

# The socio-economic importance of water in Flanders

## Summary

### 1. Challenge

Water plays a vital role for the Flemish economy. Farmers use water as drinking water for livestock, for irrigation of crops. The chemical industry, power plants, refineries, steel industries are in need of cooling water, and the food industry, semiconductor industry and other high-value industries cannot exist without the presence of high-quality of water. The total water intake by the different Flemish actors (including cooling water) amounted to 3.127 million m<sup>3</sup> in 2012. Cooling water contains 60% of the total water consumption, however the water used for the cooling purposes is actually almost all returned back to the global water cycle/receiving waters. In 2012, 716 million m<sup>3</sup> of water intake (excluding the cooling water), was actually consumed by the industry (38%), followed by agriculture (10%) and the energy sector (6%). The industry, after the household use (40%), is the biggest consumer of freshwater (Figure 1).

The **Flemish economy** creates **added value** thanks to this **water** availability, and by this, contributes to the sustainable growth and the prosperity of our society.

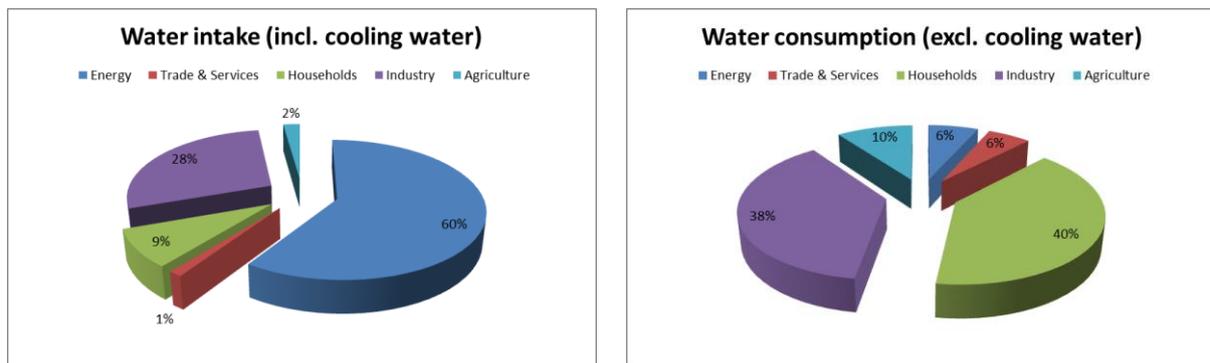


Figure 1 Distribution of (a) water intake (including cooling water) and (b) water consumption (excluding cooling water) in Flanders (ref.year 2012, source MIRA<sup>1</sup>).

<sup>1</sup> MIRA – Milieurapport Vlaanderen - <http://www.milieurapport.be/en/mira-kernset/>

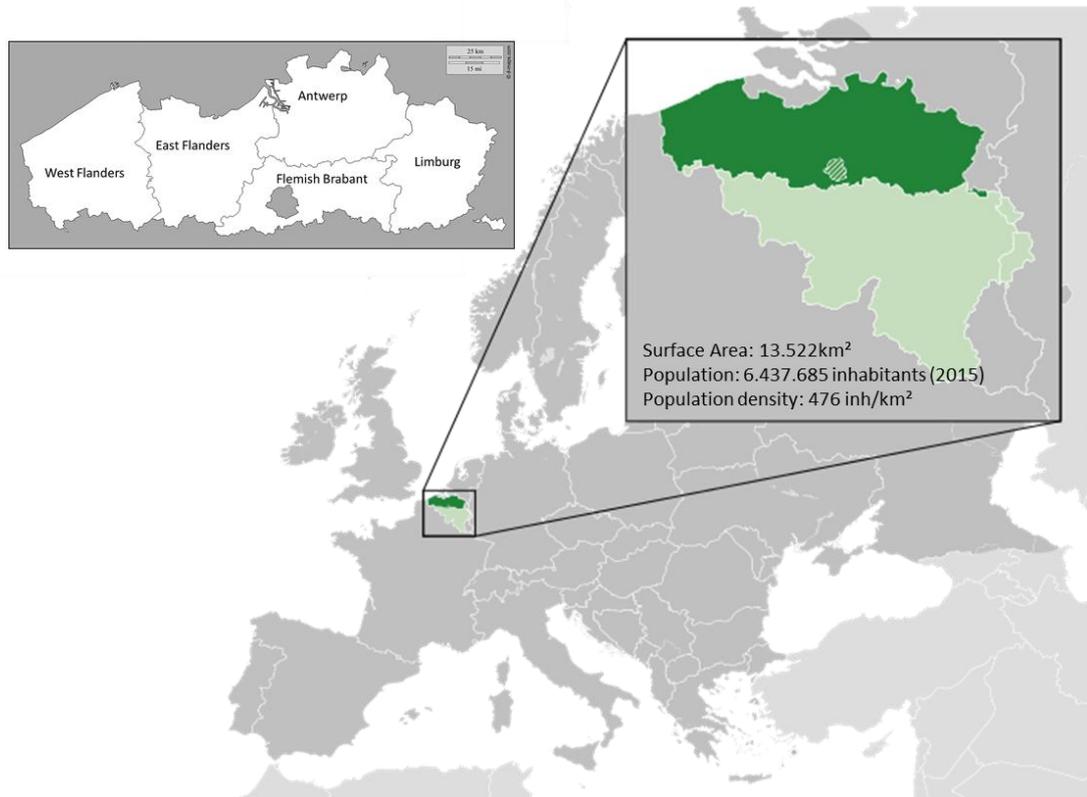


Figure 2: A map of the Flemish Community (with indication of the different provinces) within Belgium and within Europe.

However, both the **quality** and the **availability** of fresh water are **under increasing pressure**. According to the method used by the OECD and the European Environment Agency<sup>2</sup> the availability of water in Flanders and in Brussels is only 1700 cubic meters per capita. Although the figures are expressed per capita (for the sake of international comparability), this is actually the amount of water which is available for all sectors (households, industry, energy, agriculture, marine, nature ...). Internationally this is considered as very low. Only a few OECD countries have a lower water availability (such as Korea, Czech Republic, Italy). Even in countries like Spain, Portugal and Greece, the water availability per capita is higher than in Flanders and Brussels (Figure 3).

<sup>2</sup> [http://www.milieurapport.be/upload/main/themabeschrijvingen/Themabeschrijving\\_Waterkwantiteit\\_april\\_2013\\_TW.pdf](http://www.milieurapport.be/upload/main/themabeschrijvingen/Themabeschrijving_Waterkwantiteit_april_2013_TW.pdf)

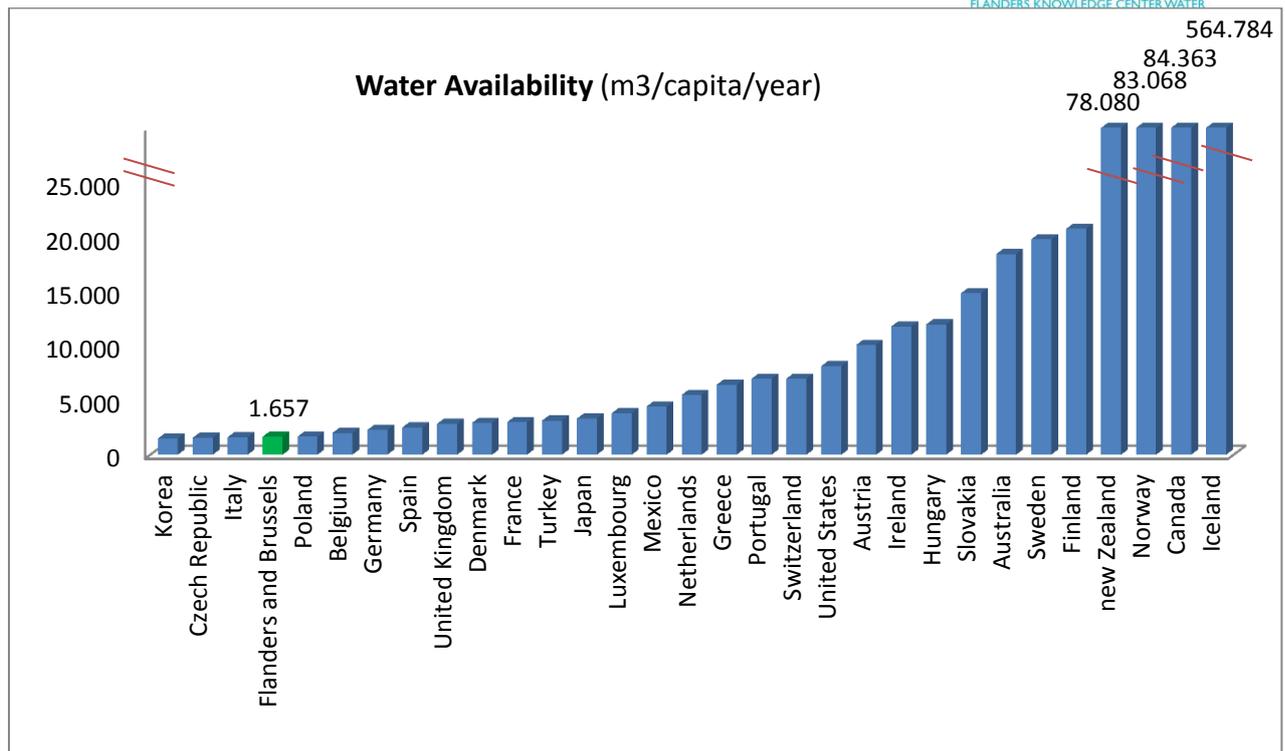


Figure 3: Water availability (m<sup>3</sup>/capita/year) in the OECD countries (ref.year 2010, source MIRA).

Despite the shortage of water availability that is apparently becoming a bigger challenge, Flanders is known for its intensive agriculture. It is the largest European producer of frozen vegetables (25% of Europe's supply of frozen vegetables are produced in Flanders). Furthermore, one of the largest chemical clusters worldwide (next to Houston, Singapore and Jubail) is located in the port of Antwerp.

Each of these economic activities depend on the availability of good quality and sufficient quantity of water, provided at a reasonable price. This is the proof that **Flanders has already built up a significant expertise in the field of water-related socio-economic policy and advanced water technologies**. However, it remains a key challenge to ensure that water quality and availability will never become an obstacle for the competitiveness of a very open and export-oriented Flemish economy.

In striving to decouple socio-economic growth from the use of decreasing water resources there is a need to study the **impact** of a possible rise of **costs for water on the profitability** of the Flemish companies. To evaluate this, Flanders Knowledge Center Water (VLAKWA) conducted a specific study<sup>3</sup> by using the following background information from the regional databases :

- Flemish Environment Agency (VMM) database: data from the 41.261 companies / business sites for the year of 2010 on: water intake/consumption, paid taxes, charges, levies, fees;
- The National Social Security Office (RSZ) and The National Institute for the Social Security of the Self-employed (RSVZ): data on employment for the year of 2010;
- Belfirst: financial data of the companies: gross value added, operating income and other financial data for the year of 2010.

<sup>3</sup> Outsourcing the consultancy company WES –Research & Strategy

This analysis allowed to identify the priority sectors sensitive to a possible increase of water costs. It can also help to develop specific actions and strategies to ensure the competitiveness of these priority sectors and their sensitivity on water availability, costs and employment.

## 2. Results

### 2.1. Water intake and consumption

In the first part of the study, the total water intake and water consumption of the Flemish companies has been analysed by using 41.261 business sites. The total water intake of these companies in 2010 amounted to 3.506.417.382 m<sup>3</sup>/year (Figure 4).

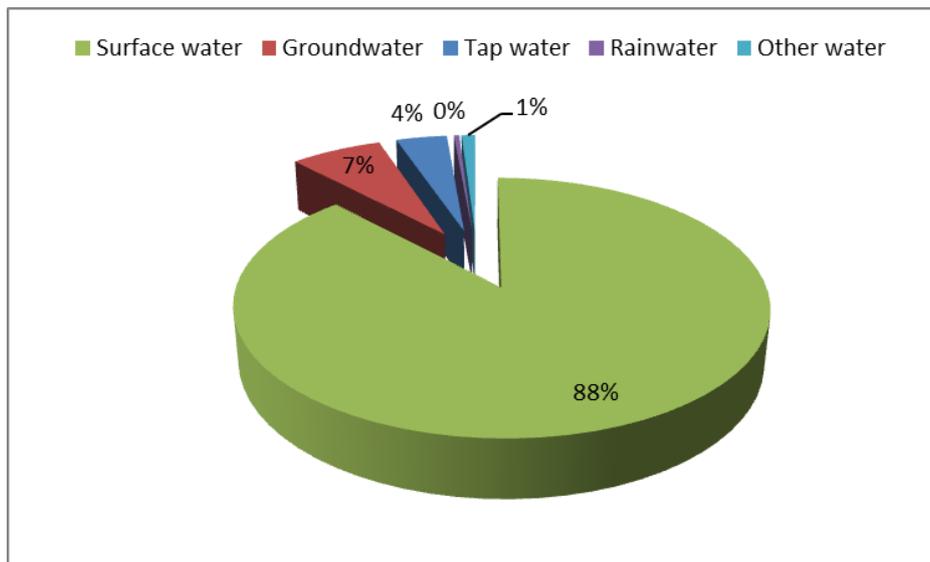


Figure 4 The total water intake of the Flemish companies (n= 41.261) broken down by type of water (ref.year 2010).

The economic sector that abstracts the biggest amount of water, is the energy sector. On the 2<sup>nd</sup> and the 3<sup>rd</sup> place respectively, is the chemical industry and the industry for the manufacturing of cokes and refined petroleum products. One of the characteristics of these sectors is that a lot of the abstracted water is used for the cooling purposes. When looking to the amount of water that was actually consumed, the analysis shows that the lead clearly has been taken by the chemicals sector, followed by the drinking water companies, agriculture, food manufacturing and metal industry (Figure 5).<sup>4</sup>

\* Water intake/consumption of the drinking water companies is an underestimation since not all the abstracted water by the drinking water companies is subjected to a tax and by this not reported in the tax database of the VMM.

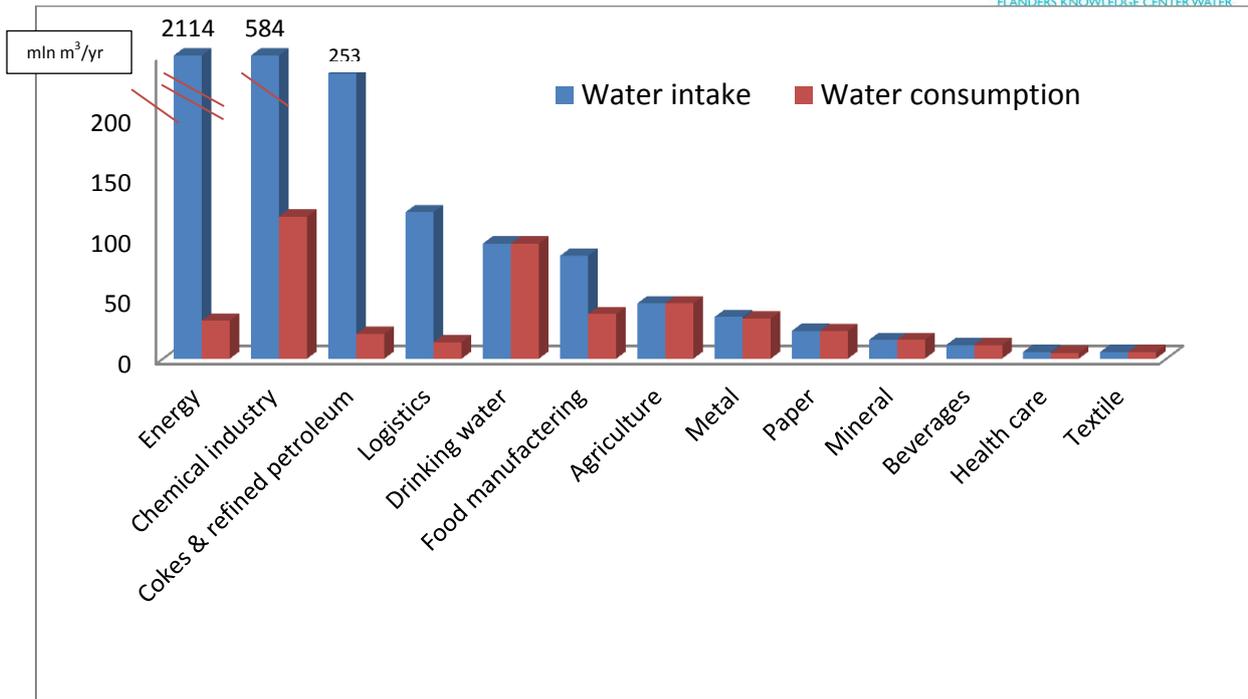


Figure 5 Total water intake and water consumption (millions of m3) by the sector (ref. year 2010).

Concerning the water intake per Flemish province (see Figure 6), the companies located in East Flanders abstract most of the water. East Flanders abstracts nearly 2/3 of the water of the Flemish region, followed by Antwerp (28%). The other provinces all show values below 5%. The share of water intake doesn't seem to have a direct link with the number of the companies in the province, as for example, West Flanders abstracts only 2% of all water resources but have more than 30% of the companies in the region. Average annual consumption per company (excluding cooling water) also vary per province with West Flanders and Flemish Brabant showing values, that are around a 1/5 lower than those in Antwerp. The difference is due to the greater or lesser presence of a certain industries, in certain provinces.

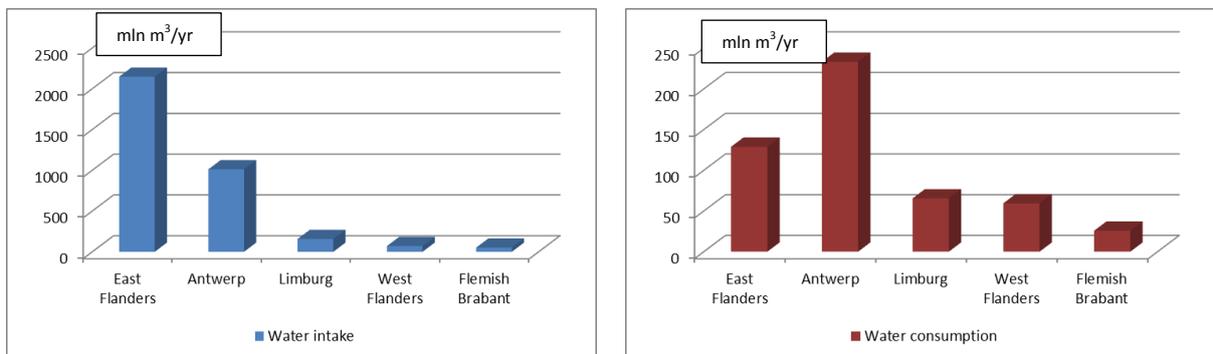


Figure 6 Total water intake and water consumption per province (millions of m³, ref. year 2010).

Analysis of the importance of the different water sources for the economic and societal needs per province, shows that surface water is the most important water source for the provinces of East Flanders, Antwerp, Limburg and Flemish Brabant (Figure 7). In East Flanders, surface water represents almost 98% of total water intake. In West Flanders the water intake looks completely

different. The surface water (25%) the groundwater (29%) and the tap water (28%) are the most important water sources. It is also important to mention that West Flanders has a higher share of rain water (6%) and other type of water (13%).

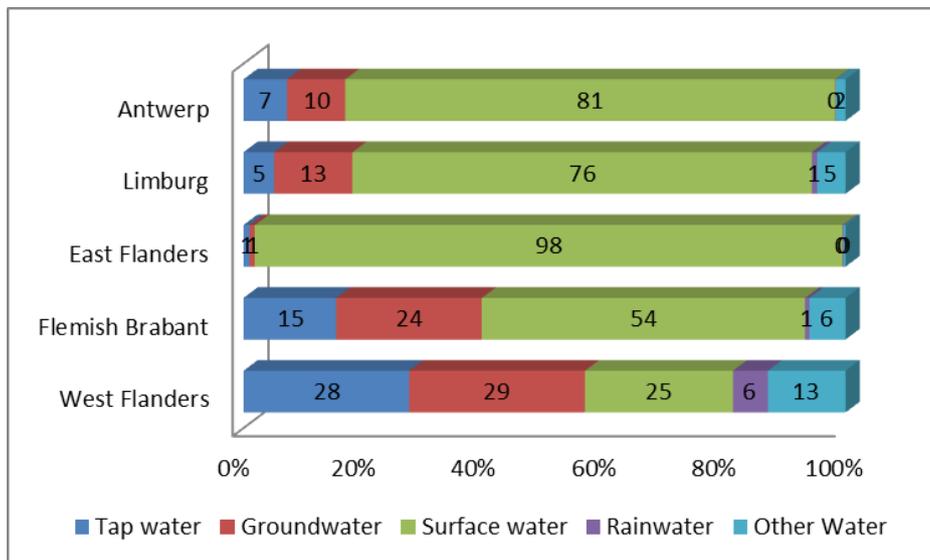


Figure 7 The relative importance of the different water sources per province (year 2010).

## 2.2. Employment in the water intensive industries

Water-intensive industries have a strong impact on employment in Flanders. On average, 1 out of 6 employees (16,7%) works in one of the 15 sectors (out of the total of 100 sectors) with the highest water intake (Figure 8). Differences exist across provinces with West Flanders having the highest share of employment in these sectors (18,2%) and Flemish Brabant having the lowest (13%).

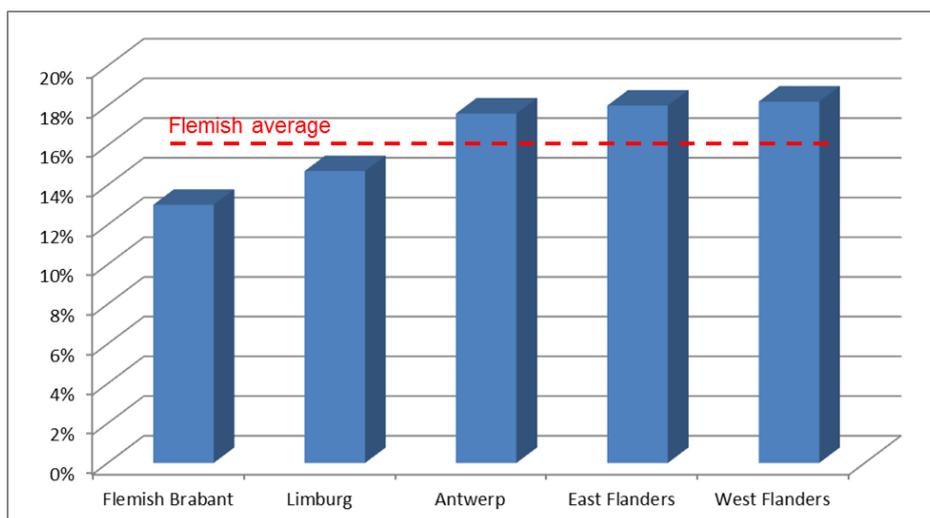


Figure 8 Share of employment in 15 the most water-intensive industries by province (year 2010).

### 2.3. Sensitivity to increased water costs

In the final part of the study, sectors, that are the most vulnerable to an increase in the cost of water, have been identified. For this purpose the ratio “**water cost/gross value added**” has been calculated. The calculation contained the external costs only, that were: the purchase price of the tap water, the levy to be paid for pumping groundwater, the fee for the abstraction of surface water, the levy for the discharge of wastewater, fees and levies for the transport and wastewater treatment. Internal costs, e.g. pumping, heating, treatment, cooling costs, were excluded from the calculation. An estimation of these internal costs was made in the context of the case studies.

The higher the ratio, the more sensitive the sector is towards an increase of water costs. For example, the ratio of 5% means that the gross added value would decrease by 5% if the water cost would increase by 100%.

Because the impact also depends on the gross margin of a sector, also the ratio “**gross value added/operating income**” has been calculated. The higher this ratio, the higher the gross margin, the better. Or in other words: the lower the gross margin, the greater the impact of a change in water costs. In Figure 9 both ratios are plotted against each other. Furthermore, the size of the circle reflects the size of the sector in terms of water consumption (the number in the circle represents the NACE-code of the sector).

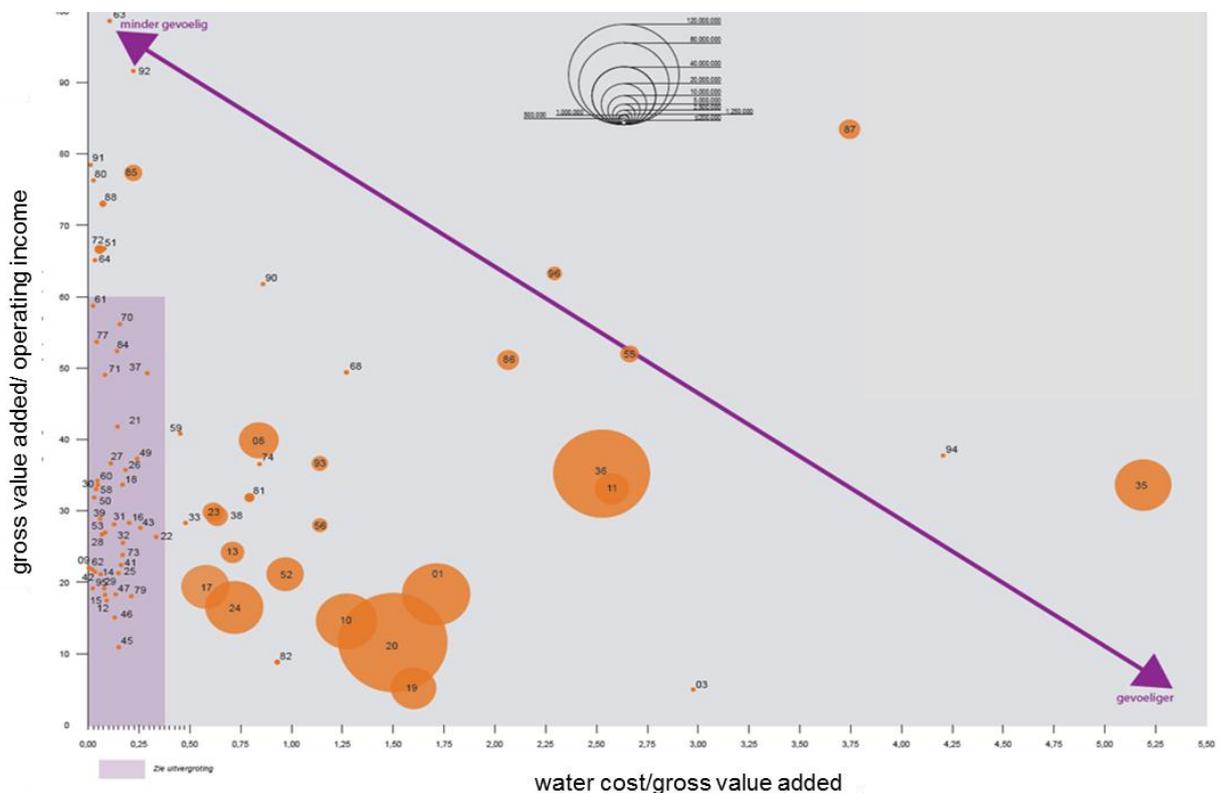


Figure 9 Representation of the most sensitive sectors towards the increased water costs (circles indicate relative total water consumption). Sensitivity increases towards the bottom right.

Sectors located at the bottom-right of the graph, are more sensitive towards an increase in water costs. In the view of a high water consumption, attention should be directed in the first place towards the following six sectors:

- Energy production (Nace- code 35)
- Drinking water companies (Nace- code 36)
- Agricultural sector (Nace- code 1)
- Manufacturing of chemical products (Nace- code 20)
- Food processing companies (Nace- code 10)
- Manufacturing of basic metals (Nace- code 24)

#### **2.4. Identifying priority sectors**

On the basis of the criteria water intake/consumption, employment and sensitivity towards increased water costs, 9 sectors were identified requiring the priority of the attention regarding the sensitivity of water prices and water availability against the economic growth and employment:

1. Manufacturing of chemical products (Nace- code 20)
2. Agricultural sector (Nace- code 1)
3. Food processing companies (Nace- code 10)
4. Manufacturing of basic metals (Nace- code 24)
5. Textile (Nace-code 13)
6. Drinking water companies (Nace- code 36)
7. Energy production (Nace- code 35)
8. Logistics (Nace-code 52)
9. Horeca (Nace-code 56)

### 3. Conclusions

The study shows that **1 out of 6 employees in Flanders is directly linked to water-intensive industry**. It also shows that the external water costs for various (especially water-intensive) economic sectors already varies from 1.25 to 5.5% of the gross added value. Taken into the consideration that this study did not take into account the internal costs (costs associated with the pumping, treatment, heating, cooling, etc.), the ratio : ‘total water costs / gross added value’ is in reality even higher. Case studies at the company level showed that the ratio can be as high as 10%.

In 2012 Flanders economy represented a Gross Added Value of 143.121 M € and employed 2.556.270 million people. In this period the Flemish Industry (NACE code 10 -30) generated a Gross Added Value of 34.992 M € and employed 374.718 people. The Flemish economy represents a share of 9.2% of the Flemish gross national product (GNP), while 10 years ago the share was 12.2%. This draws the conclusion that Flanders is facing a **heavy deindustrialization**..

An average total water costs that accounts the 2% of the gross added value corresponds to a cost for the Flemish Industry of € 699.840.000, or the equivalent of **10,000 employees**. An increase in total water cost has therefore a direct impact on employment (as about 65% of the gross added value is used for the payment of wages).

Finally it can be concluded that specific and targeted actions should be taken towards the identified water-sensitive priority sectors to ensure their sustainable anchoring in Flanders to support further a sustainable growth and creating /maintaining the jobs in Flanders.

The complete report is available on request (please contact Dirk Van der Stede – [dvds@vlakwa.be](mailto:dvds@vlakwa.be))