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Discussion paper for the Webinar

„Being serious about the no net land take target – it's time to start" on Feb. 1st, 2024

The need for no net land take

Land and healthy soils are finite resources and must therefore be used efficiently. However, within the European Union, 60-70% of the soils are in an unhealthy condition (EC 2020), and settlement and transportation areas are expanding significantly. **Land take, i.e. the conversion of natural, semi-natural and agricultural land into land with artificial surfaces**, is a major threat to fertile soils in Europe. During 2012-2018, the *net land take* in cities and the commuting zones of the EU amounted to 450 km^2 per year (EEA 2023). *Land take* leads to urban sprawl, more traffic, and the loss of ecological functions of land areas and soils (EEA 2019, EEA 2021). It decreases, amongst other things, the potential of soils to store carbon and contributes to the further decline of biodiversity. Soil sealing, i.e. the coverage of soils with impermeable surfaces, is one form of land take. Its adverse effects on soils are often irreversible. It increases the risk of surface run-off during floods and heavy rainfalls and of extraordinary heatwaves in cities (EEA 2021).

Already in 2011 in its "Roadmap to a Resource Efficient Europe", the EU Commission stated that *land take* within the EU should be reduced to net zero by 2050 (EC 2011). The United Nation's Sustainable Development Goals call for a "land degradation-neutral world" by 2030 (UN 2015). The 2014 Environmental Impact Assessment Directive (EC 2014) emphasized the importance of land-use efficiency by stipulating that "land" must be included as a separate protected resource in environmental impact assessments. Several EU member states have introduced national policies to limit further *land take*, e.g. strategies promoting the inner development of cities and the re-use of building sites (Schröter-Schlaack et al. forthcoming, Bovet & Marquard 2022). However, the observed slowing-down of the EU-wide rate of *land take* is not sufficient and the rates of land recycling are too low to reach the net-zero *land take* target, i.e. a fully circular land-use by 2050 (EEA 2019).

Against this backdrop, the EU Commission has adopted and proposed **further instruments** regarding land and soil resources in recent years. The Commission adopted the "EU Soil Strategy to 2030" (EC 2021) as a key deliverable of the EU Biodiversity Strategy for 2030. The EU Soil Strategy sets out a long-term vision for healthy, protected and restored soils by 2050 and presents a mix of voluntary and binding instruments to achieve these goals. The Commission also adopted the EU Mission "A Soil Deal for Europe" (EC 2023a) which supports the implementation of the EU Soil Strategy by research and innovation activities. In 2023, the Commission submitted a proposal for a Directive on Soil Monitoring and Resilience (Soil Monitoring Law). The annexes to this proposal list *land take* and soil sealing indicators but do not detail the methodologies for monitoring them (EC 2023b).

A common understanding of no net land take?

The EEA generally defines *land take* "as the increase in artificial areas over time. It represents an increase in settlement areas (or artificial surfaces), usually at the expense of rural areas. This process can result in an increase in scattered settlements in rural regions or in an expansion of

urban areas around an urban nucleus (urban sprawl)" (EEA 2021). "Land consumption" and "artificialisation of land" are sometimes used synonymously to *land take* (Marquard et al. 2020). **Soil sealing** designates the covering of soils by a completely or partly impermeable material. "Soil sealing accompanies land take, but not all areas that are subject to land take are entirely sealed" (EEA 2021).

Net land take is calculated as the difference between the surface area turned from a non-artificial into an artificial state during a certain period and the surface area where such conversion has been reversed. In the French law, e.g., it is defined as the balance of the artificialization and re-naturalization (land recultivation) over a given area and time (*cf.* French Code of Urbanism, Art. L101-2-1), recultivation being the conversion from urban or otherwise developed/built-up areas into agriculture, forest or other seminatural areas. Achieving the goal of no *net land take* requires both, decreasing the rate of new *land take* and reversing former *land take* by re-naturalization of artificial land into (semi-)natural land.

To exchange knowledge effectively on *land take* and on policies to reduce it as well as for monitoring the rates of *land take* comparably, there is a need for a common understanding of the relevant terminology. Currently, **definitions of land take** and related terms such as urban sprawl and land consumption partly diverge among the member states as well as between the member state level and the EU level. Furthermore, there are significant differences regarding the methods for monitoring *land take* (Marquard et al. 2020), e.g. the tools applied include remote sensing, field surveys, or the analysis of cadastres. As a result, different types of data are used (information on land cover, land use, or administrative categories).

At the **European level**, there are two different classification systems: **CORINE** Land Cover (CLC) and **LUCAS** (European Union's Land Use and Coverage Area frame Survey). The EEA uses CORINE data for calculating the land take indicator. The European Statistical Office uses LUCAS data for monitoring land use and land cover changes and for reporting, amongst other things, on relevant SDG indicators such as settlement area per capita. CORINE monitors parcels of 100 m^2 every six years by remote sensing. Consequently, smaller developments, infrastructures and transportation roads are not registered, and this may lead to an underestimation of the actual rate of *land take* (Fina et al. 2023). LUCAS is based on in-situ field observations at 250.000 sites across the EU. At the **national level**, several Member States established soil monitoring schemes that can lead to quite different results for the same process (Fina et al. 2023). Member States use diverging sampling methods, "frequencies and densities, and use different metrics and analytical methods, resulting in a lack of consistency and comparability across the EU" (EC 2023b). Some Member States track *land take* using **cadastral data,** others use CORINE as monitoring scheme. With such differences in place, ensuring no *net land take* will require leaving flexibility to Member States as well as striving for harmonisation where needed.

Finding common ground with the EU soil monitoring law?

Taking up the approach of the EEA, the current Draft of the Soil Monitoring Law defines *land take* consistently to the EEA definition as "the conversion of natural and semi-natural land into artificial land" (Art. 3 (17)). Member States will be required to establish soil districts (Art. 4). Member States will be requested to establish a monitoring framework based on their soil districts, to ensure that regular and accurate monitoring of soil health and *land take* is carried out (Art. 6). According to the current proposal, the monitoring framework will be based on soil health criteria (Art. 7, Annex I), soil sampling points (Art. 8 (2)), *land take* and soil sealing indicators (Art. 7 (1), Annex I Part D) and, eventually, remote sensing data and soil measurements carried out by the Commission (Art. 6 (4)). The directive also sets out the *land*

take **mitigation principles**: avoid, reduce, minimize, and compensate. Member States will have to ensure that the value of the *land take* and soil sealing indicators are updated at least every two years. They will report to the Commission only every five years, and reporting will be limited to the information that the Commission needs to fulfil its role in overseeing implementation of the directive, evaluate it and report to the other EU institutions.

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