biofuture platform

Kickstarting a global, advanced bioeconomy

AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

Policy Blueprint

Methodology and policy examples summary

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DISCLAIMER

This document was prepared in consultation with Biofuture Platform Clean Energy Ministerial Initiative national focal points, as well as selected experts.

Considerations, opinions, conclusions and recommendations expressed in this publication do not necessarily represent a consensus among consulted experts on any given point, and do not necessarily reflect consensus views of Biofuture Initiative members.

1. AIM AND APPROACH

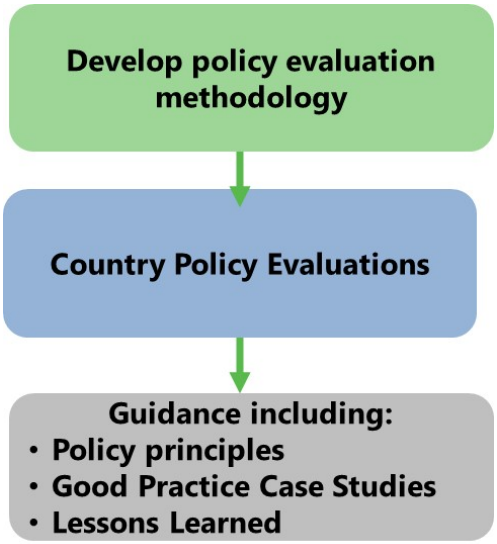
The aim of the Blueprint is to develop

- A set of guidelines on the key elements that need to be included in a policy portfolio capable of stimulating a sustainable bioeconomy.
- A set of case studies showing examples of successful policies and lessons learned in their development and application.

The approach being used to develop the Blueprint is indicated in Figure 3. This is to develop and apply a methodology that allows a detailed review of how the bioeconomy is evolving in a number of countries and at the policies that they have put in place. These country reviews will allow for a critical review of a country's policies in order to:

- Assess the extent to which the production and use of sustainable bioenergy and other aspects of the bioeconomy are increasing.
- Identify the policy principles which indicate what are the critical components of a successful policy portfolio
- Identify good practice policies that can be used as examples for other countries along with lessons learned in their development
- Help countries identify additional areas for policy action.

Blueprint Approach



The intention is to develop the Blueprint so that it covers the different aspects of the whole bioeconomy. However, the first phase is focussing on the production and use of biofuels within the transport sector. The approach will later be extended to other bioenergy sectors and then to the development of a wider bioeconomy.

In order to develop and refine the methodology, the approach is being tested in some volunteer Biofuture Platform countries before being used more widely. Evaluations of biofuels policies in three countries have so far been completed (Brazil, Netherlands, and the United States).

2. POLICY BLUEPRINT – BIOFUELS TRANSPORT METHODOLOGY

The methodology is based on structured evaluation of a country's biofuels market and policy portfolio which is summarised in a Country Profile.

The Country Profiles have been developed in collaboration and discussion with national authorities. They make use of IEA energy statistics, along with nationally produced data. They also make use of existing literature including the BFP's report "Creating the Future" [1], and IEA Bioenergy Task 39's report "Implementation Agendas". [2]

The Country Profiles are based on the following structure:

- The **national context**, which describes briefly the main trends in the energy market (e.g., in overall energy use), the most important overall policy drivers and measures, the ways in which bioenergy is used in the country, and the bioenergy resource potential.
- A **review of the biofuels trends** in the country, including production and use trends, the arising benefits and impacts, and the main policy measures affecting biofuels.
- A description of the **main relevant policies** in place.
- **Analysis** of the information based on a number of quantitative indicators relating to the status and prospects for bioenergy in the transport sector, and of a qualitative analysis of the policy portfolio.

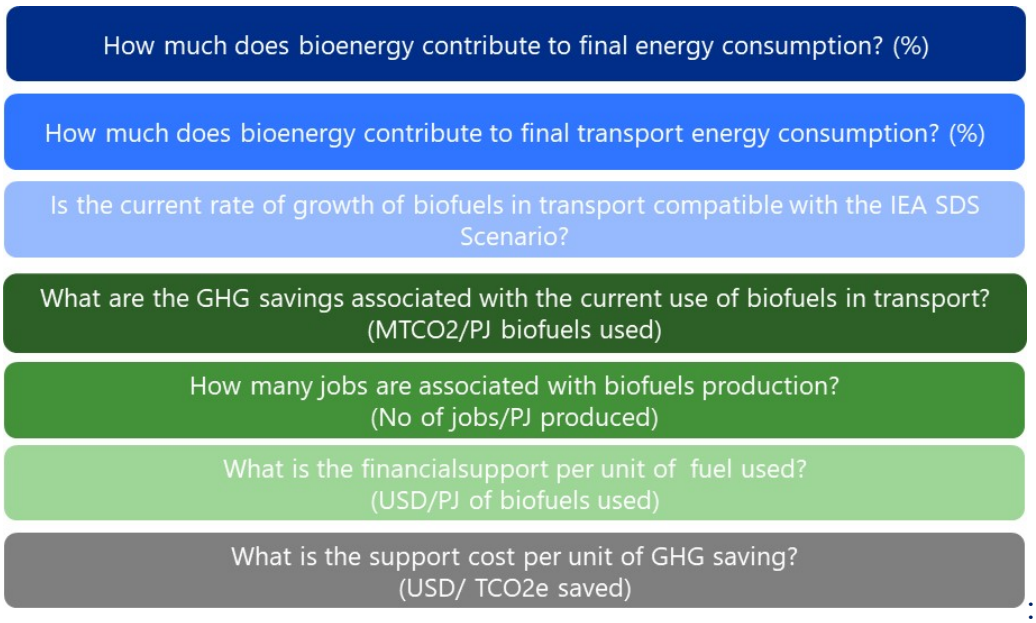
Policy Review and Analysis

The information reported in the first two sections in analysed in a standard format by calculating a number of quantitative indicators relating to the development of the biofuels market in the country, and its benefits and costs. In addition, there is a qualitative analysis of policy portfolio in place.

Quantitative Indicators

The quantitative analysis focuses on the following seven indicators as summarised in Figure 4 which indicate the extent to which bioenergy contributes to the main policy drivers' objectives, associated with energy diversity and GHG reduction, economic benefits in terms of employment and also the financial support provided.

Seven key policy indicators



1. The current share of bioenergy in overall final energy production and consumption based on IEA data or on national data. (The current analysis is based on the data for 2019, as the latest full dataset available)

2. The current share of bioenergy in transport energy demand, based on national data.

3. Rate of growth of bioenergy measured as the average annual increase in biofuel use between 2015 and 2019. This is tracked by an indicator which compares the rate of increase in biofuels with that needed to meet national aspirations (as defined in national targets or plans).

   In order to add an evaluation if the level of ambition, the rate of increase is also compared that needed to be compatible with the level of biofuels in IEA's Sustainable Development Scenario in 2030; Where available the comparison is made with the specific country figure within the SDS as listed in the IEA World Energy Outlook 2020 – see Box 2).[3] Where country specific data is not provided by the WEO Scenario, the relevant regional number is used. For example, the NL data has been benchmarked against the WEO scenario data for the EU.

   This is measured by the Policy Impact Indicator (PII), developed by the IEA for such evaluations.[4] The indicator is calculated according to the formula below.

$$\text{PII} = \frac{\text{(Rate of growth of biofuels, 2015-2019)}}{\text{(Rate of growth of biofuels needed to meet IEA WEO Scenario by 2030}}$$

4. An indicator showing the levels of GHG savings per unit of biofuels used, expressed in TCO2e/PJ of bioenergy use in transport. This is based on the

quantity of biofuels used, based on national statistics, and on the national estimate of related GHG savings. (It is acknowledged that there are currently significant differences in the ways that GHG saving are calculated in different regions and countries represented with the BFP. Analysing this is beyond the current scope of this exercise, but there is a specific element on harmonising the approach within the BFP work programme.)

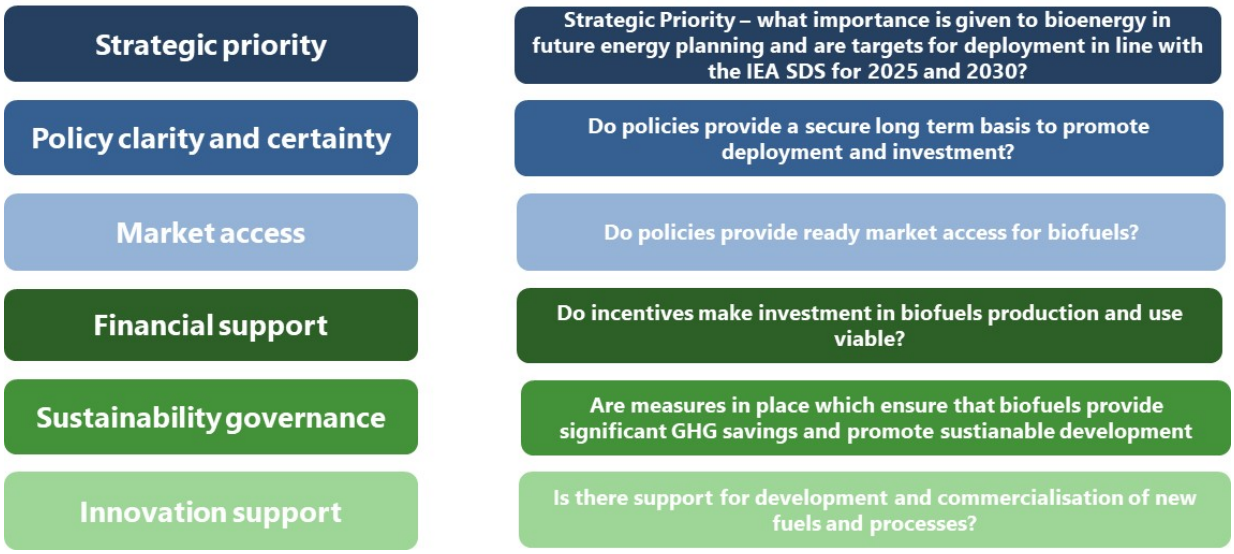
5. The number of direct jobs produced per PJ of biofuels energy produced in 2019, calculated using either using national jobs data or else as a default information from IRENA's renewable energy jobs database.[5]
6. The level of financial support provided. This is estimated by taking the total costs of support measures provided by all identifiable and quantifiable policy instruments (such as the prices on blending certificates, tax and duty reductions and other specific measures), and expressed as USD/GJ of biofuels used.
7. A further indicator calculates the financial support in terms of the GHG savings achieved and expressed in USD/TCO_2e and based on the GHG saving and cost indicators above.

Qualitative Indicators

The Policy portfolio analysis within the Biofuture Platform Policy Blueprint looks principally at policies introduced at a national level, but where appropriate also considers policies at a subnational level (in particular states or provinces) where these are having a material effect.

The analysis focusses six areas for policy action elements judged to be critical to success, as indicated in Figure 5.

Critical Policy Issues



These are:

1. **Strategic Priority** – Is importance given to bioenergy and biofuels in future energy planning by setting targets for 2030 and beyond? Are these targets for deployment in line with the levels for the country indicated in IEA SDS for 2030 and 2050?
2. **Policy clarity and certainty** – Are there clear measures in the policy portfolio that provide the necessary market certainty to encourage investment (for example via clear mandates or other requirements)?
3. **Market access** – Do policies remove barriers to the market for biofuels, and do they promote higher biofuels blends in the road transport sector and use in other sectors such as marine and aviation.
4. **Financial support or incentives** – do incentives make use of biofuels cost competitive with those of fossil equivalents?

5. **Sustainability Governance.** Is there a rigorous sustainability governance regime in place which encourages, and rewards improved GHG reductions, while also providing comprehensive safeguards against other sustainability risks and strongly promoting social, environmental and economic benefits?
6. **Support for innovation**. Are there measures designed to stimulate development of improved fuels, processes and feedstocks and to promote their commercialisation?

Country policies covering each of these issues are evaluated using criteria set out in the Methodology report.

This analysis provides a quantitative analysis of market trends and policy impacts and for the identification of examples of policy good practice, while also highlighting areas for further policy development or refinement.

Policy Examples

The Policy Profiles describe the main policy measures in place in each country. In each of the three cases studied, the policy portfolio has been analysed in terms of the six main policy priority areas set out in Figure 5 above. This illustrates how different approaches and policy mechanisms are used to meet these requirements in each case, depending on national circumstances and priorities and allows the identification of "good practice" policy examples. These are listed in Table 1. More detailed descriptions of the policies are available in the relevant Country Profiles.

Policy examples

Country	Policy
Policy Priority	
Brazil	Brazilian energy policy is closely linked to its commitment to the objectives of the UN Framework Convention on Climate Change and to its Nationally Determined Contribution. This is embodied in the main energy planning document, the Ten-Year Energy Plan (PDE), developed by the Energy Research Agency (EPE) and published annually by the Ministry of Mines and Energy (MME). Bioenergy and particularly transport biofuels is a key component of this plan. The PDE foresees a 39% increase in the use of bioethanol by 2029 and a 64% expansion in biodiesel use using 2019 as reference year, bringing the total in that year to 1.3 EJ.[6]
Netherlands	The NL 2019 Climate Act sets targets to reduce GHG emissions by 49% by 2030 and by 95% by 2050 (versus 1990 levels). The Netherlands has developed a detailed policy framework to drive the achievement of these targets, the core of which is the 2019 Climate Agreement.[7] The Agreement includes emissions reductions targets and measures in five sectors: electricity, industry, the built environment, mobility, and agriculture and the natural environment. It sets the intention to reduce emissions in road transport by an additional 2 MTCO2e, compared to the a baseline projection for 2030; Measures to achieve this include increasing the use of renewable fuels in road transport from 33PJ in 2019 to 60 PJ, plus a further 5PJ to be used in inland waterways.
Policy Clarity and Certainty	

Brazil	The long-term use of biofuels blending mandates has provided policy certainty that has successfully stimulated investment in bioethanol and biodiesel production. The ambitious future expansion if the role of biofuels along with the introduction of the RenovaBio Policy provides additional certainty going forward.
NL	Growth in biofuels to meet the internal and EU targets has been successfully driven by a blending obligation and certificate system. Annual obligation levels have been established and extended extended to 2030, with levels leading progressively to that associated with the 2030 target. This provides a high level of clarity and certainty for investors and market actors.
USA	The Renewable Fuel Standard (RFS) has provided long term policy certainty that has successfully stimulated investment in bioethanol and biodiesel production. The RFS and state initiatives such as the Californian Low Carbon Fuel Standard (LCFS) are strongly stimulating development of increased biofuels use and production capacity especially for Renewable Diesel and Renewable Natural Gas (RNG). However, here are uncertainties around future levels of the RFS and its future post 2022.
Market Access	
Brazil	Market access is assures via mandatory blending of high levels of ethanol in gasoline (27%) and increasing levels of biodiesel (currently 12%), plus availability of unblended hydrous ethanol for use in flex-fuel vehicles.
Netherlands	The Annual Obligation obliges fuel suppliers are obliged to achieve a level of biofuels use or face financial sanctions for non-compliance. The levels of the obligation are set through to 2030, providing market certainty. There are few measures aimed at stimulating higher blends of biofuels in road transport.
USA	The RFS ensures market access for ethanol and biodiesel. The maximum level of corn ethanol has now been reached and other gasoline substitutes are not so far being produced in significant quantities. There are few measures aimed at stimulating higher blends of biofuels in road transport.
Financial Support	

Brazil	Tax and duty differentials between biofuels and fossil fuels are the main mechanism used to make the production and use of biofuels economic in Brazil. The introduction of the RenovaBio Policy is providing increased motivation for expanded production of ethanol and biodiesel.
Netherlands	Financial support for biofuels production and use is provided by the award of tradable renewable energy units for each GJ of eligible biofuels provided under the Obligation. Fuels produced from waste and residues can qualify for 2 units for each GJ of energy used.
USA	Support for biofuels production and use is provided by the award of certificates for qualifying biofuels through the RFS and other Federal mechanisms including the biodiesel blending credit. These are supplemented by additional financial incentives provided by some US states and especially via the LCFS in California which provides additional support which amounts to around 200 USD/TCO2e. These levels have been sufficient to stimulate investment in biofuel production capacity and biofuel use.
Sustainability Governance	
Brazil	The RenovaBio Policy incentivises good GHG performance, and places requirements on the areas from which feedstocks are sourced. The production of biofuels by smaller producers is incentivised.
Netherlands	The sustainability governance of biofuels in the Netherlands is based on the comprehensive EU RED (2) framework. This defines a series of sustainability and GHG emission criteria that transport biofuels must meet in order be counted towards targets and to be eligible for financial support by public authorities. There are strict minimum standards for GHG reductions due to biofuels. In particular RED II reinforces the measures aimed at reducing ILUC effects. The use of fuels produced from wastes and residues is incentivised by allowing two certificates per unit of fuel under the Obligation, whereas the levels of crop-based fuels are constrained.
USA	The RFS has sets minimum standards for GHG savings and incentivises improved GHG performance, as do state-level support systems such as California's Low carbon Fuel Standard.

	The GHG calculation procedure includes provisions for emissions associated with land use change. Other regulations are aimed to ensure sustainability of feedstocks from within the US and imported from elsewhere.
Innovation Support	
Brazil	There is a national R&D effort aimed principally at improving and optimising current production systems, as well as looking at new processes and fuels.
Netherlands	In the 2019 NL National Climate Agreement, Euro 200 million has been reserved for support of production of advanced renewable fuels including advanced biofuels. A support scheme for this funding is currently being elaborated. Renewable energy, including biofuels, used in aviation and the marine sector are eligible under the Annual obligation system using the "opt-in" system (until 2025). Biofuels used in these sectors can count towards the 14% renewable energy in transport target in the RED2 with a multiplier of 1.2 on their energy content.
USA	There is a very significant R&D effort aimed at developing new biofuels and reducing costs, sponsored by the US DoE. Commercialisation of new fuels is encouraged by the banding rules within the RFS and by state initiatives such as the LCFS. Commercialisation is also promoted by measures such as Risk Loans for novel bioenergy projects.

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