European Commission
DG Environment

Compliance Costs of the Urban Wastewater Treatment Directive

Final report

September 2010

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DG Environment

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1 Executive summary

Final report

This is the final report of the study "Cost of compliance for the implementation of the Urban Waste Water Treatment Directive"[1].

It should be noted that the main purpose has been to assess the order of magnitude of costs and finance related to remaining compliance with the Urbanc Wastewater Treatment Directive. The focus has been on looking forward including the periods from 2007 to 2013 and the period from 2014 and onwards. It is not been a purpose to estimate the total costs by Member State of complying with the Urban Wastewater Treatment Directive but to see if there would financing gaps in achieving full compliance with the Directive. The study has applied a simplified costing approach and hence, the presented data for given Member State might deviate from what the Member State would consider its best estimate taking all the local specific conditions into account.

1.1 Background and objectives

Objective and tasks

In the context of monitoring the implementation of the Urban Waste Water Treatment Directive (91/271/EEC), Directorate General Environment (DG ENV), via its Marine unit, has commissioned the current study called to COWI A/S Consulting Company.

In the light of the above, the mentioned study has focused on estimating (1) the actual costs of reaching compliance with the Directive, and (2) the total costs of both the investments undertaken so far and of the investments planned in all 27 member state (MS) and 3 candidate countries (CC) in order to reach full compliance with the Directive.

The overall objective of the study has been to estimate the compliance costs related to the Urban Wastewater Treatment Directive from the currently reported level compliance until full compliance has been achieved and to assess whether the estimated investment cost can be covered by the available finance.

[1] The project was undertaken during the first half year of 2010. The data applied are the data reported by Member States to the Commission and they refer the situation by the end of 2005 or 2006.

The study has included three main tasks:

- To develop methodologies for estimation of compliance costs and for assessing both historical and future projected supply of finance;
- Application of the costing methodology to estimate the compliance costs of full implementation of the UWWTD; and
- Assess historical financing of the compliance with the UWWTD and estimate the availability of future funds for achieving full implementation of the Directive.

1.2 Approach to costing

1.2.1 Methodology and assumptions

Cost functions

The approach that has been developed to assess the costs of compliance with the Urban Wastewater Treatment Directive is to apply standardised cost functions.

Existing cost model

The applied cost functions have been developed as part of comprehensive cost model[2]. Using an already established cost function approach has many advantages. For the FEASBLE model these advantages include:

- It is a tested and documented approach.
- The cost functions use the person equivalents, p.e., as the main cost driver. The p.e. value is one of the key the parameters that the specific directive requirements relate to and it is information that is available for the majority of agglomerations in the EU.
- It has been used to prepare the cost assessment for compliance with the UWWTD in Turkey and partly in the accession countries.
- The cost functions are adjusted to reflect national price levels. Differences in national price and cost levels are included by a price correction factor.

[2] The basis for the suggested costing approach is the one we have developed and used in preparing sector strategies in the water sector in a number of countries since 1998. The approach called FEASIBLE (Financing for Environmental, Affordable and Strategic Investments that Bring on Large-scale Expenditure) allows for costing of water sector infrastructure[2]. The part which is of interest in this study is the wastewater collection and treatment components. The approach presented in following sections is based on the FEASBLE model but is suggested tailored to the specific needs of this study.

Using cost functions means that the estimation of compliance costs are made transparent manner as all assumption can be reviewed.

1.2.2 Scope of the costing analysis

The estimates of the compliance costs based on the above described approach cover the most important elements of compliance with the UWWTD. The approach - based on the available data by agglomerations - allows not for all elements to be covered; in particularly renovation and re-investments can not be assessed in detail.

What is included?

- Investment costs for additional collection infrastructure based on number of PE that still needs to be connected; and
- Investment costs of additional treatment infrastructure based on the required treatment technology and capacity (generated load minus the share treated by individual appropriate systems).

What is not included?

- Costs of renovation of existing systems necessary to deliver the UWWTD requirements;
- Sludge treatment and disposal; and
- Costs of compliance with other Directives (e.g. Bathing Water Directive and WFD)

This should be kept in mind when comparing the costs and financial sources.

1.2.3 Data availability

The data sources and the quality of the data are important for understanding the results. The situation is summarised in the below table.

Table 1-1 Overview of compliance cost estimates - million EUR from 2005/2006 until relevant compliance date

	Data quality for costing analysis	Data for financing analysis
Austria	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire

	Data quality for costing analysis	Data for financing analysis
Belgium	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Bulgaria	Acceptable - data by agglomeration	Incomplete data - only data for EU funds - national contribution based on questionnaire includes only part of co-financing
Cyprus	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Czech Republic	Acceptable/poor - only data by agglomeration above 10.000 PE - un-certainty about smaller agglomerations	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Denmark	Good - Registry data file	No detailed data - limited financing of UWWTD after 2000
Estonia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Finland	Good - Registry data file	No data but less important (full compliance) No reply on question-naire
France	Good - Registry data file	Incomplete data - No reply on ques-tionnaire
Greece	Poor - only old data on the largest (> 15000 PE) agglomerations, more recent data only number - no PE data	Incomplete data - No reply on ques-tionnaire
Germany	Good - Registry data file	No data but less important (full compliance) No reply on question-naire
Hungary	Good - Registry data file	Acceptable - questionnaire reply -

	Data quality for costing analysis	Data for financing analysis
		data for national contribution may include also funds for UWWTD re-investments and renovations
Ireland	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Italy	Good - Registry data file	Questionnaire reply but data can not be distributed by the specified time periods - difficult to make comparison
Latvia	Good - Registry data file	Incomplete data - No reply on questionnaire
Lithuania	Good - Registry data file	Incomplete data - No data provided on questionnaire
Luxembourg	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Malta	Poor - no data by agglomeration - assessment based on general description	Incomplete data - No data provided on questionnaire
Netherlands	Good - Registry data file	No detailed data - no financing of UWWTD after 2000 - full compliance
Poland	Acceptable/poor - only data by agglomeration above 10.000 PE - uncertainty about status for small agglomerations	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations - no funds yet committed for future years
Portugal	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Romania	Good - Registry data file	Acceptable - questionnaire reply - data on future funds might be

	Data quality for costing analysis	Data for financing analysis
		planned rather than committed funds
Slovakia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Slovenia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Spain	Good - Registry data file	Incomplete data - No reply on questionnaire
Sweden	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire
United Kingdom	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations

The following should be noted:

- Costs data:
  - The registry data is assumed to provide accurate description of the status; and
  - The data on the use of "individual appropriate systems" for collection and treatment are important for the estimation of the costs of additional collection systems. If existing - for example septic tank - solutions are "appropriate" costs will be significantly less than in cases where central sewerage systems are to be put in place.
  - The main focus of this analysis is the investment costs that follow from compliance with the requirement of the UWWTD. However, also the associated operation costs are of interest.
  - The chosen approach allows for comprehensive assessment of all elements of achieving and maintaining compliance with the directive requirements.

- The annual expenditure needs are derived from the following four types of costs components:

- Service improvement and extensions;
- Renovations;
- Re-investments;
- Operation (and minor maintenance).

  - The relationship between re-investments, renovation and new investments can be illustrated by showing how the value of the infrastructure develops over time.

  - At a given service level defined by a connection rate and a type of treatment a new system has a value called the replacement value or the asset value of the system. This will gradually depreciate over the lifetime of the system.

  - Re-investments are then defined as the investment necessary to keep the asset value constant (at it current level). Renovation would be investments that bring a depreciated system back to its original value as a new system. New investments are those that increase the service level. Focus on this study is increasing the service level and therefore the new investments.

  - The situation where there are increasing discharges from growth in population or industrial activity new investments are needed to increase the capacity of the infrastructure. This will be considered as new investments though the purpose is to keep the service level constant.

The key requirements in the directive are Article 3, 4 and 5. Article 3 is about the collection of wastewater in agglomerations above 2000 p.e. while Article 4 is main requirement of secondary treatment of the collected wastewater. Article 5 relates to the demand for more stringent treatment when the discharge is to sensitive water bodies.

In terms of costing approach, the different situations include:

- Increased connection rate to collection systems (Article 3);

- More stringent treatment of collected wastewater (increase in treatment level required by Article 4 and for sensitive areas Article 5); and

- Improvement for treatment facilities failing monitoring samples (Article 4 and 5).

For increased connection rates the estimate will be based on the difference between the current connect rate and 100% (or the adequate compliance rate).

For more stringent treatment, the approach is similar. The cost of upgrading to advanced treatment with nutrients removal is the difference between the total investment costs for such a system minus the costs of the current system.

The available data include the generated load measured in p.e and it is assumed that these report load values includes sufficient safety margin also to cover for future developments. T

The main challenge are the facilities that formally are at the require treatment level but fail to deliver the necessary reductions. The causes for this failure could be anything from inadequate operation to major deficiencies in the infrastructure.

This can be addressed by applying a renovation factor to the existing system. We will do scenarios assuming that compliance will require only operational adjustments (no additional costs), 5% renovation and 25% renovation of the treatment plants not complying with the monitoring test.

- Financing data:
  - The analysis performed was based on existing cost data linked to the implementation of the UWWTD by Member States but also on supplementary information which was requested from the Member States, by the means of a Questionnaire.
  - The questionnaire aimed at collecting solid data on the national contribution to financing of wastewater collection and treatment investments made by the EU Member States to ensure compliance with the Urban Wastewater Treatment Directive (91/271/EEC) - thereby complementing data collected from the European Commission.
  - The national contribution stems from three sources: (i) national, regional and local budgets; (ii) wastewater companies' own funds; and (iii) loans obtained by wastewater companies.
  - The questionnaire covers two time periods: from 2000 to 2009, and from 2010 to the deadline for compliance with the Urban Wastewater Treatment Directive (for countries with derogations).
  - 17 out of 27 Member States have replied and provided data.
  - It was generally not clear whether the responses were really the disbursed and the committed finance. In one or two cases the MS included data on the EU funds for 2000-2006 and comparing them to the DG REGIO data it seems to be the committed funds not the actually disbursed amount.

- This study focuses on new investments in collection and treatment infrastructure to comply with the UWWTD. The Member States data on allocated funds might not allow for separating the new investments and therefore include all costs related to UWWTD compliance (for example renovations of existing infrastructure and sludge treatment).

- It is assumed that the general economic situation and possible continued economic downturn will not impact on the availability of the finance presented in the report. Most of the data on future financing have been provided by the Member States in May/June 2010.

The assumptions

The input data to the cost assessment comprise for most of the Member States the registry data. In order to make the compliance cost assessment a number of assumptions has been made. The mostly relate to the designated sensitive areas.

- For agglomerations marked SA or CSA it is assumed unless otherwise stated that all agglomerations above 10,000 p.e. are required to have 3NP;

- For countries with whole area designated as sensitive and using Article 5 (8) it is similarly assumed that all have to apply 3NP expect with an existing 3N or 3P is in place and the agglomeration is marked as C (in compliance). In these cases no additional treatment is assumed.

- In cases where Article 5 (4) is applied, the existing treatment comprises a mix of 3NP, 3N, 3 P and even a few 2 (secondary treatment). It is assumed that the existing treatment is sufficient unless there is clear non-compliance marking in which case 3NP is assumed.

It is possible to make scenario analysis, where the user specifies what the final requirements should be. For example in the case of sensitive areas according to Article 5 (4) it is possible to test the consequence of both the existing level of treatment and 3NP for all agglomerations.

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1.3 Results of costing assessment

An overview of the results of the costing analysis is presented in Table 1-2. It includes the investment costs for collection (Article 3) and treatment (Article 4 and 5). In case an agglomeration requires advanced treatment, the total cost of the treatment plant investment is apportioned to compliance with Article 5.

The data is based on status at either end of 2005 or 2006 so the table presents the investment costs required from that date until full compliance has been achieved.

Table 1-2 Overview of compliance cost estimates - million EUR from 2005/2006 until relevant compliance date (cover only new investments - not re-investment/renovation of existing infrastructure)

	Article 3	Article 4	Article 5	Total
Austria	0	0	0	0
Belgium	223	107	832	1,161
Bulgaria	4,208	126	790	5,125
Cyprus	295	50	18	363
Czech Republic	845	244	435	1,524
Denmark	0	0	13	13
Estonia	117	4	58	178
Finland	0	0	243	243
France	0	198	1,424	1,623
Greece	599	279	12	890
Germany	1	4	0	4
Hungary	0	2	8	10
Ireland	0	53	195	248
Italy	2,040	714	650	3,404
Latvia	149	26	112	287
Lithuania	0	2	67	69
Luxembourg	0	3	64	67
Malta	0	0	58	58
Netherlands	0	0	0	0
Poland	10,126	557	4,373	15,056
Portugal	291	152	15	458
Romania	7,875	1,527	1,940	11,341
Slovakia	442	91	343	876
Slovenia	321	94	13	428

	Article 3	Article 4	Article 5	Total
Spain	780	213	494	1,488
Sweden	0	0	0	0
United Kingdom	0	50	298	347
Total	**28,312**	**4,495**	**12,455**	**45,262**

Source: Consultant's estimate based on registry data

The compliance costs estimates do not take the actual state of the infrastructure into account. There might be a need for rehabilitation or renovation of the existing systems. The registry data files do not contain information about the actual state of the wastewater infrastructure. Instead, based on the average expected life time of the infrastructure, the annual re-investment need can be estimated.

The below table includes the estimated re-investment need by Member State (only for those where we have the full registry file data). The table shows the annual re-investment need given the current infrastructure and how much it is going to be in the future when the new infrastructure is in place. Based on the current level of re-investments a figure for the accumulated re-investment over a 7 year period is shown. This indicates the level of re-investments that would be required over the period 2007 to 2013.

Table 1-3 Overview of estimated re-investment costs for the current situation (2005/2006) and for the future full compliance situation and for a period of seven years - in million EUR

	Current annual re-investment costs	Future full compliance annual re-investment costs	Accumulated re-investments 2007 to 2013
Austria	350	350	2,449
Belgium	161	203	1,127
Cyprus	9	17	61
Denmark	279	279	1,952
Estonia	18	23	125
Finland	93	103	649
France	1,155	1,220	8,084
Germany	2,236	2,236	15,650
Hungary	108	110	757

	Current annual re-investment costs	Future full compli-ance annual re-investment costs	Accumulated re-investments 2007 to 2013
Ireland	109	132	766
Italy	1,068	1,165	7,478
Latvia	17	26	118
Lithuania	27	30	191
Luxembourg	19	22	134
Netherlands	304	304	2125
Portugal	138	150	964
Romania	95	392	668
Slovakia	47	74	332
Slovenia	15	26	108
Spain	918	962	6,428
Sweden	155	160	1086
United Kingdom	931	946	6,519

Source: Consultant's estimate based on registry data

1.4 Supply of finance

It is generally very difficult to gather complete and consistent data on supply of finance for an area such as wastewater collection and treatment. In many Member States, wastewater investments are financed through user charges which are either relatively independent utilities or under municipal ownership.

Furthermore, the supply of finance (both historical and future committed funds) could cover other investments than those estimated as compliance costs in this study. Notable this includes renovation of existing systems and requirements from other directives.

The compiled data on the supply of finance are therefore incomplete. Not all Member States have provided data on national contributions and as the committed EU funds for 2007 to 2013 only cover part of the supply only indications of the magnitude of available finance can be provided.

1.5 Financing gaps

Given the uncertainty and possible inconsistency between the estimated compliance investment costs and the estimated supply of finance, it is only possible to provide indications of where there might be financing gap issues.

Table 1-4 illustrate the net financing deficit measured as the total available finance minus total estimated investment costs. The supply of finance covers the period 2007 until 2014 or the deadline for compliance. Based on the available data, a qualitative assessment is made regarding the likelihood of a financing gap.

Table 1-4 Indicative financing gaps for 2007 to 2013 and for 2014 until full compliance (cover new investments -not re-investments/renovations)

	Financing gap (Supply - costs)		**Likelihood of financing gap**	**Comments on financing gap**
	2007-2013	**2014 -**		
Belgium	1,836	452	Gap unlikely -	The compliance deadline has passed and it will take a few years to implement all remaining investments
Bulgaria	-2,166	-2,020	Possible gap	Data on finance are incomplete but data indicates a financial gap and that annual disbursements need to increase significantly up to the deadline of 2014
Czech Republic	4,553	-	Gap unlikely but annual disbursement should increase	There is no financing gap based on reported future funds but historical annual disbursements have been low and should be higher in period up to the deadline of 2015
Estonia	576	127	Gap unlikely	No indication of significant gap. The historical finance is at balance with the required finance to achieve compliance
Ireland	844	-	Gap unlikely	Gap is unlikely - the annual finance should cover the required investments
Cyprus	1,169	40	Gap unlikely	Gap is unlikely - the annual finance should cover the required investments
Lithuania	193	-	Gap unlikely	Gap is unlikely - though data are incomplete regarding national contribution - the committed EU funds with national contribution should cover the need
Luxemburg	730	-	No gap	No gap as allocated funds exceed the investment need

	Financing gap (Supply - costs)		Likelihood of financing gap	Comments on financing gap
	2007-2013	2014 -		
Hungary	2,283	138	Gap unlikely	Gap unlikely as projected finance exceed the need and level of historical annual disbursement exceed the estimated annual investment costs
Poland	-8,678	-1,300	Possible gap	Here is the is a possible financing gap - no finance has yet been committed for future financing, but historical annual disbursement fall short the annual need
Portugal	1,017	-	Gap unlikely but annual disbursement should increase	Gap unlikely as projected finance exceed the need though it might take a few years to complete investments and annual disbursement should be higher than the historical level
Romania	-936	-5,261	Possible gap	Here, there is a possible financing gap. The planned future financing seems less than the estimated investment costs and historical annual disbursement fall short the annual need
Slovenia	367	-278	Gap unlikely	No indication of significant gap. The historical finance is at balance with the required finance to achieve compliance
Slovakia	1,392	206	Gap unlikely	Gap is not likely. The projected finance exceed the need though the historical annual finance is below the required annual finance to achieve compliance
UK	2,836	746	No gap	No gap expected.
Germany	338	-	No gap	Minor additional costs and finance available
Greece	211	-	Uncertain	Limited data both on finance and compliance costs make the assessment very uncertain. The allocated EU funds seem to cover the estimated new investment need.
France	-1,496	-	Gap unlikely	There are no data on national financing but it unlikely that there is an affordability constraint
Italy	-3,176	-	Uncertain	The provided data on national financing cover different time periods so it not possible to assess whether there might be local/regional affordability constraints that could lead to a financing gap
Latvia	-170	-116	Uncertain	There are no data on national financing and it not possible to assess whether there might be af-

	Financing gap (Supply - costs)		Likelihood of financing gap	Comments on financing gap
	2007-2013	2014 -		
				fordability constraints that could lead to a financing gap
Malta	-16	-	Gap unlikely	There are no data on national contribution but assuming national co-financing of EU funds, it unlikely that there will be financing gap
Austria	-	-	No gap	No new investment l costs
Finland	-243	-	No gap	Minor additional costs and finance should be available (cost recovery) - though no data on national contribution
Sweden	-	-	No gap	No new investments costs
Spain	2,342	-4	Gap unlikely	High remaining investment costs but allocated EU funds should be sufficient
Denmark	-13	-	No gap	Minor costs and user fee finance available
The Netherlands	-	-	No gap	No new investments costs

Overall, the study has provided a useful overview of remaining investment costs before full compliance with the UWWTD has been achieved in all Member States. It is has also revealed the difficulty of comparing the need and the supply of finance for a given purpose.

It is important to keep the following in mind when comparing the investment costs and available funds for financing the compliance investments:

- The estimated compliance costs do not include renovations of existing systems to achieve compliance (no data in registry files support assessment of renovations needs); and
- The data on available funds could include provisions for renovations, sludge treatment and compliance costs related to other directives;
- The availability of funds is to some extent based on political priorities with an overall affordability constrain. The availability of funds can be changed for example if the overall economic situation changes and priorities are revised.

Therefore, the estimated financing gaps are only indicative.

A comprehensive comparison of supply and demand of funds for implementation of the UWWTD is most useful at a national level by those responsible for allocation and prioritisation of funds. When assessing the realism of given implementation plan, it is important to realise that implementation of significant investments such as what the UWWTD requires is not only a question of the availability of sufficient funds. There needs to be institutional capacity to process the implementation. If each treatment plant is a separate investment project the whole cycle of implementation could easily take several years to complete. The implementation process includes an application phase with a feasibility study and financing plans, evaluation of the application, tendering of the actual construction work and finally the construction and testing phase.

1.5.1 Financing gaps when including estimates of re-investments

The key uncertainty on the compliance investment costs side is the need for renovation/rehabilitation of the entire existing infrastructure. The re-investment needs are estimated for the 22 Member States where the standard registry data file are available and for these Member States the financing gap assuming the re-investment need has to be covered by the same funds as the compliance investments.

Table 1-5 Indicative financing gaps when taking account of both compliance investment and re-investments for the period 2007 to 2013 - million EUR

	Total new investment and re-investment	Supply of finance (incomplete data)	Indicative financing gap (+ means surplus of finance)
	2007-2013	2007-2013	2007-2013
Belgium	2,288	2998	709
Estonia	303	754	451
Ireland	1,014	1,092	78
Lithuania	260	263	3
Luxemburg	201	797	596
Hungary	764	2,291	1,526
Portugal	1,421	1,474	53
Romania	5,672	4,067	-1,605

	Total new investment and re-investment	Supply of finance (incomplete data)	Indicative financing gap (+ means surplus of finance)
	2007-2013	2007-2013	2007-2013
Slovenia	258	517	259
Slovakia	1,121	2,181	1,060
UK	6,867	3,184	-3,683
DK	1,965	-	-1,965
NL	2,125	-	-2,125
Germany	15,654	342	-15,312
France	9,707	127	-9,581
Italy	10,882	228	-10,654
Latvia	289	1	-287
Cyprus	424	1,533	1,108
Austria	2,449	-	-2,449
Finland	892	-	-892
Sweden	1,086	-	-1,086
Spain	7,912	3,826	-4,086
Total (22 MS)	**73,554**	**25,675**	**-47,882**

Including the re-investment in the comparison with the supply of finance lead to fewer cases where the supply seems to exceed the investment needs. Considering possible backlogs of re-investments, the total rehabilitation need to be several times the estimated re-investment for the period 2007 to 2013. And this could explain any apparent "surplus" of financing resources.

2 Introduction

Final report

This is the final report on the study "Cost of compliance for the implementation of the Urban Waste Water Treatment Directive".

Objective and tasks

The overall objective of study has been to estimate the compliance costs related to the Urban Wastewater Treatment Directive and to assess whether the estimated investment cost can be covered by available finance.

The study has focused on assessing the additional compliance costs of achieving full compliance given the implementation status as reported by Member States in 2005/2006. It does not aim to give an account of what the total compliance costs of the UWWTD have been in each Member State.

The study has included three main tasks:

- To develop methodology for estimation of compliance costs and for assessing both historical and future projected supply of finance;
- Application of the costing methodology to estimate the compliance costs of full implementation of the UWWTD; and
- Assess historical financing of the compliance with the UWWTD and estimate the availability of future funds for full implementation of the Directive.

The cost estimations have been based on the so-called registry data files which include key information about each agglomeration and its current compliance status. These files are available for 22 Member States and most of them include data from end 2005 or 2006. Therefore, the estimated investment costs f for compliance with the UWWTD relates the need from the reference year /2005/2006) until full compliance.

The supply of financing has been analysed based partly on a survey among EU Member States. A questionnaire asking for data on national finance spend on compliance investments for the period 2000 to 2006 and committed future finance were submitted and replies received from about 15 Member States. These data supplement DG REGIO data for the supply of EU funds for investments in compliance with the UWWTD.

Calculation template

In addition to this final report, an Excel based calculation template has been developed. It links to the data in registry data file format and allows for estimation of the compliance costs for each Member State. The template can be used for updating the calculations when new registry data become available.

Organisation of report

The report contains the following sections:

- Chapter 2 includes a summary of the applied methodology;
- Chapter 3 presents the summary of the costing analysis, the supply of finance assessment and finally the analysis of potential financing gaps;
- Chapter 4 presents a short summary of each Member State with key figures; and.
- Section 4.26 includes the assessment of the three candidate countries.

3 Methodology

This section on methodology includes three sub-sections:

- Approach to costing (3.1)
- Compliance requirements (3.2)
- Cost functions (3.3)
- Data availability (3.4)
- Assumptions for the costing analysis (3.5)

3.1 Approach to costing

Cost functions

The approach used to assess the costs of compliance with the Urban Wastewater Treatment Directive is based on standardised cost functions.

Existing cost model

The applied cost functions have been developed as part of comprehensive cost model[3]. Using an already established cost function approach has many advantages. For the FEASBLE model these advantages include:

- It is a tested and documented approach.
- The cost functions use the person equivalents, p.e., as the main cost driver. The p.e. value is one of the key the parameters that the specific directive requirements relate to and it is information that is available for the majority of agglomerations in the EU.

[3] The basis for the suggested costing approach is the one we have developed and used in preparing sector strategies in the water sector in a number of countries since 1998. The approach called FEASIBLE (Financing for Environmental, Affordable and Strategic Investments that Bring on Large-scale Expenditure) allows for costing of water sector infrastructure[3]. The part which is of interest in this study is the wastewater collection and treatment components. The approach presented in following sections is based on the FEASBLE model but is suggested tailored to the specific needs of this study.

- It has been used to prepare the cost assessment for compliance with the UWWTD in Turkey and partly in the accession countries.

- The cost functions are adjusted to reflect national price levels. Differences in national price and cost levels are included by a price correction factor.

Using cost functions means that the estimation of compliance costs are made transparent manner as all assumption can be reviewed.

3.1.1 Cost components

Four types

The main focus of this analysis is the investment costs that follow from compliance with the requirement of the UWWTD. However, also the associated operation costs are of interest.

The chosen approach allows for comprehensive assessment of all elements of achieving and maintaining compliance with the directive requirements.

The annual expenditure needs are derived from the following four types of costs components:

- New investments in additional connections and higher level of wastewater treatment;
- Renovations;
- Re-investments;
- Operation (and minor maintenance).

The relationship between re-investments, renovation and new investments can be illustrated by showing how the value of the infrastructure develops over time.

Replacement value and new investments

At a given service level defined by a connection rate and a type of treatment a new system has a value called the replacement value or the asset value of the system. This will gradually depreciate over the lifetime of the system.

Re-investments are then defined as the investment necessary to keep the asset value constant (at it current level). Renovation would be investments that bring a depreciated system back to its original value as a new system. New investments are those that increase the service level. Focus on this study is increasing the service level and therefore the new investments.

The situation where there are increasing discharges from growth in population or industrial activity new investments are needed to increase the capacity of the infrastructure. This will be considered as new investments though the purpose is to keep the service level constant.

The data used to assess the compliance costs do not allow for specific assessment of the re-investment and renovation costs. They have been estimated at

standard approach. The implication could be an underestimation of the real expenditure needed to comply with the UWWTD in cases where any existing treatment plant is in serious need of renovation or upgrading to perform according to standards.

3.2 Compliance requirements

Key requirements

The key requirements in the directive are Article 3, 4 and 5. Article 3 is about the collection of wastewater in agglomerations above 2000 p.e. while Article 4 is main requirement of secondary treatment of the collected wastewater. Article 5 relates to the demand for more stringent treatment when the discharge is to sensitive water bodies.

In terms of costing approach, the different situations include:

- Increased connection rate to collection systems (Article 3);
- More stringent treatment of collected wastewater (increase in treatment level required by Article 4 and for sensitive areas Article 5); and
- Improvement for treatment facilities failing monitoring samples (Article 4 and 5).

For increased connection rates the estimate will be based on the difference between the current connect rate and 100% (or the adequate compliance rate).

For more stringent treatment, the approach is similar. The cost of upgrading to advanced treatment with nutrients removal is the difference between the total investment costs for such a system minus the costs of the current system.

The available data include the generated load measured in p.e and it is assumed that these report load values includes sufficient safety margin also to cover for future developments.

The main challenge is the facilities that formally are at the required treatment level but fail to deliver the necessary reductions. The causes for this failure could be anything from inadequate operation to major deficiencies in the infrastructure. This can be addressed by applying a renovation factor to the existing system. The calculations for each Member States include a scenario assuming that compliance will require 10% renovation. The calculation template used to estimate the compliance costs allows for simulation of alternative renovation scenarios from 5% to 100% renovation.

3.2.1 Operational costs

Local conditions

Operation costs depends on local conditions and practise to an even higher degree than investment expenditure. The experience gained from actual imple-

mentation or from feasibility studies concentrates on investment expenditure, and limited data has been collected on actual operational procedures and associated expenditure. The FEASABLE includes also operational costs functions that can be applied similar to the investment cost functions.

Estimation Based on the proposed cost function approach, operation costs will be estimated. This will include the O&M costs of the current situation and the increased O&M resulting from full compliance.

3.3 Cost functions

Levels of details The cost functions will be based on the generic cost functions used in our FEASBLE model. They include the following levels of details:

- Collection systems;

- Treatment level (primary, secondary and tertiary treatment).

The requirements in the Directive relates to the collection system which includes the network and pumping stations where relevant. Below the costing is present for the collection system and for treatment.

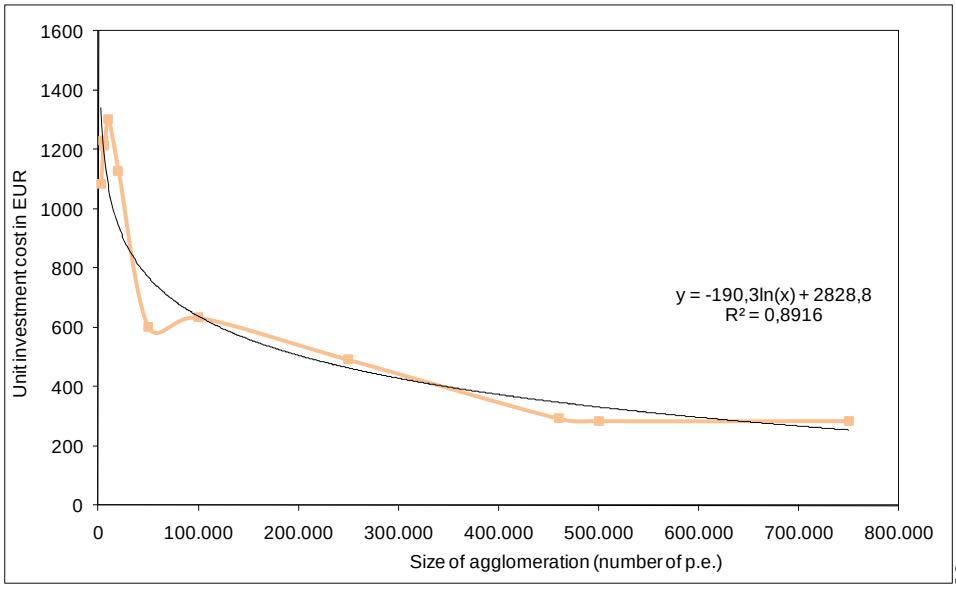
3.3.1 Collection systems

The generic cost function for the collection system has been developed based on the following:

- Function of the total length of pipes with number of pe. as driver;
- Distribution of pipe length on pipe diameters; and
- Cost for each diameter size.

The resulting cost function displaying the unit costs per p.e. as a function of agglomeration size in p.e. is illustrated below (Figure 2-1). The graph includes both the point cost estimates and the fitted curve which has been used to derive the costs used here.

Figure 3-1 Replacement value function for wastewater collection networks



Source: Consultant's estimate

The total replacement value function illustrated above is a result of combining the assumptions on the function concerning total pipe length based on connected population, with the default distribution on pipe diameters as a function of population size and, finally, the unit price of pipes of different diameters. It reflects the unit replacement value of the collection system as a function of population.

The investment cost function show the costs of a single pipe separate system excludes storm water run-off, i.e. it is designed for separate sanitary wastewater only.

Price corrections

The price correction is done using the general principle of cost shares and price indicators. The cost shares differ among pipe sizes, the larger the pipe diameter, the larger the share of the costs of the pipe itself compared to the civil works, reinstatement of the road surface etc.

Re-instatement of road surface is cost element that sometimes is excluded from the analysis. It depends on the existing situation and though there might be smaller towns which have no hard surface on all roads, the general situation is considered to require road reinstatement and it is therefore included in the present analysis.

The adjustment to national price levels is suggested to be done in the following way. Materials which first of all includes the pipes themselves is not adjusted based on the assumption that there is international competition on supply of materials and therefore no significant cost difference across Member States.

Table 3-1 Price correction factors and national prices

Cost component	Share of cost components in total costs	National price level
Materials	20%	100%
Civil works and other cost elements	80%	75%
Correction factor	80%	

On specific construction projects one might find prices that differs as a contractor is given situation might deviate from the "normal" price level. For the overall cost assessments such effects should not be included. What is more complicated is the possibility of import of cheaper lower quality pipes. For construction projects there is always the possibility of using cheap low quality products but it will reduce the lifetime of the construction significantly leading to higher re-investment needs. The assessment in this study is based on the use of "normal" quality of material and equipment.

For civil works and the other cost elements that includes a significant share of local manpower, the adjustment is suggested to be based on Eurostat price level indicators[4]. The costs are therefore dived into material and other costs as two aggregated categories.

New investments

The estimation of additional connection to the sewer systems will be based on cost functions that describes the costs investment in collection network as function of p.e.:

- New connections = Investment costs of remaining number of connections.

The collection networks' costs are difficult to assess based on the available information. Collection networks vary according to local conditions and the only information available is the number of p.e. that needs to be connected to the collection system.

Furthermore it is assumed that the estimated investments cover only public networks (not any pipes needed at private properties). As the investments eligible for financial support includes only the public part of the network, all previous costing study includes only the public part, and the individual property owner might have savings from existing systems (e.g. septic tanks or similar) which are not included it is suggested not to include this part.

Re-investments

As we have no information of the quality of the existing network, it is not possible to estimate any specific need for re-investment. It is instead based on assuming constant annual re-investments. Assuming a lifetime of 50 years for the collection system, one should invest 2% of the replacement value of the system every year to maintain it.

[4] EUROSTAT: DS-071064-Purchasing power parities (PPPs), price level indices and real expenditures for ESA95 aggregates. Comparative price level indices (EU27=100) Data for 2008 (downloaded January 2010).

3.3.2 Treatment

Cost functions

As part of developing the FEASIBLE model, cost functions for wastewater treatment were developed. They were developed based on a combination of our experience with design of treatment plants over many years and actual construction costs from a large sample of Danish treatment plants[5].

Five cost levels

The following combinations of wastewater treatment plants are considered, where category refers to five cost levels each having its own cost function:

M	Mechanical	Category 1
MP	Mechanical with P removal	Category 2
MB	Mechanical-Biological	Category 2
MBP	Mechanical-Biological with P removal	Category 3
MBN	Mechanical-Biological-Nitrification	Category 3
MBNP	Mechanical-Biological-Nitrification with P removal	Category 4
MBND	Mechanical-Biological-Nitrification-Denitrification	Category 4
MBNDP	Mechanical-Biological-Nitrification-Denitrification-with P removal	Category 5

The investment costs of wastewater treatment plants are divided into categories 1 to 5 as shown above.

The influent water quality assumed is illustrated in the table below

Table 3-2 Influent quality in mg/L (yearly average)

BOD	N	NH_4 - N	P	SS
250	50	30	8	300

Source: Consultant's estimates.

The categories are assumed to provide the effluent quality illustrated in the below table.

Table 3-3 Effluent quality by type of treatment (in mg/L - yearly average)

Treatment	Expenditure category	Effluent quality in mg/L				
		BOD	N	NH_4 - N	P	SS
M	1	175	45	35	7	25
MP	2	100	40	35	2	25
MB	2	25	35	30	6	25
MBP	3	15	35	30	1	25

[5] DEPA: Calculation system for investment costs for wastewater treatment (in Danish), COWI and Lønholt&Jans I-S, 1990. These cost functions is also used in a text book on civil engineering in the wastewater sector: Winther, L et al, "Spildevandsteknik", 2009 Polyteknisk Forlag. (in Danish).

Treatment	Expenditure category	Effluent quality in mg/L				
		BOD	N	NH_4 - N	P	SS
MBN	3	15	35	2	6	25
MBNP	4	15	35	2	1	25
MBND	4	15	8	2	6	25
MBNDP	5	15	8	2	1	25

Source: Consultant's estimates.
Note: The assessment of effluent quality is based on frequent 24-hour sampling proportional to flow (say, at least 12 samples taken at regular intervals over one year).

Organic pollution (BOD) is the primary parameter for establishing the costs functions for the capital expenditure of new wastewater treatment plants.

Assumptions made

The following assumptions have been made:

- The pollution parameter used in the expenditure functions is p.e.. The number of p.e.is defined at the total load of BOD (including industry) divided by 60 g/day.
- The function assumes a wastewater flow of 200 litre/p.e./day.
- $BOD_{inlet}/N_{inlet} = 4.5$
- Peak $flow_{rain}$/Peak $flow_{dry\ weather}$ is equal to 2
- "Medium quality" design. Very fancy and very cheap solutions have not been assumed.

In terms on the need to cost the requirements in the UWWTD the following assumptions have been made which translates the above treatment technologies into the following categories used to describe the situation in the Member States.

Table 3-4 Relevant wastewater technologies

UWWTD and registry terminology	Cost function equivalent treatment technology
Primary treatment (called 1 in the registry database)	Mechanical
Secondary treatment (called 2 in the registry database)	Mechanical-Biological
Advanced treatment with removal of P (called 3P in the registry database)	Mechanical-Biological-Chemical

UWWTD and registry terminology	Cost function equivalent treatment technology
Advanced treatment with removal of N (called 3n in the registry database)	Mechanical-Biological-Chemical-Nitrification
Advanced treatment with removal of both N and P (called 3NP in the registry database)	Mechanical-Biological-Nitrification-Denitrification-Organic P

Investment costs

The investment cost functions are shown in Table 3-5.

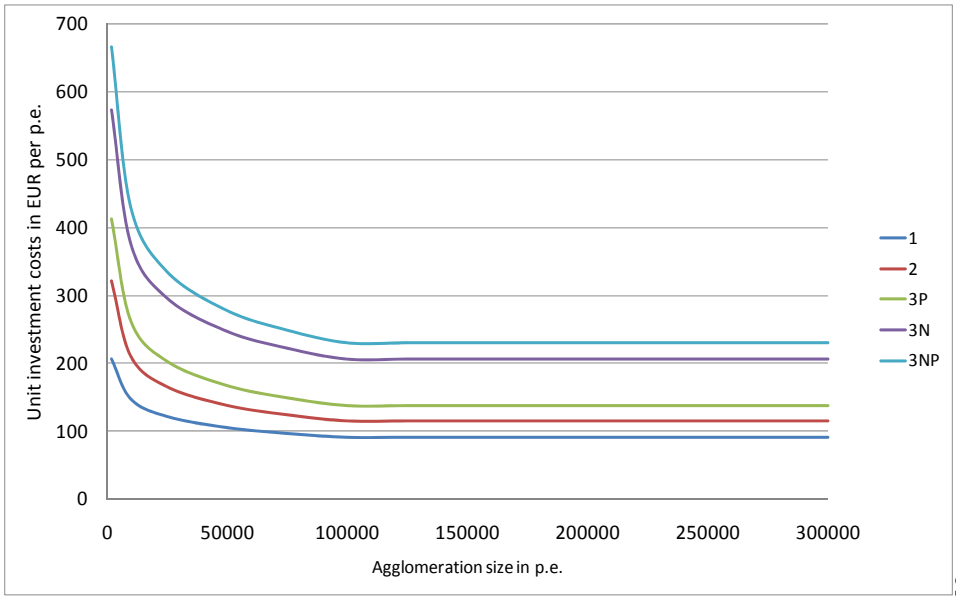
Table 3-5 Investment expenditure functions for wastewater treatment plants

		Cost functions EUR per p.e. 2008 DK price level	
		Load in p.e.	
	Technology	2,000-100,000	>100,000
1	Primary (Mechanical)	=10^(-0.2073*log(PE)+3.6385)*0.23	92
2	Secondary (mechanical biological)	=10^(-0.2632*log(PE)+4.0149) *0.23	115
3P	Advanced with P-removal	=10^(-0.2808*log(PE)+4.1823) *0.23	138
3N	Advanced with N-removal	=10^(-0.2612*log(PE)+4.2600) *0.23	207
3NP	Advanced with N and P removal	=10^(-0.2722*log(PE)+4.3608) *0.23	230
3 Other	Advanced - not specified	=10^(-0.2808*log(PE)+4.1823) *0.23	138

Source: Consultant's estimates.

The expenditure functions are illustrated in Figure 3-2.

Figure 3-2 Investment expenditure functions for wastewater treatment



Source: Consultant's estimate

Operation costs

The operation costs for wastewater services are estimated using a percentage of the investment expenditure. This covers all operational expenditure except electricity, which will be specified separately.

Other operation costs: 3% of the total investment expenditure for wastewater treatment. The operational cost functions by technology are presented in Table below[6].

Table 3-6 Cost functions for operation costs

		Cost functions EUR per p.e. 2008 DK price level	
	Technology	O&M excl energy	kWh/p.e.
1	Primary (Mechanical)	= 3 % of invest	15
2	Secondary (mechanical biological)	= 3 % of invest	25
3P	Advanced with P-removal	= 3 % of invest	40
3N	Advanced with N-removal	= 3 % of invest	40
3NP	Advanced with N and P removal	= 3 % of invest	40

[6] Given the assumed electricity consumption and current electricity prices the total operational costs including energy amount to about 6% of the investment costs.

Price corrections

The approach to price correction (adapting cost estimates to the national price level) is the same as described for collection systems.

The price correction is done using the general principle of cost shares and price indicators. For civil works and the other cost elements that includes a significant share of local manpower, the adjustment is suggested to be based on Eurostat's price level indicators[7]. The costs are therefore dived into material and other costs as two aggregated categories

Table 3-7 Resulting weight factors for price correction of investment costs for treatment plants

Category	Share	Value to be used
Materials	35%	Default international average price level =100%
Civil works, design and all other cost elements	65%	Adjusted by national price level compared to DK level

The result of the price correction is illustrated in Table 3-8 in a case where the national price level is 75% of the international. In this case the cost of treatment investment will be 84% of the international price level.

Table 3-8 Price correction factors and national prices

Cost component	Share of cost components in total costs	National price level
Materials	35%	100%
Civil works and other cost elements	65%	75%
Correction factor	84%	

New investments

Most towns and cities already have some form of treatment, primary or secondary. The key issue for the costing analysis is therefore what the costs of the upgrade to secondary from primary and from secondary to advanced treatment will be.

The two alternative approaches are:

[7] EUROSTAT: DS-071064-Purchasing power parities (PPPs), price level indices and real expenditures for ESA95 aggregates. Comparative price level indices (EU27=100) Data for 2008 (downloaded January 2010).

- The cost of upgrade is estimated at the simple difference between the costs of to treatment levels; or

- The cost of upgrade is estimated as above plus a percentage for adapting the existing system to the upgrade.

The possible additional costs for adapting or renovating the existing facility to accommodate the upgrade will vary from plant to plant. There is no data to support such an assessment.

Instead the calculations will include a separate element of annual re-investments in the existing facilities. Based on an assumed life time of the treatment plans of 25 years, the annual re-investment need is 4% of the total replacement value.

As described in section 2.3.2 the main challenge is the facilities that formally are at the required treatment level/technology but where the monitoring data indicate the necessary effluent qualities are not achieved.

As the causes for the failure is not known it was suggested to apply renovation factor to the existing plants where the data show that the monitoring tests have failed. This is done by applying specific renovation percentages to the replacement value of the existing treatment plants not complying with the monitoring test.

3.3.3 Uncertainty on cost functions

The generic cost functions do not take all the site specific conditions into account. For a given agglomeration, the estimated costs could deviate from the "actual" costs. In principle there could be quite significant differences and our experience would suggest up to a factor of 2. It means that "actual" costs could be 50% less or 100% more than the estimated value.

The elements that contribute to uncertainty on the cost estimates are:

- The value of any existing infrastructure (need for renovation/re-investment);

- Specific conditions (soil conditions, typography, etc);

- Price levels (price and costs levels for wastewater infrastructure deviate from general price level in that country).

The estimation of compliance investments does not take the need for major re-habilitation of the existing infrastructure into account. If there is a treatment plant providing secondary treatment and the compliance level is advanced treatment, the estimated costs cover only the upgrade of the plant.

The calculation model allows for estimation of re-investment based on the life-time of the infrastructure. This is however, a standardised calculation with no account of the specific state of the existing infrastructure in each agglomeration. At the aggregated level however, the estimated re-investment can give indications of the uncertainty on the estimated compliance costs.

An example can illustrate the how much re-investment and in particular any backlog of maintenance can account for. The unit cost for secondary treatment plant above 100,000 PE is 115 EUR while the investment costs for advanced (3NP) is 230 EUR per PE. The estimated investment cost would therefore be 115 EUR per PE in case the requirement is advanced treatment and currently only secondary treatment is in place. The annual re-investment is 4% which means that is almost 5 EUR per PE. Over 7 year period this would amount to 35 EUR and if there is a backlog of maintenance it could be higher. It means that it could be in order of 50% of the estimated investment costs.

If the compliance gap is from primary to secondary treatment, the investment costs is less and in a situation, the re-investment could be in the same order as the new investment costs.

At the aggregated level for one country, the effects of the site specific conditions are likely to cancel out. The price correction approach could however, lead to more systematic deviations at Member State level. The approach as described in Section 3.3.1 and 3.3.2 assumes that the total investment costs is split into a component which is directly materials and one component which includes mainly civil works. The material component is not scaled down while the civil works component is adjusted using an indicator for the price level in each Member States. If also materials are produced locally and priced based on the local price level, the adjusted investment should be lower than when using the standard assumption. How much this would affect the estimated compliance costs depend on the price level in each Member State. For Member States with lowest price levels - about 30% of the international - the difference between only adjusting the civil works component instead of adjusting both investment components will lead to investment costs that are 32% too high for collection systems and 45% too high for treatment systems. The effect is shown below for alternative values of the national price level compared to the price level that has been used in the generic cost functions.

Table 3-9 Sensitivity analysis of price level adjustment

National price level in % of price level used in generic cost functions	Impact on total cost estimates (% that cost estimates are higher than when adjusting all cost components)	
	Collection systems	Treatment systems
30%	32%	45%
50%	17%	26%
80%	5%	8%

Overall, the sensitivity is about +/- 50% of the estimated values.

3.4 Data availability

The data sources and the quality of the data are important for understanding the results.

The costing analysis is for 22 out of 27 Member States based on the registry data files. They include basic information that is used to estimate the compliance costs:

- Load by agglomeration
- Connection rate to central sewage and to "individual appropriate systems" (IAS),
- Existing treatment technology
- Monitoring results

The financing analysis is based on:

- DG REGIO data on EU funds
- A Member State survey conducted as part of this study. The survey cover national contribution to financing of the UWWTD compliance investments. 16 out of 27 Member States have replied and provided data.

The situation regarding data availability and quality is summarised in the below table.

Table 3-10 Overview of compliance cost estimates - million EUR from 2005/2006 until relevant compliance date

	Data quality for costing analysis	Data for financing analysis
Austria	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire
Belgium	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Bulgaria	Acceptable - data by agglomeration	Incomplete data - only data for EU funds - national contribution based on questionnaire includes only part of co-financing
Cyprus	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Czech Republic	Acceptable/poor - only data by agglomeration above 10.000 PE - uncertainty about smaller agglomerations	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Denmark	Good - Registry data file	No detailed data - limited financing of UWWTD after 2000
Estonia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Finland	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire
France	Good - Registry data file	Incomplete data - No reply on questionnaire
Greece	Poor - only old data on	Incomplete data - No reply on ques-

	Data quality for costing analysis	Data for financing analysis
	the largest (> 15000 PE) agglomerations, more recent data only number - no PE data	tionnaire
Germany	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire
Hungary	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Ireland	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Italy	Good - Registry data file	Questionnaire reply but data can not be distributed by the specified time periods - difficult to make comparison
Latvia	Good - Registry data file	Incomplete data - No reply on questionnaire
Lithuania	Good - Registry data file	Incomplete data - No data provided on questionnaire
Luxembourg	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Malta	Poor - no data by agglomeration - assessment based on general description	Incomplete data - No data provided on questionnaire
Netherlands	Good - Registry data file	No detailed data - no financing of UWWTD after 2000 - full compliance
Poland	Acceptable/poor - only data by agglomeration above 10.000 PE - un-	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-

	Data quality for costing analysis	Data for financing analysis
	certainty about status for small agglomerations	investments and renovations - no funds yet committed for future years
Portugal	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Romania	Good - Registry data file	Acceptable - questionnaire reply - data on future funds might be planned rather than committed funds
Slovakia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Slovenia	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations
Spain	Good - Registry data file	Incomplete data - No reply on questionnaire
Sweden	Good - Registry data file	No data but less important (full compliance) No reply on questionnaire
United Kingdom	Good - Registry data file	Acceptable - questionnaire reply - data for national contribution may include also funds for UWWTD re-investments and renovations

The following should be noted:

- Costs data:
  - The registry data is assumed to provide accurate description of the status
  - The data on the use of "individual appropriate systems" for collection and treatment are important for the estimation of the costs of additional collection systems. If existing for example septic tank solutions

are "appropriate" costs will be less in cases where central sewerage system is to be put in place.

- As there is no data on the actual state of the existing infrastructure, there is a risk of underestimation of the compliance investment costs. If an agglomeration current is indicated to have the correct level of treatment (e.g. secondary treatment) but it is old and need maybe to be completely rebuild, the costs could be higher than what the standard re-investment calculation will suggest.

- Financing data:

  - It is generally not clear whether the responses are really the disbursed and the committed finance. In one or two cases the MS has included data on the EU funds for 2000-2006 comparing them to the DG REGIO data it seems to the committed funds not the actually disbursed amount.

  - This study focuses on new investments in collection and treatment infrastructure to comply with the UWWTD. The Member States data on allocated funds might not allow for separating the new investments and therefore include all costs related to UWWTD compliance (for example renovations of existing infrastructure and sludge treatment).

  - It is assumed that the general economic situation and possible continued economic downturn will not impact on the availability of the finance presented in the report. Most of the data on future financing have been provided by the Member States in May/June 2010.

3.5 Assumptions

The input data to the cost assessment comprise for most of the Member States the registry data. In order to make the compliance cost assessment a number of assumptions has been made. The mostly relate to the designated sensitive areas.

- For agglomerations marked SA or CSA it is assumed unless otherwise stated that all agglomerations above 10,000 p.e. are required to have 3NP;

- For countries with whole area designated as sensitive and using Article 5 (8) it is similarly assumed that all have to apply 3NP expect with an existing 3N or 3P is in place and the agglomeration is marked as C (in compliance). In these cases no additional treatment is assumed.

- In cases where Article 5 (4) is applied, the existing treatment comprises a mix of 3NP, 3N, 3 P and even a few 2 (secondary treatment). It is assumed that the existing treatment is sufficient unless there is clear non-compliance marking in which case 3NP is assumed.

It is possible to make scenario analysis, where the user specifies what the final requirements should be. For example in the case of sensitive areas according to Article 5 (4) it is possible to test the consequence of both the existing level of treatment and 3NP for all agglomerations.

4 Summary of results

This section includes the summary of the results for the EU 27 Member States. It comprises the following sections:

- A summary of the costing analysis
- Summary of the analysis of the supply of finance
- Assessment of possible financing gaps

The costing approach as described in Section 3 provides consistent and relatively transparent estimates of the remaining investments costs required for full compliance with Article 3, 4 and 5 of the UWWTD. The estimated costs are based on the status in each Member States either end of 2005 or end of 2006.

As with any costing based on standardised cost functions - though they are adopted to take national price levels into account - the resulting estimates are subject to some uncertainty.

The assessment of the supply of finance has covered available data for the EU funds - notable Cohesion Fund grants - committed or allocated to support investments in wastewater collection and treatment combined with a Member State survey on national contribution to investments for compliance with the UWWTD.

Assessing the availability of finance and comparing it to the need for finance is a very complex task. Hence, when comparing the investment costs to the supply of finance one has to keep in mind that:

- Providing financial resources is always a question of priority. Therefore there is no simple way to determining affordability is in relation to specific purpose such as financing the necessary investment for compliance with the UWWTD;
- The estimated supply of finance might include funds for investments not covered by the compliance costing analysis (notably renovation and reinvestment costs, sludge treatment and disposal costs or treatment requirement in relation to other directives); and

- The replies on the supply of finance survey have been incomplete and the assessment of the available finance is therefore subject significant uncertainty.

4.1 Costing analysis

The section presents a summary of the individual country analysis and compares the key figures across EU27. The section includes the following:

- Current level of collection systems
- Current level of treatment systems
- Compliance with Article 3, 4 and 5 ("old" Member States only)
- Investment costs for compliance with Article 3, 4 and 5
- Total operational costs for existing and full compliance situation

4.1.1 Status on collection and treatment systems

The total number of PE for each Member States is illustrated below for all agglomerations above 2000 PE. All agglomerations above 2,000 PE should comply with Article 3 and 4, while only agglomerations above 10,000 PE that discharge into sensitive areas should comply with Article 5 requirements.

Table 4-1 presents total PE (based on the registry data files) and the share of the PE that are subject to Article 5 requirements.

Table 4-1 Overview of total PEs

	Total PE (Article 3 and 4)	Share of PE subject to Article 5
Austria	19,712,580	92%
Belgium	9,701,500	88%
Bulgaria	10,963,402	83%
Cyprus	858,800	25%
Czech Republic	10,990,000	85%
Denmark	11,769,028	89%
Estonia	1,488,789	92%

	Total PE (Article 3 and 4)	Share of PE subject to Article 5
Finland	4,984,100	90%
France	67,180,943	50%
Greece	10,130,200	6%
Germany	114,707,843	91%
Hungary	9,643,155	4%
Ireland	8,513,502	56%
Italy	71,912,413	4%
Latvia	1,545,385	57%
Lithuania	2,474,700	91%
Luxembourg	1,035,350	89%
Malta	594,200	66%
Netherlands	16,181,570	97%
Poland	44,661,133	84%
Portugal	11,255,420	5%
Romania	26,418,557	61%
Slovakia	5,054,900	80%
Slovenia	1,531,749	6%
Spain	8,513,502	56%
Sweden	7,889,073	87%
United Kingdom	70,573,091	37%

Source: Registry data

Compliance for the EU15 is illustrated below. The data refer to either end 2005 or end 2006. The table shows percentage of p.e. that are not covered an appropriate collection system and percentage of agglomerations that fails compliance with Article 4 and 5 based on treatment level, monitoring data or both.

Table 4-2 Non-compliance with Article 3, 4 and 5

	Article 3	Article 4	Article 5
Austria	0%	0%	0%
Belgium	2%	34%	51%
Denmark	0%	0%	25%
Finland	0%	11%	66%
France	0%	35%	52%
Germany	0%	0%	0%
Ireland	0%	78%	99%
Luxembourg	0%	5%	71%
Netherlands	0%	0%	0%
Portugal	5%	60%	87%
Sweden	0%	2%	33%
United Kingdom	0%	8%	92%

Source: Registry data

In the case of Article 3 compliance in Belgium and Portugal, 2% and 5% respectively of the total load (p.e.) are not covered; however, the number of agglomerations where the coverage of an appropriate system is less than 100% amounts to 36% and 15% respectively.

The compliance with Article 4 and 5, the estiamates are based on the registry data and the assessment of both treatment type and monitoring results. In some cases, most of the non-compliance seems to be caused by monitoring results while in other cases, it caused by lack of the appropriate treatment.

The estimation of investment costs is addressing only non-compliance due to lack of appropriate treatment technology. In case the monitoring results show non-compliance the need for additional investment depends on whether the failure can be removed by just operational measures or some renovation would required. Hence, this element is not included and it potentially means a slight underestimation of the required compliance investments.

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4.1.2 Compliance costs

The compliance costs have been estimated for each Member State applying the approach presented in Chapter 3. It should be stressed again here that the compliance costs here include only new investments. So any-reinvestment needed to maintain compliance is not included; see also Section 4.1.3.

An overview of the results for collection (Article 3) and treatment (Article 4 and 5) are presented in Table 4-3.

The apportionment of the investment costs for the treatment plant is based on the most demanding requirement. If an agglomeration needs to comply with Article 5 and thus introduce advanced treatment, the entire investment amount is apportioned as Article 5 driven. Advanced treatment means that also the secondary treatment requirements are complied with but it would complicate the estimations unnecessarily if the investments costs should be divided into the part that provides the secondary treatment (the Article 4 requirement) and the part the provides the advanced treatment (typically removal of N and P) as required by Article 5.

Table 4-3 Overview of investment compliance cost estimates - million EUR from 2005/2006 until relevant compliance date

	Article 3	Article 4	Article 5	Total
Austria	0	0	0	0
Belgium	223	107	832	1,161
Bulgaria	4,208	126	790	5,125
Cyprus	295	50	18	363
Czech Republic	845	244	435	1,524
Denmark	0	0	13	13
Estonia	117	4	58	178
Finland	0	0	243	243
France	0	198	1,424	1,623
Greece	599	279	12	890
Germany	1	4	0	4
Hungary	0	2	8	10
Ireland	0	53	195	248
Italy	2,040	714	650	3,404

	Article 3	Article 4	Article 5	Total
Latvia	149	26	112	287
Lithuania	0	2	67	69
Luxembourg	0	3	64	67
Malta	0	0	58	58
Netherlands	0	0	0	0
Poland	10,126	557	4,373	15,056
Portugal	291	152	15	458
Romania	7,875	1,527	1,940	11,341
Slovakia	442	91	343	876
Slovenia	321	94	13	428
Spain	780	213	494	1,488
Sweden	0	0	0	0
United Kingdom	0	50	298	347
Total	**28,312**	**4,495**	**12,455**	**45,262**

Source: Consultant's estimate based on registry data

The estimates of the compliance investment costs are based on generic cost functions as described in Section 3.3 applied to the relatively detailed agglomeration level data. The uncertainty on the estimates is around +/- 30% excluding the effect of lacking renovation/rehabilitation work; see Section 3.3.2.

4.1.3 Re-investment and operational costs

The registry data files do not contain information about the actual state of the wastewater infrastructure. Hence, it is difficult to assess whether there is any specific need for renovation or rehabilitation of the either the collection or the treatment systems.

Based on the average expected life time of the infrastructure, the annual re-investment need can be estimated. In practice, re-investments will not take place at an annual basis but in large renovation/rehabilitation projects. At an aggregated level, the approach with lifetime based depreciation values might provide a reasonable indicator for the annual re-investment activity.

The below table includes the estimated re-investment need by Member State (only for those where we have the full registry file data). The table shows the annual re-investment need given the current infrastructure and how much it is going to be in the future when the new infrastructure is in place. Based on the current level of re-investments a figure for the accumulated re-investment over a 7 year period is shown. This indicates the level of re-investment that would be required over the period 2007 to 2013.

Table 4-4 Overview of estimated re-investment costs for the current situation (2005/2006) and for the future full compliance situation and for a period of seven years - in million EUR

	Current re-investment costs	Future full compliance re-investment costs	Accumulated re-investments 2007 to 2013
Austria	350	350	2,449
Belgium	161	203	1,127
Cyprus	9	17	61
Denmark	279	279	1,952
Estonia	18	23	125
Finland	93	103	649
France	1,155	1,220	8,084
Germany	2,236	2,236	15,650
Hungary	108	110	757
Ireland	109	132	766
Italy	1,068	1,165	7,478
Latvia	17	26	118
Lithuania	27	30	191
Luxembourg	19	22	134
Netherlands	304	304	2125
Portugal	138	150	964
Romania	95	392	668
Slovakia	47	74	332

	Current re-investment costs	Future full compli-ance re-investment costs	Accumulated re-investments 2007 to 2013
Slovenia	15	26	108
Spain	918	962	6,428
Sweden	155	160	1086
United Kingdom	931	946	6,519

Source: Consultant's estimate based on registry data

To illustrate how important the re-investment could be in the overall demand for financial resources, the estimated re-investment for 2007 to 2103 and the compliance investments for the same period can be compared.

Table 4-5 Overview of estimated re-investment and compliance investment costs for the period 2007 to 2013 - in million EUR

	Accumulated re-investments 2007 to 2013	Compliance costs for 2007 to 2013[1]	Total investments 2007 to 2013
Austria	2,449	0	2,449
Belgium	1,127	1,161	2,288
Cyprus	61	363	424
Denmark	1,952	13	1,965
Estonia	125	178	303
Finland	649	243	892
France	8,084	1,623	9,707
Germany	15,650	4	15,654
Hungary	757	8	764
Ireland	766	248	1,014
Italy	7,478	3,404	10,882
Latvia	118	171	289
Lithuania	191	69	260
Luxembourg	134	67	201

	Accumulated re-investments 2007 to 2013	Compliance costs for 2007 to 2013[1]	Total investments 2007 to 2013
Netherlands	2,125	0	2,125
Portugal	964	458	1,421
Romania	668	5,003	5,672
Slovakia	332	789	1,121
Slovenia	108	150	258
Spain	6,428	1,484	7,912
Sweden	1,086	0	1,086
United Kingdom	6,519	348	6,867
Total (for 22 MS)	**57,770**	**15,784**	**73,555**

Source: Consultant's estimate based on registry data
Note 1) Some Member States have compliance costs beyond 2013 that are not included.

As this comparison only includes data from 22 Member States and some the new Member States with high compliance investment costs are not included, the overall balance might not reflect the EU27 situation. It illustrates however, the re-investments are very important for understanding the overall financing situation. The re-investments could amount to more than the estimated compliance investments but the timing of these investments are not known. As many Member States have only recently completed a lot of the necessary treatment infrastructure, the need for re-investment might be 15 to 20 years ahead.

Investments in collection systems and more advanced treatment will increase the recurrent costs of operating the wastewater systems in the Member States. Estimates have been made of the current level of operational costs based on the data in the registry files and the costing approach described in Section 2. The results are presented in Table 4-6.

Table 4-6 Overview of estimated operational costs for the current situation (2005/2006) and for the future full compliance situation - million EUR

	Current operational costs	Future full compliance operational costs
Austria	377	377
Belgium	159	205

	Current operational costs	Future full compliance operational costs
Cyprus	13	23
Denmark	263	264
Estonia	17	21
Finland	82	89
France	986	1,049
Germany	2,315	2,315
Hungary	137	138
Ireland	157	172
Italy	1,328	1,439
Latvia	16	24
Lithuania	30	34
Luxembourg	18	21
Netherlands	312	312
Portugal	140	155
Romania	117	414
Slovakia	58	88
Slovenia	14	23
Spain	1,034	1,097
Sweden	65	134
United Kingdom	1,054	1,085

Source: Consultant's estimate based on registry data

4.2 Supply of finance

4.2.1 Introduction

The supply of finance for the investment in compliance with the Urban Waste-water Treatment Directive has been assessed.

The main purpose of the analysis of the available finance is to compare the estimated remaining investment costs with committed finance and to assess whether there likely to be a financial gap.

Furthermore, an assessment of the historical funding has been undertaken. This has been done to in order to support the projection of possible future financing. Data on actual disbursed funds give an indication of the realistic and affordable future level of financing. Hence, the actual allocated funds for the period 2000 to 2006 have been complied. This time period has been chosen because it the period where substantial EU funds have allocated and disbursed.

In general, it should be emphasised that the reported supply of finance might cover more than what is included in the narrow definition of new investments in compliance with Article 3, 4 and 5 which has been used for the costing analysis. From Member States point of view there could be funds required for full compliance than the new investment definition applied here. It means that when relatively high figures for the supply of finance are indicated, it might be the additional required funds related to re-investments, renovations and sludge treatment.

4.2.2 Funds for 2000 to 2006

The assessment of the historical data for the period 2000 to 2006 is based on the following sources:

- DG REGIO data for EU funds - allocated and disbursed over the period 2000 to 2006

- A questionnaire to Member States regarding nationally disbursed funds for investment to the UWWTD in the period 2000-2006.

Each source is presented below.

EU funds for 2000 to 2006

Based on data from DG REGIO's database with information on all relevant EU funds for the investment in wastewater collection and treatment, an overview of the committed and disbursed funds for the period 2000 to 2006 has been established.

Data are registered based some general categories of purpose and sector. The relevant category is the one of "Sewerage and purification". There is a general

category called "Environment - not classified" and in some cases the relevant wastewater projects are comprised in that category. The amounts shown in Table 4-7 therefore include an estimated component. For some Member States a number of projects include both a water supply and a wastewater component and in such cases, the share of wastewater investments have been estimated using a split similar to that of the total amounts allocated for the categories of "Drinking water" and "Sewerage and purification".

The table shows that the total EU funds in the period 2000 to 2006 are around 8 billion EUR in net commitments, while only 75% or 6 billion have actually been paid out.

Table 4-7 EU cohesion and other funds for 2000 to 20006 in million EUR

Member State	Net Committed	Total paid	Paid / Net Committed
Bulgaria	246	135	55%
Czech Republic	397	302	76%
Estonia	110	91	83%
Greece	629	471	75%
Spain	2,968	2,344	79%
Ireland	282	273	97%
Cyprus	-	-	N/A
Latvia	7	5	82%
Lithuania	269	213	79%
Hungary	493	313	64%
Malta	-	-	N/A
Poland	1,254	869	69%
Portugal	505	404	80%
Romania	679	469	69%
Slovenia	117	79	67%
Slovakia	259	202S	78%
Total	8,215	6,172	75%

Source: DG REGIO

National funds for 2000 to 2006

Based on a questionnaire to all Member States, data on the national contribution have been gathered. The process of collecting and compiling data on the national contribution has shown that there are many complications involved in providing an overview of allocated resources.

- National funds are generally coming from various sources: The central budget, regional or municipal budgets, the utilities own funds and loans;
- Funds are allocated not specifically for compliance with certain directives; i.e. funds are allocated to wastewater collection and treatment and that might be funds for normal maintained or compliance with directives such as the UWWTD, the Bathing Water Directive and the WFD.
- It is assumed that the general economic situation and possible continued economic downturn will not impact on the availability of the finance presented in the report. Most of the data on future financing have been provided by the Member States in May/June 2010.

Hence, the collected data give some understanding but they are not consistent in a way that allows for cross national comparison.

Table 4-8 National contribution to UWWTD investments for 2000 to 20006 in million EU'R

	National	Loans	Total national
Belgium	2,662	439	3101
Bulgaria[1]	4		4
Czech Republic	126	51	177
Estonia	176	21	197
Ireland	2,147	-	2,147
Cyprus	209	186	395
Luxemburg	294	-	294
Hungary	1,239	194	1,434
Poland	2,360	1,732	4,092
Portugal	296	639	935
Romania	96	18	114
Slovenia	390	-	390

	National	Loans	Total national
Slovakia	66	-	66
UK	5,101	-	5,101

Source: Questionnaire to Member States 2010

Notes: 1) Include only funds for selected projects in Maritsa river basin and in Bourgas and Rousse.

The data provided through the questionnaire can be compared to the requirement for national co-financing of the EU supported projects.

Table 4-9 Comparison of total national contribution to UWWTD investments for 2000 to 20006 and the required co-financing of EU funds - million EUR

	Total national funds based on Member State questionnaire	Required national co-financing of EU funds based on the DG REGIO data
Bulgaria[1]	4	85
Czech Republic	5,891	119
Estonia	197	32
Ireland	2,147	81
Hungary	1,434	297
Poland	4,092	612
Portugal	935	218
Romania	114	259
Slovenia	390	84
Slovakia	66	141

Notes: 1) Include only funds for selected projects in Maritsa river basin and in Bourgas and Rousse.

Overall, the comparison shows that Member States eligible for EU funding have allocated significantly more than required as co-financing. There are a few exceptions. Bulgaria can not be assessed as the provided data on national funds only cover certain regions and agglomerations. For Romania the data indicates that up to now not all the committed funds have been disbursed. Only about 70% of the EU funds have been disbursed and therefore the actual national co-financing could be lower as well. The same is the situation for Slovakia where

about 78% of the EU funds for the period have been disbursed. For Romania, Slovakia and also likely for Bulgaria, the national contribution seems to cover only the necessary co-financing.

4.2.3 Funds for 2007 and until relevant compliance deadline

The projection of future finance is based on data for committed EU funds for the period 2007 to 2013 and questionnaire replies on nationally actually spend funds 2007 to 2009 plus committed funds for the period onwards to full compliance.

EU funds for 2007 to 2013

The funds allocated for wastewater projects for the period 2007 to 2013 for all Member States eligible to financial support is presented in Table 4-10.

Table 4-10 Planned EU cohesion funds for 2007 to 2013 in EUR

Member State	2007 to 2013	Per year
Bulgaria	768,469,973	109,781,425
Czech Republic	1,344,868,832	192,124,119
Germany	287,318,061	41,045,437
Estonia	203,878,160	29,125,451
Greece	929,942,806	132,848,972
Spain	3,108,308,077	444,044,011
France	118,000,000	16,857,143
Italia	227,862,362	32,551,766
Lithuania	206,166,750	29,452,393
Hungary	1,350,126,780	192,875,254
Malta	42,500,000	6,071,429
Poland	3,164,883,744	452,126,249
Portugal	765,903,337	109,414,762
Romania	1,388,266,080	198,323,726
Slovenia	156,985,442	22,426,492

Member State	2007 to 2013	Per year
Slovak Republic	691,710,376	98,815,768
Total for wastewater	**14,755,190,780**	**2,107,884,397**

Source: DG Regio

In total EU has committed between 14 and 15 billion EUR for the period 2007 to 2013.

National funds for 2007 to and until compliance

The questionnaire to Member States has aimed to reveal the amount of committed finance for the future. For 2007 to 2009, the finance is the actual disbursed amounts similar to what was asked for the period 2000 to 2006. For 2010 and onward the amounts should in principle only by the committed finance. Some data might also include planned financing.

Table 4-11 National contribution to UWWTD investments for 2007 to 2013 and from 2014 until the last compliance date in million EUR

	Total national finance 2007 to 2013	**Total national finance 2014 - compliance data**
Belgium	2997	452
Bulgaria[1]	59	-
Czech Republic	4,732	-
Estonia	583	127
Ireland	1,079	-
Cyprus	1,516	40
Luxemburg	797	-
Hungary	754	140
Poland	1,529	-
Portugal	593	-
Romania	2469	1077
Slovenia	321	-
Slovakia	1,433	293

	Total national finance 2007 to 2013	Total national finance 2014 - compliance data
UK	3,184	746

Source: Questionnaire to Member States 2010

Notes: 1) Include only funds for selected projects in Maritsa river basin and in Bourgas and Rousse.

Total supply of finance for 2007 and until compliance

Adding the national contribution and the committed EU funds provides an overview of the total finance that is available for financing of the investment in compliance with the UWWTD.

As there no EU funds yet committed beyond 2013, the available finance for the period from 2014 until the compliance data is only the reported national finance and as explained above, in many Member States commitments are not made for this more distant future. The actual availability is therefore likely to be significantly higher.

Table 4-12 Total supply of finance for UWWTD investments in million EUR

	Total supply 2007 to 2013	Total supply 2014 -	Comments on future finance
Belgium	2998	452	Data might include funds for re-investment/renovation etc
Bulgaria[2]	939	-	Incomplete data
Czech Republic	6,077	-	Very high figures reported
Estonia	754	127	Data might include funds for re-investment/renovation etc
Ireland	1,092	-	Data might include funds for re-investment/renovation etc
Cyprus	1,533	40	Data might include funds for re-investment/renovation etc
Luxemburg	797	-	Data might include funds for re-investment/renovation etc

Hungary	2,291	140	Data might include funds for re-investment/renovation etc
Poland	5,078	-	No data for future committed finance has been reported - only actual funds for 2007 to 2008
Portugal	1,474	-	Data might include funds for re-investment/renovation etc
Romania	4,067	1,077	Data might include planned funds - not only committed
Slovenia	517	-	Data might include funds for re-investment/renovation etc
Slovakia	2,181	293	Data might include funds for re-investment/renovation etc
UK	3,184	746	Data from the water companies approved investment plans

Notes: 1) Include only funds for selected projects in Maritsa river basin and in Bourgas and Rousse.

Having assessed the supply of finance the next section compares the estimated compliance costs to the available financial resources.

4.3 Financing gaps

The financing gap is defined as the total supply of finance minus the estimated need for finance to cover the compliance investment costs. As discussed in relation to the supply there are several uncertainties surrounding the data that can be compiled. Overall there following points should be kept in mind when looking at the estimated financing gaps:

- Data on supply of finance is are incomplete;
- Data on supply of finance might include funds for other UWWTD costs than the new investments covered by the compliance costing analysis:
  - Renovation and re-investment costs

- Sludge treatment and disposal
- Bathing water and Water Framework Directive investments

• The estimated compliance costs are based on either end of year 2005 or 2006. In case the reference year is 2005, the compliance costs should be covered by the available finance from 2006 and onwards. In these cases, the supplies of finance to cover the investment needs are slightly underestimated.

Thus, the estimated financing gaps are only indicative.

Table 4-13 Indicative financing gaps for 2007 to 2013 and for 2014 until full compliance

	Compliance costs		**Total reported supply of finance (data incomplete)**		**Financing gaps**	
	2007-2013	2014 -	2007-2013	2014 -	2007-2013	2014 -
Belgium	1,161	-	2998	452	1836	452
Bulgaria	3,105	2,020	939	-	-2,166	-2,020
Czech Republic	1524		6,077	-	4553	-
Estonia	178	-	754	127	576	127
Ireland	248	-	1,092	-	844	-
Cyprus	363	-	1,533	40	1,169	40
Lithuania	69	-	263	-	193	-
Luxemburg	67	-	797	-	730	-
Hungary	8	2	2,291	140	2,283	138
Poland	13,756	1,300	5,078	-	-8,678	-1,300
Portugal	458	-	1,474	-	1,017	-
Romania	5,003	6,338	4067	1077	-936	-5,261
Slovenia	150	278	517	-	367	-278
Slovakia	789	87	2,181	293	1,392	206
UK	348	-	3,184	746	2,836	746

	Compliance costs		Total reported supply of finance (data incomplete)		Financing gaps	
	2007-2013	2014 -	2007-2013	2014 -	2007-2013	2014 -
Denmark	13	-	-	-	-13	-
Netherlands	0	-	-	-	-	-
Germany	4	-	342	-	338	-
Greece	890	-	1,101	-	211	-
France	1,623	-	127	-	-1,496	-
Italy	3,404	-	228	-	-3,176	-
Latvia	171	116	1	-	-170	-116
Malta	58	-	43	-	-16	-
Austria	0	-	-	-	-	-
Finland	243	-	-	-	-243	-
Sweden	0	-	-	-	-	-
Spain	1,484	4	3,826	-	2,342	-4

In terms of the importance of the EU funds for covering the remaining compliance investments, the share covered by the committed EU funds for the period 2007 to 2013 is presented below.

Table 4-14 Coverage by committed EU funds of compliance investments in the period 2007 to 2013

	Compliance costs	**EU funds (Cohesion)**	**Difference between EU Cohesion funds and compliance costs**
	2007-2013	2007-2013	2007-2013
Belgium	1,161	1	-1,160
Bulgaria	3,105	880	-2225
Czech Republic	1524	1,345	-179
Estonia	178	223	45
Ireland	248	13	-235
Cyprus	363	17	-346
Lithuania	69	263	193
Luxemburg	67	-	-67
Hungary	8	1,536	1,528
Poland	13,756	3,549	-10,207
Portugal	458	881	424
Romania	5,003	1,598	-3,406
Slovenia	150	195	46
Slovakia	789	749	-41
UK	348	-	-348
Germany	4	342	338
Greece	788	1,101	211
France	1,623	127	-1,496
Italy	3,404	228	-3,176
Latvia	171	1	-170
Malta	58	43	-16

	Compliance costs	EU funds (Cohesion)	Difference between EU Cohesion funds and compliance costs
	2007-2013	2007-2013	2007-2013
Austria	-		-
Finland	243		-243
Sweden	-		-
Spain	1,484	3,826	2,342

It should be noted that:

- For some Member States (e.g. the Czech Republic) the compliance date is beyond the period 2007 to 2013 but that does not mean that there will be no investment during that period so allocated EU funds might support achieving a later deadline;

- The allocated EU funds could cover other costs than those included in the compliance assessment (e.g. renovation costs and sludge treatment).

Therefore, a surplus of EU funds is unlikely to be a "real" surplus, see for example Table 4-17 that includes also re-investments.

Given that data on the supply of finance are incomplete no definite conclusions can be drawn. To support the assessment, the average annual disbursed finance for the period 2000 to 2006 has been estimated and is compared to the average annual need for finance to cover the compliance costs.

For the new Member States which have derogations this is shown in the Table 4-15. If the column "Missing annual finance" shows a negative value, it indicates that there is a possible financing gap.

Table 4-15 Comparison of historical annual funds and annual investment need for compliance with UWWTD - Member States with time derogation

	Average annual supply 2000-2006	Average annual investment costs 2007 until deadline	Missing annual finance
Bulgaria	20	641	-621
Czech Republic	885	169	715

Estonia	41	45	-3
Cyprus	56	61	-4
Lithuania	30	23	7
Hungary	250	1	248
Poland	709	1673	-964
Romania	83	945	-862
Slovenia	67	48	19
Slovakia	38	97	-59

Table 4-16 Comparison of historical annual funds and total investment need for compliance with UWWTD - Member States with no time derogation

	Average annual supply 2000-2006	**Total investment costs**	**Years to implement**
Belgium	443	1161	3
Ireland	346	248	<1
Luxemburg	42	67	2
Portugal	191	458	2
UK	729	348	<1

For all the "old" Member States, the deadline for compliance has already passed and it is assumed that they should implement all investments in one year.

Overall, the Member States can be roughly grouped in the following way:

- Member States that are in full compliance or where the funds for minor remaining investments are available
- Member States with more substantial compliance investments where the allocated funds are sufficient to cover the investments

- Member States with more substantial compliance investment where the supply of finance might not be fully appropriate and therefore a financing gap could appear.

Comments on each Member State is provided in the below table.

Table 4-17 Indicative financing gaps for 2007 to 2013 and for 2014 until full compliance (cover new investments -not re-investments/renovations)

	Financing gap (Supply - costs)		Likelihood of financing gap	Comments on financing gap
	2007-2013	2014 -		
Belgium	1,836	452	Gap unlikely -	The compliance deadline has passed and it will take a few years to implement all remaining investments
Bulgaria	-2,166	-2,020	Possible gap	Data on finance are incomplete but data indicates a financial gap and that annual disbursements need to increase significantly up to the deadline of 2014
Czech Republic	4,553	-	Gap unlikely but annual disbursement should increase	There is no financing gap based on reported future funds but historical annual disbursements have been low and should be higher in period up to the deadline of 2015
Estonia	576	127	Gap unlikely	No indication of significant gap. The historical finance is at balance with the required finance to achieve compliance
Ireland	844	-	Gap unlikely	Gap is unlikely - the annual finance should cover the required investments
Cyprus	1,169	40	Gap unlikely	Gap is unlikely - the annual finance should cover the required investments
Lithuania	193	-	Gap unlikely	Gap is unlikely - though data are incomplete regarding national contribution - the committed EU funds with national contribution should cover the need
Luxemburg	730	-	No gap	No gap as allocated funds exceed the investment need
Hungary	2,283	138	Gap unlikely	Gap unlikely as projected finance exceed the need and level of historical annual disbursement exceed the estimated annual investment costs

	Financing gap (Supply - costs)		Likelihood of financing gap	Comments on financing gap
	2007-2013	2014 -		
Poland	-8,678	-1,300	Possible gap	Here is the is a possible financing gap - no finance has yet been committed for future financing, but historical annual disbursement fall short the annual need
Portugal	1,017	-	Gap unlikely but annual disbursement should increase	Gap unlikely as projected finance exceed the need though it might take a few years to complete investments and annual disbursement should be higher than the historical level
Romania	-936	-5,261	Possible gap	Here, there is a possible financing gap. The planned future financing seems less than the estimated investment costs and historical annual disbursement fall short the annual need
Slovenia	367	-278	Gap unlikely	No indication of significant gap. The historical finance is at balance with the required finance to achieve compliance
Slovakia	1,392	206	Gap unlikely	Gap is not likely. The projected finance exceed the need though the historical annual finance is below the required annual finance to achieve compliance
UK	2,836	746	No gap	No gap expected.
Germany	338	-	No gap	Minor additional costs and finance available
Greece	211	-	Uncertain	Limited data both on finance and compliance costs make the assessment very uncertain. The allocated EU funds seem to cover the estimated new investment need.
France	-1,496	-	Gap unlikely	There are no data on national financing but it unlikely that there is an affordability constraint
Italy	-3,176	-	Uncertain	The provided data on national financing cover different time periods so it not possible to assess whether there might be local/regional affordability constraints that could lead to a financing gap
Latvia	-170	-116	Uncertain	There are no data on national financing and it not possible to assess whether there might be affordability constraints that could lead to a financing gap

	Financing gap (Supply - costs)		Likelihood of financing gap	Comments on financing gap
	2007-2013	2014 -		
Malta	-16	-	Gap unlikely	There are no data on national contribution but assuming national co-financing of EU funds, it unlikely that there will be financing gap
Austria	-	-	No gap	No new investment l costs
Finland	-243	-	No gap	Minor additional costs and finance should be available (cost recovery) - though no data on national contribution
Sweden	-	-	No gap	No new investments costs
Spain	2,342	-4	Gap unlikely	High remaining investment costs but allocated EU funds should be sufficient
Denmark	-13	-	No gap	Minor costs and user fee finance available
The Netherlands	-	-	No gap	No new investments costs

4.3.1 Financing gaps when including re-investments

The key uncertainty on the compliance investment costs side is the need for renovation/rehabilitation of the existing infrastructure. The estimation of the re-investment is a rough approximation for this aspect; see the discussion above in Section 4.1.3.

The re-investment needs are only estimated for the 22 Member States where the standard registry data file are available and for these Member States the financing gap assuming the re-investment needs have to be covered by the same funds as the compliance investments.

Table 4-18 Indicative financing gaps including both compliance investment and re-investments for the period 2007 to 2013 - million EUR

	Total new investment and re-investment	**Supply of finance (incomplete data)**	**Indicative financing gap**
	2007-2013	2007-2013	2007-2013
Belgium	2,288	2,998	709
Estonia	303	754	451
Ireland	1,014	1,092	78
Lithuania	260	263	3
Luxemburg	201	797	596
Hungary	764	2,291	1,526
Portugal	1,421	1,474	53
Romania	5,672	4067	-1605
Slovenia	258	517	259
Slovakia	1,121	2,181	1,060
UK	6,867	3,184	-3,683
DK	1,965	-	-1,965
NL	2,125	-	-2,125
Germany	15,654	342	-15,312
France	9,707	127	-9,581
Italy	10,882	228	-10,654
Latvia	289	1	-287
Cyprus	424	1,533	1,108
Austria	2,449	-	-2,449
Finland	892	-	-892
Sweden	1,086	-	-1,086

	Total new investment and re-investment	Supply of finance (incomplete data)	Indicative financing gap
	2007-2013	2007-2013	2007-2013
Spain	7,912	3,826	-4,086
Total (22 MS)	**73,554**	**25,675**	**-47,882**

Including the re-investment in the comparison with the supply of finance lead to fewer cases where the supply seems to exceed the investment needs. Considering possible backlogs of re-investments, the total rehabilitation needs could in fact be several times the estimated re-investment for the period 2007 to 2013. And this could explain any apparent "surplus" of financing resources or even lead to more financing gaps.

4.3.2 Overall conclusions on financial gap assessment

The analysis has demonstrated the difficulties of undertaking aggregated financing gap assessment.

It is not possible to estimate a total financing gap for EU27. Not only are the data on supply of finance or incomplete, also the difficulty of estimating the need for renovation and rehabilitation of existing wastewater collection and treatment infrastructure complicates the assessment of financing gaps. Therefore only indicative financing gaps by Member States have been estimated.

The sector financing strategy concept which includes a comparison of the need for finance and the relevant supply of finance is very useful for preparing financial sector strategy within country or region. It is a decision support approach that allows the relevant authority to make realistic long term plans. It is a precondition for the excise that all relevant cost elements are considered. It is also important that estimate of available financial funds are "realistic". The availability of funds is to some extent based on political priorities with an overall affordability constrain. The availability of funds can be changed for example if the overall economic situation changes and priorities are revised.

In order to establish a sector financing strategy for wastewater collection and treatment it is in most Member States necessary to include water supply in the analysis as many municipal utilities that deals with wastewater also provide drinking water. When applied by an external party the financing strategy approach can only provide indications of where there could be financing gaps. They might not materialise due to more finance being allocated or the investment costs have been overestimated. The reverse could also be the case where the less finance will become available due to changed priorities and/or the investment costs could have been underestimated.

The analysis undertaken here is just a partial assessment addressing the specific investment needs for compliance with the Urban Wastewater Treatment Directive and it just highlight where there could be financing gaps.

5 Country profiles

For each Member State the result of the compliance cost analysis is presented in this section.

For each country there two set of table. Firstly, the basic situation at the reference date is described including information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

It should be noted that regarding the data on agglomerations subject to the requirements of Article 4 and 5, these are more technical results used for the calculation of the compliance costs. The figure on compliance with Article 5 shows only agglomerations where the target treatment is defined as advanced. If a Member State complies with Article 5(4) there might be specific agglomerations that require less than advance treatment and they are not presented in Table 2 as requiring complying with Article 5.

Tables regarding the treatment level might show "number" higher than the number of agglomerations. In cases where there are several treatment plans in a given agglomeration, they are each counted in Table 4, 6, 7, and 8.

Secondly, the cost estimates are presented in the tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

It is a standard set of data and estimates based on the registry data files or the best available data.

5.1 Austria

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Austria the whole territory is either designated as sensitive or discharge/drain into a sensitive catchment area and therefore it has to comply with Article 5 . As the compliance is based on Article 5(4) and no agglomerations have been marked as in non-compliance with respect to treatment level all the existing treatment plant have been assumed to comply with the Article 5 requirements.

There is no non-compliance and no further treatment plants required.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	367	1,630,944	367	1,630,944	0	0
10,000-100,000	246	7,526,886	246	7,526,886	0	0
>100,000	28	10,554,750	28	10,554,750	0	0
Total	**641**	**19,712,580**	**641**	**19,712,580**	**0**	**0**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	367	1,630,944
10,000-100,000	0	0	0	0	0	0	246	7,526,886
>100,000	0	0	0	0	0	0	28	10,554,750
Total	**0**	**0**	**0**	**0**	**0**	**0**	**641**	**19,712,580**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	17	62,878	350	1,568,066
10,000-100,000	0	0	0	0	7	156,500	239	7,370,386
>100,000	0	0	0	0	1	400,000	27	10,154,750
Total	**0**	**0**	**0**	**0**	**25**	**619,378**	**616**	**19,093,202**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	17	62,878	350	1,568,066
10,000-100,000	0	0	0	0	7	156,500	239	7,370,386
>100,000	0	0	0	0	1	400,000	27	10,154,750
Total	**0**	**0**	**0**	**0**	**25**	**619,378**	**616**	**19,093,202**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	0	0
10,000-100,000	0	0	0	0	0	0	0	0
>100,000	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Given that there is full compliance, no compliance costs have been estimated. The operational costs are estimated and presented as well as the annual re-investment costs that in principle are necessary to off set the depreciation of the systems.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	0	0%	0	0%	0	0%
10,000-100,000	0	0%	0	0%	0	0%	0	0%
>100,000	0	0%	0	0%	0	0%	0	0%
Total	**0**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**0**	**0**	**0**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	0	0	0
10,000-100,000	0	0	0
>100,000	0	0	0
Total	**0**	**0**	**0**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	48,590,850	57,920,964	106,511,814	48,590,850	57,920,964	106,511,814
10,000-100,000	164,792,850	172,298,749	337,091,598	164,792,850	172,298,749	337,091,598
>100,000	164,040,927	119,666,508	283,707,434	164,040,927	119,666,508	283,707,434
Totals	**377,424,626**	**349,886,220**	**727,310,846**	**377,424,626**	**349,886,220**	**727,310,846**

5.2 Belgium

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.2.1 Current compliance situation

The basic situation at the reference date end of 2005 is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);

- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Belgium all water bodies have been designated as sensitive. The tables show that there may agglomerations not incompliance either due insufficient treatment level; there is about one-third of the total PE that currently (2005) have no treatment.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	421	1,105,600	425	1,105,600	138	0
10,000-100,000	227	3,925,700	2	20,000	139	3,905,700
>100,000	71	4,670,200	0	0	15	4,670,200
Total	**719**	**9,701,500**	**427**	**1,125,600**	**292**	**8,575,900**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	350	3,142,691	362	3,255,213	364	3,263,018

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	166	4,292,388	158	4,189,846	173	4,351,490

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	13	27,000	392	571,800	158	506,800
10,000-100,000	0	0	0	0	33	775,600	108	3,150,100
>100,000	0	0	0	0	8	2,125,600	7	2,544,600
Total	**0**	**0**	**13**	**27,000**	**433**	**3,473,000**	**273**	**6,201,500**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	245	394,889	0	0	102	291,528	74	343,994
10,000-100,000	75	663,472	0	0	37	294,317	115	2,911,587
>100,000	30	1,990,438	0	0	25	989,018	16	1,579,114
Total	**350**	**3,048,799**	**0**	**0**	**164**	**1,574,863**	**205**	**4,834,695**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	347	746,685	74	348,306
10,000-100,000	0	0	0	0	4	9,705	223	3,908,538
>100,000	0	0	0	0	0	0	71	4,654,420
Total	**0**	**0**	**0**	**0**	**351**	**756,390**	**368**	**8,911,264**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-245	-394,889	0	0	245	455,157	0	4,311
10,000-100,000	-75	-663,472	0	0	-33	-284,612	108	996,951
>100,000	-30	-1,990,438	0	0	-25	-989,018	55	3,075,306
Total	**-350**	**-3,048,799**	**0**	**0**	**187**	**-818,473**	**163**	**4,076,569**

5.2.1 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and

Annual operational and reinvestment costs (Table 12).

The total compliance costs have been estimate at about 1.2 billion EUR out of which 940 million is for treatment plants and the rest is for additional collection systems.

The investments are for agglomerations where the deadline for compliance has passed and in Table 10 these costs are assigned to year 2006.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	85,404,184	38%	104,699,946	98%	1,579,278	0%	191,683,407	17%
10,000-100,000	56,487,478	25%	1,832,191	2%	266,823,965	32%	325,143,634	28%
>100,000	81,034,701	36%	0	0%	563,611,047	68%	644,645,748	56%
Total	**222,926,363**	**100%**	**106,532,137**	**100%**	**832,014,290**	**100%**	**1,161,472,790**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	222,926,363	106,532,137	832,014,290
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**222,926,363**	**106,532,137**	**832,014,290**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	42,200	8	565,363
10,000-100,000	1,025,800	28	4,470,769
>100,000	6,898,600	23	11,256,435
Total	**7,966,600**	**59**	**16,292,567**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	23,018,031	29,001,100	52,019,131	28,584,819	34,960,352	63,545,171
10,000-100,000	81,629,283	88,225,723	169,855,006	94,040,134	100,101,719	194,141,853
>100,000	53,982,163	43,764,390	97,746,553	82,856,511	67,929,526	150,786,037
Totals	**158,629,477**	**160,991,212**	**319,620,690**	**205,481,464**	**202,991,597**	**408,473,061**

5.3 Bulgaria

For Bulgaria, there is no full registry data, though there are data by agglomeration that has allowed for an assessment of the compliance costs.

Bulgaria has derogation that states 2014 as deadline for compliance, while there is an intermediate deadline of compliance in agglomerations above 10,000 PE by 2010.

The data on agglomerations and biodegradable load measured by number of PE is illustrated in Table 1.

Table 1 Data on agglomeration

	Article 3		**Article 4**		**Article 5**	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	802	1,908,397	802	1,908,397	0	0
10,000-100,000	107	3,487,471	0	0	107	3,487,471
>100,000	17	5,567,534	0	0	17	5,567,534
Total	**926**	**10,963,402**	**802**	**1,908,397**	**124**	**9,055,005**

The compliance costs are estimate to around 5 billion EUR. The majority of the investments are related to the extension of the collection network.

Table 2 Estimated compliance cost in EUR

Agglomeration	**Collection**		**Treatment**			
	Article 3		**Article 4**		**Article 5**	
2,000-10,000	1,893,370,267	45%	126,283,113	100%		
10,000-100,000	763,328,798	18%			348,490,317	44%
>100,000	1,551,562,979	37%			441,785,531	56%
Total	**4,208,262,044**	**100%**	**126,283,113**	**100%**	**790,275,847**	**100%**

The timing of the investment is illustrated in Table 3.

Table 3 Estimated compliance cost in EUR by deadline

	Article 3	Article 4	Article 5
2010	2,314,891,776		790,275,847
2014	1,893,370,267	126,283,113	

5.4 Cyprus

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.4.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Cyprus the key deadline is end of 2012. There are intermediate deadlines for four specific agglomerations and these deadlines have been included in the registry data file.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2012	31-12-2012	
10,000-100,000	31-12-2012	31-12-2012	31-12-2012
>100,000	31-12-2012	31-12-2012	31-12-2012

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	46	191.800	46	191.800	0	0
10,000-100,000	8	302.000	1	229.000	0	73.000
>100,000	2	365.000	6	220.000	3	145.000
Total	**56**	**858.800**	**53**	**640.800**	**3**	**218.000**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	41	170.600	4	5.500	8	15.700	0	0
10,000-100,000	4	92.000	3	182.500	1	27.500	0	0
>100,000	0	0	1	220.000	1	145.000	0	0
Total	**45**	**262.600**	**8**	**408.000**	**10**	**188.200**	**0**	**0**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	40	0	0	0	0	0	9	29.598
10,000-100,000	4	0	0	0	0	0	4	146.865
>100,000	0	0	0	0	2	128.480	4	378.450
Total	**44**	**0**	**0**	**0**	**2**	**128.480**	**17**	**554.913**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	40	168.100	9	34.700
10,000-100,000	0	0	0	0	4	92.000	4	210.000
>100,000	0	0	0	0	2	188.774	4	435.000
Total	**0**	**0**	**0**	**0**	**46**	**448.874**	**17**	**679.700**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-40	0	0	0	40	168.100	0	5.102
10,000-100,000	-4	0	0	0	4	92.000	0	63.135
>100,000	0	0	0	0	0	60.294	0	56.550
Total	**-44**	**0**	**0**	**0**	**44**	**320.394**	**0**	**124.787**

5.4.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	151,396,278	51%	33,731,717	67%	1,085,845	6%	186,213,840	51%
10,000-100,000	99,204,336	34%	11,321,006	22%	6,863,063	38%	117,388,405	32%
>100,000	44,389,262	15%	5,419,488	11%	9,970,689	56%	59,779,439	16%
Total	**294,989,876**	**100%**	**50,472,211**	**100%**	**17,919,597**	**100%**	**363,381,684**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	0
2007	0	0	0
2008	21,859,312	0	0
2009	31,584,411	5,419,488	0
2010	0	0	0
2011	13,479,954	0	13,804,301
2012	228,066,199	45,052,723	4,115,296
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**294,989,876**	**50,472,211**	**17,919,597**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	0	0	0
10,000-100,000	0	0	0
>100,000	0	0	0
Total	**0**	**0**	**0**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	750,176	661,250	1,411,425	5,243,141	5,081,878	10,325,019
10,000-100,000	3,673,999	2,765,191	6,439,190	7,106,715	5,476,640	12,583,355
>100,000	8,428,919	5,291,057	13,719,976	10,538,993	6,794,449	17,333,443
Totals	**12,853,094**	**8,717,497**	**21,570,591**	**22,888,850**	**17,352,967**	**40,241,817**

The compliance costs have been estimated to about 360 million EUR out of which almost 300 million EUR relates to additional collection systems.

5.5 Czech Republic

For the Czech Republic the whole territory is designated as sensitive. The key data on agglomerations are presented in Table 1.

The overall deadline for compliance is 2015 and there is an intermediate deadline for 18 specific agglomerations by 2004 and further 36 agglomerations by 2006.

The data sources for this analysis comprise specific information about the 54 agglomerations with the intermediate targets and the Article 17 reporting for the remaining agglomerations.

The 54 agglomerations account for around 4.6 million PE which is 40% of the total load.

Table 1 Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	214	1,610,000	214	1,610,000	0	0
10,000-150,000	117	3,750,000	0	0	117	3,750,000
>150,000	10	5,630,000	0	0	10	5,630,000
Total	**341**	**10,990,000**	**214**	**1,610,000**	**127**	**9,380,000**

The data indicate that there is almost compliance for the 54 specific agglomerations. For 10 of them the monitoring data do not comply but these agglomerations account for only 6% of the load in the 54 agglomerations.

For the other agglomerations the data from the Article 17 reporting covering data from 2002 is used.

The following assumptions have used for the agglomerations not covered by the data file:

Table 2 Assumptions on existing connection rate and treatment level

Agglomeration	Connection rate	Existing treatment
2,000-10,000	50%	No treatment
10,000-150,000	80%	Primary treatment
>150,000	90%	Secondary treatment

The compliance costs are estimate to around 1.5 billion EUR. Half of these investments are for additional collection systems mainly in the small agglomerations.

Table 3: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	600,721,679	71%	244,489,085	100%	0	0%	845,210,764	55%
10,000-100,000	51,738,791	6%	0	0%	57,360,284	13%	109,099,075	7%
>100,000	192,049,945	23%	0	0%	377,725,162	87%	569,775,107	37%
Total	**844,510,416**	**100%**	**244,489,085**	**100%**	**435,085,445**	**100%**	**1,524,084,946**	**100%**

These investments are due by 2015 as the intermediate requirements seem to be fulfilled and no investments are estimated for the 54 specific agglomerations.

5.6 Denmark

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.6.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Denmark, all collection systems are in place and there are also advanced treatment at most agglomerations. As all sensitive water bodies have been designed following Article 5 (8) and with respect to both N and P, it is assumed that all treatment plant should be 3NP. There are a few treatment plants that are only 3P and that leads to non-compliance and associated investment costs.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	248	1,173,687	248	1,173,687	8	0
10,000-100,000	141	4,450,960	9	90,000	132	4,360,960
>100,000	34	6,144,381	0	0	26	6,144,381
Total	**423**	**11,769,028**	**257**	**1,263,687**	**166**	**10,505,341**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	1	2,000	1	2,000	1	2,000

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	6	85,400	16	2,504,675	21	2,577,675

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	256	1,173,687
10,000-100,000	0	0	0	0	0	0	141	4,450,960
>100,000	0	0	0	0	0	0	26	6,144,381
Total	**0**	**0**	**0**	**0**	**0**	**0**	**423**	**11,769,028**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	7	21,797	32	102,732	209	1,049,158
10,000-100,000	0	0	0	0	0	0	141	4,450,960
>100,000	0	0	0	0	0	0	34	6,144,381
Total	**0**	**0**	**7**	**21,797**	**32**	**102,732**	**384**	**11,644,499**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	6	19,797	33	104,732	209	1,049,158
10,000-100,000	0	0	0	0	0	0	141	4,450,960
>100,000	0	0	0	0	0	0	34	6,144,381
Total	**0**	**0**	**6**	**19,797**	**33**	**104,732**	**384**	**11,644,499**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	-1	-2,000	1	2,000	0	0
10,000-100,000	0	0	0	0	0	0	0	0
>100,000	0	0	0	0	0	0	0	0
Total	**0**	**0**	**-1**	**-2,000**	**1**	**2,000**	**0**	**0**

5.6.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	229,956	100%	0	0%	229,956	2%
10,000-100,000	0	0%	0	0%	12,964,478	100%	12,964,478	98%
>100,000	0	0%	0	0%	0	0%	0	0%
Total	**0**	**0%**	**229,956**	**100%**	**12,964,478**	**100%**	**13,194,434**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	229,956	12,964,478
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**229,956**	**12,964,478**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	14,980	5	310,429
10,000-100,000	77,500	3	2,468,452
>100,000	125,000	1	2,871,622
Total	**217,480**	**9**	**5,650,502**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	38,003,277	48,098,901	86,102,178	38,012,213	48,108,099	86,120,313
10,000-100,000	109,688,511	123,829,496	233,518,007	110,077,445	124,348,075	234,425,520
>100,000	115,531,365	106,869,218	222,400,583	115,531,365	106,869,218	222,400,583
Totals	**263,223,152**	**278,797,615**	**542,020,767**	**263,621,023**	**279,325,392**	**542,946,416**

The estimated compliance costs of about 13 million EUR relates to upgrading of advanced treatment from removal of only P to removal of both N and P.

The renovation scenario assumed a 10% renovation of treatment plants where the monitoring data fails to comply with the requirements.

5.7 Estonia

The assessment is based on the registry data file which includes data from end of 2006 as the reference.

5.7.1 Current compliance situation

The basic situation at the reference data are described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2010	31-12-2010	31-12-2010
10,000-100,000	31-12-2009	31-12-2009	31-12-2009
>100,000	31-12-2009	31-12-2009	31-12-2009

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	27	114.877	27	114.877	0	0
10,000-100,000	15	505.537	0	0	0	505.537
>100,000	4	868.375	0	0	19	868.375
Total	**46**	**1.488.789**	**27**	**114.877**	**19**	**1.373.912**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	18	57.950	3	9.500	8	47.427	0	0
10,000-100,000	3	49.671	4	128.200	8	327.666	0	0
>100,000	0	0	0	0	4	868.375	0	0
Total	**21**	**107.621**	**7**	**137.700**	**20**	**1.243.468**	**0**	**0**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	1	2.288	16	34.774	12	32.473
10,000-100,000	0	0	0	0	5	170.358	10	249.378
>100,000	0	0	0	0	1	163.342	3	669.463
Total	**0**	**0**	**1**	**2.288**	**22**	**368.474**	**25**	**951.313**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	1	4.400	16	55.698	12	54.779
10,000-100,000	0	0	0	0	0	0	15	505.537
>100,000	0	0	0	0	0	0	4	868.375
Total	**0**	**0**	**1**	**4.400**	**16**	**55.698**	**31**	**1.428.691**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	2.112	0	20.923	0	22.307
10,000-100,000	0	0	0	0	-5	-170.358	5	256.159
>100,000	0	0	0	0	-1	-163.342	1	198.912
Total	**0**	**0**	**0**	**2.112**	**-6**	**-312.776**	**6**	**477.378**

For Estonia the main deadline is 2010 but for all agglomerations above 10,000 PE there is an intermediate deadline of 2009 as indicated at Table 1.

At the date of the registry data, the remaining infrastructure comprises additional collection systems and additional advanced treatment in agglomerations above 10,000 PE.

5.7.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	36,899,673	32%	3,590,899	100%	5,512,758	10%	46,003,330	26%
10,000-100,000	57,365,427	49%	0	0%	34,192,840	59%	91,558,267	51%
>100,000	22,248,594	19%	0	0%	18,248,660	31%	40,497,253	23%
Total	**116,513,693**	**100%**	**3,590,899**	**100%**	**57,954,258**	**100%**	**178,058,850**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	0
2007	0	0	0
2008	0	0	0
2009	79,614,021	0	52,441,500
2010	36,899,673	3,590,899	5,512,758
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**116,513,693**	**3,590,899**	**57,954,258**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	96,177	23	1,368,961
10,000-100,000	145,841	7	1,919,602
>100,000	625,062	2	8,145,783
Total	**867,080**	**32**	**11,434,346**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	1,365,763	1,793,035	3,158,798	2,194,301	2,895,175	5,089,475
10,000-100,000	5,826,435	6,764,649	12,591,085	7,973,938	9,279,671	17,253,610
>100,000	9,512,498	9,323,326	18,835,824	10,593,236	10,498,245	21,091,481
Totals	**16,704,696**	**17,881,011**	**34,585,707**	**20,761,475**	**22,673,091**	**43,434,566**

Total compliance costs have been estimated to about 180 million EUR. A bit more that half of that is for additional collection systems and the rest for up-grading to advanced treatment.

5.8 France

The assessment is based on the registry data file which includes data from end of 2006 as the reference.

5.8.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);

- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

All deadlines have passed but recently assigned areas as sensitive may have future deadlines. Designated areas in 2005 and 2006 are only required to have advanced treatment in 2012 and 2013.

France complies with Article 3 on collection systems as can be seen in Table 5 with 100% coverage.

For Article 4, many agglomerations are currently not in compliance is due to failure of monitoring data. For Article 5, there are about 30% of the agglomerations that have insufficient treatment technology, while about 50% do not comply with regard to monitoring data.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	2.040	8.816.969	2.040	8.816.969	0	0
10,000-100,000	860	24.191.615	19	12.086.213	0	12.105.402
>100,000	104	34.172.359	464	12.771.247	481	21.401.112
Total	**3.004**	**67.180.943**	**2.523**	**33.674.429**	**481**	**33.506.514**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	152	4.638.216	704	22.753.666	744	23.789.954

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	157	13.140.965	193	17.110.577	204	17.437.002

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	2.065	8.816.969
10,000-100,000	0	0	0	0	0	0	860	24.191.615
>100,000	0	0	0	0	0	0	104	34.172.359
Total	**0**	**0**	**0**	**0**	**0**	**0**	**3.029**	**67.180.943**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	74	303.650	31	133.320	1.021	4.100.672	926	4.279.327
10,000-100,000	22	397.677	32	922.790	272	7.346.255	542	15.524.887
>100,000	0	0	8	2.959.481	29	14.477.074	72	16.438.774
Total	**96**	**701.327**	**71**	**4.015.591**	**1.322**	**25.924.001**	**1.540**	**36.242.988**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	15	78.702	1.111	4.458.940	926	4.279.327
10,000-100,000	0	0	6	122.583	228	6.239.440	634	17.829.586
>100,000	0	0	0	0	27	8.672.605	82	25.202.724
Total	**0**	**0**	**21**	**201.285**	**1.366**	**19.370.985**	**1.642**	**47.311.637**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-74	-303.650	-16	-54.618	90	358.268	0	0
10,000-100,000	-22	-397.677	-26	-800.207	-44	-1.106.815	92	2.304.699
>100,000	0	0	-8	-2.959.481	-2	-5.804.469	10	8.763.950
Total	**-96**	**-701.327**	**-50**	**-3.814.306**	**44**	**-6.553.016**	**102**	**11.068.649**

5.8.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	73,034,226	37%	0	0%	73,034,226	5%
10,000-100,000	0	0%	66,265,777	33%	428,424,739	30%	494,690,515	30%
>100,000	0	0%	59,017,897	30%	995,869,317	70%	1,054,887,214	65%
Total	**0**	**0%**	**198,317,900**	**100%**	**1,424,294,056**	**100%**	**1,622,611,956**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	0	198,317,900	1,424,294,056
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**0**	**198,317,900**	**1,424,294,056**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	1,817,612	429	45,101,969
10,000-100,000	9,221,549	318	160,089,457
>100,000	31,443,751	46	243,179,845
Total	**42,482,912**	**793**	**448,371,271**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	207,443,683	287,180,673	494,624,356	210,135,162	290,102,042	500,237,204
10,000-100,000	424,409,861	539,348,127	963,757,987	442,480,217	559,135,747	1,001,615,964
>100,000	354,362,981	328,386,745	682,749,726	395,914,422	370,582,234	766,496,656
Totals	**986,216,525**	**1,154,915,545**	**2,141,132,070**	**1,048,529,801**	**1,219,820,023**	**2,268,349,824**

The main costs of about 5.6 billion EUR relates to upgrades or new constructions of wastewater treatment plant to achieve advanced treatment.

Table 10 shows that the majority of the investments are related to requirements for sensitive areas. Many of the sensitive areas were designated in 2005 and 2006 and therefore subject to implementation by 2012 and 2013.

Assuming that failure to comply with monitoring data requires renovation of equivalent to 10% of the value of the treatment plant, total renovation costs amounts to 450 million EUR.

Annual operational and re-investment costs are shown for the current situation and for the further full implementation of also the sensitive areas designated in 2005 and 2006.

5.8.3 Issues

The analysis has identified the following issues that need clarification:

- Deadline of advanced treatment in sensitive areas: Areas designated in 2005/2006, while registry data file says they are "non-compliant".

5.9 Finland

The assessment is based on the registry data file which includes data from end of 2006 as the reference.

5.9.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Note that the number of treatment plants are higher than the number of agglomerations. It means the values indicated under "number" in Table 3 to 8 can be higher than the number of agglomerations presented in Table 2.

For Finland, there is a large share of advanced wastewater treatment plant of the type 3P where the designation of sensitive water bodies requires both N and

P. It means that Table 4 below on compliance status indicates that 65 treatments fail the required standard, while Table 7 shows the same number of advanced treatment system in target situation (full compliance) as currently in place (Table 6). This is because both type 3P and 3NP are counted as advanced treatment and therefore the total number of advanced treatment plans are the same though some should be upgraded to 3NP. The estimated investment costs shown in Table 9 reflect that.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	107	522,100	107	522,100	0	0
10,000-100,000	62	1,977,100	0	0	0	1,977,100
>100,000	8	2,484,900	0	0	70	2,484,900
Total	**177**	**4,984,100**	**107**	**522,100**	**70**	**4,462,000**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	26	573,039	26	573,039

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	65	2,387,974	79	2,930,059	79	2,930,059

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	107	522,100
10,000-100,000	0	0	0	0	0	0	62	1,977,100
>100,000	0	0	0	0	0	0	8	2,484,900
Total	**0**	**0**	**0**	**0**	**0**	**0**	**177**	**4,984,100**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	108	515,429
10,000-100,000	0	0	0	0	0	0	66	1,957,329
>100,000	0	0	0	0	0	0	21	2,460,051
Total	**0**	**0**	**0**	**0**	**0**	**0**	**195**	**4,932,809**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	108	515,429
10,000-100,000	0	0	0	0	0	0	66	1,957,329
>100,000	0	0	0	0	0	0	21	2,460,051
Total	**0**	**0**	**0**	**0**	**0**	**0**	**195**	**4,932,809**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	0	0
10,000-100,000	0	0	0	0	0	0	0	0
>100,000	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

5.9.2 Compliance costs

The cost estimates are presented in the below tables including:

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	0	0%	0	0%	0	0%
10,000-100,000	0	0%	0	0%	160,501,115	66%	160,501,115	66%
>100,000	0	0%	0	0%	82,000,521	34%	82,000,521	34%
Total	**0**	**0%**	**0**	**0%**	**242,501,635**	**100%**	**242,501,635**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	242,501,635
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**0**	**242,501,635**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	89,800	17	2,599,136
10,000-100,000	391,500	13	8,200,565
>100,000	195,100	1	1,902,986
Total	**676,400**	**31**	**12,702,687**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	12,547,572	16,748,068	29,295,640	12,547,572	16,748,068	29,295,640
10,000-100,000	35,417,205	43,094,015	78,511,220	40,232,238	49,514,060	89,746,298
>100,000	33,606,733	32,892,128	66,498,862	36,066,749	36,172,149	72,238,898
Totals	**81,571,510**	**92,734,212**	**174,305,722**	**88,846,559**	**102,434,277**	**191,280,836**

The estimated compliance costs all relate to upgrading of advanced treatment of type 3P to 3NP.

5.10 Germany

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.10.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

There is almost full compliance based on the registry data for end year 2005. Only a few smaller treatment plants need upgrading from primary to secondary treatment.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	2,286	10,710,786	2,286	10,710,786	0	0
10,000-100,000	1,728	49,920,146	35	49,564,863	0	355,283
>100,000	188	54,060,846	1,869	54,060,846	12	0
Total	**4,202**	**114,691,778**	**4,190**	**114,336,495**	**12**	**355,283**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	5	18,019	73	539,694	70	525,025

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	1	2,009	2,314	10,708,777
10,000-100,000	0	0	0	0	0	0	1,728	49,920,146
>100,000	0	0	0	0	0	0	188	54,060,846
Total	**0**	**0**	**0**	**0**	**1**	**2,009**	**4,230**	**114,689,769**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	3	14,669	2	3,350	518	1,660,109	1,787	8,672,688
10,000-100,000	0	0	0	0	4	38,343	1,727	49,082,617
>100,000	0	0	0	0	0	0	190	53,679,768
Total	**3**	**14,669**	**2**	**3,350**	**522**	**1,698,453**	**3,704**	**111,435,073**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	523	1,678,546	1,787	8,672,680
10,000-100,000	0	0	0	0	4	38,343	1,727	49,082,816
>100,000	0	0	0	0	0	0	190	53,679,768
Total	**0**	**0**	**0**	**0**	**527**	**1,716,890**	**3,704**	**111,435,264**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-3	-14,669	-2	-3,350	5	18,437	0	-8
10,000-100,000	0	0	0	0	0	0	0	199
>100,000	0	0	0	0	0	0	0	0
Total	**-3**	**-14,669**	**-2**	**-3,350**	**5**	**18,437**	**0**	**191**

5.10.2 Compliance costs

The cost estimates are presented in the below tables including:

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	573,947	63%	3,504,584	100%	-2,841	-9%	4,075,690	92%
10,000-100,000	335,952	37%	0	0%	36,061	109%	372,013	8%
>100,000	0	0%	0	0%	0	0%	0	0%
Total	**909,899**	**100%**	**3,504,584**	**100%**	**33,220**	**100%**	**4,447,703**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	3,504,584	33,220
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**3,504,584**	**33,220**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	435,263	95	11,954,220
10,000-100,000	1,526,464	63	35,063,651
>100,000	5,961,725	11	93,747,970
Total	**7,923,452**	**169**	**140,765,841**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	296,301,268	350,723,972	647,025,240	296,457,966	350,875,521	647,333,487
10,000-100,000	1,110,333,691	1,157,727,826	2,268,061,517	1,110,339,869	1,157,735,988	2,268,075,857
>100,000	908,068,280	727,258,198	1,635,326,478	908,068,280	727,258,198	1,635,326,478
Totals	**2,314,703,239**	**2,235,709,996**	**4,550,413,234**	**2,314,866,116**	**2,235,869,706**	**4,550,735,822**

The estimated compliance costs are very small at 3.5 million EUR. For the treatment plants failing monitoring requirement, the renovation scenario assuming a 10% renovation at all failed plants would result in renovation costs at 140 million EUR.

5.11 Greece

For Greece the available data set is incomplete. The analysis is based on data from 2003 reporting plus some recent updates though that includes only number of agglomerations.

The available data cover some data for agglomerations above 10.000 PE while only the number of smaller agglomerations is known. For agglomerations between 2000 and 10,000 PE it has been assumed that the average load is 5000 PE. The estimated loads are therefore only approximate.

Table 1 Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-15,000	311	1,555,000	311	1,555,000	0	-
15,000-100,000	83	2,696,200	65	2,171,500	18	524,700
>100,000	11	6,190,000	10	6,070,000	1	120,000
Total	405	10,441,200	386	9,796,500	19	644,700

Based on the available data an estimate of the compliance costs as of 2003 have been made.

It has been assumed that for agglomerations where the collection system was not in compliance with Article 3, the existing collection rate was 75% - leaving 25% new connects to be established.

For existing treatment plants, the available data indicates compliance for normal areas which is assumed to be secondary treatment, while the specific treatment in place are indicated for the plants discharging into sensitive areas.

Table 2: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,00	545,827,518	78%	220,898,391	71%	0	0%	766,725,909	75%
10,000-100,	113,156,479	16%	71,731,552	23%	0	0%	184,888,031	18%
>100,000	39,324,551	6%	19,401,020	6%	12,142,135	100%	70,867,707	7%
Total	**698,308,548**	**100%**	**312,030,963**	**100%**	**12,142,135**	**100%**	**1,022,481,646**	**100%**

The compliance investments have been estimated at 1,000 million EUR. The majority of the investments are for the smaller agglomerations and a large share if for improving the collection system.

5.12 Hungary

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.12.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2015	31-12-2015	
10,000-100,000	31-12-2010	31-12-2010	31-12-2008
>100,000	31-12-2010	31-12-2010	31-12-2008

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	247	1,230,757	247	1,230,757	0	0
10,000-100,000	137	3,691,705	0	3,597,483	0	94,222
>100,000	20	4,720,693	150	4,450,032	7	270,661
Total	**404**	**9,643,155**	**397**	**9,278,272**	**7**	**364,883**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	1	18,609	1	18,609

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	1	18,609	1	18,609

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	247	1,230,757
10,000-100,000	0	0	0	0	0	0	137	3,691,705
>100,000	0	0	0	0	0	0	20	4,720,693
Total	**0**	**0**	**0**	**0**	**0**	**0**	**404**	**9,643,155**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	1	1,699	1	11,357	52	144,952	191	675,096
10,000-100,000	0	0	4	22,406	22	414,016	113	2,326,879
>100,000	0	0	0	0	3	404,705	17	3,787,803
Total	**1**	**1,699**	**5**	**33,763**	**77**	**963,673**	**321**	**6,789,778**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	57	158,007	191	675,096
10,000-100,000	0	0	0	0	24	399,775	115	2,363,526
>100,000	0	0	0	0	3	404,705	17	3,787,803
Total	**0**	**0**	**0**	**0**	**84**	**962,488**	**323**	**6,826,425**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-1	-1,699	-1	-11,357	5	13,056	0	0
10,000-100,000	0	0	-4	-22,406	2	-14,241	2	36,647
>100,000	0	0	0	0	0	0	0	0
Total	**-1**	**-1,699**	**-5**	**-33,763**	**7**	**-1,185**	**2**	**36,647**

There is almost full compliance based on the registry data with information updated to end of year 2005. Only a few smaller treatment plants need upgrading from primary to secondary treatment.

The time derogation for Hungary requires full compliance by 2015. Intermediate deadlines are 2008 for agglomerations above 15,000 PE in sensitive areas and by 2010 for all agglomerations above 10,000 PE. These deadlines are comprised in the registry data file.

5.12.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	1,225,569	53%	0	0%	1,225,569	12%
10,000-100,000	0	0%	1,100,570	47%	4,278,597	56%	5,379,166	54%
>100,000	0	0%	0	0%	3,390,046	44%	3,390,046	34%
Total	**0**	**0%**	**2,326,138**	**100%**	**7,668,643**	**100%**	**9,994,781**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	118,628	0
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	173,205	0
2011	0	0	7,668,643
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	2,034,305	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**2,326,138**	**7,668,643**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	458,448	118	7,012,710
10,000-100,000	1,344,987	53	15,670,147
>100,000	469,531	3	5,322,149
Total	**2,272,966**	**174**	**28,005,007**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	20,784,511	21,842,287	42,626,799	20,840,284	21,891,310	42,731,594
10,000-100,000	53,273,743	47,155,961	100,429,704	53,529,362	47,371,128	100,900,490
>100,000	64,387,562	41,829,486	106,217,048	64,489,264	41,965,088	106,454,352
Totals	**138,445,817**	**110,827,735**	**249,273,551**	**138,858,910**	**111,227,526**	**250,086,436**

The estimated compliance investment costs amounts 10 million EUR. The majority is for investment in advanced treatment in sensitive areas and have to be implemented by 2008.

It should be noted that the data show that the appropriate collection and treatment technologies are in place. As the relevant deadlines for compliance were not due at the reference date for the registry data, it is not possible to assess whether there is an extended need for renovation and rehabilitation of existing facilities. There are for example no monitoring data on N and P removal. There might be a need for renovation or completion of infrastructure beyond the costs estimated here.

5.13 Ireland

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.13.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Ireland almost 60% of the load measure by number of PE is discharged into sensitive areas.

Current compliance is low as most of treatment plants are below the required treatment level for Article 5 compliance.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	144	609,013	144	609,013	0	0
10,000-100,000	71	1,920,822	38	1,090,284	33	830,538
>100,000	8	5,748,868	3	2,078,000	5	3,670,868
Total	**223**	**8,278,703**	**185**	**3,777,297**	**38**	**4,501,406**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	28	1,136,152	93	6,603,421	93	6,603,421

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	35	5,988,394	35	6,138,842	41	6,283,531

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	144	609,013
10,000-100,000	0	0	0	0	0	0	71	1,920,822
>100,000	0	0	0	0	0	0	8	5,748,868
Total	**0**	**0**	**0**	**0**	**0**	**0**	**223**	**8,278,703**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	8	36,885	16	52,669	51	201,872	69	317,587
10,000-100,000	11	265,000	2	33,500	14	422,198	44	1,200,124
>100,000	1	400,000	1	400,000	2	434,000	4	4,514,868
Total	**20**	**701,885**	**19**	**486,169**	**67**	**1,058,070**	**117**	**6,032,579**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	75	291,426	69	317,587
10,000-100,000	0	0	0	0	21	630,426	50	1,290,396
>100,000	0	0	0	0	2	728,000	6	5,020,868
Total	**0**	**0**	**0**	**0**	**98**	**1,649,852**	**125**	**6,628,851**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-8	-36,885	-16	-52,669	24	89,554	0	0
10,000-100,000	-11	-265,000	-2	-33,500	7	208,228	6	90,272
>100,000	-1	-400,000	-1	-400,000	0	294,000	2	506,000
Total	**-20**	**-701,885**	**-19**	**-486,169**	**31**	**591,782**	**8**	**596,272**

5.13.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Total compliance costs are estimated to around 320 million EUR out of which 270 millions relate to compliance with Article 5 on advanced treatment.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	12,875,379	25%	0	0%	12,875,379	5%
10,000-100,000	0	0%	31,332,087	60%	31,550,066	16%	62,882,153	25%
>100,000	0	0%	8,328,640	16%	163,664,714	84%	171,993,354	69%
Total	**0**	**0%**	**52,536,107**	**100%**	**195,214,779**	**100%**	**247,750,886**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	0	52,536,107	195,214,779
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**0**	**52,536,107**	**195,214,779**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	265,567	66	6,507,410
10,000-100,000	812,778	31	16,126,156
>100,000	5,348,868	7	83,304,750
Total	**6,427,213**	**104**	**105,938,316**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	17,973,251	19,405,625	37,378,876	18,658,729	19,920,640	38,579,369
10,000-100,000	42,270,284	41,377,367	83,647,650	45,336,516	43,892,653	89,229,169
>100,000	90,459,946	48,673,331	139,133,277	98,683,368	55,553,066	154,236,433
Totals	**150,703,481**	**109,456,323**	**260,159,804**	**162,678,613**	**119,366,359**	**282,044,972**

5.14 Italy

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.14.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	1,627	7,562,012	1,627	7,562,012	0	0
10,000-100,000	823	24,608,757	746	22,408,831	77	2,199,926
>100,000	130	39,699,510	125	38,665,041	5	1,034,469
Total	**2,580**	**71,870,279**	**2,498**	**68,635,884**	**82**	**3,234,395**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	1,196	3,447,629	1,720	10,244,201	1,801	10,377,118

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	3	1,573,521	2	704,275	83	1,576,321

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	50	241,100	55	241,047	312	1,474,725	1,210	5,605,140
10,000-100,000	26	735,529	22	622,378	196	5,956,981	579	17,293,869
>100,000	0	0	2	226,282	36	15,208,765	92	24,264,463
Total	**76**	**976,629**	**79**	**1,089,707**	**544**	**22,640,471**	**1,881**	**47,163,472**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	587	438,330	104	146,801	1,306	3,954,107	532	1,923,008
10,000-100,000	414	860,541	47	274,833	521	9,138,482	553	11,245,716
>100,000	89	669,843	9	219,685	101	10,406,892	142	26,502,349
Total	**1,090**	**1,968,714**	**160**	**641,319**	**1,928**	**23,499,481**	**1,227**	**39,671,073**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	18	63,760	1,979	5,261,170	532	2,197,276
10,000-100,000	0	0	20	381,231	894	10,380,434	621	13,533,527
>100,000	0	0	2	105,237	193	11,468,922	146	27,269,773
Total	**0**	**0**	**40**	**550,228**	**3,066**	**27,110,526**	**1,299**	**43,000,576**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-587	-438,330	-86	-83,041	673	1,307,063	0	274,268
10,000-100,000	-414	-860,541	-27	106,398	373	1,241,952	68	2,287,812
>100,000	-89	-669,843	-7	-114,448	92	1,062,031	4	767,424
Total	**-1,090**	**-1,968,714**	**-120**	**-91,091**	**1,138**	**3,611,045**	**72**	**3,329,504**

5.14.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Total compliance costs are estimated at 3.4 billion EUR and about 60% of the compliance investments are in new collection systems.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	437,759,994	21%	279,070,663	39%	94,859,589	15%	811,690,246	24%
10,000-100,000	983,457,919	48%	325,187,505	46%	424,884,844	65%	1,733,530,268	51%
>100,000	619,024,439	30%	109,813,571	15%	129,930,153	20%	858,768,162	25%
Total	**2,040,242,351**	**100%**	**714,071,740**	**100%**	**649,674,585**	**100%**	**3,403,988,676**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	2,040,242,351	714,071,740	649,674,585
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**2,040,242,351**	**714,071,740**	**649,674,585**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	1,462,845	315	27,887,364
10,000-100,000	6,963,732	217	79,163,202
>100,000	21,634,676	71	87,434,704
Total	**30,061,253**	**603**	**194,485,269**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	173,059,887	189,776,103	362,835,990	197,430,688	213,488,513	410,919,201
10,000-100,000	477,594,951	440,690,440	918,285,391	534,831,269	490,362,492	1,025,193,761
>100,000	677,341,094	437,817,987	1,115,159,081	704,597,581	459,788,225	1,164,385,807
Totals	**1,327,995,932**	**1,068,284,530**	**2,396,280,462**	**1,436,859,538**	**1,163,639,230**	**2,600,498,769**

5.15 Latvia

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.15.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2015	31-12-2015	
10,000-100,000	31-12-2015	31-12-2015	31-12-2011
>100,000	31-12-2015	31-12-2015	31-12-2008

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	56	254,868	56	254,868	0	0
10,000-100,000	26	727,113	0	0	26	727,113
>100,000	1	153,018	0	0	1	153,018
Total	**83**	**1,134,999**	**56**	**254,868**	**27**	**880,131**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	56	254,868	0	0	0	0
10,000-100,000	0	0	0	0	26	727,113	0	0
>100,000	0	0	0	0	1	153,018	0	0
Total	**0**	**0**	**56**	**254,868**	**27**	**880,131**	**0**	**0**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	4	8,533	14	39,171	69	190,439	4	16,096
10,000-100,000	1	50,150	1	50,150	28	640,387	8	219,569
>100,000	0	0	0	0	1	153,018	0	0
Total	**5**	**58,683**	**15**	**89,321**	**98**	**983,844**	**12**	**235,665**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	87	396,905	4	26,826
10,000-100,000	0	0	0	0	0	0	38	960,256
>100,000	0	0	0	0	0	0	1	153,018
Total	**0**	**0**	**0**	**0**	**87**	**396,905**	**43**	**1,140,100**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-4	-8,533	-14	-39,171	18	206,466	0	10,730
10,000-100,000	-1	-50,150	-1	-50,150	-28	-640,387	30	740,687
>100,000	0	0	0	0	-1	-153,018	1	153,018
Total	**-5**	**-58,683**	**-15**	**-89,321**	**-11**	**-586,939**	**31**	**904,435**

The time derogation for Latvia is for full compliance by 2015 and with the intermediate targets of compliance in all agglomerations above 100,000 PE by 2008 and for agglomerations between 10,000 and 100,000 by 2011. The targets are incorporated in the registry data file.

5.15.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Total compliance costs are estimated at 290 million EUR and half of that is for additional collection systems.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	84,285,866	57%	25,787,377	100%	2,246,728	2%	112,319,971	39%
10,000-100,000	55,544,061	37%	0	0%	96,385,439	86%	151,929,500	53%
>100,000	9,154,520	6%	0	0%	13,108,446	12%	22,262,965	8%
Total	**148,984,447**	**100%**	**25,787,377**	**100%**	**111,740,613**	**100%**	**286,512,436**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	0
2007	0	0	0
2008	9,154,520	0	13,108,446
2009	0	0	0
2010	0	0	0
2011	55,544,061	0	96,385,439
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	86,923,917	26,622,102	2,246,728
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**151,622,497**	**26,622,102**	**111,740,613**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	192,067	36	2,043,170
10,000-100,000	555,518	22	5,929,337
>100,000	153,018	1	1,072,509
Total	**900,603**	**59**	**9,045,017**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	3,535,215	4,280,954	7,816,169	5,913,556	7,088,036	13,001,592
10,000-100,000	10,421,453	11,159,685	21,581,138	15,307,146	16,125,984	31,433,130
>100,000	1,474,767	1,386,679	2,861,446	2,217,177	2,094,108	4,311,285
Totals	**15,431,434**	**16,827,319**	**32,258,753**	**23,437,878**	**25,308,127**	**48,746,006**

5.15.3 Issues

The registry data file does not include the connection rate for collection systems. The Article 17 report with data end of 2006 includes some data on connection rates. The above estimate is based on approximated connection rates where it is assumed that 60% of the load in collected and treated (if there is a treatment plant) for agglomerations below 10,000 PE, while a connection rate of 90% is assumed for agglomerations above 10,0000 PE.

5.16 Lithuania

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.16.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For Lithuania, compliance is by 2009 but with an intermediate deadline of compliance with Article 4 and 5 for agglomerations above 10,000 PE by 2007. These deadlines are incorporated in the registry data file.

For collection systems, there is a large share of individual appropriate systems which means that total coverage with appropriate collection systems are 100% in all agglomerations.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2009	31-12-2009	
10,000-100,000	31-12-2009	31-12-2007	31-12-2007
>100,000	31-12-2009	31-12-2007	31-12-2007

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	42	0	42	223,400	0	0
10,000-100,000	28	0	0	0	0	801,300
>100,000	5	0	0	0	33	1,450,000
Total	**75**	**0**	**42**	**223,400**	**33**	**2,251,300**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	42	223,400
10,000-100,000	0	0	0	0	0	0	28	801,300
>100,000	0	0	0	0	0	0	5	1,450,000
Total	**0**	**0**	**0**	**0**	**0**	**0**	**75**	**2,474,700**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	3	9,902	2	6,500	28	77,259	9	40,006
10,000-100,000	0	0	2	30,500	13	328,800	13	442,000
>100,000	0	0	1	241,000	1	138,000	3	1,071,000
Total	**3**	**9,902**	**5**	**278,000**	**42**	**544,059**	**25**	**1,553,006**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	33	93,652	9	40,006
10,000-100,000	0	0	0	0	0	0	28	801,300
>100,000	0	0	0	0	0	0	5	1,450,000
Total	**0**	**0**	**0**	**0**	**33**	**93,652**	**42**	**2,291,306**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-3	-9,902	-2	-6,500	5	16,394	0	0
10,000-100,000	0	0	-2	-30,500	-13	-328,800	15	359,300
>100,000	0	0	-1	-241,000	-1	-138,000	2	379,000
Total	**-3**	**-9,902**	**-5**	**-278,000**	**-9**	**-450,406**	**17**	**738,300**

5.16.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

The compliance costs are estimated at approximately 70 million EUR for further investments in advanced treatment.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	2,130,638	100%	0	0%	2,130,638	3%
10,000-100,000	0	0%	0	0%	37,151,365	55%	37,151,365	54%
>100,000	0	0%	0	0%	29,950,840	45%	29,950,840	43%
Total	**0**	**0%**	**2,130,638**	**100%**	**67,102,206**	**100%**	**69,232,844**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	0
2007	0	0	67,102,206
2008	0	0	0
2009	0	2,130,356	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**2,130,356**	**67,102,206**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	0	0	0
10,000-100,000	0	0	0
>100,000	0	0	0
Total	**0**	**0**	**0**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	2,489,303	2,986,848	5,476,151	2,579,397	3,072,074	5,651,470
10,000-100,000	10,876,702	11,049,114	21,925,816	12,421,098	12,535,168	24,956,266
>100,000	16,770,137	13,196,577	29,966,714	18,320,883	14,394,611	32,715,494
Totals	**30,136,143**	**27,232,539**	**57,368,682**	**33,321,377**	**30,001,853**	**63,323,231**

5.17 Luxemburg

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.17.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);

- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	26	103,850	26	103,850	0	0
10,000-100,000	15	631,500	1	10,000	14	621,500
>100,000	1	300,000	0	0	1	300,000
Total	**42**	**1,035,350**	**27**	**113,850**	**15**	**921,500**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	3	44,550	6	54,450	6	54,450

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	8	651,420	8	651,420	8	651,420

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	26	103,850
10,000-100,000	0	0	0	0	0	0	15	631,500
>100,000	0	0	0	0	0	0	1	300,000
Total	**0**	**0**	**0**	**0**	**0**	**0**	**42**	**1,035,350**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	1	7,920	0	0	25	94,892	0	0
10,000-100,000	2	36,630	0	0	2	45,540	11	530,415
>100,000	0	0	0	0	0	0	1	297,000
Total	**3**	**44,550**	**0**	**0**	**27**	**140,432**	**12**	**827,415**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	26	102,812	0	0
10,000-100,000	0	0	0	0	1	9,900	14	602,685
>100,000	0	0	0	0	0	0	1	297,000
Total	**0**	**0**	**0**	**0**	**27**	**112,712**	**15**	**899,685**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-1	-7,920	0	0	1	7,920	0	0
10,000-100,000	-2	-36,630	0	0	-1	-35,640	3	72,270
>100,000	0	0	0	0	0	0	0	0
Total	**-3**	**-44,550**	**0**	**0**	**0**	**-27,720**	**3**	**72,270**

For Luxemburg the deadlines have passed by end 2005, there was not compliance with the Article 5 requirements for about 50% of the PE. In principle advanced treatment is available in most agglomerations where required but there is only removal of P where the designation is marked as required both N and P.

5.17.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	1,572,783	46%	0	0%	1,572,783	2%
10,000-100,000	0	0%	1,853,839	54%	39,804,014	62%	41,657,853	62%
>100,000	0	0%	0	0%	24,182,088	38%	24,182,088	36%
Total	**0**	**0%**	**3,426,622**	**100%**	**63,986,102**	**100%**	**67,412,724**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	3,426,622	63,986,102
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**3,426,622**	**63,986,102**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	10,000	3	244,227
10,000-100,000	331,000	6	4,467,097
>100,000	300,000	1	3,627,313
Total	**641,000**	**10**	**8,338,637**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	2,363,071	3,076,310	5,439,381	2,429,639	3,139,222	5,568,860
10,000-100,000	11,675,228	12,418,790	24,094,018	13,120,744	14,085,104	27,205,848
>100,000	4,412,518	3,650,899	8,063,417	5,137,981	4,618,183	9,756,164
Totals	**18,450,817**	**19,146,000**	**37,596,816**	**20,688,363**	**21,842,509**	**42,530,872**

Compliance costs are estimated to investments of about 70 million EUR and the majority is for the upgrade of advanced treatment to achieve 3NP for agglomerations above 10,000 PE.

5.18 Malta

5.18.1 Current compliance situation

The information for Malta is incomplete and the assessment preliminary.

The designation of sensitive areas is not clear from the available data and the current status of treatment also needs further clarification.

Based on information in letter dated November 2009, it is assumed that:

- All collection systems are in place and comply with Article 3
- Malta - South (350,000pe.): treatment plant to be constructed (3NP)
- Other treatment plants are in place (Article 4).

This means that the intermediate deadlines stipulated in the accession agreement as well as the general derogation to 20006 are now met.

The resulting data by agglomeration category and articles are illustrated below in Table 1.

Table 1 Data on agglomeration

	Article 3		**Article 4**		**Article 5**	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	2	10,200	2	10,200	0	0
10,000-100,000	2	84,000	1	40,000	1	44,000
>100,000	2	500,000	1	150,000	1	350,000
Total	**6**	**594,200**	**4**	**200,200**	**2**	**394,000**

5.18.2 Compliance costs

Given the above assumption, the compliance costs are estimated at approximately 60 million EUR.

If it is assumed that the sensitive areas were only designated in 2005, the deadline for the upgrade to advanced treatment would be in 2011 so the whole amount is due by that date.

Table 2 Estimated compliance cost in EUR

Agglomeration	**Collection**		**Treatment**			
	Article 3		**Article 4**		**Article 5**	
2,000-10,000	0	0%	0	0%	0	0%

Agglomeration	Collection		Treatment			
	Article 3		Article 4		Article 5	
10,000-100,000	0	0%	0	0%	3,418,055	6%
>100,000	0	0%	0	0%	54,959,862	94%
Total	**0**	**0%**	**0**	**0%**	**58,377,917**	**100%**

5.19 The Netherlands

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.19.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:½

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

For the Netherland there is full compliance.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	99	0	99	541,717	0	0
10,000-100,000	196	0	0	0	196	6,743,834
>100,000	45	0	0	0	45	8,876,479
Total	**340**	**0**	**99**	**541,717**	**241**	**15,620,313**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	99	541,717
10,000-100,000	0	0	0	0	0	0	196	6,743,834
>100,000	0	0	0	0	0	0	45	8,876,479
Total	**0**	**0**	**0**	**0**	**0**	**0**	**340**	**16,162,030**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	8	40,212	91	501,505
10,000-100,000	0	0	0	0	8	268,441	192	6,702,930
>100,000	0	0	0	0	0	0	56	12,729,523
Total	**0**	**0**	**0**	**0**	**16**	**308,653**	**339**	**19,933,958**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	8	40,212	91	501,505
10,000-100,000	0	0	0	0	8	268,441	192	6,702,930
>100,000	0	0	0	0	0	0	56	12,729,523
Total	**0**	**0**	**0**	**0**	**16**	**308,653**	**339**	**19,933,958**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	0	0
10,000-100,000	0	0	0	0	0	0	0	0
>100,000	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

5.19.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

As there is full compliance, no additional compliance costs are estimated and also no renovation scenario has been analysed.

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	0	0%	0	0%	0	0%
10,000-100,000	0	0%	0	0%	0	0%	0	0%
>100,000	0	0%	0	0%	0	0%	0	0%
Total	**0**	**0%**	**0**	**0%**	**0**	**0%**	**0**	**0%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	0	0	0
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**0**	**0**	**0**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	0	0	0
10,000-100,000	0	0	0
>100,000	0	0	0
Total	**0**	**0**	**0**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	15,697,282	18,810,668	34,507,950	15,697,282	18,810,668	34,507,950
10,000-100,000	144,183,242	152,031,432	296,214,675	144,183,242	152,031,432	296,214,675
>100,000	151,758,973	132,702,919	284,461,892	151,758,973	132,702,919	284,461,892
Totals	**311,639,498**	**303,545,019**	**615,184,517**	**311,639,498**	**303,545,019**	**615,184,517**

5.20 Poland

5.20.1 Current compliance situation

For Poland, there are data with some of the registry data information for agglomerations above 15,000 PE. For the smaller agglomerations the Article 17 reporting provides some information.

For Poland the whole territory is designated as sensitive area.

Based on these data sources, the overall requirement by agglomeration category and articles are presented in Table 1.

Table 1 Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-15,000	1123	7,349,018	1123	7,349,018	0	-
15,000-100,000	378	14,370,964	0	-	378	14,370,964
>100,000	80	22,941,151	0	-	80	22,941,151
Total	**1,581**	**44,661,133**	**1,123**	**7,349,018**	**458**	**37,312,115**

Poland has a general derogation to 2015 for compliance with the Directive. A set of intermediate targets include the following

- 31.12.2005: 69% of the biodegradable load (674 agglomerations);
- 31.12.2010: 86% of the biodegradable load (1069 agglomerations);
- 31.12.2013: 91% of the biodegradable load (1165 agglomerations);

69% is equivalent to 30 million PE. The data for the 674 agglomerations show that by the reference date (2009?) show that agglomerations with the appropriate treatment with the mark "passed" on the compliance with the requirements, comprise 28.7 million PE which 64% of the load.

5.20.2 Compliance costs

The compliance costs have been estimated to 15 billion EUR. Two-thirds relate to the extension of the collection network. The rest is mainly for the upgrading of treatment plants to advanced treatment.

Table 2 Estimated compliance cost in EUR

Agglomeration	Collection		Treatment			
	Article 3		Article 4		Article 5	
2,000-15,000	1,806,506,923	18%	556,647,563	100%		
15,000-100,000	4,650,241,442	46%			1,057,382,634	24%

>100,000	3,669,207,415	36%			3,316,016,646	76%
Total	10,125,955,781	100%	556,647,563	100%	4,373,399,280	100%

The phasing of the investments to comply with intermediate deadlines results in the distribution of the investments shown in Table 3.

Table 3 Estimated compliance costs by deadlines for compliance in EUR

	Article 3	Article 4 and 5	Total
2010	8.590.424.896	4.456.896.414	13.047.321.310
2013	541.952.077	166.994.269	708.946.346
2015	993.578.808	306.156.160	1.299.734.967
Total	**10.125.955.781**	**4.930.046.842**	**15.056.002.623**

5.20.3 Issues

There are some estimates of the estimated investments as part of available data files. These estimates might reflect the actual local conditions better than the standardised costing approach. The two set of data has not yet been compared.

5.21 Portugal

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.21.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Portugal has passed the deadlines and there a number treatment plants that that needs upgrading to provide secondary treatment. There are relatively few agglomerations in sensitive areas that need to have N and P removal.

There are also additional collection systems to be constructed in agglomerations accounting for about 15% of the total load.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	253	1,095,920	253	1,095,920	0	0
10,000-100,000	123	3,733,600	107	3,226,500	16	507,100
>100,000	28	6,425,900	28	6,425,900	0	0
Total	**404**	**11,255,420**	**388**	**10,748,320**	**16**	**507,100**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	33	2,897,500	298	6,725,792	298	6,725,792

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	14	610,620	17	1,020,430	17	1,020,430

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	5	19,300	1	0	11	24,200	282	1,052,420
10,000-100,000	5	152,800	4	111,900	12	560,400	102	2,908,500
>100,000	2	435,000	0	0	3	354,500	23	5,636,400
Total	**12**	**607,100**	**5**	**111,900**	**26**	**939,100**	**407**	**9,597,320**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	10	31,725	1	520	229	914,502	27	133,200
10,000-100,000	6	161,533	7	291,936	97	2,388,004	30	670,006
>100,000	6	634,855	3	1,637,460	17	1,896,440	17	1,951,345
Total	**22**	**828,113**	**11**	**1,929,916**	**343**	**5,198,946**	**74**	**2,754,551**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	240	962,720	27	133,200
10,000-100,000	0	0	1	3,438	95	2,682,037	44	1,048,126
>100,000	0	0	1	120,000	25	4,331,875	17	1,974,025
Total	**0**	**0**	**2**	**123,438**	**360**	**7,976,632**	**88**	**3,155,351**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-10	-31,725	-1	-520	11	48,218	0	0
10,000-100,000	-6	-161,533	-6	-288,499	-2	294,033	14	378,120
>100,000	-6	-634,855	-2	-1,517,460	8	2,435,435	0	22,680
Total	**-22**	**-828,113**	**-9**	**-1,806,479**	**17**	**2,777,686**	**14**	**400,800**

5.21.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	13,885,036	5%	8,831,154	6%	0	0%	22,716,190	5%
10,000-100,000	149,007,373	51%	41,490,627	27%	13,096,655	87%	203,594,655	44%
>100,000	127,910,093	44%	101,333,643	67%	1,975,816	13%	231,219,552	51%
Total	**290,802,502**	**100%**	**151,655,423**	**100%**	**15,072,471**	**100%**	**457,530,397**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	290,802,502	151,655,423	15,072,471
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**290,802,502**	**151,655,423**	**15,072,471**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	424,500	94	8,256,094
10,000-100,000	2,032,200	55	17,679,788
>100,000	3,749,400	16	14,478,263
Total	**6,206,100**	**165**	**40,414,145**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	21,265,418	26,056,513	47,321,931	21,829,641	26,687,460	48,517,101
10,000-100,000	51,878,573	55,823,330	107,701,903	57,371,890	60,986,969	118,358,859
>100,000	66,712,388	55,775,668	122,488,056	75,613,151	62,466,249	138,079,399
Totals	**139,856,379**	**137,655,512**	**277,511,890**	**154,814,681**	**150,140,677**	**304,955,359**

The compliance costs are estimated at 450 million EUR. Almost 300 million EUR are for still missing collection systems. The rest of the investments are for upgrade of treatment plant to secondary and advanced treatment. Some of the investment relates to treatment plants in areas that have been designated as sensitive by 2004 and therefore the deadline is assumed to be 2011.

5.22 Romania

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.22.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2018	31-12-2018	
10,000-100,000	31-12-2013	31-12-2015	31-12-2015
>100,000	31-12-2013	31-12-2015	31-12-2015

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	2,341	10,168,011	2,341	10,168,011	0	0
10,000-100,000	231	5,674,858	2	20,000	229	5,654,858
>100,000	33	10,575,688	0	0	33	10,575,688
Total	**2,605**	**26,418,557**	**2,343**	**10,188,011**	**262**	**16,230,546**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	2,318	9,956,381	33	134,793	36	65,592	2	11,245
10,000-100,000	127	1,931,748	69	2,417,776	35	1,325,334	0	0
>100,000	2	350,000	6	944,464	25	9,281,224	0	0
Total	**2,447**	**12,238,129**	**108**	**3,497,033**	**96**	**10,672,150**	**2**	**11,245**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	2,217	133,978	60	112,696	67	136,399	3	10,259
10,000-100,000	91	512,770	41	706,055	124	1,904,246	3	30,074
>100,000	19	3,398,135	3	341,046	24	4,890,695	1	311,040
Total	**2,327**	**4,044,883**	**104**	**1,159,797**	**215**	**6,931,340**	**7**	**351,373**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	2,344	10,076,117	3	22,416
10,000-100,000	0	0	0	0	2	19,300	257	5,652,771
>100,000	0	0	0	0	0	0	47	10,575,735
Total	**0**	**0**	**0**	**0**	**2,346**	**10,095,417**	**307**	**16,250,922**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-2,217	-133,978	-60	-112,696	2,277	9,939,718	0	12,157
10,000-100,000	-91	-512,770	-41	-706,055	-122	-1,884,946	254	5,622,696
>100,000	-19	-3,398,135	-3	-341,046	-24	-4,890,695	46	10,264,695
Total	**-2,327**	**-4,044,883**	**-104**	**-1,159,797**	**2,131**	**3,164,078**	**300**	**15,899,548**

Romania has derogation for full compliance up to 2018. There is a set of intermediate deadlines including:

- 31.12.2013 –Article 3 in agglomerations of above 10,000 p.e. and
- 31.12.2015 –Article 5(2) in agglomerations of above 10,000 p.e.

These deadlines are included in the registry data file. Moreover, there are gradual intermediate deadlines as follows:

Deadline	Article 3	Article 4 and 5(2)
31.12.2010	61	51
31.12.2013	69	61
31.12.2015	80	77
31.12.2018	100	100

They are not included in the data file and for the investment cost assessment an approximation has been made to provide investment costs by intermediate deadlines.

5.22.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	6,005,405,043	76%	1,524,058,899	100%	2,210,425	0%	7,531,674,366	66%
10,000-100,000	1,306,993,298	17%	2,459,862	0%	857,944,070	44%	2,167,397,230	19%
>100,000	562,806,636	7%	0	0%	1,079,504,345	56%	1,642,310,981	14%
Total	**7,875,204,977**	**100%**	**1,526,518,761**	**100%**	**1,939,658,839**	**100%**	**11,341,382,577**	**100%**

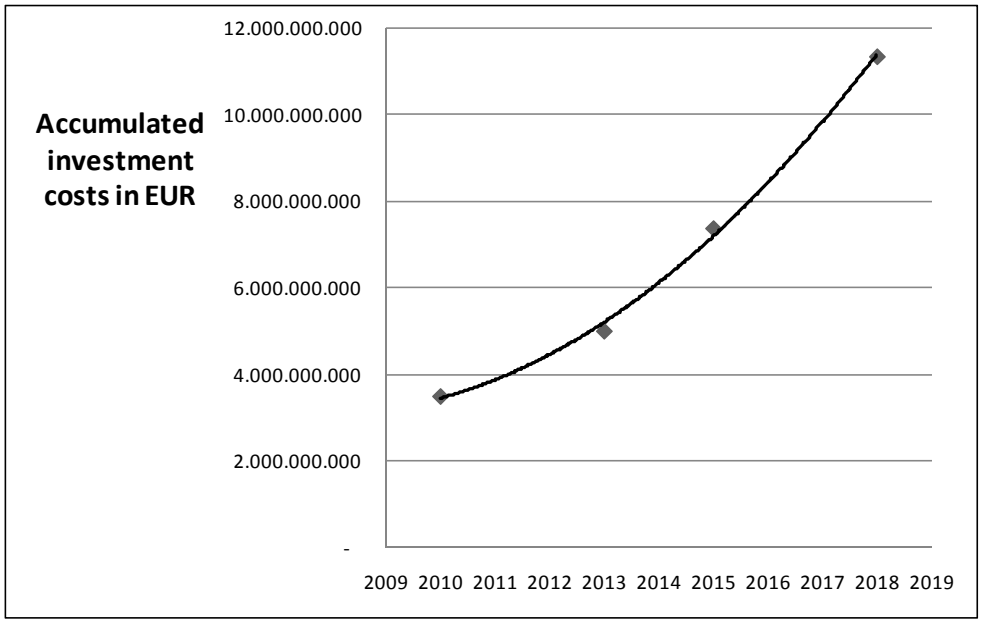
The total investment costs in compliance with the Directive are estimated to 11 billion EUR.

Table 10 Estimated compliance costs by deadlines for compliance in EUR

	Article 3	Article 4 and 5	Total
2010	1.854.240.704	1.643.072.858	3.497.313.562
2011			
2012			

	Article 3	Article 4 and 5	Total
2013	1.183.953.182	322.171.149	1.506.124.331
2014			
2015	1.716.358.774	655.274.713	2.371.633.487
2016			
2017			
2018	3.120.652.317	845.658.881	3.966.311.198
Total	**7.875.204.977**	**3.466.177.600**	**11.341.382.577**

The below graph illustrates the accumulated investment requirements.



A renovation scenario has been compiled based on the assumption that all treatment plants that fail on monitoring data needs to be renovated at a rate of 10% of the value of a new treatment plant.

Also the impact on operational costs of the full compliance situation has been estimated. When necessary collection and treatment systems are in place the annual operational costs will increase from 120 million EUR to 400 million EUR.

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	838,551	129	4,060,332
10,000-100,000	4,646,044	164	25,330,401
>100,000	7,156,666	28	39,605,594
Total	**12,641,261**	**321**	**68,996,327**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	5,770,219	6,963,140	12,733,360	168,752,112	188,122,014	356,874,127
10,000-100,000	38,594,207	38,892,502	77,486,709	102,084,052	99,448,525	201,532,578
>100,000	73,065,167	49,637,590	122,702,757	143,651,542	104,073,897	247,725,439
Totals	**117,429,593**	**95,493,233**	**212,922,826**	**414,487,707**	**391,644,436**	**806,132,143**

5.23 Slovenia

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.23.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2015	31-12-2015	
10,000-100,000	31-12-2015	31-12-2010	31-12-2008
>100,000	31-12-2015	31-12-2010	31-12-2008

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	127	514,320	127	514,320	0	0
10,000-100,000	27	556,689	22	463,529	5	93,160
>100,000	2	460,740	2	460,740	0	0
Total	**156**	**1,531,749**	**151**	**1,438,589**	**5**	**93,160**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	54	212,330	30	122,001	40	167,282	5	12,707
10,000-100,000	1	22,928	8	120,843	17	396,739	1	16,179
>100,000	0	0	0	0	2	460,740	0	0
Total	**55**	**235,258**	**38**	**242,844**	**59**	**1,024,761**	**6**	**28,886**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	67	121,671	0	0	60	81,051	0	0
10,000-100,000	15	209,861	3	40,268	11	150,687	0	0
>100,000	1	128,406	0	0	1	256,202	0	0
Total	**83**	**459,938**	**3**	**40,268**	**72**	**487,940**	**0**	**0**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	127	393,529	0	0
10,000-100,000	0	0	1	18,680	23	399,717	5	71,127
>100,000	1	140,488	0	0	1	320,252	0	0
Total	**1**	**140,488**	**1**	**18,680**	**151**	**1,113,498**	**5**	**71,127**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-67	-121,671	0	0	67	312,478	0	0
10,000-100,000	-15	-209,861	-2	-21,588	12	249,029	5	71,127
>100,000	0	12,082	0	0	0	64,050	0	0
Total	**-82**	**-319,450**	**-2**	**-21,588**	**79**	**625,557**	**5**	**71,127**

5.23.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	199,133,026	62%	57,347,796	61%	0	0%	256,480,822	60%
10,000-100,000	83,616,267	26%	30,849,554	33%	13,180,455	100%	127,646,276	30%
>100,000	38,579,797	12%	5,310,561	6%	0	0%	43,890,358	10%
Total	**321,329,090**	**100%**	**93,507,910**	**100%**	**13,180,455**	**100%**	**428,017,456**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	38,579,797	5,310,561	0
2008	19,878,873	2,880,956	13,180,455
2009	0	0	0
2010	47,812,227	22,287,739	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	215,058,193	63,028,654	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**321,329,090**	**93,507,910**	**13,180,455**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	38,423	10	582,689
10,000-100,000	123,576	6	1,134,732
>100,000	0	0	0
Total	**161,999**	**16**	**1,717,421**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	4,141,612	5,497,064	9,638,676	9,442,884	11,773,637	21,216,521
10,000-100,000	5,520,610	6,490,044	12,010,654	8,923,101	9,923,569	18,846,671
>100,000	3,921,279	3,390,399	7,311,677	4,897,833	4,374,417	9,272,249
Totals	**13,583,501**	**15,377,506**	**28,961,007**	**23,263,818**	**26,071,623**	**49,335,441**

5.24 Slovakia

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.24.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8)[8].

Slovakia has a set of intermediate deadlines for gradual phase in of the compliance. Overall, full implementation has to be achieved by 2015. The intermediate deadlines specify percentages of biodegradable load that need to collected and treated. These deadlines have been incorporated into the registry data by specifying deadlines for each agglomeration. The deadlines included in the registry data have been compared to the requirement by adding the PE values for all agglomerations by deadlines.

The registry data provides a reasonable approximation to the deadlines and the resulting investment costs by the respective years (Table 10) can be used to approximate the investment need by the deadlines. The below table includes the transitional targets and how this match with the deadlines by agglomerations specified in the registry file.

Deadline	% of the biodegradable load	% as by registry data file
31.12.2004	83	87
31.12.2008	91	94
31.12.2010	All agglomerations of above 10,000 p.e.	Included
31.12.2012	97	98
31.12.2015	100	100

By the reference date - end of 2005 - at least 87% of the BOD load should be covered. For the collection systems, this requirement was fulfilled. For the treatment assuming the intermediate requirement is for secondary treatment only Table 5 shows that about 65% of the load measured by number PEs was covered by either secondary or advanced treatment.

[8] Table 6,7 and 8 all refer to total number of treatment plants not agglomerations.

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2015	31-12-2015	
10,000-100,000	31-12-2015	31-12-2015	31-12-2010
>100,000	31-12-2015	31-12-2015	31-12-2010

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	276	1,012,190	276	1,012,190	0	0
10,000-100,000	72	2,167,150	1	10,690	71	2,156,460
>100,000	8	1,875,560	0	0	8	1,875,560
Total	**356**	**5,054,900**	**277**	**1,022,880**	**79**	**4,032,020**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	32	154,596	72	1,460,748	72	1,460,748

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	0	0	0	0

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	87	258,410	65	221,320	112	420,800	45	111,660
10,000-100,000	1	10,690	10	212,940	42	1,047,710	19	895,810
>100,000	0	0	1	164,800	5	1,240,500	2	470,260
Total	**88**	**269,100**	**76**	**599,060**	**159**	**2,709,010**	**66**	**1,477,730**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	185	161,974	0	0	100	226,969	7	7,108
10,000-100,000	22	327,518	0	0	54	1,162,048	10	261,249
>100,000	1	29,264	0	0	6	1,022,636	4	619,433
Total	**208**	**518,755**	**0**	**0**	**160**	**2,411,653**	**21**	**887,790**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	285	695,913	7	9,776
10,000-100,000	0	0	0	0	1	7,590	85	1,930,028
>100,000	0	0	0	0	0	0	11	1,798,428
Total	**0**	**0**	**0**	**0**	**286**	**703,503**	**103**	**3,738,232**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-185	-161,974	0	0	185	468,944	0	2,668
10,000-100,000	-22	-327,518	0	0	-53	-1,154,458	75	1,668,779
>100,000	-1	-29,264	0	0	-6	-1,022,636	7	1,178,994
Total	**-208**	**-518,755**	**0**	**0**	**126**	**-1,708,150**	**82**	**2,850,441**

5.24.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	250,374,320	57%	90,290,069	99%	1,015,017	0%	341,679,406	39%
10,000-100,000	129,541,080	29%	1,127,426	1%	232,160,201	68%	362,828,707	41%
>100,000	62,282,026	14%	0	0%	109,420,411	32%	171,702,437	20%
Total	**442,197,427**	**100%**	**91,417,495**	**100%**	**342,595,628**	**100%**	**876,210,549**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2006	258,291,669	20,050,160	281,767,944
2007	0	0	0
2008	33,140,313	11,443,719	60,805,298
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	86,510,248	37,114,121	0
2013	0	0	0
2014	0	0	0
2015	64,177,401	22,809,494	22,387
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
Total	**442,119,630**	**91,417,495**	**342,595,628**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	72,710	18	687,898
10,000-100,000	669,270	20	5,356,214
>100,000	830,960	4	6,791,012
Total	**1,572,940**	**42**	**12,835,125**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	6,990,104	7,781,847	14,771,951	15,214,847	16,441,537	31,656,384
10,000-100,000	27,129,828	24,078,680	51,208,509	41,191,244	36,001,007	77,192,251
>100,000	23,805,449	15,574,942	39,380,391	31,095,548	21,197,399	52,292,947
Totals	**57,925,381**	**47,435,470**	**105,360,850**	**87,501,639**	**73,639,943**	**161,141,583**

Total investment costs are estimated at around 875 million EUR. About half if of additional collection systems while the rest is for upgrading of treatment; the majority of the investments being in advanced treatment as the whole area is designated as sensitive.

About 550 million EUR of investments were due by 2004 as required by the intermediate deadlines (they are referred to year 2006 as the first year after the reference year of the data).

5.25 Spain

The assessment is based on the registry data file which includes data from end of 2006 as the reference.

5.25.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	1,551	7,023,598	1,551	7,023,598	0	0
10,000-100,000	697	20,330,978	504	14,368,985	193	5,961,993
>100,000	133	44,385,053	79	25,754,041	54	18,631,012
Total	**2,381**	**71,739,629**	**2,134**	**47,146,624**	**247**	**24,593,005**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	606	2,403,626	1,311	12,744,595	1,321	12,990,431

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	109	13,285,171	96	5,887,194	125	13,885,264

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	53	207,144	16	84,916	8	37,045	1,473	6,692,493
10,000-100,000	20	642,402	4	136,993	21	753,893	652	18,797,690
>100,000	1	112,638	1	664,838	2	1,051,717	129	42,555,860
Total	**74**	**962,184**	**21**	**886,747**	**31**	**1,842,655**	**2,254**	**68,046,043**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	532	347,397	28	148,011	850	3,928,363	140	723,562
10,000-100,000	65	184,086	15	437,134	382	10,521,834	235	7,681,758
>100,000	3	0	3	686,723	83	28,058,911	44	14,381,903
Total	**600**	**531,483**	**46**	**1,271,868**	**1,315**	**42,509,109**	**419**	**22,787,222**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	42	49,291	1,368	4,522,007	140	732,058
10,000-100,000	0	0	15	50,136	352	9,011,736	330	10,234,516
>100,000	0	0	0	0	55	16,464,975	78	26,931,473
Total	**0**	**0**	**57**	**99,427**	**1,775**	**29,998,718**	**548**	**37,898,048**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-532	-347,397	14	-98,720	518	593,644	0	8,497
10,000-100,000	-65	-184,086	0	-386,998	-30	-1,510,098	95	2,552,758
>100,000	-3	0	-3	-686,723	-28	-11,593,936	34	12,549,571
Total	**-600**	**-531,483**	**11**	**-1,172,441**	**460**	**-12,510,391**	**129**	**15,110,825**

5.25.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	200,458,793	26%	105,055,564	49%	2,085,653	0%	307,600,009	21%
10,000-100,000	422,087,312	54%	80,547,976	38%	114,142,770	23%	616,778,058	41%
>100,000	157,608,890	20%	27,853,491	13%	377,888,029	76%	563,350,410	38%
Total	**780,154,994**	**100%**	**213,457,031**	**100%**	**494,116,452**	**100%**	**1,487,728,477**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	780,154,994	213,457,031	490,253,632
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	3,862,820
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**780,154,994**	**213,457,031**	**494,116,452**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	554,171	110	11,155,629
10,000-100,000	6,711,089	215	96,791,503
>100,000	8,626,593	38	90,336,451
Total	**15,891,853**	**363**	**198,283,583**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	130,950,297	160,434,181	291,384,478	138,469,593	168,729,005	307,198,599
10,000-100,000	344,246,870	353,747,388	697,994,258	363,133,835	369,976,764	733,110,599
>100,000	558,592,986	404,126,318	962,719,304	595,285,789	423,508,157	1,018,793,945
Totals	**1,033,790,153**	**918,307,887**	**1,952,098,040**	**1,096,889,217**	**962,213,926**	**2,059,103,143**

The compliance investment costs are estimate at almost 1.5 billion EUR. Half of the investment costs for upgrade of the collection systems.

5.26 Sweden

The assessment is based on the registry data file which includes data from end of 2005 as the reference.

5.26.1 Current compliance situation

The basic situation at the reference date is described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	214	1,001,591	214	1,001,591	0	0
10,000-100,000	112	2,948,565	2	20,000	110	2,928,565
>100,000	13	3,938,917	0	0	13	3,938,917
Total	**339**	**7,889,073**	**216**	**1,021,591**	**123**	**6,867,482**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	0	0	17	154,420	17	154,420

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	70	2,011,946	39	1,223,841	73	2,245,151

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	222	1,001,591
10,000-100,000	0	0	0	0	0	0	112	2,948,565
>100,000	0	0	0	0	0	0	13	3,938,917
Total	**0**	**0**	**0**	**0**	**0**	**0**	**347**	**7,889,073**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	214	1,001,591
10,000-100,000	0	0	0	0	0	0	115	2,948,565
>100,000	0	0	0	0	0	0	18	3,938,917
Total	**0**	**0**	**0**	**0**	**0**	**0**	**347**	**7,889,073**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	214	1,001,591
10,000-100,000	0	0	0	0	0	0	115	2,948,565
>100,000	0	0	0	0	0	0	18	3,938,917
Total	**0**	**0**	**0**	**0**	**0**	**0**	**347**	**7,889,073**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	0	0
10,000-100,000	0	0	0	0	0	0	0	0
>100,000	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

For Sweden, there are a number of advanced treatment plant of the 3P type which should be 3NP according the criteria for designation of the sensitive areas. T

5.26.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)
- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	0	0%	0	0%	0	0%
10,000-100,000	0	0%	0	0%	94,942,040	80%	94,942,040	80%
>100,000	0	0%	0	0%	23,894,631	20%	23,894,631	20%
Total	**0**	**0%**	**0**	**0%**	**118,836,671**	**100%**	**118,836,671**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	0	0	118,836,671
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**0**	**0**	**118,836,671**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	90,424	18	2,525,662
10,000-100,000	699,591	34	13,198,855
>100,000	629,435	5	8,728,200
Total	**1,419,450**	**57**	**24,452,717**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	25,184,189	32,617,812	57,802,001	25,184,189	32,617,812	57,802,001
10,000-100,000	58,898,528	69,807,311	128,705,839	61,746,790	73,604,993	135,351,782
>100,000	57,459,290	52,719,479	110,178,769	58,176,129	53,675,265	111,851,393
Totals	**141,542,007**	**155,144,603**	**296,686,609**	**145,107,107**	**159,898,069**	**305,005,176**

The estimated investment costs related to upgrading of the 3P treatment plants to 3NP and the total investment costs are approximately 120 million EUR.

5.27 UK

The assessment is based on the registry data file which includes data from end of 2006 as the reference year.

5.27.1 Current compliance situation

The basic situation at the reference data are described in the following tables that include information about:

- Compliance deadlines (Table 1);
- Data on agglomerations and Article 3, 4 and 5 (Table 2);
- Compliance with Article 4 and 5 (Table 3 and 4);
- Status on collection network (Table 5); and
- Status on treatment technologies (Table 6, 7 and 8).

Table 1: Compliance dates

	Article 3	Article 4	Article 5
Agglomeration			
2,000-10,000	31-12-2005	31-12-2005	
10,000-100,000	31-12-2000	31-12-2000	31-12-1998
>100,000	31-12-2000	31-12-2000	31-12-1998

Table 2: Data on agglomeration

	Article 3		Article 4		Article 5	
Agglomeration	Number	PE	Number	PE	Number	PE
2,000-10,000	982	4,544,720	982	4,544,720	0	0
10,000-100,000	705	22,276,417	323	10,719,933	382	11,556,484
>100,000	144	43,751,954	89	29,007,412	55	14,744,542
Total	**1,831**	**70,573,091**	**1,394**	**44,272,065**	**437**	**26,301,026**

Table 3: Compliance Article 4

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	39	644,132	79	5,474,485	105	5,916,916

Table 4: Compliance Article 5

	Treatment type		Monitoring results		Final	
	Number	PE	Number	PE	Number	PE
NC	481	42,225,948	487	42,178,486	488	42,497,471

Table 5: Status on collection system (share of PE with appropriate collection system)

	0-50%		50-75%		75-99%		100%	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	0	0	982	4,544,720
10,000-100,000	0	0	0	0	0	0	705	22,276,417
>100,000	0	0	0	0	0	0	144	43,751,954
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1,831**	**70,573,091**

Table 6: Status on treatment systems

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	5	30,788	24	112,152	774	3,469,697	180	904,682
10,000-100,000	9	237,908	3	41,769	391	12,254,886	303	9,447,904
>100,000	0	0	1	240,000	87	29,621,893	57	13,364,758
Total	**14**	**268,696**	**28**	**393,921**	**1,252**	**45,346,476**	**540**	**23,717,344**

Table 7: Target for treatment systems

	Target treatment type 0		Target treatment type 1		Target treatment type 2		Target treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	0	0	0	0	803	3,612,637	180	904,682
10,000-100,000	0	0	0	0	241	7,787,588	465	14,194,880
>100,000	0	0	0	0	69	22,796,387	76	20,430,264
Total	**0**	**0**	**0**	**0**	**1,113**	**34,196,612**	**721**	**35,529,825**

Table 8: Difference between target and current status of treatment technologies

	Treatment type 0		Treatment type 1		Treatment type 2		Treatment type 3	
Agglomeration	Number	PE	Number	PE	Number	PE	Number	PE
2,000-10,000	-5	-30,788	-24	-112,152	29	142,940	0	0
10,000-100,000	-9	-237,908	-3	-41,769	-150	-4,467,298	162	4,746,975
>100,000	0	0	-1	-240,000	-18	-6,825,506	19	7,065,506
Total	**-14**	**-268,696**	**-28**	**-393,921**	**-139**	**-11,149,864**	**181**	**11,812,481**

For UK there is a large share of agglomerations - accounting for load of about 60% of the national total - that do not comply with Article 5 requirements.

5.27.2 Compliance costs

The cost estimates are presented in the below tables including

- Compliance costs by agglomeration size and article (Table 9);
- Compliance cost by deadline and article (Table 10)

- Renovation costs, which assumes 10% renovation for all treatment plants that are non-compliance due to failure of monitoring data (Table 11); and
- Annual operational and reinvestment costs (Table 12).

Table 9: Estimated compliance costs in EUR

	Collection/ Article 3	%	Treatment/ Article 4	%	Treatment/ Article 5	%	Total	%
Agglomeration			(Secondary treatment)		(Advanced treatment)			
2,000-10,000	0	0%	13,561,180	27%	0	0%	13,561,180	4%
10,000-100,000	0	0%	31,566,955	64%	152,422,363	51%	183,989,318	53%
>100,000	0	0%	4,516,464	9%	145,313,703	49%	149,830,166	43%
Total	**0**	**0%**	**49,644,599**	**100%**	**297,736,065**	**100%**	**347,380,664**	**100%**

Table 10: Estimated compliance costs by deadline for compliance (EUR)

	Collection	Treatment	Treatment
Dates		Article 4	Article 5
2007	0	47,749,711	297,736,065
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	0	2,266,316	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
Total	**0**	**50,016,027**	**297,736,065**

Table 11: Renovation scenario

	PE	Number	Renovation costs
Agglomeration			
2,000-10,000	129,964	29	2,709,645
10,000-100,000	1,170,638	33	16,233,160
>100,000	4,243,057	14	40,878,008
Total	**5,543,659**	**76**	**59,820,814**

Assumed renovation %

10%

Note: Renovation is defined as treatment plants where the technology is in compliance but monitoring results fail
The renovation scenario assumes that treatment plants have to renovate the selected percentage of the total replacement value

Table 12: Annual cost overview - costs in EUR

	Current situation			Future compliance situation		
Agglomeration	O&M	Re-investment	Total	O&M	Re-investment	Total
2,000-10,000	102,856,758	123,170,989	226,027,747	103,469,359	123,713,436	227,182,795
10,000-100,000	390,640,496	397,927,981	788,568,477	404,599,794	405,287,553	809,887,347
>100,000	559,493,864	410,202,622	969,696,486	575,780,795	416,195,829	991,976,624
Totals	**1,052,991,119**	**931,301,592**	**1,984,292,711**	**1,083,849,948**	**945,196,818**	**2,029,046,766**

The compliance costs are estimated to 350 million EUR out of which 300 millions are for upgrade to advanced treatment.

This covers only new investments so any re-investment or renovation necessary to comply or continue to comply are not included in the estimated compliance costs in Table 9 and 10.

5.28 Candidate countries

For the candidate countries estimates have been made using the same approach and cost methodology as applied for the Member States.

These assessments have been based on several key assumptions and one that affects the investment costs is the designation of sensitive water bodies. Therefore, typically alternative scenarios have been made with different levels of designation of sensitive areas.

5.28.1 Croatia

For Croatia there is a financing strategy[9] which includes estimation of the costs of compliance with the UWWTD based on the FEASIBLE model which means that it uses the same costing approach as been used for the Member States.

The basic assumption on agglomerations, current connection rates and current levels of treatment are summarised in Table 4-1.

Table 5-1 Overview of agglomeration and current collection and treatment of wastewater (data from 2006)

Category of settlements	No	PE	Connection rate	Treated as share of collected	Treatment	
					Primary	Secondary
2,000-10,000	187	831,739	35%	43%	78%	22%
10,000-50,000	29	781,050	70%	43%	79%	21%
>50,000	8	1,785,153	80%	65%	40%	60%
Total	224	3,397,942	0.67	54%	59%	41%

Source: COWI (2008)

The results of the costing analysis are summarised below. It illustrates the total investments costs for both new connection and new treatment infrastructure in two alternative scenarios regarding the designation of sensitive water bodies.

Table 5-2 Estimated compliance investment costs EUR in 2006 prices

UWWTD compliance scenario	Total investments in new collection and treatment systems in EUR

[9] COWI (2008) *Environmental Investment and Financing Strategy* - Croatia. Report for European Commission.

Scenario with whole territory as normal areas	1,330,000,000
Scenario with whole territory sensitive	1,690,000,000

Source: COWI (2008)

The estimation shows total investment costs between 1, 3 and 1.7 billion EUR.

It is very important to note that these compliance costs are those based on the same definition as used for the EU27. **If the re-investment costs are included they have estimated to around 1.7 billion EUR so then the total investment costs for the period 2005 to 2021 would between 3 and 3.4 billion EUR.**

5.28.2 Turkey

For Turkey there is a financing strategy[10] which includes estimation of the costs of compliance with the UWWTD based on the FEASIBLE model which means that it uses the same costing approach as been used for the Member States.

The key figure on population and agglomeration are presented in Table 4-3.

Table 5-3 Overview of agglomeration and current collection and treatment of wastewater (data from 2002)

Category of agglomeration	Population	Number of agglomerations	Connection rates to collection systems	Number of existing treatment plans[1]
>500,000	23,611,788	15	89%	9
150,000 - 500,000	4,552,354	27	86%	12
50,000 - 150,000	7,901,040	96	70%	23
10,000 - 50,000	10,052,383	375	63%	27
2,000 - 10,000	10,331,549	2500	52%	13
Total	**56,449,114**	**3013**	**75%**	**84**

[10] COWI (2005) *Technical Assistance for Environmental Heavy-Cost Investment Planning, Turkey: Directive Specific Investment Plan for Council Directive 91/271/EEC concerning Urban Wastewater Treatment*

Note 1): Number of secondary and advanced treatment plants
Source: COWI (2005)

The cost estimation has been done for alternative scenarios regarding the designation of sensitive areas. The minimum scenario includes the following regarding designation of water bodies:

- Marmara Sea, costal line of Aegean Sea, Antalya Bay and Iskenderun Bay are considered sensitive.
- Inland waters are considered sensitive if the point of wastewater discharge into a drinking water catchment is closer than 100 kilometres to the drinking water source.
- Other inland waters are normal recipients.
- Black Sea is considered as less sensitive area. Discharges to the lower layer of Bosporus are also considered as discharge to less sensitive areas, as the flow direction here is towards the Black Sea.

The maximum scenario assumed all water bodies designated as sensitive.

Furthermore, the estimation of the investment in additional collection systems is based on the assumption that connection rates to central collection systems are increased to 90% - 95%.

The results regard the estimated investments costs for the minimum and maximum scenarios are presented in Table 4-4.

Table 5-4 Estimated compliance investment costs million EUR in 2004 prices

	Scenario	
	Minimum	Maximum
Collection - Total	4230	4230
Treatment - Total	3424	5387
Totals by category		
>500,000	2747	3690
150,000 - 500,000	535	705
50,000 - 150,000	1062	1372
10,000 - 50,000	1532	1957
2,000 - 10,000	1776	1893
Total	**7652**	**9617**

Source: COWI (2005)

The total compliance investment costs are estimated at between 7.6 and 9.7 billion EUR.

It is very important to note that these compliance costs are those based on the same definition as used for the EU27. **The approximation strategy for Turkey includes also re-investment costs and there the approximation strategy indicates total investment costs for the period 2007 to 2023 at 18 billion EUR.** The approximation strategy assumes the minimum scenario with regards to designation of sensitive areas.

5.28.3 Former Yugoslavian Republic of Macedonia

In the case of Former Yugoslavian Republic of Macedonia, there are limited data available. There are some data on the few wastewater treatment plants currently in place or under construction and combined with population statistics and assumptions on existing connect rates etc, the assessment of the potential compliance investment costs have been carried out.

Table 5-5 Overview of assumptions on agglomeration and collection rates

Agglomeration	Number	PE	Connection rates
2,000-10,000	21	135,003	50%
10,000-100,000	22	754,141	70%
>100,000	2	520,484	80%
Total	**45**	**1,409,628**	**72%**

Source: Government of the Former Yugoslavian Republic of Macedonia (2007)[11], State Statistical Office 2010 and consultant's estimate

Regarding the current level of treatment and the assumption for compliance with the Directive, the following assumptions have been applied.

Table 5-6 Overview of assumptions on agglomeration and collection rates

Agglomeration	No treatment	Secondary treatment	Advanced treatment
2,000-10,000	70,971	11,831	2,302

[11] Government of the Former Yugoslavian Republic of Macedonia (2007) *Operational Programme Regional Development 2007 - 2009*

10,000-100,000	515,655	97,982	21,087
>100,000	398,400	0	101,265
Total	**985,026**	**109,813**	**124,653**

Source: Government of the Former Yugoslavian Republic of Macedonia (2007), State Statistical Office 2010 and consultant's estimate

Two compliance costs scenarios have been estimated: One assuming all areas normal and one assuming sensitive areas. The resulting investment costs are presented in Table 4-7.

Table 5-7 Estimated compliance investment costs in EUR

Agglomeration	Collection systems	Treatment systems	
		All areas normal	All areas sensitive
2,000-10,000	68,760,864	28,581,850	28,581,850
10,000-100,000	194,376,435	95,625,351	206,319,263
>100,000	62,789,240	52,460,656	111,959,221
Total	**325,926,539**	**176,667,857**	**346,860,335**

Source: Consultant's estimate

The total estimated investment costs vary between 500 million EUR and 670 million EUR depending on how many sensitive areas are designated.

It is important to note that these compliance costs are those based on the same definition as used for the EU27. They do not include the need for renovation and rehabilitation of existing infrastructure. The current annual re-investment need based on the cost model approach is estimated to around 13 million EUR.