

# Biomass in the balance

A sustainability framework  
for high-value use of bio-based  
raw materials



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#### Contents

Foreword .....	2
<b>Outline report .....</b>	<b>4</b>
1. What is the background to this advisory report?.....	4
2. What is the main message? .....	5
3. What is the SER's underlying vision? .....	8
4. What does the SER's vision mean for the sustainability framework? .....	9
5. What does the assessment framework mean for the use of bio-based raw materials? . .....	13
6. Are there potentially enough bio-based raw materials to meet Dutch demand?.....	15
7. Why is effective government action necessary?.....	16
8. What form does the SER think the assurance of sustainable production should take?.. .....	18
8.1 Enshrined in law .....	18
8.2 Private certification schemes .....	19
8.3 Public oversight and enforcement.....	20
9. What are the guiding principles for encouraging and assuring the sustainable use of bio-based raw materials? .....	20
10. What are the policy measures for each area of application?.....	23
11. What is the role of policymakers?.....	26

## Foreword

In order to achieve the transition to a climate-neutral, circular economy by 2050, we will have to pull out all the stops. A much more efficient use of energy, raw materials and resources on the one hand and the use of sustainable energy and renewable raw materials on the other hand, are absolute prerequisites in a growing global economy for securing the prosperity of ourselves, our children and our grandchildren.

However, transitions are hard to predict and require major adaptations, both in terms of technology and the economy and in terms of society. It is therefore no surprise that the use of biomass in our economy is the subject of heated debate. Even among scientists, as this advisory process has shown. For example, climate scientists look differently at the use of certain forms of biomass than ecologists who put biodiversity at the heart of their research. This makes the debate even more difficult for non-specialists.

This strengthens my conviction that this unanimous advisory report of the Social and Economic Council of the Netherlands (SER) provides a good framework for weighing up the various perspectives and interests. Its great benefit is that parties have united to produce a sustainable blueprint for the future. This shared vision enabled us to formulate an advisory report on the use of sustainable bio-based raw materials now and in the near future as a possible interim solution. The developments have stabilised sufficiently in a number of areas and the parties in this advisory report are anticipating the results of this assessment. Often, however, the picture is still unclear and follow-up steps require further consideration by politicians.

The use of biomass, or rather bio-based raw materials, therefore plays an important part in making our economy and way of life more sustainable. Sometimes the use of bio-based raw materials is an interim solution because technical alternatives are not yet affordable and available, as is the case with heavy road transport, shipping and aviation. But the direction of travel is clear: sustainable bio-based raw materials in the form of high-value applications in materials and certain sectors, such as chemicals, are a permanent part of a sustainable blueprint for the future.

The fierce scientific and social debates have been reflected in major studies by the Netherlands Environmental Assessment Agency (PBL) and Royal HaskoningDHV, who supported this fact-finding exercise. But the fact-finding exercise was also fuelled by dozens of letters from civil society organisations and citizens, by administrators at local government level and by the members of the broadly based SER committee and working group. This extensive run-up to the final advisory report is one of the most valuable benefits of this advisory process. I am therefore very proud that we have succeeded in reaching a unanimous advice. I would like to point out that we at the SER attach great importance to the fact that – in addition to Crown members and social partners – nature conservation and environmental organisations are also full members of the preparatory committees when sustainability issues are involved. I also find it very encouraging that all the participating parties have stuck their necks out to produce this report and take the debate on the use of bio-based raw materials a step further. I would particularly like to thank our Crown member Katrien Termeer who chaired the working group which prepared the advisory report and Ed Nijpels who chaired the Sustainable Development Committee which adopted the advisory report. The SER secretariat skilfully supervised the process in difficult times and wrote the carefully balanced text of the advisory report.

Finally, I would like to point out that the SER has been asked by the Dutch government to come up with a report to provide guidance to help the government make choices. I am convinced that the assessment framework in this advisory report can help the government to take control and give direction both now and in future. This is also necessary to ensure that we can invest in sustainable bio-based raw materials for a sustainable and fair future.

Mariëtte Hamer  
*Chair, SER*

The SER advisory report *Biomass in the balance. A sustainability framework for high-value use of bio-based raw materials* was adopted on 6 July 2020 by the SER Committee on Sustainable Development (DUO).<sup>1</sup> The report consists of two parts: an outline report and a full report. These two documents can be read independently. The outline report is derived from the full report; the latter is also where its content is substantiated with references.

## Outline report

### 1. What is the background to this advisory report?

#### *Request for advice*

This advisory report of the Social and Economic Council of the Netherlands (SER) deals with the role of biomass in the transition to a carbon-neutral, circular economy by 2050. Biomass can be produced from crops, trees and plants, algae and animal products. In order to make the desired contribution to transition processes, biomass must be produced and used as sustainably as possible.

In light of its policy objectives for 2030 and 2050, the government has two basic principles for the use of sustainable biomass:

- only sustainable biomass contributes to the transition to a low-carbon, circular economy;
- ultimately, sustainable biomass must be used in the most limited and high-value way possible. This applies to biomass of both national and international origin.

In order to abide by these principles, the government has asked the SER to advise on creating a sustainability framework for the use of biomass. This sustainability framework should contain widely supported, coherent criteria for the sustainable production and use of biomass, in addition to any existing legal national and international sustainability criteria. In addition, the government asked the SER to advise it on the availability and applicability of sustainable biomass, and to address the issue of distribution. Finally, the government asked the SER to advise on ways of dividing responsibilities between private parties and the government with regard to both the availability of sustainable biomass and the prioritisation and cascading of flows for sustainable applications.

#### *Building blocks for the report*

The SER was able to make grateful use of the preliminary work commissioned from the Netherlands Environmental Assessment Agency (PBL) and Royal HaskoningDHV (RHDHV) by the Dutch government. The PBL report *Availability and possible applications of sustainable biomass* and the report *Broadly applicable biomass sustainability criteria* of RHDHV are important building blocks for this SER advisory report. The input for this advisory report also includes a stakeholder process, roadmaps and numerous written contributions. The box below describes the way in which the SER has incorporated scientific and social insights into this advisory report.

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<sup>1</sup> The Board of Friends of the Earth Netherlands is recommending the report to its members, knowing that no decision can be taken until the general members' meeting on 29 August 2020.

### Incorporating scientific and social insights

A joint fact-finding process formed part of the PBL report. Over 150 scientists, companies and civil-society organisations were consulted, over 400 studies were included and three stakeholder meetings were held. This did not necessarily involve a search for consensus, but rather an insight into the main reasons behind the various positions in the social debate.

The proposal for specific sustainability criteria for the production of bio-based raw materials by RHDHV was also based on a stakeholder process. The report gave the working group an insight into stakeholders' views on sustainability criteria for the production of bio-based raw materials and their assurance.

In addition, the SER working group has taken note, with thanks, of many written contributions from various parties and coalitions. Also included are relevant roadmaps drawn up in the spring of 2020 by various stakeholders within the framework of the Climate Agreement, i.e. the Green Gas Roadmap, the Cascading Roadmap and the Bio-Based Raw Materials Roadmap. Finally, at the working group's request, a delegation of local and regional authorities raised questions and concerns both in writing and orally (at a digital meeting).

## 2. What is the main message?

### *Use of bio-based raw materials must contribute to three sustainability transitions*

In this advisory report, the SER provides guidance on the development of a sustainability framework and illustrates the consequences of this for the use of bio-based raw materials in various areas of application (see box *From biomass to bio-based raw materials*). The SER's ambition is to ensure that the use of bio-based raw materials will contribute to three sustainability transitions in order to promote a broad concept of prosperity.

To begin with, there is the need to drastically cut carbon emissions by reducing the use of fossil resources such as oil, coal and gas as far as possible and replacing them with renewable alternatives as part of an approach to counteract global warming (carbon neutral by 2050). The use of bio-based raw materials in feedstocks, materials and certain energy applications are measures which are needed to achieve the objective of the Paris Climate Agreement. The SER sees a limited role for them in energy applications in the long term because more and more alternatives are being developed; for the short term, the SER foresees a role as a bridging solution for sectors that are difficult to make sustainable, such as heavy road transport, aviation and shipping.

Secondly, bio-based raw materials have a vital role to play in the transition to the circular economy, where they have the potential to significantly reduce the climate impact of sectors such as chemicals and construction. Long-term carbon sequestration in materials has great potential for both the climate and the circular economy. The SER therefore foresees a substantial growth in the use of bio-based raw materials in materials and chemicals.

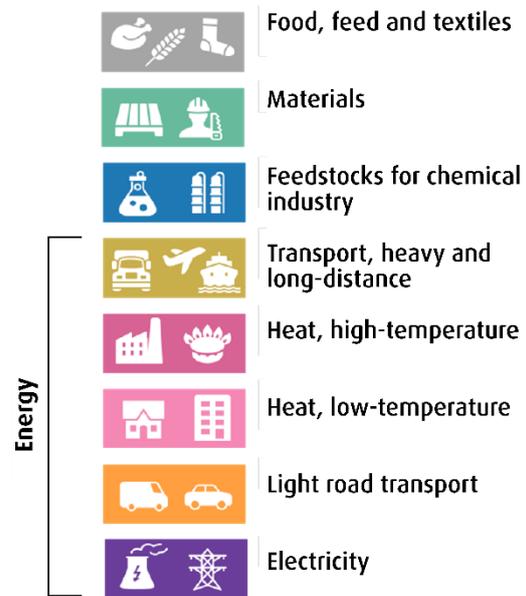
Finally, the use of bio-based raw materials as soil improvers, possibly in a cascaded form, will play a more prominent role in agriculture (transition to circular agriculture). The three sustainability transitions are crucial if we are to make the economy more sustainable and maintain the competitive position of the Netherlands and therefore employment in important sectors of the Dutch economy, including the agro-industry, the chemical industry, the energy sector, the construction sector and the logistics sector.

### From biomass to bio-based raw materials

Biomass has a wide range of existing and new applications for society. In order to better reflect the diversity and value of biomass, the SER has chosen to use the concept of bio-based raw materials in this advisory report.

The SER focuses mainly on the *emerging* applications of bio-based raw materials (energy, feedstocks and materials) and less on fibres (textiles and paper), food and animal feed, for which the vast majority of biomass is used.\*

The different applications of bio-based raw materials are shown in the figure on the right. The order in which they are shown illustrates the importance of the use of bio-based raw materials for an application arising from the assessment framework presented by the SER in this advisory report. Food and the use of bio-based raw materials in chemicals and materials (e.g. wood in the building industry) represent the greatest value.



\*Use of biomass to maintain soil quality (structure, nutrients and soil life) are part of the sustainability criteria for production in this advisory report. It is therefore a prerequisite to be able to use bio-based raw materials.

### Recalibrate the role of bio-based raw materials in the Dutch economy

Implementation of the sustainability framework results in the recommendation to review the role of bio-based raw materials in the Dutch economy. High-value applications, such as in the chemical industry and in materials, are of great importance and should therefore be better exploited and promoted. Examples include innovative bio-materials, such as bio-composites, bio-concrete (based on elephant grass) and other materials. Low-value applications, on the other hand, such as combustion for electricity generation, heat (low temperature) and fuel blending for light road vehicles, should be phased out. This also requires sustainable alternatives to be made available at a reasonable cost. Bio-based raw materials may still be needed only in specific cases, such as for the heating of old inner cities and where insufficient electricity is available from sun and wind.

Under the right conditions, bio-based raw materials can therefore also be a bridging solution towards a carbon-neutral economy if there are not enough alternative, more sustainable technologies available for the time being. In the next few years, some bridging applications will still be in a build-up phase. From 2030 onwards, the SER expects that other technological solutions will be further developed and come on to the scene (see also Figure 2). This explicitly applies to biofuels for heavy road transport, aviation, (sea) shipping and high-temperature heat. The SER does, however, point out that a situation must be avoided where the demand for bio-based raw materials for these bridging applications becomes too great and government policy to promote more sustainable alternatives is not being developed, or is being developed too slowly (lock-in situations). Supported by government policy, the Dutch business community will therefore have to invest heavily in the rapid development of more sustainable solutions. For transport and mobility, this means, for example, fuel-saving measures and synthetic fuels based on renewable energy.

By using the valuable elements of bio-based raw materials more efficiently, they can make a greater contribution – certainly in the longer term – to the aforementioned sustainability transitions, a future-proof economy and good employment prospects. The Dutch business community can seize opportunities by focusing on the high-value application and multiple value creation of bio-based raw materials. What is an optimal cascading approach depends on the circumstances and the phase in the transition to a carbon-neutral, circular economy. The Council points out that even within a circular economy, there will continue to be sustainably produced flows that do not have a high-value application after cascading. These can be used for energy applications, provided that market incentives are aimed at high-value rather than low-value utilisation.

In short, the SER observes that the future-oriented use of bio-based raw materials requires an adjustment of government policy and business models, because bio-based raw materials are too valuable to serve as a one-to-one replacement for all fossil applications. This implies that low-value applications of bio-based raw materials, where alternatives are available and yet to emerge, will have to be phased out over the next few years. Phase-out must go hand in hand with the phase-in of fully-fledged sustainable alternatives. In the case of a phase-out pathway that is quicker than companies and employees could reasonably foresee, it will be appropriate to pay compensation for investment and for employment and social consequences. After all, the Dutch government has a shared responsibility for a fair transition, which also covers the impact of the transition on society and public spending. The SER does, however, stress the importance of having reliable public authorities. The fulfilment of agreements is of great importance in ensuring companies' confidence in the investment climate. The active involvement of social partners and public authorities, both at central and at regional and local level, in policy changes is necessary to properly manage the resulting process of job losses and also new employment opportunities.

*Limited sustainable availability of bio-based raw materials means choices have to be made*  
According to the Council, strict criteria are needed for the sustainable production of bio-based raw materials. The European Union's Renewable Energy Directive RED II provides a widely applied basis for this. Wishing to ensure a level playing field, cascading and multiple value creation, the SER is therefore in favour of aligning, wherever possible, the sustainability requirements that apply to the energy sector as specified in RED II with other sectors (industry, chemicals, construction). Moreover, from a broad perspective of prosperity, the SER sees a number of possible additions to these guidelines, such as the inclusion of socio-economic criteria in ensuring the sustainable production of bio-based raw materials.

The use in the Netherlands of bio-based raw materials that meet the desired criteria is limited by global capacity limitations on producing bio-based raw materials sustainably and on minimising the ecological and social risks that may arise earlier in the raw material supply chains. Although a basic comparison of demand and availability shows that, both globally and in Europe, there is sufficient potential to meet the Dutch demand for sustainable bio-based raw materials, the SER believes that the Netherlands should not make a disproportionate claim on the availability of sustainable bio-based raw materials. It is therefore legitimate to ask what constitutes a fair share of bio-based raw materials for the Netherlands. The SER can only pronounce on this in general terms. There is no unambiguous and generally accepted basis available to operationalise this principle in policy, not even for other raw materials. The SER does, however, advise the government to make a distinction between sectors that produce primarily for the domestic market and sectors that produce for the international market.

Finally, the limited availability also requires the government to make choices that will ensure the effective and efficient use of valuable bio-based raw materials, so that they contribute to a

circular economy, the fight against climate change, a clean and healthy living environment and socio-economic progress.

### **3. What is the SER's underlying vision?**

#### *The SER uses a broad concept of prosperity*

The SER uses the broad concept of prosperity as a starting point for policy advice. Based on this vision, the Council develops the sustainability framework in this advisory report, using the seventeen United Nations Sustainable Development Goals (SDGs) as the gold standard. Socio-economic policy must focus not only on material progress, but also on social cohesion, a healthy living environment, good working and employment conditions and good environmental quality (both now and in future, but also here and elsewhere). There may be synergy between the various pillars of sustainability or broad prosperity, but environmental, social and economic objectives (Planet, People, Profit) will often have to be weighed against each other. Not everything is possible, not everywhere, and certainly not at the same time. This means that priorities need to be set and smart combinations are needed, where opportunities and threats are sometimes not far apart.

#### *The SER believes that different perspectives must be respected*

The SER observes an increasing degree of polarisation regarding the use of woody biomass, mainly due to a strong difference of opinion as to how the sustainability gains from using bio-based raw materials should be assessed and a lack of confidence in the certification of sustainable production. Similarly, the PBL concludes that the controversies stem from different perspectives as regards the production and use of bio-based raw materials. It makes a difference, for example, whether climate change or biodiversity is chosen as the starting point and whether the use of bio-based raw materials is regarded as an opportunity or a risk. Distribution issues also play an important role in the considerations. The SER does not opt for a single perspective, but believes that all perspectives based on a clear desire for sustainability must be respected.

#### *The SER takes a transition perspective*

The use of bio-based raw materials should contribute to three sustainability transitions as a necessary precondition for fair and broad social prosperity: reduction of greenhouse gases (carbon-neutral), transition to a circular economy and the agricultural transition. Every sustainability transition has its own goals, strategies and actors. There is a lot of overlap between the transitions, which can lead to synergy. Developments that contribute to multiple transitions at the same time can increase support. For example, bio-based raw materials are at the heart of the circular economy as a supplier of renewable feedstocks, medicines, chemicals and materials. In the case of energy and raw material transitions, the circular economy often strengthens climate policy. Conversely, a circular economy is only conceivable if there is sufficient renewable energy. Tensions arise when the energy transition takes place in a linear economy, which can lead to scarcity of bio-based raw materials, including critical metals.

#### 4. What does the SER's vision mean for the sustainability framework?

The SER vision is reflected in the guiding principles of the assessment framework that underlies the choices to be made with regard to the production and use of bio-based raw materials. This framework has been drawn up for bio-based raw materials with applications in the Netherlands for energy, feedstocks for the chemical industry and use in bio-based materials. It does make connections with the agricultural transition, but the framework cannot (yet) be used as an assessment framework for sustainable food. The SER advises that in future the sustainability framework should be further developed into an integrated framework that will eventually apply to all types of bio-based raw materials, including their use in other applications, such as food, animal feed and fibres (textiles and paper).

##### *Assessment framework: general principles*

The assessment framework consists of a number of general principles:

- Do not mortgage the future by burdening future generations with a "debt", either in the Netherlands or elsewhere. And apply the precautionary principle where applicable by preventing irreversible damage (see Section 3.2.2 of the advisory report).
- The sustainability requirements we set for the production of bio-based raw materials exceed the potential need for their use. If it turns out when criteria are applied that there are insufficient sustainable bio-based raw materials available to match the government's ambitions, the SER believes that this cannot and should not lead to a reduction in the sustainability requirements for the production of bio-based raw materials.
- Production of bio-based raw materials must comply with uniform sustainability criteria, irrespective of their use. This means, for example, that sustainability requirements for the production of wood, including by-products, should be the same for different uses, such as building materials, paper or heat.
- Sustainable production regardless of type of products or by-products. The SER considers it sensible to make as little distinction as possible between products and by-products when setting sustainability requirements for the production of bio-based raw materials and to avoid the term "residual flow" (although RED II does refer to "residues"). There is no unequivocal way of distinguishing production flows from by-products, and continuing development of the bio-based economy and the circular economy will further blur the distinction between main flows and by-products.
- The sustainability framework is a growth model with increasingly sophisticated production requirements and more high-value applications.

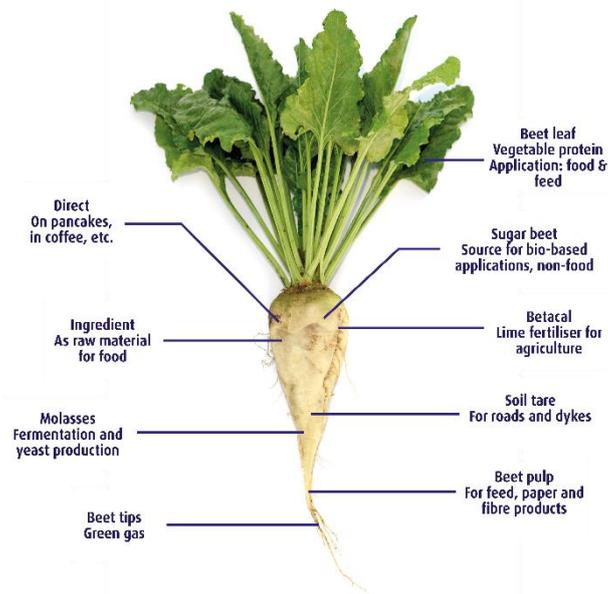
##### *Principles of application: cascading as a tool*

The main route to a circular economy consists of reducing the use of raw materials, re-using products and recycling them at end of their useful life. Renewable raw materials will still be needed. Cascading offers a strategy for using bio-based raw materials in as high-value, optimal and efficient a way as possible. Cascading is an important means of determining whether the market leads to optimal value creation and which incentives the market needs to do a better job. The SER argues in favour of supporting multiple value creation (see box *Multiple value creation*). What is considered 'optimal' in the case of cascading and multiple value creation will constantly be changing as a result of innovation; from a technical and economic point of view, energy applications will continue to be possible for a time at the end of a cascade.

### Multiple value creation

Conversion technologies and "flexible crops" facilitate the growth of multiple value creation. A "flexible crop" can be cultivated simultaneously for the production of food and other applications and therefore contribute to multiple sustainability transitions.

Thanks to conversion technologies, such as biorefineries, the digestible parts of a crop can first be extracted and by-products can be used in other applications. For example, sugar beet (see illustration) is grown for sugar (food), while secondary production is possible for animal feed (from beet pulp), as a feedstock for chemicals (from molasses), and for the production of green gas (from beet tops).



### *Assessment framework: criteria for the production of bio-based raw materials...*

The degree of sustainability in the use of bio-based raw materials is ultimately determined by the supply chain from production to use. It covers a multitude of aspects, both socio-economic (good working and employment conditions for local workers, workers' rights and protecting the position of indigenous peoples) and environmental (water availability, biodiversity, harmful emissions, soil quality and carbon stock). The SER also considers any encroachment on local food production and indirect land use change to be irresponsible (see also Section 3.2). At the same time, the SER considers it essential for continuous improvement to be part of the sustainability process. For this reason, a target has been set for criteria for 2030 as well as for the criteria for 2020.

### *... and criteria for the use of bio-based raw materials in the Netherlands*

The SER believes that trade-offs with regard to the use of bio-based raw materials must be assessed from a transition perspective. Policies should be geared towards accelerating the pace at which the various policy objectives are achieved. Growth pathways differ and insights into the sustainability of uses can change over time. This dynamic calls for government control of the "interim period", in which swapping between different goals is sometimes necessary, because doing nothing is a worse (less sustainable) option. Right from the initial phase of transitions, it is important to focus on the phase-out of existing less sustainable activities, as well as recasting existing activities in a sustainable direction and phasing in new, sustainable niches.

### *Bridging applications require special attention in the assessment framework*

If more sustainable alternatives are not yet in sight or can only be used in the long term, it should be considered whether choosing bio-based raw materials as a bridging solution is preferable to (in the long term) a direct switch to the alternative in order to avoid lock-ins or "path dependencies". Conversely, there may also be a trailblazer: the current, growing market for biofuels, for example, may boost the development of a market for bio-based chemicals,

because larger volumes of products and by-products of sufficient quality will become available. These trade-offs therefore have nuances for each use or even within uses. Against this background, the sustainable use framework (see also Section 3.3) weighs up to what extent bio-based raw materials contribute to the transition to a circular economy, the fight against climate change, a clean and healthy living environment (see box) and socio-economic progress (including employment aspects). Figure 1 summarises the use of the sustainability framework for bio-based raw materials.

**Use of bio-based raw materials and a clean and healthy living environment**

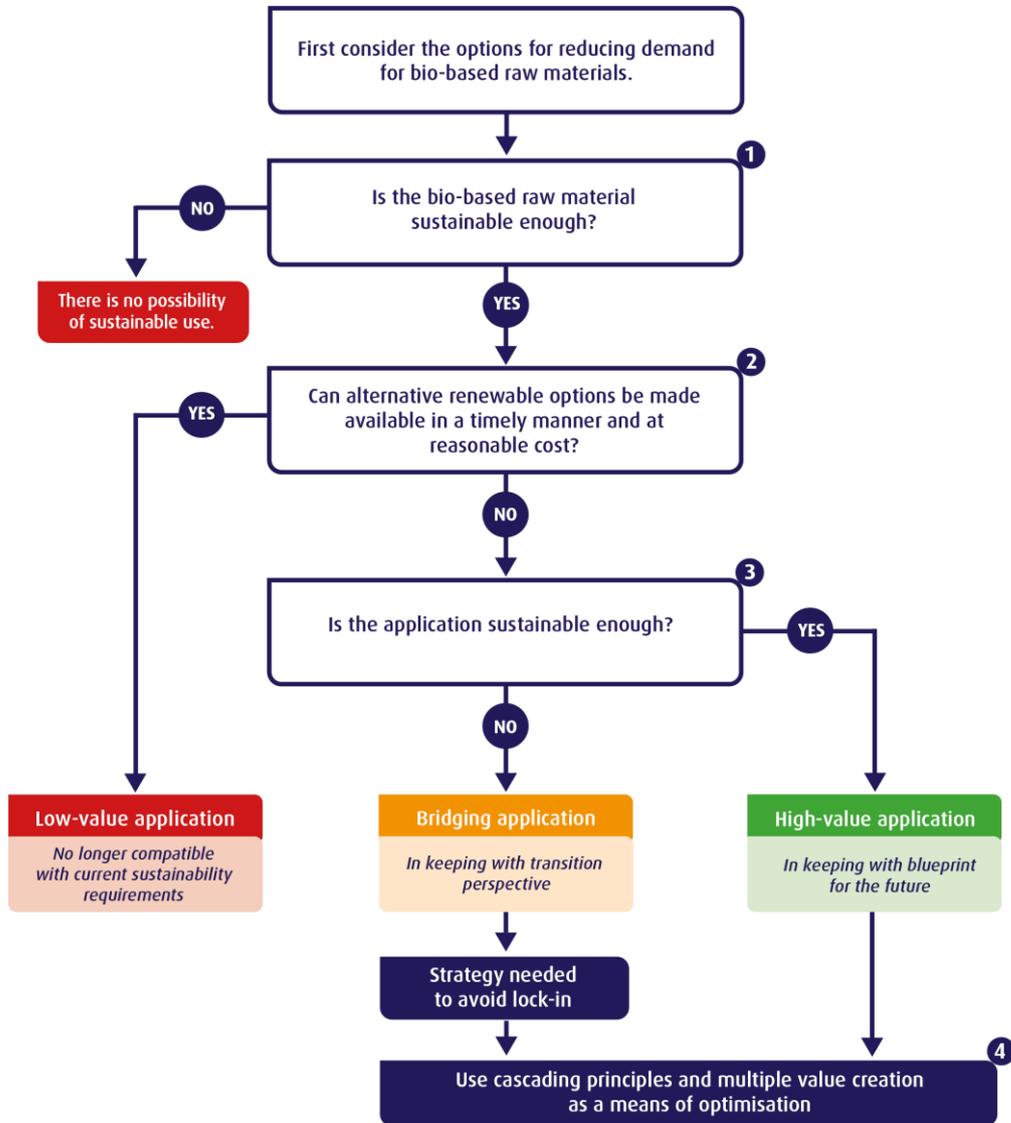
The use of bio-based raw materials can have an impact on air quality and therefore cause health effects. This is particularly important when burning solid bio-based raw materials to generate heat in the built environment. The SER shares the concerns of residents that a further increase in wood burning can lead to more emissions and therefore possibly to higher concentrations of harmful substances in the local area. However, the extent to which air quality deteriorates depends not only on the amount of solid bio-based raw materials being burnt, but also on the use of technical improvements and filters. The SER identifies three relevant questions to be raised in any consideration of the sustainable use of bio-based raw materials:

- How do local effects (air quality) relate to other sustainability aspects, such as climate?
- Are there alternatives to fossil fuels that cause less air pollution?
- Can air pollution be minimised by choosing the right technology, scale and filters?

Figure 1. Guidance on the use of the sustainability framework for bio-based raw materials

### Assessment framework for the use of bio-based raw materials

How does the use of bio-based raw materials instead of non-renewable (fossil-based) raw materials fit in with the transition to a carbon-neutral, circular economy?



- 1 Production complies with all the 2020 criteria in Table 3.1. NB: Carbon reduction throughout the supply chain compared with the fossil-based alternative is one of the criteria.
- 2 For energy: compare with solar, wind, etc. For materials: compare with recycling, etc.
- 3 The application fulfils several criteria set out in Table 3.2: (1) Substantial reduction of CO<sub>2</sub> in the atmosphere (2) Efficient and effective use of raw materials in a circular economy (3) Clean and healthy living environment (4) Socio-economic progress
- 4 Low-value applications can also be part of multiple value creation on a temporary basis.

## 5. What does the assessment framework mean for the use of bio-based raw materials?

The sustainability requirements for the production of bio-based raw materials determine the nature and quantity in which they can be supplied. For the time being, the SER is using the lower limit of the range of bio-based raw materials, as estimated in the PBL report, that are potentially available for supply under strict sustainability criteria in the Netherlands, Europe and globally.

### *Potential does not automatically mean available*

It is not necessarily the case that potential sustainable bio-based raw materials will actually become available:

- At present, there is no market for demonstrably sustainable bio-based raw materials that meet the strictest criteria. For example, the proportion of certified bio-based raw materials is still limited.
- It is uncertain at what price demonstrably sustainable bio-based raw materials can be supplied. It is to be expected that the Netherlands will not be the only country that will want to lay claim to these bio-based raw materials. The question is: for which uses will sustainable bio-based raw materials be a cost-effective solution in the long term? This depends on policy frameworks that give value to climate, sustainability and circularity and on the development of market demand for sustainable alternatives.

### *Bio-based raw materials and areas of application*

On the basis of underlying reports, the SER has identified suitable areas of application for bio-based raw materials. In each case, the Council assesses whether the use of sustainable bio-based raw materials results in a low or high-value application, or whether a bridging application is concerned (Section 4 of the advisory report).

The SER foresees the following consequences for the application of the assessment framework, provided that bio-based raw materials are sustainably produced and actually available:

- In the long term, the bio-based economy (excluding food applications) will be dominated by applications in materials and chemicals. This is where most value will be added from a broad sustainability perspective. In order to achieve this desired blueprint for the future, the focus must be on maximum sustainable growth for chemicals and materials. The pace of development is limited by the speed at which new or existing applications can be scaled up and the availability of sustainable bio-based raw materials. In the long term, domestic demand will also fall in this case if circular principles are applied.
- Within a circular economy, there will continue to be sustainably produced flows that do not have a high-value application after cascading. These can be used for energy applications, provided that market incentives are aimed at high-value rather than low-value utilisation. This fits in with both the bridging period and the blueprint for the future.
- Energy applications where more sustainable options become available on time and at a reasonable cost are basically low-value. For electricity, more sustainable alternatives based on sun and wind are available. For light road transport, there are electric cars for example. In the case of low-temperature heat, heat pumps are rapidly developing as an option for well-insulated houses and geothermal heat is becoming increasingly popular alongside alternative low-temperature sources (e.g. aquathermia) for district heating systems. The use of bio-based raw materials for flexible capacity, for heat via existing district heating systems and peak loads could be possible bridging applications.
- There are situations where there are no alternatives at present, so bio-based raw materials may be needed for a prolonged period. The SER regards the following applications as bridging applications: high-temperature heat, heavy road transport,

aviation and shipping. The bridging time of these applications depends heavily on the speed at which sustainable alternative applications and alternative fuels (e.g. synthetic fuels via power-to-liquids) are developed.

- Due to their unique characteristics and existing infrastructure, gaseous energy carriers have an important part to play in the transition to a carbon-neutral, circular economy. The SER supports the policy now in place where green gas is regarded as the final step in the energy transition, which will be deployed where alternative sustainability strategies are not technically or economically feasible. These include primarily high-temperature heat in industry and houses in city centres that are difficult to make sustainable, but possibly also flexible capacity.

*Development differs by area of application of bio-based raw materials*

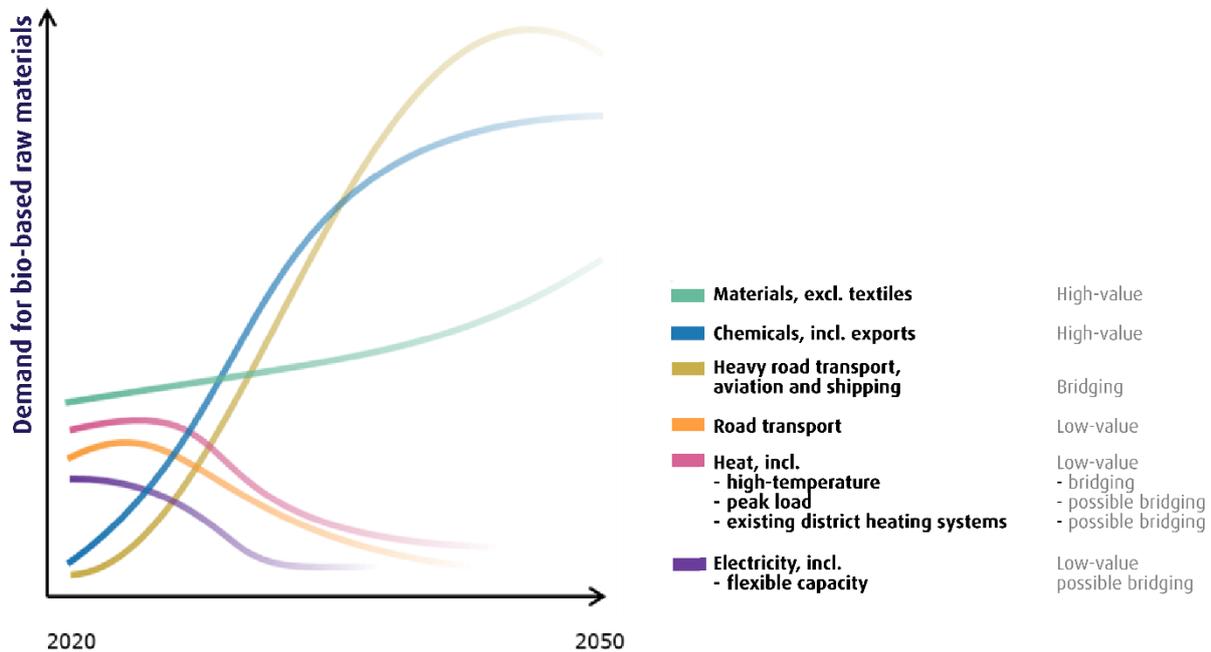
In a number of cases, bio-based raw materials therefore still provide a bridging solution where swapping between goals can occur, but where synergies are also conceivable. Careful management is required to ensure that the bridging solution does not get in the way of the transition to the blueprint for the future. Parties see different speeds at which the areas of application will or may develop. Scenarios also vary considerably, e.g. for the speed at which synthetic fuels can be produced at scale and on site in a technically feasible way and at reasonable cost. Policy is also a determining factor here, e.g. through demand-driven management.

In order to facilitate the debate on this subject, the SER uses Figure 2 to illustrate tentative development based on the assessment framework for each area of application for the course of the transition. This sketch shows that bio-based raw materials play a role in the transition phase, but according to current insights they will also be needed after 2050 for some of the energy applications, feedstocks and materials. The Council is definitely not intending to paint an ideal picture. Parties each have their own ideals. Nor is it based on a scenario analysis. Moreover, food, animal feed and current fossil-based applications are not shown in Figure 2 (the size of the current bioeconomy is shown in Section 1 of the advisory report). Figure 2 can both help to eliminate possible existing concerns and help to identify "new" concerns. The figure can also provide guidance for weighing up options and making choices about phasing, prioritisation and cascading. The Council urges that these choices be made with sustainability and investment security in mind.

Figure 2.

### Focus on tentative development per field of application of biofuels.

Indicative and not to scale. No determined subsidies have been taken into account



Organisation of energy applications in 2020 based on KEV (PBL, 2019). Transition pathways based on SER assessment framework combined with possible demand development from CE Delft (2020) Bio-scope. The development of high-value chemicals is linked to the development of biofuels for road transport, aviation and shipping.

## 6. Are there potentially enough bio-based raw materials to meet Dutch demand?

### *Bio-based raw materials are needed for use inside and outside the Netherlands*

CE Delft has charted the future supply of and demand for bio-based raw materials with very wide margins (see box below). In addition to the wide margins of uncertainty concerning the quantitative outcomes, it is also important that the demand for bio-based raw materials does not only involve domestic needs for energy and raw materials. The Dutch companies that use bio-based raw materials now and in future serve the global market. This emphatically applies to greenhouse horticulture, the chemical industry, aviation and shipping. For example, the Dutch chemical industry exports 80 percent of its production. In the case of transport fuels, it is notable that the share of the potential demand for bio-based raw materials for maritime shipping is particularly large (60-70 percent). The large share of aviation and shipping in the demand for bio-based raw materials is due to the major ports located in the Netherlands. Heat for the built environment, on the other hand, is explicitly produced for the Dutch market.

CE Delft's estimates, on which the PBL report is based, give a very broad range for the Netherlands' primary demand for bio-based raw materials by 2030 (from 400 to 2,000 PJ per annum, rounded off) and by 2050 (from 500 to 4,200 PJ per annum, rounded off). The estimate of future demand is shown to be subject to very substantial and fundamental uncertainties. The Council also notes that there is the impression that the figures in the study do not yet sufficiently reflect the potential for savings and recycling. For this reason, the Council believes that the quantitative data should not be regarded as absolute predictions, but as estimates with large uncertainties that give an indication of the order of magnitude involved.

*Other countries also need bio-based raw materials*

The Netherlands is certainly not the only country that needs sustainable bio-based raw materials as part of the transition to a carbon-neutral, circular economy. In order to gain a better insight into the actual and potential availability of sustainable biofuels in the longer term, there is a need for a bio-based raw materials model, in which price developments are related to the development of the global supply of and demand for bio-based raw materials.

*In principle, there is sufficient to satisfy Dutch needs*

A basic comparison of need and availability – without taking into account demand from other countries – shows that there is sufficient potential globally and in Europe in principle to meet Dutch needs (including exports) for sustainable bio-based raw materials. Regardless of the need for more in-depth research into whether and where distribution issues may arise, however, the SER believes that the Netherlands has a moral duty to make further efforts:

- to reduce the need for sustainable bio-based raw materials for energy applications;
- to increase the availability of sustainable bio-based raw materials by stimulating regional flows and increasing the availability within Europe, e.g. by (re)using marginal and degraded soils. These soils can be used in nature development, cultivation of bio-based raw materials, extensive farming, etc.;
- to promote robust conversion techniques, enabling a wide range of bio-based raw materials to be converted into multi-purpose raw materials, feedstocks and energy carriers (e.g. biorefineries).

**7. Why is effective government action necessary?**

In the first place, in our economy, the market determines whether and how bio-based raw materials are used. Government action is necessary when public interests are under pressure, when production does not take place within the limits of the earth's capacity or when social rights are being violated. Another question is whether companies are sufficiently equipped to deal effectively with future scarcity and supply risks. In addition, government has a role to play in the field of research and innovation, because this produces social returns that are more important than private returns and that would not be achieved without government intervention. Sustainability transitions are necessary, but do not happen by themselves. They require the large-scale deployment of policy instruments and public expenditure and therefore also have a major social impact, including the impact on employment, both positive and negative.

*Government interventions have dictated the use of bio-based raw materials so far*

The SER observes that in recent years it has mainly been politicians who have dictated the purposes for which bio-based raw materials are used and therefore also the purposes for which they are not. For example, all parties stress that the size and effectiveness of the SDE+ subsidy as well as the strict application and enforcement of sustainability criteria dictates the use and therefore the production of bio-based raw materials. The Council notes, for example, based on current knowledge, that the policy choices made in the Energy Agreement of 2013

have since led to the unilateral use of bio-based raw materials and that the intended higher-value supply chains - for example through cascading - have not materialised in practice.

#### *Impact of transitions on society*

The Dutch government has a shared responsibility for effecting a fair transition which also covers the impact of the transition on society. Major public investment must therefore go hand in hand with investment in new skills and training and support for workers who are (or are at risk of) losing their jobs. This will also be necessary to strengthen support in Dutch society for the transitions in general and the use or non-use of bio-based raw materials in particular.

#### *Confidence in guarantee of sustainable production*

The SER observes that the increasing degree of polarisation regarding the use of woody biomass is partly due to a lack of trust among various parties in society in the sustainability of production and in the way in which sustainability risks are safeguarded through instruments such as legal criteria, private certification schemes and verification mechanisms. Parties may have various reasons for this: desired sustainability requirements are not included in legal requirements, criteria are not strict enough or not consistent for all product flows, or monitoring and enforcement do not inspire confidence.

The SER believes that the government must safeguard public interests, but that this is a shared responsibility between the government and the market. The increasing sustainability of supply chains of various raw materials such as wood, palm and soy is mainly due to the years of attention from the Netherlands and the EU. Private certification schemes, such as Better Biomass, have been established with input from various civil society organisations. A number of them, including the FSC, are also sufficient to give NGOs confidence. The SER believes that the government can build on this, on the express condition that it provides effective assurance of the sustainability criteria more than is currently the case. This requires regulation (strict sustainability requirements) and effective monitoring of compliance.

## 8. What form does the SER think the assurance of sustainable production should take?

The structure of an assurance scheme is highly complex and technical in nature. The SER uses the general structure described in Figure 3 to ensure the sustainable production of bio-based raw materials. This is also the guiding principle for the discussion of this subject.

Figure 3. Structure for assuring sustainable production of bio-based raw materials based on uniform principles and criteria derived from a broad concept of prosperity



### 8.1 Enshrined in law

#### *Build on EU Directives*

In terms of energy production, the European Union has laid the foundations for legal sustainability criteria for the production of and trade in bio-based raw materials from inside and outside Europe in the form of renewable energy directives RED and RED II (see Annex 2.4). Member States must implement RED II in national legislation by 1 July 2021. These directives are both the determining and limiting factor for the legal assurance of sustainability in the Netherlands. The SER has three ideas for achieving potential improvements as much as wherever possible within these EU frameworks:

- Research shows that the environmental criteria for sustainable production are largely covered by RED II (see Annex 2.4). This does not apply to the socio-economic criteria (see below).
- Following the example of the Corbey Commission and the RHDHV report, the SER believes that principles and criteria for all production of bio-based raw materials should be internationally harmonised as far as possible, at least within the EU. Imposing a multiplicity of requirements causes confusion in the market, waterbed effects between sectors, an uneven playing field and unnecessary administrative burdens for producers. Moreover, Dutch market power is insufficient to prevent displacement effects, for example.
- The restrictive nature of RED II allows Member States to impose only a minimum of additional legal requirements. Additional national sustainability criteria may only be laid down for the use of solid bio-based raw materials, but not for liquids and biofuels.

#### *A ban on imports of non-sustainable bio-based raw materials is not possible*

In principle, WTO law does not allow the Dutch or European legislator to impose requirements on the production of imported bio-based raw materials (non-product-related non-trade concerns). Under certain conditions, the EU and the Netherlands can impose sustainability requirements on companies that import, process or consume bio-based products. The sustainability requirements must then be linked to, for example, subsidies, procurement programmes or obligations (see Section 5.2) to produce an increasing share sustainably (as in the case of energy and fuel). However, EU state aid rules are a matter of concern.

### *Additional policy measures needed*

RED II offers a widely applied basis for the use of sustainable bio-based raw materials in Europe, provided that compliance and enforcement are carefully monitored (see also Section 8.3). The SER still sees a number of possible additions to the EU directives. They relate to the implementation of RED II in Dutch legal frameworks and the forthcoming European agenda:

- The SER recommends recognising socio-economic principles as a fundamental part of broad prosperity and, to this end, also involving socio-economic criteria in assuring the sustainable production of bio-based raw materials (see also Section 8.3 and SER advisory report (2019) *Seizing opportunities and managing risks – the relationship between the SDGs and IRBC*).
- The SER is in favour of aligning sustainability requirements from RED II for the electricity, heating and cooling sector and transport sector with other sectors (irrespective of application). The use of bio-based raw materials outside these three pillars (industry, chemicals, construction) falls outside the scope of the RED II. The SER proposal is to align sustainability criteria as much as possible so as to enable a level playing field, cascading and multiple value creation.
- The SER also considers it important that the requirements should apply to the use of bio-based raw materials for smaller-scale energy applications. RED II offers scope for extending the sustainability criteria to include installations with a total rated thermal input of *less* than 20 MW (solid biofuels) and 2 MW (gaseous biofuels). This applies to the use of bio-based raw materials in installations for the production of electricity, heating and cooling or fuels.
- The SER attaches great importance to developing a risk approach for the sustainability framework. The sustainability risks are not the same for all bio-based raw materials flows or uses or for all countries or regions. This calls for differentiation according to bio-based raw materials flows or uses and regions to the extent that criteria need to be assessed, so that the actually relevant sustainability risks receive all the attention they need and do not become unnecessary costs.

## **8.2 Private certification schemes**

### *Private certification schemes can serve public interests*

The Dutch government determines the scope and level of ambition of criteria. In line with RED II, the SER regards private certification (beforehand) and verification (afterwards) as suitable tools for assessing with some certainty whether the production of bio-based raw materials complies with certain predetermined (mainly legal) sustainability requirements. Certification and verification can function well at international scale and in the supply chain for bio-based raw materials. Under WTO rules, for example, the Dutch government cannot impose detailed requirements on the activities of companies in other countries.

Private certification schemes (such as FSC and Better Biomass) which have been established in a multi-stakeholder setting are generally widely supported and inspire confidence. Private certification schemes often provide "super-statutory" criteria, which means that they cover more than the legally required sustainability criteria. For example, the RHDHV report makes it clear that it is quite possible to assure the widely applicable sustainability principles that we consider important in the Netherlands with existing private certification schemes; the same applies to the socio-economic criteria (see box "Social criteria in schemes" in Section 5.2.3 of the advisory report). For example, NTA8080 (*Better Biomass*), ISCC PLUS, RSPO-RED, RTRS and RSB are suitable, also for materials (feedstocks).

### 8.3 Public oversight and enforcement

#### *Government's tasks are testing and enforcement*

The SER notes that the Dutch government relies on the use of sustainable bio-based raw materials and, at present, also mainly on private oversight of the sustainability of bio-based raw materials to achieve policy objectives. The Council therefore explicitly regards it as the government's task to carry out testing and enforcement both to ensure that private certification schemes meet the legally established criteria and to ensure that companies are submitting the correct certificates. RED II also makes this possible. This also means that any signs of unsustainable production, despite certification, must be seriously investigated, and that – if they are correct – an appropriate response must be forthcoming, otherwise confidence in the production of sustainable bio-based raw materials will be seriously undermined (see also PBL (2020)).

#### *Due diligence offers an additional contribution*

Neither certification, verification nor legislation provides a conclusive guarantee of the sustainability of bio-based raw materials. A sustainability framework should guard against the creation of paper checklists, rather than the impact in the real world. This requires a risk approach. Due diligence can make an additional contribution by increasing manageability and preventing the idea of a "box-ticking" exercise. Moreover, a due diligence approach ensures that parties further down the supply chain are not automatically relieved of their responsibility if boxes have been ticked earlier in the chain.

In April this year, EU Commissioner Reynders (Justice) announced that the European Commission would be presenting a proposal in 2021 to enshrine due diligence for social and environmental risks in legislation. The Dutch Ministry of Foreign Trade and Development Cooperation is also working on proposals for a well-considered policy mix for IRBC (International Responsible Business Conduct), in which agreements and certification systems could be supplemented with legislation. The SER will be issuing an advisory report on this subject in the autumn. This may also have consequences for bio-based raw materials.

## 9. What are the guiding principles for encouraging and assuring the sustainable use of bio-based raw materials?

#### *Recalibrate the role of bio-based raw materials in the Dutch economy*

The SER sees an important role for the bio-economy in the CO<sub>2</sub>-neutral, circular economy of 2050, but this requires a review of the way sustainable bio-based raw materials are used. As far as the SER is concerned, any review of the role of bio-based raw materials will lead to a transformation process. The use of bio-based raw materials is focusing less and less on finding a cost-effective way of achieving the climate targets and is moving towards a use in which the merits of bio-based raw materials are utilised to the maximum in order to make an effective contribution to the climate, the economy and employment. In other words, the aim here is to work towards finding the highest-value application for sustainable bio-based raw materials: Figure 2 showed that the available sustainable bio-based raw materials will be badly needed for bio-based chemicals and materials. As little use as possible should be made of sustainable bio-based raw materials in low-value applications. They should be used with care in bridging applications. For example, it is crucial that sustainable alternatives become available at a reasonable cost.

### *Transitions require phase-in, conversion and phase-out policy*

In many cases, the use of bio-based raw materials provides a bridging option from fossil to a blueprint for the future that is in keeping with the broad sustainability perspective used by the SER. For some applications the alternative is already available and competitive but, for others, alternatives are still thin on the ground. This is complicated and therefore requires not just one but two rounds of phasing in and phasing out solutions within an area of application. A simplified example: transitioning from fossil fuels to bio-fuels for electricity generation and from bio-fuels to sun and wind for electricity generation. This requires the Dutch government to think at an early stage in the formulation of policy in terms of phasing in, converting and phasing out (see Figure 4 for details for each area of application):

- *Phasing in:* The use of bio-based raw materials has yet to get off the ground and calls for incentive policies, e.g. in the form of innovation and exploitation policies and other forms of demand management. This also requires commitment to employee training and development.
- *Converting:* Sustainable bio-based raw materials are a temporary alternative to the traditional raw materials that were used in the past. Policy measures are needed to develop alternative renewable options and avoid lock-in situations. The type of activities can remain roughly the same, but the use of raw materials is changing fundamentally: sustainable bio-based raw materials are an alternative to the traditional raw materials that were used in the past. This is reflected in the chain of suppliers and customers, the production processes within the company, the necessary knowledge, skills and abilities of its employees and business cases.
- *Phasing out:* The use of bio-based raw materials must be phased out. This may call for a phase-out of incentive policies for the use of bio-based raw materials, disincentive policies, etc. and, in the case of accelerated phasing out, compensation for companies and employees where necessary, as well as ensuring that sufficient resources are available to deal with employment and social consequences for workers in a socially responsible way (see also SER advisory report (2018) *Energy transition and employment*). As with converting, policy measures may be needed to develop alternatives and prevent lock-in situations when phasing out.

### *Strengthening employment and training policies*

The company-specific transformations associated with the sustainable production and use of bio-based raw materials also have an impact on employment. This transformation process can result in job losses, major changes in jobs and job content and shortages of qualified staff. It is important to identify these impacts on employment. The SER advisory report (2018) *Energy transition and employment* made major recommendations on this subject, which have found their way into the Climate Agreement.

In the context of the Climate Agreement, agreements have been made to draw up sectoral training and employment agendas in order to monitor and cushion the impact of the transformation processes on employment in a socially responsible manner. To this end, a special Employment and Training Task Force has been set up under the leadership of SER Chair, Mariëtte Hamer. The Council recommends that the necessary strengthening of employment and training policy resulting from the transformations to promote the sustainable use of bio-based raw materials should also be taken on by the Employment and Training Task Force.

### *Guiding principles for encouraging sustainable use*

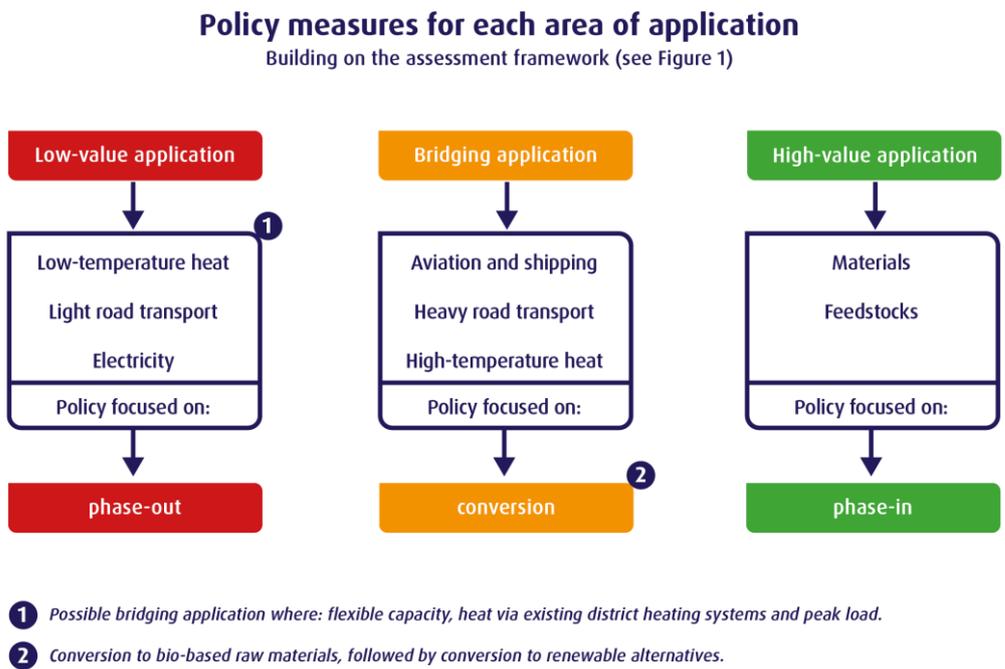
The market demand for bio-based materials and products is currently limited, because competing products from fossil-based and other non-renewable raw materials are cheaper and the market is not willing to pay extra for a more sustainable alternative. Encouraging and assuring the sustainable use of bio-based raw materials through subsidies, procurement programmes or mandatory measures give governments the opportunity to set requirements (including for sustainable production) and influence the speed of developments. The SER uses the following guiding principles:

- The polluter pays: the SER invariably applies the principle that policy for transitions should preferably be shaped by internalising the negative (external) impact of uses in prices, both of current techniques and of proposed more sustainable alternatives. In doing so, the affordability of the transitions for all groups in society should be considered and, where necessary, result in flanking policies (see also: SER (2018), *Study: Financial instruments for a circular economy*).
- Encouragement through the pricing of positive externalities (e.g. subsidies) is second-best and temporary.
- As regards uses of bio-based raw materials, incentive policies should only be used if the use is a necessary precondition for the transitions.
- In doing so, the government can distinguish between different uses and give more encouragement to the highest-value uses. Calculating the real carbon gain and focusing on sequestering carbon for as long as possible is an important prerequisite for achieving a carbon-neutral, circular economy with high-value uses for bio-based raw materials. The Council calls for a methodology to be developed for this purpose.
- Technologies are developing rapidly and raw material prices are changing. This requires an adaptive approach in which the level of encouragement can be fine-tuned.
- In order to use bio-based raw materials in a context of the highest possible value, adaptive and flexible cascading is required that matches as closely as possible the current volumes of bio-based raw materials used in the energy sector. Appreciate the full value creation of crops and robust conversion techniques with applications that keep raw materials in the supply chain longer and maintain high quality. Prevent lock-ins by doing serious work on the simultaneous development of sustainable alternatives that do not require any bio-based raw material.

**10. What are the policy measures for each area of application?**

Areas of application for bio-based raw materials are at different stages of development in the transitions towards a carbon-neutral, circular economy. This means that different policies are relevant for each area of application and this may change over time. The SER emphasises that it is up to the government to set the pace, to communicate this clearly and to set up appropriate policy incentives, for phasing in, converting and phasing out. Figure 4 outlines the policy direction that the Council recommends for the use of bio-based raw materials in each area of application, provided that the bio-based raw materials have been produced sustainably. The remainder of this section provides an explanation of the Council's advice for each area of application.

Figure 4.



*Focus on phasing in bio-based chemicals and materials*

The Council notes that the use of bio-based raw materials in feedstocks and construction materials (such as bio-composites, bio-concrete, and timber frame construction) is a necessary development for the creation of a carbon-neutral, circular economy and is also essential for maintaining the Dutch competitive position. In the long term, the bio-based economy will be dominated by applications in materials and chemicals. Carbon sequestration for as long as possible and the avoidance of fossil carbon sources provide important benefits for a carbon-neutral, circular economy.

In order to achieve this, it is necessary to focus on maximising sustainable growth for chemicals and materials in the short term. This will not happen by itself. Current policy focuses mainly on energy applications, carbon emissions from chimneys, cost efficiency and national carbon reductions. As a result, the optimal value creation for bio-based raw materials (cascading) hardly gets off the ground. There is not a level playing field, as a result of which the market does not automatically opt for maximum use. Policies are

needed to accelerate the transition. Because these are complex processes that take a lot of time (20 to 40 years is not exceptional), policies should focus on a rapid *phase-in*:

- The playing field for the applications for chemicals and materials will have to be aligned at least with both the fossil-based alternatives and the use of bio-based raw materials in energy.
- Encouraging the long-term sequestration of biogenic carbon in materials and products through targeted positive subsidy schemes, such as the SDE++ subsidy, so that they can eventually compete without subsidy.
- Supporting the upscaling and roll-out of innovative bio-based processes that fit best in a circular economy.
- Providing long-term security so that investments can be made.
- Training and employment must be aligned with this development, taking account of the wishes of the employees themselves.

#### *Focus on converting to biofuels for heavy road transport, aviation and shipping*

The SER concludes that, for heavy road transport, aviation and shipping, biofuels will play a bridging role in contributing to the climate challenge for a longer period of time (see Figure 2), because the technological alternative of synthetic fuels has not yet been sufficiently developed.

Policies aimed at converting to biofuels are set out in the EU Renewable Energy Directive (RED II). Blending biofuels is a cost-effective way of complying with this Directive in the transport sector. Moreover, for the Netherlands, biofuel production is currently an attractive economic activity that can mobilise the bio-based raw materials that are also needed for bio-based materials and chemicals. It also gives the Netherlands a strong position in renewable fuels for aviation and shipping.

The SER is, however, concerned about the potential scale of the demand for biofuels for aviation and, in particular, the shipping industry. For this reason, the Council is expressly calling for policies aimed at conversion, e.g. through accelerated development of alternative technological options, such as electrification and synthetic fuels. The business community also recently made this appeal in its position paper (in the context of green recovery) for the Lower House of the Dutch Parliament. Finally, the Council stresses the crucial role that fuel-saving measures and the use of other modes of transport can play in reducing the demand for biofuels.

#### *Focus on phasing out biofuels for light road transport*

The Council notes that, from a transition perspective, the need to use biofuels for lighter road transport will disappear in the shorter term (see Figure 2).

European requirements for renewable energy are another major consideration for road transport. Bearing in mind what was agreed in the Climate Agreement about blending, the Council emphasises the scope and the additional incentive that RED II offers both for the use of advanced biofuels and for the use of other renewable alternatives which are more in keeping with the blueprint for the future. The SER believes that the production of biofuels from food is undesirable. The SER considers it advisable, from a transition perspective, to focus as much as possible on available alternatives, such as electric vehicles and the use of other modes of transport.

#### *Location-dependent policy measures for phasing out heating plants*

The SER recommends phasing out the use of bio-based raw materials to generate low-temperature heat (see Figure 2). Phase-out must go hand in hand with the phase-in of fully-

fledged sustainable alternatives. The Council believes that subsidies for bio-based raw materials for heat generation may prevent the higher-value use of bio-based raw materials. The SER therefore recommends phasing out subsidies for the use of bio-based raw materials in generating low-temperature heat for base load. The vital requirement is that the sustainable alternatives are available at reasonable cost. The SER calls on the government to set up the instruments in such a way that it is possible to achieve both of these objectives rapidly – to phase out bio-based raw materials and phase in more sustainable alternatives – so that the current climate targets in the built environment can be met.

The SER maintains that the decision on the operation of a bio-heating plant requires careful consideration and the sustainability framework must provide regional and local administrators with the right tools. The trade-offs between various main routes to sustainability in the built environment and greenhouse horticulture (district heating systems, all-electric or green gases) must be made in the transition strategies and the Regional Energy Strategies (RESs). In this context, the Council stresses the importance of guarantees that any use of bio-based raw materials is temporary and will eventually be replaced by other sustainable sources. The Council also argues that this assessment should first be made for neighbourhoods which are expected, with a relatively high degree of certainty, to have to go over to a district heating system.

Where air quality is concerned, the SER states that the government must tighten up the emission requirements for power stations. The logical extension of this is the lowering of the threshold at which it is mandatory to obtain a permit (currently 15 MW). It is not credible that most of the smaller installations do not currently require a permit under the Dutch Environmental Act. The use of heat sources proved to have poor environmental performance, such as older conventional and open fires and stoves, should be discouraged. The SER is also pleased to note that the subsidy on pellet stoves was discontinued this year. The Council would also ask the government to explore how behaviour can be influenced to prevent private owners of fireplaces and stoves from using them on certain days (when weather conditions are likely to result in smog formation, for example).

#### *Green gas as the final step*

Due to their unique characteristics and existing infrastructure, gaseous energy carriers have an irreplaceable part to play in the transition to a carbon-neutral, circular economy. The SER supports the policy now in place where green gas is regarded as the final step in the energy transition, which will be deployed where alternative sustainability strategies are not technically or economically feasible.

#### *Phase out electricity from bio-based raw materials*

There are now sufficient profitable alternatives to the use of bio-based raw materials for baseload electricity, which are better suited to a sustainable blueprint for the future of energy supplies. The SER therefore recommends that subsidies be phased out as soon as possible and that scope be provided for the use of bio-based raw materials in the development of higher-value applications. Steps have been taken by not issuing any new decisions; the current decisions on mixing biomass with conventional fuels will expire in 2027. The SER does, however, stress the importance of having reliable public authorities. In the case of a phase-out pathway that is faster than companies could reasonably foresee, it will be desirable to pay compensation for the investment made, and to ensure that sufficient resources are available to deal with employment and social consequences for employees in a socially responsible manner.

Against this background, the SER proposes that the government consult with the social partners on the way in which central government fulfils its social responsibility.

In the future, more peak capacity will be required in the energy system when there is no power from solar and wind energy. The SER endorses the conclusion from the Climate Agreement that there are, in theory, sufficient potential alternatives and that the market must determine which solution is used. Only technology-neutral incentives will be considered if the market fails to develop. The development of flexible capacity will be closely monitored.

## **11. What is the role of policymakers?**

### *Towards a widely supported sustainability framework*

The SER is working towards a widely supported sustainability framework for the sustainable availability of bio-based raw materials. The Council believes that this requires a framework that is recognisable, explainable and implementable. There is increasing polarisation in society with regard to the sustainability of bio-based raw materials. Although "bio-based raw material" is a very general term, controversies focus mainly on the origin of certain product flows, such as woody biofuels, and on certain uses of bio-based raw materials, such as the co-firing of bio-based raw materials in coal-fired power stations.

### *Respect different perspectives on sustainability*

The SER recognises that these controversies are difficult to resolve. The Council therefore believes that a widely supported sustainability framework and policy can only be achieved if it acknowledges the facts and uncertainties surrounding bio-based raw materials and respects the different perspectives that come to the fore in the debate. In addition, it is important for all parties to provide assurance of the sustainability of bio-based raw materials so that society has confidence in it and to prevent the use of this framework from becoming impracticable or resulting in high transaction costs.

In order to avoid controversies about the use of bio-based raw materials in future, the SER considers it of great importance to achieve greater scientific consensus on the climate impact and other sustainability effects of the use of bio-based raw materials in different applications. The SER calls on the government to commission an international committee of scientific experts, led by an independent scientific authority, to develop an approach.

### *A transition perspective also includes possible changes of course*

The SER believes that considerations on the role of bio-based raw materials in achieving sustainability objectives must be assessed from a transition perspective. The Council notes that the pace at which the various policy objectives are achieved varies and insights into the sustainability of applications may change over time. For example, the co-firing of bio-based raw materials in power stations is viewed in a different way now than it was about a decade ago. The SER therefore considers it important, from the initial phase of transitions, to focus on phasing out existing non-sustainable activities, as well as converting existing activities and phasing in new, sustainable niches. In addition, a change of course in public policy requires appropriate compensation for investors who have started economic activities in good faith (reliable public authorities) and sufficient resources for mobility and training schemes and financial compensation for any loss of income for employees, as was done when coal-fired power stations were shut down. In this way, the employment and social consequences for employees can be dealt with in a responsible manner.

### *Avoid lock-ins and path dependencies in bridging applications*

If sustainable technological alternatives can only be used in the long term, it will have to be considered whether choosing (not yet) sustainable bio-based raw materials as a bridging solution is ultimately preferable to (in the long term) a direct switch to the alternative in order to avoid lock-ins or path dependencies, so that the use is shown to be temporary. The trade-off is whether alternatives are already available or have the potential to become the most cost-effective.

This involves a trade-off, firstly with regard to more sustainable non-bio-based raw material applications (such as solar and wind energy or feedstocks based on recycled materials) and, secondly between different bio-based raw material applications.

#### *Embrace potential synergies and potential trailblazers*

These trade-offs should also take into account potential synergies between sectors. The current, growing market for biofuels, for example, could give a boost to the development of a market for bio-based chemicals and therefore pave the way for making the chemical sector more sustainable. These trade-offs therefore have nuances for each use or even within uses. This requires a differentiated approach in which the consistency of intermediate objectives with final objectives must be constantly assessed.

#### *Sustainability framework is also a growth model*

The sustainability framework is being primarily developed for the use of bio-based raw materials in energy generation and as a raw material in the chemical industry and materials. The SER aims to create a growth model, with increasingly sophisticated production requirements and more high-value applications, that will eventually apply to all types of bio-based raw materials, including their use in other applications, such as food, animal feed and fibres (textiles and paper). A balance has to be found for applications at the phase-in stage: if stricter requirements apply than for existing applications, the phase-in stage may not get off the ground. Although the framework will therefore cover various (European) policy areas, making it a more complicated fit, the SER regards this as necessary to prevent adverse shifts and negative excesses with regard to the production of palm oil and soy, for example. An integrated (i.e. not partial) sustainability framework is needed to build confidence in the sustainable production of bio-based raw materials.

#### *The government must take control*

The use of bio-based raw materials is a necessary step on the way to making the economy and society more sustainable. However, the global capacity to produce bio-based raw materials sustainably is limited and, moreover, the SER believes that the Netherlands should not make a disproportionate claim on it. This forces us to make choices. The assessment framework is a suitable instrument for this purpose. It provides insight into the choices that policymakers have to make with regard to sustainability issues and investment security. This involves trade-offs between interests, preferences and estimates of opportunities and risks. It is therefore the government's responsibility to determine the strategy for the use of bio-based raw materials in the Netherlands, to create the relevant frameworks and to take control of the implementation process.

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