

SUMMARY

Context

In the autumn of 2018, Environment Report Flanders or MIRA¹ publishes its Environment Outlook 2018, based on three pillars: i) environmental indicators, ii) horizon scanning, including megatrends and iii) solutions that could lead to a more sustainable (ecologic) energy, mobility and food system. This report is part of the third pillar 'solutions' and describes spatial solutions or 'strategies' needed to support the transition towards a more sustainable (ecologic) food, energy and mobility system.

Within this scope, it explores the two following questions:

- I. Which spatial strategies are needed to support the transition towards a more sustainable energy, mobility and food system in Flanders?
- II. Which thresholds and levers are available to implement these spatial strategies?

To provide an answer to these questions, the first part identifies the priority spatial strategies, out of which eight will be selected and further detailed in part two. The combination of all these eight strategies is essential to initiate the sustainable transition of the energy, mobility and food system. The report describes the thresholds and levers for each selected strategy and explains the preconditions that are necessary to maximize the environmental benefit of each one of them.

Assessment of sustainable spatial strategies according to the environmental potential

Chapter 2 provides an analysis of the spatial strategies that could help realizing the transition of the three social systems energy, mobility and food. A first step consists in studying the relationship between sustainable spatial strategies and the environmental solutions for these systems. To do so, the report provides a summary of the environmental solutions for the energy, mobility and food systems which can be supported, encouraged or realized through spatial policy or spatial planning. More in specific, the report searches the spatial component in each one of the environmental solutions. At the same time, it draws up a longlist of sustainable spatial strategies, based on the most recent Flemish policy visions and frameworks about spatial use. These spatial strategies are then linked to the environmental solutions for food, energy and mobility in order to identify the mutual relationships. These relationships are discussed and refined during an experts' workshop. This results into a list of 25 spatial strategies having a positive impact on the ecologic transition of the Flemish energy, mobility and food system.

This longlist is bundled into four main objectives:

Main objective 1: Developing a dynamic network of cores and poles with sustainable infrastructure serving as a support

- Developing a polycentric network of cities, cores and poles with a high-quality public transport network serving as a backbone
- Developing a multilayer, hierarchical road network between cities, cores and poles
- Developing a multilayer, hierarchical cycle routes network between cities, cores and poles
- Developing a multilayer, hierarchical electricity distribution network

¹ Short for 'Milieuraapport'

Main objective 2: Strengthening and protecting a robust and offensive open space network

- Safeguarding the open space of inappropriate use by preventing the implementation of additional undesirable functions and by scaling down existing, badly-located functions in the open space
- Increasing the viability of agricultural activities in the open space
- Integrating food production and a more robust, more natural water system
- Integrating food production and nature
- Integrating energy production in the open space

Main objective 3: Clustering residential areas, facilities and local activities in easily accessible cores

- Clustering housing and facilities in cities and well-equipped and easily accessible cores
- Smart implementing and organizing of activities, with focus on the exchange of waste flows and the creation of heat networks
- Smart implementing and organizing of activities in cores, with focus on sustainable transport modes
- Improving the quality of life in cores in terms of facilities level, air quality, greenery, public space and master plan
- Improving the traffic viability in cores by focusing on more road safety for vulnerable road users and lower impact of large traffic flows
- Creating an offer of affordable housing and a range of housing typologies
- Facilitating the spatial interweaving of activities and facilities in cores
- Creating space for energy production in the cores
- Intensive and multiple spatial use in cores
- More compact building forms in cores

Main objective 4: Clustering the supralocal economic activities in multimodal poles

- Clustering the supralocal activities in multimodal poles
- Clustering agricultural activities that are not land-bound in easily accessible, agricultural business parcs
- Space for renewable energy production in multimodal, easily accessible economic poles
- Using waste flows and closing circuits in multimodal, easily accessible economic poles
- Intensive and multiple spatial use in multimodal, easily accessible poles
- More compact building forms in multimodal, easily accessible poles

Towards a selection of eight spatial strategies

Eight spatial strategies are selected from the longlist of 25 listed strategies. Strategies are selected based on their positive impact on improving the ecologic sustainability of the energy, mobility and food system, and also on their feasibility and innovative nature. This results in eight strategies that will be analyzed in depth in chapter 3.

1. Developing a polycentric network of cores and poles with a high-quality public transport network serving as a backbone
2. Safeguarding the open space of inappropriate use by hard functions
3. Clustering housing and facilities in cities and well-equipped cores
4. Clustering activities that cannot be interwoven in well-located, multimodal and easily accessible economic poles



5. Facilitating the spatial interweaving of activities in cores
6. Spatial differentiating of agricultural activities in the open space
7. Integrating energy production in the open space
8. Exchanging waste flows and encouraging the creation of heat networks in cores

Each selected strategy will be subject to a literature research and two experts will elaborate on these issues in a double interview. Within this scope, the content and background of each strategy has been analyzed. The expected environmental benefit as well as the preconditions that must be met to realize the potential environmental benefit, are identified. The second research question, aiming to identify the thresholds and levers of these priority strategies, has been addressed by analyzing the actors and tools on three levels (macro, meso and micro) and by describing the content-related and instrumental thresholds and levers needed to realize each strategy.

The spatial strategies explored in this report derive from a wide range of measures that can be taken through spatial policy or territorial management in order to steer the spatial planning. To do so, the report distinguishes four strategy types. Location policy concerns the settlement of infrastructure and activities, considering criteria such as accessibility, facilities level, spatial context, soil, nature values ... to determine the most suitable location for a given function or development. The second strategy type addresses the networks and describes the relationship between locations and functions, and identifies the infrastructure (road infrastructure, distribution networks ...) that is needed to create the link. Location policy and networks are strongly complementary. The third type concerns the spatial organization or configuration, and steers the effective design and lay-out of the space. The fourth strategy type addresses the final use of the space and consists of 'softer' strategies related to behavior, experience ... This report does not handle the strategies of the fourth type as such, but only as a result from or in relation to the three other strategy types.

Analysis of eight spatial strategies

Chapter 3 elaborates on the eight selected spatial strategies and identifies the environmental potential, the necessary actors and tools, as well as the thresholds and levers.

1: Developing a polycentric network of cities, cores and poles with a high-quality public transport network serving as a backbone

Flanders has many of the characteristics that are typical of a polycentric region with a dense public transport network. This is the product of historical development. However, the recent peripherisation has resulted into an expanding settlement area, a reduction of the facilities level in the cores and an increasing part of the car as dominant form of transportation within the mobility system, while the public transport offer has been reduced and has become less reliable. Since the nineties, spatial policy is working on alternative spatial planning, returning to the region's historic, polycentric character. The spatial structural plan for Flanders 'Ruimtelijk Structuurplan Vlaanderen (RSV)' and the forthcoming spatial policy plan for Flanders 'Beleidsplan Ruimte Vlaanderen (BRV)' are bringing the clustering of functions and the reduction of the settlement area, especially in the open space, back to the forefront. However, the translation of these visions into a concrete set of (planning) tools and a voluntary permit policy does not go smoothly. The impact on the field is less than hoped for; indeed, the settlement area is still expanding. This hampers the ecological transition of the mobility system in Flanders as it increases the travel distances and induces a strong car dependency. A polycentric network where activities are clustered in a selected number of cores and nodes is easier to be served by collective and more sustainable transport systems. In addition, this kind of network also promotes the active and environmental friendly modes of transport. Recently, a changing



(social and political) discourse has emerged, partly resulting from the increasing problems in terms of mobility, climate, water management ... However, the realization of this strategy is considerably hampered by the oversupply of land that is destined to be used as areas for living and working, but which are not located in or nearby cores that are easily accessible by public transport and a provide a good facilities level. The necessary development and improvement of the public transport network is hindered by the dispersed settlement structure in Flanders and the lack of investment means.

2: Safeguarding the open space of inappropriate use by hard functions

To strengthen the open space structure in Flanders, the open space must be safeguarded as much as possible against hard functions. This will increase the sustainability of the mobility system as the dispersed settlement of origin and destination locations will be reduced. In addition, protecting the open space from hard functions such as housing and activities will create space for more sustainable food and energy production. The objective to limit hard functions within the open space, has already been set out in the spatial structure plan for Flanders RSV and has been confirmed later on in several policy plans. In practice however, the settlement area in Flanders is still expanding by 6 ha a day; there are still developments going on within the open space that are not desirable in terms of sustainability. The ambitions of the positive policy plans are systematically undermined by generic regulations allowing all kinds of undesirable developments within the open space. The core of the problem is to be found in the excess of building rights that have been granted for the open space in the seventies and eighties, and which are today very difficult to reduce. At the same time, many investments have been made in the open space itself, but not to the extent that this open space undergoes a global, positive transformation. Levers are to be found in the fact that the old discourse emphasizing the scarcity of building land for housing and working, is getting under pressure. However, a voluntary policy that wants to put an end to the building rights that are still existing but not yet executed, still finds little support. This is certainly the case for measures aiming to eliminate existing, badly-located constructions or infrastructure from the open space. This kind of measures can only stand a chance if a positive, largely supported social discourse can be introduced about the role of the open space and the importance of a sustainable open space policy, dedicated to, among other things, food, energy and mobility. A large coalition of open space users, and inspiring, engaging and widely known pilot projects will support this policy. But the set of planning tools also needs to be renewed to enable the elimination or relocation of existing building rights (TDR) and to support rural areas through a compensation system. The realization of the new set of tools, the pilot projects and the open space coalition will require more supralocal cooperation on these topics.

3: Clustering housing and facilities in cities and well-equipped cores

The counterpart of safeguarding the open space, is the clustering of housing and facilities in cores that are easily accessible and provide a sufficient facilities level. This has to be combined with a high-quality core strengthening policy that focuses on a higher quality of life in cities and cores in terms of environmental quality, traffic safety, greenery, a well-developed facilities offer, affordable housing ... The positive results of this core strengthening and urban renewal policy must therefore be continued and expanded to smaller cities and selected village centers. Growth will also improve the attractiveness of these cores. Clustering reduces the travel distances and promotes a sustainable modal shift. In addition, it also has a positive impact on the energy efficiency of buildings. The most important mission of this strategy is not only overcoming the obstacles to prevent dispersed developments, but also focusing on the need for high-quality core strengthening. But there is even a higher need for social debate emphasizing the importance of clustering for energy, water, ecology, mobility, ageing population, etc. But the successful outcome of a core strengthening strategy also largely depends on the attractiveness and quality of the core strengthening projects. It convinces inhabitants and companies to settle in cores and it creates a positive alternative for



the prevailing negative attitude towards compaction. To achieve this goal, local authorities often lack the necessary steering tools, land positions and/or capacity.

4: Clustering of activities that cannot be interwoven in well-located, multimodal and easily accessible economic poles

Companies that cannot be interwoven in cities or cores for reasons of mobility pressure or environmental impact, have to be clustered into multimodal, easily accessible business parks that are able to take up their role as an economic pole. The current fragmentation of the economic fabric dispersed over a big number of local and supralocal business parks requires a supralocal and area-oriented approach. This approach allows not only to address another cause of the fragmented spatial use in Flanders but also to support a sustainable *modal shift* for both commuter traffic and freight traffic. In addition, the clustering of economic activities supports circular economy, leads to lower energy consumption for building heating and increases the potential for local reuse of residual heat. Supralocal cooperation between authorities and the business world will be necessary to select the poles and determine the development perspectives. Area coordinators will be needed to steer these developments and help companies finding the right location. Strategic (pilot) projects allow to create a positive story. At the same time, the existing, badly located plots for activities and the further development of small-scale and/or unimodal business parks must be restricted the sooner the better. An area-oriented and tailor-made approach, in coordination with the business world, prevents an approach that is too generic and merely based on the categorization of industrial sites that are not consistent with business logics.

5: Facilitating the spatial interweaving of activities in cores

Insofar as the business activities allow it, it is highly recommended to interweave these activities within the cores. From an historic point of view, the economic activities in Flanders have always been deeply interwoven within cities and village centers. Although the number of business parks outside the cores has largely increased during the last decades, about 80% of the economic activities in Flanders are still established in the interwoven areas. This situation is extremely favorable from the mobility point of view as it reduces the travel distances. In addition, it also supports environmental solutions, such as the local reuse of residual heat for domestic heating. There is however an important precondition when interweaving economic activities: it may not increase the pressure on the local mobility (due to freight transport for instance), nor have a negative impact on the environmental quality. Recent evolutions in the manufacturing industry have strongly reduced the environmental impact of this kind of activities and have as such largely eliminated the obstacles for interweaving. But it seems that the manufacturing industry is no longer finding its way to the cities. Indeed, local residents and authorities do not recognize the added value of interweaving, project developers can only get limited financial added value out of it, and companies consider interweaving rather as an impediment than as a benefit: higher land prices, stricter regulation, reduced accessibility (by car) ... A change in behavior is needed, putting more focus on the added value that the urban environment provides to companies: proximity of the market and workforce, good facilities offer, sustainable accessibility (by public transportation, by bicycle, by foot), more opportunities to exchange knowledge ... Good pilot projects are one way to draw the attention to these benefits, but support from the authorities to set up land use policies and permit policies is also essential.

6: Spatial differentiating of agricultural activities in the open space

The food system, and in particular agricultural activities in Flanders, are under pressure. In addition, the increasing urbanization and peripherisation of other functions exerts additional pressure on the available farming land. The current, generic policy of function segregation and delimitation of agricultural land has not been able to bring considerable changes as it has no say over the insidious occupation of agricultural



land by function or zoning changes, such as horsification, gardening and leisure agriculture. The positive social and landscape role that agriculture has played for centuries is compromised, which is also due to higher land prices and smaller margins for farmers. This situation prevents the realization of considerable environmental benefits that might be obtained through the food system. This strategy proposes an alternative approach of agriculture and open space, based on a differentiation of a more strategic, co-productive view on agricultural activities. This allows a differentiated approach of the agricultural activities when planning and organizing the open space. The agricultural land area can be organized in another, more sustainable way by considering the land-bound nature of the activities, the environmental impact, the resource consumption or the potential relationship with other functions. According to the type of activity, the strategy allows to cluster or interweave the activities, whether in the open space, whether in the urban built system. This approach reduces the negative environmental impact of agricultural activities and increases the support for agriculture, both for high dynamic agribusiness companies and smaller farming companies favoring local embedding and extension. However, there are currently no planning tools to realize this differentiated spatial policy for agriculture. It is also essential to first address the many factors that have put the agricultural industry under pressure and brought it to a defensive position: spatial pressure, necessary scaling-up due to high land prices and low output prices, fragmentation of the agricultural area, conflicts with other functions, both urban-related and nature-related ...

7: Integrating energy production in the open space

The transition towards an energy system based on renewable resources constitutes a large challenge for the Flanders region. Such a system of renewable resources is mainly based on decentralized installations which take up a substantial amount of the collective space. The space for wind power for instance will have to be found in the outlying areas due to the strict regulations on buffer zones that are in force around large-scale wind turbines. But the production of biomass also requires open space. Several studies indicate that there is not enough available open space to accommodate the Flemish energy transition, unless additional spatial measures are taken. From this perspective, it is recommended to stop the extension of settlement area within the open space and to eliminate the dispersed developments to make place for energy production. An integrated and area-oriented approach considering the open space as an 'energy landscape' is needed to restrict the spatial and environmental impact of this production infrastructure. The decentralized nature of the renewable energy production and its dependency on external factors, increase the importance of an intelligent distribution and storage system and requires the efficient matching of supply and demand. A successful energy transition needs a strong focus and vision, including at area level. But today, this focus and vision are non-existing in Flanders. The current spatial structure constitutes an important threshold to find the necessary space for accommodating the energy infrastructure. Therefore, Flanders has adopted an ad hoc policy leading to suboptimal results. This also reduces the social support. The Flemish regulations and tax laws are not tailored to the requirements of a large-scale energy transition. But this transition also offers a lot of opportunities, not only to make the energy system more sustainable in view of the climate and the local air quality, but also to keep a substantial part of the economic added value at local level.

8: Exchanging waste flows and promoting the creation of heat networks in cores

A heat network allows to heat buildings through the collective production of residual heat. Collective production is more efficient and makes it easier to use renewable energy or residual heat for heating purposes. Provided to choose a sustainable heat source, it allows to obtain a more sustainable energy system. The realization of heat networks requires measures, firstly in terms of spatial organization and settlement of functions and buildings (energy-oriented development), and secondly in terms of spatial planning of the soil where all the distribution infrastructure must be incorporated. For many Flemish cities



and municipalities, this last step is a particularly challenging one. Solid decision making requires a consistent vision and framework for the specific role of heat networks within the spatial and energy policy. The right approach consists in initially using pilot projects, initiated at local level. A local heat vision is needed to prevent any ad hoc approach. But it also requires supralocal measures to make heat networks more attractive from a financial and organizational point of view. Levers for heat networks are, among others things, technologic innovations creating networks of the fourth generation - able to combine several sources and become as such more flexible - and, last but not least, the local economic added value generated by these heat networks. But the practical realization of heat networks, especially in existing neighborhoods, is still challenging. The realization of the underground infrastructure as well as the required measures to connect individual buildings to the network, turn heat networks into a complex matter.

Conclusions

The findings of this report have revealed a certain number of essential links between the eight spatial strategies that have been explored in the study on the one hand and the environmental solutions for the energy, mobility and food systems on the other hand (**chapter 4**). For instance, it is impossible to reduce the environmental impact of the mobility system without a better spatial planning based on the clustering of cores and poles, and without safeguarding the open space against hard functions. Environmental solutions for the energy system are also largely spatial. Minimizing the energy consumption for heating and mobility can only become realistic if buildings are built closer to each other and if functions are more interwoven. This study also points out that the local production of sufficient green power is only possible by providing enough space for energy production. This requires a significant change in terms of spatial policy. With regard to the food system, many environmental solutions concern eating behavior and distribution systems, what makes them less spatial. The study of the spatial diversification of agricultural activities has also pointed out that many environmental benefits can be obtained by locating them in wiser and better targeted manner, for instance by taking into account the capacity and vulnerability of the ecosystems (soil, water, nature ...). To realize this objective, it is once again necessary to protect the open space as much as possible from hard functions.

The study identifies thresholds and levers for each one of the eight strategies. Some of them appeared more frequently and can therefore be considered as transversal thresholds and levers for a more sustainable spatial use.

Persistent and outdated ideas about spatial use have dominated the spatial policy for a long time and are dominating the discourse until today. It is difficult to set up a new, more sustainable vision on space if we keep thinking in terms of scarcity of building land and business parks, not question the individual property rights and stick to the predominant Flemish housing ideal. In addition, there is no strong coalition of stakeholders defending the interest of open space functions. It seems that the past decades have been marked rather by conflicts between open space functions than by a joint plea to safeguard the open space. Environment and spatial planning should form a coalition defending a true, open space and core strengthening policy, but they do not stand out as such. There is a lack of concerted criteria to identify the added value of certain spatial strategies. This is most evident in the environmental assessment of compact development projects in the cores, which are rather focusing on the direct local impact and not on the global, positive effects. A joint approach could also allow to optimize the communication about the larger social added value of such strategies.



- A more active land policy by the government, focusing on repurchasing unsustainable development land, and buying and making available strategic land plots within the cores. This also requires the set-up of a realistic system of land valuation in view of compensation.
- An adjusted set of (planning) tools enabling differentiations within the agricultural areas based on agriculture types (for instance by making a difference between high- and low dynamic activities, whether or not land-bound), environmental impact and their relationship to the urban environment.
- The right regulation to further develop energy networks ('microgrids') adapted to the local production and consumption, local storage, and collective production, for instance through local cooperatives and local energy communities.

