

Disproportionate costs – a special type of assessment



92	■ Introduction
95	■ In France, national guidelines with local adaptations
111	■ In the U.K., a top-down approach
120	■ Conclusion

Introduction

The European water framework directive, voted in December 2000, requires that the Member States reach ambitious environmental objectives for all water bodies in all the major river basins (river-basin districts as per the WFD).

The directive set four essential objectives:

- no further deterioration of water resources;
- reaching good status or good potential of water bodies by 2015;
- reducing or eliminating pollution by priority substances;
- complete compliance with all standards in protected zones by 2015.

To reach these objectives in each river-basin district, it is necessary to characterise the pressures and impacts, run economic analysis of water uses (article 5), draft a water-management plan (article 13) and set up a programme of measures (article 11). In addition, participation by the public is mandatory (article 14).

Economic analysis plays a major role in WFD implementation. It serves as a decision-aid tool throughout the planning process because it can be used to:

- assess and contrast the economic value of water uses and the related issues;
- estimate the degree of cost recovery and the incentive value of price levels;
- determine the most cost-effective combinations of measures to achieve environmental objectives;
- **justify exemptions for deadlines and/or objectives on the basis of disproportionate cost.**

There are two types of exemptions for WFD requirements.

Exemptions for deadlines are mentioned in article 4.4 (see Figure 38a).

Reaching good status or good potential of water bodies may be postponed until 2021 or 2027 at the latest. This type of exemption must be justified using one of the three arguments below:

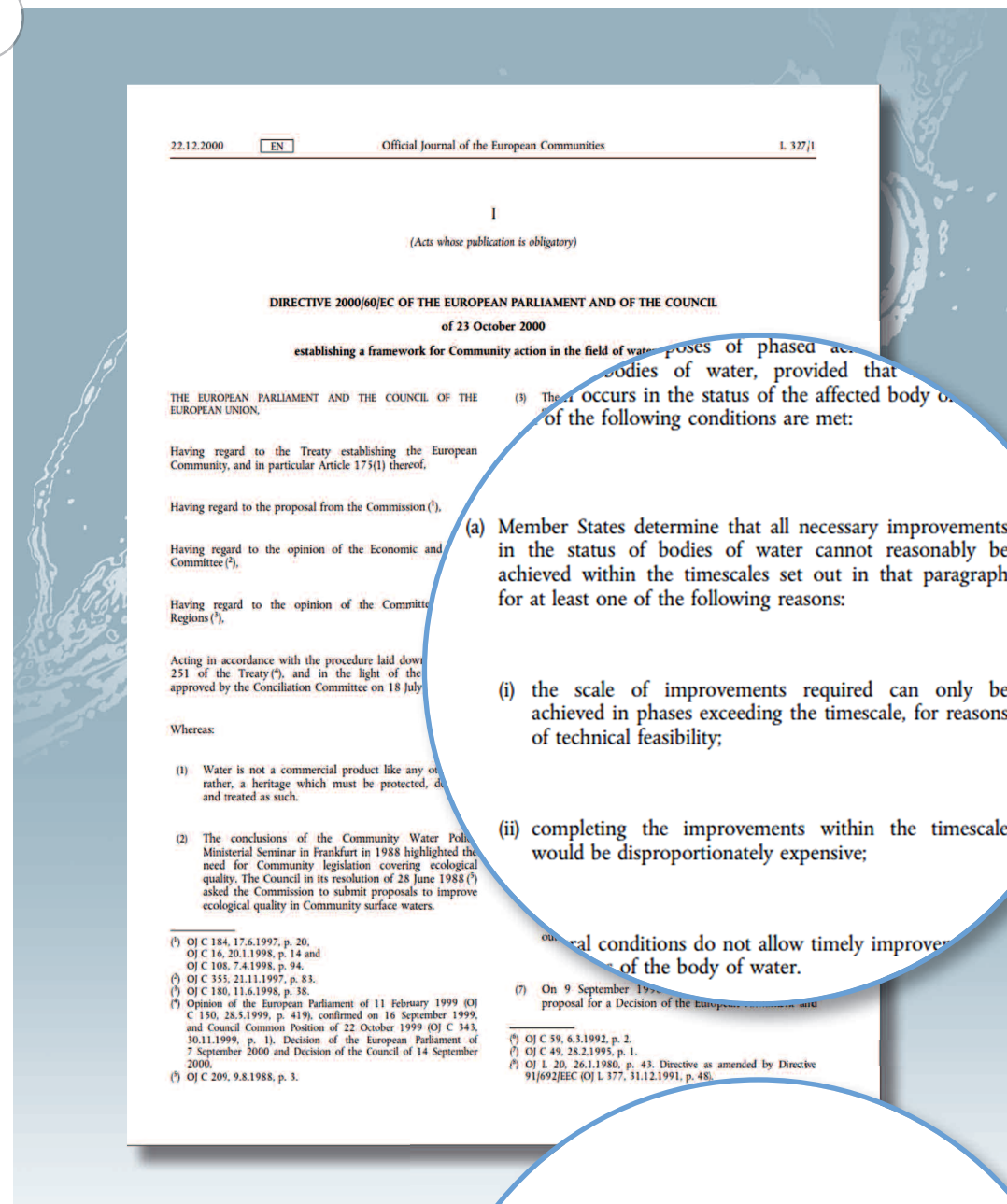
- for technical reasons, the necessary improvements can be made only in a series of steps running beyond the deadlines set for the programme;
- the cost of the necessary improvements within the set deadlines would be disproportionately expensive;
- the existing natural conditions make it impossible to carry out the improvements in the water bodies within the set deadlines.

Exemptions for objectives are mentioned in article 4.5 (see Figure 38b).

Similar to the above arguments, the WFD accepts that the Member States set less rigorous environmental objectives for certain water bodies that have been so modified by human activities or where the natural conditions are such that it would be impossible to reach the set objectives or the cost would be disproportionate even if spread over several WFD management cycles.

The concept of disproportionate cost can thus be used to justify exemptions in terms of both deadlines and the final status. It is therefore an important component in the formulation and planning of programmes of measures. In both France and the U.K., it was deemed better to strictly limit exemptions for objectives and to opt instead, whenever possible, for deadline exemptions.

Figure 38



Excerpts from WFD articles 4.4 and 4.5.

5. Member States may aim to achieve less stringent environmental objectives than those required under paragraph 1 for specific bodies of water when they are so affected by human activity, as determined in accordance with Article 5(1), or their natural condition is such that the achievement of these objectives would be infeasible or disproportionately expensive, and all the following conditions are met:

- (a) the environmental and socioeconomic needs served by such human activity cannot be achieved by other means, which are a significantly better environmental option not entailing disproportionate costs;



Basic measures and supplementary measures

It is important to note that the WFD, article 11, stipulates that programmes of measures shall include:

- basic measures, i.e. those pertaining to existing national and European legislation, notably concerning the directives for nitrates, urban wastewater treatment, bathing, shellfish and untreated water intended for drinking water;
- supplementary measures that must be implemented to achieve good status if the basic measures are found to be insufficient.

The basic measures are the minimum requirements, which explains why exemptions may be granted exclusively for supplementary measures. However, the total cost of all the measures will be taken into account when analysing the economic impact of programmes of measures on the stakeholders who must pay for them.

However, beyond those few guidelines, the WFD did not indicate precisely just what the concept of disproportionate costs means and covers. The required methods to justify exemptions are not explicitly laid out. A number of work groups, notably the *WATECO* (WATER ECONOMICS) group, subsequently produced guidelines to facilitate day-to-day WFD implementation.

A document was drafted on how to justify exemptions. It explains that:

- judgement on the disproportionate cost of a measure is a political decision based on economic information;
- the disproportion threshold is not situated where costs exceed the quantifiable benefits;
- the assessment of costs and benefits must include quantitative, but also qualitative elements;
- the proportion by which costs exceed benefits must be both ascertainable and relatively certain, and decision-makers may take into account the ability to pay of the stakeholders concerned by the measures.

However, the document does not go beyond the above recommendations and is relatively brief.

Each Member State was thus obliged to make an effort to better understand and more precisely define the notion of disproportionate cost. What exactly does it mean and what is its scope? Which economic methods and analyses must be used to show that a set of measures for a water body or group of water bodies would lead to disproportionate costs? For example, which methods have been implemented in France and in the U.K.? To what extent do the methods employed differ from one country to the other?



In France, national guidelines with local adaptations

The national method to justify exemptions for economic reasons

The WFD 2006/17 ministerial instructions on the preparation, contents and scope of programmes of measures propose a method to justify extended deadlines and exemptions for objectives. This method was subsequently developed and presented in greater detail in the methods guide on justifying WFD exemptions, published in October 2009.

As a first step, it is necessary to determine the **relevant scale** for analyses in view of justifying exemptions. Even though WFD environmental objectives are formulated for water bodies, the correct scale for an analysis depends on the problem at hand.

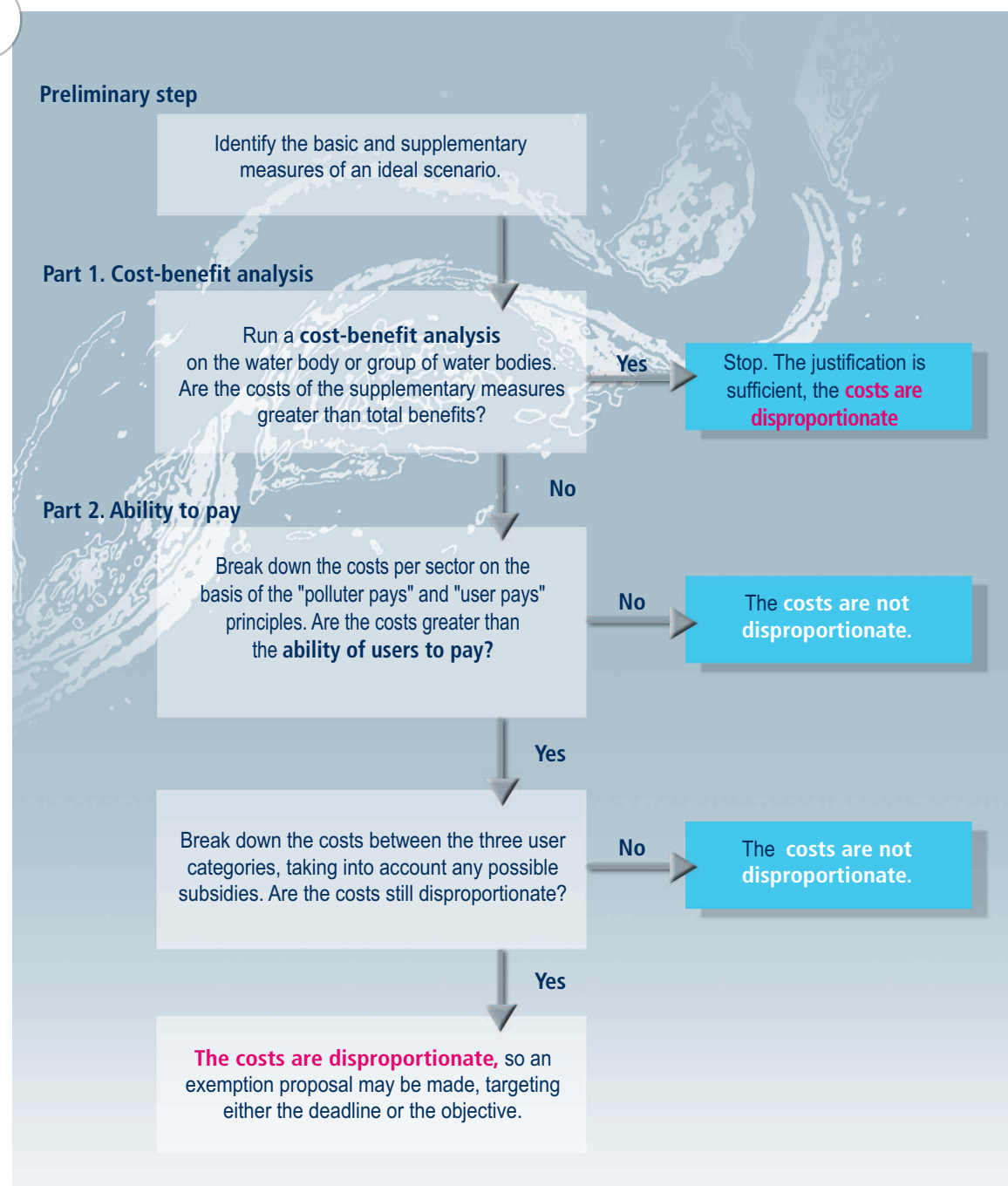
The cost-benefit analysis should be carried out on the appropriate hydrographic scale to take into account, among other aspects, the fact that costs incurred for one water body may produce benefits in a downstream water body. Analysis can therefore be carried out on the level of:

- a water body when good status is not reached because of pollution discharged to the water body or because of hydrological modifications caused by an installation;
- a group of water bodies making up a river basin when the detected problem concerns the entire basin.

As a second step, the method suggests examining whether any **technical reasons and the natural conditions** do not, in and of themselves, justify extending the deadline after 2015. It is only when the objectives for 2015 appear technically feasible taking into account the natural conditions that an extension of the deadline for disproportionate cost becomes a possibility. It follows that **analysis to provide economic justification for an extension should be carried out only after having tested the technical feasibility and studied the natural conditions**.

Once the appropriate scale has been selected and the technical feasibility / natural conditions have been confirmed, the procedure to justify an exemption for economic reasons may be launched, as shown in Figure 39.

The method consists of identifying the basic and supplementary measures of an ideal scenario in order to determine the costs, where an ideal scenario is one in which good status of the water body (or group of water bodies) is reached by 2015.



Flow chart to determine whether an exemption based on disproportionate cost is justified in France.
Source: Maria Salvetti based on the WFD 2006/17 ministerial instructions concerning the preparation, contents and scope of programmes of measures.

■ Cost-benefit analysis

The first part of the method consists of a cost-benefit analysis (CBA) on the water body or group of water bodies and addressing the transition from the current status to good status in 2015.

It was decided on the European level that the cost-benefit analyses would take into account only the costs of the supplementary measures. This is because exemptions are available only for the supplementary measures, i.e. those not related to the implementation of the other directives mentioned above. However, for practical reasons, it was decided to calculate the potential benefits of both the basic and supplementary measures. It should be noted that this simplification results in an overestimation of the benefits with respect to the costs (because the latter are calculated only for the supplementary measures).

If the cost of the supplementary measures is greater than the potential benefits, it is considered disproportionate. On the other hand, if the benefits are greater than the cost, it is necessary to proceed with the second part of the analysis.

Costs, benefits and present value

CBA takes into account not only the investment costs, but also the recurring costs (maintenance, operation) of the supplementary measures foreseen in the ideal scenario of the programme of measures. Costs are calculated starting in 2010 whereas benefits are calculated only from 2015 onward.

The main difficulty in estimating costs lies in sizing the measures and in translating that information into cost data. This is because it is fairly easy to calculate the unit cost of a measure, however it is more difficult to quantify the number of metres of river that must be renaturalised or the pollution that must be treated to reach good status, and consequently to determine the total cost of a measure given the uncertainty concerning the probable impacts of the considered measures. It is therefore necessary to deal with the uncertainty and propose sizing solutions taking care to explain the selected assumptions.

The benefits assessed and taken into account include:

- market benefits, i.e. those having a market value that can be estimated on the basis of existing economic circuits. These may include economic profits made by certain local activities, e.g. increased added value for recreational activities, or avoided costs, e.g. lower treatment costs for drinking water or reduced water consumption for industries, etc. These benefits may be quantified;
- non-market benefits, i.e. those not having a market value that can be estimated on the basis of existing economic circuits. Examples may be the satisfaction of consumers following an improvement in water quality or the interest shown by inhabitants (whether or not consumers) for an improvement in the natural heritage (more fish species, improvements for bathing and in biodiversity, enhanced ecosystems, etc.). These benefits are more difficult to assess and are often estimated qualitatively. They are, however, of the utmost importance for environmental assessments.

Other aspects of more or less importance on the local level may also be examined, e.g. the impacts on health, flooding, etc.

In the absence of consensus among the concerned local stakeholders (owners of installations and users) on the estimates for these values, more precise assessments of the uses (local surveys) and the potential benefits may be carried out.

The estimated costs and benefits are then discounted at a rate of 4% per year over a 30-year period. These recommendations concerning the discount rate and duration were set by the Prime minister on the basis of a report drafted by the General planning commission.

Present value and discount rate

The General planning commission defines present value as “the mathematical operation used to compare economic values spread over long periods. The purpose is to convert the future value of an item or a future expense to its present value. The discount rate is the conversion percentage between the future and the present. It represents the value of time for a company or a local government and may even be called the price of time”. Calculation of the present value serves to convert future expenses and benefits so that they may be taken into account in the analysis. The decision concerning the level of the discount rate is in fact a decision assigning a relative value to the future compared to current issues and values. The higher the percentage, the greater the preference for the present and the less importance accorded to the future.

Practically speaking, the calculation consists of applying a coefficient to reduce the value of future costs and benefits compared to present values. The level of the discount rate influences the results of a cost-benefit analysis.

The General planning commission has recommended that there be a single public discount rate and that it be used for all public investment projects in all sectors of activity. In 2005, the commission proposed a revision to the rate which is now 4% in France for 30-year periods. For comparison purposes, the discount rate is 4% in Sweden and 3.5% in the U.K.

Leeway in appraising the cost-benefit ratio

Given the uncertainty affecting CBA calculations, the Ecology ministry has recommended applying a 20% margin when comparing costs and benefits. For example, the cost-benefit ratio must be less than 0.8 before drawing the conclusion that the cost of supplementary measures is disproportionate to the potential total benefits. Otherwise, if the total benefits represent 80% or more of the costs for the supplementary measures, it is necessary to proceed with an analysis of the ability of stakeholders to pay.

A tool to assess benefits

In order to ensure consistency and facilitate the vast amount of work required for the many water bodies likely to receive an economic exemption, the department for economic studies and environmental evaluation at the Ecology ministry developed a spreadsheet tool to accelerate execution of large numbers of cost-benefit analyses. The tool uses a database containing unit costs and unit willingness-to-pay data in a predetermined list. This makes it possible to calculate the key ratios of the cost-benefit analysis rapidly (http://www.economie.eaufrance.fr/spip.php?rubrique65&id_mot=78).

The tool also facilitates the calculation of benefits through the use of average "unit guide values" based on data drawn from approximately 40 studies on the topic in France, for example the value of a day of fishing, the purification value of a hectare of wetland, the average annual value of bathing in a river, etc. The result is, in essence, an intermediate approach between a rough qualitative study and an in-depth on-site study. The figures produced should not be seen as unquestionable values, but rather as an initial step in the assessment process. The tool can also calculate totals for discounted costs and benefits using the discount rate proposed by the General planning commission.

A user's guide is also provided with the tool (see Figure 40).

Figure 40



Cover of the guide on benefit assessment drafted by the department for economic studies and environmental evaluation at the Ecology ministry.

■ Analysis of the ability to pay by the categories of water users

Breakdown of costs per economic sector on the basis of the "polluter pays" principle

The second part of the method consists of comparing the financial capacities of water users to the total costs required to reach good status. To that end, the costs of measures are broken down and assigned to the various economic sectors on the basis of the polluter-pays and user-pays (i.e. the beneficiaries) principles. All costs are distributed among the polluters in the given area (water body, group of water bodies, sub-basin).

When a polluter does not exist or cannot be identified, the costs are assigned to the local beneficiaries. For measures addressing hydromorphological and rainwater issues, if a polluter and a beneficiary cannot be identified, the costs are assigned uniformly to the taxpayers in the given area.

The polluters and beneficiaries are divided into three main economic sectors as stipulated by the WFD (i.e. agriculture, households and industry), to which taxpayers must be added, who pay for measures funded via local or national taxes. All costs are fully transferred to the three categories of stakeholders, without taking into account at this point in the analysis any subsidies or alternative funding (Water agencies, departmental councils, State, etc.).

The total costs of measures (both basic and supplementary) are divided among the categories of users and compared to a set of financial indicators specific to each category (added value, taxable income, water prices, etc.) in order to determine whether the costs are disproportionate. Thresholds must be set for each of the selected indicators.

Indicators for each category of water user

Sheet number 5 in the WFD 2006/17 ministerial instructions suggested a number of indicators for each category of water user. Below is the list.

Households

- Cost of techniques commonly implemented by local governments of the same size.
- Cost of specific work required to achieve objectives. This cost must be compared to the cost of the investment programme carried out in past years or planned by the local government to continue its development and the creation of facilities.
- Price of water and observed average prices.
- Average income of households compared to observed average incomes.

Industry

- Cost of the best technologies available and commonly used by the industrial sector in question.
- Cost of procedures and systems going beyond the basic measures.

Agriculture

- Cost of the best environmental practices commonly used by the agricultural sector in question.
- Cost of procedures and systems going beyond the basic measures.

In the methods guide mentioned above, it is advised to determine whether costs for farmers and industry are disproportionate by looking at the potential impact of the measures on their gross operating margins. However, the applicable thresholds for gross operating margins must be set for each river basin. For households, the guide recommends determining whether costs are disproportionate by examining the potential impact of the measures on water prices. If the measures are projected to increase water bills to a level between 2% and 3% of taxable income of the households (based on INSEE statistical data), the costs may be considered disproportionate prior to taking into account alternative funding sources.

If this step determines that the costs are disproportionate, it is necessary to go on to the last step in the analysis, which again consists of distributing the costs among the user categories, but taking into account any possible subsidies and alternative funding sources.

If, on the other hand, the costs are not considered disproportionate, the measures are deemed affordable by the local stakeholders, though it may be advisable to have the Water agencies or other funding organisations intervene to reduce somewhat the impact of the measures on the concerned sectors.

The ability to pay and alternative funding sources

This phase takes any alternative funding sources into account in the analysis in order to reduce the financial impact on the various sectors and to determine whether the available subsidies are sufficient to make the costs acceptable.

Once the alternative funding sources have been presented in detail, all costs are divided among the three categories of stakeholders taking into account, i.e. subtracting, the available subsidies (Water agencies, departmental and regional councils, EU funds, etc.). The analysis then proceeds as in the previous step for each of the three categories of users, using the same ratios and the same reference values.

If the costs are still disproportionate in spite of the subsidies, it is necessary to propose extensions of deadlines. If in 2027 the distributed costs taking into account the subsidies were still disproportionate, it would then be necessary to select less rigorous environmental objectives for the concerned water bodies (or at least for the parameters in question).

Local adaptations of the national guidelines

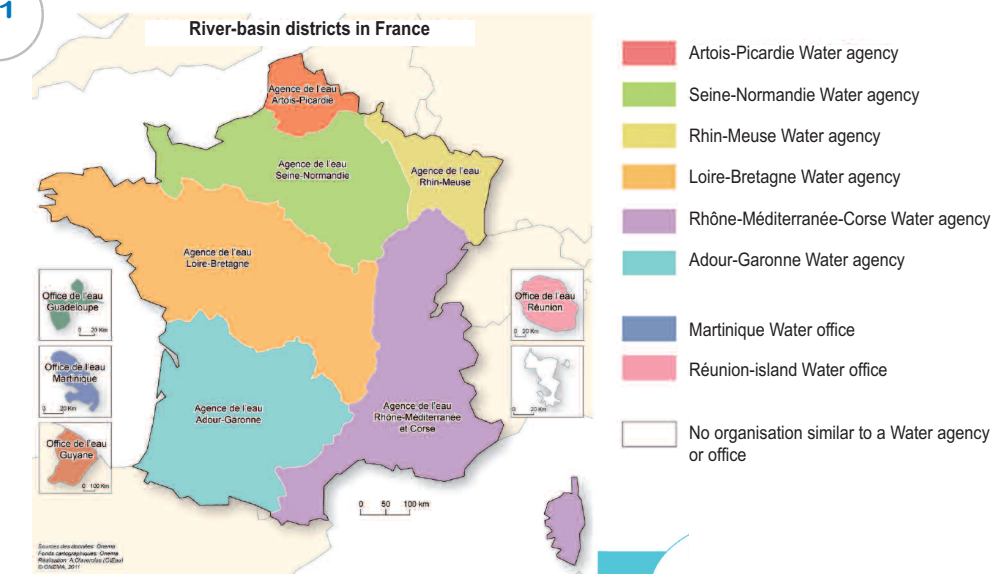
The Water agencies had to justify extended deadlines and exemptions to objectives for a certain number of water bodies in their respective basins (see Figure 41). Tables 20 and 21 present a rapid quantitative summary of the various objectives targeted for water bodies in France.

Tableau 20

Distribution of water bodies in the river-basin districts (source: Water agencies, regional environmental directorates, BRGM, Onema, IOWater, Water offices, Ecology ministry (2011), Processing by SOeS, 2011).

River-basin district	Total water bodies	Total surface water bodies	Including heavily modified water bodies	Total groundwater bodies
Seine Normandie	1 803	1 750	120	53
Artois Picardie	98	80	28	18
Adour Garonne	2 913	2 808	174	105
Rhin Meuse	669	643	88	26
Loire Bretagne	2 293	2 150	227	143
Rhône Méditerranée Corse	3 195	3 006	232	189
Guadeloupe	64	58	0	6
Martinique	50	44	2	6
Guyane	956	944	1	12
Réunion	56	40	1	17
Mayotte		46	2	6
TOTAL	12 150	11 569	875	581

Figure 41



Water agencies and offices in France.

Number of exemptions due to disproportionate costs compared to other exemptions.
(Source: <http://www.rapportage.eaufrance.fr/dce/2010/valorisation/tableaux>)

	Articles 4.4 and 4.5 Technical feasibility	Articles 4.4 and 4.5 Disproportionate costs	Articles 4.4 Natural conditions
Exemptions due to the ecological status/potential			
Moderate ecological status in 2009	2 324	808	1 006
Poor ecological status in 2009	703	446	337
Bad ecological status in 2009	167	79	127
Ecological status unknown in 2009 (natural water bodies)	3	0	6
Moderate ecological potential in 2009	103	25	31
Poor ecological potential in 2009	89	50	54
Bad ecological potential in 2009	112	38	41
Ecological potential unknown in 2009 (artificial and heavily modified water bodies)	51	6	45
TOTAL	3 552	1 452	1 647
Exemptions due to the chemical status of surface waters			
Bad chemical status in 2009 (natural water bodies)	1 521	435	107
Chemical status unknown in 2009 (natural water bodies)	484	366	73
Bad chemical status in 2009 (artificial and heavily modified water bodies)	178	39	44
Chemical status unknown in 2009 (artificial and heavily modified water bodies)	43	3	35
TOTAL	2225	843	259
Exemptions due to the chemical status of groundwater			
Bad chemical status in 2009	49	31	153
Chemical status unknown in 2009	0	0	0
TOTAL	49	31	153
Exemptions due to the quantitative status of groundwater			
Bad quantitative status in 2009	3	3	5
Quantitative status unknown in 2009	0	0	0
TOTAL	3	3	5

To justify these exemptions, the Water agencies started with the national method presented in the WFD 2006/17 ministerial instructions and the methods guide on justifying exemptions, and adapted them to their local context and needs. Certain elements of the local adaptations of the national method are presented in detail below.

■ Order of analyses on cost-benefits and ability to pay

The national method recommends starting with the cost-benefit analysis and then proceeding, if necessary, with an analysis of the ability of stakeholders to pay.

However, it has been noted that the Loire-Bretagne, Rhin-Meuse and Seine-Normandie Water agencies reversed the order of the two types of analysis. In these three river basins, the analysis of the ability to pay was carried out first as an initial filter to limit subsequent analysis to the water bodies effectively likely to receive an extended deadline due to disproportionate cost. Then, cost-benefit analyses were run on the resulting geographic sectors in order to terminate the work.

To illustrate this point, the box on the next page presents the economic justification for an extended deadline in the southern Morbihan region (Loire-Bretagne basin).

■ Presentation of benefits in cost-benefit analyses

In carrying out cost-benefit analyses, the national method recommends taking into account both market and non-market benefits. All Water agencies followed this advice.

However, the Rhin-Meuse Water agency decided to characterise the benefits expected from the implementation of the measures using different terminology in a different presentation. In its analysis, the agency distinguished between benefits related to use of water and aquatic environments, and non-use benefits.

Use benefits include boating recreation, fishing, walks and reduced treatment costs.

Non-use benefits take into account the bequest value and the enhanced value of ecosystems.

In addition, it should be noted that the benefit-transfer method was used to assess certain benefits.

The tables shown in the Annex recapitulate the cost-benefit analyses carried out in the Rhin-Meuse basin and propose a presentation of the costs and benefits taken into account.



Justification of deadline extensions in the southern Morbihan region

■ Part 0. Presentation of the procedure

The first step consisted of an analysis, covering the entire basin, on the ability to pay. It was carried out as an initial filter to limit subsequent analysis to the water bodies effectively likely to receive an extension due to disproportionate cost. Then in the second step, cost-benefit analyses were run on the geographic sectors of the river basin in order to finish the assessment work.

■ Part 1 (a). Results of the initial filter (ability-to-pay analysis)

The analysis of the ability to pay in the Loire-Bretagne basin produced two major conclusions:

- the first, concerning treatment of urban wastewater. Sizing of the programmes of measures is consistent with the objectives. The degradation targeted by the work (organic and oxydisable matter, or macropollutants not including nitrates and phosphorous) should be sufficiently eliminated to meet WFD objectives by 2015 and, with some exceptions, exemptions may not be justified by disproportionate costs;
- the second, concerning nonpoint-source pollution from farms and river morphology. The programme of measures required to attain good status by 2015 is more ambitious than the currently planned policies. The management committees for certain projects may be insufficiently robust or reticent to launch the projects. In addition, technical lead times for the implementation of projects and the inertia of the environment mean that the time required to reach the objectives would be very long.

Under these conditions and in compliance with the decisions of the planning commission, extensions of deadlines and even reduced objectives have been accepted for water bodies affected by certain types of degradation (nitrates, particulate phosphorous, river morphology) and requiring the most work to achieve good status.

■ Part 1 (b). Application to the Côtier Breton Nord Manche sector

The geographic commission is broken down into four sectors, namely the Vilaine River basin, the Côtier Breton Nord Manche river basins (including both the Couesnon and Douron basins), the coastal basins in the Finistère department (including the Laïta basin) and the Côtier Breton Sud Morbihan basins (including the Scorff basin to the Golfe du Morbihan). The total amounts for the territory of the commission mask major local differences caused notably by poor quality criteria in certain basins with respect to good status. The highest investment and operating costs for supplementary measures are noted in the Vilaine River basin. The Côtier Breton Sud Morbihan sector, the smallest, has the lowest costs. The supplementary measures deal primarily with nonpoint-source pollution and river morphology. The investment and operating costs for supplementary measures target essentially rural areas (local rural development).

Morphology is the main disqualifying parameter in terms of the numbers of water bodies affected. For very small rivers, given the lack of knowledge on their physical-chemical situation, morphology is virtually the only disqualifying characteristic. **Nitrates** affect all categories of water bodies. The **trophic nature** of lakes is illustrated by the importance of phosphorous as a parameter to justify extensions of deadlines. The programme also includes measures on **micropolluants** in estuarine and coastal waters.

Implementation of the supplementary measures, the high level of implication on the part of the funding parties and the often positive changes in water quality in the areas managed by the geographic commission over the past few years have made it possible to upgrade the objectives for good status of water bodies.

The supplementary measures would appear to produce significant results in rivers, however other types of water bodies are less reactive. This may justify extended deadlines for lakes, coastal and transitional waters, and groundwater. Finally, it should be noted that in the area

managed by the geographic commission, there are major benefits arising from seashore tourism, as well as from the supply of drinking water and the development of shellfish farming.

The Côtier Breton Sud Morbihan sector in particular stands out for the supplementary measures to manage micropollutants, phosphorous and macropollutants.

During the first analysis (ability to pay), this observation resulted in extended deadlines on the basis of disproportionate costs.

It should be noted that this sector is characterised by highly divergent problems which may cause difficulties in implementing a consistent and uniform cost-benefit analysis over the sector as a whole.

Finally, the seashore and tourism in the area managed by the geographic commission suggest that there are also significant environmental benefits. These elements justify further analysis in the attempt to determine whether costs are effectively disproportionate (see Part 2).

The results of the first filter (ability to pay) indicate that of 61 rivers, 21 were granted extended deadlines on the basis of disproportionate costs. Of four lakes, 1 was granted an extended deadline on the basis of disproportionate costs. No extensions were granted for groundwater and coastal waters. Cost-benefit analysis must be carried out on the rivers and lakes to confirm these decisions.

■ Part 2 (a). Cost-benefit analysis

In terms of the method employed, in order to avoid double counts of benefits and remain consistent with the analysis of the programme of measures in each sector, the CBAs were initially carried out on each geographic sector, distinguishing between the surface water bodies (rivers, lakes, coastal waters) and groundwater.

When the overall analysis of each sector did not justify exemptions based on disproportionate cost, **analyses on each type of issue** (morphology, quantitative aspects, eutrophication, etc.) were carried out, again distinguishing the types of water body (lakes, rivers, etc.) in the sector. When the necessary data was available, **analyses on sub-sectors** (zones for work to achieve good status) were carried out. Finally, in the cases where the above analyses were insufficient, additional analyses were run on water bodies.

■ Part 2 (b). Application to the Côtier Breton Nord Manche sector

The CBA run on the entire geographic sector did not produce relevant results given the very divergent issues at hand in the sector.

In light of the types of measures and their distribution in the sector, three types of CBA are proposed:

- a cost-benefit analysis on lakes in view of managing the phosphorous problem;
- a cost-benefit analysis on morphology issues (on the entire sector and for each water body).

Lakes were the topic of an additional CBA on the issues surrounding phosphorous. For each lake, the costs of restoration measures and the value of benefits were distinguished. The CBA on the lakes, in particular the Moulin Neuf and Saint-Michel lakes, produced a ratio of 0.6, i.e. a largely negative value confirming the initial deadline-extension decision based on disproportionate costs for these water bodies.

The second CBA addressed **morphology issues as well as micropollutants and macropollutants**. The result was a ratio of less than 0.8 for the water bodies taken as a whole. Additional analysis on each water body was proposed to fill out the results. The results of the additional analysis were highly divergent, depending on the water body.

Type of cost-benefit analysis implemented

The CBA on the entire sector compared the measures for the sector as a whole with the benefits expected from good status. The CBAs on individual water bodies compared the cost of measures addressing morphology issues with the benefits expected from the measures.

The CBA on lakes compared the set of measures addressing phosphorous issues with the benefits expected from good status.

Concerning the **results of the second filter (CBA)**, the analyses on specific issues and categories of water body confirmed the disproportionate cost of measures for most of the water bodies initially selected for extended deadlines. Nine water bodies were put back on track for 2015 (in spite of the CBAs) thanks to the Grenelle environmental agreements. Seven water bodies subsequently lost their extensions on the basis of disproportionate cost, but nonetheless continued to benefit from extended deadlines for other reasons.

Source: Loire-Bretagne Water agency.

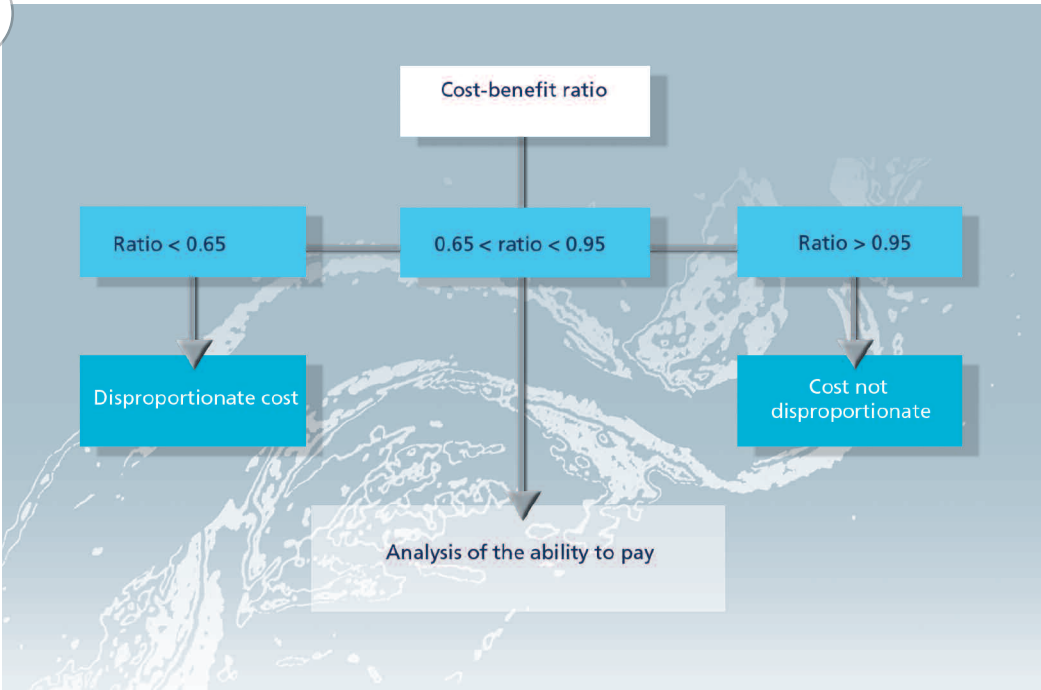
■ Cost-benefit ratio and disproportionate costs

The cost-benefit ratio produced by the CBAs is used to determine whether the costs of measures are disproportionate. Given the uncertainty affecting CBA calculations, the Ecology ministry has recommended applying a 20% margin when comparing costs and benefits. For example, the cost-benefit ratio must be less than 0.8 before drawing the conclusion that the cost of supplementary measures is disproportionate with respect to the potential total benefits.

The Rhône-Méditerranée-Corse water agency refined this approach by testing a method using different value ranges. Costs are considered disproportionate if the cost-benefit ratio is less than 0.65. However, sensitivity tests are carried out on all values between 0.5 and 0.8. Costs are not considered disproportionate if the cost-benefit ratio is greater than 0.95. In this case, sensitivity tests are carried out on all values between 0.8 and 1.1.

If the cost-benefit ratio is between 0.65 and 0.95, analysis of the ability to pay is undertaken. Figure 42 illustrates this method.

Figure 42



Analysis method for cost-benefit ratios, version 1.
Source: Rhône-Méditerranée-Corse Water agency.

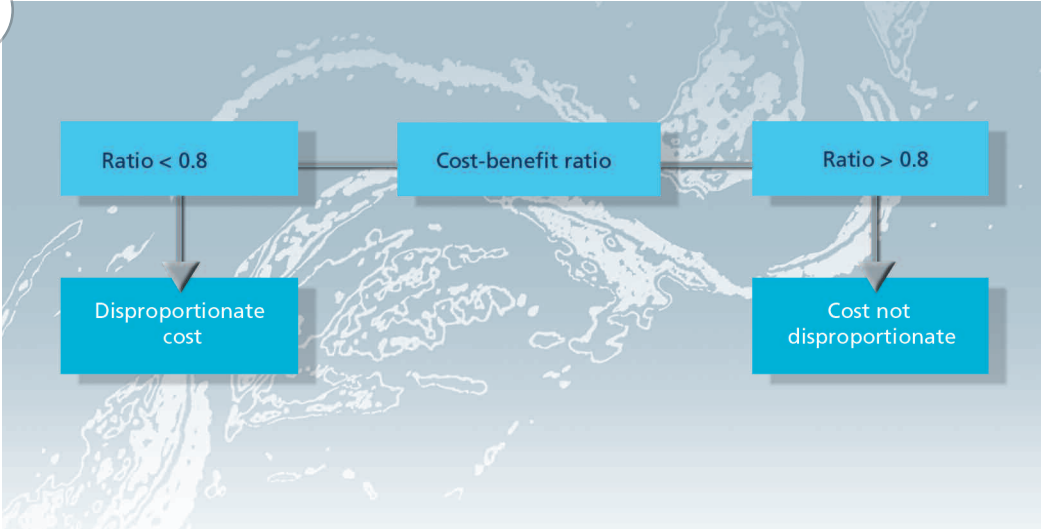
A large part of the work consisted of setting the threshold values of the cost-benefit ratio within which an analysis on the ability to pay must be carried out.

The decision on these values in effect determines a cost level considered acceptable whatever the expected benefits. A number of tests on costs (ranging from 1 to 15 million euros) showed that, even though the level significantly impacts the number of sub-basins concerned (approximately 40 to 80), it has little impact on the number of water bodies likely to benefit from an exemption (approximately 400 to 500). In addition, it has very little impact on the total costs likely to affect subsequent management plans (600 million to 1 billion euros).

Following discussions, it was decided to select a high threshold in order to ensure a degree of flexibility for negotiations with stakeholders. For this reason, a threshold of 10 million euros was selected. Under this threshold, costs are considered acceptable given the economic indicators and the different levels of cost analysis. This means that when costs exceed 10 million euros, an analysis on the ability to pay is required before it may be concluded that the cost of a programme of measures is disproportionate. It is on the basis of this threshold (10 million euros) that the threshold values for cost-benefit ratios were set.

However, it is interesting to note that after running tests on the method using value ranges (0.65 to 0.95) and on the method using the pivot value recommended by the Ecology ministry (0.8), no notable differences were observed in the conclusions of the cost-benefit analyses (see Figure 43). It was therefore decided to opt for the method using the pivot value in order to determine whether costs are disproportionate.

Figure 43



Analysis method for cost-benefit ratios, version 2.
Source: Rhône-Méditerranée-Corse Water agency.

■ Selection of key indicators and threshold values for ability-to-pay analysis

The second part of the analysis on disproportionate costs consists of comparing the financial capacities of water users to the total costs of the measures required to reach good status. The total costs of measures (both basic and supplementary) are divided among the categories of users and compared to a set of financial indicators specific to each category (added value, taxable income, water prices, etc.) in order to determine whether the costs are disproportionate. Thresholds must be set for each of the selected indicators.

The indicators, threshold values and assessment methods for the ability to pay developed by the Rhin-Meuse Water agency to determine whether costs are disproportionate constitute an original approach presented in Table 22.

Tableau 22 The indicators selected by the Rhin-Meuse Water agency (Source: Rhin-Meuse Water agency).

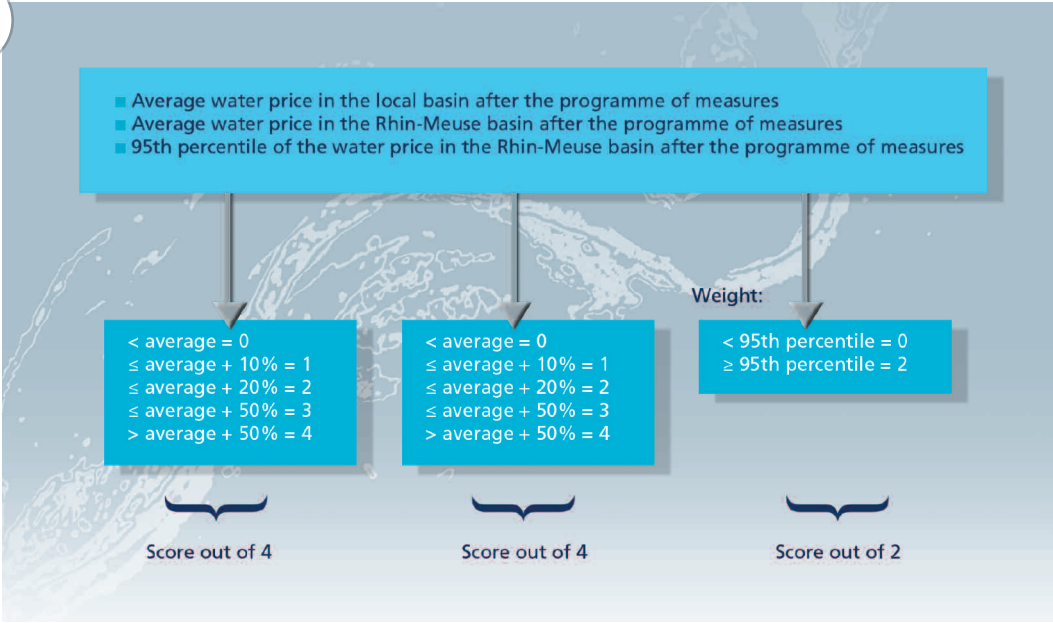
Field of application for measures	Economic indicators
Sanitation	Sanitation prices Percentage of household income spent on sanitation
Industry Main facilities, facilities not including GEREP (polluting emissions) and crafts/trade companies	Added value Gross operating margin Cash flow Annual investment Profit rate
Crafts/trade companies	Sales Added value
Agriculture	Added value Gross operating margin EBIT Cash flow
Hydromorphology	Local taxes (housing tax, property tax)

Using these indicators, threshold values were set to determine whether the costs of measures are disproportionate.

Taking the "price of water" indicator as an example, water prices before and after implementation of the programme of measures are compared. To avoid taking outliers into consideration, the comparison uses the 95th percentile of the average water price in the Rhin-Meuse basin, which excludes the 5% highest prices.

Depending on the differential between the "price of water" indicators, a score is assigned. For example, if the new water price exceeds by over 50% the average in the local river basin in which the water body is located, a score of four points is given, as indicated in Figure 44.

Figure 44

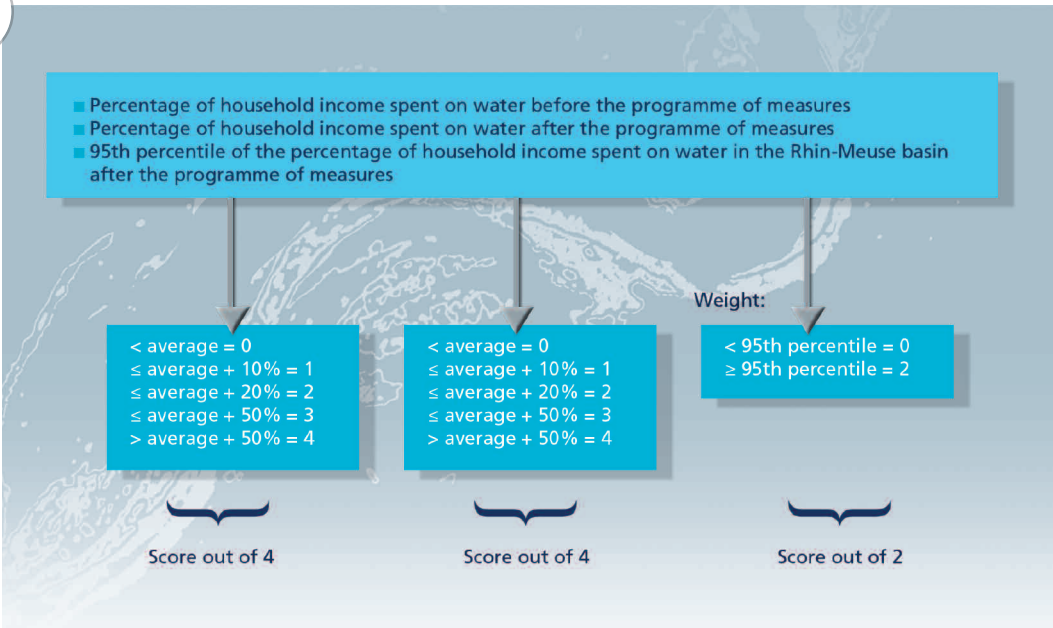


Threshold values for the "price of water" indicator.
Source: Rhin-Meuse Water agency).

For the "percentage of household income spent on water" indicator, the method is the same. The "percentage of household income spent on water" before and after the programme of measures is compared. To avoid taking outliers into consideration, the comparison uses the 95th percentile of the average percentage in the Rhin-Meuse basin, which excludes the 5% highest percentages.

A different weight is assigned to the indicator, depending on how it compares with the reference 95th percentile. For example, if the new percentage is less than 120% of the average in the local river basin, a score of two points is given, as indicated in Figure 45.

Figure 45



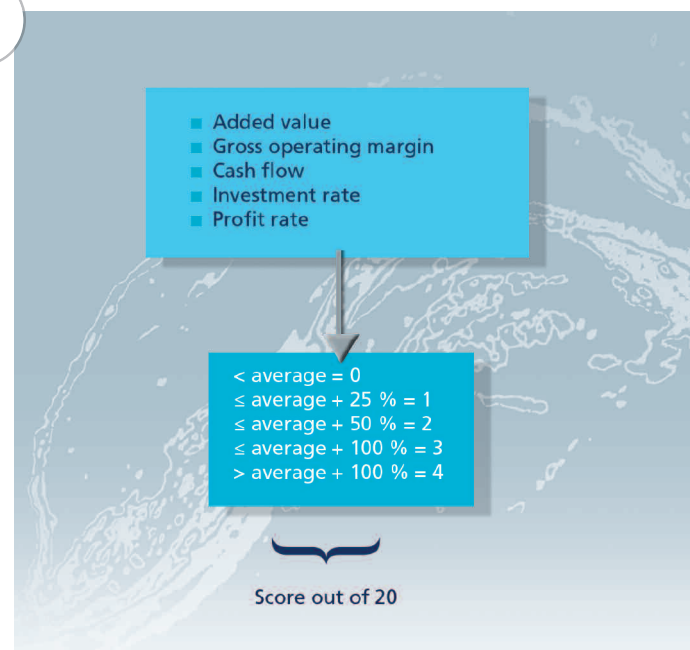
Threshold values for the "percentage of household income spent on water" indicator.
Source: Rhin-Meuse Water agency).

Calculation of the indicators for the price of water and the percentage of household income spent on water results in a maximum score of 20 points.

Following the Rhin-Meuse RBMP commission meeting on 15 June 2007, it was decided that when a water body receives a score of 12 or more, the cost of the programme of measures for that water body may be disproportionate.

For the five industrial indicators, the local value for each indicator is compared with the average value of that indicator for the entire Rhin-Meuse basin. Zero to four points are attributed depending on the degree to which the average is exceeded. Practically speaking, this system of points indicates the deviation from the mean (average). Figure 46 shows how points are attributed for each indicator.

Figure 46



Scoring system for the industrial indicators.
Source: Rhin-Meuse Water agency).

Calculation of the indicators for added value, gross operating margin, cash flow, investment rate and profit rate results in a maximum score of 20 points. Following the Rhin-Meuse RBMP commission meeting on 15 June 2007, it was decided that when a water body receives a score of 12 or more, the cost of the programme of measures for that water body may be disproportionate.

For crafts/trade companies, the maximum score for the two indicators is eight points. If a water body receives a score of 5 or more, the cost of the programme of measures for that water body may be disproportionate.

For each agricultural indicator, the threshold was set at 3%.

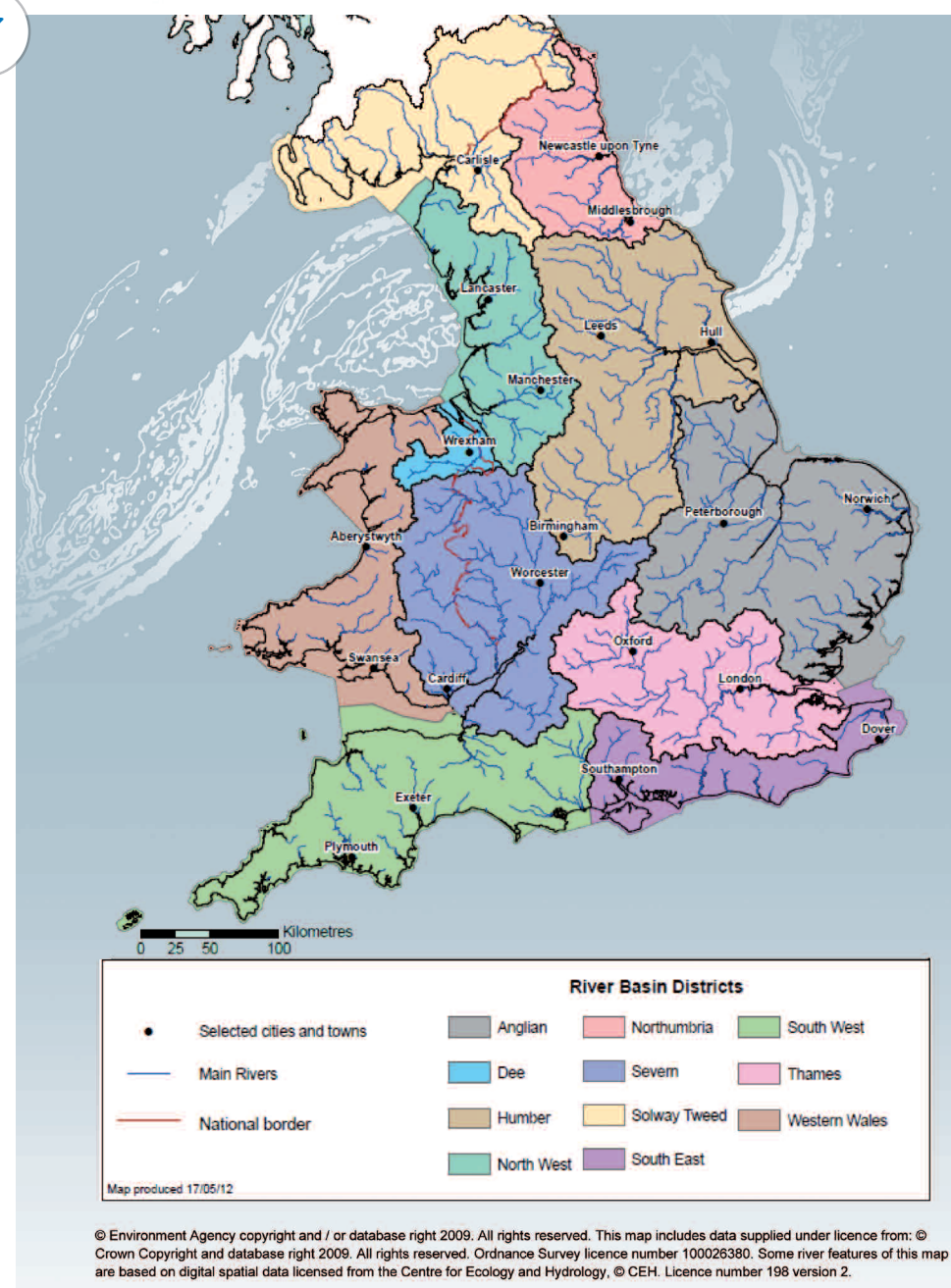
The three indicators for hydromorphological measures (housing tax and two property taxes) are calculated together and produce a maximum score of four points. If a water body receives a score of 3 or more, the cost of the programme of measures for that water body may be disproportionate.

For comparison purposes, the Rhône-Méditerranée-Corse water agency recommends a threshold value of 3% for the indicators selected for households, agriculture and industry. This means that for ability-to-pay analyses in the RMC basin, the costs of programmes of measures are considered disproportionate when they exceed 3% of the gross operating margin of farms or industrial companies, or when water bills exceed 3% of the taxable income of households.

In the U.K., a top-down approach

In the eleven river-basin districts of England and Wales (not including Scotland), basic and supplementary measures are divided into the M1, M2, M3 and M4 categories.

Figure 47



The eleven river-basin districts of England and Wales.

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Definitions and general recommendations

■ M1, M2, M3 and M4, basic and supplementary measures on the national and local levels

The basic measures are divided into M1 (currently implemented on the national level) and M2 (new statutory measures on the national level). For M1 and M2 measures, exemptions due to disproportionate cost are not possible.

Supplementary measures are divided into M3 (new measures on the national level) and M4 (new measures on the local level). M3 measures may be statutory or voluntary. They are decided on the national level. M4 measures are voluntary and decisions are taken on the river-basin level by the Liaison Panel (equivalent of the territorial commission in France).

Table 23 presents briefly the various categories of measures and highlights the top-down nature of the system.

Tableau 23

Nomenclature of WFD measures (Source: Maria Salvetti using data from the Environment Agency River Basin Management Plan, Annex E: Actions appraisal and justifying objectives, December 2009, pages 11 and 12).

	Types of measures	Examples
M1	Measures already implemented Measures already agreed and funded that may contribute to meeting WFD objectives	Nitrates Directive, Price Review, Coal authority mine-water restoration programme, etc.
M2	New statutory measures Measures that will be implemented (generally under other directives) and that may contribute to meeting WFD objectives	Directives on Freshwater fish, Urban wastewater treatment, Habitats, Nitrates, Bathing waters, Priority substances, etc.
M3(a)	New national measures New WFD measures requiring only a national decision	Controls on chemicals, fertilisers and the formulation of other products (e.g. detergents), as well as national rules and codes of practice applying to specific activities
M3(b)	New national measures with local adaptations National measures adapted to specific conditions in water bodies and river basins	Catchment sensitive farming, new catchments, catchment-scale protection zones, etc.
M4	New local measures (decision on the river-basin level) New measures for the WFD requiring only a local decision	Greener Futures initiatives, local partnerships, etc.

Only M3 and M4 measures may receive an exemption and consequently undergo analysis for disproportionate cost.

■ General recommendations for analysis of disproportionate cost

On the basis of the advice contained in the River Basin Planning Guidance drafted by DEFRA (Department for Environment, Food and Rural Affairs) and in the Common Implementation Strategy (CIS) document no. 20, a few general recommendations on how to carry out disproportionate-cost analysis (DCA) are listed below.

- The objective of DCA is to identify and collect data to determine whether an exemption to WFD requirements is justified.
- The analysis must be carried out on a quantity of data sufficient to make a decision within acceptable limits of uncertainty concerning risks.
- The analysis must be carried out on the largest possible geographic scale to determine whether costs are disproportionate.
- Initially, it is advised to proceed simply with collecting already available information.
- Certain non-market benefits should be assessed on a qualitative basis rather than as a benefit transfer.
- Disproportionate costs should be assessed on the basis of the marginal WFD effects, i.e. only the costs of supplementary measures should be taken into account.

■ Measures and delivery mechanisms, two distinct notions

For the economic analyses required by the WFD, DEFRA and the Environmental agency (EA) decided to distinguish between measures themselves and the delivery mechanism used to implement them.

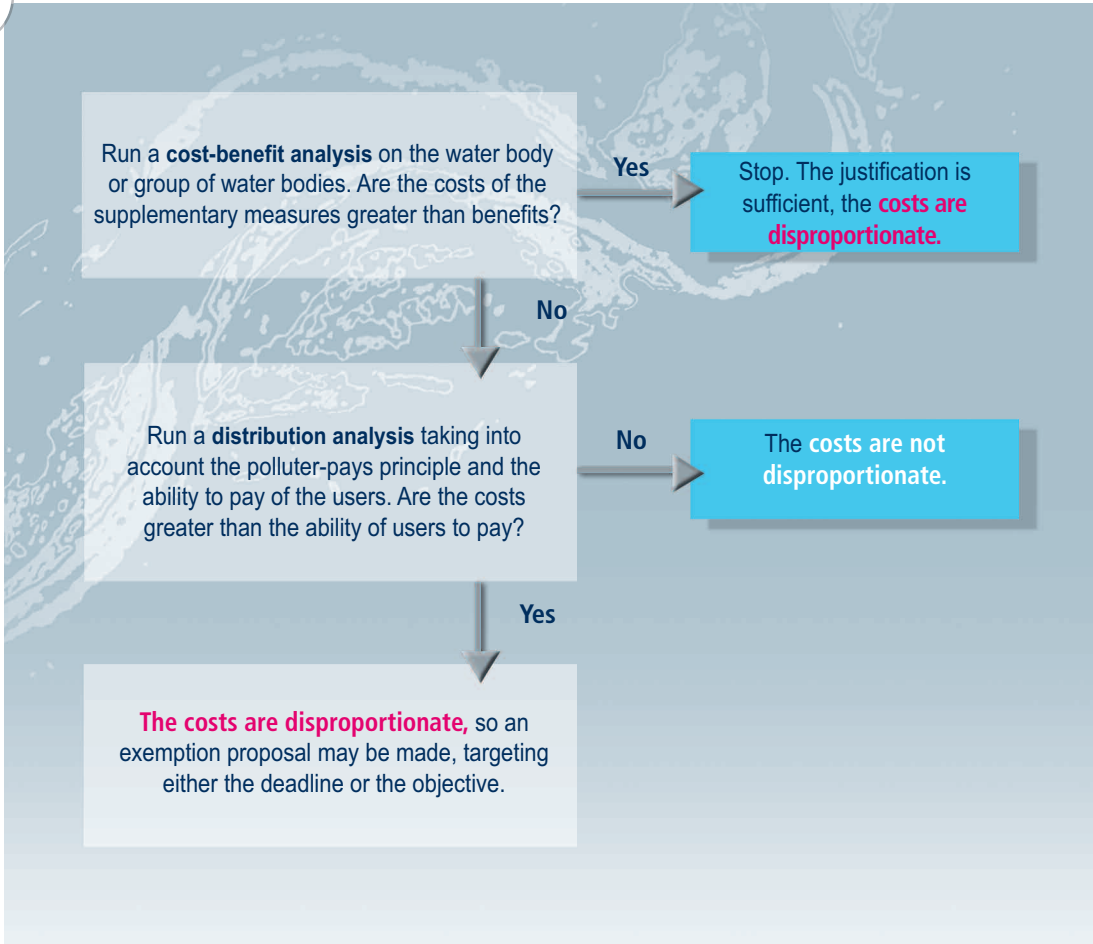
Measures are defined as concrete activities in view of achieving good status of water bodies. Delivery mechanisms are the modifications required for the actual and effective implementation of the measures. The mechanisms must be sufficiently realistic and incentive if they are to succeed in measure implementation. There are many different types of mechanisms, e.g. voluntary agreements, standard regulations, information campaigns, economic instruments, etc. The type of delivery mechanism selected for a given measure is in itself important. This is because its cost can vary and influence the cost-effectiveness and cost-benefit ratios of the measure.

The analysis on the disproportionate cost of a measure takes into account the type of delivery mechanism for the measure (or combination of measures). In other words, the cost of the delivery mechanism is included in the cost-benefit analysis.

DCA method

In addition to the general recommendations listed above, the method for disproportionate-cost analysis is presented in detail by DEFRA and EA. DCA is a process used to determine whether the cost of the planned measures is proportionate to the expected benefits. Proportionality is assessed by undertaking two successive analyses, i.e. first a cost-benefit analysis, followed by a distribution analysis (see Figure 49).

Figure 49



Flow chart to determine whether an exemption based on disproportionate cost is justified in the U.K.
Source: Maria Salvetti using data from DEFRA/Wag, River basin planning guidance).

■ Analysis of economic efficiency

Analysis of economic efficiency is used to determine whether the total costs of a measure are proportionate to the total benefits of the measure. In other words, the goal is to assess whether implementation of the measure would be an efficient use of resources.

It is essentially a cost-benefit analysis that includes the economic, social and environmental costs and benefits. It should be noted that the analysis is carried out on the national level. The discount rate set by the HM Treasury Green Book is 3.5%.

CBA takes into account not only the investment costs, but also the recurring costs (maintenance, operation) of the supplementary measures. Benefits must be assessed both quantitatively and qualitatively. The costs and benefits taken into account are not limited to those directly linked to water and aquatic environments. The analysis includes non-market benefits as well as market costs and benefits indirectly linked to water. The scope of the analysis thus covers economic, social and environmental costs and benefits linked directly and indirectly to improvements in the aquatic environment.

Table 24 below lists a number of examples of benefits directly and indirectly linked to improvements in the aquatic environment.

Tableau 24 List of direct and indirect benefits.

Direct benefits	Indirect benefits
Water resources, water quality, aquatic habitats, migration of fish	Biodiversity, fauna and flora
Regulation of water levels in water bodies	Landscape (nature park, aesthetic value, etc.)
Nutrient cycles	Cultural and historic monuments (preservation)
Preservation of wetlands	Remarkable geological sites (preservation)
Spawning grounds	Soil and land (erosion, contaminated soil, creation of parks, etc.)
Storm and flood protection	Air quality
Product of commercial fishing	Climatic factors (emission of greenhouse gases, carbon sequestration, renewable energy, etc.)
Product of recreational fishing	Waste (waste management, waste reduction, etc.)
Commercial navigation	Population
Energy production (hydroelectricity)	Human health and safety
Recreation (walks along banks, etc.)	Non-use value, existence value
Water sports (canoeing, skiing, etc.)	
Fishing	
Bathing	

National study on benefits

A national benefits survey was carried out in the U.K. to assess in monetary terms the value assigned by households to improvements in the aquatic environment thanks to WFD implementation.

In July 2007, 1 487 interviews were carried out in approximately 50 different places throughout England and Wales. The results of this contingent-valuation method informed on the willingness to pay depending on the expected benefits. The results were subsequently used as factors in cost-benefit analyses and were completed as needed by local assessments of other environmental benefits expected following implementation of measures.

Leeway in drawing conclusions

Generally speaking, costs are considered disproportionate when the negative impacts of a measure (or combination of measures) exceed the positive. There is no "room for judgement" when comparing costs and benefits. However, attention is paid to the fact that greater certainty exists concerning costs than benefits. As a result, costs are not necessarily disproportionate if they exceed the quantified and monetised benefits alone. In addition, any uncertainty affecting the DCA must be clearly explained.

If the economic-efficiency analysis concludes that the costs are greater than the benefits, then the costs of the measure are considered disproportionate. An exemption on this basis may be justified.

On the other hand, if the economic-efficiency analysis concludes that the costs are less than the benefits, then a distribution analysis is carried out.

■ Distribution analysis on the ability to pay and respect of the polluter-pays principle

The distribution analysis indicates how the costs and benefits of the measure are spread among the various local stakeholders. It identifies the economic flows and transfers between categories of users causing the pressures, funding the measures and benefiting from the measures. The analysis takes into account both the ability to pay of the different user categories and the polluter-pays principle.

In this context, costs are considered disproportionate if:

- implementation of the measures incurs excessive costs for one or more economic sectors, given its ability to pay. The ability is determined using the ratio between the annual costs for the measure assumed by the sector and the annual revenues of the sector. Depending on whether the result exceeds a threshold value for the ratio, that must be set on a case-by-case basis, the costs are deemed disproportionate. It is also recommended to analyse the profitability of the given sector both before and after implementation of the measures in order to judge whether the costs are disproportionate. This phase of the analysis should also take into account any alternative sources of funding for the measures;
- implementation of the measures results in non-observance of the polluter-pays principle. In this case, it is necessary to identify and compare the economic flows between categories of users causing the pressures, funding the measures and benefiting from the measures.

CRP Project 3 tool

In 2007, the Collaborative Research Programme (project 3) developed an Excel tool to collect and present in a consistent manner the data and conclusions of disproportionate-cost analyses. It is used to record data and information on cost-benefit analyses and distribution analyses carried out to determine whether exemptions are justified.

The Environment Agency justified extended deadlines and exemptions to objectives for a certain number of water bodies in the 11 river-basin districts in England and Wales (see Table 25). Table 26 provides a brief quantitative summary of exemptions granted for water bodies in England and Wales.

Tableau 25

Number of water bodies in each district (Source: Maria Salvetti using data from the Environment Agency River Basin Management Plan, Main document, December 2009).

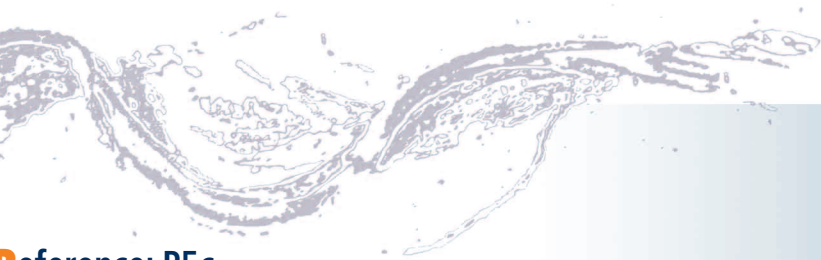
River-basin district	Total water bodies	Total surface-water bodies	Total heavily modified water bodies	Total artificial water bodies	Total groundwater bodies
Anglian	867	251	431	154	31
Dee	115	60	48	1	6
Humber	1 165	508	430	177	50
Northumbria	476	285	130	52	9
North West	749	333	315	83	18
Severn	912	633	148	91	40
Solway Tweed	653	500	80		73
South East	441	212	159	40	30
South West	1 093	823	182	44	
Thames	617	312	169	90	46
Western Wales	814	657	122	10	25
TOTAL	7 902	4 574	2 214	742	328

Tableau 26

A brief quantitative summary of exemption requests granted for water bodies in England and Wales. (Source : Maria Salvetti using DEFRA/Wag data, National impact assessment, Appendix 4, December 2009, page 28).

		Number of exempted water bodies in England and Wales
Technical feasibility	No available technical solution	1 705
	Cause of negative impacts is unknown	1 911
	Practical constraints (technical nature)	0
	Number of water bodies for which technical feasibility was used to justify the exemption	3 258
Disproportionate cost	Unfavourable cost-benefit ratio	327
	Significant risk of unfavourable cost-benefit ratio	2 771
	Disproportionate costs for users	121
	Number of water bodies for which disproportionate cost was used to justify the exemption	3 007
Natural conditions	Long ecological response time	25
	Long response time of groundwater bodies	3
	Number of water bodies for which natural conditions were used to justify the exemption	28
	Total number of water bodies in England and Wales for which an exemption was requested	5 059

To illustrate this point, the box below presents the economic justification for extended deadlines for water bodies in the Anglian river basin.



Reference: P5c

Element predicted not to achieve good status by 2015 : phosphate or total phosphorous
Reason for failure : confirmed - point-source water industry sewage works
Alternative objective : extended deadline
Reason for alternative objective : disproportionately expensive, unfavourable balance of costs and benefits

Justification for alternative objective
The discharge causing the phosphorus failure is known and a site-specific appraisal has shown the improvement measure available to be currently disproportionately expensive.

Through our price review 2009 (PR09) planning work, we identified the sewage treatment works causing the phosphorus failure. We identified the costs of the required measure and identified potential benefits and other impacts that improving the discharges will deliver. This showed the measure to be currently disproportionately expensive.

- These appraisals used :**
- site-specific costs provided by Ofwat following submission of water company final business plans;
 - site-specific information on embedded carbon and operating carbon emissions to calculate carbon costs;
 - environmental outcomes recorded as length of river improved to meet WFD objectives;
 - benefits based on the NERA National Benefits Survey (Collaborative Research Project 4b/c);
 - additional local benefits identified after consultation with RBD liaison panels.

Our PR09 appraisal of the costs and benefits of phosphorus removal schemes assessed 51 cases, of which 15 were assessed as being not justified because of the unfavourable balance of costs, benefits and other impacts. The 36 schemes that were assessed as having a favourable balance of costs, benefits and other impacts will improve 25 water bodies and 268 kilometres of river. Technological improvements may make the improvement needed less costly and/or the estimated benefits may change significantly with better information. An extended deadline for achieving good ecological status is therefore required.

Investigation type

Investigate proportionate measures.

Example of investigation

- At these sites, the assessments will be reviewed as further information becomes available that might change the balance of costs, benefits and other impacts. This might come from :
- an improved understanding of the relative importance of other sources such that combined action becomes cost-beneficial;
 - benefits may be valued more highly;
 - benefits may increase if outcomes become more certain;
 - advancements in treatment technology may reduce the cost of the measures and/or improve the outcome that can be realised.

If measures are shown to be proportionate, we will look to progress measures as soon as practicable. These future measures may need to be phased, particularly if they depend on action to address other sources.

Possible future measures

Possible future measures could include further phosphorus removal for sewage discharges as well as action on agricultural sources, depending on the relative significance of these (and other) sources. Development of new techniques and practices for both of these sources could also provide more effective measures which achieve a better balance of costs, benefits and other impacts.

Measures required to achieve 100% GES/GEP by 2027 that are likely to be technically infeasible or disproportionately expensive

It will be disproportionately expensive to install phosphorus removal technology on all municipal sewage treatment works in England and Wales. To do so would cost up to 6 billion pounds and result in benefits of approximately 2 billion pounds. Removing phosphorus requires more energy and so has a carbon impact. Depending on the size of the works and the treatment technology used, it is estimated that 16 to 1 426 tonnes of additional carbon are produced per tonne of phosphorus removed.

It is likely that installing phosphorus removal technology on many of the works serving less than 250 people will be disproportionately expensive. It costs between 157 and 7 408 £/kg to remove phosphorus from these size works.

Reference: GC5a

Element predicted not to achieve good status by 2015 : surface water, general quality test
Reason for failure : confirmed – disused mines point and/or diffuse source; the failures were mainly caused by metals (e.g. iron)
Alternative objective : extended deadline
Reason for alternative objective : disproportionately expensive, disproportionate burdens

Justification for alternative objective
The costs of the measures are proportionate to the benefits, but would impose a disproportionate burden if implemented by 2015.

A phased Coal Authority scheme is being implemented in this groundwater body to restore the body to good status. Treasury has agreed that the funding for these schemes will be phased over three river basin management planning cycles to 2027 due to affordability issues. To bring forward the implementation date of all these mine-water remediation schemes would also cause considerable practical difficulties, for example gaining permission for, and undertaking the necessary works. This phased approach will allow time to investigate and implement the most cost effective solution in each case, and it will also allow learning to take place. Our PCEA study has shown that a phased approach is likely to significantly reduce the overall cost of the whole programme. It would therefore impose a disproportionately burden to meet good status by 2015. Achieving good status by 2027, with the highest priority sites tackled by 2015, is a proportionate and cost-effective response to the problem.

Affordability is one area where there is limited guidance available at a European level and hence additional care must be taken in justifying exemptions to ensure that they follow the spirit of the Directive and its objectives. Although the adoption of the WFD entails obligations for Member States to make available the necessary means for implementation, this needs to be moderated by the option available to Member States to phase the implementation (through extended deadlines) of measures to spread the costs of implementation (while taking clear and demonstrable action in the first cycle).

To apply a time extension on grounds of affordability, consideration should be given to the availability of alternative financing mechanisms, the consequences of non-action and steps taken to resolve affordability in the future. We have considered all of these factors as part of justifying this alternative objective.

Investigation type

Further investigate feasible measures and their applicability at individual sites.

Example of investigation

Investigation and prioritisation of mine-water remediation schemes to achieve maximum environmental benefit.

Possible future measures

Mine-water remediation schemes.
Measures required to achieve 100% good chemical status by 2027 that are likely to be technically infeasible or disproportionately expensive.
Immediate implementation of mine-water remediation schemes for all discharges.

Source: Environment Agency River-basin management plan, Anglian river basin district, Annex E, Actions appraisal and justifying objectives, December 2009.



Conclusion

There are a number of similarities, but also differences in the approaches to disproportionate cost developed in France and the U.K.

Similarities in the French and British approaches

The overall method for disproportionate-cost analysis is **fairly similar** in the two countries. A two-step process is used to determine whether costs are disproportionate. The first step is a **cost-benefit analysis**, followed by a **distribution analysis** taking into account the polluter-pays principle and any sources of alternative funding. In both countries, the overall method for disproportionate-cost analysis is a **top-down approach**.

And each country has developed an **Excel tool** to facilitate and make more consistent the recording of data for disproportionate-cost analysis. It should be noted, however, that the French tool is intended strictly for cost-benefit analysis, whereas the British tool can be used for both cost-benefit analysis and distribution analysis.

Differences in the French and British approaches

A few significant differences may be observed in the French and British approaches to disproportionate cost.

The **discount rate** is not the same in the two countries and this impacts the calculation of the present value of costs and benefits.

The **categories of measures** differ between France and the U.K. French categories are limited to the WFD requirements and simply distinguish between basic and supplementary measures. The British system distinguishes between basic and supplementary measures, but also introduces a notion of scale by distinguishing between national and local measures.

The Environment Agency and DEFRA also **distinguish between measures and their delivery mechanism**. The type of delivery mechanism and its cost can vary and thus influence the cost-effectiveness and cost-benefit ratios of the measure. In the British approach, the analysis on the disproportionate cost of a measure takes into account the type of delivery mechanism for the measure (or combination of measures).

For cost-benefit analyses, the **range of benefits taken into account** in the U.K. would appear to be less restrictive than in France. The British method includes an assessment of the economic, social and environmental benefits that are not directly linked to water.

The **leeway afforded in judging whether a measure is cost beneficial differs** between France and the U.K. In France, calculations determined that a cost-benefit ratio as low as 0.8 may still be cost beneficial. In the U.K., this issue is left to the decision-makers, but the uncertainty affecting the economic assessment of costs and benefits must be taken into account.