ECOFYS

sustainable energy for everyone

Agentschap NL
Ministerie van Economische Zaken

4th meeting of the GBEP Working Group on Capacity Building for Sustainable Bioenergy (WGCB)

AG2 – "Exchanging and discussing first experiences and lessons learned - focus on a selection of 4 indicators"

Lessons learned in testing the GBEP sustainability indicators

30/05/2013

Questions for discussion

1. Approach

- Could the GBEP methodology be fully/partially used?
- What are the main differences between the used methodology and the GBEP methodology?

2. Data availability

- Which data were available, which not? Are data up-to-date?
- Are data available consistent with GBEP requirements?
- How reliable are the data?

3. Approach used to deal with data gaps and quality issues?

4. Efforts needed to complete indicator?

- Stakeholders? Time? Other resources?

5. Use for policy making/evualation and monitoring?

What are your recommendations for the further development of the indicator?

Indicator coverage – Environmental pillar

	Colombia	Germany	Ghana	Indonesia	Netherlands
1) Lifecycle Green House Gas (GHG) emissions					
2) Soil quality					
3) Harvest levels of wood resources					
4) Emissions of non-GHG, air pollutants, including air toxics (NOx, SO2, ...)			Lack of data		
5) Water use and efficiency			Lack of data		
6) Water quality			Lack of data		
7) Biological diversity in the landscape			Lack of data		
8) Land use and land-use change related to bioenergy feed stock production					

Indicator 2. Soil quality

Description:

Percentage of land for which soil quality, in particular in terms of soil organic carbon, is maintained or improved out of total land on which bioenergy feedstock is cultivated or harvested.

Measurement unit(s):

Percentage

To maintain or improve soil quality on land used for bioenergy feedstock production, it is necessary to address the effects of soil and crop management, and in some cases forest and woody vegetation management, on five key factors that contribute to soil degradation:

1. loss of soil organic matter, leading to decreased carbon and soil fertility;
2. soil erosion, leading to soil loss (especially of fertile topsoil);
3. accumulation in soils of mineral salts (salinization) from irrigation water and/or inadequate drainage, with possible adverse effects on plant growth;
4. soil compaction, reducing water flow and storage, and limiting root growth;
5. loss of plant nutrients, e.g. through intensive harvest.

Questions for discussion

1. Approach

- Could the GBEP methodology be fully/partially used?
- What are the main differences between the used methodology and the GBEP methodology?

2. Data availability

- Which data were available, which not? Are data up-to-date?
- Are data available consistent with GBEP requirements?
- How reliable are the data?

3. Approach used to deal with data gaps and quality issues?

4. Efforts needed to complete indicator?

- Stakeholders? Time? Other resources?

5. Use for policy making/evualation and monitoring?

Indicator 2. Soil quality- Some lessons learned

Approach

- Applied methodology partly deviates from GBEP methodology.

Data availability

- Soil carbon content is not (regularly) measured.
- Land area for bioenergy had to be mostly estimated from total area for feedstock production (as feedstock have several uses).

Approach used to deal with data gaps and quality issues?

- Literature, estimations based on secondary sources.

Use for policy making/evualation and monitoring?

- Useful for monitoring and reporting in different contexts.

What are your recommendations for the further development of the indicator?

Indicator 2. Soil quality- Recommendations from pilots

- Allow a step-wise methodological approach to enable good data sets to be built up over the time. E.g.
  - Land use change data combined with data on carbon storage of given crop/land cover.
  - „Qualitative" approach, overlaying overall soil quality maps with maps of bioenergy crop area
- What to do when almost no data are available? E.g.
  - Start data collection in high risk areas (previous risk assessment)
  - Focus on large new developments for feedstock production and expand scope progressively to cover all area.

Indicator coverage – Social pillar

	Colombia	Germany	Ghana	Indonesia	Netherlands
9) Allocation and tenure of land for new bioenergy production			Lack of data		Less relevant
10) Price and supply of national food basket					Less relevant
11) Change in income			Lack of data		
12) Jobs in the bioenergy Sector					
13) Change in unpaid time spent by women and children collecting biomass	Lack of data	Less relevant	Lack of data		Less relevant
14) Bioenergy used to expand access to modern energy services		Less relevant			Less relevant
15) Change in mortality and burden of disease attributable to indoor smoke		Less relevant	Lack of data		Less relevant
16) Incidence of occupational injury, illness and fatalities	Lack of data		Lack of data		

Indicator 10. Price and supply of national food basket

Indicator 10 Price and supply of a national food basket

Description:

Effects of bioenergy use and domestic production on the price and supply of a food basket, which is a nationally defined collection of representative foodstuffs, including main staple crops, measured at the national, regional, and/or household level, taking into consideration:

- changes in demand for foodstuffs for food, feed, and fibre;
- changes in the import and export of foodstuffs;
- changes in agricultural production due to weather conditions;
- changes in agricultural costs from petroleum and other energy prices; and
- the impact of price volatility and price inflation of foodstuffs on the national, regional, and/or household welfare level, as nationally determined.

Measurement unit(s):

Tonnes; USD; national currencies; and percentage

Questions for discussion

1. Approach

- Could the GBEP methodology be fully/partially used?
- What are the main differences between the used methodology and the GBEP methodology?

2. Data availability

- Which data were available, which not? Are data up-to-date?
- Are data available consistent with GBEP requirements?
- How reliable are the data?

3. Approach used to deal with data gaps and quality issues?

4. Efforts needed to complete indicator?

- Stakeholders? Time? Other resources?

5. Use for policy making/evualation and monitoring?

What are your recommendations for the further development of the indicator?

Indicator 10. Price and supply of national food basket – Some lessons learned

Approach

- GBEP methodology partially used.

Data availability

- A number of the data underlying the GBEP methodology are available; others are not measured.

Approach used to deal with data gaps and quality issues?

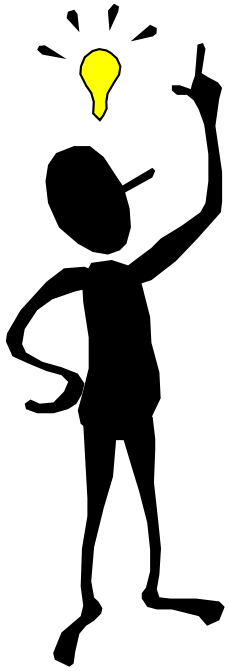
- Calculation of subindicators for which data were available.

Use for policy making/evualation and monitoring?

- Considered highly relevant for policy making and monitoring actual developments

Indicator 10. Price and supply of national food basket – Recommendations from some pilots

- Focus on part of the sub-indicators.
- Focus on few components of the food basket.
- Assess this indicator at regional level instead of national level. E.g. EU27



Indicator coverage – Economic pillar

	Colombia	Germany	Ghana	Indonesia	Netherlands
17) Productivity					
18) Net energy balance					
19) Gross value added			Lack of data		
20) Change in the consumption of fossil fuels and traditional use of biomass					
21) Training and re-qualification of the workforce		Less relevant	Lack of data		Less relevant
22) Energy diversity			Lack of data		
23) Infrastructure and logistics for distribution of bioenergy					
24) Capacity and flexibility of use of bioenergy			Lack of data		

Indicator 17. Productivity

Indicator 17 Productivity

Description:

(17.1) Productivity of bioenergy feedstocks by feedstock or by farm/plantation

(17.2) Processing efficiencies by technology and feedstock

(17.3) Amount of bioenergy end product by mass, volume or energy content per hectare per year

(17.4) Production cost per unit of bioenergy

Measurement unit(s):

(17.1) Tonnes ha per year

(17.2) MJ/tonne

(17.3) Tonnes/ha per year, m^3/ha per year or MJ/ha per year

(17.4) USD/MJ

Questions for discussion

1. Approach

- Could the GBEP methodology be fully/partially used?
- What are the main differences between the used methodology and the GBEP methodology?

2. Data availability

- Which data were available, which not? Are data up-to-date?
- Are data available consistent with GBEP requirements?
- How reliable are the data?

3. Approach used to deal with data gaps and quality issues?

4. Efforts needed to complete indicator?

- Stakeholders? Time? Other resources?

5. Use for policy making/evualation and monitoring?

What are your recommendations for the further development of the indicator?

Indicator 17. Productivity – Recommendations from some pilots

Approach

- GBEP methodology partially used.

Data availability

- Most yield data available from national statistics.
- Actual conversion efficiencies and production costs from literature.

Approach used to deal with data gaps and quality issues?

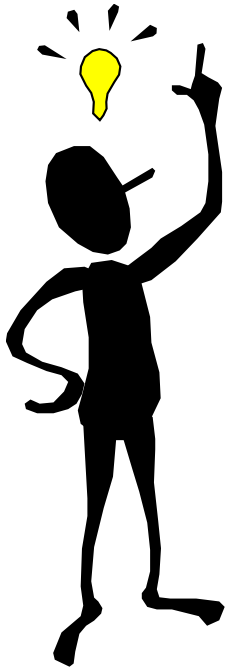
- Data from literature

Use for policy making/evualation and monitoring?

- Overall indicator is relevant. However, subindicator 17.1 (feedstock yield) is less relevant for countries importing most of bioenergy.

Indicator 17. Productivity – Recommendations from some pilots

- Sub-indicator 17.2 is expressed in MJ/tonne. Express it in MJ useful energy per MJ feedstock input
- Modify indicator 17.4 to use market prices or turnover instead production costs.



Indicator coverage – Environmental pillar

	Colombia	Germany	Ghana	Indonesia	Netherlands
1) Lifecycle Green House Gas (GHG) emissions					
2) Soil quality					
3) Harvest levels of wood resources					
4) Emissions of non-GHG, air pollutants, including air toxics (NOx, SO2, ...)			Lack of data		
5) Water use and efficiency			Lack of data		
6) Water quality			Lack of data		
7) Biological diversity in the landscape			Lack of data		
8) Land use and land-use change related to bioenergy feed stock production					

Some lessons learned from the pilots – Indicator 6. Water quality

Indicator 6 Water quality

Description:

(6.1) Pollutant loadings to waterways and bodies of water attributable to fertilizer and pesticide application for bioenergy feedstock production, and expressed as a percentage of pollutant loadings from total agricultural production in the watershed

(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

Measurement unit(s):

(6.1) Annual nitrogen (N) and phosphorus (P) loadings from fertilizer and pesticide active ingredient loadings attributable to bioenergy feedstock production (per watershed area):

- in kg of N, P and active ingredient per ha per year
- as percentages of total N, P and pesticide active ingredient loadings from agriculture in the watershed

(6.2) Pollutant loadings attributable to bioenergy processing effluent:

- pollutant levels in bioenergy processing effluents in mg/l (for pollutant concentrations and biochemical and chemical oxygen demand – BOD and COD), and (if also measured) ºC (for temperature), µS/m (for electrical conductivity) and pH
- total annual pollutant loadings in kg/year or (per watershed area) in kg/ha/year
- as a percentage of total pollutant loadings from agricultural processing in the watershed

Questions for discussion

1. Approach

- Could the GBEP methodology be fully/partially used?
- What are the main differences between the used methodology and the GBEP methodology?

2. Data availability

- Which data were available, which not? Are data up-to-date?
- Are data available consistent with GBEP requirements?
- How reliable are the data?

3. Approach used to deal with data gaps and quality issues?

4. Efforts needed to complete indicator?

- Stakeholders? Time? Other resources?

5. Use for policy making/evualation and monitoring?

What are your recommendations for the further development of the indicator?

Some lessons learned from the pilots – Indicator 6. Water quality

Approach

- GBEP methodology partially used. Indicator 6.2 not calculated.

Data availability

- Data on crop land and watersheds area, N and P loads (kg/ha/y) from overall agricultural sector and total use of pesticides per crop available from national statistics and information services.
- Actual data on N, P and pesticides loads from bioenergy feedstocks production not available.
- Pollutant loadings from bioenergy processing not available

Approach used to deal with data gaps and quality issues?

- Estimations based on available data.

Use for policy making/evualation and monitoring?

- Relevance depend on the framework conditions of the country.

Some lessons learned from the pilots – Indicator 6. Water quality

- Sub-indicator 6.1
  - Provide alternatives to simplify data collection and processing
  - Regional aggregation (EU)
- Sub-indicator 6.2
  - Compare pollutant load with total load in other industrial sectors instead of agricultural processing
  - Take into account potential benefits of bioenergy on water quality.

Final remarks