets are more likely to be able to provide funds for the own share of funded GHG reduction measures than smaller budgets. Smaller municipalities therefore require relatively greater support, both organisationally and financially, than larger municipalities.

Another important result is that a more comprehensive portfolio of funding programmes is used in municipalities with CAM. The application procedures, the funding conditions as well as the reporting demands for the funding programmes differ greatly. It seems easier for municipalities with the appropriate staff to use a variety of programmes, while cities without CAM can often only use one or two of the funding programmes investigated due to the administrative efforts.

The positive effect of municipal climate action management is also evidenced by the fact that in cities and municipalities without a CAM, fewer projects are implemented, fewer subsidies are used and fewer GHG reductions are achieved before the hiring of a CAM than after the hiring. This means, on the one hand, that the CAM enables the municipality to apply for more and larger projects. On the other hand, it is proof that CAMs actually take on the task of acquiring funding. In the years when the CAM was hired, the number of projects and the funding volume often were lower than before. This is an indication that the administration is initially more burdened with the hiring and can put fewer resources into the implementation of

measures, and that the CAMs must first familiarise themselves before a positive effect can become visible.

In conclusion, it can be stated that staff positions for CAMs in municipalities are important for achieving the climate goals, as they contribute significantly to increasing the amount of GHG reductions achieved. A nationwide introduction of municipal CAMs in Germany would lead to a significant increase in the use of funding, increase the number of implemented measures and lead to significantly more GHG reductions.

The results could also be interpreted to mean that the municipalities are raising funds and then hiring managers to work on the projects. However, there are no indications of this. It is known from empirical surveys that the majority of municipalities are overburdened with the application for funding, reach the limits of their staff capacity, and are therefore less able to access funding. Kenkmann et al. (2021) shows, for example, that in municipalities with CAM, climate protection activities are significantly greater than in municipalities without CAM. The awareness and use of various funding programmes are also consistently higher in municipalities with CAM. (Kenkmann et al. 2021).

Conclusion

Many cities and municipalities in Germany are already active in climate protection. However, there are numerous obstacles to climate protection activities. The main obstacles include the lack of personnel capacities for the implementation of measures and the lack of funds. In order to financially support the implementation of climate protection measures, there are a number of funding programmes in Germany that either directly address municipalities or can also be applied for by municipalities.

The funded position of CAM helps to maintain personnel capacities in the municipalities that enable them to raise more funds from public funding programmes and thus to implement more climate protection measures. In our study, we were able to show that the effect of the CAM is clearly positive in this respect. The conclusion from these analyses is that the municipalities need personnel capacities to be able to carry out climate protection effectively. However, as long as climate protection is not part of the legally defined 'municipal services of general interest' and thus does not have to be implemented on a mandatory basis and is financed accordingly, small and medium-sized municipalities in particular can only build up personnel capacities for climate protection to a very limited extent.

For federal policy, this means that in the short term, widespread CAMs for all German municipalities would have a major climate protection effect. Beyond that, however, climate protection in municipalities must quickly be placed on a new legal basis with appropriate financing. What is meant is the introduction of a 'municipal mandatory task of climate protection' by the federal states and corresponding financial support by the states and also by the federal government. The political discussion must continue in this direction.

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