Commissioned by :

Rijkswaterstaat
Ministry of Infrastructure and Water Management

TOWARDS CLIMATE-NEUTRAL AND CIRCULAR PROCUREMENT

An analysis of the procurement system and a proposed roadmap for an effective monitoring framework

FEBRUARY 2019

METABOLIC

CONTENTS

EXECUTIVE SUMMARY

TOWARDS INTEGRATED EFFECT MONITORING

Sustainable Public Procurement (SPP) refers to the purchasing of public products and services, while taking into account its effects on social and environmental health (both direct, and in the supply chain). The Dutch SPP approach embraces six distinct themes, two of which are unpacked in detail for this study: climate-neutral procurement and circular procurement. Included in these two themes are aspects such as CO_2 and other greenhouse gas emissions, as well as the reuse of raw materials at the highest possible level of value.

SPP is a highly topical issue for a steadily growing number of organisations in the Netherlands: action plans are being written, requirements and criteria are being formulated, and tools are being produced. Together, these activities are creating a growing demand for instruments that evidence the impact of SPP.

Climate and circular economy ambitions

In parallel, the Dutch government has ambitious policy goals in the spheres of climate change and the circular economy. Aims include a fully circular economy for the Netherlands by 2050 and a 50% reduction in the use of primary materials by 2030. Another target is to reduce the impact of CO_2 emissions by 95% in 2050, with an interim target of a 49% reduction by 2030. The government's objective is to reduce CO_2 emissions by 1 Mtonne, specifically through the use of circular procurement, which focuses on closing product and material loops guided by circular economy principles.

Need for integrated effect monitoring

In order to steer policies to meet these targets, it is necessary to track the effects of SPP, climate-neutral, and circular procurement measures. This calls for a robust and uniform effect monitoring framework that allows direct comparison between offers and clear pathways towards the most sustainable purchase choices. The Learning Network for Effect Monitoring was established to share learnings in the field of effect monitoring. The network formulated one principal question that this study attempts to answer:

"How do we create an integrated effect monitoring system for climate-neutral and circular procurement?"

An integrated effect monitoring system for procurement is essential to guide efforts to achieve policy goals. The monitoring system should produce four results:

- It should provide insight into the contribution of SPP to meeting policy targets relating to climate, the circular economy, and the Sustainable Development Goals.
- It should provide guidelines for translating the objectives of public authorities' action plans for SPP into specific measures.
- It should enable public authorities to adjust policies in light of the potential impact of SPP.
- It should encourage market actors to participate in the transition to more sustainable and circular products and services.

EXECUTIVE SUMMARY

Background

Metabolic was asked to analyse the various instruments that are currently available in the field of SPP. This analysis supplements the work of the Learning Network for Effect Monitoring.

The analysis focuses on various levels - the level of a product group, the level of an organisation, and the level of national reporting – illustrating where challenges need to be addressed. We then produce a roadmap showing what action is needed in the next five years to create a more uniform monitoring framework for climate-neutral and circular procurement.

The analysis was co-financed with funds earmarked for climate policy in the coalition agreement. With this report, the government aims to boost the transition to a climate-neutral and circular economy through procurement.

More information?
www.pianoo.nl/klimaatenveloppe

CURRENT SITUATION

To ascertain the current situation of effect monitoring in the Netherlands, we have mapped the 'SPP system' as holistically as possible. We reviewed the system at three levels: procurement, organisation, and policy. This analysis forms the starting point for developing a uniform monitoring system for climate-neutral and circular procurement in the coming years. The system diagram produced shows the interactions and data flows between the various actors, tools and databases engaged in the process of procurement and accountability. Not exclusively tailored to climate-neutral and circular procurement, it encompasses the entire SPP process. The analysis of existing tools, which is based on indicators and tools for climate-neutral and circular procurement, is specifically designed to address those two themes.

Integrated effect monitoring and impact measurement at the organisational level is not yet possible

The SPP system is still evolving and numerous tools and methods are being developed. However, effect monitoring and the synergy between methods that have been developed at product and organisational level face a major challenge. Many organisations have translated various aspects of policy on SPP into action plans. To measure the impact of these plans, a uniform method for aggregating the effects from product groups at the level of the organisation is needed.

The following conclusions need to be taken into account in developing an integrated system for effect monitoring:

- There are already tools that can provide the necessary information for certain product groups (e.g., civil engineering), but it is still very difficult for other product groups (e.g., catering).
- It is easier to aggregate the effects for CO_2 emissions than for the consumption of raw materials.
- The information available for effect monitoring differs from one product group to another. Tools for effect monitoring are being developed for various product groups.
- For CO_2 emissions, and to a lesser extent consumption of raw materials, good effect monitoring is already possible for some product groups.
- It is not yet possible to aggregate effects to show the total impact at organisational level.
- The availability of the data necessary for effect monitoring still varies from one product group and cluster to another.
- Circular strategies (e.g. recycle, reuse, refurbish) and avoided procurement are difficult to determine and are still difficult to combine with LCA methods.

CHALLENGES AND NECESSARY SYSTEM CHANGES

The analysis of the SPP system and the methods used at different levels highlight clear challenges. Those challenges form the starting point for future decisions on how to unify impact monitoring methods for climate-neutral and circular procurement measures.

We find that there are still obstacles to creating an integrated effect monitoring framework at various points in the system; these can be found in the interaction and data streams between actors, tools and databases, but also in the absence of a consensus regarding the relevant indicators. Six major challenges are translated in terms of the necessary system changes: steps that will facilitate integrated effect monitoring for climate-neutral and circular procurement.

The six challenges in the SPP -system:

1. **Prioritising** focus and resources on **policy that will have an impact** is unclear. Monitoring is expensive and resources must therefore be used effectively.
2. **Tools and databases are not yet widely available** for selecting options on the basis of their effect on climate-neutral and circular procurement.
3. **Data** from surveys and supplied by market actors is too **limited to monitor effects**.
4. There is **limited insight into the actual use** and reuse of the product/service.
5. **Effects can still not be aggregated at the organisational level:** it is still not possible to monitor progress on CO_2 emissions reduction and the use of raw materials.
6. There is **no consensus on a harmonised set of sustainable and circular indicators** for effect monitoring.

The six necessary system changes:

1. **Insight into the greatest impact** allows for **effect-driven policy.**
2. **Drafting of a protocol for tools** and databases of effects for product groups **with a major impact.**
3. **Connection to and prescription of information to be provided** by market actors in a tender.
4. Design of **contract and facility management** in such a way as to show **actual use and end of life** (circularity).
5. **Insight into** an organisation's **total CO_2 and material impact** by **creating an effects dashboard** to generate insight and facilitate effect-driven management.
6. A **framework of circular and climate neutral indicators:** inclusion of environmental and circular effects for measuring the impact of SPP.

CHALLENGES

The challenges in the system are highlighted with exclamation marks.

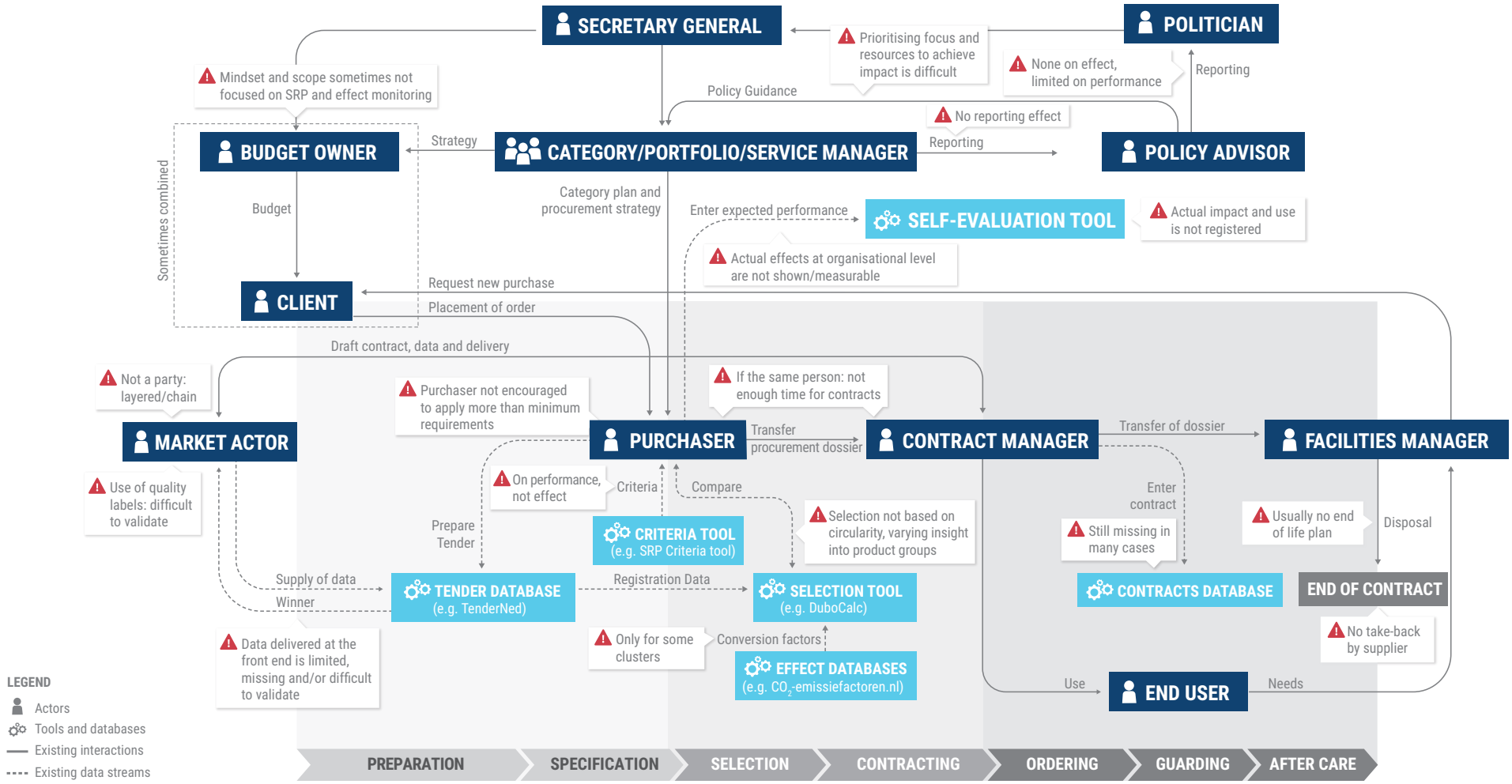
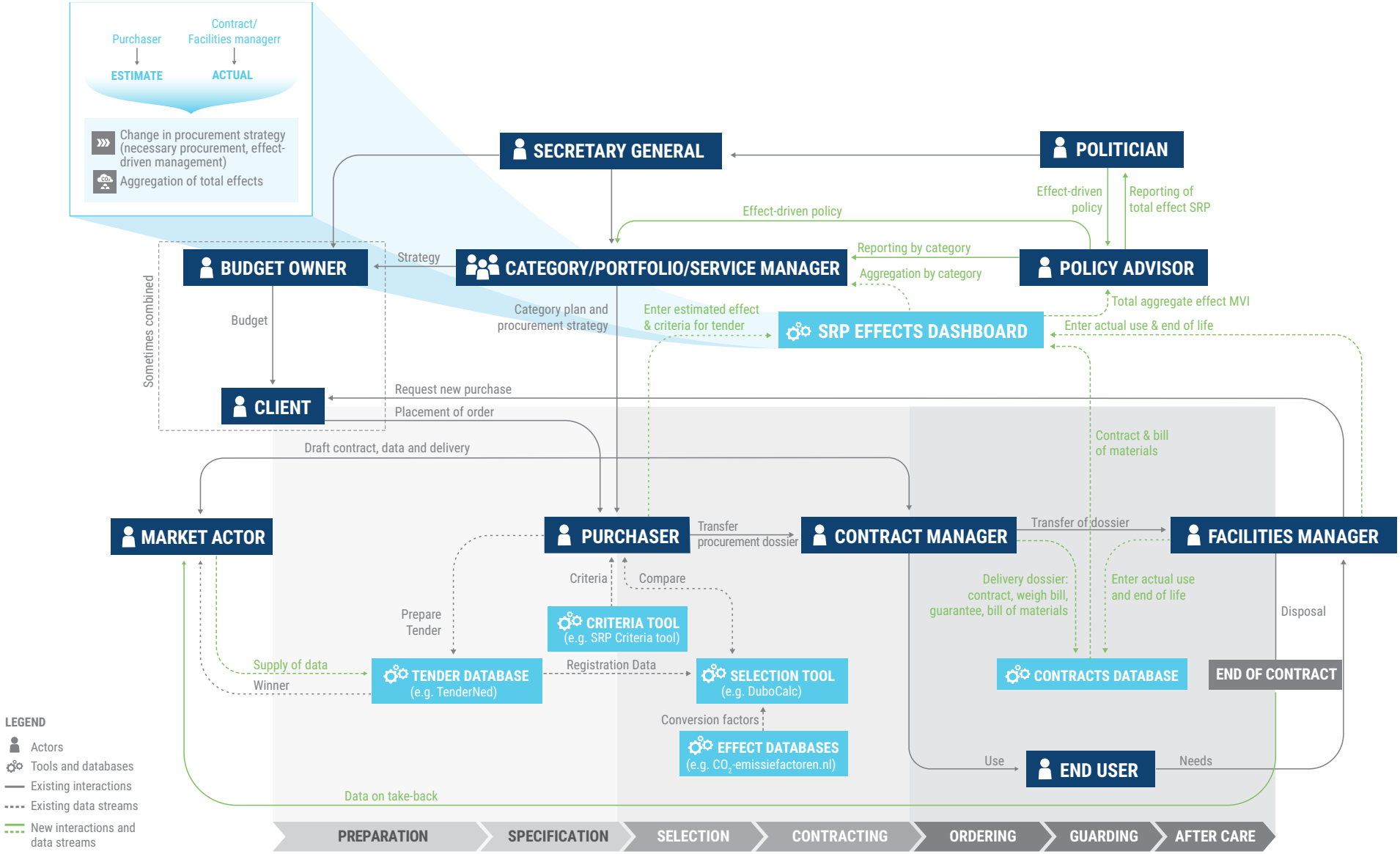
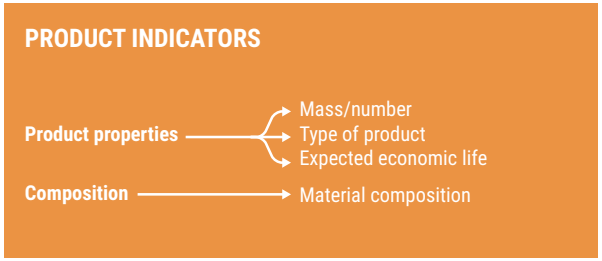


DIAGRAM OF IDEAL SYSTEM OF RESPONSIBLE PROCUREMENT EFFECT MONITORING



PROPOSAL FOR INDICATOR FRAMEWORK

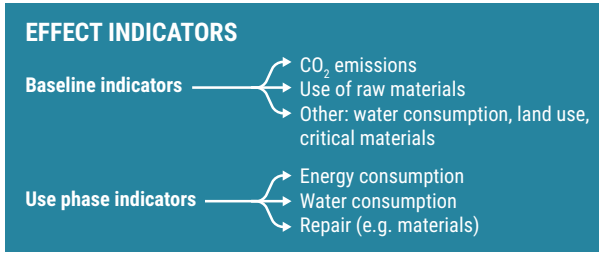


The first category comprises product indicators. These are indicators provided by the supplier and therefore have to be validated.

This involves considering the products' properties:

- How many products are there?
- What is the mass of these products?
- What type of product is it (energy label, type of vehicle)?
- What is its expected end of life?

The material composition ('bill of materials') is also very important for determining the effects.

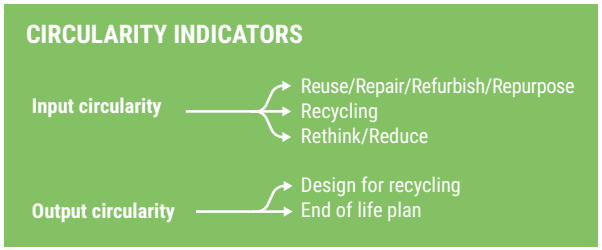


The effect indicators are based on LCA data and conversion factors. The key indicators here are CO_2 emissions and the use of raw materials, but other effects can be included depending on one's wishes and the complexity. Our proposal:

- Critical materials
- Water consumption and land use
- Use of non-renewable energy
- Toxicity

The effects of the use of the product or service are also included here. They include transport, consumption during operation (water, energy) and the use of raw materials during operation.

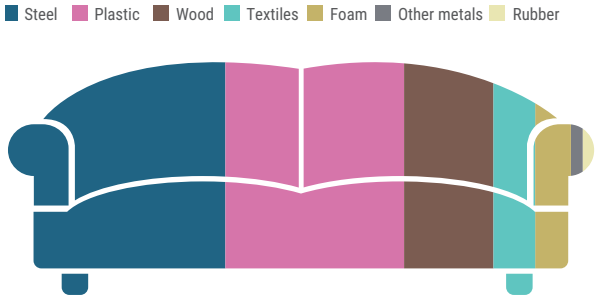
The list of effect indicators can also be expanded to include social factors in this system, but that will require further research.



The circularity indicators are broken down into two factors: input and output. For input, we look at whether procurement is required in the first place, and if so, whether circular principles such as reuse, repair, refurbish, and repurpose are enforced so that the product retains the highest possible value with the purchase. Here we follow the R-ladder of circular strategies that is also used by the Netherlands Environmental Assessment Agency (PBL). We also look at output: if the producer remains the owner of the product or promises to take back the product, the impact of this can be discounted.

THE MONITORING FRAMEWORK APPROACH

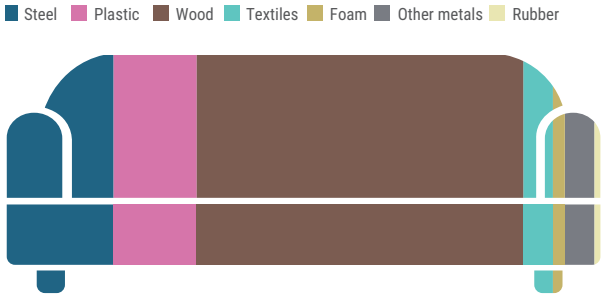
OFFICE FURNITURE



The approach for this indicator framework is based on the use of one or more baseline estimates to determine the impact of each product group. Impact estimates include CO_2 emissions, use of raw materials, and selected additional Life Cycle Assessment (LCA) data. Supply chain and production phase impacts (energy, materials of products or services) are also included here.

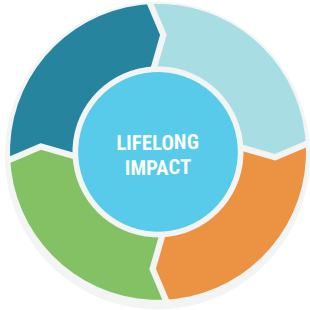
The set of baseline impact indicators is the same for all product groups, which enables the impact to be measured at organisational or national level.

REFURBISHED SOFA



The weighted impact incorporates the product indicators: what is the composition of the purchased product? Does it contain recycled materials? On the basis of this 'bill of materials', a weighted impact per kilogram of product can be determined for each material.

Accordingly, the impacts of the actual products can be related to effect with a relatively small set of baseline calculations.



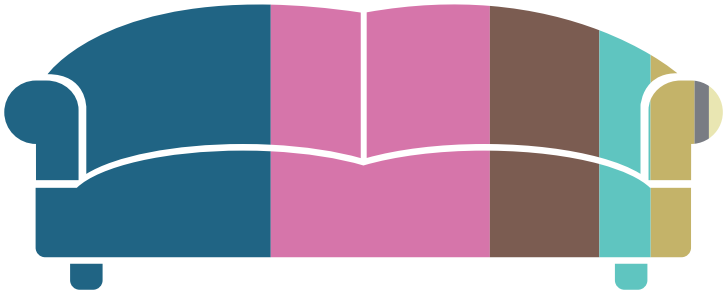
Finally, the life cycle impact is determined: both the impact over the entire life of the product (suitable for the allocation at organisational level) and the impact per year of life (suitable for comparing products).

This impact is calculated by multiplying the weighted impact per kilogram of product by the mass and the number of products ordered.
The next factor to be considered is the circularity of the product, since the impact of production is lower with a used or refurbished product. For the various strategies in the R ladder (reuse, refurbish, recycle), a descending factor between 0 and 1 can be selected. If a product is reused with a higher-value purpose, that factor will be closer to 0. Further research is needed to properly combine retention of value and LCA data.

THE MONITORING FRAMEWORK APPROACH

OFFICE FURNITURE

Steel Plastic Wood Textiles Foam Other metals Rubber



BASELINE IMPACT

BASELINE IMPACT
50kg CO_2 per day
28.5kg materials per kg

Office furniture: Sofa

MATERIALS	MASS		IMPACT		
	kg	%	CO_2 (kg)	Materials (kg)	e.g. land use (km^2)
Steel	25	37	172	250	...
Plastic	20	30	37	50	...
Wood	10	15	6	63	...
Textiles	5	7	44	39	...
Foam	4	6	22	10	...
Other metals	1.5	2	64	27	...
Rubber	1.5	2	9	9	...
SUM			353	448	
PER KG			5.3	6.7	

Available in own database

REFURBISHED SOFA

Steel Plastic Wood Textiles Foam Other metals Rubber

WEIGHTED IMPACT

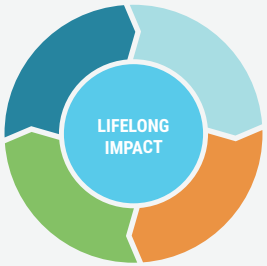
Refurbished Sofa

MATERIAL	COMPOSITION		IMPACT			
	Mass (%)	Recycled (%)	Weighted impact (%)	Weighted impact CO_2(kg)	Weighted impact materials (kg)	e.g. land use (km^2)
Steel	18	90	2	12	18	...
Plastic	14	0	14	26	35	...
Wood	55	50	28	17	172	...
Textiles	5	75	1	11	10	...
Foam	2	0	2	11	5	...
Other metals	5	50	3	106	45	...
Rubber	1	0	1	6	6	...
SUM			189	291		
PER KG			2.8	4.3		

Material composition, provided by supplier

Material composition, provided by supplier

Weighted impact



LIFELONG IMPACT

Weighted impact
×
Mass/Number
×
R-Factor
×
EoL-Factor
+
Use phase impact
=
LIFELONG IMPACT (EXPECTED)
÷
Anticipated end of life
=
LIFELONG IMPACT PER YEAR

Verstrekt door leverancier

DESIGN CRITERIA FOR SPP TOOLS

Many of the tools and methods for selecting and measuring impact will ultimately be developed by the market. Because of the major differences between product groups and their properties (types of impact, product vs. service, diversity of products within a product group), a one-size-fits-all tool is undesirable. However, every method should ideally be designed in such a way that it:

- is capable of measuring the same indicators;
- allows for aggregation of impact at organisational level;
- allows for validation of data;
- matches systems and databases used in the procurement process.

We have therefore drawn up a list of requirements for SPP tools and methods which can serve as design criteria for new tools in the SPP system. We have divided them into design criteria which we regard as 'no regret', and criteria that can provide a better total overview of the impact and circularity, but which require more work and resources to implement.

Checklist for development of 'no regret' SPP tools:

√ Consensus on a set of basic indicators suitable for all product categories.

√ Drafting of indicators to be measured for all 46 product categories.

√ Matching to and drafting of detailed criteria documents with 'rules' for the data to be supplied by market actors.

√ Effects to be based on the composition of materials ('bill of materials').

√ Conversion of production information into effect in a tool, not by the market actor.

√ Include circular strategies (recycle, reuse, refurbish) in the weighting of effects.

Checklist for development of 'total impact' SPP tools:

√ Formulate LCA baseline impacts for all product categories (for a limited number of products in each category).

√ Formulate reference values for effect per product category to determine impact reduction at organisational level.

√ Encourage market actors to accept ownership and/or take-back obligation in contracts.

√ Include possibilities in the tool for fulfilling the purpose of the tender with fewer products or services.

TOOLS, DATABASES AND ROLES

CREATING INSIGHT INTO IMPACT OF PRODUCT GROUPS

Bottleneck:
It is still not really possible to pursue an effect-driven policy. Objectives are general and relate to the system as a whole.

Solution:
Conducting studies to determine which product groups have the greatest impact will show where the greatest gains can be made. This will ensure that effect monitoring at organisational level remains realistic and efficient.

System change:
- Politicians and policymakers can be guided by the actual impact and dynamically adjust their policy.
- With insight into the effects of procurement, buyers and category managers can adjust their strategy and stimulate the market.

DEVELOPING A PROTOCOL FOR TOOLS AND EFFECT DATABASES

Bottleneck:
Many tools and databases are being developed, but methods of monitoring effects are not yet available for enough product groups.

Solution:
Develop basic conditions for tools and effect databases for selecting high-impact product groups.

System change:
- The purchaser can select on the basis of effects.
- The market actors are judged on the actual impact on humans and the environment of the product or service they supply.

DRAFTING UNFORM RULES FOR INFORMATION PROVISION

Bottleneck:
There is no uniform protocol for supplying product data to allow for a proper calculation and comparison of estimated effects.

Solution:
Modification of criteria documents for request and of tender platform so that the correct data is supplied by the market actors. Also match to developments in the market (BIM model, materials passport).

System change:
- More and more detailed data will enable the buyer to measure effects.
- By requesting the right information, market actors will be encouraged to continue innovating on sustainable and circular aspects.

CREATING INSIGHT INTO ACTUAL EFFECTS DURING USE

Bottleneck:
Not enough is known about the assets and there is no link between the measurement of the (estimated) effect of procurement and the actual use and end of life.

Solution:
Ensure existing contract databases are capturing or modelling meaningful outcome metrics, and are being implemented.

System change:
- There is insight into the actual use and reuse of products.
- Contract and facilities managers will have tools to offer products for re-sale, thereby extending their end of life.

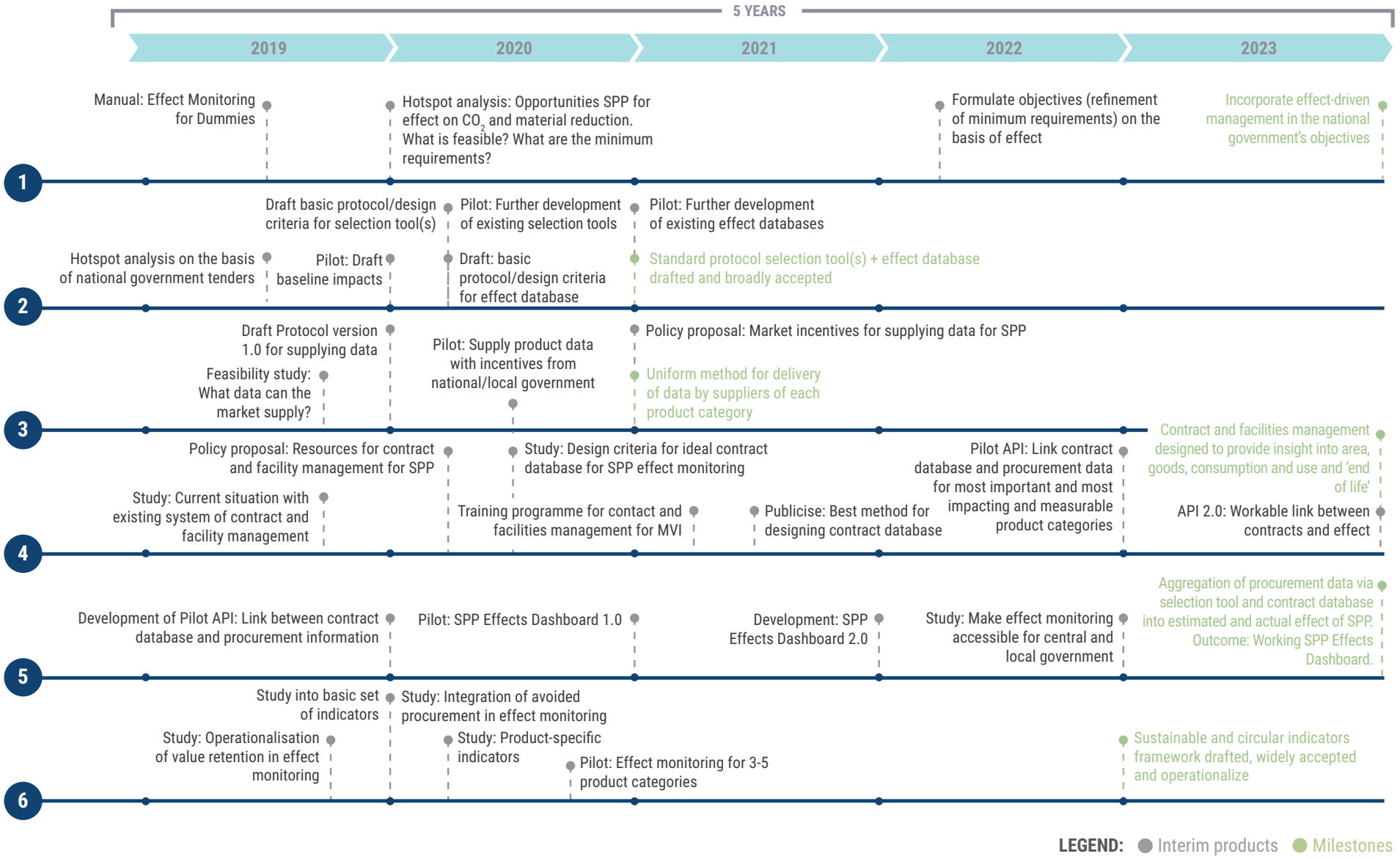
CREATING A DASHBOARD FOR AGGREGATION OF EFFECTS

Bottleneck:
Procurement data is currently aggregated solely on the basis of performance (the inclusion of circular criteria in awarding the contract) and not yet on the actual effects achieved with the tender.

Solution:
Insight into the total CO_2 and material impact of an organisation by establishing an effects dashboard, which facilitates effect-driven insight and management.

System change:
- Insight into the effect of SPP throughout the entire organisation.
- Possibility to manage according to the effect of SPP per product category and according to different effects.

PROPOSED ROADMAP FOR INTEGRATED EFFECT MONITORING



ROADMAP

We appear to be on the cusp of a revolution in Sustainable Public Procurement (SPP). The possibility of introducing effect-driven management with regard to both climate and materials, is starting to take shape. To do this properly, a number of steps need to be taken in the short term, six of which are summed up here, together with the first intermediate products on the path to reaching the six specified milestones.

In association with the learning network and a group of experts, we have drawn up a roadmap for implementing the six necessary system changes. We have defined milestones and enabling projects within a time frame of five years. The final milestones are shown in green. The enabling projects , studies, analyses, pilot projects and tools are positioned on the timeline on the previous page, commencing at the beginning of 2019.

1. Undertake an 80/20 study

Demonstrate where the greatest effects can be achieved with specific actions (20 percent of the effort towards 80 percent of the goal). This could be by means of a material flow analysis with a calculation of the effects in specific areas (e.g., CO_2, reduction in the use of materials, land and water use).

2. Understand value retention

Formulate a uniform indicator framework, with special attention paid to the retention of the value of products at end of life.

3. Develop a basic set of indicators

Draw up a basic set of indicators that can be used to aggregate calculated effects.

4. Assess the market

Create insight into the product data that market actors can already supply, and use it to draw up a protocol for the information that should be provided for the purpose of comparability (when tendering) and monitoring (during the term of the contract).

5. Look into contract and facility management

Investigate the practices of contract and facilities management in order to identify pointers for how best to show the actual effect.

6.Raise awareness

Ensure that the importance of effect monitoring is endorsed as quickly and as widely as possible. A switch from performance-related agreements to effect-driven management, and the need for monitoring, are essential in this respect.

CHAPTER 01

INTRODUCTION & APPROACH

INTRODUCTION

Sustainable Public Procurement (SPP) is an important issue. In 2016, ambitions were drawn up in the Sustainable Public Procurement Manifesto 2016 - 2020. Around 150 public authorities signed the manifesto and have translated it into an action plan with measures designed to achieve their ambitions. In 2018, the government adopted the target of saving 1 Mtonne of CO_2 every year on public procurement. Now that many organisations have drawn up their action plans and are incorporating SPP principles into their requirements and criteria for tenders, there is a growing need to measure the effects and to monitor the impact of procurement. The Learning Network for Effect Monitoring was established in 2018 by PIANOo and Rijkswaterstaat.

SPP encompasses various themes, including climate-neutral and circular procurement. It is therefore important to adopt a holistic approach that incorporates environmental and social factors such as land use, health and toxicity in order to prevent the unintended shifting of problems from one domain to another.

Various frameworks for monitoring the circular economy have been formulated at the European and national levels. It is important to follow these national and international initiatives to ensure that policy objectives can be translated to the local authority level. While some work has already been done in this respect, national and international initiatives are still only loosely connected to local goals.

It is important that they are properly connected: monitoring must be as comprehensive and detailed as possible, but must also be feasible in practice.

We seek to answer the following questions with this project:

- What indicators should be measured to provide a comprehensive picture of SPP?
- How do the monitoring systems at different levels mesh with one another?
- What data is needed for effective monitoring, and who should provide it?
- How do you make the system accessible to actors at every level?

In this context, it is important to form a clear impression of the eventual shape a monitoring system for SPP might take. The steps that are now being taken could then contribute to achieving that long-term vision.

The main question addressed in this study is:

“How do we create an integrated effect monitoring system for climate-neutral and circular procurement?”

LEARNING NETWORK FOR EFFECT MONITORING

Background

Metabolic was asked to analyse the various instruments currently available in the field of SPP. Its analysis supplements the work of the Learning Network for Effect Monitoring.

The analysis focuses on different levels - the level of a product group, the level of an organisation and the level of national reporting – illustrating where challenges need to be addressed. We go on to produce a roadmap of the actions that need to be taken in the next five years to establish a more uniform system of effect monitoring for climate-neutral and circular procurement.

This analysis was co-financed with money earmarked for climate policy in the coalition agreement. Through this report, the government is providing a boost for the transition to a climate-neutral and circular economy via the procurement process.

More information? *www.pianoo.nl/klimaatenveloppe*

Structure of the Learning Network

The structure of the Learning Network for Effect Monitoring is different to that of other learning networks. This is partly due to the complexity of the subject: there are many questions to be answered and much is already being done in the field of effect monitoring. However, it is still unclear how well these activities fit together. Accordingly, the focus lies more on research and on ascertaining the aspects that are most important to the participants' organisations. Various participants from the Ministry of Infrastructure and Water Management, Rijkswaterstaat, the National Institute for Public Health and the Environment (RIVM), the Netherlands Environmental Assessment Agency (PBL), municipalities, water boards, research firms and universities discussed the issues and refined this analysis at a series of three meetings.

Sessions of the Learning Network

- **Kick-off:** Identifying the requirements of effect monitoring in procurement processes.
- **Session 1:** Identifying the 'blind spots' at the three levels and providing feedback on indicators and monitoring systems.
- **Session 2:** Roadmap towards uniform monitoring of the effects of SPP: actors, data and tools.

Approach and goal of the project

The goal of this project was to produce a roadmap towards a system of integrated effect monitoring for climate-neutral and circular procurement. The framework covers the following levels:

- **Product:** what is the effect of SPP with respect to a standard alternative product / service?
- **Organisation:** what is the aggregate effect (environmental, social, economic) of SPP for the entire organisation?
- **National:** what effect does SPP have in relation to relevant policy objectives for the circular economy and climate at national level?
- **European:** what effect does SPP have in relation to relevant policy objectives for the circular economy and climate at European level?

EXISTING EFFECT MONITORING

IDENTIFICATION OF IMPROVEMENTS

SPECIFICATION OF ENVISAGED SPP FRAMEWORK

ROADMAP TOWARDS INTEGRATED EFFECT MONITORING FOR SPP

CHAPTER 02

TOWARDS A CIRCULAR ECONOMY

PLANETARY BOUNDARIES

Exponential times

Since the industrial revolution, there has been an exponential increase across a number of factors that greatly influence quality of life on the planet. Population growth and the accompanying expansion of economic activity has led to a steady increase in demand for raw materials to fuel the linear economy. This has, in turn, contributed to deforestation, the use of artificial fertilisers, more frequent serious flooding, rising temperatures, higher water consumption, and an alarming loss of biodiversity. These exponential curves present us with an enormous challenge.

An unsustainable system

A number of the fundamental boundaries of our planet are rapidly being exceeded. The Stockholm Resilience Institute has identified nine planetary boundaries, four of which currently represent a growing threat and two of which constitute a serious threat to a safe operating space for humanity.

For example, deforestation is rapidly increasing due to the intensification of agriculture, which has a negative impact on important natural systems and leads to the loss of biodiversity. The worldwide carbon cycle is also being disrupted with major effects on the climate. There is also disruption of worldwide nutrient cycles, such as phosphorous and nitrogen, which is creating 'dead zones' in the oceans, among other things.

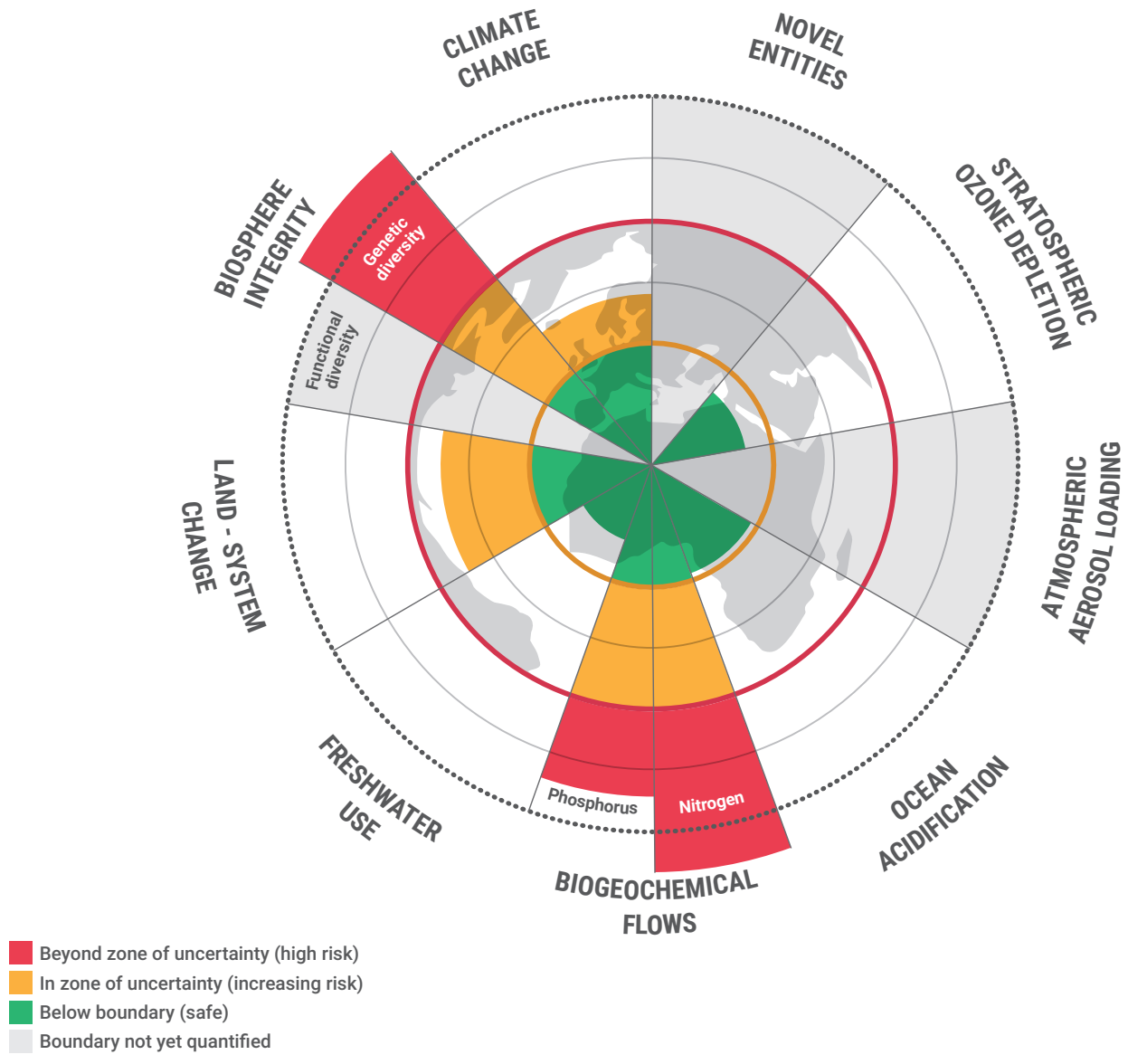


Figure 1: A safe navigation space for people on earth. Adapted from the report One Planet Approaches, p. 16. (Sabag Muñoz & Gladek, 2017, adapted from Rockström et al., 2009).

TOWARDS A CIRCULAR ECONOMY

The circular economy

One way of breaking the linear pattern that currently characterises our economic activities is the circular economy. Instead of extracting, processing and using raw materials and losing them as waste, this system is aimed at retaining raw materials at the level of their highest value (and complexity). This applies for biotic (plants, food, wood, bio-based, etc.) and abiotic (plastics, metals, chemicals) cycles.

In a circular economy, materials are preserved for the system in accordance with principles of recycling, maintenance, repair, re-creation, etc. Recycling is only considered if there is absolutely no further possibility of reuse. If even recycling is impossible, incineration (with heat recovery) can be considered, with landfilling of waste as a last resort. In the last few years, the link between a circular and climate-neutral economy has also been made more frequently. For example, the Netherlands Bureau for Environmental Assessment (PBL) has calculated that the circular economy could reduce CO_2 emissions by 8 Mtonne in 2030 (PBL, 2018).

Preconditions and the risk of shifting the problem

The aim of a circular and climate-neutral economy is to create a liveable and resilient planet for people. It is a means to an end and it should be accomplished within frameworks of justice, equality, safety and health. At the same time, it is important always to ensure that addressing a problem does not cause other problems elsewhere in the system (shifting the problem). Accordingly, the incineration of electric cables to retrieve raw materials is not an example of an integrated sustainable and circular approach.

The UN's Sustainable Development Goals can provide guidelines for an integrated approach to sustainable challenges. These basic conditions should always be considered when goals are being formulated for specific aspects of the system. A solution in one domain should never lead to insurmountable or irreversible problems in another domain.

Burning site, Agbogbloshie By Fairphone CC BY-NC 2.0

THE SEVEN PILLARS OF THE CIRCULAR ECONOMY

Metabolic maps the circular economy in holistic terms. It takes account not only of aspects such as the use of raw materials and the impact on the climate, but also factors such as biodiversity, health and the impact in the social, economic and cultural domains. These themes are very important in considering the transition to a climate-neutral and circular economy. This combination of factors shows that focusing on a single aspect can have negative consequences in another domain. Inequality in the division of the costs and benefits of the energy transition is a topical example in that context.

In the case of procurement, in focusing on CO_2 emissions and the use of raw materials it is important not to lose sight of other aspects. Although this study does focus on climate-neutral policies and the use of materials, we also feel it is essential to maintain a broad view and ultimately consider the entire system. This is the only way in which a transition can take place without shifting costs and problems to domains that are also of fundamental importance for a robust and resilient environment.

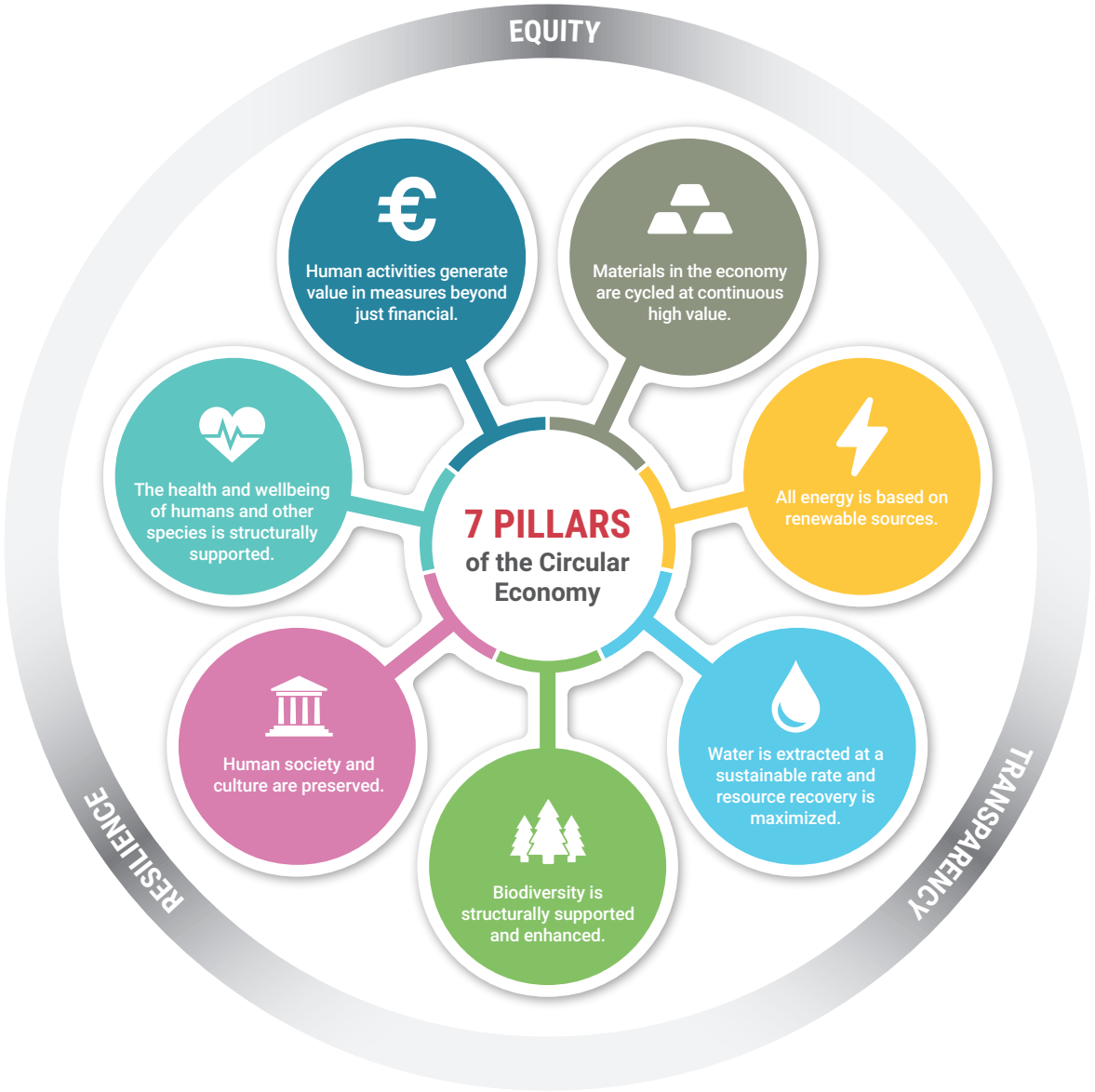


Figure 2:In line with the focus of this study, of the seven pillars in Metabolic's circular economy, climate impact (e.g., CO_2 emissions) and the use of materials are included in the analysis. Metabolic however takes a holistic view of the transition to a circular economy and also considers other social and planetary systems.

CHAPTER 03

BACKGROUND: SUSTAINABLE PUBLIC PROCUREMENT (SPP) AND POLICY

POLICY OBJECTIVES FOR CLIMATE AND THE CIRCULAR ECONOMY

In 2015, agreement was reached in Paris to limit the rise in temperature worldwide to a maximum of 2° Centigrade. The national objectives for the Netherlands' contribution to achieving that goal are currently laid down in a National Climate Agreement.

The Netherlands has formulated the target of becoming climate-neutral by 2050: by then CO_2 emissions should have been reduced by 95% compared with 1990. In 2030, emissions should have been reduced by between 49% and 55%. The Netherlands has also stated the ambition of transitioning to a circular economy. Targets formulated in this regard include that the country's economy should be entirely circular by 2050 and it should have reduced its use of primary raw materials by 50% in 2030.

COP21 · CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

CLIMATE

- Limit worldwide rise in temperature to 2° Centigrade, with the aim of limiting the increase to 1.5° Centigrade.
- 30% reduction of greenhouse gases in 2030 (compared with 1990).
- 27% of energy from renewable sources.

Klimaat-akkoord

- 50% less use of primary raw materials in 2030 (mineral, fossil, metals).
- The Netherlands fully circular in 2050.

SPP CONTRIBUTES TO THE ENERGY TRANSITION AND A CIRCULAR ECONOMY

Sustainable Public Procurement (SPP) refers to the purchasing of public products and services, while taking into account its effects on social and environmental heath (both direct, and in the supply chain). The Dutch SPP approach embraces six distinct themes, two of which are unpacked in detail for this study: climate-neutral procurement and circular procurement. Included in these two themes are aspects such as CO_2 and other greenhouse gas emissions, as well as the reuse of raw materials at the highest possible level of value.

It was agreed by the Dutch Government that from 1 January 2015 all public procurement would be socially responsible. With public authorities in the Netherlands together spending an estimated € 73 billion on procurement every year, the potential impact is enormous (Significant, 2016). However, the proportion of total procurement that actually meets the definition of SPP is very uncertain and needs to be further investigated.

PIANOo distinguishes 46 different product groups for which SPP criteria have been formulated. The relevant documents prescribe specific minimum requirements for each product group, at various levels. These requirements and criteria were recently updated and can be found at *www.mvicriteria.nl.*

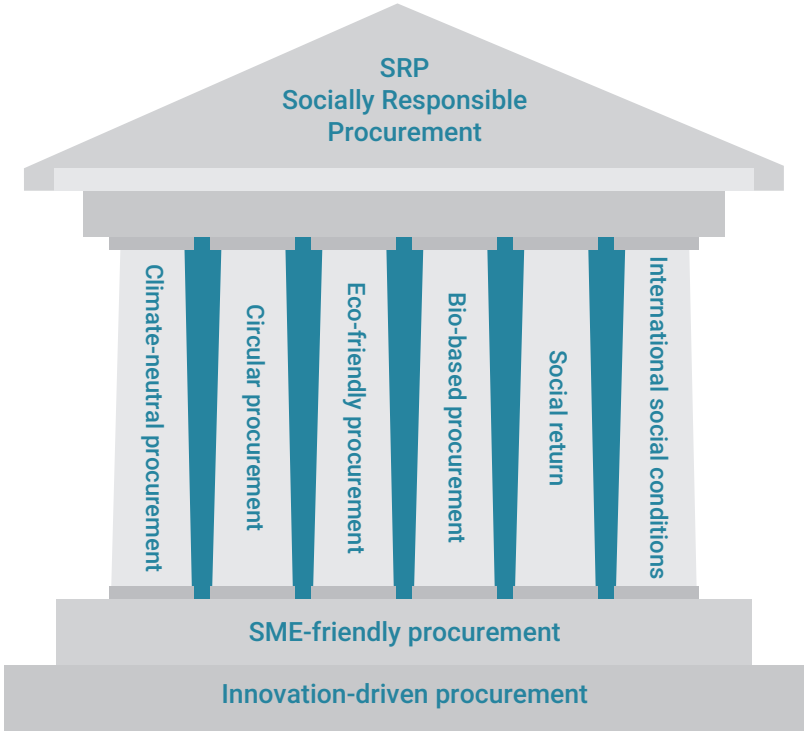


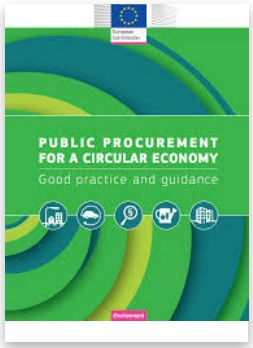
Figure 3: Various terms used in relation to Sustainable Public Procurement, divided into substantive themes (pillars) and cross-sectoral principles (horizontal bars)).

Focus on climate-neutral and circular procurement, system changes applicable for SPP as a whole

This report focuses on the effects to be measured for climate-neutral and circular procurement. The proposed indicator framework focuses on these aspects, with the qualification that we take a holistic approach and the framework can also be extended to other SPP themes. The challenges and the necessary system changes ensue from an analysis of the entire procurement and reporting process and are therefore applicable to SPP as a whole.

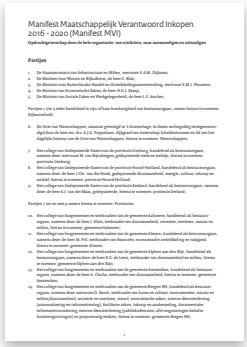
FROM SUSTAINABLE PROCUREMENT TO SPP

The EU thinks in terms of performance requirements (x% circular procurement), which is more in line with the old-fashioned way of thinking in terms of sustainable procurement rather than on the basis of effect (1 Mtonne/ year CO_2 reduction in the Netherlands). Developments at EU level will therefore have to be monitored carefully.



Sustainable Procurement Monitor

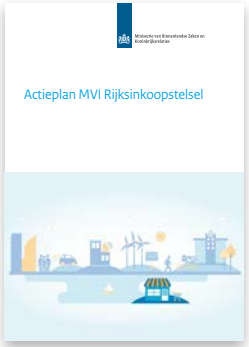
Goal: 100% sustainable procurement in 2015



Manifesto on Ambitions for SPP

Goal: Professionalisation

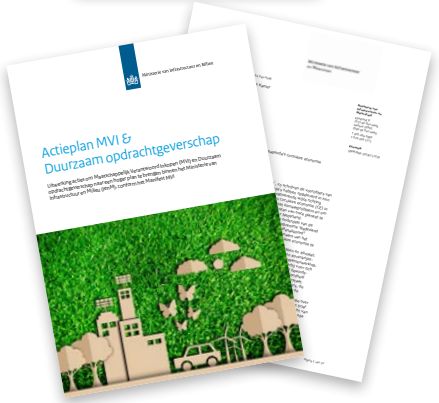
- Pilots/ Green Deal
- Monitoring of effect



SPP Action Plan

Goal: Monitoring of effect

Ambition: 10% circular procurement in 2022



Ministry of Infrastructure and Water Management SPP Action Plan

Goal: Preparing and anchoring pilot projects

Government reaction to Circular Economy transition agendas

Goal: 1 Mtonne CO_2 reduction annually via procurement from 2021

Sustainable Procurement Monitor

Result: 100% sustainable procurement in theory, but definition and approach are unclear

2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018

MONITORING OF PROGRESS IS ESSENTIAL TO ACHIEVING POLICY OBJECTIVES

Goals of effect monitoring

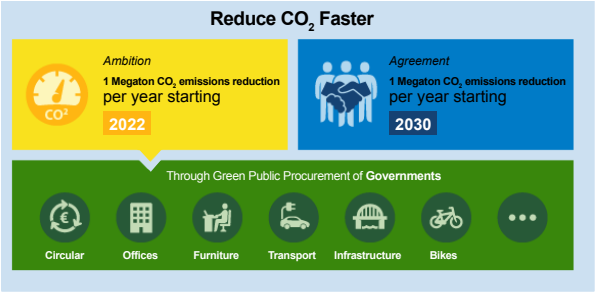
The shift from measuring performance and the efforts made to setting targets for impact has also created a need for monitoring. Implementing SPP and monitoring its effects are necessary to:

- Gain an insight into SPP's contribution to achieving the objectives for climate policy, the circular economy and, in time, the Sustainable Development Goals.
- Provide guidelines for specific actions to achieve the ambitions set out in the SPP action plan.
- Calibrate the focus of policy on the basis of the monitored effects.
- Encourage the market to join the trend towards more sustainable and circular products and services.

Building on earlier studies

Various studies carried out in recent years have represented initial steps towards measuring the impact of SPP. We build on the conclusions from these studies:

- A quick scan of procurement by the national government produced a qualitative estimate of the product groups with the greatest environmental impact (CE Delft, 2017). The report showed that the clusters around energy, building and data centres have a substantial impact. The impact of civil engineering was not determined.
- A study into the available tools for SPP identified the various methods and indicators and the application of these tools (RIVM, 2017). This analysis incorporates the findings of that study and expands on them with recent advances in the tools.
- In 2018, a method to measure the effects of SPP was devised and applied to eight product groups (RIVM, 2018). It showed that avoided CO_2 emissions can already be measured for some groups, but also that tenders still lack a lot of the data required to gain an impression of the impact of SPP.



Ministry of Infrastructure and Water Board, January 2018

COMPATIBILITY WITH MONITORING AT NATIONAL AND INTERNATIONAL LEVEL

The interest in monitoring circularity and environmental effects at different geographic levels has grown in the last five years, and numerous steps are being taken. Before 2017, most of the reports explored the possibilities for formulating indicators on the basis of data from the European Environment Agency (EEA, 2016) and Statistic Netherlands (Delahaye & Baldé, 2016). Since that time, various frameworks for monitoring at macro level have been developed. In 2017, the French Ministry of Environment, Energy and Water Boards published a report in which it formulated ten indicators for the circular economy (Manier et al., 2017). The European Commission and the Netherlands Environmental Assessment Agency (PBL) also published frameworks in 2018 (EC, 2018, Potting et al., 2018).

It is crucial to remain aware of these international trends and to reconcile the indicator framework for SPP with existing research. The following table presents a number of leading frameworks relating to monitoring of the circular economy.

SOURCE	NAME OF PUBLICATION	FUNCTION
European Commission (2018)	A monitoring framework for the circular economy	Framework for monitoring the circular economy
Ministry of Environment, Energy and Water, France (2017)	10 Key Indicators for Monitoring the Circular Economy	10 key indicators for monitoring the circular economy
PBL, CBS & RIVM: Potting et al. (2018)	Circulaire economie: wat we willen weten en kunnen meten [Circular economy: what we want to know and can measure]	Framework for monitoring the circular economy
EUROSTAT (2016)	Material flows and resource productivity	Supporting theory
European Commission (2014)	EU Resource Efficiency Scoreboard 2015	Framework
OECD (2017)	Green Growth Indicators 2017	Framework
Netherlands Environmental Assessment Agency, Potting, Hekkert, & Worrell (2016)	Circulaire econmie: Innovatie meten in de keten [Circular Economy: Monitoring innovation in the chain]	Supporting theory
EEA (2016)	Circular Economy in Europe - Developing the knowledge base	Supporting theory
Circle Economy, Shifting Paradigms. De Wit et al. (2018)	The circularity gap report: an analysis of the circular state of the global economy	Framework for monitoring the circular economy
Wuppertal Institute (2014)	Material intensity of materials, fuels, transport services, food	Supporting theory

COMPATIBILITY WITH MONITORING AT NATIONAL LEVEL

At the national level, the Netherlands Environmental Assessment Agency is currently developing a monitoring system to measure both the progress towards a circular economy and the effects of the transition to a circular economy (PBL, 2018). This effect monitoring is designed to show whether the national targets to reduce the use of abiotic raw materials are on course to be met (50% reduction in 2030; completely circular in 2050). The framework makes a distinction between four types of indicators (horizontal) relating to the transition process and its impact:

- **Dynamic:** progress towards a circular economy, for example the number of relevant patents.
- **Actions:** actions and plans that have been drawn up to make the transition, including action plans and pilot projects.
- **Performance:** the quantitative results of efforts, for example 10% circular procurement.
- **Effect:** the actual effect of these actions, for example a CO_2 reduction of 1 Mtonne/year.

There are also three levels of indicators (vertical):

- **Key:** limited set, general key indicators for rapid insight.
- **Dashboard:** broader set of dashboard-indicators for a more nuanced insight.
- **Product-specific:** indicators relevant for a specific product or service.

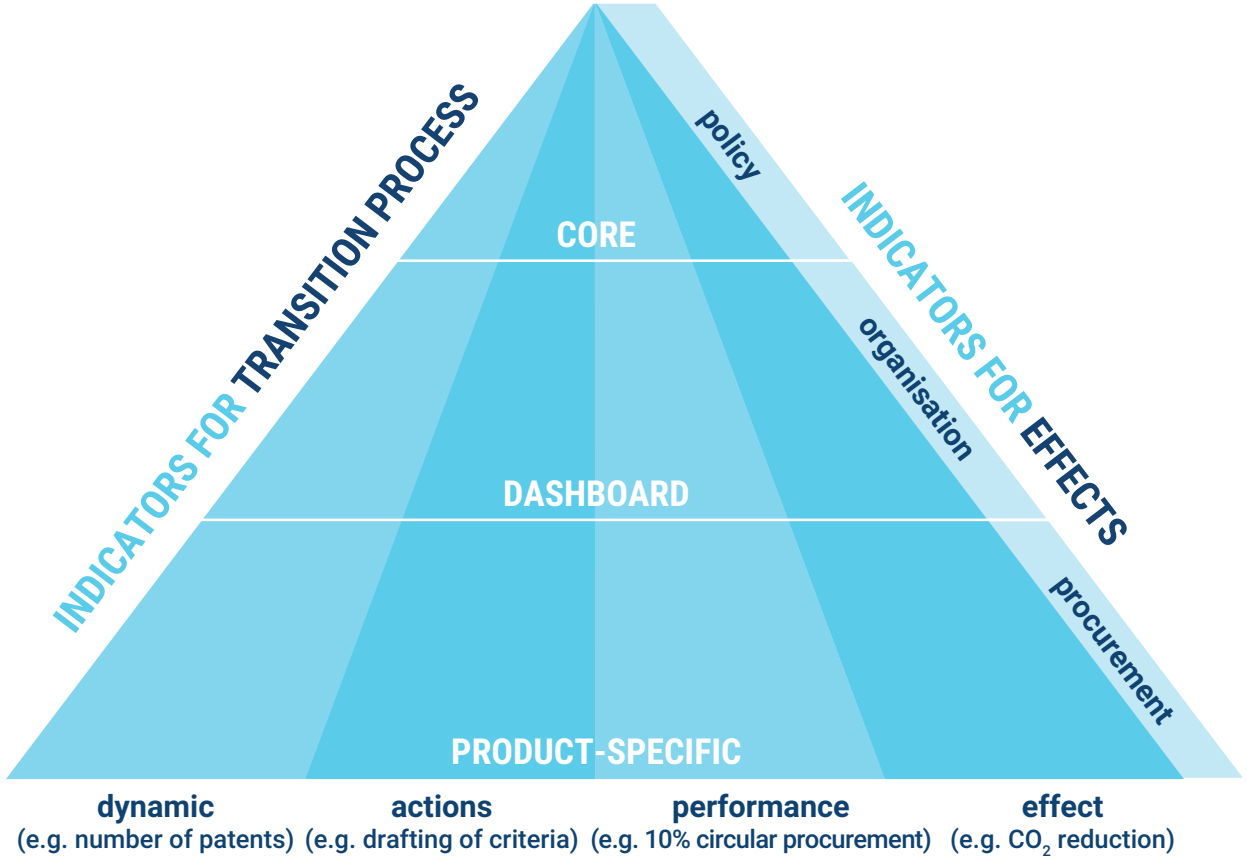


Figure 4: The triangle is based on the PBL study (2018) and shows the different levels and indicators.

TOWARDS INTEGRATED EFFECT MONITORING AT DIFFERENT LEVELS

The PBL's pyramid structure is the starting point for our analysis. In it the procurement process is product-specific, dashboard indicators give an impression at organisational level, and key indicators are suitable for political accountability.

This project is concerned with integrated effect monitoring with a focus on CO_2 reduction and the use of raw materials. It is important to distinguish between the two goals of effect monitoring:

- At procurement level, the purchaser must be able to compare different options and select the most sustainable one.
- At organisation level, the total effect of the purchase must be clear in order to show the progress being made in achieving the policy goals.

Another important aspect is that procurement focuses on the front end of the circular process, the purchase. At that point in time, the effects can be estimated, but they have to be revised during the actual use and subsequent high-value reuse.

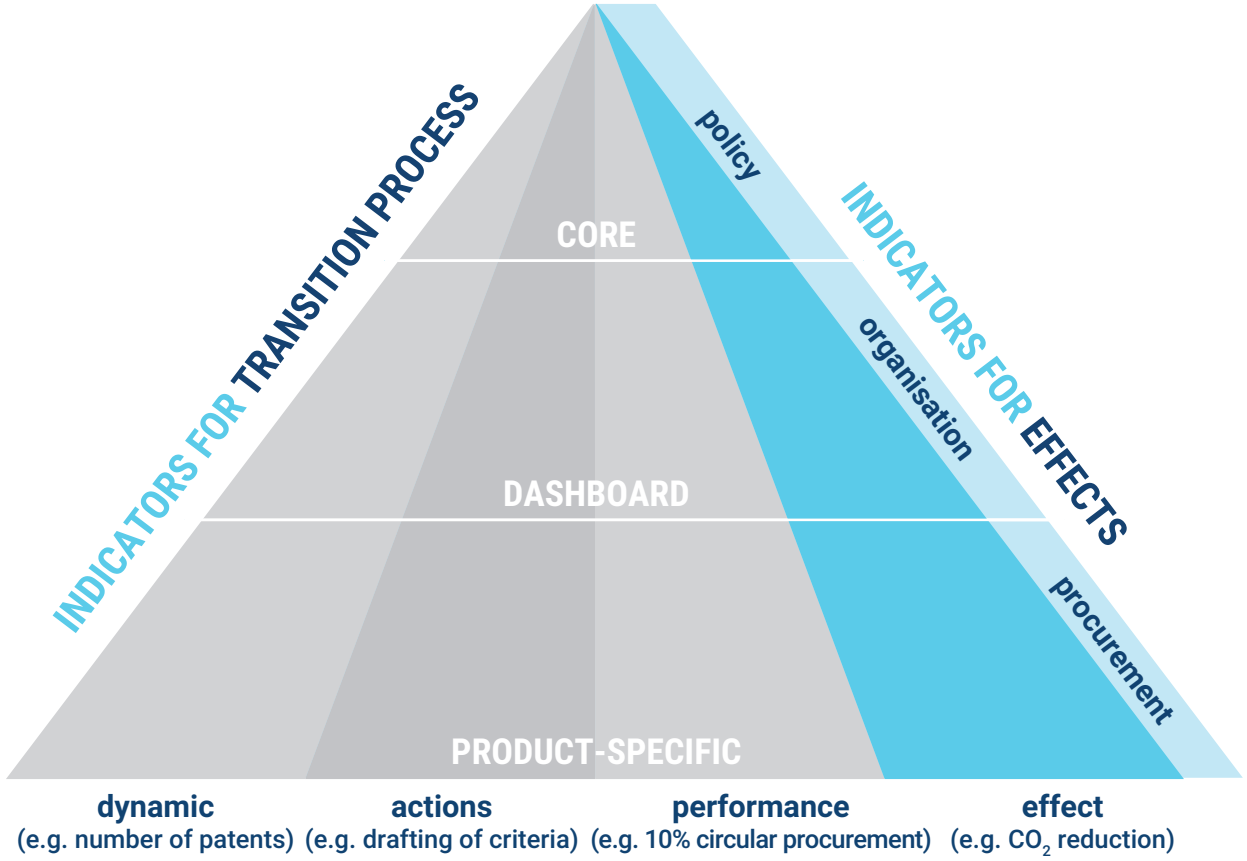


Figure 5: The triangle shows that the focus of this study is on effect monitoring at different levels.

CHAPTER 04

CURRENT STATE OF EFFECT MONITORING

READER'S GUIDE TO THE SYSTEM DIAGRAM

To accurately evaluate effect monitoring, our mapping of the 'SPP system' is based on a systemic approach. We examined three levels: product-specific, organisation and policy. This holistic perspective of the SPP system enables us to identify obstacles and opportunities to a uniform system of effect monitoring for climate-neutral and circular procurement.

This chapter contains two parts:

A. **A diagram of the SPP system,** mapping the interactions and data streams between various actors, tools and databases in the procurement and accountability process. This diagram embraces the entire SPP system, since a procurement system is not unique to climate-neutral and circular procurement.

B. **An analysis of existing tools**, based on indicators and tools for climate-neutral and circular procurement.

In the system diagram we distinguish three aspects: the indicators that are measured, the tools and databases needed to measure those indicators, and the actors who will use those tools. These three aspects are represented by three icons, which will be used in the remainder of this document.

WHAT DO YOU WISH TO MEASURE?	**Indicators**
HOW WILL YOU MEASURE IT?	**Tools & Databases**
WHO WILL MEASURE IT?	**Organisation & Policy**

THE ACTORS IN THE SPP SYSTEM

Roles in the procurement process

CLIENT	Responsible for issuing the purchase order.
MARKET ACTOR	Responsible for supplying the requested product or service.
BUYER	Responsible for drafting the invitation to tender and selecting the best tender on the basis of the criteria.
CONTRACT MANAGER	Responsible for recording the contract, delivery and administration in the contract database.
FACILITY MANAGER	Responsible for the management, maintenance and handling of the final contract.
END USER	Responsible for the internal use of the product or service.

Roles in accountability & strategy

BUDGET OWNER	Responsible for determining, allocating and issuing the procurement budget.
CATEGORY MANAGER	Responsible for drawing up a strategy and plans for each group of products or services.
POLITICIAN	Responsible for formulating policy and objectives.
SECRETARY GENERAL	Responsible for translating political objectives into priorities for the entire organisation.
POLICY ADVISOR	Responsible for translating political objectives into policy and reporting on progress to the government.

The roles played by the various actors in the SPP system are crucial since they are all together responsible for procurement. We have defined the actors in the SPP process, each of whom performs a specific role at a different time in the process of procurement and accountability. We make a distinction between the actors that play a role in every individual procurement process and those whose roles relate to the overarching accountability and strategy.

In order to propose effective interventions to promote integrated effect monitoring, our analysis addresses three questions:

1. **What is the interaction between the actors?**
2. **How do the actors use the different tools and databases?**
3. **Where do the crucial, system-defining interactions occur?**

THE PROCUREMENT PROCESS, TOOLS AND ACTORS

The procurement process from preparation to follow-up

Procurement is the entire process from identifying the need for a particular product (or service) up to and including the monitoring and evaluation of the purchase. The purchaser can use SPP criteria in drawing up the tender so that environmental and social factors are taken into account.

Interaction with market and user

The actors in the SPP system interact with one another at various times during the procurement process. A good procurement process with close cooperation is important for achieving ambitious sustainability goals. This process relates to the performance in awarding a contract, and also to the performance during the use of the product and the agreements for end of life.

Interaction with tools and databases

The actors use a variety of approaches, tools (such as TenderNed or Negometrix) and databases to invite tenders. They also use tools to select the best tender and a contract database to register the actual products or services. These systems are all crucial for monitoring effects, both in terms of the estimated impact (at the time of selection) and the actual impact (end of life, high-value reuse).

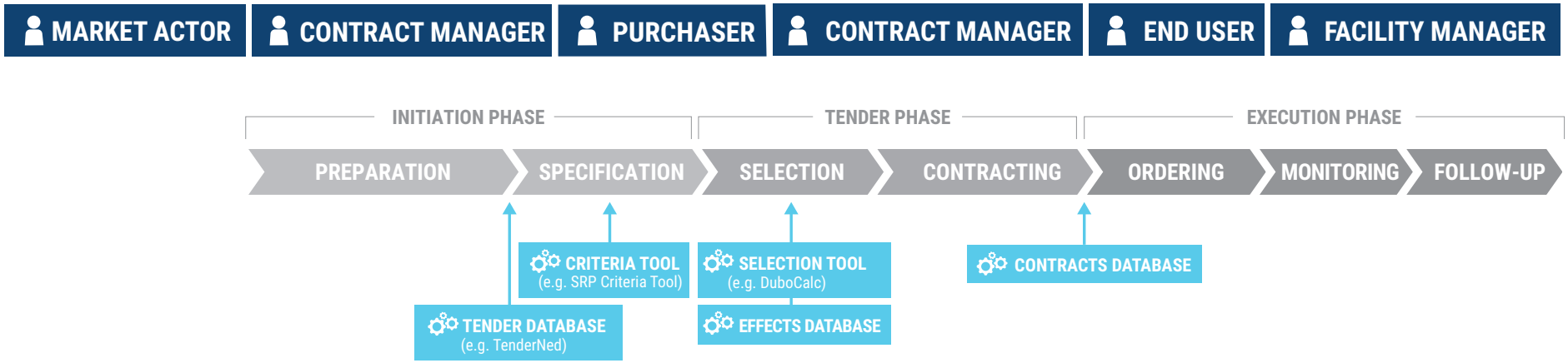
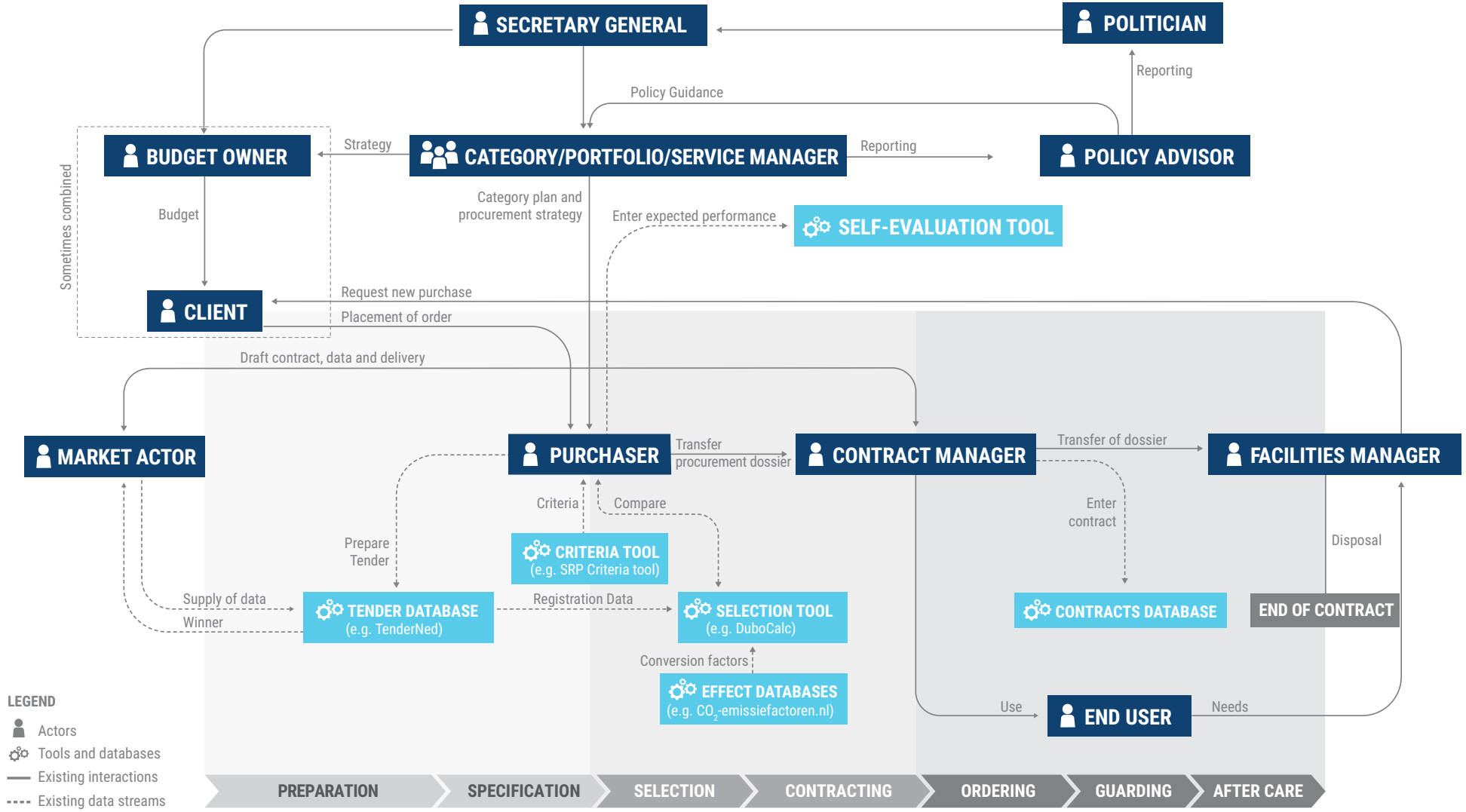


Figure 6: The procurement process.

SPP SYSTEM SKETCH



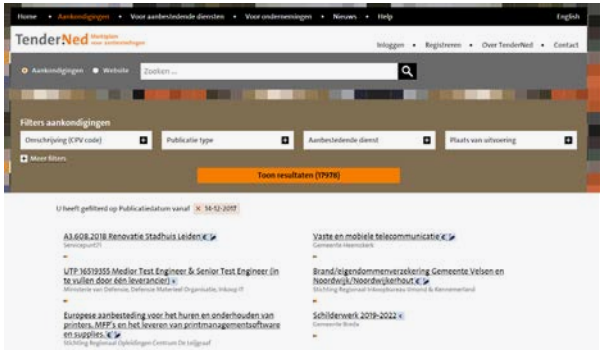
MAP OF THE EXISTING SPP SYSTEM

The SPP system is mapped to show the interactions between the various actors, tools and databases. This has been done at the different levels of the procurement process (the grey areas), the aggregation at organisation level, and finally the reporting to, and guidance from, government. In some smaller public authorities, roles will be combined or some systems will not be used. This method of illustrating the SPP system provides a point of departure for identifying blind spots and challenges in the system.

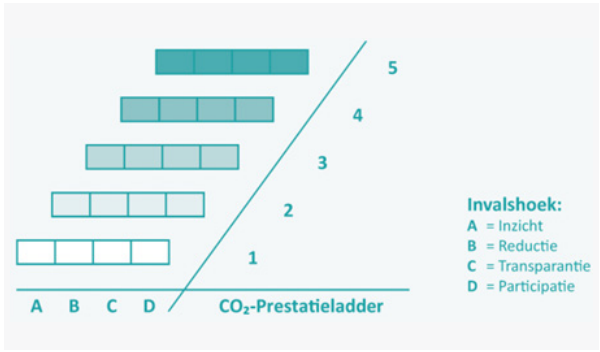
Interaction between the procurement process and the organisation and policy levels

To gain an impression of the progress being made in achieving the specified goals (e.g., CO_2 reduction and the use of materials), it is important to know the total effect of procurement by national and local government. This calls for data about the effects of procurement, which has to be aggregated in an integrated manner to provide insight into the total effect.

The procurement process is guided by organisational strategy or political policy. The interaction between the procurement process and policy is shown in the top half of the system diagram.



Example of tendering platform (TenderNed)

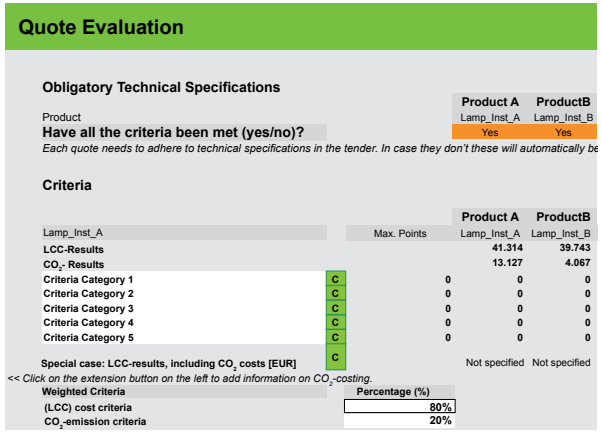


Example of selection tool (CO_2 performance ladder)

EXISTING METHODS AND TOOLS

TOOL	DESCRIPTION	PRODUCT GROUP	METHOD	COMPLEXITIES
CO_2 performance ladder	Increasing organisation's sustainability and Sustainable Public Procurement by means of a performance ladder.	All	Performance ladder	Medium
Ecochain	Combination of different LCAs at business and chain level for a holistic impression of the impact.	All	LCA	High
GPR Gebouw	LCA tool to determine a building's performance (including environmental and energy performance).	Building	LCA	High
DuboCalc	Extensive LCA tool for calculating the environmental impact of tenders for civil engineering works.	Civil engineering	LCA	High
Modint EcoTool	LCA-based tool to determine the environmental impact of textile products (indicative).	Textile	LCA	Medium
DuboMat	Simplified version of DuboCalc for determining environmental impact in civil engineering.	Civil engineering	Dashboard	Medium
LCC-CO_2	Tool for calculating life-cycle cost and CO_2 emissions and comparing them between products.	All	Dashboard	High
Resource Identification Tool	Extensive framework for evaluating the circularity and fairness of products.	All	Dashboard	High
SPP self- evaluation tool	Provides insight into the performance and progress with SPP for contracting authorities.	All	Dashboard	Low
Webtool ISO 20400	Helps companies and (semi-)public organisations to implement the ISO 20400 standard.	All	Dashboard	Low
Circular IQ	Online platform for awarding contracts on the basis of material use, circular design and operations	All	Dashboard	Medium
Optimal SCANS	Online tool for comparing the circularity of products and business operations.	All	Dashboard	Medium
GSES System	Combination of ISO standards and systems, including ISO standards for sustainable procurement, CO_2 reduction and circular business operations.	All	Dashboard	Medium
PRP e-Procurement	E-procurement tool for performance-oriented circular procurement, comparison and circular management.	All	Dashboard	Medium
RIVM effect method	Method for measuring the impact of circular, bio-based and eco-friendly procurement.	All	Dashboard	Medium

ANALYSIS OF EXISTING EFFECT MONITORING TOOLS



Quote Evaluation

Obligatory Technical Specifications

	Product A	ProductB
Product	Lamp_Inst_A	Lamp_Inst_B
Have all the criteria been met (yes/no)?	Yes	Yes

Each quote needs to adhere to technical specifications in the tender. In case they don't these will automatically be

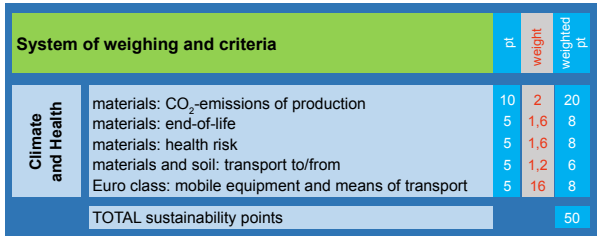
Criteria

			Product A	ProductB
Lamp_Inst_A		Max. Points	Lamp_Inst_A	Lamp_Inst_B
LCC-Results			41.314	39.743
CO_2- Results			13.127	4.067
Criteria Category 1	C	0	0	0
Criteria Category 2	C	0	0	0
Criteria Category 3	C	0	0	0
Criteria Category 4	C	0	0	0
Criteria Category 5	C	0	0	0
Special case: LCC-results, including CO_2 costs [EUR]	C		Not specified	Not specified

<< Click on the extension button on the left to add information on CO_2-costing.

Weighted Criteria	Percentage (%)
(LCC) cost criteria	80%
CO_2-emission criteria	20%

Snapshot of the dashboard of the LCC-CO_2 tool



System of weighing and criteria		pt	weight	weighted pt
Climate and Health	materials: CO_2-emissions of production	10	2	20
	materials: end-of-life	5	1,6	8
	materials: health risk	5	1,6	8
	materials and soil: transport to/from	5	1,2	6
	Euro class: mobile equipment and means of transport	5	16	8
	TOTAL sustainability points			50

Snapshot of the DuboMat dashboard

Analysis of existing tools

There are various systems already in use for effect monitoring, each with its own target group and specific purpose. We have made a list of existing systems and initiatives at different levels, broken down into product-, chain- and organisation-oriented systems. This analysis was designed to expand on the existing foundations and to identify possible improvements. The ultimate aim should be to reconcile the indicators and to link these systems to national and European frameworks for effect monitoring. This analysis builds on the analysis Tools for Sustainable Public Procurement (RIVM, 2017) and the analysis by the Utrecht Sustainability Institute (2017).

We have analysed the existing tools in order to highlight the pros and cons and the blind spots in the monitoring, based on the following aspects:

- Was the tool developed for a **specific** product group?
- What **method** is used (a Life Cycle Analysis (LCA), a dashboard with indicators, a performance ladder)?
- Is the tool easy to use or is it very **complex**?
- Is the tool intended for a **product, a chain or an organisation**?
- Is the tool geared to **criteria, selection or execution** in the procurement process?
- Are the indicators geared to **resources, actions, performance or effect**?
- On which themes have indicators been formulated in accordance with the seven pillars of the circular economy?
- What are the tools' **inputs** (data) and **outputs** (indicators)?

We also analysed the clusters with a view to understanding the impact, complexity and available data for each cluster.

EXISTING METHODS AND TOOLS

		LEVEL			PHASE			TRANSITION PROCESS VS. EFFECT			
Tool	Method	Product	Chain	Organi-sation	Criteria	Selec-tion	Execu-tion	Means	Action	Perfor-mance	Effect
CO_2 prestatieladder	Performance Ladder	●	●	●	●	●	●	●	●	●	
Ecochain	LCA	●	●	●	●	●				●	●
GPR Gebouw	LCA	●	●		●	●				●	●
DuboCalc	LCA	●	●		●	●				●	●
Modint EcoTool	LCA	●	●		●	●				●	●
DuboMat	Dashboard	●	●		●	●				●	●
LCC-CO_2	Dashboard	●	●		●	●					●
Resourse Identification Tool	Dashboard	●	●		●	●				●	●
MVI zelf-evaluatietool	Dashboard			●			●		●	●	
Webtool ISO 20400	Dashboard	●	●	●	●			●	●	●	
Circular IQ	Dashboard	●	●	●	●	●	●		●	●	
Optimal SCANS	Dashboard	●	●	●	●	●	●		●	●	
GSES System	Dashboard	●	●	●	●	●	●		●	●	
PRP e-Procurement	Dashboard	●	●	●	●	●	●		●	●	
RIVM effectmethodiek	Criteria	●		●	●	●					●

Tools based on Life Cycle Analysis (LCA) are the only tools designed to measure effect.

However, these tools are often incapable of aggregating effects to show the total effect at organisational level.

Tools that cover various levels and phases are generally concerned with actions and performances, not with effect monitoring.

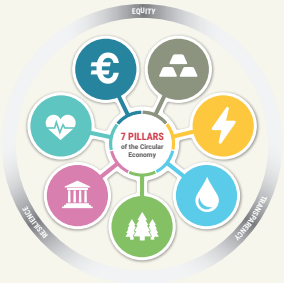
EXISTING METHODS AND TOOLS

		INDICATORS - 7 PILLARS							
Tool	**Method**								**Circular strategies**
CO_2 prestatieladder	Performance Ladder		●				●		●
Ecochain	LCA	●	●		●	●	●		
GPR Gebouw	LCA	●	●	●			●		
DuboCalc	LCA	●	●	●					
Modint EcoTool	LCA	●	●	●	●		●		●
DuboMat	Dashboard	●	●						
LCC-CO_2	Dashboard		●				●	●	
Resourse Identification Tool	Dashboard	●	●	●	●	●	●	●	
MVI zelf-evaluatietool	Dashboard	●	●	●	●	●	●		
Webtool ISO 20400	Dashboard	●	●	●	●	●	●		●
Circular IQ	Dashboard	●	●	●	●	●	●		●
Optimal SCANS	Dashboard	●	●				●	●	
GSES System	Dashboard	●	●		●		●	●	●
PRP e-Procurement	Dashboard	●				●	●		●
RIVM effectmethodiek	Criteria	●	●	●	●		●		●

The circularity of products (high-value reuse) and materials (recycling) is almost never included in effect monitoring.

Dashboard tools incorporate a broad view of circularity, but the questionnaires are concerned with actions or performance and do not provide insight into the impact on aspects such as biodiversity, water use or social conditions.

Many tools focus on energy, materials and emissions (CO_2 reduction); there is seldom any integration of social and economic indicators.



The tools that were analysed focus on climate-neutral and circular procurement. However, in this analysis we also considered what other aspects were included and where there are still blind spots.

ANALYSIS OF CLUSTERS OF PRODUCT GROUPS

		CLUSTER					
		01. Automation & telecommunication	2. Energy	3. Office facilities and services	4. Civil engineering	5. Office buildings	6. Transport
	Spending per cluster (million euro)	290,000,000	80,000,000	225,000,000	-	220,000,000	135,000,000
	Major product groups (million euro)	Data centre & ICT hardware: 130	Electricity: 44 Gas: 35	Catering: 32 Office furniture: 50 Industrial clothing: 22			Company cars: 40 Post: 84
TOOLS	Specific tools	-	-	Catering: 32	DuboMat, DuboCalc	GPR Gebouw, GPR Bouwbesluit, OneClick LCA, MRPI MPG	-
TOOLS	Non-specific tools	CO_2 performance ladder	CO_2 performance ladder	Office furniture: 50	CO_2 performance ladder	CO_2 performance ladder	CO_2 performance ladder
TOOLS	Method	Shadow price	Shadow price	Industrial clothing: 22	LCA, Shadow price	LCA, Shadow price	Shadow price
DATA	Databases	-	CO_2 emission factors	Modint (textiles)	National Environmental Database and DuboCalc database	National Environmental Database & NIBE Environmental Classifications	CO_2 emission factors
DATA	Database availability	Low	High	CO_2 performance ladder	High	High	Medium
IMPACT	CO_2 impact (kg CO_2/kg product)	-	7.00		0.26	1.77	2.01
IMPACT	Use of materials (kg material/kg product)	0.2	3.3	-	-		0.8
IMPACT	Specific impact	E-waste, high electricity consumption	CO_2 emissions, NOX, use of fossil fuels	Varies, but high impact in production process	Substantial material use, impact on water consumption and transport causes CO_2 emissions	Major impact on material use, energy consumption	Local emissions and use of fossil fuels, aviation causes high CO_2 emissions

This is an analysis of the procurement process by the Dutch national government only; municipalities are not included. The sizes of the product groups are based on the Government Procurement Quick Scan (CE Delft, 2018). The CO_2 and material impact are national averages for these categories based on the Climate Monitor (CBS, 2017) and the Material Flow Monitor (CBS, 2016). Although the composition of the clusters will differ, the table gives an indication of the impact. Additional research is needed to determine where the biggest gains can be made in terms of climate-neutral and circular procurement.

CONCLUSION FROM CLUSTER ANALYSIS

1. AUTOMATION

Impact: ●●●○○
Complexity: ●●●●○
Suitable for pilot: −

Conclusion:
Many different products, difficult to measure impact and effects (origin of materials, effect on social factors)

2. ENERGY

Impact: ●●●●○
Complexity: ●●○○○
Suitable for pilot: +

Conclusion:
Substantial impact as cluster and relatively straightforward starting point for measuring effect.

3. CIVIL ENGINEERING

Impact: ●●●●●
Complexity: ●●●○○
Suitable for pilot: +−

Conclusion:
Already good basic methods and considerable impact, expand to circularity.

4. OFFICE FACILITIES

Impact: ●●○○○
Complexity: ●●●●○
Suitable for pilot: +

Conclusion:
A lot of different products/services in this cluster, but individual groups are highly suitable for pilots.

5. OFFICE BUILDINGS

Impact: ●●●●○
Complexity: ●●●○○
Suitable for pilot: +−

Conclusion:
Already good basic methods, expand to circularity. Relatively large volume of data available, make use of them.

6. TRANSPORT

Impact: ●●●○○
Complexity: ●●○○○
Suitable for pilot: +

Conclusion:
Considerable impact as a cluster and relatively straightforward starting point for measuring effect.

CONCLUSION: INTEGRATED EFFECT MONITORING IS NOT YET POSSIBLE

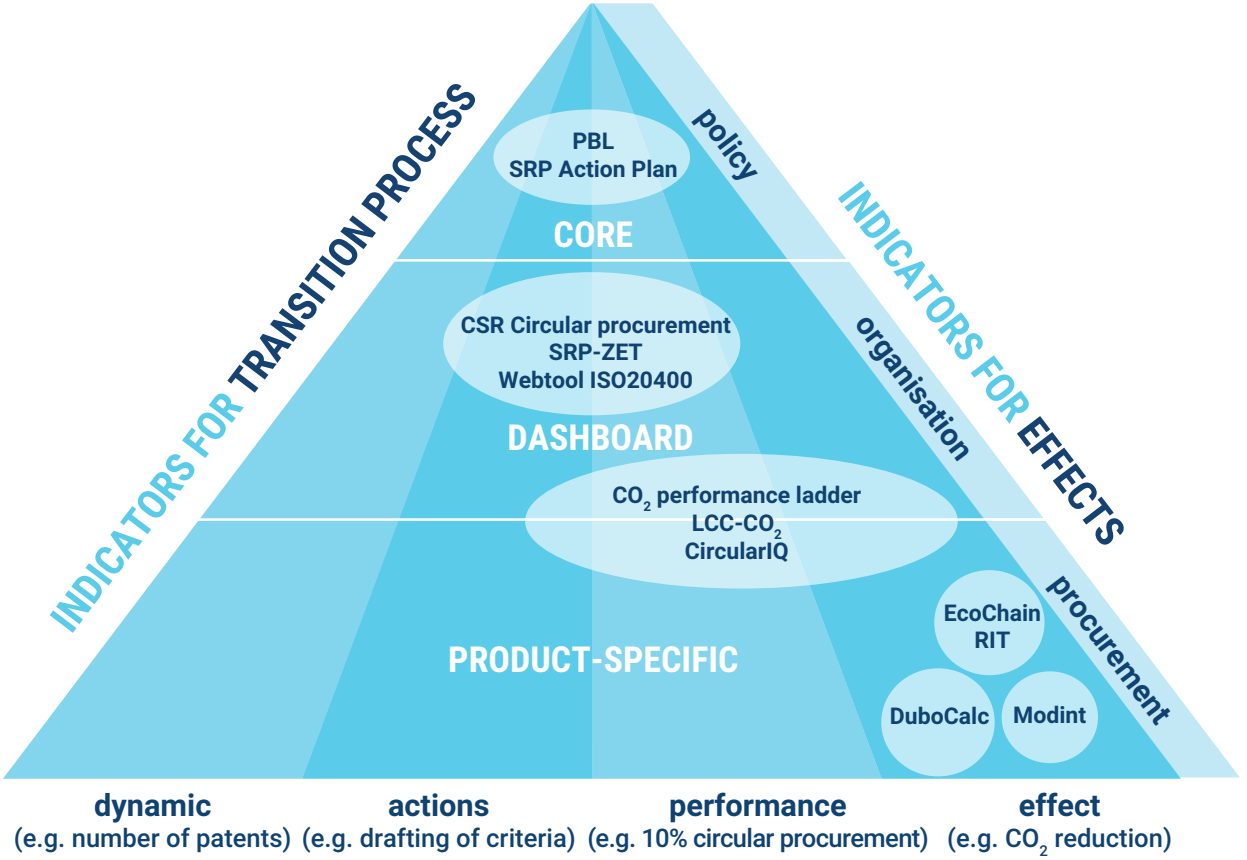
Integrated effect monitoring and impact measurement at organisational level is not yet possible

The analysis shows that the various effect monitoring methods at product and organisation level are not sufficiently coherent.

The policy on SPP has recently been translated into action plans in many places. To measure the effects of those action plans, what is needed is a uniform method for aggregating the effects of product groups at the organisational level.

The following conclusions are important in relation to the development of a system of integrated effect monitoring:

- For certain product groups, there are tools that can provide the necessary insight (e.g., civil engineering), but this is still very difficult for other product groups (e.g., catering).
- It is easier to aggregate the effects for CO_2 emissions than it is for the use and throughput of raw materials.
- The available information for effect monitoring differs from one product group to another.
- For CO_2 emissions, and to a lesser extent the use of raw materials, good effect monitoring is already possible for some product groups.
- Tools for effect monitoring are being developed for various product groups.



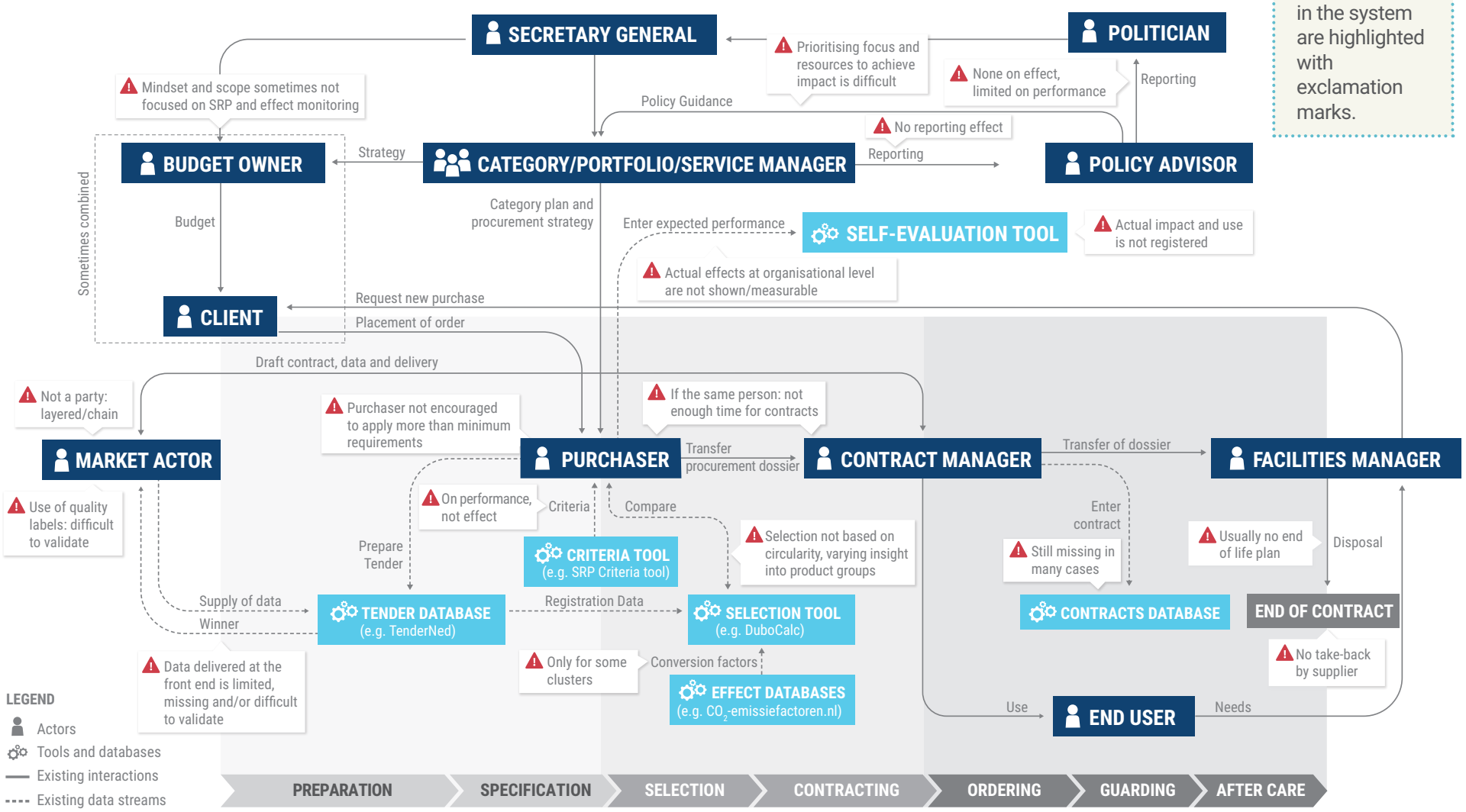
- It is not yet possible to aggregate effects to show the total impact at organisation level.
- The availability of data required for effect monitoring varies among product groups and clusters.
- Circular strategies (recycle, reuse, refurbish) and avoided procurement are difficult to determine and are still difficult to combine with LCA methods.

CHAPTER 05

CHALLENGES OF SPP SYSTEM

CHALLENGES

Challenges in the system are highlighted with exclamation marks.



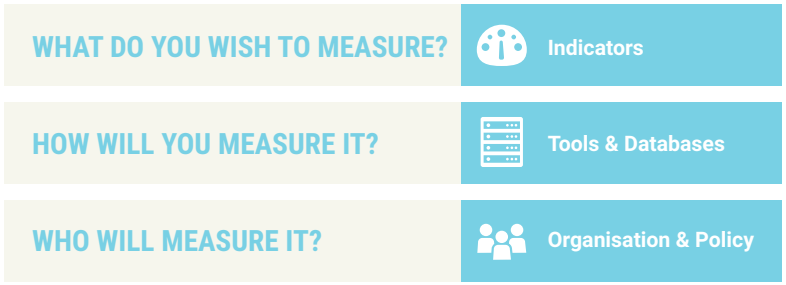
CHALLENGES IN THE SPP SYSTEM

The above analysis of the SPP system and the various instruments in use, illustrates existing challenges. These challenges serve as starting points for determining what needs to be done in the coming years, to establish a more uniform monitoring of the impact of procurement on climate- and circular-related performance

Various challenges are highlighted in the systems diagram with red exclamation marks: in the indicators and databases, as well as in the interaction between the actors and the various databases.

We have further identified the six most important challenges which need to be addressed in the coming years. They often encompass a range of aspects and are expanded upon in the following pages. For each of these challenges we outline:

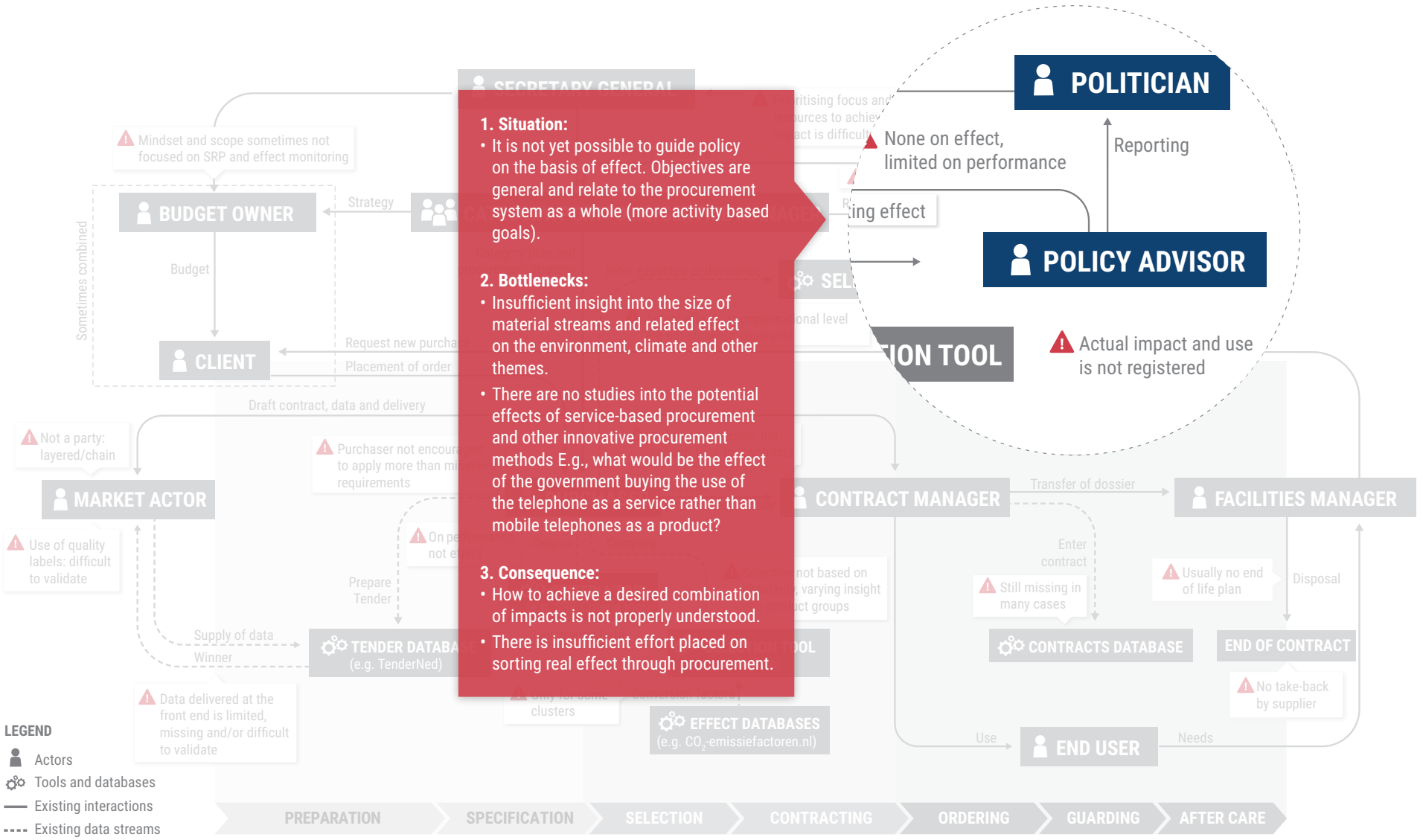
- The **situation:** how is the system designed at the moment?
- The **bottlenecks:** where are there still challenges in relation to effect monitoring?
- The **consequences:** what detrimental effects do these bottlenecks lead to?



The six challenges in the SPP system:

1. **Prioritisation** of focus and resources **to have an impact** is unclear (80/20 rule).
2. How are we going to measure: **Tools and databases** are not yet widely available for selecting products or services on the basis of the effect (CO_2 reduction or material use) of climate-neutral and circular procurement.
3. **Data** requested from, and supplied by, market actors is too limited to monitor effects.
4. There is only **limited insight** into actual **use and reuse** of the product/ service.
5. **Aggregation of effects on the scale of the organisation is not yet possible:** progress with CO_2 reduction but reductions in the use of raw materials cannot yet be measured.
6. Measurement goals: **there is no consensus on a uniform framework of sustainable and circular indicators** for effect monitoring.

1. THERE IS A LACK OF CLEAR IMPACT GOALS



1. Situation:

- It is not yet possible to guide policy on the basis of effect. Objectives are general and relate to the procurement system as a whole (more activity based goals).

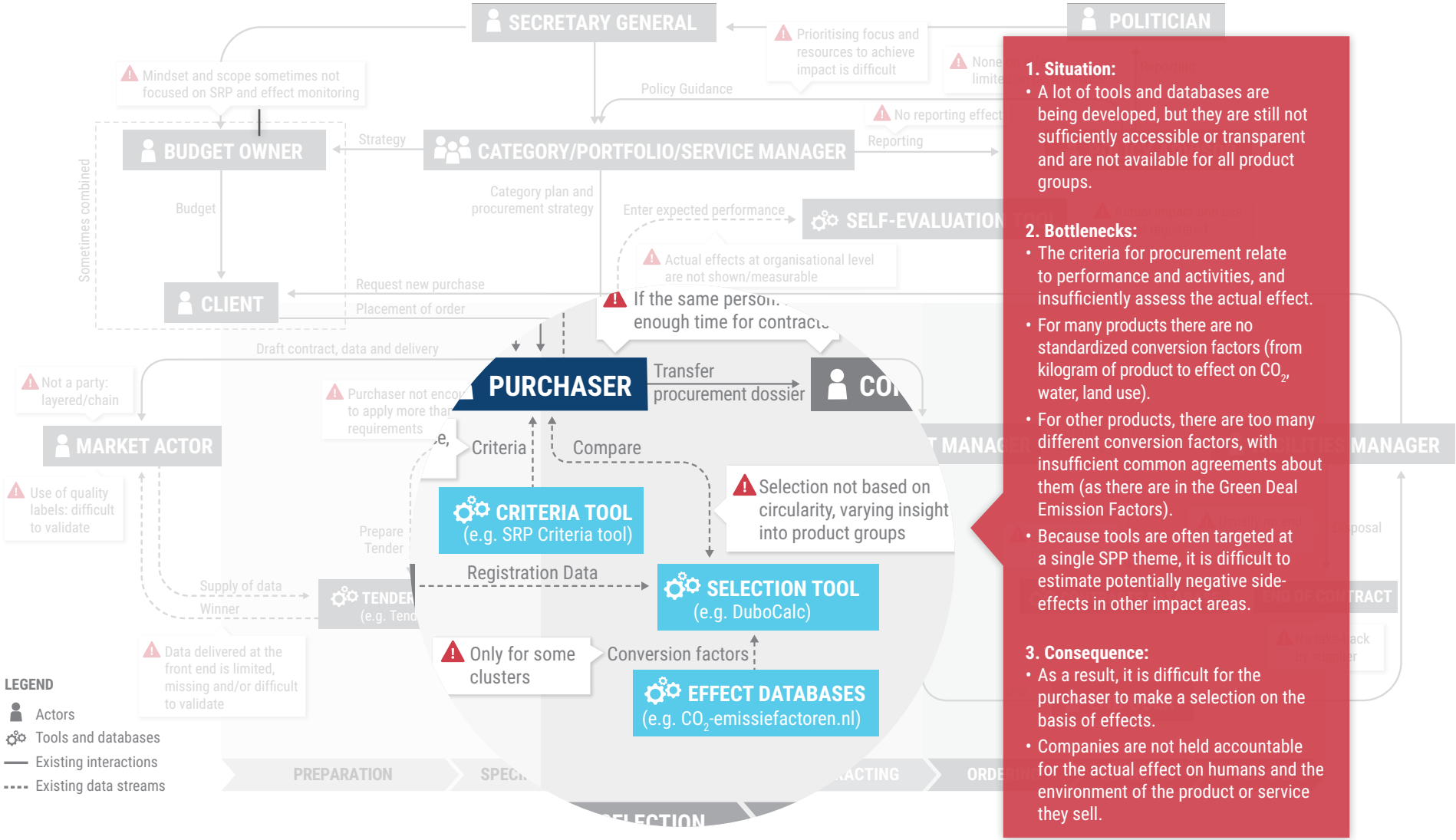
2. Bottlenecks:

- Insufficient insight into the size of material streams and related effect on the environment, climate and other themes.
- There are no studies into the potential effects of service-based procurement and other innovative procurement methods E.g., what would be the effect of the government buying the use of the telephone as a service rather than mobile telephones as a product?

3. Consequence:

- How to achieve a desired combination of impacts is not properly understood.
- There is insufficient effort placed on sorting real effect through procurement.

2. TOOLS AND DATABASES ARE NOT YET WIDELY AVAILABLE



1. Situation:

- A lot of tools and databases are being developed, but they are still not sufficiently accessible or transparent and are not available for all product groups.

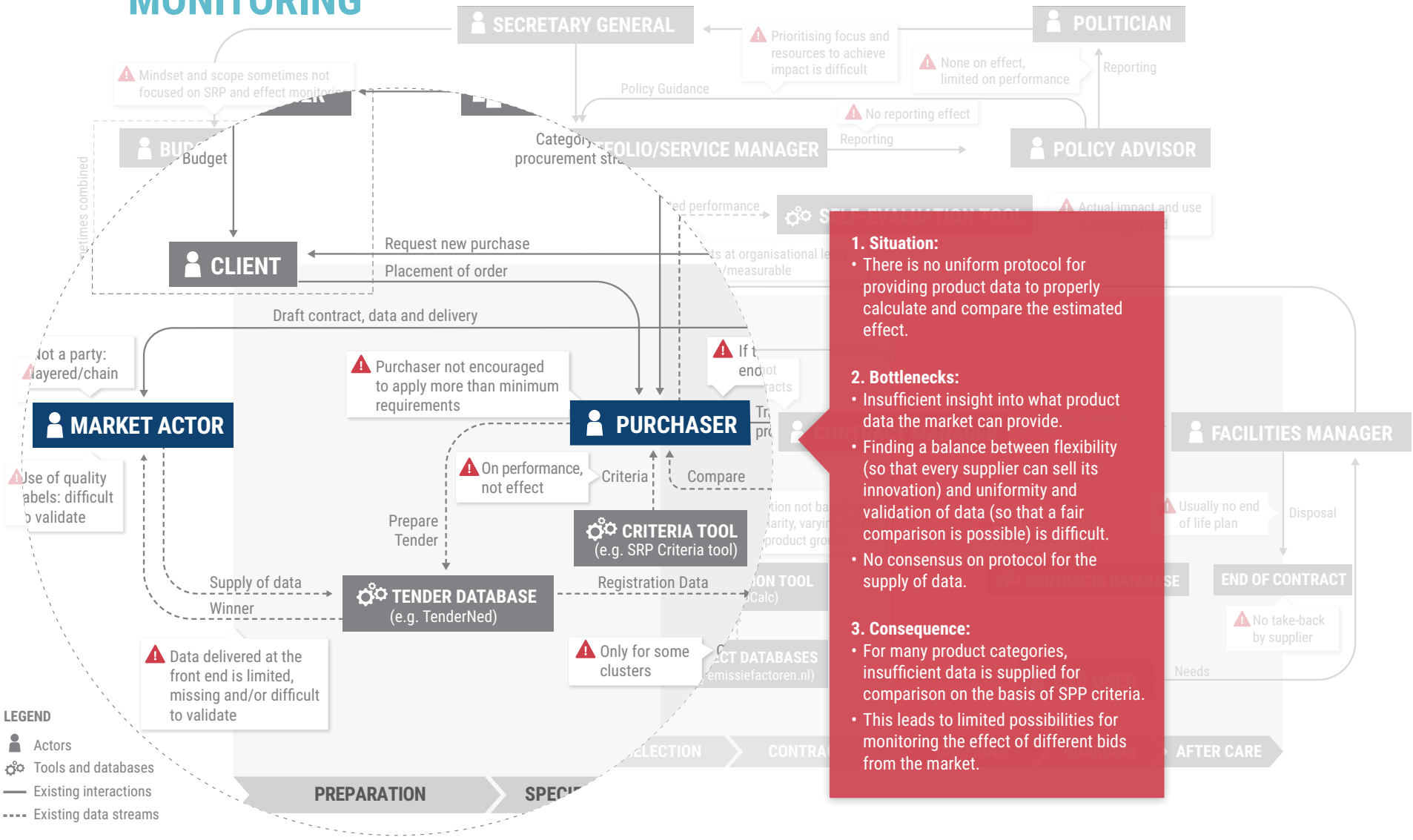
2. Bottlenecks:

- The criteria for procurement relate to performance and activities, and insufficiently assess the actual effect.
- For many products there are no standardized conversion factors (from kilogram of product to effect on CO_2, water, land use).
- For other products, there are too many different conversion factors, with insufficient common agreements about them (as there are in the Green Deal Emission Factors).
- Because tools are often targeted at a single SPP theme, it is difficult to estimate potentially negative side-effects in other impact areas.

3. Consequence:

- As a result, it is difficult for the purchaser to make a selection on the basis of effects.
- Companies are not held accountable for the actual effect on humans and the environment of the product or service they sell.

3. DATASETS REQUESTED AND PROVIDED ARE TOO LIMITED FOR EFFECT MONITORING

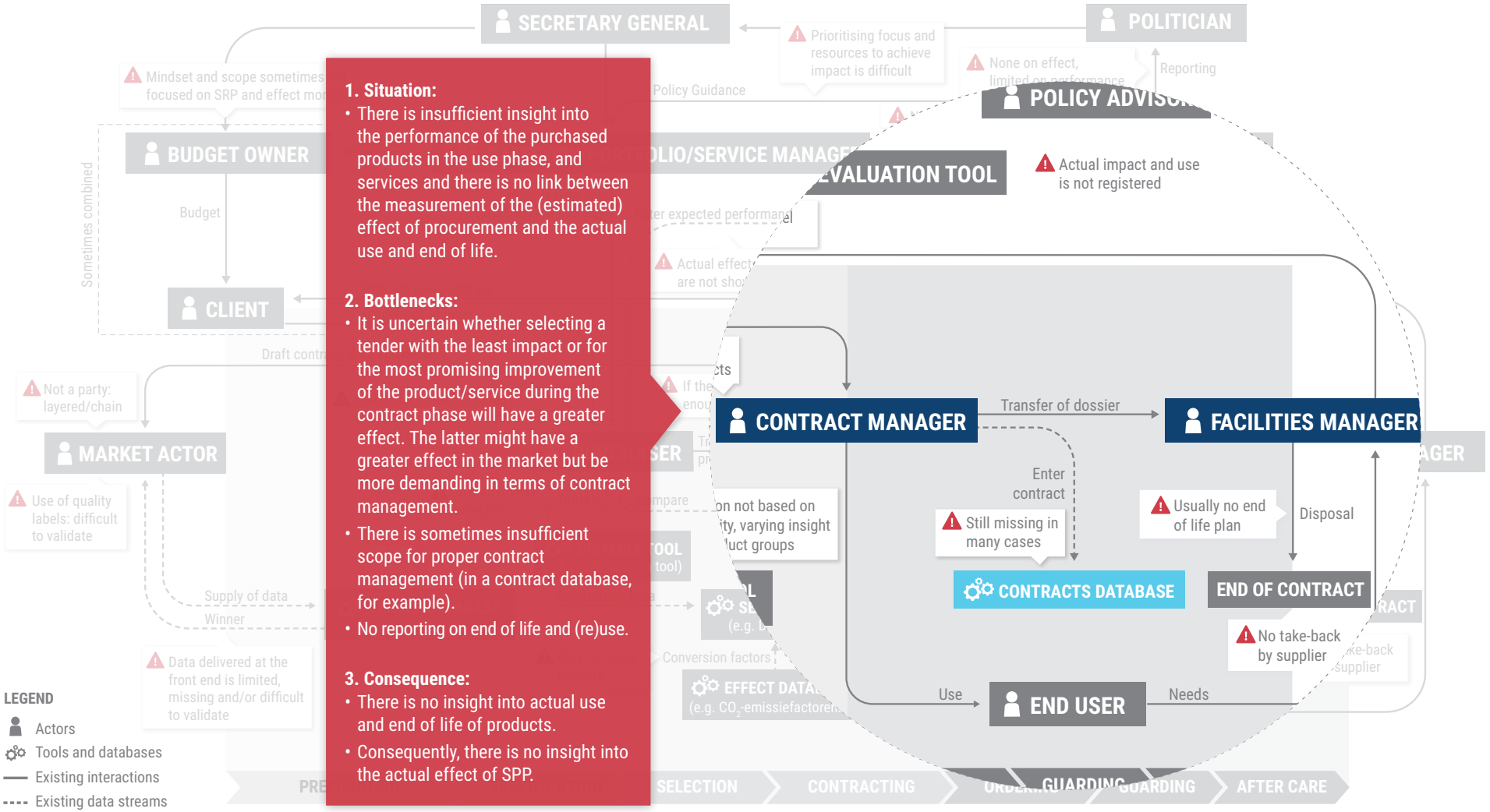


1. Situation:
- There is no uniform protocol for providing product data to properly calculate and compare the estimated effect.

2. Bottlenecks:
- Insufficient insight into what product data the market can provide.
- Finding a balance between flexibility (so that every supplier can sell its innovation) and uniformity and validation of data (so that a fair comparison is possible) is difficult.
- No consensus on protocol for the supply of data.

3. Consequence:
- For many product categories, insufficient data is supplied for comparison on the basis of SPP criteria.
- This leads to limited possibilities for monitoring the effect of different bids from the market.

4. LIMITED INSIGHT INTO ACTUAL USE AND REUSE



1. Situation:

- There is insufficient insight into the performance of the purchased products in the use phase, and services and there is no link between the measurement of the (estimated) effect of procurement and the actual use and end of life.

2. Bottlenecks:

- It is uncertain whether selecting a tender with the least impact or for the most promising improvement of the product/service during the contract phase will have a greater effect. The latter might have a greater effect in the market but be more demanding in terms of contract management.
- There is sometimes insufficient scope for proper contract management (in a contract database, for example).
- No reporting on end of life and (re)use.

3. Consequence:

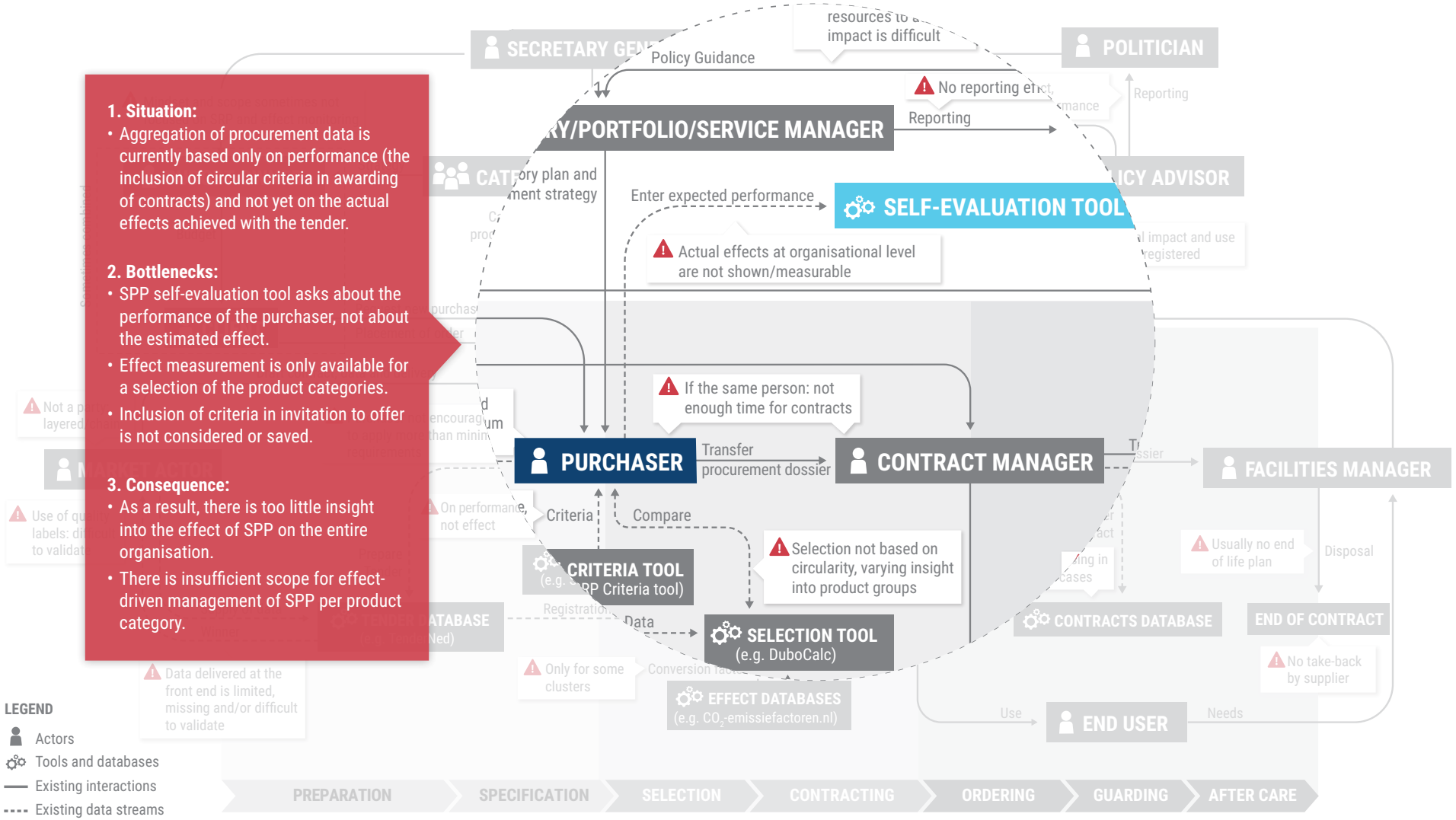
- There is no insight into actual use and end of life of products.
- Consequently, there is no insight into the actual effect of SPP.

5. AGGREGATION OF EFFECTS AT ORGANISATION LEVEL IS NOT YET POSSIBLE

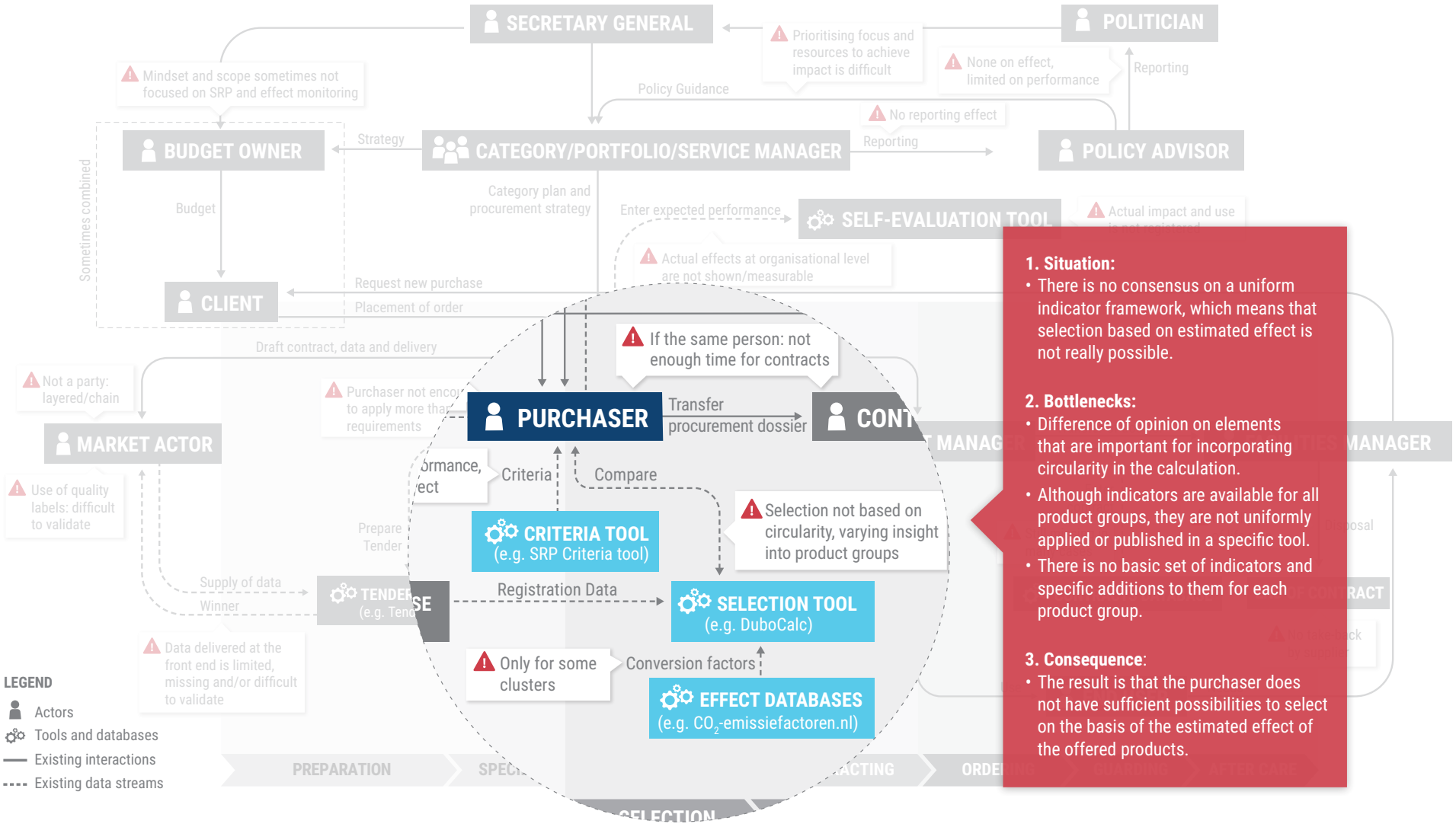
1. Situation:
- Aggregation of procurement data is currently based only on performance (the inclusion of circular criteria in awarding of contracts) and not yet on the actual effects achieved with the tender.

2. Bottlenecks:
- SPP self-evaluation tool asks about the performance of the purchaser, not about the estimated effect.
- Effect measurement is only available for a selection of the product categories.
- Inclusion of criteria in invitation to offer is not considered or saved.

3. Consequence:
- As a result, there is too little insight into the effect of SPP on the entire organisation.
- There is insufficient scope for effect-driven management of SPP per product category.



6. NO CONSENSUS ON UNIFORM INDICATOR FRAMEWORK



1. Situation:

- There is no consensus on a uniform indicator framework, which means that selection based on estimated effect is not really possible.

2. Bottlenecks:

- Difference of opinion on elements that are important for incorporating circularity in the calculation.
- Although indicators are available for all product groups, they are not uniformly applied or published in a specific tool.
- There is no basic set of indicators and specific additions to them for each product group.

3. Consequence:

- The result is that the purchaser does not have sufficient possibilities to select on the basis of the estimated effect of the offered products.

CHAPTER 06

TOWARDS INTEGRATED EFFECT MONITORING

NECESSARY SYSTEM CHANGES

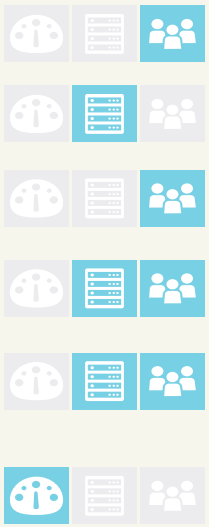
There are still obstacles to creating an integrated effect monitoring system at various points in the system. This chapter outlines the system changes that are needed to address the challenges we have identified and to implement integrated effect monitoring.

The envisaged situation is shown in the system diagram, in which new interactions and data streams are shown in green. The SPP effects dashboard, where both the aggregation from product to organisation level and the comparison of the estimated and actual effect occurs, plays an important role.

At the same time, we place more emphasis on the indicator framework, since the drafting of climate-neutral and circular indicators is essential for an understanding of the effect of SPP.
These necessary system changes form the starting point for the roadmap in chapter 7.

The six necessary system changes:

1. **Insight into the greatest impact** allows for **effect-driven policy.**
2. How are we going to measure: **Development of a protocol** for tools and effect databases for product groups **with a high impact**.
3. **Reconciling with and prescribing of information to be supplied** by market actors in a tender.
4. Design of **contract and facility management so that actual use and end of life** (circularity) is clear.
5. **Insight into an organisation's total CO_2 and material impact** by creating **an effects dashboard**, to provide insight and facilitate effect-driven management.
6. What are we going to measure: **A circular indicator framework:** inclusion of environmental and circular effects for measurement of the impact of SPP.

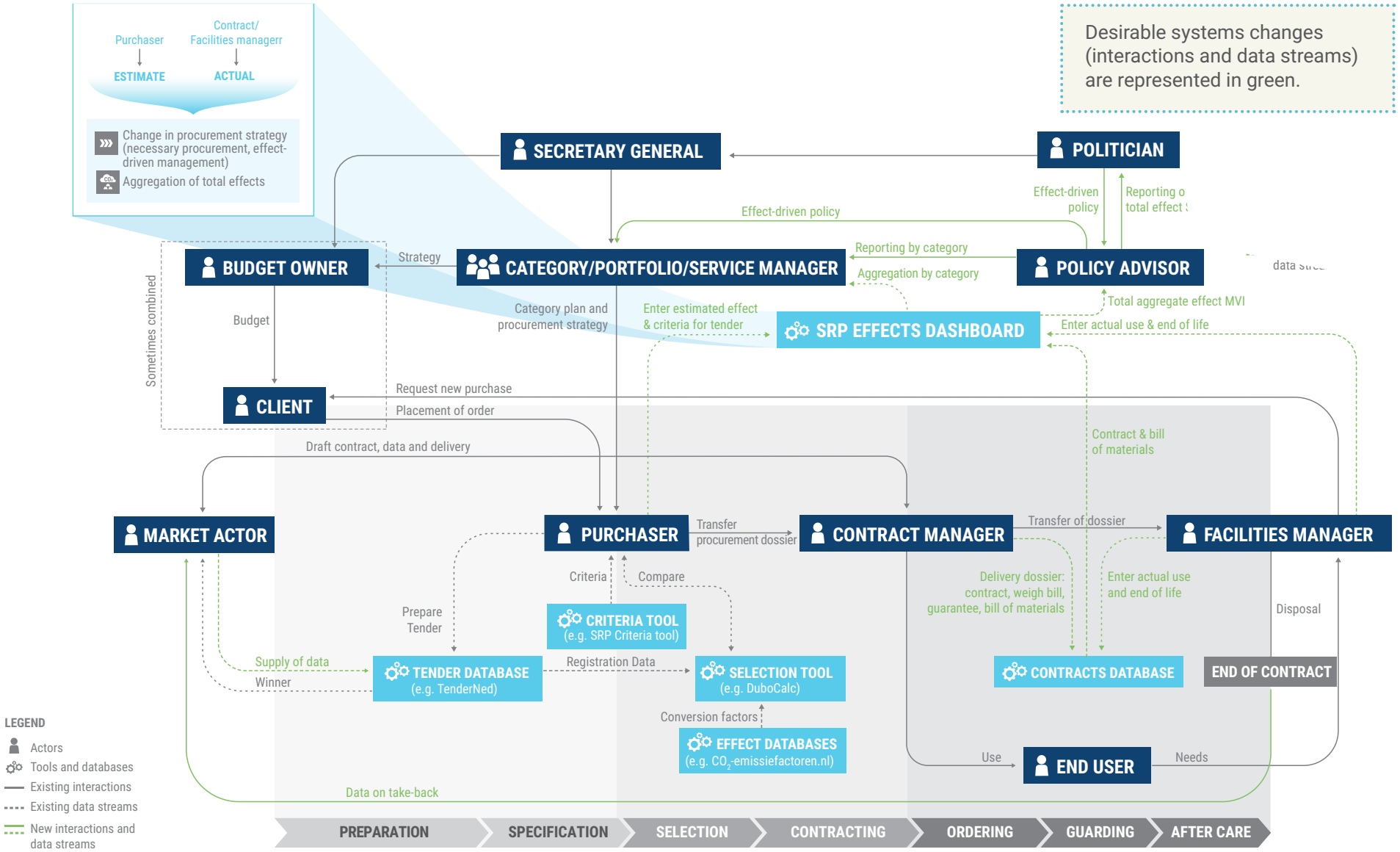


This chapter is divided into two parts:

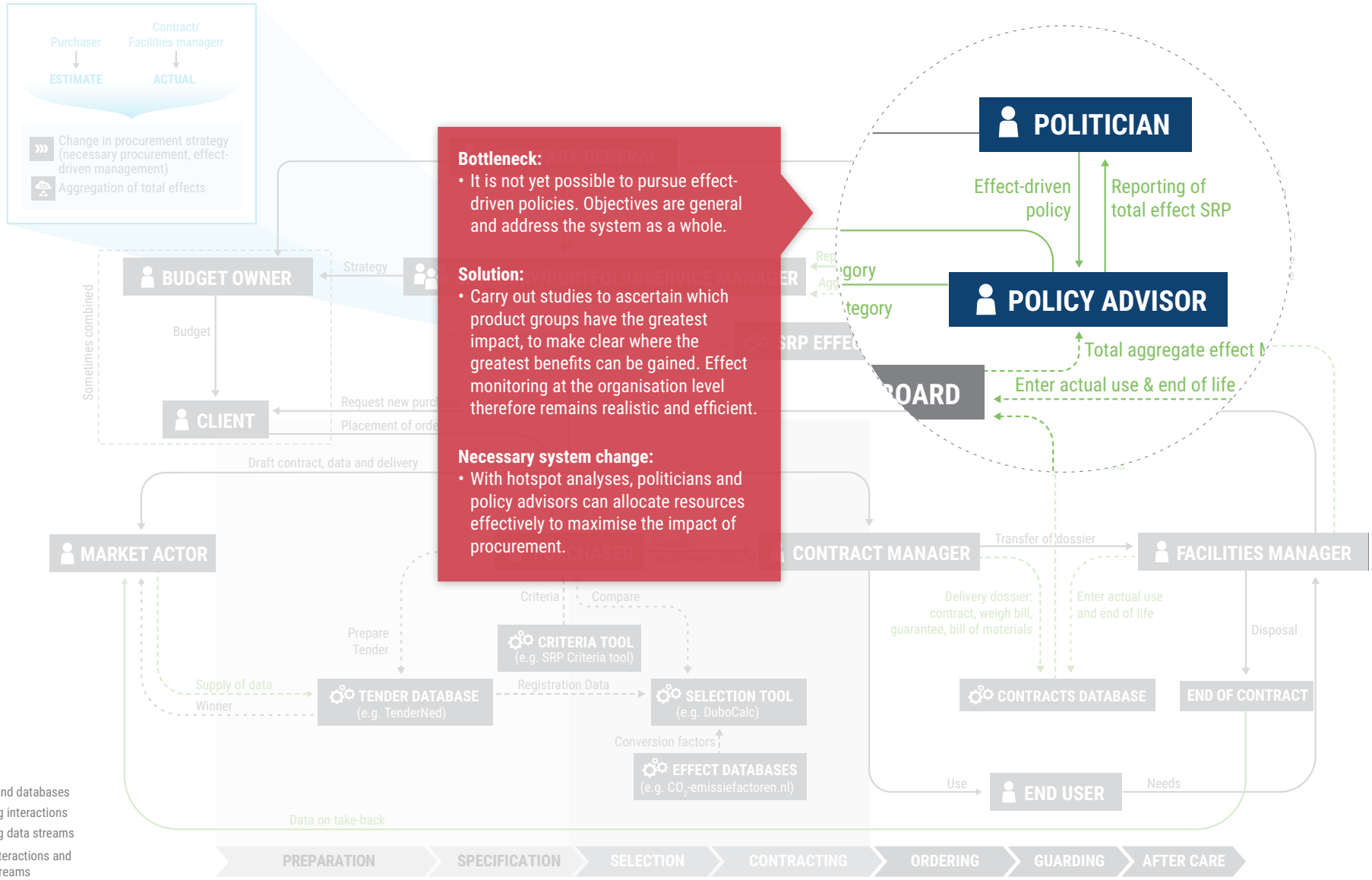
A. The **necessary changes** in the SPP system, which address the challenges outlined earlier. This applies for SPP in general, since this system is not specific to climate-neutral and circular procurement.

B. A proposal for an **indicator framework,** with indicators and a method of calculation allowing for measurement of effects.

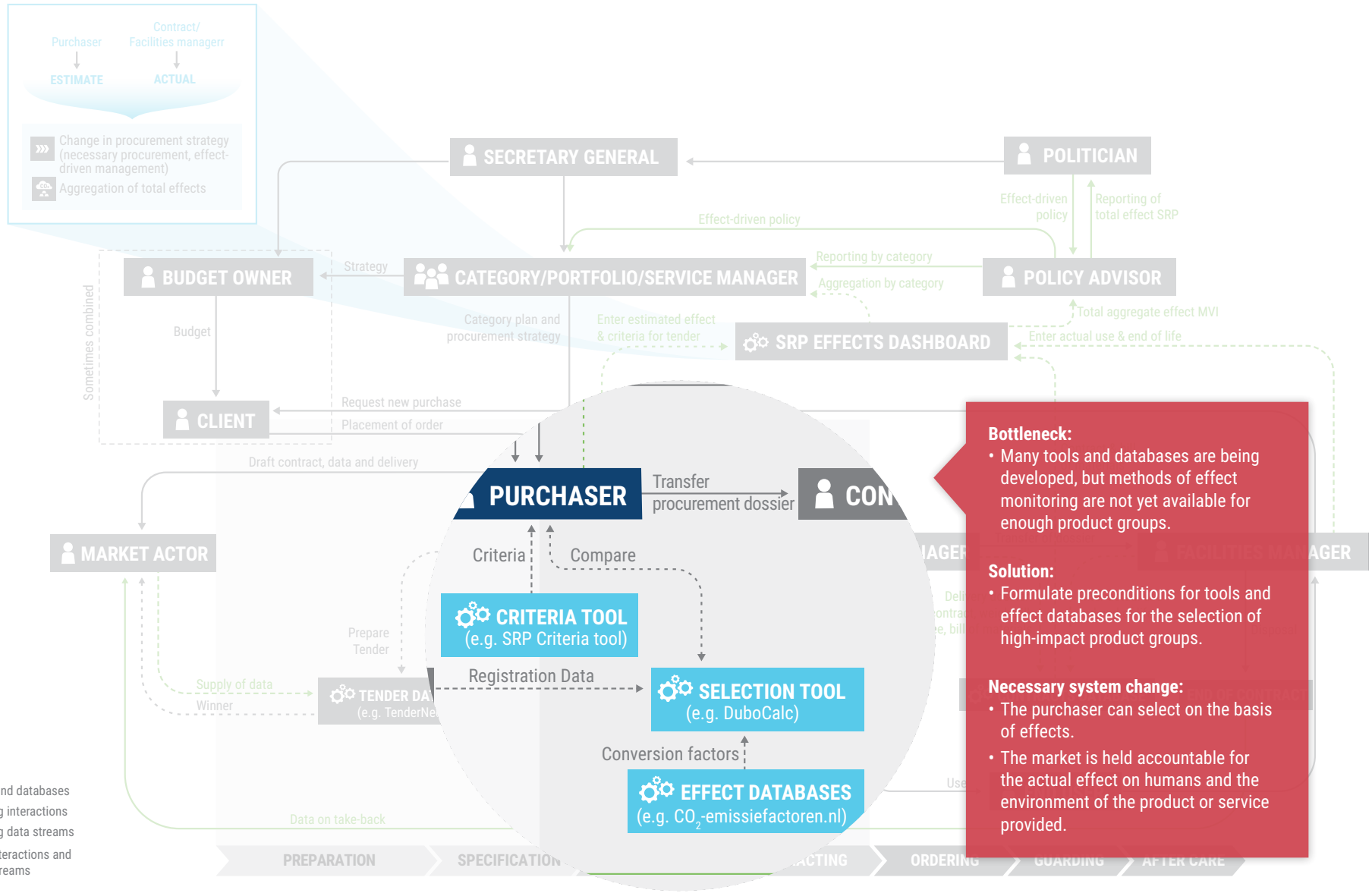
SYSTEM SKETCH: INTEGRAL EFFECT MONITORING



1. PROVIDE INSIGHT INTO THE IMPACT OF PRODUCT GROUPS



2. DEVELOP PROTOCOL FOR TOOLS AND EFFECT DATABASES

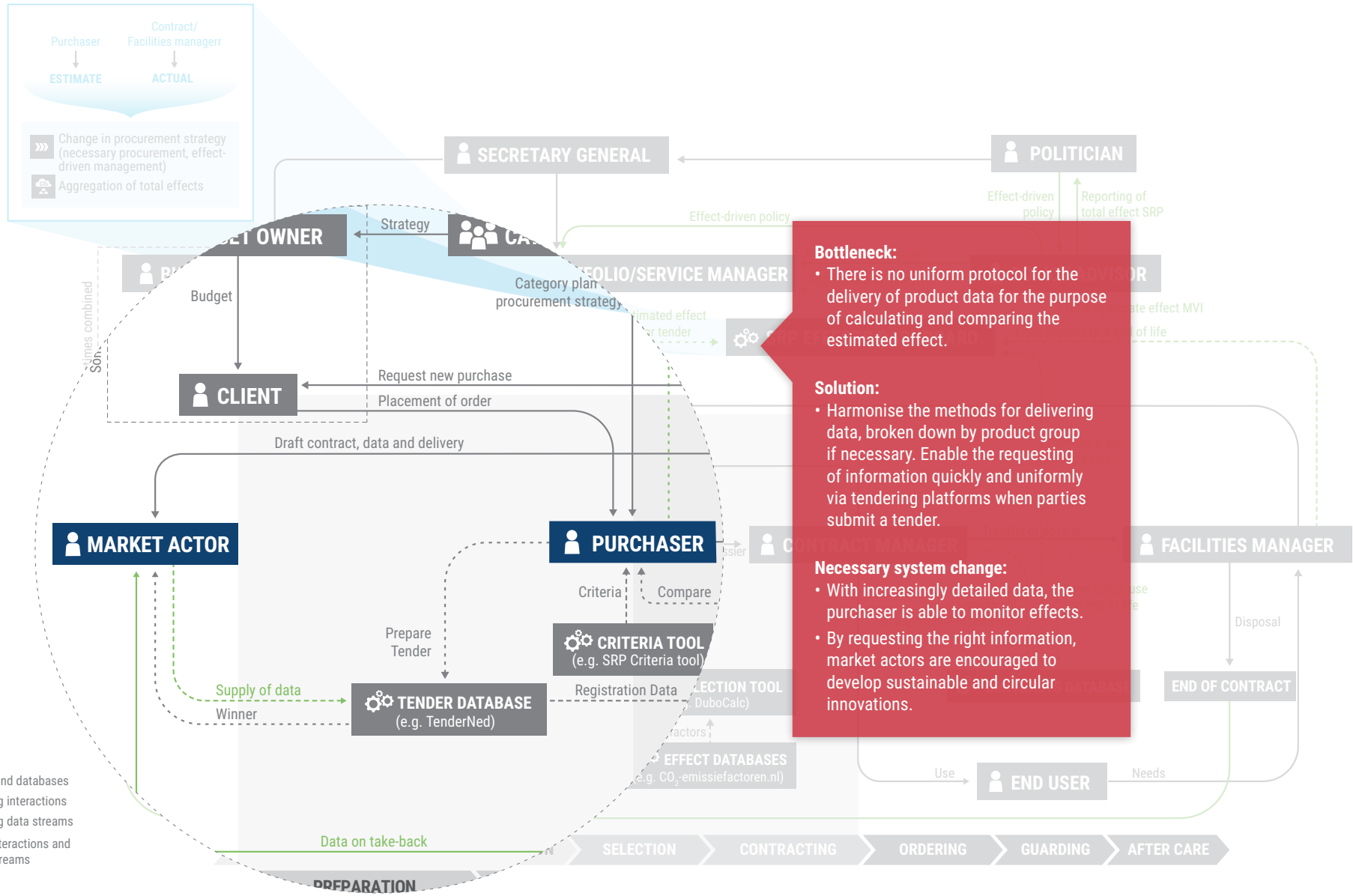


Bottleneck:
- Many tools and databases are being developed, but methods of effect monitoring are not yet available for enough product groups.

Solution:
- Formulate preconditions for tools and effect databases for the selection of high-impact product groups.

Necessary system change:
- The purchaser can select on the basis of effects.
- The market is held accountable for the actual effect on humans and the environment of the product or service provided.

3. DRAFT UNIFORM RULES FOR INFORMATION PROVISION

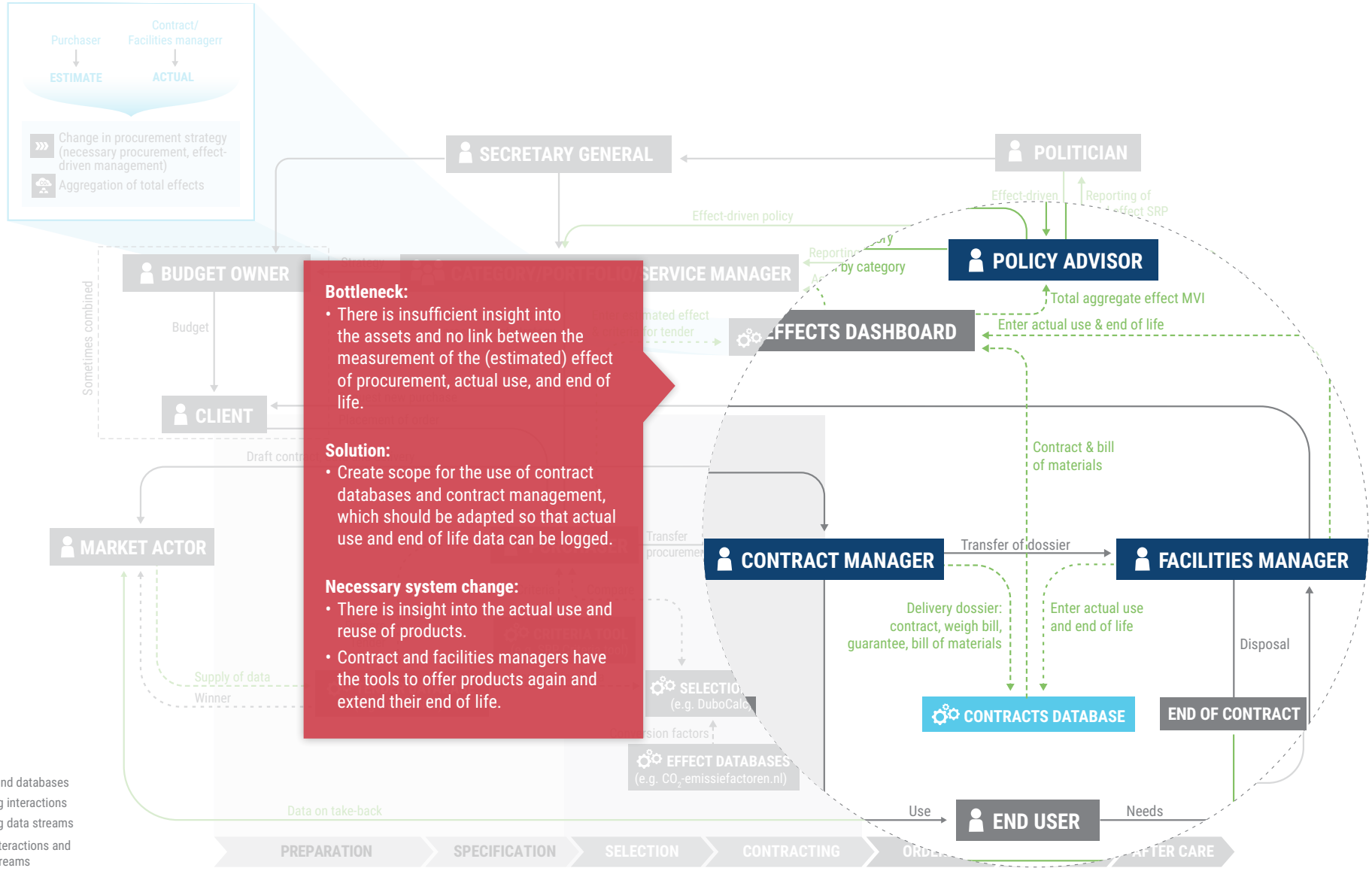


Bottleneck:
- There is no uniform protocol for the delivery of product data for the purpose of calculating and comparing the estimated effect.

Solution:
- Harmonise the methods for delivering data, broken down by product group if necessary. Enable the requesting of information quickly and uniformly via tendering platforms when parties submit a tender.

Necessary system change:
- With increasingly detailed data, the purchaser is able to monitor effects.
- By requesting the right information, market actors are encouraged to develop sustainable and circular innovations.

4. CREATE INSIGHT INTO ACTUAL EFFECTS DURING USE



Bottleneck:
- There is insufficient insight into the assets and no link between the measurement of the (estimated) effect of procurement, actual use, and end of life.

Solution:
- Create scope for the use of contract databases and contract management, which should be adapted so that actual use and end of life data can be logged.

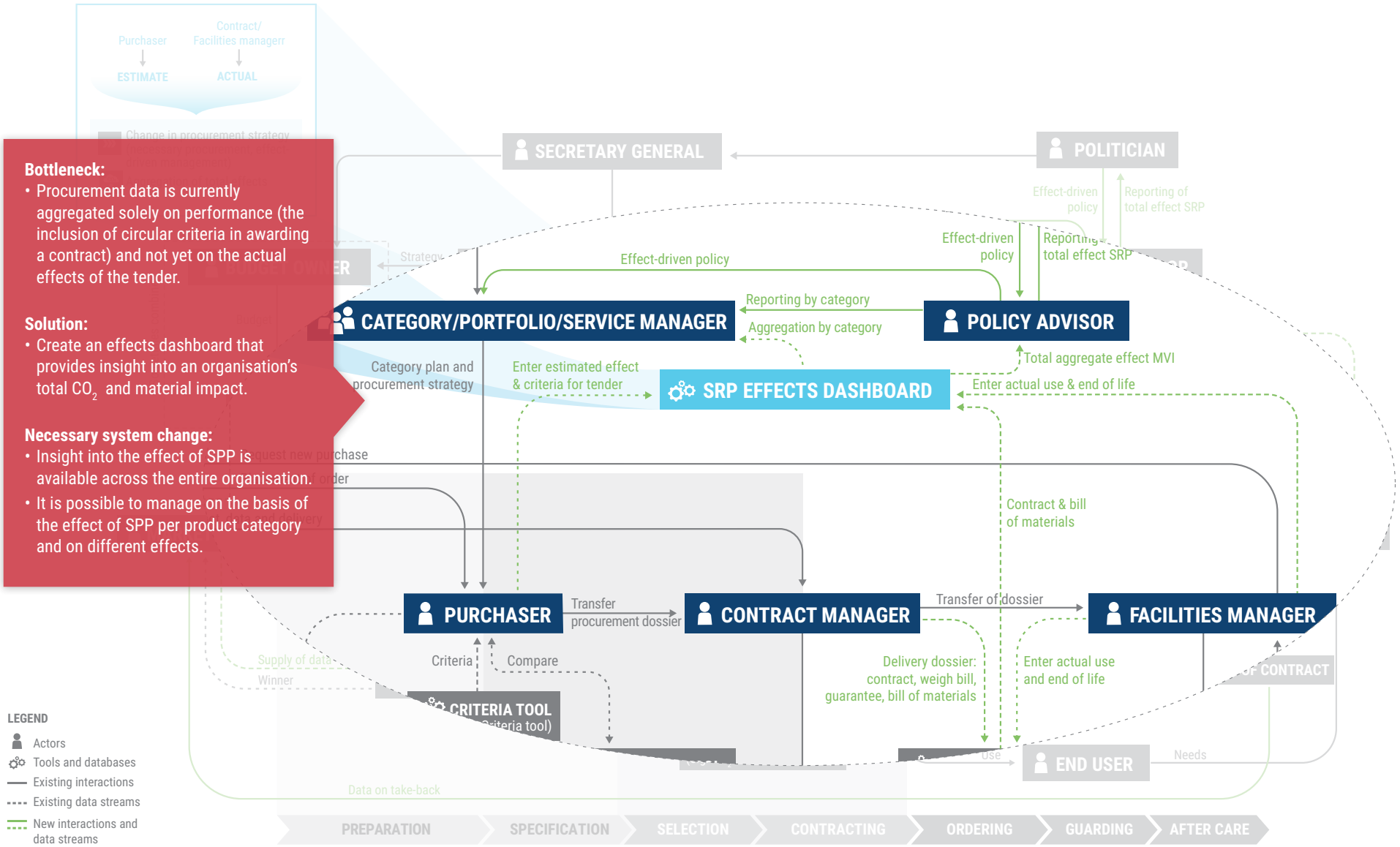
Necessary system change:
- There is insight into the actual use and reuse of products.
- Contract and facilities managers have the tools to offer products again and extend their end of life.

5. CREATE AN AGGREGATED EFFECTS DASHBOARD

Bottleneck:
- Procurement data is currently aggregated solely on performance (the inclusion of circular criteria in awarding a contract) and not yet on the actual effects of the tender.

Solution:
- Create an effects dashboard that provides insight into an organisation's total CO_2 and material impact.

Necessary system change:
- Insight into the effect of SPP is available across the entire organisation.
- It is possible to manage on the basis of the effect of SPP per product category and on different effects.



STARTING POINTS FOR INDICATORS

A proposal for an indicator framework

One of the challenges is to develop a set of indicators which includes not only CO_2 emissions, but also circular and other environmental indicators. Social and economic indicators will eventually need to be added, but the focus in this project is on climate-neutral and circular procurement.

The aim is to develop a framework that can be used for every product group so that it is ultimately possible to determine the impact of SPP across all product groups. Specific indicators could weigh more heavily for certain product groups (such as toxic substances in products used in a natural environment).

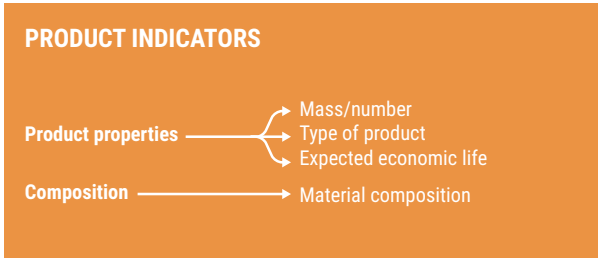
Starting points for the framework

The framework is designed in such a way that it corresponds with existing methods and current trends, both at product level and at national and international level, with the PBL and the European Commission. Five principles were adopted in drafting the framework:

- It outlines a way of thinking about integrated effect monitoring but is not yet operational.
- It must be suitable for achieving the two goals of effect monitoring: selection of the best option, and impact monitoring throughout the organisation.
- It must be applicable for the 46 product groups, each of which contains a range of products.
- It must be applicable for national and local government authorities.

Monitoring the effect of procurement is a challenge because, ideally, LCA-based effects are allocated to each product, but that is not practical in reality.

PROPOSAL FOR INDICATOR FRAMEWORK

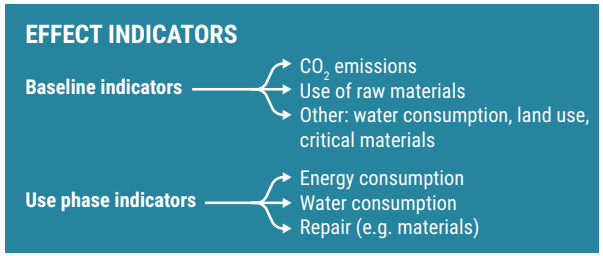


The first category is the product indicators. These are provided by the supplier, so must be verified.

In that context, we look at the product properties:

- How many products are there?
- What is the mass of these products?
- What type of product is it (energy label, type of vehicle)?
- What is the expected end of life?

In addition, the product's material composition ('bill of materials') is very important for determining its effects.

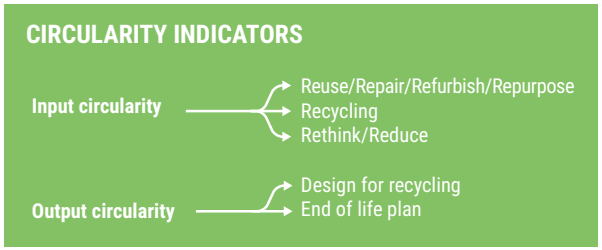


The effect indicators are based on LCA data and conversion factors. The key indicators here are CO_2 emissions and the use of raw materials, but other effects can be added as desired or required by the product's complexity, such as:

- Critical materials
- Water and land use
- Use of non-renewable energy
- Toxicity

Here too, the effects of the use of the product or service are also included, such as the consumption of water, energy and raw materials during transport and operations.

The effect indicators can also be extended to social factors in this system, but this requires further research.

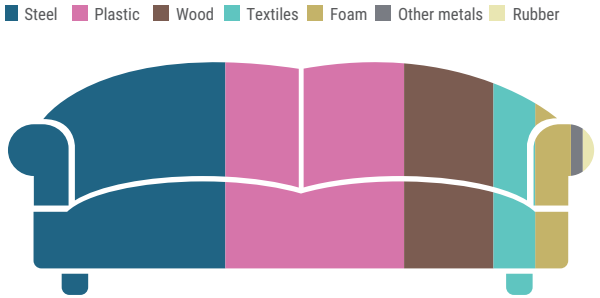


The circularity indicators are divided between two factors: input and output. By input we mean whether the products are already being reused during procurement: is value retained by virtue of the purchase? Here we follow the R-ladder of circular strategies that the PBL also uses.

We also consider output: if the producer retains ownership of the product or promises to take back the product, this can be discounted from the impact.

METHOD OF CALCULATING EFFECT

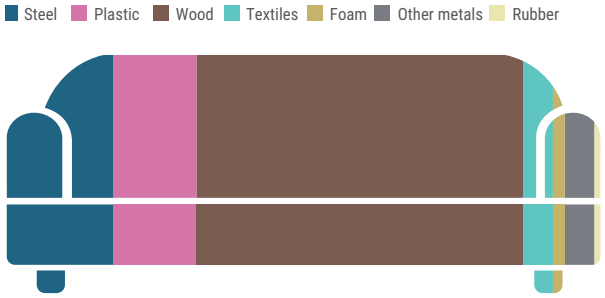
OFFICE FURNITURE



The approach with this indicator framework is based on one or more baseline estimates of the impact of each product group. The impact encompasses the CO_2 emissions, the use of raw materials, and, optionally, additional LCA data. This baseline impact is based on LCA data and is an initial estimate of the composition of products in the product group. The impact originating in the chain and production (energy, materials) is also included.

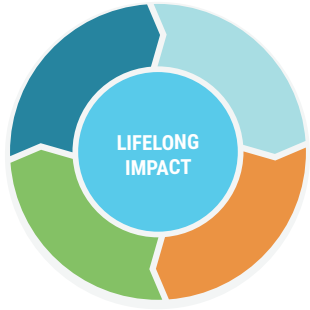
The baseline impact indicators are the same for all product groups, making impact monitoring at organisation or national level also possible.

REFURBISHED SOFA



The weighted impact incorporates the product indicators: what is the composition of the purchased product and are materials recycled in the product? On the basis of this 'bill of materials', a weighted impact per kilogram of product can be determined for each material.

In this way, the impacts of the actual products can be related to their effect with a relatively small set of baseline calculations.



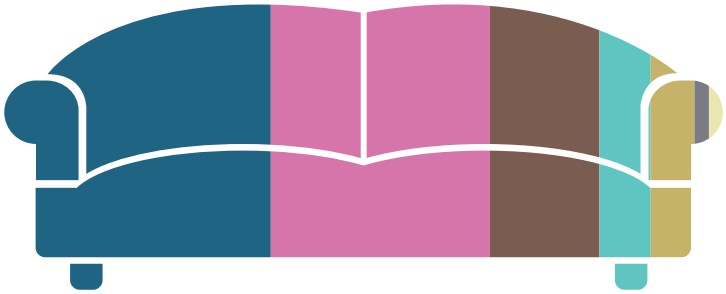
Finally, the lifelong impact is determined: both the impact over the entire life cycle (suitable for allocation at organisation level) and the impact per year of life (suitable for comparing products). It is calculated by multiplying the weighted impact per kilogram of product by the mass and the number of products ordered.

The circularity of the product is then also considered, since the impact of production is lower if the product is recycled or refurbished. For the various strategies in the R-ladder (reuse, refurbish, recycle), a descending factor between 0 and 1 can be selected. For products that are reused at a higher value, the factor will be closer to 0. Further research is needed to properly combine retention of value and LCA data.

EXAMPLE: METHOD OF CALCULATING EFFECT

OFFICE FURNITURE

Steel Plastic Wood Textiles Foam Other metals Rubber



BASELINE IMPACT

BASELINE IMPACT
50kg CO_2 per day
28.5kg materials per kg

Office furniture: Sofa

MATERIALS	MASS kg	MASS %	IMPACT CO_2 (kg)	IMPACT Materials (kg)	IMPACT e.g. land use (km^2)
Steel	25	37	172	250	...
Plastic	20	30	37	50	...
Wood	10	15	6	63	...
Textiles	5	7	44	39	...
Foam	4	6	22	10	...
Other metals	1.5	2	64	27	...
Rubber	1.5	2	9	9	...
SUM			353	448	
PER KG			5.3	6.7	

Available in own database

REFURBISHED SOFA

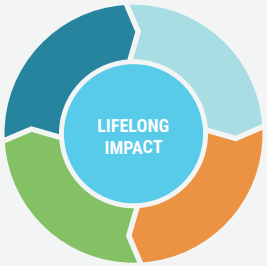
Steel Plastic Wood Textiles Foam Other metals Rubber

WEIGHTED IMPACT

Refurbished Sofa

MATERIAL	COMPOSITION Mass (%)	COMPOSITION Recycled (%)	IMPACT Weighted impact (%)	IMPACT Weighted impact CO_2(kg)	IMPACT Weighted impact materials (kg)	IMPACT e.g. land use (km^2)
Steel	18	90	2	12	18	...
Plastic	14	0	14	26	35	...
Wood	55	50	28	17	172	...
Textiles	5	75	1	11	10	...
Foam	2	0	2	11	5	...
Other metals	5	50	3	106	45	...
Rubber	1	0	1	6	6	...
SUM				189	291	
PER KG				2.8	4.3	

Material composition, provided by supplier
Material composition, provided by supplier
Weighted impact



LIFELONG IMPACT

Weighted impact
×
Mass/Number
×
R-Factor
×
EoL-Factor
+
Use phase impact
=
LIFELONG IMPACT (EXPECTED)
÷
Anticipated end of life
=
LIFELONG IMPACT PER YEAR

Verstrekt door leverancier

EXEMPLARY INDICATORS: OFFICE FURNITURE

PRODUCTION INDICATORS	
Product properties	
Mass per item	ton
Number of items	number
Composition	
Steel	%
Other metals	%
Plastic	%
Textiles	%
Wood	%
Paper	%
Other	%

EFFECT INDICATORS	
Baseline indicators	
CO_2-emissions	kg CO_2-eq/kg
Use of raw materials	kg materials/kg
Other: land use / water consumption / acidification	m^3 / m^2 / kg PO4-eq
Use phase indicators	
Energy consumption	Energy label or kWh/year
Water consumption	m^3/year
Maintenance costs	€/year

CIRCULARITY INDICATORS	
Recycling	%
Value retention (R-ladder)	Reuse/Repair/ Refurbish/n.a
End of life plan	Ownership/Take-back guarantee

In this study we have looked at two product categories to show that the indicators needed for a product such as office furniture are different than the indicators for a service like catering.

EXEMPLARY INDICATORS: CATERING

PRODUCTION INDICATORS	
Product properties	
Av. size of portion	kg/person
Av. energy per portion	Joule/kg
Organic	%
Hot meals	%
Composition	
Potatoes	%
Vegetables	%
Legumes	%
Fruit, nuts and seeds	%
Milk and (fermented) milk drinks	%
Grains and grain products	%
Meat and meat products	%
Fish and shellfish	%
Eggs and egg products	%
Fats and oils	%
Sugar and confectionery	%

EFFECT INDICATORS	
Baseline indicatoren	
CO_2-emissions	kg CO_2-eq/kg
Use of raw materials	kg materials/kg
Other: land use / water consumption / acidification	m^3 / m^2 / kg PO4-eq
Use phase indicators	
Energy consumption	%
Gas consumption	%
Water consumption	%

CIRCULARITY INDICATORS	
Local procurement	%
Food waste	%
Av. biowaste production	kg/jaar/person
Av. plastic waste production	kg/jaar/person
Av. paper waste production	kg/jaar/person
Av. other waste production	kg/jaar/person

DESIGN CRITERIA FOR SPP TOOLS

A set of design criteria for SPP tools

A large proportion of the tools and methods for the selection and measurement of impacts will ultimately be developed by the market. Because of the large differences in properties between the product groups (types of impact, product vs. service, diversity of products in a product group), a one-size-fits-all tool is undesirable. However, it is essential to ensure that every method is designed in such a way that it is capable of:

- Measuring the same indicators;
- Aggregating impact at the level of the organisation;
- Validating data;
- Being reconciled with systems and databases that are used in the procurement process.

We have therefore formulated preconditions for SPP-tools and methods, which can serve as design criteria for new tools in the SPP system. We have broken these down into design criteria that we feel are 'no regret', and criteria that enhance the total overview of the impact and circularity, but require more work and resources to implement.

Checklist for development of 'no regret' SPP tools:

√ Agree on a set of basic indicators suitable for all product categories.

√ Draft indicators to be measured for all 46 product categories.

√ Create detailed criteria documents with 'rules' for the data to be supplied by market actors.

√ Base effects on the composition of materials ('bill of materials').

√ Convert production information into effect via a tool, not the market actor.

√ Include circular strategies (recycle, reuse, refurbish) in the weighting of effects.

Checklist for development of 'total impact' SPP tools:

√ Formulate LCA baseline impacts for all product categories (for a limited number of products in each category).

√ Develop reference values for effect per product category for determining the rimpact reduction at organisational level.

√ Encourage market actors to accept ownership and/or take-back obligation in contracts.

√ Ensure the tool considers options for fulfilling the purpose of the tender with fewer products or services.

CHAPTER 07
ROADMAP

ROADMAP

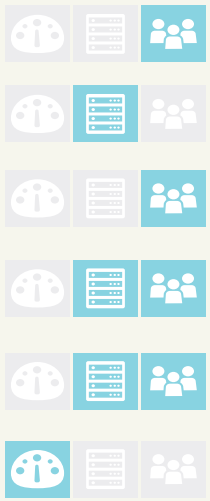
Towards integrated effect monitoring

In chapter 5, we identified and explained a number of major challenges to establishing an integrated effect monitoring system. In chapter 6, we proposed a number of system changes that are needed to surmount those challenges. In this chapter we present a roadmap with activities for making the necessary changes.

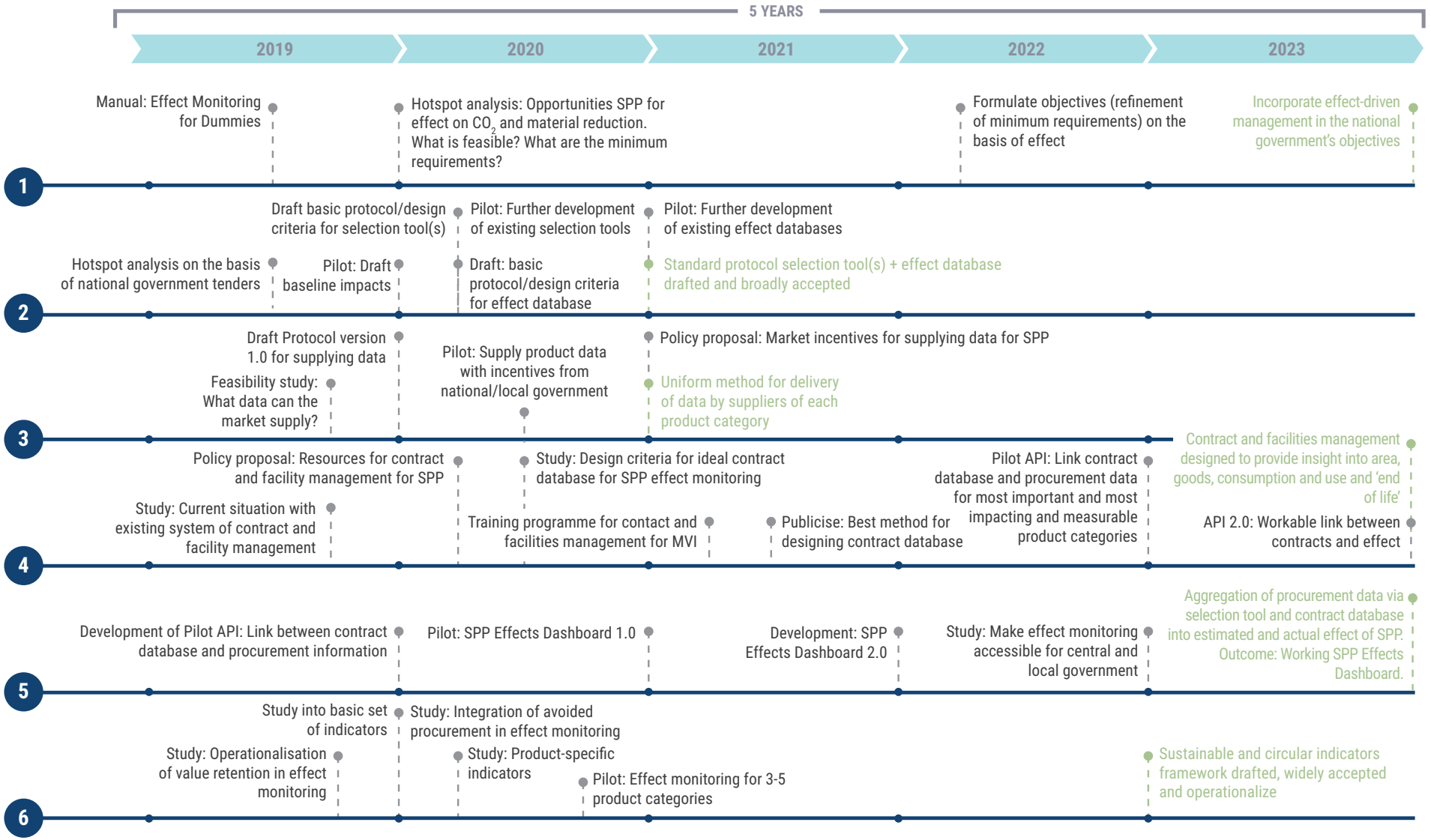
In consultation with the learning network, we have defined milestones for 2023 in relation to the six necessary system changes. Progress can be made towards achieving those targets with a number of enabling projects, such as studies, pilot projects and specific policy proposals. In the figure on the next page we present these milestones and the associated enabling projects on a timeline. In the subsequent pages the individual milestones are described in more detail, with additional information about the relevant parties and the expected and desired outcomes of various elements.

The six necessary system changes:

1. **Insight into where the greatest impact can be made** allows for **effect-driven policy.**
2. **Development of a protocol** for tools and effect databases for product groups **with a high impact.**
3. **Reconciliation of information supplied** by market actors in a tender.
4. Design of **contract and facility management so that the impacts of actual use and end of life** are clear.
5. **Insight into an organisation's total CO_2 and material impact** by creating **an effects dashboard,** to facilitate effect-driven management.
6. Development of a **circular indicator framework that** includes environmental and circular effects for measurement of the impact of SPP.



ROADMAP INTEGRATED EFFECT MONITORING



LEGEND: Interim products Milestones

EFFECT-DRIVEN MANAGEMENT OF SPP

Milestone 1: Incorporation of effect-driven management in central government objectives.
Deadline: 2021

	TITLE	OUTCOME	PARTNERS	DEADLINE
ENABLING PROJECTS	Hotspot analysis: Impact of procurement on CO_2 and use of raw materials.	Insight into the best ways for SPP to address climate change and other social and environmental challenges.	I&W	2019 - Q4
	Manual - Effect Monitoring for Dummies.	Raise awareness of the importance of effect monitoring and effect-driven management (vs. performance monitoring and activities-driven management).	RWS / I&W	2019 - Q2
	Formulation of objectives (refinement of minimum requirements) for SPP on the basis of effect.	Effect-driven management by the central government and local government .	I&W / RWS	2022 - Q1

DEVELOPMENT OF PROTOCOL FOR TOOLS AND EFFECT DATABASES

Milestone 2: Standard protocol for selection tool(s) and effects database has been developed and is broadly supported.
Deadline: 2020

	TITLE	OUTCOME	PARTNERS	DEADLINE
ENABLING PROJECTS	Hotspot analysis on the basis of central government tenders (looking at impact and practical measurability).	Selection of the most impactful and practically measurable product categories.	I&W / RWS	2019 - Q2
	Pilot: 'Drafting baseline impacts' for 3-5 most impactful product categories. Looking at material composition of product categories and associated impacts.	Broadly supported (dynamic) database that can be adjusted in light of developments in the market, with reference baseline impacts for effect monitoring.	I&W / RWS / Various knowledge institutes (TU Delft, Wuppertal Institute, Yale)	2019 - Q4
	Drafting of basic protocol / design criteria for selection tool(s).	Consensus on basic protocol.	To be determined	2020 - Q1
	Drafting of basic protocol / design criteria for effects database.	Consensus on basic protocol.	To be determined	2020 - Q1
	Pilot: Further development of existing selection tools (e.g. DuboCalc).	Integration of basic protocol / design criteria into existing selection tools.	To be determined	2020 - Q4
	Pilot: Further development of existing effects databases (e.g. CO_2-emmissiefactoren.nl).	Integration of basic protocol / design criteria into existing effect databases.	To be determined	2020 - Q4

PRESCRIPTION OF COMPATIBLE INFORMATION SUPPLIED BY THE MARKET

Milestone 3: Uniform method for delivery of data by suppliers of each product category (bill of materials, use data, mass/number, guarantees, etc.)
Deadline: 2020

	TITLE	OUTCOME	PARTNERS	DEADLINE
ENABLING PROJECTS	Feasibility study: What data can the market deliver (in the most impactful product categories) and what data do we need for effective effect monitoring.	Insight into the most effective method of encouraging the market to supply data + insight into what is not yet possible	I&W / RWS / trade associations/ PIANOo	2019 - Q3
	Drafting of version 1.0 of protocol for supply of data for five product categories (chosen on the basis of hotspot analysis of the most impactful product categories).	Consensus on method and protocol for supply of data by the market.	I&W / RWS / market actors	2019 - Q4
	Pilot: Delivery of product data with incentives from central/local government.	Insight into success factors and obstacles in requesting data from the market.	I&W / RWS / market actors	2020 - Q2
	Policy proposal: Market incentives for supplying data for SPP.	Political support for new system of requesting data from the market.	To be determined	2020 - Q4

DESIGN OF CONTRACT AND FACILTY MANAGEMENT

Milestone 4: Contract and facility management are designed to provide insight into assets, goods, consumption and use and 'end of life'.
Deadline: 2023

	TITLE	LEIDING	PARTNERS	DEADLINE
ENABLING PROJECTS	Study: Current situation with the existing system of contract and facility management (insight into assets, stock and end of life).	Insight into the feasibility of gathering data for consumption, use, end of life, and identification of gaps in information regarding the most impactful product categories.	I&W / RWS / market actors	2019 - Q3
	Policy proposal: Resources for contract and facility management for SPP (including training).	Enhancing quality of contract and facility management.	I&W	2020 - Q1
	Training programme in contract and facility management for SPP (extending end of life, reducing procurement, reporting on use and end of life).	Enhancing quality of contract and facility management.	I&W / market actors	2021 - Q1
	Study: Design criteria for the ideal contract database for effect monitoring for SPP,	Design principles and criteria for effective contract management.	To be determined	2020 - Q2
	Publicise the best method of organising a contract database that takes account of use, consumption and end of life.	Allows contract and facilities managers to keep records of current use and consumption of products and services.	To be determined	2021 - Q2
	Pilot API: link contract database and procurement data for the most impactful and measurable product categories.	Insight into the actual effect of procurement, and lessons on how to improve the system.	I&W / market actors	2022 - Q4
	API 2.0: Practical link between contracts and effect.	Insight into the actual effect of procurement, and lessons on how to improve the system.	I&W / market actors	2023 - Q4

ESTABLISHMENT OF THE SPP EFFECTS DASHBOARD

Milestone 5: Aggregation of procurement data using selection tools and contract databases into the estimated and actual effect of SPP in an Effects Dashboard.
Deadline: 2023

	TITLE	OUTCOME	PARTNERS	DEADLINE
ENABLING PROJECTS	Development of Pilot API: Link between contract database and procurement information.	Link between estimated effect of SPP and actual effect (until end of life).	I&W / RWS / market actors	2019 - Q4
	Pilot: SPP Effects Dashboard 1.0 in which the effects (estimated and actual) are related to each other and highlighted.	First workable dashboard that provides insight into the effect of SPP.	I&W / RWS / market actors	2020 - Q4
	Development: SPP Effects Dashboard 2.0 in which the effects (estimated and actual) are related to each other and highlighted.	Workable dashboard that provides insight into the effect of SPP.	I&W / market actors	2021 - Q4
	Study: Make effect monitoring accessible for central and local government.	Making effect monitoring tool accessible at various levels of central and local government.	I&W / RWS / market actors	2022 - Q4

A CIRCULAR INDICATOR FRAMEWORK

Milestone 6: Sustainable and circular indicator framework has been formulated, is widely supported, and has been operationalised.
Deadline: 2023

	TITLE	OUTCOME	PARTNERS	DEADLINE
ENABLING PROJECTS	Study: Operationalisation of 'value retention' in effect monitoring.	Integration in R-ladder framework: use, consumption, recycling, high- and low-value reuse, etc.	PBL/ RWS	2019 - Q3
	Study into the basic set of indicators (CO_2, material reduction, land use, circular design, etc).	Broad support for a basic set of indicators for effect monitoring.	PBL/ RIVM/ RWS	2019- Q4
	Study into integration of avoided procurement in effect monitoring.	Insight into how avoided procurement can be measured within the framework.	RWS /PBL/ RIVM/ Metabolic	2019 - Q4
	Study: Product-specific indicators.	List of indicators of specific relevance for different product categories.	RIVM/PBL/ RWS	2020 - Q1
	Pilot: Effect monitoring for 3-5 product categories.	Insight into the process of making an estimate of the effect of procurement + selection on the basis of SPP.	To be determined	2020 - Q3

MOST IMPORTANT STEPS IN THE SHORT TERM

We appear to be at the beginning of a revolution in SPP. The possibility of implementing effect-driven management in relation to climate and materials is starting to take shape. To do this effectively, a number of steps should be taken in the near future. The six most important steps in the short term are summarised here, together with the first enabling projects on the way to achieving the six milestones outlined in the roadmap.

1. Undertake an 80/20 study

Demonstrate where the greatest effects can be achieved with specific actions (20 percent of the effort towards 80 percent of the goal). This could be by means of a material flow analysis with a calculation of the effects in specific areas (e.g., CO_2, reduction in the use of materials, land and water use).

2. Understand value retention

Formulate a uniform indicator framework, with special attention paid to the retention of the value of products at end of life.

3. Develop a basic set of indicators

Draw up a basic set of indicators that can be used to aggregate calculated effects.

4. Assess the market

Create insight into the product data that market actors can already supply, and use it to draw up a protocol for the information that should be provided for the purpose of comparability (when tendering) and monitoring (during the term of the contract).

5.Look into contract and facility management

Investigate the practices of contract and facilities management in order to identify pointers for how best to show the actual effect.

6. Raise awareness

Ensure that the importance of effect monitoring is endorsed as quickly and as widely as possible. A switch from performance-related agreements to effect-driven management, and the need for monitoring, are essential in this respect.

BIBLIOGRAPHY

- **Barendregt, E., & Gerdes, E. (2017).** De waarde van Maatschappelijk Verantwoord Inkopen.
- **Centraal Bureau voor de Statistiek (CBS). (2018).** Duurzame ontwikkelingsdoelen: destand voor Nederland.
- **Centraal Bureau voor de Statistiek (CBS). (2017).** CO_2-uitstoot in Nederland.
- **Centraal Bureau voor de Statistiek (CBS). (2016).** Nationale rekeningen 2016.
- **De Graaff, L. (2017).** Quickscan Rijksinkopen: productgroepen met de grootste milieu-impact.
- **Delahaye, R., & Baldé, K. (2016).** De Nederlandse economie - Circulaire economie in Nederland. Den Haag.
- **EEA. (2016).** Circular economy in Europe Developing the knowledge base. Retrieved from https://www.eea.europa.eu/publications/circulareconomy-in-europe
- **European Comission. (2017).** Public procurement for a circular economy.
- **European Commission (EC). (2016).** EU Resource Efficiency Scoreboard 2015. Retrieved from http://ec.europa.eu/environment/resource_efficiency/targets_indicators/scoreboard/pdf/EUResource Efficiency Scoreboard 2015.pdf
- **European Commission (EC). A monitoring framework for the circular economy (2018).** EU: http://eur-lex.europa.eu. Retrieved from http://eur-lex.europa.eu/legal-content/EN/
- **EUROSTAT. (2015). H**andbook for estimating Raw Material Equivalents of imports and exports and RME-based indicators on country level – based on Eurostat's EU RME model, (October), 1–25. Retrieved from http://ec.europa.eu/eurostat/documents/1798247/6874172/Handbook-country-RME-tool---May-2015/a5657918-cc8f-4e55-b40d-5f64ce4ae7a1
- **EUROSTAT. (2001).** Economy-wide material flow accounts and derived indicators. https://doi.org/10.1016/j.marpolbul.2013.07.028•• Kok, L., & Zijp, M. C. (2016). Tools voor Maatschappelijk Verantwoord Inkopen.
- **Ministerie van Binnenlandse Zaken. (2017).** Actieplan SPP Rijksinkoopstelsel.
- **Ministerie van Infrastructuur en Milieu. (2018).** Actieplan SPP & Duurzaam opdrachtgeverschap.
- **Ministerie van Infrastructuur en Waterstaat. (2018).** Kabinetsreactie op de transitieagenda's circulaire economie.
- **Ministerie van Infrastructuur en Waterstaat & Ministerie van Economische Zaken. (2016).** Nederland circulair in 2050. Den Haag. Retrieved from https://www.government.nl/documents/leaflets/2016/09/22/a-circular-economy-in-thenetherlands-by-2050
- **PIANOo. (2015).** Manifest Maatschappelijk Verantwoord Inkopen 2016 – 2020 (Manifest SPP), 4(1), 27–36. https://doi.org/10.1080/0305498780040103
- **Planbureau voor de leefomgeving (PBL). (2018).** Kan de circulaire economie een bijdrage leveren aan de energietransitie?
- **Potting, J., Hanemaaijer, A., Delahaye, R., Hoekstra, R., Ganzevles, J., & Lijzen, J. (2018).** Circulaire economie: wat we willen weten en kunnen meten. https://doi.org/10.1128/IAI.69.1.245-251.2001
- **Potting, J., Nierhoff, N., Francesca, M., Antikainen, R., Colgan, S., Hauser, A., Montevecchi, F. (2017).** Input to the European Commission from European EPAs about monitoring progress of the transition towards a circular economy in the European Union. Retrieved from http://www.pbl.nl/sites/default/files/cms/publicaties/PBL-2017-EPA-networkdiscussion-paper-monitoring-progress-of-thecircular-economy-in-the-EU_2772.pdf
- **Significant. (2016).** Het inkoopvolume van de Nederlandse overheid.
- **United Nations. (2014).** System of Environmental-Economic Accounting 2012 Experimental Ecosystem Accounting. Retrieved from https://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf
- **Van De Pol-de Jongh, L. A., Keller, K., Delahaye, R., & CBS. (2016).** Material Flow Monitor Time Series 2008-2014.
- **van Driel, J. (2017).** Circulair, circulairder, circulairst: Een vergelijking van tien veelgebruikte tools voor circulair inkopen, (November).
- **Zijp, M. C., Kok, L., & Valk, E. De. (2018).** Het effect van Maatschappelijk Verantwoord Inkopen.

Rijkswaterstaat
Ministry of Infrastructure and Water Management

COLOPHON

AUTHORS:

Chandar van der Zande *(Metabolic)*
Jorrit Vervoordeldonk *(Metabolic)*
Thomas Thorin *(Metabolic)*

WITH THE SUPPORT OF:

Sybren Bosch *(Copper8)*
Gerard Roemers *(Metabolic)*

GRAPHIC DESIGN:

Marta Sierra García *(Metabolic)*
Sunniva Unneland *(Metabolic)*

COMMISSIONED BY:

Rijkswaterstaat: Directorate-General for Public Works and Water Management

METABOLIC

METABOLIC

+31 (0) 203690977
info@metabolic.nl
www.metabolic.nl

Meteorenweg 280M
1035RN Amsterdam
The Netherlands