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POLICY BRIEF

No net land take trajectories

Policies and practices
across Europe

OCTOBER 2024



As part of the European Green Deal, the EU biodiversity strategy for 2030 aims to protect nature and to reverse the degradation of ecosystems (European Commission, 2020). This strategy states that ‘... nature is in a state of crisis’ and land take is among the main direct drivers of biodiversity loss. All EU Member States and partner states experience problems with increasing pressure on soil and land, and research has shown that more than 60 % of EU soils are in an unhealthy state. The European Commission aims to improve this situation with a soil strategy and a proposal for a soil monitoring law. One of the long-term objectives laid down by the soil strategy is for the continent to achieve no net land take (NNLT) by 2050.

This policy brief aims at contributing to the achievement of the NNLT objective by discussing the need of an operational definition of land take, the way different countries are implementing measures to achieve the NNLT objective, and the various discourses that take place in these countries around NNLT. In addition, it sets out to inspire stakeholders at different levels of governance by presenting the implemented approaches in various regions and Member States to address potential challenges.

KEY POLICY MESSAGES

Policy debates about NNLT are both topical and sensitive. They involve allocating an increasingly scarce land resource to various legitimate but competing public policy objectives including housing construction, accommodation of new economic activities, maintaining space for agriculture, development of transport infrastructure, and preservation of natural areas, etc.

While the objective of promoting land frugality seems achievable at the continental level, notably due to lesser demographic pressure to come and the potential for improving land-use efficiency, European countries and even more regions must deal with highly heterogeneous territorial profiles in terms of space consumption and needs for their own social and economic development.

To highlight possible pathways towards green transition trajectories at different territorial levels, this document ⁽¹⁾ suggests the following key policy messages.

- In general, the pursuit of NNLT is considered a worthwhile endeavour, provided it is not regarded as an end in itself. The most promising way to achieve this objective is to integrate its implementation into a broader transformation of territorial and sectoral policies, including housing, mobility, environmental protection, economic development and agriculture.
- Policy debate and intergovernmental cooperation is needed to help reconcile the aims for preserving soil quality and sustainable urbanisation. In addition, a European level definition of NNLT is expected that shall be shared by Member States and regions to facilitate meaningful transnational discourse and collaboration.
- For building concerted local trajectories, it is necessary to align stakeholders and conduct horizontal dialogues across policy sectors. Although not everyone has the same requirements, all needs must be heard to safeguard spatial justice and equity. Understanding stakeholders’ needs and identifying win/win strategies are key positions regions can take in many countries.
- An economic model for implementing NNLT has yet to be invented but is possible. Within this model, new compensation tools and taxes or economic incentive mechanisms would be valuable instruments for transforming development and planning policies. Experience with these tools in various countries should be considered.

(1) A more detailed overview of findings related to NNLT can be found in the final report of the ESPON NNLT project ‘No net land take: Policies and practices in European regions’. This report explains the debates that could arise around NNLT policies in various stages of implementation and the solutions that have been found - or not - to alleviate these difficulties. See: <https://www.espon.eu/projects/nnlt-no-net-land-take-policies-and-practices-european-regions>

Definitions

Land use

Land use corresponds to the socio-economic description (functional dimension) of areas: areas used for residential, industrial or commercial purposes, for farming or forestry, for recreational or conservation purposes, etc. Links with land cover are possible; it may be possible to infer land use from land cover and conversely. But situations are often complicated, and the link is not so evident. Contrary to land cover, land use is difficult to 'observe'. For example, it is often difficult to decide if grasslands are used or not for agricultural purposes. Distinctions between land use and land cover and their definitions have impacts on the development of classification systems, data collection and information systems in general ⁽²⁾.

Land cover

Land cover corresponds to a (bio)physical description of the earth's surface. It is that which overlays or currently covers the ground. This description enables various biophysical categories to be distinguished – basically, areas of vegetation (trees, bushes, fields, lawns), bare soil, hard surfaces (rocks, buildings) and wet areas and bodies of water (watercourses, wetlands) ⁽³⁾.

Land take / artificialisation / land consumption

Land take is a process, often driven by economic development needs that transforms natural and semi-natural areas

(including agricultural and forestry land, gardens and parks) into artificial land development by using soil as a platform for constructions and infrastructure, as a direct source of raw material or an archive for historic patrimony (European Commission, 2023). Note that land take is related to land use in the form of land-use change, in favour of artificial areas and at the expense of natural and agricultural land.

Artificial use of land / artificial land use

This is defined as an area that has undergone a process of artificialisation.

Soil sealing

Soil sealing is the loss of soil resources due to the covering of land for housing, roads or other construction work ⁽⁴⁾. Soil sealing refers to changing the nature of the soil such that it behaves as an impermeable medium (for example, compaction by agricultural machinery). Soil sealing is also used to describe the covering or sealing of the soil surface by impervious materials, such as concrete, metal, glass, tarmac and plastic ⁽⁵⁾. Note that soil sealing is related to land cover.

Urban fabric

Areas mainly occupied by dwellings, and buildings used by administrative/public utilities, including their connected areas (associated lands, approach road network, parking lots) ⁽⁶⁾.

(2) See: <https://www.eea.europa.eu/help/glossary/eea-glossary/land-use>

(3) See: <https://www.eea.europa.eu/help/glossary/eea-glossary/land-cover>

(4) See: <https://esdac.jrc.ec.europa.eu/themes/soil-sealing>

(5) See: <https://www.eea.europa.eu/help/glossary/eea-glossary/soil-sealing>

(6) See: https://www.eea.europa.eu/publications/COR0-part2/land_coverPart2.1.pdf

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Taking stock of land take in Europe

The European Green Deal sets out an ambitious roadmap that serves to achieve climate neutrality by 2050 in line with the Paris Climate Agreement (European Council, 2019). Included in the Green Deal are various EU strategies that define policy goals for different sectors to make certain that the EU fulfils the Green Deal objectives. The EU biodiversity strategy for 2030, for instance, aims to protect nature and reverse the degradation of ecosystems (European Commission, 2020). As stated in the latter strategy, ‘... nature is in a state of crisis’ and changes in land use are among the main direct drivers of biodiversity loss.

Land take and its resulting soil sealing cause various negative impacts. Firstly, adverse effects are observed on the environment, due to a loss of biodiversity and fragmentation of habitats. Secondly, the primary productive capacities of the soil, such as agriculture and forestry, can be affected. Thirdly, land take exacerbates the vulnerabilities of territories, for example, by increased heat island effects and floods. Fourthly, it leads to the consumption of a non-renewable resource, namely soil. When it spreads (urban sprawl), land take also results in increased demand for transport (of persons and goods), and thus, for energy. All these elements can pose challenges to territorial cohesion and sustainable land use.

All EU Member States and partner states experience problems with increasing pressure on soil and land. Analysis done by the ESPON SUPER project (ESPON, 2020) showed that from 2000 to 2018, about 1.26 million ha of land across the ESPON territory was converted to urban use (Map 1)⁽⁷⁾. Only in Romania (-0.8 %) and Bulgaria (-0.1 %) did the share of urban land decrease as a whole, mostly in unused areas such as construction or dump sites. In total, 8.6 times more land was converted to urban/artificial use than the other way around.

Figure 1 shows the origin and destination of this land-use conversion. Regarding the destination, a significant portion (40 %) is in a transitory state (construction sites). Of the total amount of land that did convert to some form of urban use, 35 % became urban fabric (predominantly residential), 37 % industrial (including business parks and offices), 17 % infrastructure (including airports) and 11 % urban green space. Regarding the origin, most of this urbanisation came at the expense of agricultural land (78 %), i.e. arable land, grassland or land with some other agricultural function. A few regions in Austria and Scotland saw most new urban land coming from natural areas.

(7) Note that land-use change in the maps and figure included in this chapter has been measured using CORINE Land Cover data.

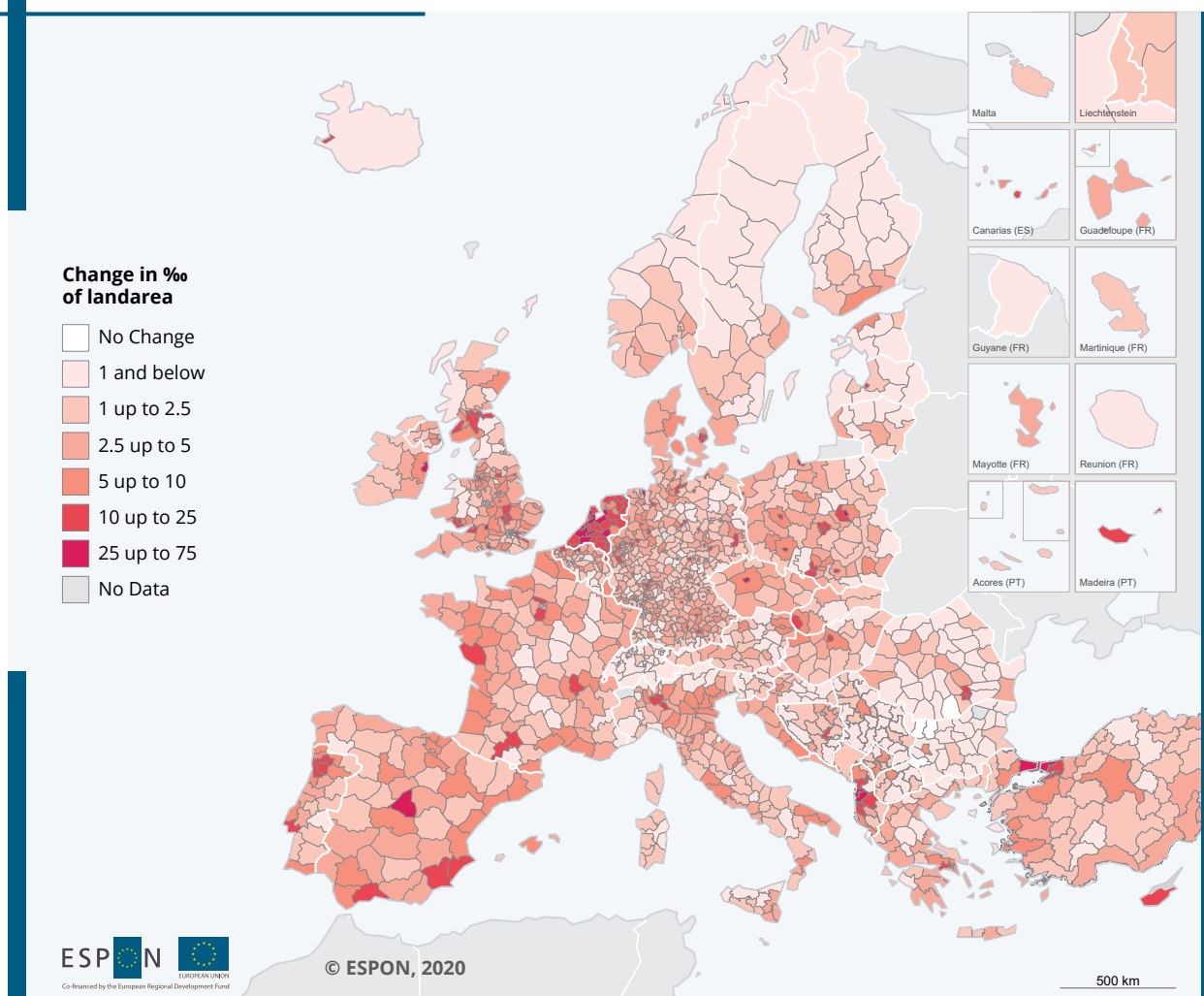
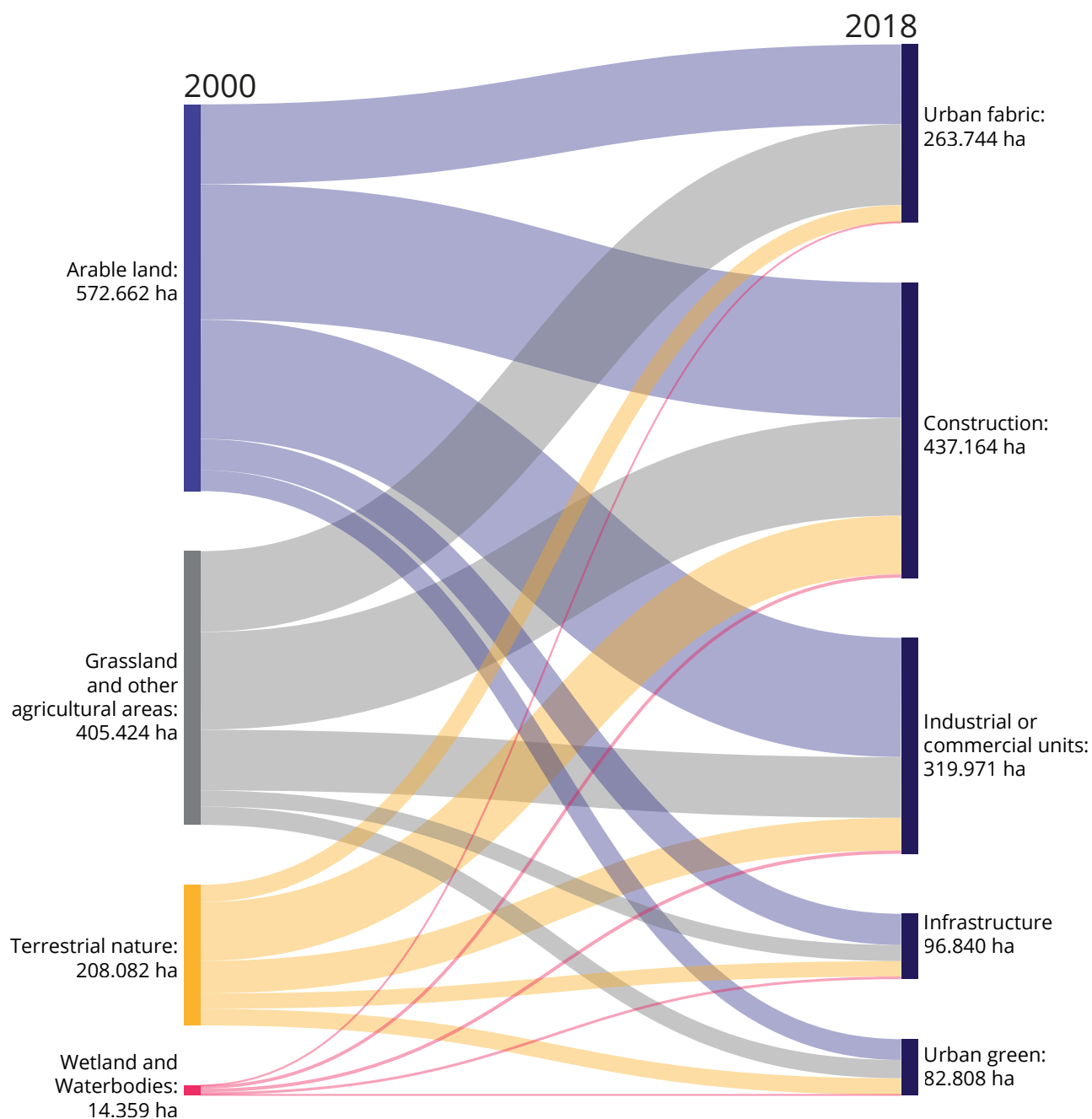
Map 1**Development of urban use in % of land area (2000-2018)**

Figure 1
Land converted to urban use ⁽⁸⁾ in the period from 2000 to 2018



Source: ESPON, 2020

(8) The urban land-use categories applied here are: urban fabric (see definitions); construction (areas under construction development that change or are modified into artificial surfaces by human activities); industrial or commercial units (land units that are under industrial or commercial use or serve as public service facilities with buildings, other built-up structures and artificial surfaces occupying most of the area); infrastructure (land associated with road, rail, ports and airports); urban green (areas voluntarily created for recreational use such as urban parks and sport and leisure facilities).

According to research, more than 60 % of EU soils are in an unhealthy state (European Commission, 2020). Unsustainable land management, soil sealing, contamination and overexploitation are the main drivers of this degradation process, which is further exacerbated by impacts of climate change and extreme weather events. The driving forces as well as the consequences of soil degradation go beyond administrative borders and create risks for human health, the environment, climate, economy and society (European Commission, 2023).

Against this backdrop, the EU soil strategy for 2030 was issued as a framework to ensure that ‘... all EU soil ecosystems are in healthy condition and are thus more resilient ...’ by 2050 (European Commission, 2021). The strategy acknowledges the significance of healthy soils⁽⁹⁾ not only for various economic sectors, but also for the provision of ecosystem services (among which include water absorption and filtering, carbon storage, avoidance of heat island effects) as well as people’s well-being. It includes concrete measures to protect and restore soils and ensure that they are used sustainably. In this respect, the soil strategy is a key pillar of both the EU biodiversity strategy for 2030 as well as the climate adaptation strategy, and is set to contribute to various international policy objectives. Likewise, the Nature Restoration Law, adopted by the European Parliament but still awaiting adoption by the Council, underpins the ambitions of the aforementioned EU strategies and shall help to reach international commitments concerning the restoration of degraded ecosystems (European Parliament, 2024). Finally, the European Commission’s proposal for a soil monitoring law requires Member States to monitor soil

health and land take in their soil districts, which they are expected to establish throughout their respective territories. Furthermore, Member States are to ensure that land take mitigation principles are being applied, i.e. avoiding or reducing, as much as possible, land take and compensating the loss of soil capacity to provide ecosystem services (European Commission, 2023).

One of the long-term objectives laid down by the soil strategy is for the continent to achieve NNLT by 2050. Land take ‘transforms natural and semi-natural areas (including agricultural and forestry land, gardens, and parks) into artificial land development, using soil as a platform for construction and infrastructure, as a direct source of raw material or as an archive for historic patrimony’ (European Commission, 2023). According to EEA⁽¹⁰⁾, urban green areas as well as sport and leisure facilities are considered artificial surfaces. Land take is often driven by economic development needs and can lead to urban sprawl, increased traffic, and the loss of ecological functions (Öko-Institut e.V. et al., 2024). In general, one can conclude that land take occurs predominantly in commuting zones while inner-city densification increases the degree of soil sealing but does not increase land take.

Soil sealing⁽¹¹⁾ is one of the most extreme results of land take because whenever soil is sealed and built on, its capacity for providing crucial ecosystem services is irreversibly lost, which has repercussions on the occurrence of climate induced hazards like floods and heat waves. Having experienced increased vulnerability to such hazards, some EU Member States have introduced policies to reduce land take (see Chapter 3).

(9) ‘Soils are healthy when they are in good chemical, biological and physical condition, and thus able to continuously provide as many [...] ecosystem services as possible’ (European Commission, 2021).

(10) See: <https://www.eea.europa.eu/en/analysis/indicators/net-land-take-in-cities?activeAccordion=546a7c35-9188-4d23-94ee-005d97c26f2b>

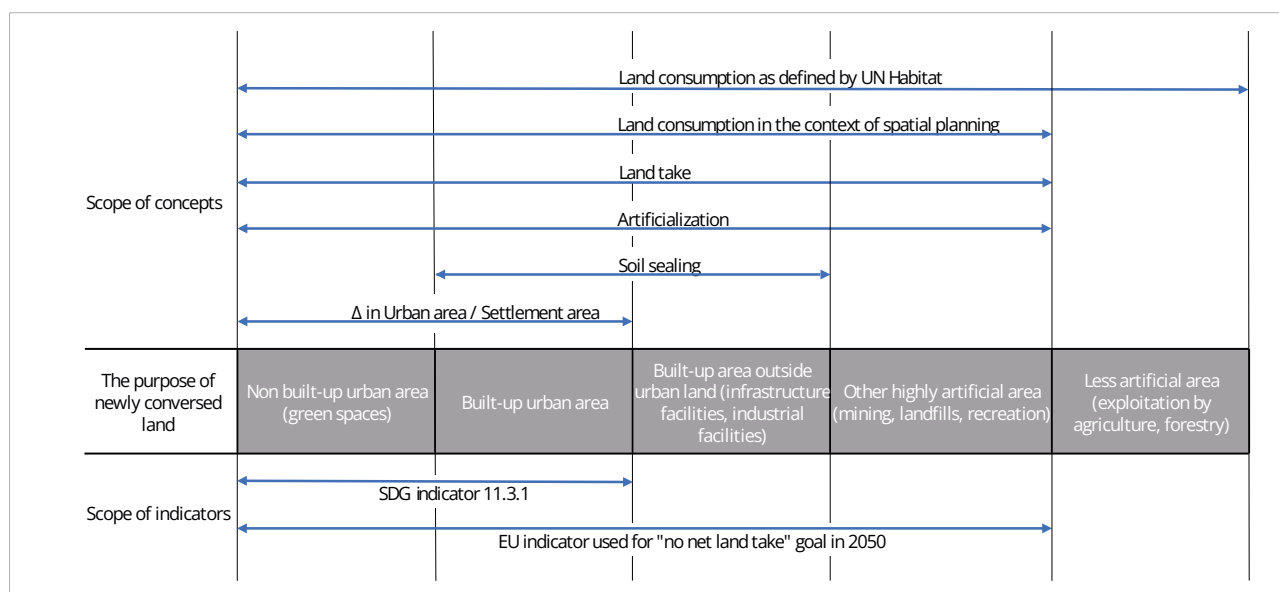
(11) ‘Soil sealing designates the covering of soils by a completely or partly impermeable material’, (Öko-Institut e.V. et al., 2024). It ‘accompanies land take, but not all areas that are subject to land take are entirely sealed’ (European Environment Agency, 2021).

2 Towards an operational definition of land take

Research has shown that definitions of land take differ within scientific and policy relevant literature (Marquard et al., 2020). Studies of scientific and policy relevant literature resulted in eight definitions of land consumption, thirteen definitions of land take, and four definitions of artificialisation. Land consumption, artificialisation and land take often have the same meaning, particularly in the

context of urbanisation and spatial planning. However, when the thematic focus changes, land consumption might be conceived differently and more broadly. 'If, e.g. deforestation for agricultural purposes is discussed, land consumption could be an appropriate term, but not land take' (Marquard et al., 2020).

Figure 2
Scopes of the discussed concepts and indicators in relation to different land-use / land-cover categories



Source: Marquard et al., 2020

As mentioned above, the EU soil strategy for 2030 requests Member States to define, by 2023, objectives to reduce net land take by 2030 at national, regional and local levels. As a first step, countries need to define their understanding of net land take. The definition of land take differs between and even within countries (ESPON, 2024a). In some countries the definition of net land take is set at the national level (France, Luxembourg, Germany and

Switzerland) and is related exclusively to the ecological functions of the soil (Switzerland) or goes beyond the ecological functions to include the agricultural functions of the soil as well (Luxembourg). In some countries, the definition is very detailed, such as in Luxembourg (Example 1), whereas in other countries, the definition is quite broad, such as in Germany, where it focuses on built-up areas by settlements and transportation (ESPON, 2024a).

EXAMPLE 1**Defining land take in Luxembourg**

In the context of urban development in Luxembourg, land ‘taken’ refers to built-up land for residential use (buildings, houses) or commercial use (offices, factories, etc.), paved or stabilised surfaces (roads, railways, car parks, roundabouts, etc.) and land that is not built-up but has been heavily shaped by human activity and can thus be categorised as artificial (building sites, quarries, mines, landfill sites, etc.). Land ‘taken’ also includes artificial ‘green’ areas (urban parks and gardens, sports and leisure facilities, etc.).

Source: ESPON, 2024a

In Italy and Belgium, the definition varies across regions (Example 2). This underscores the importance of considering regional specificities as well as coordinating efforts in reducing artificialisation. Some other countries have not yet clearly defined what they mean by land take (e.g. Estonia, Poland and Czech Republic). This, however, does not mean that nothing is being done in relation to NNLT. Often, underlying objectives regarding the limiting urban sprawl, for example, are being addressed and as such, a contribution towards the NNLT objective is being made. In the Czech Republic, various policies at national, regional, urban and local levels use and apply principles and practices associated with NNLT and address the issue of sustainable use of land.

Policies and practices related to the objectives and mechanisms of NNLT can be identified along the following three mutually interrelated areas.

1. There is a long-term, established political goal and practice of protecting the quality of agricultural land, forest and water, with a specific priority for arable land protection, because arable land is seen as a valuable and scarce resource for agricultural production.
2. The key objectives of spatial and land-use planning concern sustainable development. This is understood as the balanced conditions for economically efficient, environmentally sustainable and socially inclusive development that favour the utilisation of previously developed land in already urbanised areas, thus protecting non-developed land and areas.
3. There are policies and strategies that support sustainability by providing objectives to tackle trends that threaten sustainable development, such as processes that lead to the loss of land outside already built-up areas. These policies prioritise, for example, keeping cities compact and dense with an imperative to provide alternative development sites within urban, built-up areas. With this approach, land take in greenfield and sprawling, greenfield construction outside cities and towns to enlarge commuting regions is being avoided.

EXAMPLE 2

Defining land take in Italy

In Italy, land take is defined at the national level as a change from non-artificial land cover to artificial land cover. However, because spatial planning has been entrusted to regions since the 1970s, land take is being defined in various ways by the Italian regions. Some examples of how regions defined land take in their legislation are found below.

- Veneto follows the national definition and European recommendations most closely. The region defined land take as the increase in natural and semi-natural surfaces that are affected by soil sealing interventions, or by artificial covering, excavation, or removal, and interventions that compromise the ecosystemic functions and production potential of the soil.
- The Lombardy region, on the other hand, defines land take as the change from agricultural surface to other uses not connected with previous land use, excluding new parks and including supra-municipal infrastructures.
- The Emilia Romagna region defines land take by the areas where urban plans envisage new urbanisation outside the perimeter of so-called 'urbanised territory'.

Land take is included in a new law that is being developed by the Italian Institute of Urban Planning (INU). This law aims to update the national planning system and guide the regions. A final proposal will be presented to the ministries and the government this year.

Source: ESPON, 2024a

To keep track of the status and progress of net land take, it needs to be monitored at national, regional and local levels. To ensure the monitoring of net land take is comparable across countries and to support countries with fewer possibilities for measuring net land take themselves, it would be good if all countries could use the same European data source. However, European data sources, which are based on satellite image analysis, have their limitations regarding monitoring net land take (Decoville and Schneider, 2015; ESPON, 2020; Nicolau and Condessa, 2022) and largely deviate from the figures found when using official national land-use statistics (Fina et al., 2023). A main reason could be the difference between land use versus land cover. European databases are land-cover databases while, in most cases, national databases are using cadastral data (i.e. land-use data). Using both data sources without accounting for these differences can have important policy implications. For example, for Belgium, the average urbanisation rate using the CORINE database is several times lower than using the nationally collected data which are based on smaller mapping units. This means that within the current Belgium ambition of 3 ha/day land take should be reduced by 50 % from a national perspective. But from the EU perspective, using CORINE, Belgium is allowed a significant increase in land take (ESPON, 2020).

European data sources available for monitoring land cover to measure net land take related variables are indicated below.

- **CORINE Land Cover** (CLC) data has been used to develop indicators to measure net land take (European

Environment Agency, 2019; Copernicus, 2022a). CLC, however, cannot be used to identify changes of less than 5 ha and is therefore not ideal to measure net land take at national and regional levels.

- **Urban Atlas** (UA) data has been used to develop indicators to measure the recycling of developed land (Urban Atlas, 2022). Although UA data has a higher spatial resolution, i.e. 0.25 ha for urban and 1 ha for rural classes, it does not provide a complete coverage of the land.
- **Copernicus** data has also been used to develop indicators to measure the density (0-100 %) of artificially sealed areas and the presence/absence (1/0) of built-up areas (Copernicus, 2022b). Both indicators are very relevant for land take and have a high spatial resolution of 0.01-1 ha. However, they focus on only one aspect of net land take and omit the possibilities of land take due to infrastructure, etc.
- **Global human settlement layer** (GHSL) provides a number of datasets with spatial information about the human presence in the form of population density, settlement and built-up maps (Kemper et al., 2021). An example is a built-up density map (GHS-BUILT) showing residential and non-residential areas with a 10 m resolution. Also, the focus here is limited and does not address all elements of land take.

A more detailed comparison of and discussion about possible data sources for measuring land take can be found

in Fina et al. (2023). Because of the limitations mentioned above, countries that started monitoring and assessing land take mostly use national data sources, which are generally more detailed than those available at the European level.

A disadvantage of this situation is that the results are less comparable between countries. Not only because of the use of different data sources, but also because of the different definitions of net land take.

EXAMPLE 3

Monitoring NNLT in Germany

In Germany, data on land use is being derived from the Real Estate Cadastre Information System. Regarding NNLT, the most relevant indicator is 'settlement and transportation area' (*Siedlungs- und Verkehrsfläche* (SuV)), which mainly consists of built-up, transportation, and urban recreational areas. The Federal Statistical Office publishes the degree of and increase in SuV on an annual basis. The indicator 'increase in SuV' (shown in hectares per day) is part of the indicator set for the German sustainability strategy.

Source: ESPON, 2024a

As stated above, countries that monitor net land take measure it in various ways. Some countries make use of cadastral information (e.g. Germany and Czech Republic) (Example 3). In these cases, public domain land, such as road infrastructure, ports and monuments, is not included. In other countries, such as France, the measurement is done manually. The legal measure of land take in France is based on compulsory declarations for any construction registered in the municipal land register. Based on these declarations, the body responsible for monitoring land use assesses, piece by piece, the surface area that has been developed, and classifies development by type (housing, business, mixed use). These data cover the whole territory but have two limits: they do not take roads into account, and they include unbuilt plots if they have been declared buildable by the local planning authority.

Countries also differ in what they do and do not consider as land take. For example, in Czech Republic, land with green surface such as gardens and parks (including those within the built-up areas of a city) are not considered as land taken by development. Whereas in Luxembourg, artificial 'green' areas (urban parks and gardens, sports and leisure facilities, etc.) are included in land 'taken'. In France, exceptions are provided for major projects of national or European scope as well as for areas where photovoltaic panels are installed if they can be used for agricultural purposes. In Estonia, land take for solar and wind parks and other energy facilities has emerged as a new theme needing special balanced attention. The reason for this

is that a simplistic ban or controversial siting decision can lead to internal conflicts and mismanagement in the operationalisation of sustainability. Also, the regional law of Emilia Romagna ⁽¹²⁾, which has the objective of zero net land take by 2050, does not include energy efficiency interventions in the calculation of land take. Moreover, in Switzerland, the stabilisation principle for sealing outside the building zone (reflecting an idea of balance and focusing on buildings and sealing, including the possibility of a demolition subsidy) only applies to agricultural areas that are farmed all year round. It also excludes sealing for agricultural and touristic purposes, as well as sealing related to energy production and transmission facilities, or cantonal or national transport facilities ⁽¹³⁾. Another challenge that should be mentioned concerns French regions that have already made quite some efforts in the past to reduce their land take. These efforts are not always considered by the new monitoring system that is being developed to accompany the implementation of the new law on climate and resilience that established NNLT as a national objective.

Finally, monitoring net land take alone does not bring a country closer to reaching the objective of NNLT in 2050. What countries or regions undertake to come closer to meeting the objective is diverse. This diversity of approaches is partly explained by differences in regulatory frameworks, urban planning tools available to authorities, as well as practices and contexts related to territorial development (Example 4 and 5).

(12) No 24 of 21 December 2017 (Regional regulations on land protection and use).

(13) Article 1 al. 2 let. Bquater and Article 8d al. 2 nLAT.

EXAMPLE 4**Trajectories and centralities in Wallonia (BE)**

In Wallonia, the draft territorial development strategy (SDT) is based on the concept of spatial optimisation and specifically emphasises two trajectories: one aimed at reducing net land take and another aimed at limiting urban sprawl. To optimise land use, it also defines centralities, which are parts of cities and villages with a concentration of housing, proximity to services and amenities, as well as good accessibility to public transportation, and where residential development is prioritised. This draft strategy and its trajectories also rely on the principles of subsidiarity, progressivity and operationalisation.

Source: ESPON, 2024a

Countries that do not have an explicit NNLT objective often address it through other targets, such as limiting urban sprawl, no soil sealing and improving the soil quality. In Switzerland, for example, several recent legislative reforms to the Federal Law on Spatial Planning concern urban sprawl which could contribute significantly to the realisation of NNLT. In Poland, tools against urban sprawl and for environmental protection of the land and soil, especially for agricultural use, are linked to the NNLT objective. Also in the Czech Republic, issues related to NNLT are discussed in the state environmental policy 2030, in which the main challenge described is the high proportion of impermeable paved areas in settlements and the expansion of settlements into the open landscape (urban sprawl) instead of using brownfield sites. Finally, Estonia addresses the objective of NNLT in the draft environmental strategy for 2023. Here, land take is strictly governed by the Nature Protection Act, which restricts and limits development and construction in nature protection zones and areas. The country aims to increase the proportion of protected areas from 20 % to 30 % (year to be determined) (ESPON, 2024a).

Even though the countries mentioned above do make some contribution towards the NNLT objective, it is unclear to what extent. More details on this can be found in Chapter 4.

The above observations lead to the possibility to measure land take in a more diversified way and not only binary. For example, by looking at what is happening with the land after it has been 'taken', or analysing the quality of the soil before the land is being taken. Also, the natural character of agricultural land is frequently questioned: is an agricultural or forest plot still considered natural when the soil quality is significantly altered or degraded by production processes (such as pesticides, fertilisers, etc.)? Conversely, private gardens in urban contexts may be considered artificial, even though, in terms of biodiversity, they are particularly rich in organic matter and provide numerous ecoservices.

Eventually, at what point, based on which indicators, can anthropogenic rewilding of a fallow land allow the soil to be reclassified as natural? In that context, restoration of the land, recultivation, or unsealing of the soil does not necessarily make the soil healthier (ESPON, 2024b).

EXAMPLE 5**Water shortage leading to a period of NNLT in Viimsi (EE)**

Water shortages in the Viimsi municipality near Tallinn triggered public debates. General public and political sentiment turned against further development, leading to a planning and construction ban for about 2 years approved by the Viimsi municipal council, although the population of Viimsi had tripled to 23 000 since 2000. Exceptions could be made for purposes of public interest, public premises, water, and waste management. This ban can be considered a pioneering local act on no land take.

Source: ESPON, 2024a

The need for a clearer definition of NNLT at the European level

The analysis of nine case-study countries highlights the need for a clear and shared definition regarding NNLT. The target of NNLT is ambiguous as it covers both a reduction of land take and prevention of soil degradation through soil sealing (Marquard et al., 2020). Legal bases and definitions vary significantly between countries, challenging transnational comparisons, exchange, and discussions. To facilitate meaningful transnational discourse and collaboration, a common understanding of NNLT must be developed, particularly since many countries lack a general definition.

Furthermore, the way NNLT is monitored, and in relation to which spatial and environmental issues, varies widely, often relying on diverse databases within each individual country and different methodologies. Some countries use land-registry data (France or the Czech Republic) and other countries use data from earth-observation satellites (but with different resolutions and methods). The absence of a unified approach underscores the necessity for an overarching narrative or clarification of the concept. This involves gathering and comparing different understandings to establish a cohesive framework. At the European level, there is a pressing need to bring discussions on NNLT together to search for a common definition, approach, and facilitate mutual learning.

The ambiguous target of NNLT, torn between reducing land take and preventing soil degradation, complicates both its definition and monitoring. It becomes crucial to carefully consider what aspects are monitored, as this significantly influences the goals that can be set or followed, the way governance frameworks can be structured and how public debates on this important issue for sustainable development can be properly handled. In summary, addressing the challenges surrounding NNLT requires collaborative efforts to establish a shared understanding, harmonise definitions, and develop a cohesive monitoring approach, especially at the European level.

A quantitative target of land take as a lever for sustainable land use

Concerns about a purely or mainly quantitative approach to urban planning have been raised by the adoption of NNLT strategies. But to deal effectively with NNLT, it appears essential to complement traditional land-use planning with approaches that improve soil quality, ecosystem services, etc. NNLT must be viewed as a tool for promoting sustainable land use and planning, rather than

as an isolated and purely quantitative objective in itself, particularly because its application varies across different countries, serving diverse spatial goals. It is thus crucial to approach the NNLT objective with caution, avoiding a solely quantitative perspective that may oversimplify or divert attention from other essential land-use goals and targets like biodiversity or social cohesion.

In many European countries, NNLT serves as a catalyst for initiating more comprehensive land-use monitoring and projects. These projects go beyond traditional dichotomies and challenge purely agriculturally productive or resource-centred definitions of soil and land. For example, integrating ecosystem service approaches in urban planning provides a more holistic perspective, fostering a nuanced understanding of land use and promoting sustainable practices.

The relevance and the capacity to reach the 'zero' net land take target is questioned by many experts or decision-makers who are confronted with the need of improving housing and public services to remain attractive for industrial, tourism and agricultural development (Halleux et al., 2024. Geronnez et al., 2024).

Moreover, some are concerned that the 'zero' target is not suitable for spatial planning, which must remain adaptable, especially in the face of demographic, environmental or geopolitical crises. Some insist on the variety of the territorial contexts throughout Europe in terms of demographic development, economic attractiveness, as well as the financial and physical ability to reuse brownfields and densify existing urban areas. In shrinking Austrian areas, for example, many empty, old houses are available where no one wants to live and new houses are being built to accommodate young people. Also, in Greece, a seismic country, old houses and buildings are not always safe and new houses are being built. Demolishing the old buildings can be problematic because of cultural heritage regulations. (ESPON, 2024b)

There is no consensus for an NNLT strategy at the European level. However, the fact of setting a quantitative target for land use seems to be a good way to stimulate the debate on land and soil use and is a useful lever to change urban planning methods and practices. In this sense, it could be recommended at the European level to invite countries and regions to set a quantitative target for land take. Periodic monitoring of land take, based on a common definition and methodology, could be relevant to discuss and challenge the different planning systems in Europe and align them with other objectives, such as local and regional housing needs as advocated in particular by the developers and house builders' sector in Europe ⁽¹⁴⁾.

(14) See: <https://buildeurope.net/>

3

Implementing NNLT policies

In most countries, the institutional and legal frameworks in which spatial planning and territorial governance take place have historically not been designed to achieve the NNLT objectives (Example 6). A prominent example of this is the prevailing practice where local authorities often rely on revenue from land-use taxes, which incentivises urbanisation and development. Consequently, the introduction of NNLT objectives sparks debates regarding the necessary evolution of territorial governance to facilitate their implementation (ESPON, 2024a).

The roles assigned to local authorities vary significantly across Europe. However, their primary function usually

involves adapting the provision of various public services (such as sport and cultural amenities, schools, or public transport) to local needs. As ecological concerns gain more prominence, local authorities are increasingly tasked with understanding their role in ecological transitions, including the reduction of land take. This represents a fundamental shift in perspective for local authorities, necessitating not only a demonstration of their contributions in line with local residents' needs but also their alignment with European and national environmental objectives (ESPON, 2024a).

EXAMPLE 6

Implementing NNLT within more or less favourable contexts (EU)

Across Europe, countries can be categorised based on the extent to which their existing spatial planning systems converge with the objective of reducing land take, as follows:

- through dispersed urban dynamics, supported by prevailing urban planning strategies, as evidenced by Estonia and Poland;
- by intermediary positions, where the NNLT policy supplements other measures aimed at addressing urban sprawl. These nations face numerous dispersion tendencies due to factors such as the high number of municipalities, complexities in local taxation systems, and the presence of sparsely populated regions. Prominent examples include the Czech Republic, Belgium, France and Italy;
- via well-established planning traditions favouring compact urban development, thus making the new NNLT targets more achievable. This category includes Germany, Luxembourg and Switzerland.

Figure 3
Convergence of NNLT objective with existing national planning systems



Source: ESPON, 2024a

In countries and regions where explicit targets exist to reduce land take, national and regional authorities delegate implementation responsibilities to local authorities. Understandably, these targets cannot be uniformly and automatically replicated from the national or regional level down to the municipal level. Therefore, local

authorities are encouraged to tailor their approaches, taking into consideration factors like demographic trends and opportunities for redeveloping brownfield sites, to collectively work towards regional or national goals. This approach highlights the importance of strong cooperation

among municipalities, which at present, is not always fully developed across all countries (ESPON, 2024a).

The involvement of civil societies depends on the degree of control exercised by local authorities. A significant part of housing production occurs without institutional oversight, particularly in small towns and remote rural municipalities, which lack the capacity to regulate urbanisation processes after authorisations have been granted. In contrast, larger cities often have greater control over urban housing construction, supported by technical and administrative capacities, financial resources, and effective negotiation skills. This dichotomy underscores the importance of transferring planning responsibilities to the appropriate territorial level to strengthen the capabilities of public authorities (ESPON, 2024a).

The impacts of NNLT policies

Land take is not solely driven by population growth but is also influenced by socio-economic mechanisms. On the demand side, various households and businesses contribute to sprawl through property investments and lifestyles that require extensive urban spaces. Conversely, on the supply side, developers find it more economically viable to cater for this demand in sparsely populated areas due to lower construction costs, rather than engaging in urban recycling, which typically incurs higher expenses compared to developing natural land and greenfields. Hence, public authorities are actively striving to realign these socio-economic mechanisms to promote more compact urban development. To achieve this, authorities use two main strategies: incentivising urban densification and discouraging construction on natural or agricultural land. Many countries have introduced incentive-based funding programmes to address both production and demand aspects. However, these initiatives, while helpful in facilitating NNLT implementation, may not fully redirect both demand and production towards achieving no net land objectives (ESPON, 2024a).

Thus, NNLT is intricately linked to broader discussions surrounding the economic impact of land-use change, introducing complexities that go beyond governance frameworks. The primary aim is to contain urban sprawl, which often conflicts with spatial planning frameworks designed to promote development, thus necessitating a closer examination of land-use economics. This scrutiny highlights the importance of addressing issues related to ecological compensation, a concept restricting new land take unless offset by equivalent land 'de-sealing' or ecological enhancements. These compensation approaches can occur at different territorial scales. The practical implications of this approach, including the appropriate scale and potential regional effects, however, remain topics of debate within academic and expert circles. Discussions have emerged, for instance in countries like Germany and Luxembourg, advocating for a significant socio-economic shift through compensation (ESPON, 2024b). Example 7 presents the implementation of a compensation concept in Berlin.

Exploring the underlying socio-economic mechanisms can reveal insights into the implications of NNLT and its potential to promote sustainable land-use practices. Such exploration has the capacity to instigate a shift in planning systems, where economic factors assume a crucial role in shaping land-use policies. Considering NNLT within a broader context emphasises the interconnectedness of environmental, social and economic factors. This holistic perspective is essential for developing effective policies that balance economic development with ecological sustainability, thus fostering a more comprehensive and resilient planning approach. Against that background, it would be useful to investigate how, within regional development and spatial planning, the NNLT objective can be merged and linked with other environmental objectives, including the ones related to the green transition. A more inclusive panorama from different fields should be framed (ESPON, 2024b).

EXAMPLE 7

Comprehensive urban compensation concept in Berlin (DE)

As part of its landscape programme, Berlin developed some instruments to support public authorities in optimising spatial planning and creating compensation for unavoidable deterioration of nature and landscape as local as possible. As Berlin is densely built, it is often not possible to fully compensate for deterioration of nature and landscape of a specific construction project at the same location.

The initiative started with a 'comprehensive urban compensation concept' (GAK), developed in 2004 and further refined in 2016. The concept assists in applying compensation where it is most needed or can be implemented most effectively. An ecological counter (Ökokonto), adopted by the Berlin Senate in 2019, is used to identify and map urban areas within the state of Berlin where further action on nature and landscape is necessary. If environmental damage needs to be compensated, these areas should be given priority. It is also possible to compensate for several small construction projects together, making the measures more efficient and allowing the city to more easily manage the development of its open spaces.

The central idea of this concept and counter is to implement compensation measures before the projects requiring compensation are initiated, theoretically speeding up approval procedures. Nature protection projects then feed into the ecological counters, from which project developers can easily draw appropriate compensation projects.

However, the application of the compensation concept at the city-state level seems to be reaching its limits, due to a lack of available land for carrying out compensation measures and considering the objectives of constructing new housing. To solve this, Berlin is seeking cooperation with Brandenburg in order to use ecological counters as efficiently as possible. In addition, future projects will be examined for using ecological counters.

Source: Senatsverwaltung für Umwelt, Verkehr und Klimaschutz Berlin, 2019

4

Conclusions for an effective uptake of NNLT measures

The differences in definitions for land take and soil degradation can be explained by the categories of stakeholders most involved in the debate. The three main groups of stakeholders involved are the agricultural sector, the supporters of more 'intensive' or compact urban development and the institutions responsible for protecting the environment. Other, more specific sectors involved, typically come from the fields of research, public transport, large landowners in already urbanised areas, and insurance companies. The agricultural sector can be quite ambivalent towards NNLT policy. In general, this sector aims to ensure that there is sufficient agricultural land available. However, they are also reluctant to trust local authorities to tackle soil degradation and instead focus discussions around agricultural practices. In Belgium and France, NNLT strategies have emerged when two categories of actors mobilised together: environmentalists and promoters of a more 'intense' and 'compact' urbanisation (ESPON 2024a).

Not surprisingly, the more precise and rigid a country's legislation, the more heated the public debate on NNLT becomes. This is why the debate is less intense in Estonia and Poland, for example. In Germany, Italy and Luxembourg, the debates are not very intense either. It is most likely because the aim to reduce land take is expressed in these countries, but it is not legally binding (ESPON 2024a).

In France, the debate is very lively. The Law of Climate and Resilience of 2021 has faced criticism from business entities due to its potential impact on economic development, with concerns that it may hinder the ability to attract industrial sites, particularly large-scale factories. Moreover, the NNLT policy is seen as undermining decentralisation, as local authorities are obliged to take this objective into account when drawing up their town planning document. In Belgium, and particularly in Flanders, there are also debates, notably on the compatibility of NNLT policy with demographic and economic growth. Surprisingly, although Switzerland has very ambitious legislation on the subject of NNLT, public debate on the topic is less intense. The Swiss legislation probably only supplements an already very restrictive planning system that is set to limit urban sprawl (ESPON, 2024a).

Many public debates concern the compatibility of the NNLT policy with economic development and the building of affordable housing (Gernonnez et al., 2024). Public debates are limited because the effects of such long-term orientations on urbanisation are not yet strongly felt either by municipalities or by the real estate market.

Moreover, the intensity of public debate could also be linked to demographic trends and therefore be stronger in countries or regions with a strong demographic growth, like Flanders.

The need for an informed and broadened public debate

The implementation of NNLT faces many barriers: the fiscal system (very often fostering urban sprawl), the local governance framework (because of the need for more local horizontal cooperation to adapt the differentiated local trajectories to the common goal of reducing land take), the socio-economic mechanisms of urban development, etc. (ESPON, 2024a). NNLT could be seen as an important initial step, which should be considered in relation to subsequent measures such as transformations in land-tax systems, mobility, and infrastructure transitions to achieve a 'green' transition. If understood in such a way, NNLT has the potential to drive planning reforms at various governmental levels.

Because NNLT is assumed to lead to scarcity of land, driving up the value of land and harming social and territorial justice, there is a need to focus the discussion within NNLT on social justice (e.g. new fiscal instrument). The question is then, how to design such a system and on what scale should it best be used. Moreover, who is in charge, sets rules, and receives the benefits (ESPON, 2024b).

In general, the public discourse on NNLT remains relatively limited (ESPON 2024a). Although the topic is actively discussed in academic and governmental circles, it has not gained significant consideration in the public domain. This discrepancy may stem from the technical nature of the subject, which might not readily capture public interest. Bridging this gap in awareness is crucial to fostering informed public discourse and garnering public support for policies related to NNLT. By linking NNLT to everyday concerns and more central socio-political debates in relation to land use, it is possible to stimulate a broader public dialogue that lines up with academic and governmental efforts to address the challenges and opportunities associated with NNLT.

To properly raise public debates around NNLT it is crucial to carefully consider what aspects are being monitored as this significantly influences the goals that can be set and the way governance frameworks can be structured. Setting a quantitative target for land use seems a good way to stimulate the debate on land and soil use and

is considered a useful lever to change urban planning methods and practices. Collaborative efforts are needed to establish a shared understanding, harmonise definitions, and develop a cohesive monitoring approach, especially at the European level.

The public debate must be based on facts and data. NNLT is often perceived as contradictory to other fundamental spatial needs, notably those related to the need for additional and affordable housing and economic development (mainly reindustrialisation). It is crucial to approach this potential conflict with awareness and address or nuance these apparent paradoxes. One critical consideration involves being mindful of issues such as the dominant narrative of the urban-rural divide and the different dynamics of both growth and shrinkage in various regions. Addressing this issue requires a comprehensive understanding of the implications of NNLT on different spatial contexts, ensuring that policy discussions are inclusive and sensitive to diverse needs and challenges.

To implement NNLT measures successfully, it is therefore necessary to monitor the impact of the policy on housing affordability, economic development, regional imbalances and the urban-rural divide, because this could highlight the need for other sectoral policy reforms to implement NNLT related policies. Moreover, without an evidence-based discussion of its effects, NNLT could be susceptible to fears of economic or territorial decline. NNLT risks therefore being rejected by a large proportion of the population and the potential effect of its capacity to create a 'domino effect' on public policies for green transition would be lost.

Connection to other ongoing (political and societal) debates

NNLT policy faces many obstacles and is intricately connected to numerous ongoing debates in the field of spatial governance and sustainable land use (ESPON,

2024b). Some examples of this include the tax system (which very often encourages urban sprawl), the local governance framework (because of the need for more local horizontal cooperation to adapt the differentiated local trajectories to the common goal of reducing land take), and the socio-economic mechanisms of urban development.

In that context, NNLT could be seen as an important initial step, which should be considered in relation to subsequent measures such as transformations in land tax systems, mobility and infrastructure developments to achieve a 'green' transition. If understood in such a way, NNLT has the potential to drive reforms at various levels of government and to contribute meaningfully to broader dialogues and initiatives.

The potential of NNLT also lies in its ability to serve as a nexus for integrating diverse perspectives and concerns within the broader context of spatial planning and governance. It provides an opportunity to address the intricate relationships between land use, environmental conservation, and societal needs (Lacoere et al., 2024).

By recognising NNLT as a dynamic tool in the context of sustainable land use, it can contribute to comprehensive planning strategies that line up with multiple societal and environmental objectives. NNLT involves comparing and inventorying various means and mechanisms of compensation, both at local and regional levels. By focusing on these underlying mechanisms, we gain insights into the economic implications of NNLT and its impact on sustainable land-use practices. This exploration could potentially lead to a radical shift in planning systems, as economic considerations play a pivotal role in shaping land-use policies. A holistic perspective is essential for developing effective policies that balance economic development with ecological sustainability, fostering more comprehensive and resilient planning systems.

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Co-funded by
the European Union
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The ESPON EGTC is the single beneficiary of the ESPON 2030 cooperation programme. The single operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the partner states, Iceland, Liechtenstein, Norway, and Switzerland.

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Alexandre Leclercq – CREAT- UC Louvain

Acknowledgements

Michel Dachelet, Aline Dewaele, Pascale Fouchs, Renee Peters, Claire Vanschepdael – Service Public de Wallonie (SPW-Territoire)

Disclaimer

This delivery does not necessarily reflect the opinion of the members of the ESPON 2030 Monitoring Committee.

ISBN: 978-2-919816-86-6

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Published in October 2024

