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About InnProBio

InnProBio relates to the Horizon 2020 Work Programme 2014-2015 'Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy' and call topic ISIB-7-2014 'Public procurement networks on innovative bio-based products' within the call for an 'Innovative, Sustainable and Inclusive bioeconomy'.

InnProBio identified relevant stakeholders from European, national, regional and local level including representatives from public procurement bodies and relevant decision makers. Stakeholders were approached to provide information on their specific needs related to Public Procurement & Innovation (PPI) with bio-based products & services (BBPS). This gave insights on drivers and barriers for bio-based product procurement in the public sector. The assessment took into account the results of the Business to Public Procurer (B2P) expert surveys in the framework of the EU-FP7 funded Open-Bio project (Opening bio-based markets via standards, labelling and procurement project).

Furthermore, InnProBio prepared educational material to support public procurement practitioners. The material was collected in an online toolbox. Moreover, the toolbox was presented to public procurers during the trainings that took place in the Netherlands, Germany and Poland. The online toolbox is available under: <https://www.biobasedconsultancy.com/>. The educational material consists of various different outputs that inform and support public procurement practitioners.

Executive Summary

The following report was prepared by the Agency for Renewable Resources (FNR), the Netherlands Standardization Institute (NEN) and Biomass Technology Group BV (BTG) and presents useful recommendations to overcome barriers for public procurement of Bio-Based Products and Services (BBPS), which were discovered during the 3-year project term of InnProBio. The focus of this document lies on four discovered barriers and respective recommendations to mitigate them:

➤ **Barrier #1: Knowledge Related to PPI and Procurement Methods**

The focus of barrier #1 is on insufficient market knowledge, lack of knowledge about bio-based concepts, tender procedures complexity, lack of using innovative tender specifications and lack of legal expertise in applying environmental criteria and lack of established criteria for products and services. The recommendations rely primarily on awareness raising, developing tools for procurers, simplifying environmental criteria through standards and labels, the development and implementation of standards and the labels.

➤ **Barrier #2: Procurement and Co-Operation**

The focus of barrier #2 is on lack of political and management support, no clear aims to improve procurement, lack of co-operation between authorities and a small market. The recommendations highlight the need of authorities and government institutions to jointly support the procurement of BBPS.

➤ **Barrier #3: Procurement is Broader than Procurement Departments**

The focus of barrier #3 is on the lack of communication between different procurement departments and authorities. The recommendations highlight the need to foster communication between different levels of administrations and other authorities including final end-users of BBPS.

➤ **Barrier #4: Barriers Related to the Nature of Green and/ or Innovative Products**

The focus of barrier #4 is on perceived barriers voiced by public procurement, e.g. costs, industry specific barriers and lack of trust. The recommendations focus on the organisation of market dialogues and training.

In the course of this report, there are references to important resources regarding the public procurement of BBPS which are listed below:

- [InnProBio-Homepage](#)
- [InnProBio-Toolbox](#)
- [NR im Einkauf](#) (German Procurement Project)
- [PIANOO](#) (Dutch Competence Centre for Public Procurement)
- [European Committee for Standardization, CEN](#) (Bio-based Products)
- [Open-Bio](#) (EU-project on 'Opening bio-based markets via standards, labelling and procurement')

1. Introduction

In the InnProBio project trainings for public procurers and decision makers on ‘how to procure bio-based products and services’ (BBPS) were carried out in the Netherlands, Germany and Poland. During these sessions and a separate literature review, barriers to the procurement of innovative bio-based products and services (BBPS) were identified. The identified barriers were used to provide recommendations for decision makers and for further improvements through standardisation to effectively reduce the barriers.

This report covers the barriers described in practice during the trainings, sessions and dialogues executed as part of the project. Furthermore, barriers for innovation procurement and for green public procurement (GPP)¹ are reported which were collected from a (scientific) literature survey done at the beginning of the project as basis for these events. Procurement of innovative BBPS can often be described as a combination of GPP and Innovation Procurement, so valuable information can be obtained from the research done in these fields. Some studies focus on the perceived barriers by the procurers, others on those described by the suppliers.

The barriers described in practice were identified in the InnProBio trainings and market dialogues by public procurers who were already interested in the subject of procuring BBPS.

The identified barriers are complemented by recommendations. Barriers and the respective recommendations focus on the following topics:

→ **Barrier #1: Knowledge Related to PPI and Procurement Methods**

→ **Barrier #2: Procurement and Co-Operation**

→ **Barrier #3: Procurement is Broader than Procurement Departments**

→ **Barrier #4: Barriers Related to the Nature of Green and/ or Innovative Products**

At the end of the report one can find all viable product groups identified by InnProBio. This gives a valuable impression where public procurement of BBPS can be applied. Moreover, besides the barriers presented in this report a list of all barriers experienced during the trainings and market dialogues is presented at the end of the document. In order to make the report accessible only the most relevant barriers are mentioned.

¹ GPP is a term related to the EU Commission’s GPP program. Please consider that on national level it is rather referred to sustainable procurement or environmentally friendly procurement.

2. Barriers and Recommendations

PERCEIVED BARRIERS: KNOWLEDGE RELATED TO PPI AND PROCUREMENT METHODS

The chapter on ‘Knowledge Related to PPI and Procurement Methods’ sums up the experienced barriers, which were discovered during the InnProBio trainings and market dialogues. The barriers consists of *insufficient market knowledge, lack of knowledge about bio-based concepts, tender procedures complexity, lack of using innovative tender specifications and lack of legal expertise in applying environmental criteria and lack of established criteria for products and services*. The recommendations to overcome these barriers focus on *awareness raising, developing tools for procurers, simplifying environmental criteria through standards and labels, the development and implementation of standards and the labels*.

Lack of Bio-Based Concepts’ and Market Knowledge

Even though participants of training sessions were aware of the topic of procurement of BBPS, most of the public procurers are neither aware of the topic nor the opportunities with BBPS to introduce new environmentally friendly products on the market. They also are often not aware that BBPS present an crucial alternative for products which are made of fossil-based resources and which can be harmful for the environment. The procurement of innovative goods requires in-house competence. Lack of market knowledge among procurers limits engagement with the marketplace and the development of closer supply relations to suppliers of BBPS. Lack of commercial skills is a widespread barrier. It means that procurers do not know what products and companies are relevant and which products meet their procurement needs. The reason behind this are a lack of staff capacity and time to do market research and attend events to learn about new products and services. Furthermore most of the relevant BBPS still present a small niche market and therefore companies and service providers are often hard to find. Relevant businesses are often small and not showing up at trade fairs and other communicating events. Also public procurers are often afraid to get too close with businesses where they plan to buy in the future. That makes it harder to gain experience through direct exchange.

Furthermore, there is a lack of openness of the public sector to receive and take on board unsolicited ideas from suppliers, as well. A lack of appreciation by procurers of suppliers past performance, particularly in relation to the successful delivery of innovative goods and services to the private sector adds a not important amount of scepticism, too. Additionally, public sector procurers may fail to appreciate previous innovations serving private markets, which could be incorporated and/or adapted into the public sector realm. This lack of spill overs between the private and public sector may diminish the potential catalytic effect of procurement of innovation.

Moreover, at lower levels of government and in decentralised systems there may also be a shortage of professional procurers and therefore the lack of skills for innovative purchasing becomes an important challenge.

Tender Procedures

Procurers often lack sufficient procurement expertise for complex purchases. Skill constraints hinder the adequate use of potentially more 'innovation-friendly' procurement procedures such as competitive dialogues.

Public Procurers are not allowed to include exclusion criteria of certain products into tenders. That means, prescribing that only BBPS will be accepted in a tender is not allowed, as it excludes other products, which are not derived from biomass. As a result, public procurers are hesitant to specifically relate to BBPS within tenders and further, to describe the need or will to procure BBPS. Specifications phrased in terms of outcomes or performances are considered to be better at allowing industry to propose innovative solutions. When specifications are made too rigid and/or narrow, this will prevent suppliers from proposing innovative ways of delivering outcomes. Although there is an increasing awareness of the importance of outcome specifications there is a range of reasons why they are not used more comprehensively, such as

- limited time,
- general inertia and transactions costs of the change,
- additional requirements for tender evaluations including the development of defensible evaluation criteria and methodologies.

These specifications require a variety of skills to evaluate the tenders. Procurers often fail to review or market test these specifications, not questioning whether they may be stifling innovations and raising costs.

Many procurers within public authorities do not know all the environmental and social impacts of particular products or services. In some cases procurers still struggle to define what an "environmentally preferable" product or service is, and how to include appropriate (i.e. allowed under the Procurement Directives) criteria to identify these in tendering. The ability to accurately assess and verify information submitted by tenderers in response to environmental criteria is also a challenge.

Additionally, staff responsible for carrying out procurement tasks concerning BBPS does not always have the skills to procure them. In order to effectively set thresholds or write requirements for procurement documents, knowledge is generally required for procurers on the legal and technical aspects of GPP implementation, on the concept of life-cycle costing and for end-users on the sustainable use of products. These are most of the time quite new concepts for both those effectively procuring as well as handling internal organisation specifications (or even promoting them)².

Management of Risks Associated with Procuring Innovations

Decision making in the public sector is affected by strong expectations regarding transparency and accountability. How risk is managed is a particularly important consideration for suppliers that invest in R&D. Procurers may be risk averse and unwilling to take up new solutions, suppliers are reluctant

² InnProBio-Toolbox. Glossary: <https://www.biobasedconsultancy.com/en/about-biobased/glossary1> (Last access: 06.03.2018)

to invest heavily in R&D³ and innovations activities if they fear that they will not get the necessary return. Additionally, one of the great barriers is that tenders follow a strict legal framework. If this framework is hurt slightly, or even if it seems that it is not followed completely, tenders become invalid. That means legal risks, potential significant financial harm and delays to the public institution.

RECOMMENDATION: KNOWLEDGE RELATED TO PPI AND PROCUREMENT METHODS

Awareness Raising

In the EC's Bio-based Expert Group Final report from November 2017⁴ the development of campaigns to encourage adoption of 'bio-based' in procurement criteria for public procurers were suggested in order to demonstrate the clear sustainability, economic, social and performance benefits and characteristics of using bio-based products and services.

These campaigns should revolve around viable product groups which are most important for BBPS in public procurement. InnProBio identified product categories⁵ with relevant innovative bio-based products and services (BBPS) for procurement. . These product groups represent a significant portion of public spending. They have been cross-checked on availability, applicability and completeness.

Product and material campaigns could involve e.g. information material, market dialogues, bio-based product and services fairs etc. targeted at public procurers.

Another suggestion from the EC's Bio-based Expert Group are regional and national campaigns, specifically targeting regions, which have an explicit focus on becoming bio-based regions, being bioeconomy regions and sustainability lighthouse regions.

One of the most prominent regions in this regard is the Dutch province of Zeeland with the ambition of encouraging a lower carbon economy through preferring bio-based products with a low carbon footprint, which also offer life cycle benefits.

Next to the Dutch region of Zeeland, the other Low Carbon Economy Regions include Region Syddanmark (Denmark), Region Västra Götaland (Sweden), Principado de Asturias (Spain), Regione Emilia-Romagna (Italy) and Gorenjska (Slovenia).

The Bio-based Expert Group identified these regions as primary regions to target with regional campaigns to take up BBPS procurement as lighthouse regions:

- Regions that declare special bioeconomy interests: Wallonie (Belgium), Castilla y León (Spain), Haute-Normandie (France), Puglia (Italy) and Mazowieckie (Poland) and many more.
- Regions already practising pre-commercial procurement or public procurement for innovation and environmental sustainability, and hence proactively exploring the potential of procurement platforms for innovation are for example: Nordrhein-Westfalen (Germany),

³ Research and Development

⁴ Commission expert group on bio-based products calls for alignment of bioeconomy strategy with the EU policy framework (12.11.2017): http://ec.europa.eu/growth/content/commission-expert-group-bio-based-products-calls-alignment-bioeconomy-strategy-eu-policy_en (Last access: 06.03.2018)

⁵ See Annex.

Trento (Italy), all of the Netherlands, Stockholm (Sweden), Vienna (Austria), Lombardy (Italy), Vantaa and Oulu (Finland)

- Regions which have green public procurement or social return on investment criteria already strongly embedded into their practices: All of the Netherlands (applying social return on investment criteria), Turin (Italy), Rotterdam (Netherlands), Bristol (United Kingdom), Barcelona (Spain), Copenhagen (Denmark) and a few of the cities which have active sustainable public procurement policies. (Commission Expert Group on Bio-based Products Final Report, November 2017)

Another opportunity to strengthen regional and national efforts is to strengthen national programs dealing with bio-based, green or circular procurement, such as available at the Dutch [PIANOo](#) and the German Agency for Renewable Resources⁶.

In order to show public procurers that procuring of innovative, bio-based products and services is doable and a way to overcome the perceived barrier that procurement skills and knowledge are lacking for the public procurement of BBPS, highlighting good practice cases plays a crucial role. InnProBio developed four unique and diverse case studies from the Netherlands, Sweden and Poland. The InnProBio case studies can be accessed here⁷: <https://www.biobasedconsultancy.com/en/procurement-tools111/good-practice-examples>

Tools for Public Procurers

In order to increase procurement skills and knowledge, public procurers need to be equipped with easy-to-handle materials helping with identifying bio-based products and services (BBPS) as well as procuring of BBPS.

An excellent tool for public procurers is the [InnProBio's Online Toolbox](#), which assists and informs public procurement practitioners. Its main goal is to simplify the lives of procurers and decision makers. The tool is available in English, German, Dutch and Polish.

The supporting tool offers information on various aspects of bio-based products such as their potential benefits, how they are linked to the circular economy and circular procurement, and how to find out if they are truly sustainable. Information is presented in various easy to read formats such as factsheets, frequently asked questions (FAQs) and a glossary.

The tool also includes a database of products and suppliers of bio-based products. The database provides information about the bio-based content of certain products, sustainability, functionality and end-of-life aspects such as biodegradability. Claims are supported by references to standards, technical sheets, labels and certificates. The database is meant to be a starting point for public buyers to get informed about the various bio-based products available on the market. It can be used for market research in order to widen the public procurement product portfolio beyond conventional fossil-based products. Producers of bio-based products are invited to add their products to the database.

Further, materials available as part of the InnProBio toolbox include good practice examples showing how bio-based procurement has been successfully implemented in practice, information on procurement instruments most relevant in bio-based procurement, and example texts called 'tender

⁶ Public Procurement at Fachagentur Nachwachsende Rohstoffe e.V. <https://beschaffung.fnr.de/> (Last access: 06.03.2018)

⁷ InnProBio-Toolbox. Good Practice Examples: <https://www.biobasedconsultancy.com/en/procurement-tools111/good-practice-examples> (Last access: 06.03.2018)

text blocks' which can be used to prepare tender documents. By supplying public procurers with legally sound tender text blocks with which the tender specifically asks for bio-based products and services, the risk of adding unknown specifications for the procurer is limited and the strict regulations for legally sound tender specifications are adhered to. Additionally, there are two training formats, available in PowerPoint-Presentations on the [InnProBio-website](#). These training formats provide the possibility to school public procurement practitioners from the beginning.

Rollout of Standards and Labels

Standards and labels serve a useful purpose for bio-based products. They lend credibility to originators, manufacturers, traders and retailers of bio-based products. The standards and certificates establish benchmarks of performance to which manufacturers must adhere to, and they provide valuable objective verification to intermediates and final consumers that performance claims are true. Clear standards and labels support the procurer to formulate tenders. The absence of clear targets for green public procurement underlines the barrier of political management support. Procurers somehow swim in bad waters, not knowing where to aim for in tender procedures except of the main goal of finding the Most Economically Advantageous Tender (MEAT).

Since 2011 the European Standardisation Organisation's (CEN) Technical Committee [CEN/TC 411 Bio-based products](#) has been developing European standards with uniform requirements and test methods regarding the characteristics of bio-based products. These cover horizontal issues including the essential elements of LCA, sustainability, end-of-life options and bio-based (carbon) content which are at the heart of bio-based value chains. These standards enable promotion of the benefits of bio-based products. They are fundamental for a sound understanding of the sustainability and life cycle benefits of bio-materials. Some key standards are very recent and not widely known. Some are in the final stages of development. Once complete, these standards will require considerable effort to assure their widespread acceptance and application. Currently, these standards have no defined thresholds for the minimum amount of bio-based content, nor regarding sustainability criteria for bio-based products in general. Developing and agreeing upon these standards, thresholds, criteria and appropriate certification is viewed as the collaborative responsibility of those involved in bio-based value chains, from primary producers through to consumer product manufacturers and end of life managers. Developed standards will support procurers to take justified decisions when procuring new products.

What will be essential is that European and national institutions have to take up the standards and make them obligatory in public procurement. It is difficult to name actions which ensure the uptake of standards. There were too many proposals of working groups to take up standards and labels, which were ignored.

Working Group 5 of the CEN/TC 411 "Bio-based products" is developing standards for reporting and communication of characteristics of bio-based products in Business to Business and Business to Consumer interaction. This working group has developed templates for communication which can be used in labels for products to increase clear communication on bio-based characteristics.⁸ Label schemes, while not mandatory, greatly facilitate public procurement selection processes. Efforts should be made to converge on a commonly accepted labelling approach inside an ambitious

⁸ For further information see Working Group: CEN/TC411 WG5:
https://standards.cen.eu/dyn/www/f?p=204:110:0:::FSP_PROJECT:38485&cs=1767A6D3DEEED690B15D32460F40ED830 (Last access: 06.03.2018)

timeframe, preferably by 2020. Label schemes should ideally help to ensure sustainable sourcing of the biomass and include LCA profiles.

In order to combine all proposed actions, which would at the end provide the public procurement practitioner with helpful tools, already installed tools should be used. That means, e.g. the InnProBio-toolbox could further be developed and other information material could be added. This would not only help the procurers, it would additionally support effort which has already been done in this field.

An identified challenge is the quantity of labels in the market. There are close to 500 “ecolabel systems” worldwide of which two of the more prominent are Europe’s Ecolabel and Germany’s *Blauer Engel*. Several voluntary schemes from the biofuels sector have created add-ons or extended their scope to bio-based products. These include RSB, ISCC+ and Better Biomass. The USDA Bio Preferred programme launched a dedicated bio-based label in 2011 and this is judged to have provided a significant boost to the bio-based procurement program. Indeed US stakeholders lament not having launched it several years earlier. Though this programme could not be implemented in the same form at EU-level, it clearly demonstrates the impact of a label.

There are prospects for development of a new European bio-based label based on certification against EN standard 16785-1 and this represents a strong opportunity for convergence.

Currently there are no widely used bio-based labelling practices, though there are several exploratory efforts underway such as the incorporation of bio-based criteria into the EU Ecolabel scheme. The EU-project Open-BIO and InnProBio⁹ made such efforts.

Other Projects

In the past and today there are projects which focus on policy initiatives to support the public procurement of BBPS. A strong recommendation is to look at the final results of Open-BIO and the output of the current running projects Star-ProBio and Star4BBI.

One of the Open-BIO¹⁰ work packages dealt with the question, whether the EU Ecolabel can be extended to explicitly cover bio-based products, and if yes, how. The objective was to assess the suitability of ecolabel criteria for bio-based products, or in other words, to find out whether the existing criteria of ecolabels can be applied to bio-based products, whether there are conflicts of harmonization and whether additional criteria can or have to be added in order to adequately label bio-based products. Reports can be read here¹¹

The STAR-ProBio project¹² will support the European Commission in the full implementation of European policy initiatives, including the Lead Market Initiative in bio-based products, the industrial policy and the European Bioeconomy Strategy. It will do so by developing sustainability assessment

⁹ InnProBio made great efforts to recommend technical specifications to the EC Green Public Procurement Criteria. Further, tender blocks including award criteria for BBPS were created by InnProBio which are available at: <https://www.biobasedconsultancy.com/en/procurement-tools111/tender-text-blocks>. (Last access: 06.03.2018)

¹⁰ Open-BIO: Opening bio-based markets via standards, labelling and procurement: <http://www.biobasedeconomy.eu/projects/open-bio/> (Last access: 06.03.2018)

¹¹ Open-BIO: Opening bio-based markets via standards, labelling and procurement: <http://www.biobasedeconomy.eu/projects/open-bio/> (Last access: 06.03.2018)

¹² STAR-ProBio: Sustainability Transition Assessment and Research of Bio-Based Products.

tools for bio-based products, and by developing credible cases for bio-based products with the highest actual market penetration and highest potential for the future markets.

The [Star4BBI project](#) will help establish a coherent, well-coordinated and favourable regulatory framework that helps develop a cutting-edge bio-based economy for Europe. Further, it will support adaption of the regulatory framework and of relevant standards for selected existing value chains and the development of new value chains based on biomass from forests, from agriculture and from organic waste.

PERCEIVED BARRIERS: PROCUREMENT AND CO-OPERATION

In this chapter barriers and recommendations of procurement as a strategic function are described. The list of barriers focuses on *lack of political and management support, no clear aims to improve procurement, lack of co-operation between authorities and a small market*. The recommendations focus on highlighting the need of authorities and government institutions to support the procurement of BBPS.

Lack of Political and Management Support

According to the "Green Public Procurement in Europe"¹³ report, a high percentage of public authorities cited lack of management support as a barrier to broader implementation of GPP. This indicates that senior officials within the public sector across Europe do not have a high awareness of the importance of the GPP agenda or that their awareness is not made explicit to their purchasing staff. To justify the dedication to procurement of BBPS political or management support is needed. Without a political mandate a public procurer might not go the extra-mile to procure for innovative, bio-based products and services.

A key challenge identified by many public sector organisations is changing behaviour within purchasing departments. In particular using purchase price alone to decide between offers, rather than the full life-cycle cost of the product or service, can affect the take-up of green products and services. While applying environmental criteria to procurement procedures can sometimes mean higher initial purchasing costs, the overall costs often decrease since the higher purchasing prices of green goods and services are compensated for by lower operating, maintenance or disposal costs. Suppliers complain that despite there is widespread rhetoric on innovation and procurement, these intentions are not (yet) reflected in processes and procedures.

Expectations on the capacity of procurement to deliver on a number of policy areas are paradoxically heightened at a time when increased outsourcing, multiple forms of public private service delivery and joint purchasing agencies mean that procuring authorities have individually less direct influence over procurement decisions. Procurers need to regain that influence and increase their institutional profile.

¹³ Green Public Procurement in Europe (2006). Conclusions and recommendations. http://ec.europa.eu/environment/gpp/pdf/take_5.pdf (Last access: 08.03.2018)

Lack of Co-Operation between Authorities

Not only within single institutions one can find the lack of communication and support for the public procurement practitioner, but between different procurement authorities, too.

There is a lack of joint initiative, cooperation and coordination in terms of systematic implementation of GPP within countries and also across Europe, with the majority of public authorities acting alone, often on their own initiative. Both informal and formal cooperation needs to grow to enhance GPP. The lack of coordinated exchange of best practice and networking between authorities has been identified as an obstacle to greater GPP implementation. This should not only be joint (cross-national) procurement but also experience sharing.

Disuse of Market Power

The public procurement sector has an important market power. This market power is unfortunately not used by the public sector in a way to support the shift from a fossil-based economy to a bio-based economy. The lack of joint procurement of different communities plays an important role.

Furthermore, lack of market demand has been identified as a key obstacle for innovation generally, public demand being especially important in sectors such as construction, transport and healthcare or in those instances where the public sector is a 'first user' of the innovation. A couple of procurers focus on special products or services, whereas most lack of confidence and support and go for the usual procurement process.

Regulation

One of the drivers of environmental supply chain management can also act as a barrier. Environmental legislation and regulation can inhibit innovation by prescribing best available techniques and setting unreasonable deadlines. BBPS witness a high level of regulation. Where regulations should support BBPS, they act often more as a barrier than a trigger.

RECOMMENDATION: PROCUREMENT AND CO-OPERATION

Support from Leading Positions

The barriers on 'public sector and regulations' are focusing on issues a public procurement practitioner cannot control. They focus on competence areas above the actual procurer. The following recommendations focus on the political and management support.

As noticed in the InnProBio [good practice examples](#) the procurement activities demanding for BBPS all had one common feature: underlying regional or communal manifestos, missions or values. Lack of political and management support and further, lack of co-operation between authorities has to be tackled by the leading positions in a public administration and by political decision makers. For example, the Dutch government promotes in its efforts to help stimulate innovation, the development of the bio-based economy and thus supports public procurement of bio-based products and services. The government actively supports products and services which include bio-based materials in their public calls for tender, where possible. Furthermore, bio-based procurement

is also targeted as part of the government's Responsible and Sustainable Procurement Action Plan (2015-2020)¹⁴.

A clear commitment to bio-based procurement in the form of a manifesto or a mission that provides a solid basis and mandate for public procurers helps to overcome barriers to recognition and acceptance. It will also provide visibility and authority through the support of political decision makers.

Consumer awareness must be raised. Many opinion-leading and policy-making stakeholders in Europe's public procurement community - including procurement agency executives, suppliers, politicians and end-users of the procured goods and services - are unaware of the notions of bio-based products and the associated benefits, characteristics and economic opportunities. Considerable effort should be given to articulating universal guidelines for procurement of bio-based products which should include compelling value propositions and a vision for levels of take-up in a defined timeframe.

All in all, the described barriers have overall a chance to be diminished, if authorities at decision making level decide to commit to procurement of BBPS like the Dutch government.

PERCEIVED BARRIERS: PROCUREMENT IS BROADER THAN PROCUREMENT DEPARTMENTS

The chapter on 'procurement is broader than procurement departments' describes barriers, which are namely *broader organisational perspective on procurement and communication within organisations*. The recommendation focuses on the *communication between the public procurers and the actual end-user as well as the higher decision making level*.

Broader Organisational View of Procurement

It is difficult to see how procurers can respond to the many increasingly complex policy agendas (such as skills, SMEs, innovation, sustainability) that procurement is expected to deliver when they have limited influence over some policies. In this sense, the need to apply a broader organisational perspective on procurement constitutes both a finding and a shortcoming of current literature, as in most studies only procurement professionals or suppliers were approached and no functional specialists or senior managers.

Drivers towards environmental supply chain management practices include the personal commitment of leaders, middle management, 'policy entrepreneurs' and investors. Internal organisational drivers include focusing on cost reduction through minimising waste and pollution, often leading to quality improvements.

Interaction with final users is often hindered by the lack of communication within organisations between the procurement unit and operational or service areas that are closer to end users' needs.

¹⁴ Action plan for Responsible and Sustainable Procurement by governments 2015-2020: <https://www.pianoo.nl/sites/default/files/documents/documents/netherlandsactionplanresponsibeleandsustainableprocurement20152020.pdf> (Last access: 06.03.2018)

Centralised procurement units within organisations and/or a lack of cross-functional team work in procurement can thus lead to a structural disconnect between potential suppliers, users and buyers.

Communication within Organisations

Discussions on procurement of innovation cannot take place in isolation. They should recognise both complex organisational issues and diverse, often conflicting, policy goals. Rather than elevating innovation goals above the proximate goals of public procurement, the challenge is to understand how innovation can help other policy objectives or help overcome perceived conflicts in policy goals. Decisions should be made on a case-by-case basis depending on what is being procured and its uses, as well as other political and financial constraints and objectives.

RECOMMENDATION: PROCUREMENT IS BROADER THAN PROCUREMENT DEPARTMENTS

Communication between Actors

Procurement decisions are also strategic decisions. The decisions taken higher up in the organisations will influence the procurement department. Stimulating long-term sustainability goals within governments and companies will influence procurers to procure for innovative, bio-based products and services. Furthermore, experience shows that not only should higher decision taking levels or policy levels be included in the procurement process but the end-user as well. Procurement practitioners and the end-user within a company often do not share the same work purpose. Therefore, both parties should communicate about the needs and the requirements of the product. At every level during the procurement process 'communication is key'. The commitment of every employee within an institution is therefore important.

It is recommended to build e.g. various communities of practice on a small scale. It is obvious that such a goal cannot be reached from one day to another. First, the focus should lie on building small groups of institutions which share ideas and knowledge. If that ambitious goal is achieved a melting of different small groups into a bigger group can be discussed.

PERCEIVED BARRIERS: BARRIERS RELATED TO THE NATURE OF GREEN AND/OR INNOVATIVE PRODUCTS

The chapter on ‘barriers related to the nature of green and/or innovative products’ describes the main barriers perceived and voiced by public buyers related to green or innovative products, i.e. *costs, industry specific barriers and lack of trust*. The recommendation focuses on the organisation of *market dialogues and training*. **Communication served very well to tackle these barriers and reduce misconceptions.**

Costs

The desire for lower prices may inhibit green supply chain management. Public procurers perceive green products as more expensive than traditional products. Procurers are used to tackle mainly efficiency and governance issues in their interactions with suppliers, and have little experience with broader, social demands.

Industry Specific Barriers

It has been found that companies in different industries have differing drivers, barriers and practices. These can influence how reactive or proactive firms in a particular sector are to environmental supply. Several organisations encounter barriers that represent phenomena confined to a specific industry. Some of them appear very difficult to overcome. In case of BBPS it has been discovered that companies often do not want to be connected with bio-based products¹⁵.

Lack of Trust

In analysing relationships between procurers and suppliers it was found that confidentiality was a major difficulty in green supply chains. Companies are often unwilling to exchange information on green supply for fear of exposing weaknesses or giving other companies competitive advantage. This is probably not the case in product categories or markets where product characteristics are widely known. Trust is for instance extremely important when procurers audit suppliers. Some suppliers might fear that their poor environmental performances will be publicly exposed and thus decide not to participate in a project. This might not only be a barrier to BBPS, but as companies producing BBPS are often SMEs it should be taken seriously.

¹⁵ This refers mainly to companies which produce cleaning products. This is a research result from the EU-project BioCannDo. Three main reasons were identified in a [report from BioCannDo](#). 1) lack of a well-established third party verification/ label and the cost-intensive process of applying for related labels – hindering them from claiming their products to be bio-based, 2) the very specific aspect of the subject (niche topic) – respondents assessed a rather small market share of bio-based products (especially relevant for SMEs), or they saw 3) no need/ possibility for participating in workshops.

RECOMMENDATION: BARRIERS RELATED TO THE NATURE OF GREEN AND/OR INNOVATIVE PRODUCTS

Market Dialogues/ Trainings

Through targeted outreach to market parties, such as the innovative products procurers, successful business, and standardisation parties and decision makers a significant improvement in trust in the products can be achieved. Setting an active dissemination channel expanding the public awareness of good practice and effective business cases is expected to be relevant.

Market dialogues and trainings such as those organised during the InnProBio project in the Netherlands, Germany and Poland are ideal methods to bring market parties, decision makers and standardisation experts together. Future promotion and organisation of market dialogues organised in combinations with trainings and interaction between different industries could generate and facilitate exchange of good practice examples and market drives. Additionally, all involved partners learn what others think and where certain barriers come from. The organised market dialogues revealed that many barriers exist because of a lack of communication. The barriers, e.g. costs and lack of trust can be tackled by communicating why these differences exist. Costs might be higher when buying, but at the end the Life-Cycle-Costs¹⁶ might be lower.

¹⁶ InnProBio-Toolbox. Glossary: https://www.biobasedconsultancy.com/en/about-biobased/glossary1#letter_l (Last access: 06.03.2018)

3. Conclusion

This report should be seen as a support and recommendation to decision makers and standardisation bodies on how to improve the public procurement of BBPS.

It focuses on recommendations to;

- increase the overall knowledge on public procurement of BBPS of the public procurement practitioner.
- help management positions to support the public procurement practitioner to aim at the procurement of BBPS
- reduce and finally diminish regulations, which prohibit the procurement of BBPS.
- Diminish fundamental misconceptions concerning actual costs of BBPS and barriers that interfere relations between the public procurer and suppliers of BBPS.

Summarising all recommendations, it can be noticed, that the focus lies on raising knowledge, support within procurement institutions and increased communication between all actors involved in a procurement process. The evolution of the fossil-based economy to a bio-based economy cannot be achieved in isolation but in co-operation.

Annex

Viable product groups

The following categories are relevant for procurement of innovative bio-based products and services (BBPS). The categories represent a significant portion of public spending, have a potential for BBPS and already have multiple alternative innovative BBPS available, and thus can have an impact. They have been cross-checked on availability, applicability and completeness.

Procurement sector	Bio-based products
Food, catering and events	Disposable cups and table ware from bio-based polymers
	Packaging materials and utensils from bio-based polymers
Hospitals and laboratories	Disposable lab materials: tubes, gloves, petri dishes
	Disposable nursing articles: bedpans, urinals, gloves, bed sheets, towels
Clothes and textiles	Textiles for public personnel
ICT & office supplies	Office supplies from bio-based composites
	Toner for cartridge
Vehicles and mobility	Tyres from natural rubber from dandelions or other innovative materials
	Light weight automobile interior parts
	Bio-based lubricants for vehicles and tools
	Under the hood parts of bio-based polymers
	Upholstery of soybean foams
	Floor mats of bio-based polymers

	Textiles for seating
Cleaning, hygiene and sanitary	Bio-based cleaning detergents including bio-based surfactants
	Biodegradable plastic bags for disposal & other materials relevant for hygiene
Infrastructure: construction materials	Road construction materials: asphalt, bio-asphalt, binder
	Various elements for roads: guide rail, lampposts, sound barrier, railings
	Concrete casting
	Sewerage: Pipes from bio-based PVC
	Street furniture: bins, benches, picnic tables
	Road and street signs
	Bridges and viaducts: construction materials
	Concrete: bio-based filler, reinforcement, hemp concrete
Buildings: construction materials	Wooden-frame construction
	Bio-based insulation
	Decking
	Facade panels
	Bio-based painting and varnishes
	Various bio-based indoor products for buildings
Furniture and indoor interior	Office furniture from bio-based composites
	Office upholstery and carpets from bio-based polymer fibres
	Other innovative bio-based man-made textiles for interior
Gardening and	Biodegradable bio-based pots and seeding beds

landscaping	Clips and binders from biodegradable bio-polymers
	Erosion mats and geotextiles
	Gardening tools with removable plastic parts
	Drainage and pipes
	Valorising waste streams from gardening

Overview barriers

In the following table a comprehensive overview is presented of all mentioned barriers and the respective drivers. In order to make the current report accessible not all barriers have been elaborated in the main text. Nonetheless, every barrier is important to be addressed. At first sight, it looks like a rather large number of barriers are present. However, some barriers are of similar nature and some are interconnected, i.e. if one barrier is eliminated another one is reduced or removed as well. For example, if the knowledge barrier is eliminated other barriers, e.g. ‘fear for the unknown’, ‘too many certificates’, ‘tender procedure’ and more are eliminated as well.

Type	Barriers	Drivers
Expertise	Lack of knowledge (internally and externally)	Time to gain experience
	Unknown makes unloved	<ul style="list-style-type: none"> Share successes Create a group to learn and experience and expand to other projects Communicate what is already possible, also in terms of certificates Connect with other relevant organisations and politicians Start a campaign targeting sustainability coordinators that can inform management. Share honest examples.
	Bio-based is not always sustainable.	Additional requirements required (compostable, bio-degradable)
	Fear for the unknown	Include the entire organisation, everyone needs to understand
	<ul style="list-style-type: none"> A lot of relevant information is only available in English Too much information on too many different websites Too many certificates Products are unknown to public procurers Tenders (bio-based vs. recycling – some procurers think that it’s the 	<ul style="list-style-type: none"> Translate into other European languages Make a portal on a trusted website to guide procurers to relevant pages Less certificates / less dependency on certificates Communication and education on bio-based products / training and market dialogues National contact person/s for

Type	Barriers	Drivers
	<p>same)</p> <p>Missing knowledge and as a result the incapability to procure BBPS in a correct manner</p>	<p>sustainable procurement</p> <p>More training is needed</p>
	<p>There is hardly any information on BBPS in different European languages available, public procurers are not aware of the possibility to introduce BBPS into their procurement policies.</p> <p>The life cycle costing method in public procurement of BBPS may cause a lot of problems, as there are no official an accepted calculation methods introduced. Products are unknown to public procurers.</p> <p>Missing knowledge and as a result the incapability to procure BBPS in a correct manner.</p>	<p>Make a portal on a trusted website to guide procurers to relevant pages</p> <p>Communication and education on bio-based products / trainings and market dialogues</p> <p>More training is needed</p>
Procurement Strategy	<p>Fear for law suits</p>	<p>Knowledge and experience</p>
	<p>Price of BBPS is too high (profitability of public service) especially when neglecting LCC</p> <p>Public procurer cannot do it all alone, there is a lack of internal support</p> <p>Tenders: To allow only bio-based products is problematic</p>	<p>Do not use initial costs but Life Cycle Costs</p> <p>Public Procurer needs support from all positions in his organisation (especially from high positions like directors)</p> <p>Variants should be allowed and good market research is necessary</p> <p>More good practices are needed</p>
	<p>Price of BBPS is too high (profitability of public service) especially when neglecting LCC.</p> <p>Public procurer can't do it all alone; there is a lack of internal support.</p>	<p>Public Procurer needs support from all positions in his organisation (especially from high positions like directors)</p> <p>Variants should be allowed and good market research is necessary</p> <p>More good practices are needed</p>

Type	Barriers	Drivers
Technical/ Organisation	Technical problems and adapting your own business management	Create more market volume by acting as a 'launch customer'
	(Perception:) Specifications of BBPS	Challenge the market / do not settle for less Prepare the market by announcing the vision and scope of your procurement
	Safety not yet demonstrated	Start with small pilots
	Organisation is not ready or prepared to invest	Focus on TCO and not initial costs
	Assessment: Is there enough supply available? If not, less choices and alternatives present. Higher risk.	Keep it simple and take little risk.
	Not enough BBPS alternatives Quality of bio-based products is often not sufficient Image of BBPS needs to be developed	Add BBPS to the catalogue Increase quantity and quality of bio-based products
	Not enough BBPS alternatives Quality of bio-based products is often not sufficient Image of BBPS needs to be developed	Increase quantity and quality of bio-based products

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