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| 5.1 | VALUE CHAIN DESCRIPTION AND IDENTIFICATION OF CRITICAL GBEP INDICATORS - TRANSPORT BIOFUELS |

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| **AIM** | **The questions in this chapter aim to:** * **generate a description of the transport biofuel value chain; and**
* **identify critical GBEP indicators, based on the main characteristics of the value chain and likely impacts on sustainability.**
 |

The critical GBEP indicators emerging from this chapter should be considered as additional to those identified in Chapter 2 (Description of Institutional Context and Regulatory Framework) based on the sustainability requirements and drivers/objectives of the bioenergy policy. They should be included in the Summary Booklet in Chapter 6, along with comments on the relevant sustainability factors that led to their selection.

The questions in this chapter should be addressed to relevant sectoral experts and selected producer associations. In order to answer them, information and data available in national and international databases may be used, combined with expert judgement. In some cases, ballpark estimates based on experience will be necessary.

The questions are grouped into different sections, depending on:

* the origin of the biofuel; and
* the type of feedstock used.

Questions addressing the way the additional demand for each biofuel feedstock was met are included in the feedstock questionnaire (Module 5.4).

Before addressing these issues,a few general, introductory questions are included below, with the aim to set the timeframe of the analysis and collect basic data on the level of transport biofuel production, consumption and trade. (All mentions of biofuels below refer to transport biofuels.)

***Please provide the information below in relation to biofuels for transport.***

|  |  |
| --- | --- |
|  | **Answers:** |
| **Year in which the bioenergy policy/programme and the related targets (if any) were adopted** (to be referred to as baseline year[[1]](#footnote-1)): |  |
| **Year of analysis** (to be referred to as reference year): |  |
| **Biofuel production, consumption and trade volumes** (in MJ/year).***Please provide the total volumes of biofuel produced, consumed and traded in the reference year, for each biofuel produced and consumed in the country.*** |  |
| * Total biofuel production: MJ/year
 |  |
| * Total biofuel consumption: MJ/year
 |  |
| * Total biofuel exported: MJ/year
 |  |
| * Total biofuel imported: MJ/year
 |  |

# 5.1.1 Imported biofuels.

|  |  |  |
| --- | --- | --- |
|  | **CRITICAL GBEP INDICATORS:**  | **POTENTIALLY CRITICAL GBEP INDICATORS (depending on the requirements and drivers/objectives of the biofuel policy):** |
| Imported biofuels are unlikely to present significant risks to sustainability at national level. The net trade balance of the country, which is not measured by any specific GBEP indicator, will be affected though. | **Indicator 1 (Lifecycle GHG emissions[[2]](#footnote-2)).**  | **Indicator 4 (Emissions of non-GHG air pollutants, including air toxics[[3]](#footnote-3));****Indicator 20 (Change in consumption of fossil fuels and traditional use of biomass);****Indicator 22 (Energy diversity);** **Indicator 23 (Infrastructure and logistics for distribution of bioenergy[[4]](#footnote-4));****Indicator 24 (Capacity and flexibility of use of bioenergy).** |

**WHERE TO?**

**Imported biofuel?**

Add the identified critical indicators into the Summary Booklet in Chapter 6, adding a note as to the reason for criticality.

**Domestically produced biofuels?**

Continue in this Module to **Section 5.1.2**

Go to **Section 5.1.3** in this module to identify critical GBEP indicators (if any) in relation to biofuel distribution.

# 5.1.2 Domestically produced biofuels.

***Please provide the information below for each transport biofuel produced in the country.***

|  |  |
| --- | --- |
|  | **Answers** |
| * **Biofuel feedstocks:**
 |  |
| * + **Crops/trees/grasses**:[repeat for each type of crop/tree/grass used as bioenergy feedstock]**.**
 |  |
| * + **Crop/livestock/forest residues**: [repeat for each type of residue used as bioenergy feedstock].
 |  |
| * + **Processing residues**: [repeat for each type of residue used as bioenergy feedstock].
 |  |
| * + **Waste**:[repeat for each type of waste used as bioenergy feedstock].
 |  |
| * **Main feedstock production/harvesting/collection areas** [repeat for each feedstock]:
 |  |
| * **Main sites/plants for the pretreatment of biomass:**
 |  |
| * **Main biofuel production sites:**
 |  |
| * **Main technologies used for/in:**
 |  |
| * + Biomass preprocessing/pretreatment:
 |  |
| * + Biofuel production:
 |  |

**WHERE TO?**

**Finished this section?**

Go to **Module 5.4** related to feedstock production/harvesting **before** proceeding to Section 5.1.3 in this Module.

# 5.1.3 Feedstock Transportation and Preprocessing/Pretreatment, and Biofuel Production and Distribution.

Beside the indicators identified for the feedstock production/harvesting stage, a number of additional GBEP indicators may be critical for the other stages of the biofuel supply chain, i.e., feedstock transportation and pre-processing/pretreament, and biofuel production and distribution. A few questions are included below, in order to support the identification of critical indicators associated with these stages.

|  |  |
| --- | --- |
|  | **CRITICAL GBEP INDICATORS** |
| **On average, does the feedstock travel over long distances before reaching the plants for the preprocessing/pretreatment of biomass and/or for the production of biofuels?** | **Indicator 1 (Lifecycle GHG emissions);****Indicator 18 (Net energy balance);** **Indicator 23 (Infrastructure and logistics for distribution of bioenergy).** |
| **On average, do biofuels travel over long distances before reaching fuel terminals and wholesalers?**  | **Indicator 1 (Lifecycle GHG emissions);** **Indicator 18 (Net energy balance);** **Indicator 23 (Infrastructure and logistics for distribution of bioenergy).** |
| **Are feedstock transportation and/or biofuel distribution concentrated along a few critical routes[[5]](#footnote-5)?** | **Indicator 23 (Infrastructure and logistics for distribution of bioenergy).** |
| **Is energy used in biomass preprocessing/pretreament and/or in biofuel production obtained from the combustion of:****Woodfuel;** **Fossil fuels** (e.g., coal)**.** | **Indicator 1 (Lifecycle GHG emissions);** **Indicator 3 (Harvest levels of wood resources) (ONLY woodfuel);****Indicator 4 (Emissions of non-GHG air pollutants, including air toxics);** **Indicator 18 (Net energy balance).** |
| **Is there significant room to increase the overall efficiency of biomass preprocessing/pretreatment and/or biofuel production using best available technologies?** | **Indicator 17 (Productivity[[6]](#footnote-6));** **Indicator 18 (Net energy balance).** |
| **Are the main plants for the preprocessing/pretreatment of biomass and/or for the production of biofuels located in areas with medium, high or critical levels of water stress** [as per SDG indicator 6.4.2]**?** | **Indicator 5 (Water use and efficiency).** |
| **Are the main plants for the preprocessing/pretreatment of biomass and/or for the production of biofuels located within watersheds considered most vulnerable to pollution from effluents?** | **Indicator 6 (Water quality[[7]](#footnote-7)).** |
| **Is there freedom of association and the effective recognition of the right to collective bargaining in the transportation and manufacturing sectors?** | **Indicator 11 (Change in income)[[8]](#footnote-8);****Indicator 12 (Jobs in the bioenergy sector[[9]](#footnote-9)).**  |
| **Are trainings and proper equipment provided to workers in plants for the preprocessing/pretreatment of biomass and/or for the production of biofuels, in order to minimize occupational health and safety risks?** | **Indicator 16 (Incidence of occupational injury, illness and fatalities);****Indicator 21 (Training and re-qualification of the workforce).** |

# 5.1.4 Domestic biofuel consumption.

***Please answer the questions below for each biofuel consumed in the country.***

|  |  |  |
| --- | --- | --- |
|  | **Answers** | **CRITICAL GBEP INDICATORS** |
| * **Share of biofuels consumption in each transport sub-sector:**
 |  |  |
| * **Road transport**: share (%) of final energy consumption.
 |  |  |
| * **Aviation**: share (%) of final energy consumption.
 |  |  |
| * **Maritime**: share (%) of final energy consumption.
 |  |  |
| * **Total**: share (%) of final energy consumption.
 |  |  |
| * **Progress towards target/mandate:**
 |  |  |
| * **Road transport**: share (%) of target/mandate met.
 |  |  |
| * **Aviation**: share (%) of target/mandate met.
 |  |  |
| * **Maritime**: share (%) of target/mandate met.
 |  |  |
| * **Total**: share (%) of target/mandate met.
 |  |  |
| * **Progress towards blending wall:**
 |  | **Indicator 24 (capacity and flexibility of bioenergy use).** |
| * **Road transport**: share (%) of blending wall met.
 |  |
| * **Aviation**: share (%) of blending wall met.
 |  |
| * **Maritime**: share (%) of blending wall met.
 |  |
| * **Total**: share (%) of blending wall met.
 |  |
| * **Number** **of flex-fuel vehicles that can use either fossil fuel/biofuel:**
 |  | **Indicator 24 (capacity and flexibility of bioenergy use).** |
| * Road transport
 |  |

**WHERE TO?**

Then, go to **Chapter 7** “Rapid measurement of critical GBEP indicators through monitoring of relevant safeguards and good practices”.

**Finished this Module?**

Add the identified critical indicators into the Summary Booklet in **Chapter 6**, adding a note as to the reason for criticality.

1. If no policy/programme is in place to support the adoption of modern bioenergy technologies for heating and cooking, the year in which such technologies started being introduced in the country could be used as baseline. [↑](#footnote-ref-1)
2. Especially in case the domestic policy foresees specific GHG emission saving thresholds. [↑](#footnote-ref-2)
3. From biofuel use. [↑](#footnote-ref-3)
4. This indicator will be critical especially in case the distribution of biofuels is highly concentrated along a few routes, increasing the risk of supply disruptions. [↑](#footnote-ref-4)
5. As described under GBEP indicator 23 (Infrastructure and logistics for distribution of bioenergy), “critical routes are those which are subject to significant risk of disruption and which could not easily or quickly be replaced, such as pipelines, port facilities, etc., taking into account the relative volume capacity of each mode”. [↑](#footnote-ref-5)
6. Specifically, sub-indicator 17.2 (Processing efficiencies by technology and feedstock). [↑](#footnote-ref-6)
7. Specifically, sub-indicator 6.2 (Pollutant loadings to waterways and bodies of water attributable to bioenergy processing effluents, and expressed as a percentage of pollutant loadings from total agricultural processing effluents in the watershed). [↑](#footnote-ref-7)
8. Specifically, sub-indicator 11.1 (Contribution of the following to change in income due to bioenergy production: wages paid for employment in the bioenergy sector in relation to comparable sectors). [↑](#footnote-ref-8)
9. Specifically, sub-indicator 12.2 (Total number of jobs in the bioenergy sector and percentage adhering to nationally recognized labour standards consistent with the principles enumerated in the ILO Declaration on Fundamental Principles and Rights at Work, in relation to comparable sectors). [↑](#footnote-ref-9)