Social cost-benefit analysis for circular soils

A data space case for the Netherlands

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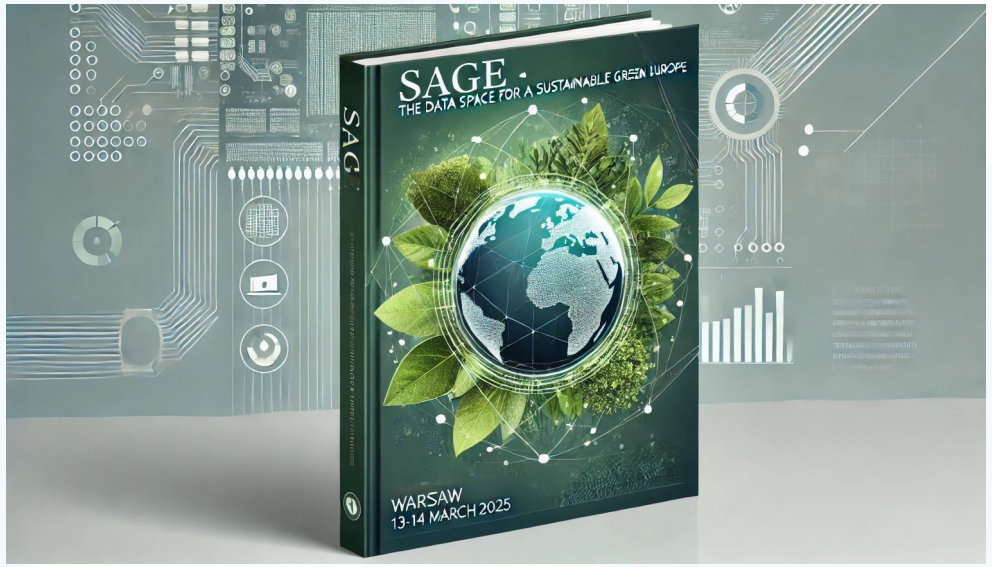
Agenda

1. Context EU SAGE project
2. Social cost-benefit analysis data space circular soils
   - Approach
   - Results
   - Conclusions

|SAGE |The Data Space for a Sustainable Green Europe



SAGE Use Case Circular soils data space is funded by:

European Commission

Ministry of Infrastructure and Water management

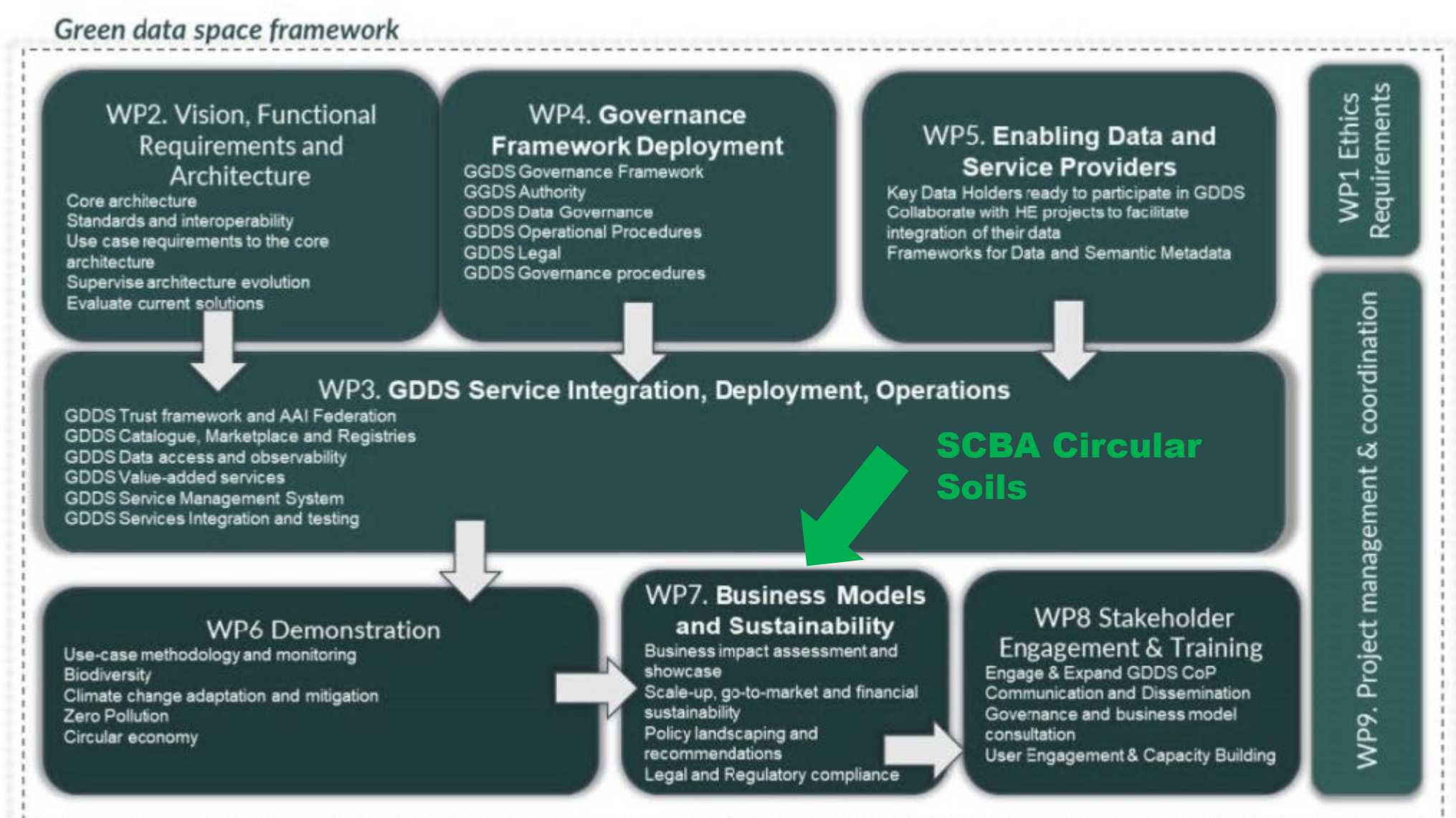
Ministry of Economic Affairs and Climate Policy

Ministry of Housing and Spatial Planning

Circular soils and the SAGE key pillars

Circular economy	The primary focus area of the use case is circularity, aiming to reduce the cost-inefficient and polluting extraction of primary soil while promoting the use of secondary soil.
Zero pollution	Optimising the transport of soil resources results in lower emissions of CO2, NOx, and PM, thus contributing to a cleaner environment. The relevance of Circular Soils is also related to the EU policy to prevent soil contamination in the Zero pollution Action Plan.
Climate change mitigation and adaptation	Soil is a crucial resource for constructing and maintaining infrastructures important for climate change mitigation (water barriers) and adaptation (construction of wind parks, solar fields).
Biodiversity	Minimizing the extraction of primary soil minimizes disruptions to natural habitats and ecosystems and thereby helps to preserve biodiversity.

EU SAGE project work packages



Business model for circular soils

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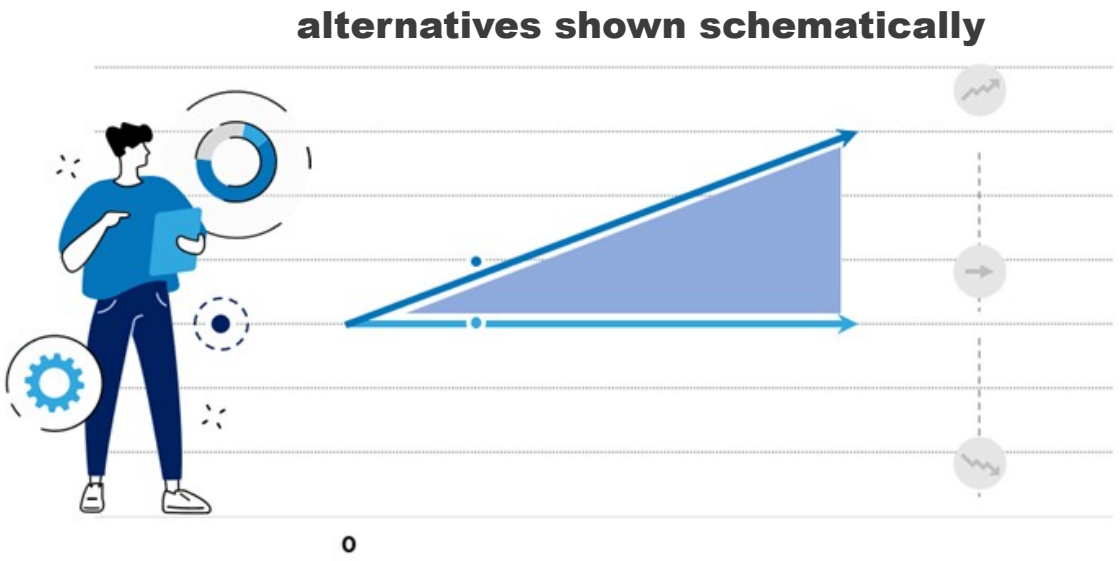
Social Cost-Benefits Analysis (SCBA) for data space circular soils in the Netherland



NL SCBA approach

Implementation of a SCBA according to the Dutch government's requirements for SCBAs:

- General Guidelines for Social Cost-Benefit Analysis, CPB (2013)
- Guide for social cost-benefit analysis of the digital government, SEO, Ecorys & Van Zutphen Advies (2019)

- A **zero alternative**: what the reality would look like with the autonomous development of the data space for circular soil flows.
- **Two policy alternatives** (the project alternative): the reality as we know it today, with the introduction of the data space for circular soils flows;
- Determining **costs and benefits**: determining the various effects (both positive and negative) of the project alternatives compared to the zero alternative. It also provides insight into which effects can and cannot be monetized;
- **Sensitivity analysis**: identifying the most important uncertainties in the analysis;
- Drawing up an overview of costs and benefits and presenting them in an accessible and clear way: clearly presenting the effects and ensuring transparency and reproducibility by means of a **SCBA report**.

Zero and 2 policy alternatives

Zero alternative

Autonomous development of some initiatives (like Fryslân Grip op Grond, DuSpot) without any policy intervention.

Policy alternative 1: Regional efforts

Policy intervention for five regional systems with limited data sharing, no coordination or standardisation, leading to partial re-use of soils.

Policy alternative 2: National data space

Policy intervention for a national data space for circular soil flows, coordinated and standardised and leading to full circular reuse in 2050.

Towards a national data space; a network of local and regional hubs for circular soils

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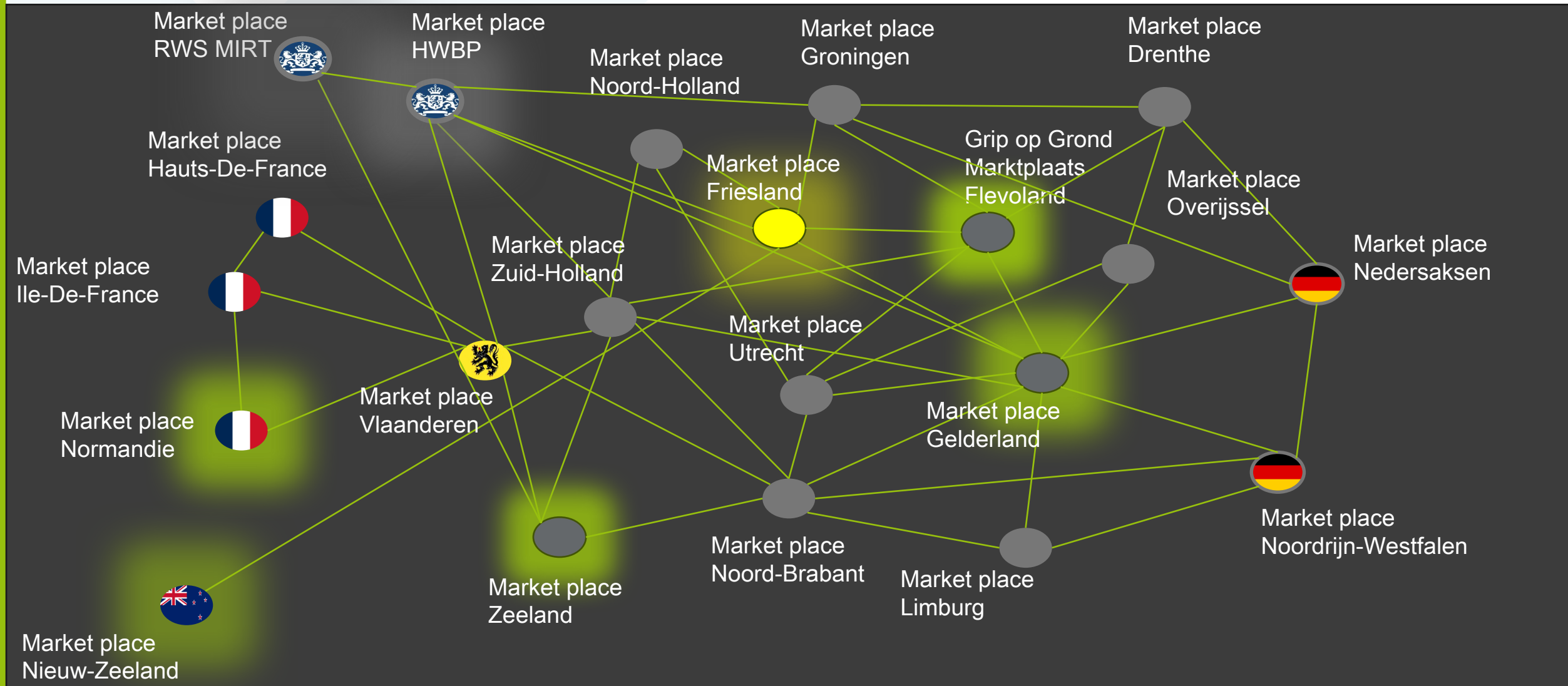

Cost scheme and analysis based on EU data space building block

DATA SPACES SUPPORT CENTRE

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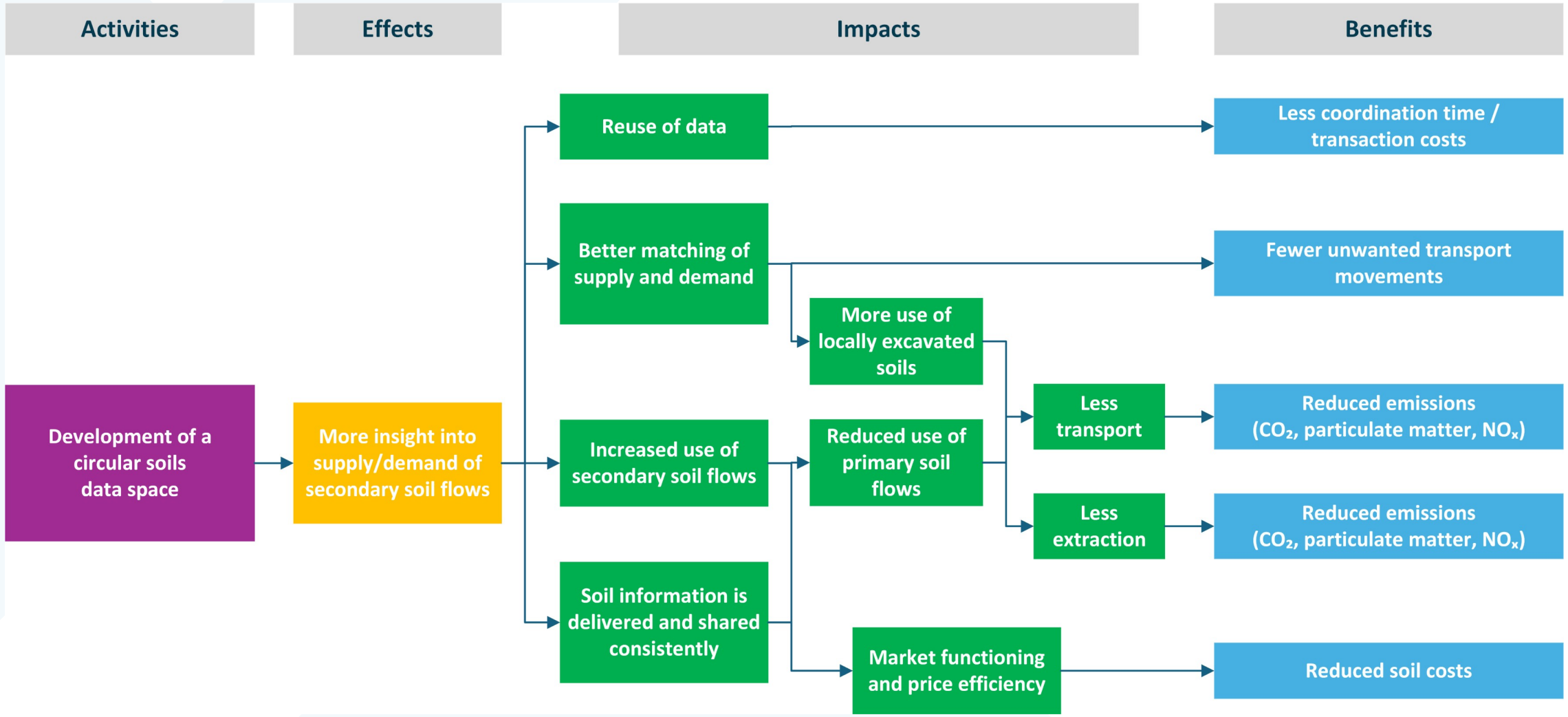
Effects scheme benefits analysi



Total investments in period 2027 - 2050

Table 1.2 Overview of total costs of introducing data space policy alternatives to zero alternative

	BA1: Regional (NPV 2027 - 2050 in € million)	BA2: National (NPV 2027 - 2050 in € million)
System of arrangements and governance	€19.5	€43.6
Coordination at regional level	€ 3.9	€ 3.9
Data space investments	€ 2.4	€4.1
Structural management costs	€13.3	€19.0
One-time connection costs	€ 2.0	€ 3.0
Soil quality maps, etc.	€11.8	€11.8
Structural connection costs	€ 38.6	€30.8
Total costs	**€91**	**€116**

NPV = Net Present Value (with 2,8% discount rate taken into consideration)

Total benefits data space

Table 1.3: Overview of total benefits introduction of data space policy alternatives to zero alternative

	BA1: Regional (NPV 2027-2050 in € million)	BA2: National (NPV 2027-2050 in € million)
Alignment time/transaction costs	€ 3.4	€5.6
Claims and failure costs	€89.3	€146.2
Traffic air pollution reduction (NO_x, PM)	€ 42.9	€96.8
CO2 reduction due to less transport	€10.1	€25.6
CO2 reduction due to less primary extraction	€9.4	€26.0
Reuse of data	€0.2 + PM	€ 0.4 + PM
Market forces and price efficiency	€80.6	€ 197.9
Enforcement	€ 11.2 + PM	€ 18,2 + PM
Soil surveys	€ 20.0	€32.8
Data entry	€1.8	€2.9
Permit granting	€0.9	€ 1.5
Ecological benefits	PM	PM
Total benefits	**€270**	**€ 554**

NPV = Net Present Value (with 2,8% discount rate taken into consideration)

Total costs-benefits balance

Table 1.1 Total overview of social costs and benefits of policy alternatives compared to zero alternative

Variable	BA1: Regional (NPV 2027-2050 in € million)	BA2: National (NPV 2027-2050 in € million)
Costs	€91	€116
Benefits	€ 270 + PM	€ 554 + PM
Balance (benefits – costs)	+ € 178 + PM	+ € 438 + PM

NPV = Net Present Value (with 2,8% discount rate taken into consideration)

Sensitivity analysis

The SCBA is robust and shown by sensitivity analysis on 5 input variables:

1. Volume growth of soils flows;
2. Savings on failure costs;
3. Price effects in the soil market
4. Reduction in transport kilometres
5. Speed of adoption.

Variations in these assumptions reduce the benefits, but the balance remains positive and the return period changes marginally (up to one year compared to the zero variant for both policy alternatives).

Conclusions SCBA by Ecorys

Even with a conservative SCBA, a national data space delivers the highest social benefits and these exceed the costs;

A regional system also yields benefits and remains profitable, but the revenues are substantially lower than nationally;

A phased introduction results in higher total costs and lower total benefits than direct national implementation;

- The SCBA is robust;
- Advise: **opt for a national data space immediately; the extra benefits far outweigh the extra costs.**

Thank you!

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