

# HMWB Workshop, 12-13 March 2009, Brussels

## Member State Questionnaire

### 1. Context

A workshop on Heavily Modified Water Bodies (HMWB) will be organised on 12-13 March 2009 in Brussels by Germany, UK and the European Commission in cooperation with the WFD CIS-ECOSTAT-group and the CIS-HYMO-activity.

The workshop aims to allow information exchange on the following topics:

- **Designation of HMWB:**  
Exchange of experiences on practical application of HMWB designation processes in Member States.
- **Establishing good ecological potential (GEP):**  
Exchange information on the practical application of both methods for deriving GEP (HMWB Guidance No 4 approach based on biological quality elements and the “Prague” approach based on mitigation measures – *see Annex*) and collect examples of results.  
Compare results of methods and discuss, if they are comparable and what are reasons of differences.
- **Objective setting and measures:**  
Collect and discuss experiences of Member States on objective setting for HMWB (including related issues like application of exemptions) and exchange information about planned mitigation measures.

A discussion document will be prepared for the workshop. In order to collect background information for the workshop discussion document, Member States are kindly asked to fill in the present questionnaire on water uses and parameters included in HMWB designation, methods for classification of HMWB and ways of objective setting for HMWB in Member States.

Please fill in one questionnaire per Member State and return to [elftheria.kampa@ecologic.eu](mailto:elftheria.kampa@ecologic.eu) at the latest by **16 January 2009**. Please do not hesitate to answer, even if you can only provide information on national RBD level.

### 2. General information

**Q2.1:** Name of Member State.

**Finland**

**Q2.2:** Name and contact details of person to be contacted if any clarifications on the reply to this questionnaire are needed.

**Mika Marttunen**

### 3. HMWB designation

*Note: For each answer below rounded figures would be appropriate.*

**Q3.1: Please tell us about the proportion of each water category you have identified for designation as heavily modified by completing the two Tables below**

#### PRELIMINARY RESULTS

##### Number of HMWB

River		Lake		Transitional water		Coastal water	
Total number of water bodies (including non-HMWBs)	Number to be designated	Total number of water bodies (including non-HMWBs)	Number to be designated	Total number of water bodies (including non-HMWBs)	Number to be designated	Total number of water bodies (including non-HMWBs)	Number to be designated
829	74	1572	31			194	13

##### Length and area of HMWB

River		Lake		Transitional water		Coastal water	
Total length of water bodies (including non-HMWBs) (Km)	Length of to be designated (Km)	Total area of water bodies (including non-HMWBs) (Km <sup>2</sup> )	Area to be designated (Km <sup>2</sup> )	Total area of water bodies (including non-HMWBs) (Km <sup>2</sup> )	Area to be designated (Km <sup>2</sup> )	Total area of water bodies (including non-HMWBs) (Km <sup>2</sup> )	Area to be designated (Km <sup>2</sup> )

**Q3.2: Please tell us about the water uses for which you have identified water bodies as heavily modified by completing the three Tables below**

#### PRELIMINARY RESULTS, RESULTS OF RIVERS ARE NOT YET AVAILABLE

*Note. If a water body has been designated for more than one use, please count each use.*

Water use [Art.4(3)(a)]	Number of water bodies
Wider environment [Art.4(3)(a)(i)] *	0
Navigation, including port facilities, or recreation [Art.4(3)(a)(ii)]	0
- Navigation, including port facilities	3 (coastal WB=water body)
- Recreation	0
Activities for the purposes of which water is stored [Art.4(3)(a)(iii)]	
- Storage for drinking water supply	2 (coastal WB)

	2 (lake WB)		
- Storage for power generation	14 (lake WB)		
- Storage for irrigation	Xx		
Water regulation, flood protection, land drainage [Art.4(3)(a)(iv)]	Total	Urban land	Agricultural land
- Water regulation	14 (lake WB)		
- Flood protection	2 (lake WB)		
- Land drainage	0		

\* Please specify your definition of “wider environment”: ...

Description of each 'equally important sustainable human development activity' for which HMWB are to be designated [Art.4(3)(a)(v)]	Number of water bodies
	No HMWB's based on this criterion

#### Multiple water uses of HMWB

Number of water bodies designated for one use	Number of water bodies designated for two uses	Number of water bodies designated for three or more uses
	2 (Lake WB)	0

**Q3.3: Please tell us about the criteria you used to decide if a water body was substantially changed in character for it to be considered for designation as heavily modified by completing the applicable Tables below**

Did you use <u>impact-related criteria</u> (e.g. length or area expected to be worse than good status or substantially changed in hydromorphology)? (yes/no)	Did you use <u>pressure-related criteria</u> (e.g. volume of water stored; height of dam)? (yes/no)	Did you use <u>use-related criteria</u> (e.g. number of people provided with drinking water; protection against particular flood return period; daily number of vessels)? (yes/no)	Did you use <u>other types of criteria</u> ? (yes/no)
No	Yes	No	No

If you used **impact-related criteria**, please complete the following Table

Water category	Description of impact-related criteria (e.g. length or area expected to be worse than good status)
River	
Lake	
Transitional water	
Coastal water	

If you used **pressure-related criteria**, please complete the following Table

Pressure	Description of pressure-related criteria (e.g. volume of water stored; height of dam)?
Impoundment	
Other hydromorphological alterations	
- Rivers	<p>Water bodies can be classified as heavily modified if the certain threshold level of some single criteria is exceeded or if the cumulative HyMo index exceeds threshold value .</p> <p>River water body can be designated heavily modified directly ( = no designation test needed), if a <b>river</b> has been changed by damming up, by dredging, by making embankments or moving the river bed and these changes together cover at least 50 % of its length or at least 50 % of the natural head of the river is dammed.</p> <p>Criteria used in HyMo index calculation:</p> <ul style="list-style-type: none"> <li>• Upstream migration barriers ( % of river length)</li> <li>• Constructed head loss (%)</li> <li>• Constructed part (%) of the river length (cleaning, embankments, new channels, dry stretches)</li> <li>• The daily discharge variation compared with mean discharge (HQwk- NQwk)/MQ under normal water conditions</li> <li>• Change (%) in the spring HQ compared with the natural discharge or the occurrence of the critical low flows</li> </ul>
- Lakes	Lake water body can be designated heavily

	<p>modified directly (= no designation test needed), if the lowering of water level of regulated lake during winter is over 3 m or at least 50 % of the mean depth or the area of a lake decreases by 50 % .</p> <p>Criteria used in HyMo index calculation:</p> <ul style="list-style-type: none"> <li>• Lowering of water level during winter (m)</li> <li>• Permanent lowering of mean water level (m)</li> <li>• Migration barrier</li> <li>• Impact of bridges and embankments (%)</li> <li>• Physically altered shoreline (shore protection etc) (%)</li> </ul>
- Transitional waters	
- Coastal waters	<p>Coastal water body can be designated heavily modified directly (= no designation test needed), if it has been dammed and as a result of damming the natural connection to sea no longer exists.</p> <p>Criteria used in HyMo index calculation:</p> <ul style="list-style-type: none"> <li>• Constructed part of the shoreline length (%)</li> <li>• Natural connection to sea (in dammed bays)</li> <li>• Impact of bridges and embankments</li> <li>• The proportion of modified sea area (navigable route area, port area, dredging and soil dumping areas, %)</li> </ul>

If you used **use-related criteria**, please complete the following Table

<b>Water use</b>	<b>Description of use-related criteria (e.g. number of people provided with drinking water; protection against particular flood return period; daily number of vessels)</b>
Wider environment [Art.4(3)(a)(i)]	
Navigation, including port facilities, or recreation [Art.4(3)(a)(ii)]	
- Navigation, including port facilities	

- Recreation	
Activities for the purposes of which water is stored [Art.4(3)(a)(iii)]	
- Storage for drinking water supply	
- Storage for power generation	
- Storage for irrigation	
Water regulation, flood protection, land drainage [Art.4(3)(a)(iv)]	
- Water regulation	
- Flood protection	
- Land drainage	
Equally important sustainable human development activity' [Art.4(3)(a)(v)]	

If you used **other criteria**, please complete the following Table

<b>Description of other criteria used to decide if water bodies are substantially changed in character to consider designation</b>

**Q3.4: Please tell us about the criteria you used to decide if implementing a measure (e.g. a restoration measure to achieve good status or a mitigation measure aimed at improving the ecological potential of a water body) would have a significant adverse effect on use by completing the two Tables below**

<b>Have you developed specific criteria on significant adverse effects on use to help prepare the draft river basin management plans?</b>	
<u>yes</u>	<u>no</u>
	<u>X</u>

<b>Have you identified <u>pressure-specific criteria</u> to help screen out measures which would have a significant adverse effect on use (e.g. reducing abstraction by &gt; 50 %)? (yes/no)</b>	<b>Have you identified <u>measure-specific criteria</u> to help screen out measures which would have a significant adverse effect on use (e.g. dismantling major dams)? (yes/no)</b>	<b>Have you identified <u>use-specific numeric criteria</u> (e.g. % loss of energy generation) to help screen out measures which would have a significant adverse effect on use? (yes/no)</b>	<b>Have you identified <u>other types of criteria</u> to help decide what constitutes a significant adverse effect on use? (yes/no)</b>
NO	NO	<u>NO</u> <u>In the national guidance there is an</u>	<u>NO</u>

		<p><u>example of our pilot case study (Lake Kemijärvi case) where a sensitivity analysis was used in order to analyse the importance of the threshold values. In the assessment the criteria was loss of energy generation profit and the threshold values for significant adverse impact varied from 2 to 10 %. However, in this case the variation of the threshold level did not affect the result of the analysis. i.e. Lake Kemijärvi is already in good ecological potential notwithstanding the threshold value (2-10 %). In the practical work, however, the consideration of significant adverse impact has been done case by case and the choice of the measures has based on the discussions with stakeholders in working groups. The final decision was made by the authority responsible for compiling the RBM plans (=regional environment centre).</u></p>	
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<b>Water use</b>	<b>Examples of the principal criteria you used to decide if a measure or combination of measures would have a significant adverse effect on use</b>
Wider environment [Art.4(3)(a)(i)]	
Navigation, including port facilities, or recreation [Art.4(3)(a)(ii)]	
- Navigation, including port facilities	
- Recreation	
Activities for the purposes of which water is stored [Art.4(3)(a)(iii)]	
- Storage for drinking water supply	
- Storage for power generation	
- Storage for irrigation	
Water regulation, flood protection, land drainage [Art.4(3)(a)(iv)]	
- Water regulation	Loss of hydropower energy (% of total energy production of power plant) and value of that lost energy production (€)
- Flood protection	

- Land drainage	
Equally important sustainable human development activity' [Art.4(3)(a)(v)]	

**Q3.5: Please tell us about the other environmental options you considered to decide if the benefits of the use could be provided by a significantly better environmental option [Art. 4(3)(b)] by completing the Table below**

Water use	Other environmental options considered
Wider environment [Art.4(3)(a)(i)]	
Navigation, including port facilities, or recreation [Art.4(3)(a)(ii)]	
- Navigation, including port facilities	
- Recreation	
Activities for the purposes of which water is stored [Art.4(3)(a)(iii)]	
- Storage for drinking water supply	
- Storage for power generation	
- Storage for irrigation	
Water regulation, flood protection, land drainage [Art.4(3)(a)(iv)]	
- Water regulation	
- Flood protection	
- Land drainage	
Equally important sustainable human development activity' [Art.4(3)(a)(v)]	

#### 4. Establishing Good Ecological Potential (GEP)

**Q4.1: Please tell us about the method you used to classify the ecological potential of heavily modified water bodies by completing the applicable Tables below**

Are you satisfied that your draft classification results reflect the effect of hydromorphological alterations on ecological potential ? (yes/no)	Have you classified the effect of hydromorphological alterations on ecological potential using <u>biological assessment methods</u> (according to CIS Guidance No. 4 – See Annex)? (yes/no)	Have you classified the effect of hydromorphological alterations on ecological potential by assessing whether <u>all practicable mitigation measures</u> have been taken (according to the Prague approach - See Annex)?	Have you developed <u>another method</u> of classifying the effect of hydromorphological alterations on ecological potential? (yes/no)

		(yes/no)	
NO	YES (TEST) A pilot study was carried out in one river (Oulujoki) and one lake (Kemijärvi)	NOT AS SUCH	YES A slightly modified version of the Prague method was developed. It aims first to identify whether good ecological potential has already been achieved by doing a semiquantitative assessment of how much all practicable mitigation measures improve the current situation. Depending on the improvement potential the water body is in GEP, not GEP or uncertain case.

**Have you adapted your existing biological assessment methods for application to heavily modified water bodies?**

YES. Data and assessment method developed in earlier water-level regulation development projects has been used in lakes. This Regcel-method has been described in Hydrobiologia. Keto, A., Tarvainen, A., Hellsten, S. & M. Marttunen, 2008. Use of the water level fluctuation analysis tool (Regcel) in hydrological status assessment of Finnish lakes. Hydrobiology:613:133–142.

**Have you developed specific biological assessment methods for classifying HMWBs?**

NOT YET. We have tested one biological assessment method in Oulujoki-pilot case study, but method need to be further developed.

Please complete the Table below if you have classified the effect on ecological potential of hydromorphological alterations using **biological assessment methods** (according to CIS Guidance No. 4 – See Annex)

Water category	Were you able to derive biological references for maximum ecological potential? (yes/no)	What biological quality element (or elements) have you used to make these assessments?
Rivers	YES in pilot case	Fish, zoobenthos
Lakes	YES in pilot case	Fish, zoobenthos, aquatic macrophytes, a-klorofyll
Transitional waters		
Coastal waters		

Please complete the Table below if you have classified the effect on ecological potential of hydromorphological alterations using the **mitigation measures approach** (according to the Prague approach - See Annex)

Water use	Did you develop	Did you identify	If applicable, did you	Did you
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	use-specific generic checklists of mitigation measures? (yes/no)	water body-specific mitigation measures rather than generic checklists? (yes/no)	modify the generic list to take account of the specific characteristics and use of each HMWB? (yes/no)	involve the water users in applying the method? (yes/no)
Navigation, including port facilities	NO	YES	YES	YES
Storage for drinking water supply	NO	YES	YES	YES
Storage for power generation	Partly YES	YES	YES	YES
Storage for irrigation	NO	YES	YES	YES
Water regulation	Partly YES	YES	YES	YES
Flood protection	Partly YES	YES	YES	YES
Land drainage	NO	YES	YES	YES
Equally important sustainable human development activity'	NO	YES	YES	YES

**If you have developed generic checklists of measures, please describe these**

In the Finnish water body information system e.g. following types of measures are listed:

- a) fishways, including technical and nature-like fishway solutions as well as dam removal
- b) river restoration measures
- c) restoration of brooks, ponds and small lakes
- d) restoration of eutrophicated lakes
- e) restoration of eutrophicated bays
- f) improvement of water course regulation schemes and policies

**Please specify if you have a special methodology for the definition of Maximum Ecological Potential (MEP), which differs from your GEP methodology**

One step in our GEP methodology is to define MEP. The approach was presented in HMWB workshop in Brussels 12.-13.3.2009.

For Member States that have used both approaches of GEP establishment (Guidance No. 4 approach & “Prague” approach):

**Q4.3:** How do the results of using the two approaches compare? Are the mitigation measures needed to achieve good ecological potential comparable? Are there any examples to combine both methods?

The methods can give different results in some cases. The Prague approach can in some cases lead to

conclusion that more mitigation measures are needed compared to the approach which defines biological status in MEP, then defines GEP based on the slight deviation from MEP and finally compares the current state to the GEP state.

## 5. Exemptions for HMWB

**Q5.1:** Do you intend to apply Art. 4(4) exemptions (time derogation) to HMWB?

<u>yes</u>	<u>no</u>
X	

Do you intend to apply Art. 4(5) exemptions (less stringent objectives) to HMWB?

<u>yes</u>	<u>No</u>
	X

How did you combine this with HMWB designation according to Art. 4 (3) and CIS guidance No 4?

Following steps were carried out:

- Is GEP already achieved?
- What kind of mitigation measures are required?
- Is it possible to realize them by 2015 taking into account technical, juridical and in some cases economic constraints?
- What is the delay in the positive impacts of mitigation measures?
- Conclusion based on the results of previous steps: time derogation needed or not?

In uncertain cases, where it is unclear whether the GEP is already achieved, we recommended further research/assessment and monitoring.

## 6. Suggestions for the workshop

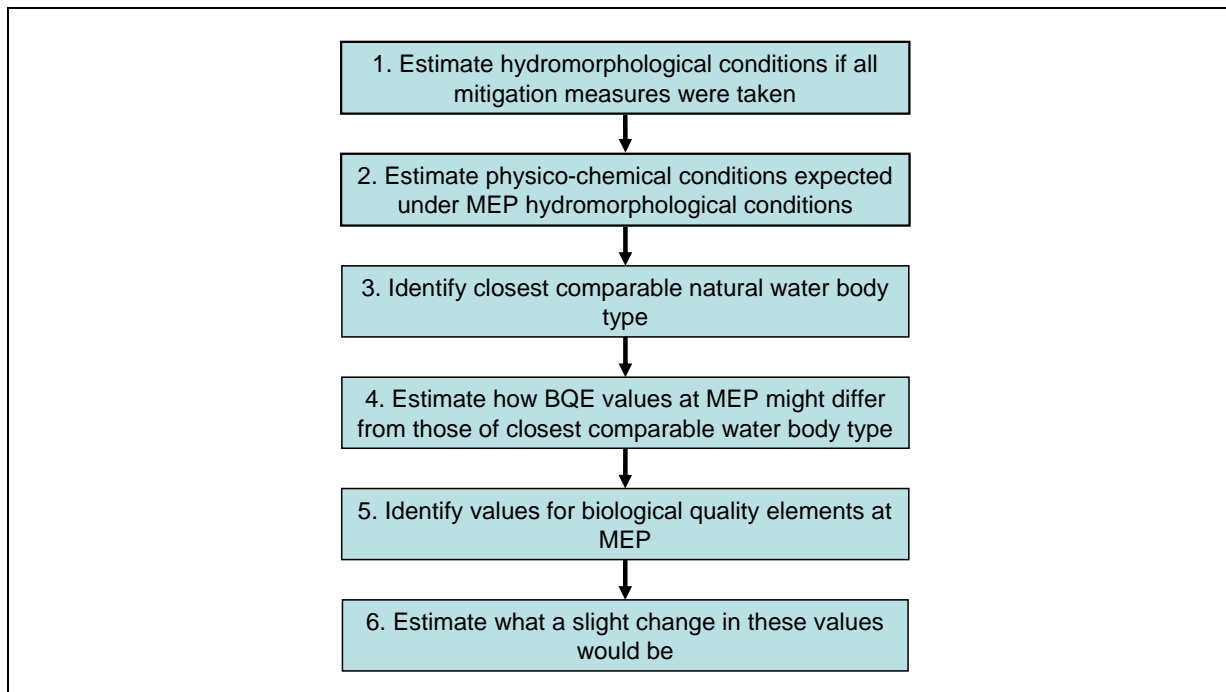
**Q6.1:** Do you have any suggestions for the upcoming workshop on Heavily Modified Water Bodies (12-13 March 2009, Brussels)? E.g.

- Any questions proposed for discussion?
- Public participation ideas concerning HMWB?
- Any pilot projects, methods for presentations at the workshop?

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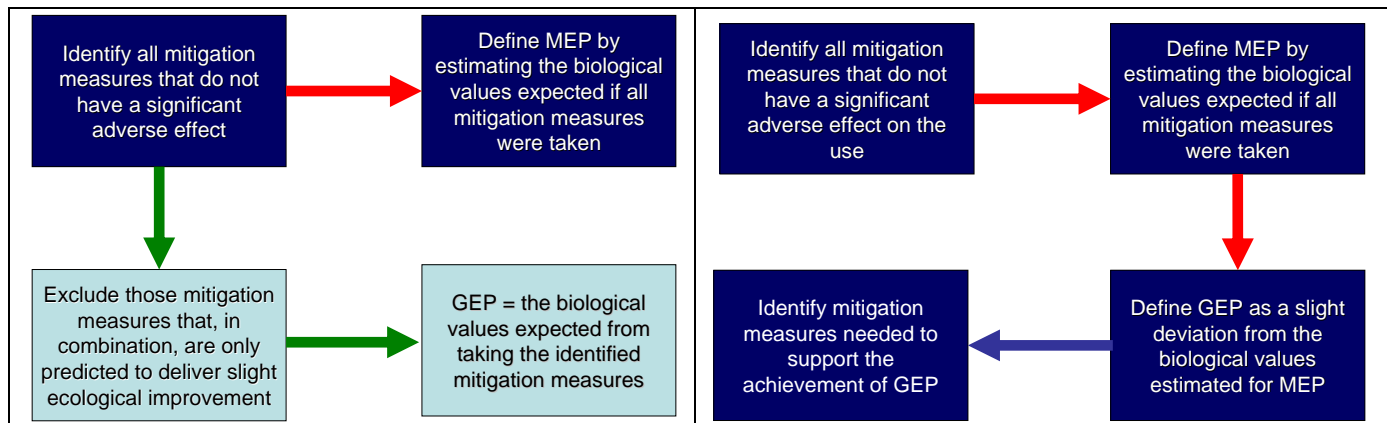
## **Annex: Additional background information on the establishment of Good Ecological Potential (GEP)**

- ✓ Good ecological potential is defined in the Annex V 1.2.5 to the Water Framework Directive as an ecological state in which *“there are slight changes in the values of the relevant biological quality elements as compared to the values found at maximum ecological potential”*.
- ✓ The values for the biological quality elements at MEP should reflect, *“as far as possible, those associated with the closest comparable surface water body type, given the physical conditions which result from the artificial or heavily modified characteristics of the water body”*. The definition recognises that the MEP biological values (a) depend on the MEP hydromorphological conditions and (b) may be different from those of the any natural surface water body type because no such natural type is completely comparable.
- ✓ The Directive defines the MEP hydromorphological conditions as those *“consistent with the only impacts on the surface water body being those resulting from the artificial or heavily modified characteristics of the water body once all mitigation measures have been taken to ensure the best approximation to ecological continuum, in particular with respect to migration of fauna and appropriate spawning and breeding grounds”*.
- ✓ The mitigation measures referred to in the definition of MEP hydromorphological conditions are limited to those that would not have a significant adverse effect on (a) the wider environment or (b) the use or uses that are dependent on the modified characteristics. The purpose of designation of a water body as a HMWB or AWB would be defeated if mitigation measures that would have such adverse effects were included.
- ✓ This also means that GEP cannot represent a state that could only be achieved using measures that would have a significant adverse effect on the wider environment or on the use or uses justifying designation in accordance with Article 4.3.
- ✓ GEP therefore represents a state in which the ecological potential of a water body is falling only slightly short of the maximum it could achieve without significant adverse effects on the wider environment or on the relevant water use or uses. An assessment of disproportionate costs of the mitigation measures should not be considered.
- ✓ In contrast, the definition of good ecological status is independent of any consideration of impact of the measures that may be needed to achieve it. Costs of these measures are also not considered.
- ✓ The generic steps relevant to defining GEP and described in the CIS Guidance Document No.4 can be summarised as in Figure 1 below.



**Figure 1:** Steps in defining GEP as described in the CIS Guidance Document No. 4.

- ✓ Technically the approach is complicated and highly reliant on good predictive modelling or expert judgement. Any errors in the estimates made in each of the steps will tend to sum. This compounding of errors could result in a definition of GEP that cannot be achieved without significant adverse effects on a relevant water use or that fails to reflect the level of ambition intended by the Directive.
- ✓ The alternative method described below defines GEP relevant to those biological quality elements and physico-chemical quality elements that are so affected by the heavily modified characteristics that they cannot achieve their GES values without measures being taken that would have a significant adverse effect on the wider environment or on a use of the water body that is reliant on the modifications. For other quality elements, their values at GEP are expected to be the same as their GES values prior to the hydromorphological modifications.
- ✓ Figure 2 summarises the main steps involved in the alternative approach to defining GEP (left side of Figure) and compares this with the main steps in the approach set out in CIS Guidance Document No. 4 (right side of Figure).



**Figure 2:** Steps involved in defining GEP using alternative approach (left side) compared to the relevant steps in the approach described in CIS Guidance Document No. 4 (right side); red arrows: steps following CIS method, green arrows: modifications of CIS method.

- ✓ Under both approaches the gap between MEP and GEP in ecological quality terms will be slight. Ecologically, GEP will represent the same level of ambition whichever of the two approaches is used.
- ✓ Nevertheless both approaches are still somewhat theoretical. Their advantages and disadvantages are yet to be demonstrated. Practical experience of defining GEP is currently very limited, the definition of GEP seems to be very complex. In the course of implementation, knowledge and understanding will increase enabling the further development and improvement of the approaches. Member States may also identify other alternative approaches.