

# WORKINGPAPER

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## Developing the 2023 SDG Monitor: Methodology and Insights

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## **Abstract**

In partnership with the VVSG, IDEA Consult and UNU-CRIS have developed a comprehensive index and website to track the SDG readiness of Flemish municipalities. This initiative aims to provide municipalities with the tools and resources they need to assess, monitor, and improve their progress toward achieving the Sustainable Development Goals (SDGs). The 2023 SDG Monitor serves as a crucial policy tool, guiding local municipalities in their efforts to meet the SDGs.

The monitor includes data on 208 indicators detailing the socioeconomic and environmental outcomes of all 300 Flemish municipalities. These indicators, focused on the progress toward achieving the SDGs, were selected based on their relevance to Flemish municipalities and their ability to measure specific development outcomes. The selection process involved stakeholder meetings with the VVSG and VVP, resulting in an extensive list of suggested indicators.

To ensure comparability, the indicators were rescaled relative to the top and bottom performance in Flanders. This approach allows for a direct comparison of all Flemish municipalities, regardless of their size or income. The rescaled indicators are grouped into 59 sub-indexes and then combined into 15 SDG indexes.

The 2023 SDG Monitor reveals a slowdown in progress over recent years, with some scores even reversing.

SDGs 2, 3, 4, 7, 12, and 16 have all decreased in the last three years, leading to a small but statistically significant drop in the overall SDG index. The main contributing factors are declines in SDG 3D Health Infrastructure, SDG 4C Pre-school and Primary Education, SDG 7C Affordability of Energy, and SDG 12B Environmental Consciousness.

## **Keywords**

Sustainable Development Goals (SDGs), SDG Monitor, Flemish Municipalities, Indicators, Socioeconomic, Environmental

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## 1. Introduction

As we enter the final phase of the Sustainable Development Goals (SDGs), municipalities face a critical window of opportunity to enact meaningful change and enhance their SDG performance. With just a few years remaining, the urgency to act has never been greater. Recognising this imperative, IDEA Consult and UNU-CRIS have continued our collaboration on a comprehensive index and accompanying website<sup>1</sup> tracking the SDG readiness of Flemish municipalities. Working in partnership with the Vereniging van Vlaamse Steden en Gemeenten (VVSG), this initiative aims to equip municipalities with the tools and resources necessary to assess, monitor, and improve their progress towards the SDGs. By leveraging this platform, local governments can strategically align their efforts, prioritise initiatives, and mobilise stakeholders towards achieving sustainable development outcomes at the community level.

This document serves as a comprehensive guide to the development of the 2023 SDG Monitor, offering detailed insights into its construction and methodology. Within these pages, readers will find an overview of SDG scores and an in-depth explanation of the methods employed in their calculation. While striving for consistency with the previous edition, the methodology and indicator selection process have been maintained. However, in instances where changes in data availability necessitate adjustments, those modifications are outlined and elucidated within this document. By providing transparency and clarity regarding the construction of the SDG Monitor, we aim to empower users to fully understand and interpret its findings correctly.

Our primary goal was to maximise the index's usefulness as a policy tool for local municipalities. As such, we deviated from the standard SDG selection found in international reports, e.g., leaving information on the number of people earning less than 2\$ a day and adding information on car sharing. In addition, we only included outcome indicators that track the progress towards the SDGs, leaving out those that track the efforts undertaken (in terms of money, personal, or count-able actions) or contextual factors. Altogether, we collected data on 208 indicators detailing the socio-economic and environmental outcomes of all 300 Flemish municipalities. This dataset contains information on all SDGs except for SDG 14, Life Below Water and SDG 17, Partnerships for the Goals. The former is excluded because it is irrelevant for most Flemish municipalities, and the latter is excluded because there is insufficient information.

More than half of these indicators (118) are provided by the Gemeente- en Stadsmonitor and a further 38 indicators by the Vereniging Vlaamse Provincies' data platform<sup>2</sup>. These are repleted with eight additional primary sources, including employment statistics from the VDAB's Arvostat website<sup>3</sup>, health statistics from the health insurance funds (IMA: Intermutalistisch Agentschap) and education statistics from the Flemish Department of Education's Dataloep website.
















To enable comparisons between the indicators, we rescaled them relative to the top and bottom performance in Flanders. As a result, a higher indicator score is always socially desirable, whether it is lowering unemployment, decreasing crimination, or increasing satisfaction. We assign a score of 100 to the municipalities with the highest score and zero for the lowest. Using the same minimum and maximum value for all years, we ensure that any change in the index values directly corresponds to a change in the underlying data. As the SDG monitor compares the minimum and maximum values in Flanders, it does not indicate how far a municipality is removed from meeting all SDG goals or how it compares to the rest of the world. Most importantly, a perfect score on a particular SDG does not mean there is no further room for improvement.

<sup>1</sup> available at <https://www.sdgmonitor.be>

<sup>2</sup> <https://provincies.incijfers.be/>

<sup>3</sup> VDAB: Vlaamse Dienst voor Arbeidsbemiddeling

Table 1: Summary table of the sub-indexes per SDG

SDG	Sub-index	SDG	Sub-index	SDG	Sub-index
	1A Relative poverty		7A Sustainable energy production		12A Trash & recycling
	1B Low work intensity		7B Energy intensity		12B Environmental consciousness
	1C Payment difficulties		7C Affordable energy		
	2A Organic agriculture		8A Employment		13A CO <sup>2</sup> emissions
	2B Agricultural emissions		8B Unemployment		13B Floods
	2C Sustainable food		8C Circular & social economy		13C Heatwaves and droughts
	3A Physical health		9A Knowledge intensive economy		15A Green surface
	3B Mental health		9B Infrastructure		15B Deforestation
	3C Road safety				15C Erosion
	3D Health infrastructure				
	3E Elderly care				
	3F Preventative care				
	3G Sports				
	4A General		10A Diversity		16A Safety
	4B Babies & Toddlers		10B Income Inequality		16B Social fabric
	4C Pre-school & Primary education		10C Discrimination		16C Satisfaction w. city council
	4D Secondary education		10D Origin gap in employment		16D Communication
	4E Higher & adult education				16E Consultation
	5A Equality in employment		11A Sustainable transportation		
	5B Discrimination and violence		11B Cycling safety		
			11C Passenger cars		
	6A Drinking water		11D Nuisances		
	6B Sewer system		11E Culture		
	6C Protecting waterways		11F Youth recreation		
			11G Affordable living		
			11H Sustainable living		
			11I Air pollution		
			11J Green municipality		

The rescaled indicators are first grouped into 59 sub-indexes and then combined into 15 SDG indexes (see Table 1). Grouping the thematically similar indicators into sub-indexes keeps the indexes tractable while allowing us to incorporate fine-grained indicators. For example, subindex SDG 5A, tracking gender equality in employment, includes a general indicator of the gender gap in overall employment and more detailed indicators that look at the gender balance in part-time employment and long-term unemployment.

While the changes in data selection remained small, there are minor inconsistencies between the 2021 and 2023 SDG scores. The overall correlation is more than 95%, but the difference is more pronounced for some SDGs. Most notable are SDG 6 and SDG 7, where the correlation between the old and new 2020 index values is below 0.6. The differences can be traced back to changes in the data selection, information on the SDGs in 2020 that was not yet available in 2021, or changes in the data source. Nevertheless, this year's version should not be compared directly with the older version when studying changes over time. For this reason, we also compute the older values of the index using the new indicator selection. For more details on the differences, see Appendix B

Compared to previous years, the SDGs have seen a clear upward trend in Flanders over the past decade. However, the 2023 version reveals a slowdown over the last years and even a reversal in some scores. Specifically, SDGs 2, 3, 4, 7, 12, and 16 have all decreased in the last three years, leading to a small but statistically significant drop in the overall SDG index. The four main contributing factors are the declines in SDG 3D Health Infrastructure, most notably the availability of general practitioners; SDG 4C Pre-school and Primary Education, mainly due to a decrease in pre-school attendance; SDG 7C Affordability of Energy, likely caused by the spike in energy prices in 2022; and SDG 12B Environmental Consciousness.

How the index is constructed allows us to compare all Flemish municipalities, including those with starkly different sizes or incomes, like Antwerp and Herstappe, whose populations differ by a factor of 7000. Following the previous year's report, we conducted a series of regressions on the SDG indexes to assess the correlation between SDG scores and socio-economic and demographic factors beyond a municipality's immediate control. Our analysis confirms last year's finding that a municipality's income level exhibits the strongest explanatory power among the contextual factors examined. We translated the statistical correlations between variables into an expected score for each municipality. These scores were then juxtaposed against the actual performance of each municipality to assess any disparities. We provide an overview of the discrepancies between observed and anticipated outcomes in a quadrant graph, which also compares the municipality to the Flemish average.

The following section provides a detailed description of how the index was constructed, followed by a general overview of the SDG performance and evolution over time.

## 2. Construction

### 2.1 Data sources

Like the previous edition, the 2023 version of the SDG monitor relies heavily on the Gemeente-Stadsmonitor database (GSM)<sup>4</sup>,<sup>4</sup> and the Provincies in Cijfers database (PinC)<sup>5</sup>,<sup>5</sup> both of which collate a large number of regional, provincial and federal databases. This is further augmented with information from eight additional sources. The complete list of sources, including those accessed indirectly via GSM and PinC, is in Table 2. For the specific origin of each indicator, we refer to Table A in the appendix.

### 2.2 Selection criteria for the indicators

We used the same subset of indicators chosen to maximise the monitor's relevance for Flemish municipalities. As part of a project commissioned by the Vereniging van Vlaamse Steden en Gemeenten (VVSG) and Vereniging Vlaamse Provincies (VVP), we organised stakeholder meetings that looked at the measurement of the SDGs in preparation for the Voluntary Sub-national Review (VSR)<sup>6</sup>. One outcome of this project was an extensive list of suggested indicators that track the progress toward the SDGs, which we narrowed down according to the selection criteria listed below.

<sup>4</sup> Available at <https://gemeente-stadsmonitor.vlaanderen.be/>.

<sup>5</sup> Available at [provincies.incijfers.be](https://provincies.incijfers.be/).

<sup>6</sup> <https://www.vvsg.be/kennisitem/vvsg/vlaams-sdg-rapport-2023>

Gemeente-stadsmonitor (GSM)	Provincies.inCijfers.be (PinC)
Agentschap Innoveren en Ondernemen	Centrum voor Kankeropsporing
Burgerbevraging	Criminaliteitsstatistieken Federale Politie
Kruispuntbank <sup>(a)</sup>	Databank Ondergrond Vlaanderen
Departement Onderwijs en Vorming	Departement Landbouw en Visserij
Departement Werk en Sociale Economie	Departement Omgeving
Kind en Gezin	Departement Onderwijs en Vorming
Statbel	Fluvius
UiT-databank, Cultuurnet	InterMutualistisch Agentschap
Vlaamse Milieumaatschappij	Kind en Gezin
VDAB <sup>(b)</sup>	Nationale Bank van België
Vlaamse Instelling voor Technologisch Onderzoek	Openbare Vlaamse Afvalstoffenmaatschappij
Vlaamse Regulator van de Elektriciteits- en Gasmarkt	Rijksdienst voor Sociale Zekerheid
Vlaamse Statistische Autoriteit	Rijksinstituut voor de Sociale Verzekeringen der Zelfstandigen
Wonen Vlaanderen	Statbel
	Vlaams Energie- en Klimaatagentschap
	Vlaamse Milieumaatschappij
Andere bronnen (niet in PinC of GSM)	
InterMutualistisch Agentschap	Vlaamse Milieumaatschappij
Jobsmonitor Circle Economy	Vlaamse arbeidsrekening - Steunpunt werk
Dataloep - Onderwijs Vlaanderen	autodelen.net
Arvastat - VDABb	Klimaatportaal vlaanderen

**Table 2.** 2023 Data sources (in dutch)

(a) Datawarehouse Arbeidsmarkt en Sociale Bescherming van de Kruispuntbank van de Sociale Zekerheid

(b) Vlaamse Dienst voor Arbeidsbemiddeling



The focus on Flanders does result in a set of indicators that deviates from what can be found in similar international initiatives. Some indicators, such as the number of people living on less than \$2 a day, were excluded, while other indicators not typically part of the SDG framework were incorporated. For instance, SDG 2 (No Hunger) includes how often you consume organic or vegetarian food. While vegetarianism is not directly mentioned in the SDGs, its environmental impact aligns with SDG 2.4, aiming for sustainable food production systems and resilient agricultural practices by 2030. For the index presented here, we narrow our selection of indicators based on the following criteria:

1. The main selection criterion is that the indicator has to measure a specific development outcome, i.e., it has to measure to what extent the sustainable development goals are being realised. This rules out indicators that measure a municipality's efforts in terms of resources used (money or personnel) or actions taken (number of meetings organised). It also excludes indicators that track the direct participation in or results of specific activities (so-called output indicators). Consider, for example, the amount of trash picked up from the streets. While removing waste is undoubtedly a societal good, the amount that is picked up depends primarily on how much is littered in the first place. This makes it hard to compare changes over time or differences between municipalities.
2. To be considered, indicators need to have a clearly identifiable impact on SDG preparedness. In practical terms, an increase in an indicator must be either unambiguously positive or unambiguously negative for the SDGs.
3. Finally, the data should be available for all or most Flemish municipalities (at least 80%) and in a relatively timely matter. As such, indicators not updated since 2019 were also excluded. When possible, we replaced them with related indicators with more recent measurements.

While the selection of indicators was preserved as much as possible, we did make several changes in the indicator list compared to last year. Table 3 provides an overview of all changes, including the reason for the change. While most changes were relatively small, a few alterations are worth pointing out. First, we added a survey question asking whether people had trouble making ends meet to SDG 1A Subjective Poverty. This was included to correct the inflation sensitivity of the measure based on fiscal income. Particularly in periods of high inflation, the number of people making less than a certain amount will decrease automatically due to the automatic indexation of wages and benefits. Second, we added the GSM indicator 'water poverty' to SDG 6A Drinking Water, which tracks the number of people on instalment plans for their drinking water debts. Third, two COVID-19-specific indicators are no longer updated and were removed from SDG 2: the percentage of people with vaccinations and the number of surplus deaths. Finally, SDG 17 is no longer included, as its single indicator tracking government expenditure on development assistance contained too many inaccuracies.

The complete list of indicators included in the 2023 version of the SDG monitor that met these criteria can be found in Table A, along with their source<sup>7</sup>.

In mapping those indicators to specific SDG goals, we follow two previous indexes created by Lafortune et al. (2019) and Aalbers (2020). One restriction when assigning indicators to SDGs is that we avoided assigning the same indicator to different goals. However, the number of indicators for which such a choice had to be made is relatively limited and often quite straightforward. For example, while the gender gap in unemployment can be assigned to SDG10 Reduced Inequalities, it is a more natural fit for SDG5 Gender Equality.

Due to the large number of indicators, there are often multiple suitable indicators for most sub-goals, each presenting a slightly different aspect of the more general question. Do we look at instances of discrimination based on sexual preference, origin or mental or physical disability? As was done last year, we resolved these dilemmas by combining similar indicators into a sub-index. Table 1 provides an overview of all sub-indexes per SDG. It should be noted, however, that in some cases (e.g., SDG 1B Low work intensity), there is only one indicator in the sub-index.

<sup>7</sup> Note that several indicators are now sourced from the PinC database that previously came from the GSM database, as the latter can be available with greater regularity. However, this had no impact on their actual values.

## 2.3 Standardisation

After selecting the indicators, we put them on equal footing so they can be compared and combined more easily. To that end, we follow the methodology proposed by Lafortune et al. (2019) and Aalbers (2020) to normalise the indicators and combine them into the SDG indexes.

Specifically, the construction of the indexes follows these steps:

1. For each indicator, we define a direction, negative or positive, according to whether or not the increase of this indicator is socially desirable. The last column of Table A summarises the directions associated with each indicator.
2. Since the SDG achievement of the Flemish cities is evaluated intra-regionally, we use the best and worst performers over the last 14 years as the benchmark values to rescale the indicators (i.e., from 2010 onward). Increasing the index values can be interpreted as improving that municipality's performance<sup>8</sup>.
3. Having defined the minimum ( $\min_t^x$ ) and maximum value ( $\max_t^x$ ) for each index  $x_t$ , we then apply the min-max method to normalise the score of the indicators. For the positive indicators, the scores are derived using Equation 1 while the negative indicators are normalised using Equation 2. So, if  $x_{it}$  is the indicator value of municipality  $i$  in year  $t$  before normalisation, the rescaled value  $y_{it}$  is given by

$$y_{it} = 100 \frac{x_{it} - \min_t^x}{\max_t^x - \min_t^x} \text{ if } x \text{ is a positive indicator if } x \quad (1)$$

$$y_{it} = 100 \frac{\max_t^x - x_{it}}{\max_t^x - \min_t^x} \text{ if } x \text{ is a negative indicator} \quad (2)$$

After normalisation, a score of 100 means that the municipality performs best on that indicator of all municipalities in Flanders, while 0 means the opposite.

## 2.4 Computation of the index

We grouped the indicators into sub-goals using a simple average to deal with the numerous indicators. These sub-goals are combined into a score per SDG, which is further aggregated into an overall score, each time using an (unweighted) average. This results in an index with the same interpretation as the indicators: 100 means the municipality has the highest score on all indicators and vice versa for 0.

The main difficulty that needs to be overcome is the difference in the data availability of the indicators. To compute the (sub) indexes in 2023, we used the available data of each indicator, going back several years if necessary. To make comparisons over time possible, we used the same approach to compute the older index values, each time using the last available data. Only when no older data was available was future data used to fill in the gaps. As such, any change in the index value represents a change in the underlying indicators **in that year**.

## 3. The 2023 SDG scores

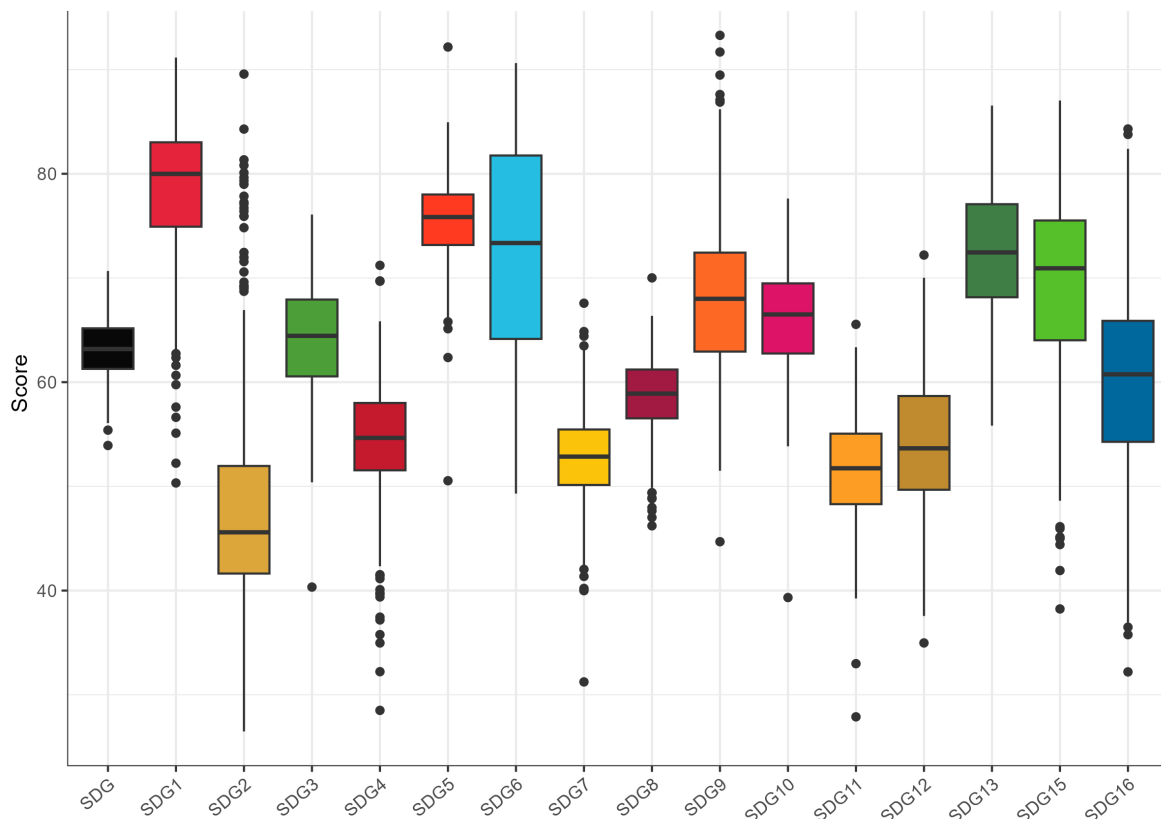
This section provides a general overview of the SDG performance in Flanders and sketches out the context within which a municipality's scores should be interpreted. Specifically, we discuss the distribution of the scores, the existence or absence of geographical patterns and how the scores have evolved over the past decade. For a more detailed look at a specific municipality or region, please visit [www.sdgmonitor.be](http://www.sdgmonitor.be).

<sup>8</sup> We still exclude Herstappe's score when computing the minimum and maximum values as its small population size (< 90) can otherwise distort our results.

### 3.1 The distribution of the scores

Before they are combined into the (sub)indexes, all indicators are first normalised such that their values lie between zero and a hundred, respectively the worst and best Flemish performance. Intuitively, we might expect to observe a median score

of 50 for most indicators and, consequently, for most indexes. However, most municipalities score above 50 on most indicators, i.e., above the halfway point between the top and bottom scores. This top-heavy distribution is also reflected in SDG indexes. As shown in Figure 1, the median score of most SDG indexes lies above 50 in 2023. The overall SDG performance has a median score of 63.2; even the lowest-scoring municipality (Ronse in East-Flanders) scores above the 50 mark. It is important to emphasise that these relatively high SDG scores do not mean that Flanders would also do well in an international comparison of the SDGs. The indexes presented here only compare Flemish cities with each other and with their historical performance.



**Figure 1.** Boxplot of the 2023 SDG values

The coloured box indicates the data lying in the 25th (Q1) and 75th percentile (Q3) and the mid-line the median value. The whiskers (lines) extend to indicate the furthest data outside of this box, up to 1.5 times the interquartile range (Q3-Q1). Any data beyond this range, the outliers, are marked by dots.

SDG 1, No Poverty, has the highest median score: 79.0 in 2023. This is driven by the substantial decrease in the number of people whose net taxable income is below a critical boundary<sup>9</sup>, and the number of people living in a family with low work-intensity over the last ten years. Compared to the previous version of the index, the effect is slightly reduced due to the inclusion of a new indicator, “subjective poverty”, in the SDG 1A subindex, which compensates for the inflation sensitivity of the first indicators.

<sup>9</sup> That critical boundary is 10,000 euros for individual tax returns and 20,000 for joint tax returns.

There are two SDGs in 2023 for which most municipalities score below 50: SDG 2, No Hunger, and SDG 7, Clean and Sustainable Energy. For SDG 8, Decent Work and Economic Growth and SDG 11, Sustainable Cities and Communities, the median score is precisely equal to 50. All four SDGs have had these lower scores since 2010, primarily due to the bottom-heavy distribution of one or a few underlying indicators. For example, most municipalities score very low on the fraction of land devoted to organic agriculture (SDG 2A) or the fraction of people working in the circular economy (SDG 8C)

As shown in Figure 1, the individual SDG indexes have a much wider range than the overall SDG index, where the values lie within a 25-point interval. This indicates that no municipality scores low on all SDGs, but instead, scores low on one particular aspect tend to be compensated by higher scores elsewhere.

### **3.2 Geographical patterns in the scores**

To give a broad overview of the scores, Figure 2 shows the values of the SDG indexes on a map of Flanders. For all graphs, a darker colour indicates a better performance.

For most SDGs, the results seem to be clustered geographically, although this pattern can differ noticeably depending on which goal is considered. For example, in the case of SDG 13, Climate Action, the high scores are in the Western portion of Flanders, while SDG 6, Clean Water and Sanitation, displays the opposite pattern. Overall, the larger cities and regional hubs seem to score (significantly) worse compared to the other municipalities. Their average score lies 3.4 points below that of other municipalities. The difference is particularly noticeable for SDG 1 (-13.5), SDG 16 (-9.1), and SDG 10 (-7.0), where tests of the means confirm that the difference is statistically significant. Only in the case of SDG 9, Industry, Innovation and Infrastructure, do we find that cities score significantly better than other municipalities (+7.2).

### **3.3 Changes in the SDG scores**

Figures 3 show the evolution in the average index values for all SDGs. To keep these figures readable, we split them up according to the four of the five Ps: people, planet, prosperity, and peace (partnership is omitted). Panel a shows a gradual increase in the SDG performance in Flanders, most of which can be traced back to a few SDGs: SDG 1, No Poverty; SDG 8, Decent Work and Economic Growth; and SDG 10, Reduced Inequality, which have grown by between 5 to 10 points.

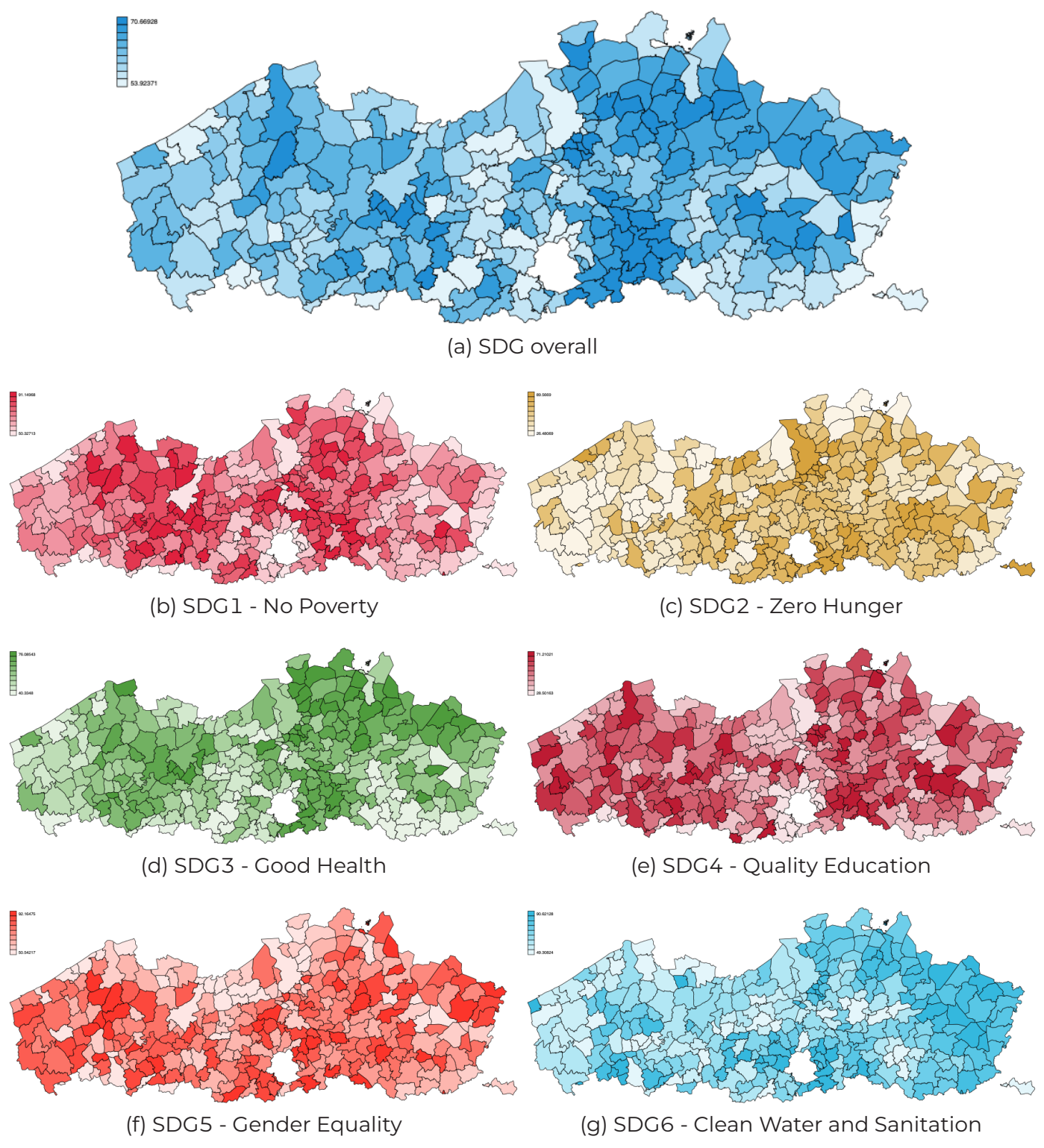
Some SDG scores remain stable even though the underlying subindexes change over time. The relative stability in SDG 3, Good Health and Well-being, hid internal variability. On the one hand, SDG 3C, road safety, and SDG 3F, preventative care, steadily improved, while SDG 3A and SDG 3B, Physical<sup>10</sup> and Mental Well-being steadily worsened. Like several other indicators, SDG 3 has decreased in recent years due to a growing dissatisfaction with healthcare facilities, most notably the availability of general practitioners. Other SDGs that have seen a similar downward movement are (in decreasing order of importance) SDG 4, SDG 7, SDG 12, SDG 16, and SDG 2. Examining their underlying indicators, we can trace this back to a decrease in attendance in preschool (SDG 4C), the affordability of energy and water (SDG 7C), and a decrease in environmentally conscious behaviour (SDG 12B and SDG 2C).

On the other hand, the one goal that has been consistently deteriorating since 2010, SDG 15, Life on Land, has seen an upward tick in the last few years. While the constant reduction in non-developed land we noted in our previous report has continued unabated (SDG 15B), Erosion (SDG 15C) and Green Surface (SDG 15A) have risen slightly in recent years.

Finally, the decrease in SDG16, which started in 2020, seems to have worsened in 2023. However, it must be noted that the average decreased by only a couple of points and is thus much more minor than panel e of Figure 3 makes it seem. Finally, the sudden drop in SDG 8 between 2017 and 2020 is an artefact of the sudden presence of information on employment in the circular economy.

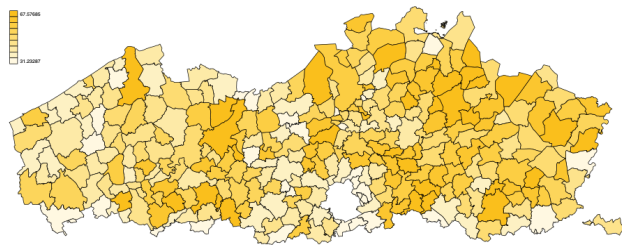
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<sup>10</sup> Caused by a gradual worsening of the prevalence of diabetes and chronic illnesses

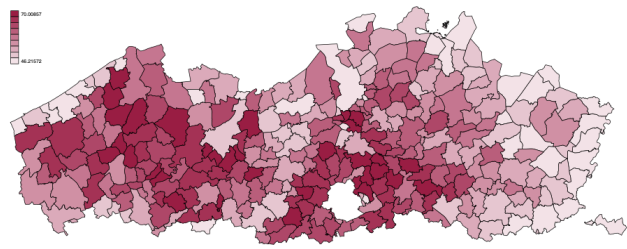


**Figure 2.** Maps of the 2023 scores for each goal  
Darker colours indicate higher scores.

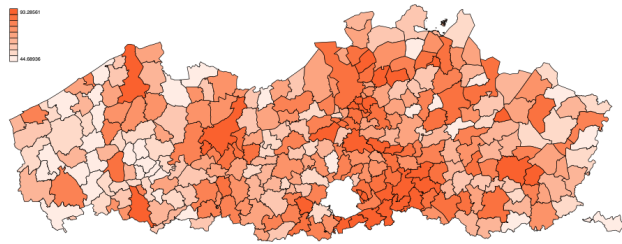




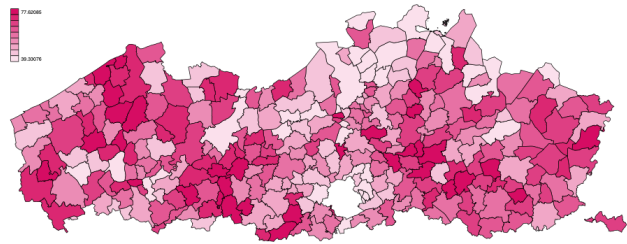
(h) SDG7 - Affordable and Clean Energy



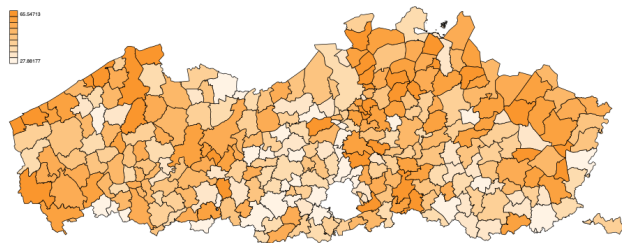
(i) SDG8 - Decent Work and Economic Growth



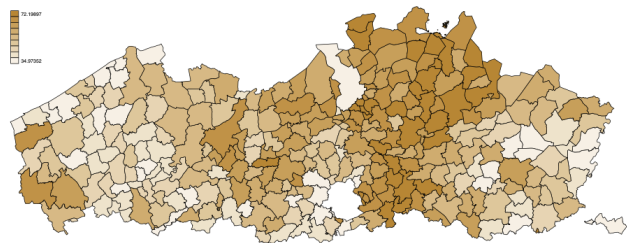
(j) SDG9 - Industry, Innovation and Infrastr.



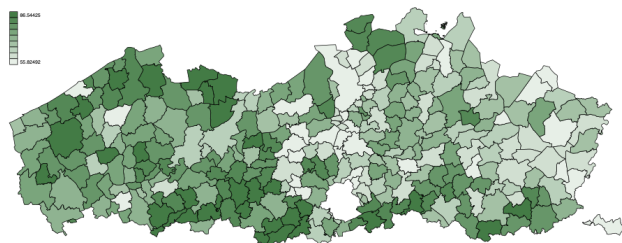
(k) SDG10 - Reduced Inequalities



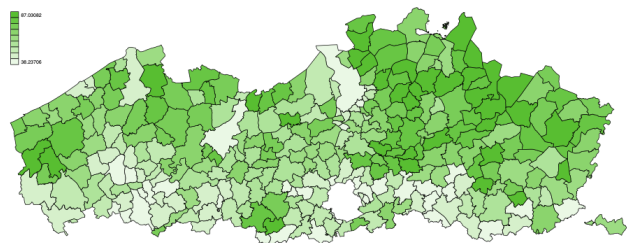
(l) SDG11 - Sust. Cities and Communities



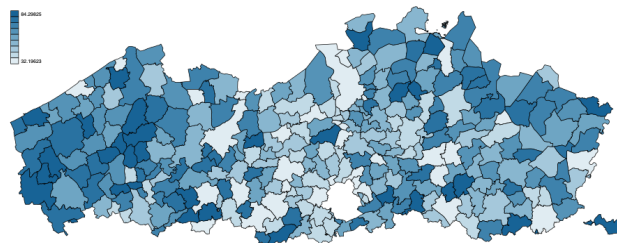
(m) SDG12 - Responsible Consump. and Product.



(n) SDG13 - Climate Action



(o) SDG15 - Life on Land



(p) SDG16 - Peace, Justice and Strong Instit.

**Figure 2.** Maps of the 2023 scores for each goal  
Darker colours indicate higher scores.

### 3.4. Regression results and quadrants

As is our practice, we ran a regression analysis on each SDG index to assess their sensitivity to factors such as the population structure, income, and other variables typically beyond immediate governmental control. The aim is not to establish causal relationships but to control for confounding factors. For example, to see whether the correlation between poverty and the proportion of older people can be explained by the latter's higher income levels. For this purpose, we selected a relatively small subset of contextual variables applicable to all SDG goals and uniformly available across all municipalities. Further details regarding the regressions and the complete results table can be found in Appendix C.

The single most potent explanatory factor for the differences in SDG progress between the Flemish cities remains the average income of its inhabitants. Specifically, we find that for every 1% increase in income, the overall SDG score increases by 0.228 points. Overall, income positively impacts almost all SDGs, except for SDG 6 and SDG 10. In this last case, this is only because high income is very strongly negatively correlated with income inequality. The importance of income is further evidenced by the fact that leaving income out of the model drops the explanatory power by more than half<sup>11</sup>. As is the case with country-level SDGs in international comparisons (see, e.g. Lin et al., 2019), more affluent regions have the highest probability of meeting the SDGs.

The negative scores for most cities established earlier seem primarily due to their larger population sizes. Being a regional hub no longer significantly impacts SDG 1, No Poverty, and for SDG 4, SDG 12 and SDG 16, the effect even becomes significantly positive. Like in the last edition, cities do particularly well on SDG 2, No Hunger. This is partly because they have more organic agriculture and emit fewer greenhouse gasses relative to their cultivated land area. In addition, they also have a higher percentage of people who use sustainable eating practices.

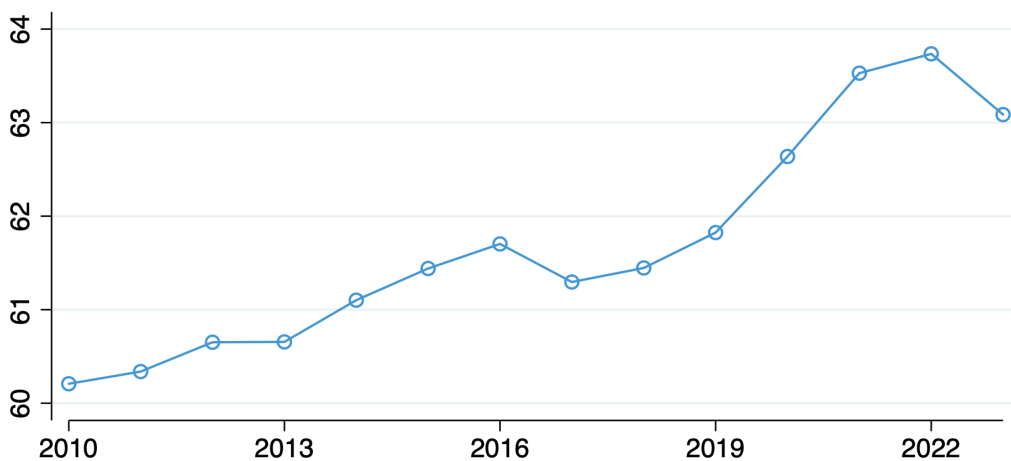
What can also be seen in the regressions detailed in Appendix C is whether the geographical patterns spotted in Figure 2 remain intact once we control for population, municipality size and income. As the patterns change depending on which SDG is considered, we limit our discussion here to the most notable results. As suggested in Figure 2, the Kempen has the best SDG performance, and this does not change once we control for the contextual factors. While the average scores for the regions of Antwerp and Oost-Brabant are also high, the regressions reveal that they are performing less well than we would have expected based on their higher median income. The opposite happens for the province of Limburg. Its overall scores tend to be lower, but once we control for the specific context in which they operate, we find that they are among the highest-scoring ones.

Figure 4 summarises the relative and expected scores. From left to right, the x-axis shows how far the city's score is removed from the median score (indicated by the vertical line). From bottom to top, the y-axis compares each SDG index value to what we would have expected the municipality to score given the contextual factors (the horizontal line). Put together, this graph separates the scores into four quadrants:

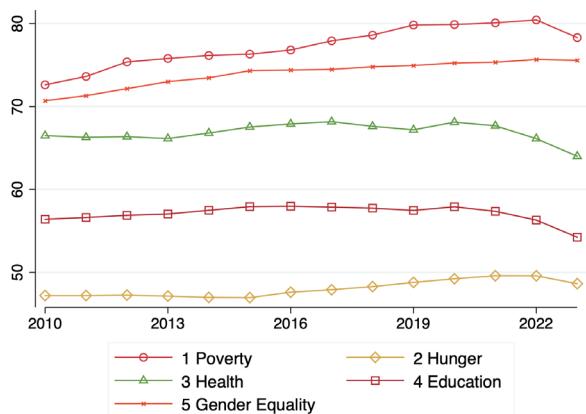
- top right are the SDGs where the city scores high and better than expected;
- top left are the SDGs where the scores are low but still better than expected;
- bottom left, we find the SDGs that are scoring low and lower than expected;
- bottom right are the SDGs where the municipality scores high but still below what we would have expected a city of that size, population and wealth to score.

By way of illustration, Figure 4 shows the quadrants for the four most populous cities in Flanders.<sup>12</sup> In Antwerp's case, most SDGs fall in the bottom right quadrant. However, not all indicators are alike. Its score on SDG 12 is close to the Flemish median but is far removed from what we had expected, while the opposite holds for SDG 16. SDG 2, on the other hand, lies far above both the mean and predicted values, primarily because of the abundance of organic farms headquartered in Antwerp. The picture is reversed in the case of Bruges and Leuven, whose scores on most SDGs exceed the Flemish median and our expectations, particularly those of Bruges. Ghent lies somewhere between these extremes, with most of its scores only a few points removed from their predicted value.

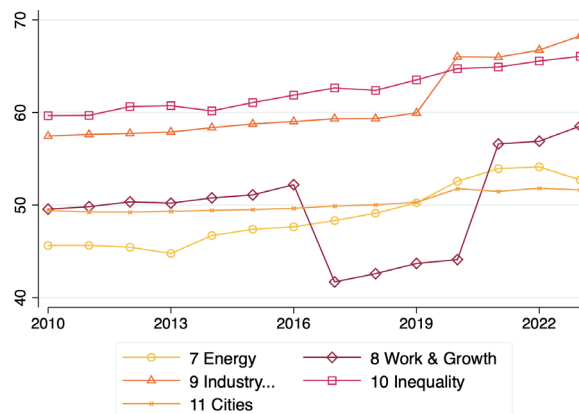
<sup>11</sup> The R<sup>2</sup> - a measure of how much of the variation is explained by the variables included in the model - drops from 57% in the overall regressions to only 27%.



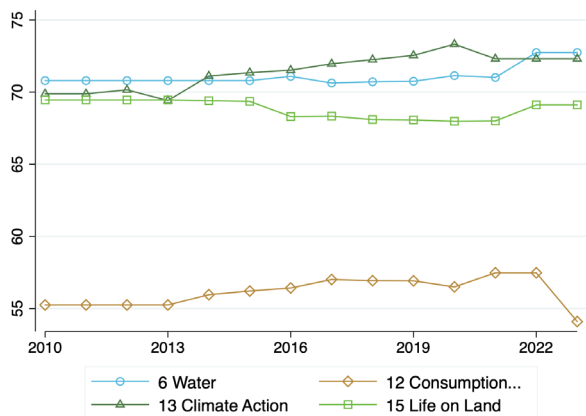
(a) Overall SDG scores



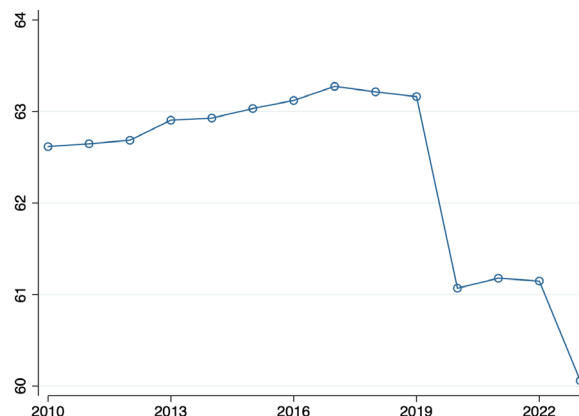
(b) People



(c) Prosperity



(d) Planet



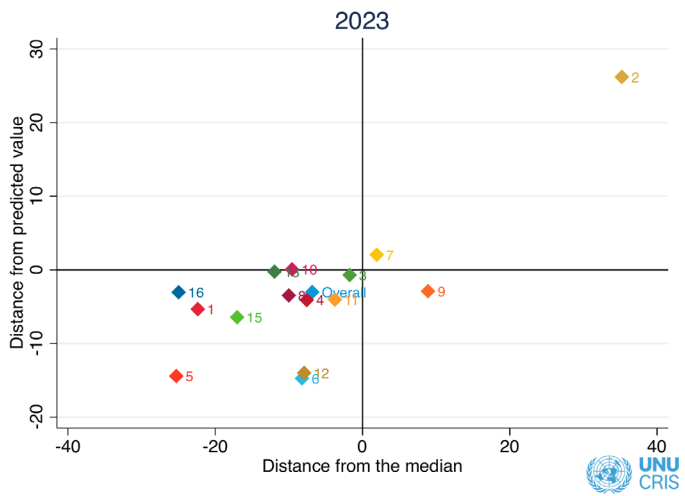
(e) Peace

**Figure 3.** Distance from the median vs. Distance from the expected score

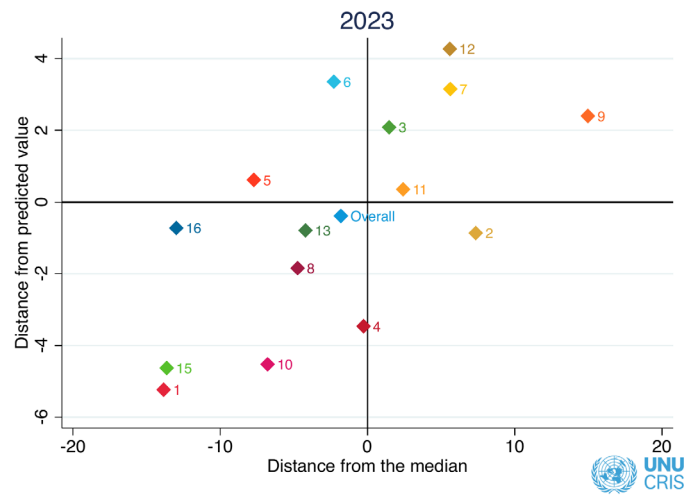
X-axis: the difference between the municipality's score and the median for each SDG in 2023.

Y-axis: the difference between the municipality's score and its expected score based on its population, size and income, as predicted by the model in Appendix C.

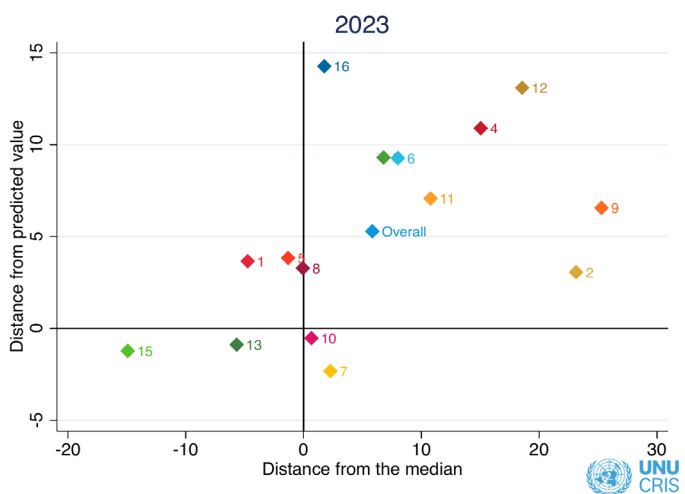




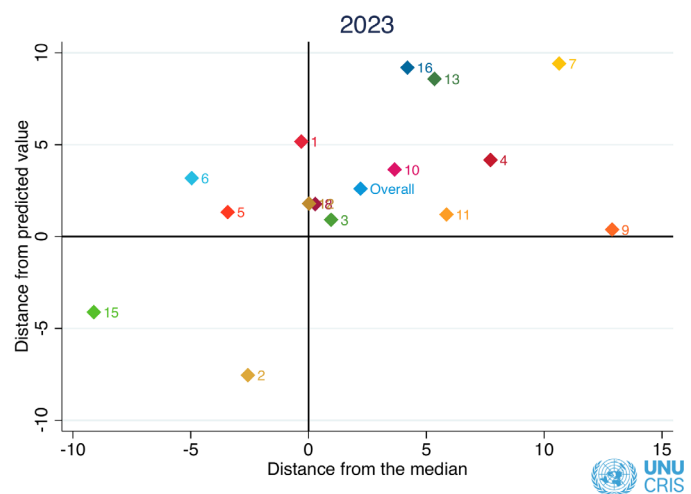
(a) Antwerp



(b) Ghent



(c) Leuven



(d) Bruges

**Figure 2.** Maps of the 2023 scores for each goal  
 Darker colours indicate higher scores.

## **References**

H. Aalbers. A territorial approach to the sustainable development goals: Synthesis report. Technical report, OECD Urban Policy Reviews, OECD Publishing, Paris, 2020.

G. Lafortune, K. Zoeteman, G. Fuller, R. Mulder, J. Dagevos, and G. Schmidt-Traub. The 2019 SDG index and dashboards report for european cities. Technical report, Sustainable Development Solutions Network (SDSN) and the Brabant Center for Sustainable Development (Telos): Tilburg, The Netherlands, 2019.

J. Y. Lin, C. Monga, and S. Standaert. The inclusive sustainable transformation index. *Social Indicators Research*, 143(1):47–80, 2019.

Table 3: Changes to indicator selection w.r.t. the 2021 index (in Dutch)

<b>Inhoudelijke wijzigingen</b>	
SDG 1	'Subjectieve armoede' is toegevoegd om te compenseren voor de inflatiegevoeligheid van 'inkomen onder kritische grens'
SDG 2	'COVID 19 vaccinatie' en 'Oversterfte' waren COVID-specifieke indicatoren die niet meer geupdated worden
SDG 9	Werknemers in hoog en mediumhoogtechnologise industrie toegevoegd aan die in de kennisintensieve dienstensector
SDG 16	'Voldoende info over voorzieningen' is toegevoegd bij de andere indicatoren over het bestuur
SDG 17	'Uitgaven aan ontwikkelingssamenwerking' is verwijderd omdat de data te veel fouten bevat.
<b>Vervangen met gelijkaardige data</b>	
SDG1	Subjectieve armoede vervangen door inwoners met betalingsmoeilijkheden in SDG 1C
SDG4	Schoolse vertraging lager onderwijs van minstens 2 jaar is vervangen met schoolse vertraging van minstens 1 jaar
SDG 7	'Afsluiting van gasnetwerk' vervangen door 'Budgetmeter aardgas' 'Afsluiting van electriciteitsnetwerk' vervangen door 'Budgetmeter electriciteit'
SDG 8	Berekening van aandeel werknemers in de sociale economie is gesimplifieerd
SDG10	'Herkomstskloof in de werkzaamheid' komt nu van de GSM ipv de Arvastat website en is anders berekend
SDG 11	'Luchtkwaliteit' vervangen door 'Luchtkwaliteit fijnstof' en 'Luchtkwaliteit stikstofdioxide'
SDG 15	'Bosteller nieuw bos' vervangen door de percentuele stijging in het aandeel van bos op het gebied van de gemeente 'Onbebouwde gekadastrateerde oppervlakte' en 'Bodemafdicthting' vervangen door 'Verhardingsgraad' Wijziging in de berekening van de erosieknelpunten
<b>Verwijderd omdat ze niet meer in de GSM survey data zitten</b>	
SDG 7	Tevredenheid over ondersteuning hernieuwbare energie
SDG 11	Voldoende aanbod duurzame mobiliteitskeuzes Tevredenheid over veilig spelen Tevredenheid over recreatievoorzieningen
<b>Verwijderd omwille van andere problemen met data beschikbaarheid</b>	
SDG 5	Gender gap in voltijdse tewerkstelling Werkloosheidsgraad (%):
SDG 8	zeer langdurige (t.o.v. NWWZ) Gemiddelde kwaliteit van de
SDG 6	waterwegen
SDG 15	Leefdichtheid

## A Full list of indicators (in Dutch)

Naam	Bron	teken
<b>SDG 1 - Geen armoede</b>		
<b>1A Relatieve armoede</b>		
Fiscale inkomen beneden de kritische grens Subjectieve armoede	GSM - Statbel	-
	GSM - Burgerbevraging	-
<b>1B Lage werkintensiteit</b>		
Personen in een gezin met zeer lage werkintensiteit <b>1C</b>	GSM - Kruispuntbank	-
<b>Betalingsproblemen</b>		
Inwoners met betalingsmoeilijkheden kredietnemers met achterstallige lening (%)	GSM - Burgerbevraging	-
	PinC - NBB	-
kredietnemers met achterstallig hypotheclair krediet (%)	PinC - NBB	-
<b>SDG 2 - Geen honger</b>		
<b>2A Biologische landbouw</b>		
Aandeel biologische landbouw (max = 10%) <sup>a</sup>	PinC - Dep't Landbouw en Visserij	+
<b>2B Landbouwemissies</b>		
Niet-energie gerelateerde uitstoot: N2O uit de bodem Niet-energie gerelateerde uitstoot: Veeveelt Ammoniak emissies landbouw	PinC - VEKA	-
	PinC - VEKA	-
	VMM	-
CO2 intensiteit landbouw <sup>a</sup>	PinC - VEKA	-
<b>2C Duurzame voeding</b>		
Aandeel lokaal gekweekte groenten en fruit Aandeel biologische producten	GSM - Burgerbevraging GSM	+
	- Burgerbevraging GSM	-
Aandeel vegetarisch gegeten	Burgerbevraging GSM	-
Aandeel seizoensgroenten	Burgerbevraging GSM	-
Aandeel kraantjeswater als drinkwater	Burgerbevraging	+
<b>SDG 3 - Goede gezondheid en welzijn</b>		
<b>3A Fysieke gezondheid</b>		
Diabetes	PinC - IMA	-
Chronische aandoeningen	PinC - IMA	-
<b>3B Mentale gezondheid</b>		
Gebruik antidepressiva	IMA	-
Gebruik antipsychotica	IMA	-
Gebruik alcoholverslaving	IMA	-
Gebruik antidementie	IMA	-
Gebruik stimulantia	IMA	-
Geluksgevoel	GSM - Burgerbevraging	+
<b>3C Verkeersveiligheid</b>		
Verkeersslachtoffers	GSM - Statbel	-
Verkeersslachtoffers bij fietsers en voetgangers Veilig naar school	GSM - Statbel	-
	GSM - Burgerbevraging	+
<b>3D Gezondheidsvoorzieningen</b>		
Tevredenheid gezondheidsvoorzieningen	GSM - Burgerbevraging	+

		Sign
Voldoende huisartsen	GSM - Burgerbevraging	+
betalingsmoeilijkheden gezondheidszorg	GSM - Burgerbevraging	-
<b>3E Voorzieningen voor ouderen</b>		
Tevredenheid ouderenvoorzieningen	GSM - Burgerbevraging	+
Voldoende zorgvoorzieningen voor ouderen	GSM - Burgerbevraging	+
<b>3F Preventieve zorg</b>		
Baarmoederhalskankerscreening	PinC - CvKO	+
Borstkankerscreening	PinC - CvKO	+
Darmkankerscreening	PinC - CvKO	+
Preventieve mondzorg	PinC - IMA	+
<b>3G Beweging en sport</b>		
Tevredenheid sportvoorzieningen	GSM - Burgerbevraging	+
Actief bewegen	GSM - Burgerbevraging	+
Sportparticipatie (minstens wekelijks)	GSM - Burgerbevraging	+
<b>SDG 4 - Kwaliteitsonderwijs</b>		
<b>4A Algemeen</b>		
Tevredenheid over onderwijsvoorzieningen	GSM - Burgerbevraging	+
Betaalmoeilijkheden schoolkosten	GSM - Burgerbevraging	-
<b>4B Baby's en peuters</b>		
Voorschoolse opvangplaatsen baby's en peuters	PinC - Kind & Gezin	+
Voorschoolse opvangplaatsen baby's en peuters met inkomenstarief	PinC - Kind & Gezin	+
Tevredenheid kinderopvang kwaliteit	GSM - Burgerbevraging	+
Betalingsmoeilijkheden kinderopvang	GSM - Burgerbevraging	-
<b>4C Kleuters en lager onderwijs</b>		
Participatie kleuter onderwijs (%)	GSM - Dept. Onderwijs & Vorming	+
Minimale aanwezigheid kleuteronderwijs (%)	GSM - Dept. Onderwijs & Vorming	+
Schoolse vertraging lager onderwijs, naar woonplaats	Onderwijs Vlaanderen - Dataloep	-
Buitenschoolse opvangplaatsen per 100 kinderen	GSM - Kind & Gezin	+
<b>4D Secundair onderwijs</b>		
Vroegtijdige schoolverlaters in secundair onderwijs, naar woonplaats	Onderwijs Vlaanderen - Dataloep	-
Vroegtijdige schoolverlaters: fractie vrouwen	Onderwijs VI.- Dataloep	-
Vroegtijdige schoolverlaters: fractie niet-Belgen	Onderwijs VI.- Dataloep	-
Vroegtijdige schoolverlaters: fractie Niet-EU	Onderwijs VI.- Dataloep	-
Schoolse vertraging secundair onderwijs, naar woonplaats (>=2jaar)	Onderwijs VI.- Dataloep	-
<b>4E Hoger en volwassenonderwijs</b>		
Studenten hoger onderwijs (naar woonplaats)	GSM - Dept. Onderwijs & Vorming	+
Inschrijvingen volwassenenonderwijs (naar woonplaats)	PinC - Dept. Onderwijs & Vorming	+

**SDG 5 - Gendergelijkheid****5A Gelijkheid in tewerkstelling**

Werkzaamheidsratio vrouw/man	Vlaamse Arbeidsrekening	+
Gender gap in deeltijdse tewerkstelling	VDAB - Arvastat	-
Gender gap in langdurige werkloosheid	VDAB - Arvastat	-

**5B Discriminatie en geweld**

Discriminatie - geslacht	GSM - Burgerbevraging	-
Intra-familiaal geweld: fysiek	PinC - Federale Politie	-
Intra-familiaal geweld: seksueel	PinC - Federale Politie	-
Intra-familiaal geweld: psychisch	PinC - Federale Politie	-
Intra-familiaal geweld: economisch	PinC - Federale Politie	-

**SDG 6 - Schoon water en sanitair****6A Drinkwater**

Afsluiting watervoorziening	VMM	-
Gemiddeld waterverbruik gezinnen <sup>a</sup>	PinC - VMM	-
Waterarmoede	GSM - VMM	-

**6B Riolering**

Zuiveringsgraad	PinC - VMM	+
Rioleringsgraad	PinC - VMM	+

**6C Beschermen waterlopen**

Gem. waterkwaliteit waterlopen: Biologie	VMM	-
Gem. waterkwaliteit waterlopen: Fysiochemie	VMM	-

**SDG 7 - Betaalbare en duurzame energie****7A Duurzame productie energie**

Lokale productie hernieuwbare energie (% verbruik)	PinC - VEKA	+
PV benuttingsgraad daken (%)	PinC - VEKA	+
Windturbines - geïnstalleerd vermogen [MW]	PinC - VEKA	+

**7B Energieintensiteit**

Energieverbruik huishoudens tav aantal inwoners	PinC - VEKA <sup>a</sup>	-
Energieverbruik bedrijven tav toegevoegde waarde <sup>a</sup>	PinC - VEKA	-
Fractie verlichting gemeente dat LED is	PinC - Fluvius	+

**7C Betaalbare energie**

Budgetmeter elektriciteit (in %)	GSM - VREG	-
Budgetmeter aardgas (in %)	GSM - VREG	-
Betaalbaarheid energie en water	GSM - Burgerbevraging	-

**SDG 8 - Eerlijk werk en economische groei****8A Tewerkstelling**

Werkzaamheidsgraad 20-64 jaar (%)	VI. arbeidsrekening	+
werkzaamheidsgraad vrouwen	VI. arbeidsrekening	+
Werkzaamheidsgraad ouderen 50-64	VI. arbeidsrekening	+
Werkzaamheidsgraad niet-belgen, EU	GSM - Kruispuntbank	+
Werkzaamheidsgraad niet-belgen, niet-EU	GSM - Kruispuntbank	+

Sign

<b>8B Werkloosheid</b>		
Werkzoekendegraad vrouwen	VDAB - Arvastat	-
Werkzoekendegraad jongeren 20-24	VDAB - Arvastat	-
Werkzoekendegraad ouderen 55-64	VDAB - Arvastat	-
Werkloosheidsgraad (%): langdurig (t.o.v. NWWZ)	VDAB - Arvastat	-
Werkloosheidsgraad(%): Laaggeschoold	VDAB - Arvastat	-
<b>8C Circularie en sociale economie</b>		
Doelgroepwerkenemers in tewerkstelling sociale economie (per 1000 inwoners)	GSM - Dept. Werk en Sociale Economie	+
Tewerkstelling circulaire jobs ratio	Jobsmonitor Circle Econ.	+
<b>8D Groei</b>		
Nettogroeiratio van ondernemingen	PinC - Statbel	+
Bruto toegevoegde waarde per inwoner	GSM - Vlaamse Statistische Autoriteit	+
<b>SDG 9 - Industrie, innovatie en infrastructuur</b>		
<b>9A Kennisintensieve economie</b>		
Aandeel zelfstandigen in kennisintensieve dienstensectoren en hoog en mediumhoogtechnologische industrie	PinC - RSVZ	+
Aandeel werknemers in kennisintensieve dienstensectoren en hoog en mediumhoogtechnologische industrie	GSM - RSZ	+
<b>9B Infrastructuur</b>		
Internetaansluiting in de woning	GSM - Burgerbevraging	+
Bezettingsgraad bedrijventerreinen	GSM - Agentschap Innoveren en Ondernemen	+
<b>SDG 10 - Ongelijkheid verminderen</b>		
<b>10A Houding tegenover diversiteit</b>		
Aanwezigheid verschillende herkomsten is verrijking	GSM - Burgerbevraging	+
Verskillende herkomsten leven goed samen	GSM - Burgerbevraging	+
Buren met andere herkomst niet prettig (%oneens)	GSM - Burgerbevraging	+
Sympathiek indien beter leren kennen	GSM - Burgerbevraging	+
Te veel verschillende herkomsten in gemeente	GSM - Burgerbevraging	+
Ontmoetingsactiviteiten zijn zinvol	GSM - Burgerbevraging	+
<b>10B Inkomensongelijkheid</b>		
Inkomensongelijkheid: interkwartiele coëfficiënt	PinC - Statbel	-
<b>10C Discriminatie</b>		
Discriminatie - seksuele geaardheid	GSM - Burgerbevraging	-
Discriminatie - herkomst	GSM - Burgerbevraging	-
Discriminatie - fysieke of mentale beperking	GSM - Burgerbevraging	-
<b>10D Herkomstkloof in tewerkstelling</b>		
Herkomstkloof in de werkzaamheid	GSM - kruispuntbank	-
Herkomstkloof in langdurige werkloosheid	VDAB - Arvastat	-
<b>SDG 11 - Duurzame steden en gemeenschappen</b>		
<b>11A Duurzaam verplaatsingen</b>		
Duurzame verplaatsingen: woon-werk	GSM - Burgerbevraging	+

		Sign
Duurzame verplaatsingen: vrije tijd	GSM - Burgerbevraging	+
Duurzame verplaatsingen: korte afstanden	GSM - Burgerbevraging	+
Voldoende openbaar vervoer	GSM - Burgerbevraging	+
tevredenheid over staat van voetpaden	GSM - Burgerbevraging	+
<b>11B Veilig fietsen</b>		
Verkeersveiligheid fietsers	GSM - Burgerbevraging	+
Voldoende fietsinfrastructuur	GSM - Burgerbevraging	+
Staat van de fietsinfrastructuur	GSM - Burgerbevraging	+
Voldoende fietsstallingen	GSM - Burgerbevraging	+
<b>11C Personenwagens</b>		
Voldoende deelsystemen	GSM - Burgerbevraging	+
Aantal deelwagens per inwoner	autodelen.net	+
Ecoscore wagenpark	GSM - VITO	+
Aandeel geregistreerde wagens hybride of op elektriciteit	PinC - Statbel	+
Aantal personenwagens per huishouden	PinC - Statbel	-
<b>11D Netheid / overlast</b>		
Lastiggevallen worden op straat (nooit/zelden)	GSM - Burgerbevraging	+
Burenlawaaï (nooit/zelden)	GSM - Burgerbevraging	+
Andere vormen van lawaaï (nooit/zelden)	GSM - Burgerbevraging	+
Milieu hinder van zwerfvuil (nooit/zelden)	GSM - Burgerbevraging	+
Buurthinder: milieu hinder van dieren (nooit/zelden)	GSM - Burgerbevraging	+
Milieu hinder van hondenpoep (nooit/zelden)	GSM - Burgerbevraging	+
Vandalisme (nooit/zelden)	GSM - Burgerbevraging	+
Drugsdealing (nooit/zelden)	GSM - Burgerbevraging	+
Verkeershinder van snel rijden (nooit/zelden)	GSM - Burgerbevraging	+
Verkeershinder van sluipverkeer (nooit/zelden)	GSM - Burgerbevraging	+
Netheid van straten en voetpaden	GSM - Burgerbevraging	+
<b>11E Cultuur en vrije tijd</b>		
Tevredenheid culturele faciliteiten	GSM - Burgerbevraging	+
Vrijtijdsaanbod per inwoner	GSM - UIT-databank, Cultuurnet	+
Tevredenheid bibliotheekvoorzieningen	GSM - Burgerbevraging	+
Erfgoedorganisaties- en instellingen	GSM - FARO	+
<b>11F Recreatie voor de jeugd</b>		
Tevredenheid over jongerenvoorzieningen	GSM - Burgerbevraging	+
Voldoende activiteiten voor kinderen en jongeren	GSM - Burgerbevraging	+
Tevredenheid over speelplekken voor kinderen	GSM - Burgerbevraging	+
<b>11G betaalbaar wonen</b>		
Betaalbaarheid van het wonen (woonquote)	GSM - Burgerbevraging	-
Tevredenheid over de woning	GSM - Burgerbevraging	+
Aantal ongeschikt verklaringe	GSM - Wonen VI.	-
<b>11H Duurzaamheid woning</b>		
Dubbel glas of driedubbel glas	GSM - Burgerbevraging	+
Energiezuinige ketel	GSM - Burgerbevraging	+
Gebruik regenwater	GSM - Burgerbevraging	+
Groen dak	GSM - Burgerbevraging	+
Isolatie dak	GSM - Burgerbevraging	+



		Sign
Isolatie muren	GSM - Burgerbevraging	+
Warmtepomp	GSM - Burgerbevraging	+
Zonneboiler	GSM - Burgerbevraging	+
Zonnepanelen	GSM - Burgerbevraging	+
E-peil nieuwbouwwoningen	PinC - VEKA	-
<b>11I Luchtvervuiling</b>		
Luchtkwaliteit stikstofdioxide	GSM - VMM	-
Luchtkwaliteit: fijn stof	GSM - VMM	-
<b>11J Groen in de gemeente</b>		
Groen in de gemeente: wijkgroen	GSM - VITO	+
Tevredenheid over natuur en groenvoorzieningen	GSM - Burgerbevraging	+
Voldoende groen in de buurt	GSM - Burgerbevraging	+
<b>SDG 12 - Verantwoorde consumptie en productie</b>		
<b>12A Afval</b>		
Totaal afval per inwoner	PinC - OVAM	-
Restafval	PinC - OVAM	-
Aandeel bestemd voor recycling	PinC - OVAM	+
<b>12B Milieubewust handelen</b>		
Fiets voor korte afstanden	GSM - Burgerbevraging	+
Te voet voor korte afstanden	GSM - Burgerbevraging	+
Aankoop plastic beperkt	GSM - Burgerbevraging	+
Weggoeien van eten beperkt	GSM - Burgerbevraging	+
Producten van eerlijke handel	GSM - Burgerbevraging	+
<b>SDG 13 - Klimaatactie</b>		
<b>13A CO2 emissies</b>		
Totale CO2 uitstoot per inwoner <sup>a</sup>	PinC - VEKA	-
Groei in CO2 uitstoot <sup>a</sup>	PinC - VEKA	-
CO2 intensiteit huishoudens <sup>a</sup>	PinC - VEKA	-
CO2 intensiteit bedrijven <sup>a</sup>	PinC - VEKA	-
Afname CO2 uitstoot door hernieuwbare elek. t.a.v. lokale consumptie electriciteit	PinC - VEKA	+
<b>13B Overstromingen &amp; Wateroverlast</b>		
% gebouwen met wateroverlast (hoog impact 2050)	Klimaatportaal VI.	-
% gebouwen met overstroming (hoog impact 2050)	Klimaatportaal VI.	-
% kwetsbare instellingen met wateroverlast (hoog impact 2050)	Klimaatportaal VI.	-
% kwetsbare instellingen met overstroming (hoog impact 2050)	Klimaatportaal VI.	-
<b>13C Hitte &amp; Droogte</b>		
% hitte getroffen (0-4 en 65+) (hoogimpact 2030)	Klimaatportaal VI.	-
% Landbouwpercelen met significante droogtestress (hoog impact 2050)	Klimaatportaal VI.	-
% Kwetsbare ecotopen met significante droogtestress (hoog impact 2050)	Klimaatportaal VI.	-

**SDG 15 - Leven op het land**

**15A Oppervlakte groen**

Oppervlakte groene ruimte (%)	PinC - Landgebruik	+
Oppervlakte waardevol ecotoop	PinC - Landgebruik	+
Verandering in opp. bos (tav tot. opp) <sup>a</sup>	PinC - Landgebruik	+

**15B Verharding**

Verhardingsgraad	PinC - Dept. Omgeving	-
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**15C Erosie**

Erosiekelpunten	PinC - Ondergrond VI.	-
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**SDG 16 - Vrede, veiligheid en sterke publieke diensten**

**16A Veiligheid**

Diefstal en afpersing	PinC - Federale Politie	-
Beschadigen van eigendom	PinC - Federale Politie	-
Misdrijven tegen de lichamelijke integriteit	PinC - Federale Politie	-
Bedrog	PinC - Federale Politie	-
Drugserelateerde misdrijven	PinC - Federale Politie	-
Overige geregistreerde misdrijven	PinC - Federale Politie	-
Onveiligheidsgevoel in de buurt: vaak/altijd	GSM - Burgerbevraging	-
Weinig vertrouwen in politie	GSM - Burgerbevraging	-

**16B Sociaal weefsel**

Mensen in de buurt willen hun burens helpen	GSM - Burgerbevraging	+
Mensen in de buurt zijn te vertrouwen	GSM - Burgerbevraging	+
Veel contact met de mensen in de buurt	GSM - Burgerbevraging	+
Zich thuis voelen bij mensen in de buurt	GSM - Burgerbevraging	+

**16C Tevredenheid bestuur**

Vertrouwen in gemeente-/stadsbestuur	GSM - Burgerbevraging	+
Tevredenheid over loketvoorziening	GSM - Burgerbevraging	+
Tevredenheid over digitale dienstverlening	GSM - Burgerbevraging	+
Tevredenheid over huisvuilvoorzieningen	GSM - Burgerbevraging	+

**16D Communicatie**

Voldoende info over geplande activiteiten	GSM - Burgerbevraging	+
Voldoende info over gemaakte beslissingen	GSM - Burgerbevraging	+
Voldoende info over nieuwe ingrepen.	GSM - Burgerbevraging	+
Voldoende info over voorzieningen	GSM - Burgerbevraging	+
Tevredenheid over communicatie van gemeentebestuur	GSM - Burgerbevraging	+

**16E Consultatie en participatie**

Consultatie inwoners	GSM - Burgerbevraging	+
Aandeel actieve betrokken burgers	GSM - Burgerbevraging	+

CvKO: Centrum voor Kankeropsporing GSM: Gemeente-Stad Monitor, Agentschap Binnenlands Bestuur; IMA: InterMutualistisch Agentschap; NBB: Nationale Bank van België; OVAM: Openbare Vlaamse Afvalstoffenmaatschappij; PinC: Provincies in cijfers; RSZ: Rijksdienst voor Sociale Zekerheid; RSVZ: Rijksinstituut voor de Sociale Verzekeringen der Zelfstandigen; VEKA: Vlaams Energie- en Klimaatagentschap; VITO: Vlaamse Instelling voor Technologisch Onderzoek; VMM: Vlaamse Milieu Maatschappij; VREG: Vlaamse Regulator van de Elektriciteits- en Gasmarkt.

## B Correspondence between the 2021 and 2023 version of the SDG monitor

As noted earlier, our choice to keep the indicator selection from the previous version of the index resulted in a very high correspondence between the old and new index. The correlation between the 2020 version, for example, is over 95%. Nevertheless, some of the changes that were made did result in noticeable discrepancies.

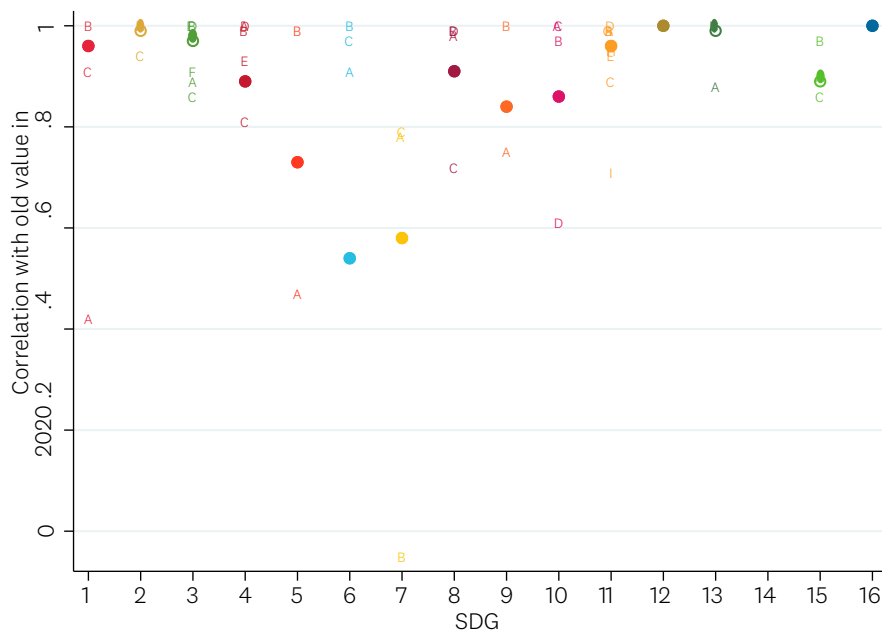


Figure 5: Comparison of the old and new index values

Correlation between the 2020 values of the old index and the 2020 values of the new index for indexes and sub-indexes.

In this section, we provide more detail as to where these alterations can be found and what their source is. Figure 5 shows the correspondence for each of the (sub-)indexes. More than two-thirds of the subindexes have a correlation that exceeds 0.9. Focussing on the 12 subindexes where the correlation is lower than 0.8, we have identified the source of the change as:

- SDG 1A: Included the new indicator for subjective poverty
- SDG 6: The minimum value of SDG 6A increased by 20 points, leading to this large shift in the overall score.
- SDG 5: Due to the change in SDG 5A
- SDG 5A: Removed gender gap in full-time employment
- SDG 7: Due to a change in SDG 7A and SDG 7B

- SDG 7A: Removed satisfaction with support for renewable energy as the data is no longer included in the GSM.
- SDG 7B: Corrected a mistake in the direction of energy intensity.
- SDG 7C: Changed the people disconnected from gas/electricity to those that have a budget meter.
- SDG 8C: Simplified the computation of the target group employees in the social economy.
- SDG 9A: Added information on workers employed in the high-tech industry.
- SDG 10D: Change in the source data on the employment gap based on origin.
- SDG 11I: new indicator for air quality.

## C Regression analysis

In this section, we try to determine the impact of the characteristics outside the municipal government's immediate control. Using a regression analysis, we account for multiple correlates simultaneously, including being a regional hub, the population size, average income, etc.

Specifically, we consider the following variables:

- the log of the population size;
- the log of the average income;
- the log of the size of the municipality;
- whether the municipality is one of the 13 larger regional cities;
- the fraction of the population that is 80 or older;
- the fraction of the population that is younger than 18;
- the reference region.








For each of the 17 SDG indexes, we run the following regression:

$$SDG_i^k = \beta_1^k \text{pop}_i + \beta_2^k \text{city}_i + \beta_3^k \text{area}_i + \beta_4^k \text{income}_i + \beta_5^k \text{pop}^{80+}_i + \beta_6^k \text{pop}^{18-}_i + \delta_i^k \epsilon_i \quad (3)$$









where the subscript  $i$  denotes the specific municipality, superscript  $k$  denotes the SDG index, and  $\epsilon_i$  is a normally distributed error term with mean zero and variance  $\sigma^2$ . The results of this analysis are described in Table 5.

The regression results presented below compare the parameter estimates of each reference region to Limburg. For most municipalities and SDGs, this results in negative coefficients, indicating that the municipalities in Limburg score, on average, higher than you would expect based on their population, median income and other characteristics.

Table 5: Revealing the patterns in Flemish SDG scores in 2023

								
City	0.93 (0.65)	-2.11 (1.64)	12.9*** (2.95)	-2.38** (1.16)	3.02* (1.61)	-3.06*** (1.18)	-3.93 (2.84)	0.046 (1.29)
Population (log)	-0.60*** (0.22)	-3.33*** (0.56)	2.30** (1.00)	1.72*** (0.40)	-1.13** (0.55)	-1.51*** (0.40)	4.53*** (0.97)	0.86* (0.44)
Area	0.63*** (0.23)	3.46*** (0.60)	-7.70*** (1.07)	0.38 (0.42)	2.24*** (0.58)	0.96** (0.43)	-4.03*** (1.03)	0.89* (0.47)
Income (log)	22.8*** (1.59)	48.5*** (4.05)	17.0** (7.26)	37.3*** (2.87)	25.3*** (3.97)	10.6*** (2.91)	7.82 (7.00)	17.1*** (3.18)
Pop. 90+	-0.44** (0.18)	-0.91** (0.45)	-0.25 (0.80)	0.082 (0.32)	-0.96** (0.44)	-0.17 (0.32)	0.92 (0.78)	-0.73** (0.35)
Pop 18-	0.051 (0.094)	0.11 (0.24)	0.081 (0.43)	0.46*** (0.17)	-0.64*** (0.23)	0.22 (0.17)	1.49*** (0.41)	-0.61*** (0.19)
Kempen	1.16** (0.48)	2.55** (1.22)	-4.30* (2.19)	2.86*** (0.87)	2.12* (1.20)	0.68 (0.88)	-4.56** (2.11)	1.32 (0.96)
Reg. Antwerp	-0.40 (0.56)	3.11** (1.42)	-2.50 (2.55)	-0.52 (1.01)	1.26 (1.39)	-3.57*** (1.02)	-11.4*** (2.46)	-1.21 (1.12)
Rivierenland	-1.48** (0.68)	3.77** (1.72)	-6.76** (3.09)	-3.16*** (1.22)	-0.042 (1.69)	0.15 (1.24)	-22.1*** (2.97)	-1.65 (1.35)
Halle-Vilv.	-3.22*** (0.58)	-2.35 (1.46)	-2.64 (2.62)	-5.86*** (1.04)	-4.02*** (1.43)	0.20 (1.05)	-12.2*** (2.53)	-3.98*** (1.15)
East-Brabant	-1.92*** (0.54)	-1.49 (1.37)	-1.43 (2.46)	-6.15*** (0.97)	-0.14 (1.34)	-0.72 (0.99)	-11.0*** (2.37)	-1.68 (1.08)
Midwest	0.34 (0.60)	8.46*** (1.51)	-10.0*** (2.71)	2.18** (1.07)	5.21*** (1.48)	1.49 (1.09)	-13.2*** (2.61)	0.26 (1.19)
Reg. Bruges	-1.21* (0.71)	3.28* (1.80)	-8.54*** (3.22)	-2.48* (1.27)	0.46 (1.76)	0.075 (1.29)	-15.8*** (3.10)	-3.87*** (1.41)
Reg. Ostend	-1.47* (0.83)	1.88 (2.11)	-5.31 (3.78)	-2.53* (1.49)	0.45 (2.06)	-2.25 (1.51)	-14.5*** (3.64)	-4.52*** (1.66)
Westhoek	0.15 (0.63)	1.43 (1.60)	-7.07** (2.87)	-1.14 (1.13)	3.34** (1.57)	-0.68 (1.15)	-12.5*** (2.76)	-3.03** (1.26)
SW-Flanders	-0.45 (0.65)	5.51*** (1.65)	-12.6*** (2.96)	1.05 (1.17)	3.89** (1.62)	-1.07 (1.18)	-10.3*** (2.85)	0.43 (1.30)
Denderregio	-3.32*** (0.63)	2.00 (1.59)	-9.89*** (2.85)	-7.22*** (1.13)	-0.48 (1.56)	-1.57 (1.14)	-19.6*** (2.75)	-4.14*** (1.25)
Reg. Ghent	-1.67*** (0.55)	2.83** (1.39)	-6.08** (2.49)	-3.07*** (0.98)	1.42 (1.36)	-2.72*** (1.00)	-17.3*** (2.40)	-2.73** (1.09)
Fl. Ardennen	-1.34** (0.64)	2.24 (1.62)	-2.16 (2.91)	-4.96*** (1.15)	1.26 (1.59)	-1.49 (1.16)	-13.9*** (2.80)	-0.60 (1.27)
Waasland	-3.34*** (0.75)	-1.17 (1.89)	-6.95** (3.39)	-5.62*** (1.34)	-2.55 (1.85)	-5.65*** (1.36)	-18.1*** (3.27)	-1.76 (1.49)
Observations	300	300	300	300	300	300	300	300
R <sup>2</sup>	0.577	0.552	0.401	0.565	0.377	0.330	0.381	0.373

Standard errors in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level.

								
City	-1.67* (0.87)	7.18*** (1.79)	-1.38 (1.46)	2.09 (1.37)	4.81*** (1.52)	-1.36 (1.72)	-4.50** (2.24)	4.37* (2.23)
Population (log)	-0.88*** (0.30)	4.61*** (0.61)	-0.86* (0.50)	0.44 (0.47)	-0.31 (0.52)	-3.83*** (0.59)	-3.47*** (0.76)	-8.12*** (0.76)
Area	1.16*** (0.31)	-2.89*** (0.65)	0.040 (0.53)	0.72 (0.50)	0.15 (0.55)	3.73*** (0.62)	5.03*** (0.81)	5.32*** (0.81)
Income (log)	22.3*** (2.14)	41.2*** (4.41)	1.53 (3.60)	25.5*** (3.38)	20.7*** (3.74)	10.8** (4.24)	19.2*** (5.52)	37.0*** (5.49)
Pop. 90+	-0.42* (0.24)	-0.12 (0.49)	-0.87** (0.40)	-1.05*** (0.37)	0.32 (0.41)	-1.16** (0.47)	-0.13 (0.61)	-1.14* (0.61)
Pop 18-	0.45*** (0.13)	0.53** (0.26)	-1.00*** (0.21)	-0.62*** (0.20)	0.82*** (0.22)	-0.47* (0.25)	-0.047 (0.33)	0.0062 (0.32)
Kempen	0.75 (0.65)	-1.35 (1.33)	-1.15 (1.09)	1.35 (1.02)	9.99*** (1.13)	1.80 (1.28)	4.45*** (1.67)	0.84 (1.66)
Reg. Antwerp	1.82** (0.75)	-1.80 (1.55)	-1.76 (1.26)	1.37 (1.18)	5.22*** (1.31)	4.55*** (1.49)	0.25 (1.94)	-0.79 (1.93)
Rivierenland	2.51*** (0.91)	-2.21 (1.87)	0.69 (1.53)	-0.41 (1.44)	4.06** (1.59)	3.46* (1.80)	2.10 (2.35)	-2.57 (2.33)
Halle-Vilv.	3.37*** (0.77)	-3.83** (1.59)	0.039 (1.30)	-3.47*** (1.22)	-3.47** (1.35)	5.82*** (1.53)	-9.78*** (1.99)	-6.17*** (1.99)
East-Brabant	1.66** (0.72)	1.01 (1.49)	2.06* (1.22)	-3.49*** (1.15)	3.14** (1.27)	4.69*** (1.44)	-7.58*** (1.87)	-7.61*** (1.86)
Midwest	7.39*** (0.80)	-6.12*** (1.65)	1.54 (1.35)	2.33* (1.26)	-3.52** (1.40)	9.15*** (1.59)	-6.61*** (2.06)	6.57*** (2.05)
Reg. Bruges	4.98*** (0.95)	-0.86 (1.95)	2.48 (1.60)	0.045 (1.50)	-3.50** (1.66)	6.57*** (1.88)	-1.77 (2.45)	0.85 (2.44)
Reg. Ostend	2.53** (1.11)	-6.17*** (2.29)	0.17 (1.87)	0.64 (1.76)	-2.59 (1.95)	10.1*** (2.21)	-1.18 (2.87)	1.15 (2.86)
Westhoek	4.57*** (0.84)	0.059 (1.74)	1.12 (1.42)	6.17*** (1.33)	-0.37 (1.48)	6.95*** (1.68)	-2.32 (2.18)	5.74*** (2.17)
SW-Flanders	4.73*** (0.87)	-4.28** (1.79)	1.29 (1.47)	0.93 (1.38)	-3.39** (1.52)	9.99*** (1.73)	-8.37*** (2.25)	5.45** (2.24)
Denderregio	1.59* (0.84)	-7.49*** (1.73)	-0.10 (1.41)	-5.56*** (1.33)	3.30** (1.47)	6.08*** (1.67)	-0.55 (2.17)	-6.19*** (2.16)
Reg. Ghent	3.27*** (0.73)	-3.19** (1.51)	1.18 (1.23)	-2.63** (1.16)	-0.031 (1.28)	7.76*** (1.45)	-2.52 (1.89)	-1.21 (1.88)
Fl. Ardennen	2.83*** (0.86)	-2.49 (1.76)	4.74*** (1.44)	-1.09 (1.35)	-1.46 (1.50)	11.6*** (1.70)	-9.59*** (2.21)	-5.00** (2.20)
Waasland	0.22 (1.00)	-6.48*** (2.06)	-1.40 (1.68)	-3.08* (1.58)	3.81** (1.75)	5.43*** (1.98)	-0.30 (2.58)	-6.47** (2.57)
Observations	300	300	300	300	300	300	300	300
R <sup>2</sup>	0.567	0.581	0.251	0.391	0.538	0.422	0.452	0.523

Standard errors in parentheses. <sup>a</sup>, <sup>b</sup>, and <sup>c</sup> indicate significance at the 1%, 5%, and 10% level.