

Mobilisation of non - food biomass in a sustainable way; Criteria & Indicators

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Various approaches to sustainability



- RED (and beyond) sustainability requirements for biofuels and bioliquids.
- Non-legally binding requirements for solid and gaseous bioenergy at the EU level (but some MS binding requirements e.g. UK and NL) - Communication from the EC (2014).
- Non-legally binding requirements for biomaterials at the EU level.

→ Urgent need of harmonised sustainability C&I across value chains





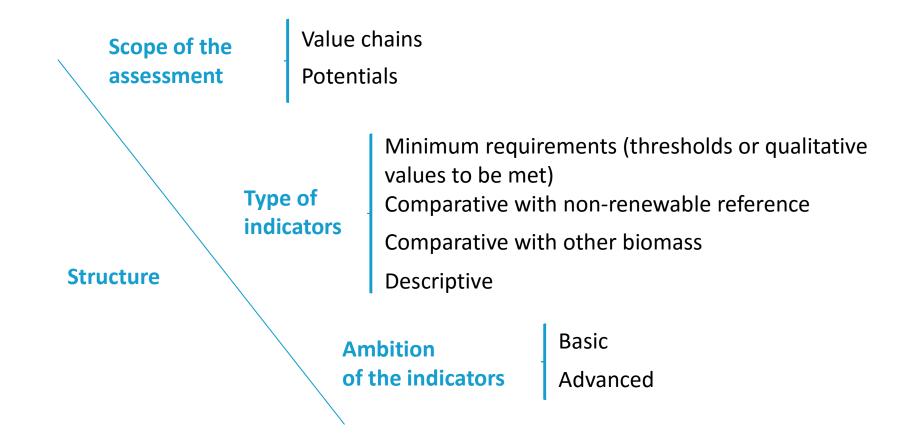
Umbrella approach for sustainability in the bioeconomy Rationale:

- Target: non-food biomass for the bioeconomy (biobased economy)
- Holistic view of sustainability: economic, social and environmental criteria
- International view: to be applied in the EU and in third countries
- Integrated approach: beyond forestry, agriculture or waste sectors



Assessing Sustainability







Scope of the assessment



Geographical scope:

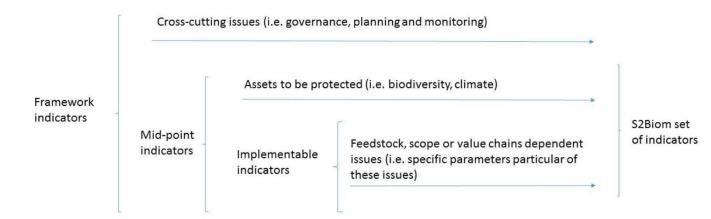
- **spatially explicit** (e.g. for biodiversity, soil, etc.) when they depend on the location.
- **partially** attributable to spatial distribution (e.g. GHG, land use efficiency) when a part of the indicator is associated to the location (i.e. production) and another part depends on the value chain.
- **non-spatial** but circumstantial (e.g. labor conditions, employment) when their performance depend on the context and not specifically on the location.



Types of Indicators (I)



Conceptualization of the types of indicators



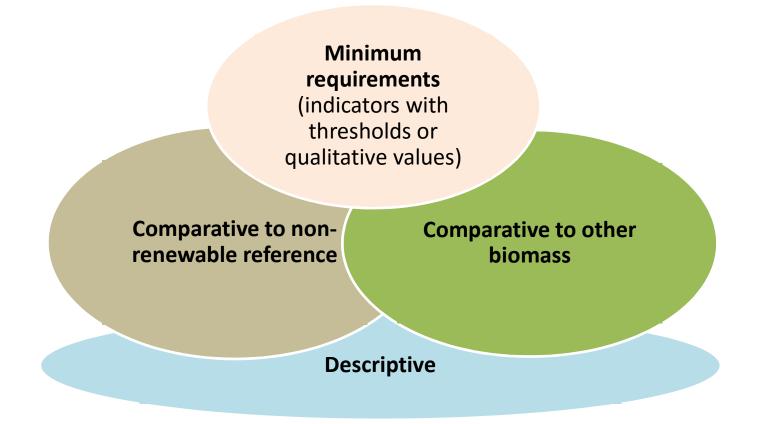
Overview of the relation between "mid-point" indicators and "implementable" indicators.

S2Biom Criteria		S2Biom Mid-point Indicators	S2Biom Implementable Indicators			
3. Biodiversity	3.1	Protected areas and land with significant biodiversity values	Amount of residues to be left on the ground in every			
	3.2	Biodiversity conservation and management				
	4.1Erosion4.2Soil Organic Carbon		location			
4. Soil						
	4.3	Soil nutrient balance				



Types of Indicators (II)







Ambition Level



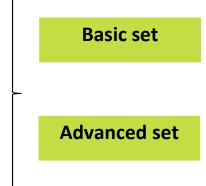
The definition of the basic and advanced sets will depend on policy decisions (stakeholder views). Different considerations might be applied to translate scientific set into the basic or advanced sets

1. Type of indicators: comparative or descriptive indicators might become a minimum requirement or minimum requirements become comparative or descriptive indicators

Scientific set

2. Threshold aspiration level: thresholds of the minimum requirements might be more/less demaning

3. Implementation Issues: list of indicators might be expanded/reduced





Sustainability C&I (I)



Data background:

- The methodology for life-cycle based environmental sustainability assessment of non-food biomass value chains, (JRC 2014)
- Current criteria and indicators developed for bioenergy at the international, EU and country level, including voluntary private sector schemes.
- Other sectoral policies with sustainability requirements (i.e. EU Forest Strategy).
- Proposals from other research projects focused (mainly) on biomass for bioenergy such as Biomass Energy Europe, Biomass Futures, Biomass Policies, Global Bio-Pact and BioTrade2020plus.
- Efforts from other projects that focuses on biorefineries such as BIOCORE, EuroBioRef, and SUPRABIO.



Sustainability C&I (II)



(Draft) List of Sustainability C&I \rightarrow Umbrella approach (12 criteria; 27 indicators)

-							
		Land Use Efficiency					
	1. Resource	Secondary Resource Efficiency					
	Efficiency	Energy Efficiency					
		Functionality (Output service quality)					
	2. Mitigate	GHG(CO ₂ eq) LCA, including LUC					
al	Climate Change	Other GHG emissions					
Environmental		Protected areas and land with significant					
Ĕ	3. Biodiversity	biodiversity values					
ē		Biodiversity conservation and management					
ž		Erosion					
Ш	4. Soil	Soil Organic C					
		Soil Nutrient Balance					
		Water availability and regional water stress					
	5. Water	Water use efficiency					
		Water quality					
	6. Air	SO ₂ equivalents					
	0.7 11	PM10					

	7. Participation and	Effective participatory processes						
	transparency	Information transparency						
	8. Secure tenure of land	Land tenure assurance						
		Full direct jobs equivalents along the full value chain						
	9. Employment and	Full direct jobs equivalent in the biomass						
		consuming region (or country)						
	labor conditions	Human and Labor Rights						
		Ocupational safety and health for workers						
	10. Health risks	Risks to public health						
	11.Food, fuelwood and other products	Food, fuelwood and other products supply security						
		Current levelized life-cycle cost						
Economic	12. Production costs	Future levelized life-cycle cost						



Environmental C&I



			Indicator			Level of ambition								
		Indicator		B	asic		Advanced							
Criterion		#	Indicator	Minimum	Comparative Comparative (non-renewable reference)	Comparative (biomass reference)	Descriptive	Minimum requirement	Comparative (non-renewable reference)	Comparative (biomass reference)	Descriptive			
e		1.1	Land use efficiency			\checkmark		\checkmark						
1. Resource	use	1.2	Secondary resource efficiency			✓		✓						
Res	ä	1.3	Energy efficiency		✓			✓						
		1.4	Functionality (Output service quality)						\checkmark	\checkmark				
2. Climate	Change	2.1	Life cycle-based CO ₂ eq including direct land use change	~				~						
2. (٦	2.2	Other GHG emissions		✓	\checkmark		\checkmark						
З.	Biodiversity	3.1	Protected areas and land with significant biodiversity values	~				~						
,	Biodiv	3.2	Biodiversity conservation and management			\checkmark		~						
	4.1 S 4.2		Erosion			✓		✓						
		4.2	Soil Organic Carbon			\checkmark		✓						
	t	4.3	Soil nutrient balance			✓		✓						
s c	ז	5.1	Water availability and regional water stress		✓			✓		\checkmark				
	water	5.2	Water use efficiency						\checkmark	\checkmark				
L	n	5.3	Water quality		✓				✓	~				
> :<		6.1	SO ₂ equivalents		✓	✓		✓						
ų	6	6.2	PM ₁₀		✓	✓		✓						



Social & Economic C&I



Theme		Indicator		Level of ambition							
			Indicator		В	asic		Advanced			
	Criterion	#	Indicator	Minimum requirement	Comparative (non- renewable reference)	Comparative (biomass reference)	Descriptive	Minimum requirement	Comparative (non- renewable reference)	Comparative (biomass reference)	Descriptive
	7. Participation and transparency	7.1	Effective participatory processes								\checkmark
		7.2	Information transparency								~
	8. Land tenure	8.1	Land Tenure assurance			✓		 ✓ 			
	9. Employment and labor rights	9.1	Full direct jobs equivalents along the full value chain		~	~			√	~	
Social		9.2	Full direct jobs equivalent in the biomass consuming region (or country)		~	~			✓	~	
		9.3	Human and Labor Rights	✓				✓			
		9.4	Occupational safety and health for workers	~				~			
	10. Health risks	10.1	Risks to public health								\checkmark
	11.Food, fuelwood and other products	11.1	Food, fuelwood and other products supply security			~		~			
Econo mic	12. Production costs	12.1	Current levelized life-cycle cost		✓	~			✓	✓	
Ecol mic		12.2	Future levelized life-cycle costs						\checkmark	✓	





Thank you for your attention !!

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Bioeconomy



Bioeconomy

food and feed industries (agriculture, forestry, horticulture, fisheries and aquaculture, plant and animal breeding, the nutrition and beverage industry), plus

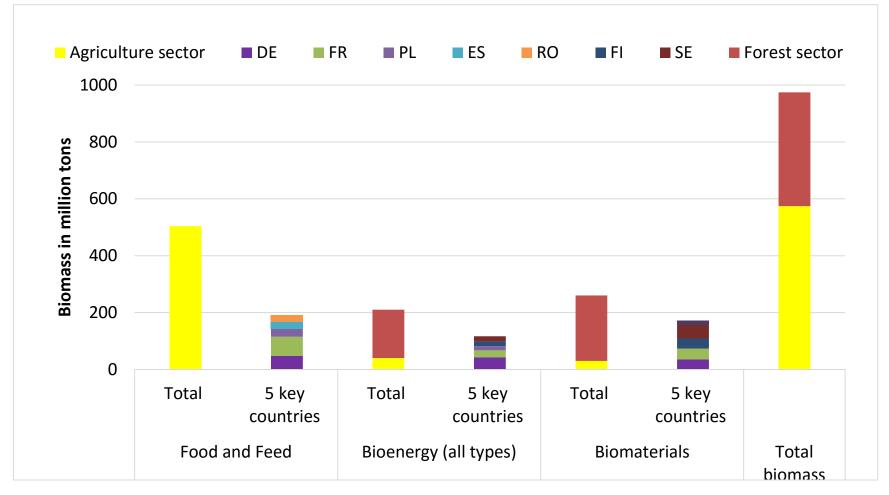
BioBased Economy

non-food industries–chemical, material, medicine, pulp+paper and wood industries + bioenergy (including biorefineries)

IEA Task 42 (2014)



Agriculture and Forest Biomass Produced S2BiOm in EU Biobased Value Chains in 2010



IINAS (forthcoming)