

The process for the selection of GBEP sustainability indicators **GBEP Task Force on Sustainability**

draft v6, 1 September 2009

Summary

The GBEP Task Force on Sustainability has established three sub-groups (environmental, social, and economic and energy security) to develop relevant, practical, science-based voluntary sustainability indicators for bioenergy production and use. These desired qualities of the GBEP sustainability indicators are described below. The geographical scale is also outlined: GBEP indicators should be capable of use in analysis of the environmental, social, economic and energy security impacts of national-level bioenergy production and use.

Each sub-group will, paying regard to indicators already in use, develop a shortlist of candidate indicators that it deems to be relevant and to cover the full range of the provisional criteria assigned to it. The sub-group will then attach additional information relating to the scientific basis (e.g. a methodology that ensures that the link between bioenergy and the impact being measured is established) and the practicality (e.g. cost of data collection) to each of these relevant candidate indicators. This information will inform the selection by each sub-group of a first draft of relevant, practical and science-based indicators. This first draft will be reviewed by the Task Force, possibly then subjected to a process of consultation of experts and stakeholders outside of the Task Force, and further refined by the sub-groups into a second draft for recommendation to the Task Force. The sub-groups will also recommend any revision of the provisional criteria that the development of indicators has shown to be appropriate.

The whole Task Force will then finalise a coherent complete list of criteria and indicators by consensus for recommendation to the Steering Committee for their approval. This list will be augmented with supporting information (including methodological descriptions) and cross-cutting recommendations that relate to issues that the Task Force considers important and relevant to sustainable bioenergy production and use, but not amenable to translation into criteria and indicators. These recommendations will be drafted by the team of Task Force Chair, sub-group leaders and Secretariat, for agreement by consensus amongst the Task Force. This same team will also be responsible for ensuring consistency and coherence of work across the sub-groups.

Introduction

At the 4th meeting of the GBEP Task Force on Sustainability, held on 19-20 March 2009 in Heidelberg, Germany, the Secretariat presented a proposal for the process for the selection of GBEP sustainability indicators. Discussion and feedback from Task Force members has

informed the drafting of this paper on the selection process, including the roles of the three sub-groups, which were established at the same meeting.

Previously at the 3rd meeting of the Task Force in Sao Paulo, on 19 November 2008, the Task Force had agreed the following text outlining the scope of the work on criteria and indicators:

This work is intended to provide relevant, practical, science-based, voluntary sustainability criteria and indicators to guide any analysis undertaken of bioenergy at the domestic level. The criteria and indicators themselves, when made part of such analysis, should be used with a view to informing decision making and facilitating the sustainable development of bioenergy and, accordingly, shall not be applied so as to limit trade in bioenergy in a manner inconsistent with multilateral trade obligations.

In accordance with this scope text, the indicators that GBEP will develop should be **relevant**, **practical** and **science-based** and their application should be **voluntary**. At the 5th meeting of the Steering Committee, held in Rio de Janeiro on 18 June 2008, GBEP criteria were defined as “categories of sustainability factors, capacities or processes that are used to evaluate the environmental, economic or social performance of bio-energy production and use.” Additionally, indicators were defined as “measurable outcomes of a criteri[on] regarding bio-energy production and use; a means for measuring or describing various aspects of the criteria.”

The role and working modalities of the sub-groups of the Task Force on Sustainability

Environmental, Social, and Economics & Energy Security Sub-groups were established in the Heidelberg meeting of the Task Force under the leadership, respectively, of Germany and UNEP, FAO, and IEA and UN Foundation. The purpose of these sub-groups is to undertake activities required to develop indicators for the provisional GBEP sustainability criteria. Additional work within the agreed scope and programme of work of the Task Force would require the agreement of the whole Task Force.

Some of the work done by sub-groups to develop indicators is expected to be by electronic discussion, with the sub-groups meeting at Task Force meetings to help ensure consistency and to share lessons learnt. There will also be opportunities for physical working meetings of the sub-groups, subject to agreement of the sub-group members and taking into account resource constraints. Sub-group members will agree the division of upcoming work between electronic discussion and meetings (and how electronic work would take place) as well as timetables, ensuring adequate time to comment at each stage. It was agreed in Heidelberg that the Environmental Sub-group would lead, in close collaboration with the other sub-groups, the activities on indirect effects, which will be defined in a separate working document to follow.

Membership of sub-groups will be open to all GBEP Partners and Observers, who are encouraged to nominate their own experts to form part of their official delegations. The involvement of additional sustainability experts (who are not part of these official delegations), for example through workshops or electronic discussion, and any possible consultation on draft criteria and indicators, should take place in a fully inclusive and transparent manner with a balanced representation of developing and developed countries. The final decision on the set of criteria and indicators to be recommended to the Steering Committee for their approval will be taken by the Task Force members alone. It should be

noted that experts from sectors other than bioenergy (e.g. forestry, conservation, agriculture) can provide valuable insights for the GBEP process.

The ad hoc group comprising the Chair, Secretariat and sub-group leaders will ensure adherence to the working modalities outlined above.

The criteria and principles for selecting indicators

The following guidance is set out in order to help define how GBEP might obtain **relevant**, **practical** and **science-based** indicators and establish a common and transparent working practice among the sub-groups. The criteria and principles are set out below, followed by a description of the process and a timeline.

Relevance: An indicator must be relevant inasmuch as it must measure as closely as possible the trend of a criterion or a component of a criterion. (Sub-groups may discuss the most important components of a criterion that they would like to focus the search for indicators on, where the scope of a criterion is particularly broad.) The indicators should provide policy-makers with targeted information as to where current policies are successful and where new policy responses are required, as well as potentially providing information of use to other bioenergy stakeholders. The sustainability of bioenergy is to be considered, where relevant and meaningful, in an energy context and therefore, where possible, indicators should be identified that allow for comparison with the fossil fuel equivalent (or alternative energy sources or policy options). However, this should not be to the detriment or exclusion of non-fossil fuel comparators desirable to demonstrate the sustainability of bioenergy.

The relevance of each indicator to policy-makers might be quite locally and possibly technology specific, and this is likely to be reflected in the choice of indicators that countries or organisations finally choose to use to inform their own analysis. However a set of universally relevant indicators, applicable to all sources of bioenergy, is the primary objective of the Task Force. Some flexibility might be required to address issues specific to certain bioenergy pathways, and options for achieving this should be discussed by the sub-groups in the first instance and subsequently by the Task Force, and taken forward if there is consensus.

Practicality: The practicality of the indicators will determine the extent of their (voluntary) use. The Task Force will strive to learn from past and ongoing indicator processes of relevance. Adopting, where appropriate, identical or similar indicators to those that are already being measured, and methodologies that are already in use, would make measuring the GBEP indicators less burdensome, but care must be taken to ensure that these indicators and methodologies disaggregate the impact of bioenergy from all other factors as well as possible.

The practicality of indicators will depend on data availability and the ability to collect the data. For example, some or all data required to produce a value for the indicator may already be available from existing sources. When the relevant data is not already being collected – the level of complexity (time, cost, technology) of the process required to measure the indicators (e.g. statistical survey, modelling, and physical measurement) needs to be considered prior to selecting the indicator. The selected indicators should be measurable within a reasonable period of time and with reasonable effort. Where quantitative indicators can be found, they are to be preferred to qualitative indicators, but this latter class should be included where appropriate, especially where methodologies for quantitative indicators do not exist and need

to be developed. Qualitative data may be preferred in some instances so as not to give a false sense of accuracy, such as in surveys or reporting of interview results. Moreover, an indicator that allows more than one aspect of the criteria to be examined would score more highly on value for money and hence practicality.

Scientific basis: The scientific basis of the indicators is crucial to the operationality, objectivity, transparency and credibility of the GBEP product. The aim is to have a well-established scientific relationship between the indicator and the effect that it is desired to measure, as expressed by a criterion or component.

The key to the indicators being science-based is having a methodical approach to proving the link between the results (i.e. values or changes in values over time) and the cause (i.e. bioenergy production and use) and principles to guide the establishment of accurate answers, taking into account resource constraints.¹ General agreement on the methodological approach and the level of certainty attached to its results would be necessary for the final selection of a GBEP indicator. It should be born in mind that the methodological approach used might encompass techniques from the full range of sciences (e.g. natural, social, behavioural), including modelling, interviews and direct physical measurement. A physical measurement, for all its precision, may in fact be subject to uncertainties related to the baseline, interference of external factors, natural (e.g. seasonal) variation of the environment etc. of a comparable or greater level than uncertainties from interview or model based results. Since an important part of science is peer-review of research findings, the existence of peer-reviewed documentation of the use of an indicator to demonstrate an impact of bioenergy production and use would be one factor in support of the scientific basis of an indicator.

Geographic scale of indicators: The GBEP sustainability indicators are intended to inform analysis at the domestic level, with the emphasis on informing national level policy analysis and development. Therefore GBEP should develop indicators that function for the measurement of the impacts (wherever they might have effect) of national-level bioenergy production and use. In addition to indicators that could be measured at the farm, production unit or batch level, the Task Force will also consider other indicators, which, through appropriate aggregation and e.g. statistical analysis, may provide good evidence of a causal link between a change in conditions and bioenergy.² On the other hand, some indicators (e.g. employment figures, soil erosion) might work adequately at any geographic scale, given sufficient data.

¹ The Oxford English Dictionary (OED) offers various definitions of the word “science”, of which the most relevant seems to be:

4. a. In a more restricted sense: A branch of study which is concerned either with a connected body of demonstrated truths or with observed facts systematically classified and more or less colligated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain.

It also provides some instances of use of the word that provide useful context:

1725 WATTS *Logic* II. ii. §9 The word science, is usually applied to a whole body of regular or methodical observations or propositions,..concerning any subject of speculation. ... **1882 ADAMSON** in *Encycl. Brit.* XIV. 781/2 It may be said that in all sciences there are implied clearly defined notions, general statements or judgments, and methodical proofs.

Another definition offered in the OED is that science “is concerned with theoretic truth,” and sometimes “the term *science* is extended to denote a department of practical work which depends on the knowledge and conscious application of principles”.

² For example, whereas it might be impossible to disaggregate satisfactorily the effect of bioenergy production on the municipal Human Development Index or Gini coefficient, a time series of such values across a country might allow statistical analysis that could produce an adequate causal link. (See “A sustainability analysis of the Brazilian ethanol” by Arnaldo Walter et al., <http://www.globalbioenergy.org/bioenergyinfo/sort-by-date/detail/en/news/20538/icode/5/>)

The path towards a final set of indicators

1. Some of the provisional criteria could be open to rather a broad interpretation. In such cases, sub-groups might wish to discuss before proposing indicators the most important components of these criteria. Such “components” would not be part of the final product, but would serve to guide the indicator selection process towards the issues considered to be of most importance, without preventing the proposal and consideration of any indicators whatsoever.
2. After selection of components for criteria where deemed necessary, sub-group leaders should invite their sub-group members to propose candidate indicators compatible with the criteria and principles described above and any others agreed by the Task Force. Candidate indicators should be submitted by use of the template (attached at Annex A). It will not be necessary to provide all the information requested in order to submit a candidate indicator; sub-groups will work collaboratively to complete this information before selecting indicators to recommend to the Task Force.
3. After this initial phase wherein sub-group members propose candidate indicators, which are collated by the sub-group leaders, sub-groups should discuss them, gather the information required to assess their relevance³ and select the most relevant of these candidate indicators. In this context, the sub-groups should also consider the quality of the available data and need for data collection strategies to address gaps in data.
4. For each indicator in this shortlist of the most relevant indicators, a description of the scientific basis of each indicator, by means of an appropriate methodological approach for the measurement of the indicator and the establishment of the link between bioenergy production and/or use and the impact measured, would need to be provided. Information about the practicality of each indicator – such as the approximate cost or level of effort of collecting the data (see above) – should likewise be provided.³
5. Then, prior to the Task Force meeting in late November, each sub-group should agree upon a first draft of indicators, informed by assessment of their relevance, practicality and scientific basis, taking into account that there may be some indicators proposed after the initial assessment of relevance.

In particular, candidate indicators considered very relevant but low in practicality and/or scientific basis should be noted in order to point to a possible requirement for further scientific work and for possible consideration in the cross-cutting recommendations.
6. The Task Force meeting in late November should give feedback to the sub-groups on their first drafts of indicators and seek agreement or indicate the need for amendments, additions or removals as appropriate. The Task Force should also consider the coherence of the full set of draft indicators and reflect on necessary revision of the criteria and basket structure. The Task Force should decide whether to classify the indicators into two or more tiers, e.g. relating to their degree of priority or their universal versus specific applicability. The Task Force should also comment on the draft cross-cutting recommendations and seek agreement and identify

³ See the draft template at Annex A for the information deemed desirable to assess the relevance, practicality and scientific basis of a candidate indicator. In the event that sub-group members do not possess the expertise or time to provide such information for an indicator that they believe to be very important to measure, the sub-group leaders should arrange for this information to be outlined by themselves or relevant experts in the sub-group.

missing issues where possible. Additional content of the final report containing the criteria and indicators should also be discussed (see below section on supporting information). The Task Force should discuss the possibility of consulting beyond its membership on the draft criteria and indicators.

7. On the basis of feedback from the Task Force and any consultation, sub-groups should then continue to refine the indicators, possibly reassessing the relevance, scientific basis and practicality of certain indicators if there are new proposals or there arise difficulties in reaching consensus on the second draft. This second draft should then be submitted to the Task Force for agreement by consensus at its meeting around March 2010. The Task Force Chair, sub-group leaders and Secretariat should also produce a second draft of the cross-cutting recommendations and a first draft of additional content of the report (see below), to be submitted to the Task Force for agreement at the same time.

Regarding the total number of indicators finally selected, the probability that they will be measured and used to inform domestic analysis of bioenergy by a large number of countries should be taken into consideration, in addition to the completeness of their coverage. The number should be adapted to the minimum felt appropriate at the end of the work.

Directionality – thresholds, indicative goals

The Task Force agreed at its 3rd meeting in Sao Paulo on 19 November 2008 to return later in the iterative process of developing criteria and indicators to the question of whether and how to introduce directionality. This topic should therefore be discussed further before the finalisation of the report containing the criteria and indicators.

Supporting information to accompany indicators

The GBEP sustainability indicators are likely to be more useful with supporting information. The Task Force must therefore decide which information it deems necessary to provide in the report of criteria and indicators. Discussion of this issue should begin once the full Task Force has discussed the first draft of indicators. The Task Force might consider using the methodology sheets of the “Energy Indicators for Sustainable Development”⁴ developed by UNDESA, IAEA et al. as a starting point and deciding which elements are worth including in the GBEP product. Preferred indicators with their units of measurement and methodological description would appear to be amongst the essential elements. Additional explanatory notes concerning the use and interpretation of the criteria and indicators should also be discussed with the goal of producing a first draft by March 2010.

⁴ e.g. www-pub.iaea.org/MTCD/publications/PDF/Pub1222_web.pdf; for methodology sheets, see p.29 ff.

Proposed Timeline

May-June 2009 – drafting of this paper outlining process for selection of indicators and role of sub-groups by Secretariat, Task Force Chair and sub-group leaders

June 2009 – comments from Task Force on proposed process for selection of indicators and role of sub-groups; consultation by sub-group leaders of their sub-group members to provide initial thoughts on candidate indicators.

July 2009 – Task Force meeting in Paris on 8-9 July, which will seek to:

- finalise the paper describing the indicator selection process;
- discuss first thoughts on candidate indicators, especially common lessons across sub-groups; and
- define path to first draft of indicators, to be agreed at next Task Force meeting, scheduled for late November.

July-November 2009 – sub-groups work to develop a first draft of indicators and discuss other issues related to the final output; Task Force Chair, sub-group leaders and Secretariat produce first draft of cross-cutting recommendations

October 2009 – a workshop involving all three sub-groups to discuss progress and further develop the indicators

November 2009 – Task Force meeting around third week of November, which will:

- discuss first draft of indicators, including possible tiering/prioritisation of indicators, informed by the sub-groups' assessment of candidate indicators;
- discuss and agree any necessary (provisional) redefinition of criteria and baskets;
- discuss first draft of cross-cutting recommendations;
- discuss appropriate format and content for final report containing agreed criteria and indicators (including e.g. guidance concerning use of the criteria and indicators and interpretation of results, methodological guidance and indicative targets); and
- receive updates from and exchange information with other initiatives developing sustainability criteria and indicators for bioenergy.

The Steering Committee will also meet directly after the Task Force and a progress report on the work on indicators will be presented to the Steering Committee for its endorsement.

December 2009-March 2010 – sub-groups work to produce final draft of indicators; Task Force Chair, sub-group leaders and Secretariat produce second draft of cross-cutting recommendations and first draft of accompanying guidance.

March 2010 – Task Force meeting to:

- agree final set of criteria and indicators and cross-cutting recommendations; and
- discuss first draft of the rest of the report on criteria and indicators.

March-May 2010 – finalisation of report and agreement by Task Force on Sustainability

May 2010 – endorsement of final report by Steering Committee

June 2010 – submission of the report to the G8 Summit in Canada

Annex A: Draft template for candidate GBEP sustainability indicators

<i>Proposed indicator</i>	
<i>Suggested unit⁵ (if applicable)</i>	
<i>Criterion</i>	
<i>Component (if applicable)</i>	

<i>I. Relevance</i>	
<i>Context of application</i>	<ul style="list-style-type: none"> Indicate whether this indicator is applicable to bioenergy... production use production <u>and</u> use Indicate whether this indicator is applicable to ... all bioenergy feedstocks/end uses/pathways only some feedstocks/end uses/pathways If only some, please list them → ... → ...
<i>Relation to criteria and sustainability</i>	<ul style="list-style-type: none"> Explain how the indicator relates to the criterion⁶ for which it is being proposed → ... Explain how the indicator will help assess the sustainability of bioenergy at the national level with regard the that criterion → ... List, if any, other provisional GBEP criteria that this indicator will also inform → ... → ...
<i>Comparison with alternative energy options</i>	<ul style="list-style-type: none"> Indicate whether comparison can be made with the fossil fuel equivalent measured by this indicator Yes No Do not know If Yes, specify with which alternatives comparison can be made: → ... Indicate whether comparison can be made with the non-fossil fuel equivalent measured by this indicator Yes No Do not know If Yes, specify with which alternatives comparison can be made: → ...

⁵ Please use SI unit system (metric) as much as possible

⁶ Description of relevance without going into details of the science involved since this will be covered in the Scientific Basis section

II. Practicality										
<i>Quantitative and qualitative data requirements</i>	<ul style="list-style-type: none"> • List the data needed to compile the indicator <ol style="list-style-type: none"> 1. ... 2. ... 3. 									
<i>Availability of data sources</i>	<ul style="list-style-type: none"> • Please list any readily-available national or international data sources that you are aware of • → ... • Please suggest a data collection strategy that could be realistically implemented to address key gaps in the available data • → ... 									
<i>Type of measurements and scale</i>	<ul style="list-style-type: none"> • Indicate which measuring methods are used <ul style="list-style-type: none"> Statistical (national/international accounts) Calculation/computation of (existing) data Physical, biological or chemical measurements Interviews and surveys Other, specify which one(s) → ... • Indicate at which geographic scale the data will be collected <table style="width: 100%; border: none;"> <tr> <td>National</td> <td>Regional</td> <td>Watershed</td> </tr> <tr> <td>Field (farming)</td> <td>Site (processing plant)</td> <td>Household</td> </tr> <tr> <td colspan="3">Other, specify which one(s)</td> </tr> </table> • → ... 	National	Regional	Watershed	Field (farming)	Site (processing plant)	Household	Other, specify which one(s)		
National	Regional	Watershed								
Field (farming)	Site (processing plant)	Household								
Other, specify which one(s)										
<i>Information about other international processes</i>	<ul style="list-style-type: none"> • If you know of other international processes which use a similar indicator, please provide relevant information 									

III. Scientific basis	
<i>Methodological approach</i>	<ul style="list-style-type: none"> • Briefly describe how the methodological approach for this indicator will allow one to assess the impact of bioenergy production and/or use, and separate it from other possible impacts⁷ → ... • Briefly explain the link between the measurement given by this indicator and the assessment of the aspect of sustainability addressed by the corresponding criterion → ... • Briefly describe the aggregation method used to build the indicator at the national level for data that are not collected at that level⁸ → ...
<i>Anticipated limitations</i>	<ul style="list-style-type: none"> • Indicate whether there are any anticipated limitations for the measurement of the indicator Yes No Do not know • If Yes, indicate which⁹ one(s). → ... → ...
<i>References</i>	<ul style="list-style-type: none"> • List any available peer-reviewed publications, government and NGO studies, technical manuals, or case studies that you are aware of that explain or support the chosen methodological approach (including from sectors other than bioenergy)¹⁰ → ...

⁷ Details here might include whether and how a baseline is established, which factors other than bioenergy might cause changes in the variable being measured, whether and how the effects of these factors are distinguished from the effect of bioenergy and accounted for, and how fluctuations in the external environment are addressed.

⁸ Details here might include the size of the sample and method for selecting the sample.

⁹ Missing data, Measurement uncertainty, Inherent difficulty in matching measurements to the intent of the indicator, etc

¹⁰ Methods such as estimations by interpolating between the known data, approximations by using proxies, etc.