FEBRUARY 2014
EUROPEAN COMMISSION, DG MARE

The development of the CISE for the surveillance of the EU maritime domain and the related Impact Assessment

PART 2: COMBINED ANALYSIS

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Executive summary

Impact assessment study that supports the establishment of CISE

COWI carried out an impact assessment study in 2013-14 as input to the European Commission, DG MARE's own Impact Assessment of "A Common Information Sharing Environment (CISE) for the surveillance of the EU maritime domain". The impact assessment study was implemented in parallel with several other activities initiated by DG MARE and thus benefited from the advice of the Technical Advisory Group (TAG) and the Member States' Expert sub-Group (MSEsG) on the integration of maritime surveillance, and in particular from the close collaboration with the Cooperation Project that provided valuable estimates of the benefits of improved maritime surveillance.

Overall the results of the study, and thus the input to DG MARE, support the establishment of CISE. The legal analysis shows that it is feasible to define and implement policy options that will create a functioning environment for CISE, and the cost and benefit analysis shows that such policy options are expected to lead to high benefit-cost ratios with significant benefits in the economic, the social as well as in the environmental domain.

Assessment of current situation in the EU maritime domain

The assessment of the likely cost and benefits from CISE was made on the basis of a thorough assessment of the current situation in the EU maritime domain. This assessment took a starting point in the acknowledgement that every day tens of thousands of activities take place in the EU waters. To ensure that these activities take place in a safe manner, and to assess and manage their impact on security, economy, and the marine environment and beyond, there is a critical need for surveillance. This need – hereunder the need for improvement – gives rise to a complex daily reality for the maritime surveillance authorities in their efforts to manage and respond appropriately to associated maritime risks.

Furthermore, COWI benefited from the expertise of the Wise Pens International in conducting an assessment of the situations and events that may negatively affect the EU maritime domain in the coming years. This risk assessment highlights whether and where there is a potential for CISE in reducing such risks. One of the main conclusions is that the maritime risk picture differs across the sources of risks as well as sea basins. For example, security-related risk factors appear to show high diversity among sea basins, while environment-related risks seem more homogenous. The application of a Delphi consultation approach concluded that

maritime risks in the EU maritime domain overall tend to be in the range of "medium to high"; hence identifying room for improvement.

The starting point for CISE is, however, not a situation with no information sharing *within* user communities across Member States or *between* user communities. User communities here refer to maritime safety, fisheries control, marine pollution, customs, border control, general law enforcement, and defence. Indeed, great efforts have already been made with respect to increasing the efficiency of surveillance activities through the collection and exchange of maritime surveillance information (position of ships, cargo data, etc.) between control authorities – including across national borders – *within* the respective maritime surveillance user communities. However, the sharing of surveillance data *between* user communities has not taken place to the same extent. This has led to situations where data that, for example, could be useful to other user communities are not shared, or where several authorities are collecting the same data.

Technical, legal and cultural limitations to informations sharing

The impact assessment study concludes via a scrutiny of the current maritime surveillance systems and cooperation arrangements in the EU maritime domain that there appear to be very few *technical* limitations to obtain a greater degree of information sharing. The *legal* conditions for the sharing of information at the EU level are fragmentised and based upon a primarily sectorial (vertical) approach. In other words, the vast majority of the legal provisions of EU sectorial legislation provide for the sharing of information only *within* the sectors and there are very few provisions allowing expressly for the sharing of information *between* functions. However, this does not necessarily exclude sharing between sectors – i.e. provided that the sharing is not excluded by personal data protection legislation, national rules governing confidentiality, IP rights, etc. The legal complexity nevertheless often results in uncertainties about what information may be shared, with whom and for what purpose. Finally, there are *cultural* factors affecting information sharing. These are much related to the high degree of sectorial thinking that prevails in maritime surveillance – and that is underpinned by sectorial legislation as just underlined. Overall the study concludes that increased information sharing will demand a change in the attitude of maritime surveillance authorities towards a *common interest* in the sea.

EU reason and right to act

The assessment of the current situation in the EU maritime domain and the legal analysis conclude that there is both a reason and a right for the EU to act to improve the sharing of maritime surveillance information. One reason is that CISE is part of the EU regulatory trend based on transnational information networking. The transnational nature of CISE is characterised by the horizontal interaction among national administrations, primarily driven by the synergies of networking. Such an approach corresponds to the European transnational tendencies in information networking as already employed. It encourages the direct interaction among national administrations, and it is a good case of the practical application of the principles of subsidiarity.

Policy options

The next issue is then to select the policy option which provides the best conditions for the Member States to connect to CISE; and thus boost information sharing for the surveillance of the EU maritime domain leading to increased efficiency and cost-effectiveness of maritime operations, hereunder via enhancing the cooperation

between maritime authorities. This translates into selecting the policy option, which best reduces technical limitations via the establishment of an appropriate IT environment, which reduces legal limitations and promotes legal certainty, and which reduces cultural limitations via the establishment of a new culture in purpose-oriented information sharing.

The identification of the preferred policy option was made via the analysis of a number of different options which, in addition to the option of (1) no further EU action, were categorised either as (2) voluntary cooperation or as (3) legally binding options:

- **Policy option 1: No EU action** (baseline scenario) leaves the current approach unchanged. The CISE-specific EU framework will be based on the existing non-binding policy arrangements and the future development of CISE will depend on the Member State and EU agencies' initiatives towards integrating maritime surveillance information sharing systems primarily at national, regional or international levels.

- **Policy option 2: Voluntary cooperation** seeks to implement CISE by employing instruments that stimulate voluntary cooperation between Member States. Policy option 2 is divided into two sub-options:

  - **Sub-option 2.1: Recommendation for the implementation and management of CISE** will provide recommendations, best practices and guidelines on information sharing, administrative practice and cooperation, and technical and operational guidelines.

  - **Sub-option 2.2: Joint undertaking** seeks to institutionalise the voluntary cooperation into a formal structure, which would provide a framework for further activities, encourage and, when appropriate, assist EU Member States to increase maritime surveillance information sharing among user communities and to achieve a more effective and coordinated information sharing.

- **Policy option 3: Legally binding options** seeks to address the CISE objectives by applying legally binding provisions. It comprises also two sub-options:

  - **Sub-option 3.1: Removing legal limitations in sectorial legislation to cross-border and cross-sector information sharing** will identify and remove limitations by legislative acts amending the existing sectorial legislation to the extent necessary for the effective implementation of CISE. This may include the possibility to transfer personal data to certain enumerated functions under the condition that such data are safeguarded in accordance with the principles of protection of the fundamental rights of an individual.

  - **Sub-option 3.2: Introducing a binding CISE framework** aims to introduce a binding legal framework encompassing multiple user communities depending on their legal basis, applicable legislative

procedures, and constitutional opt-ins and opt-outs from the EU Treaties. From a legal perspective, it is foreseen that such a legal framework, split into several umbrella packages, would rely on multiple legal bases.

It is of course also possible to combine voluntary and legal policy options. An analysis of suitable combinations is therefore also included in the impact assessment study.

Architecture visions and policy options

A CISE policy option will in practice be implemented via support of a CISE architecture. A number of architecture visions were developed by DIGIT and DG MARE and evaluated/commented upon by the MSEsG. This led to the preference for a "hybrid vision" based on multiple providers of CISE services, coordinated by Member States and user communities. Similarly, the analysis of the CISE policy options led to a preference for the hybrid vision as being the most suitable to support the implementation of each of the options.

Analysis of impacts of policy options

The analysis of the impacts of the CISE policy options was done from a top-down as well as a bottom-up approach. The top-down approach was primarily based on information collected via a questionnaire survey with maritime stakeholders in the Member States, via interviews with selected stakeholders, and via literature reviews – hereunder the two pilot projects: BluemassMed and MARSUNO. The bottom-up approach, which was the main approach, was based on estimates provided by the Cooperation Project of cost savings and other benefits for a number of different use cases of information sharing. Since this latter analysis was case-based it did not cover every possible situation by which CISE can provide benefits. Hence, the reported results are denoted as *minimum benefits*.

Cost estimates for CISE were mainly provided by Gartner. These estimates cover the development and maintenance of the necessary information exchange standards and IT components and the interconnection of existing EU sector-specific systems as well as existing Member State systems. Furthermore, the cost estimates include non-IT elements such as personnel, electricity and floor space. Gartner estimates that the total cost of CISE over a *ten year period* will be between MEUR 67.6 and MEUR 115.7.

CISE does not lead to any significant additional administrative burdens. The core of CISE and the preferred mix of policy options (see below) build upon already existing legislative measures, agreements and voluntary cooperation between relevant authorities. This implies that the administrative activities related to CISE will be business as usual costs.

Benefit estimates for CISE distinguish, as already mentioned, between cost savings and other benefits which include economic, social and environmental benefits. Cost savings cover, for example, a reduction of data duplication resulting from cross-sectorial information sources, or a rationalisation in the deployment of surveillance assets such as ships and aircrafts. As such, cost savings belong to the group of economic benefits, which also include estimates of the value to society from a reduction in smuggled and counterfeit goods entering the EU markets. Social benefits from CISE include a better handling of irregular immigration, a reduction in casualties at sea from fewer maritime accidents, and a reduction in the

socioeconomic consequences from fewer drugs and weapons entering the EU. Finally, environmental benefits mainly arise from reductions in the costs of oil spills and other discharges.

The benefit estimates for the different economic, social and environmental impacts of CISE – based on the findings of the Cooperation Project – lead to a total *full potential benefit* estimate in the order of magnitude between MEUR 162.7 and 179 *per year*, where *potential* means that the estimates are derived under the assumption that there are no limitations to information sharing in the different use cases. The cost saving potential accrues to between MEUR 40.1 and 44.1 per year while the value of economic, environmental and social impacts amount to between MEUR 122.6 and 164.9 per year. As mentioned above, these estimates are calculated using a *minimum benefit* approach, and it should in this context be noted that the Cooperation Project estimates even more optimistic CISE benefit scenarios. These higher benefit estimates strengthens the case for investing in CISE put forward by this impact assessment study.

Benefit-cost ratios were then – as shown in the below table – estimated for the different CISE policy options. These estimates are based on assumptions about how much of the *potential* additional amount of maritime surveillance information (which currently is not shared) will *actually* be shared as a result of the implementation of a given policy option. Furthermore, the cost and benefit estimates for the *ten year period* assume that the implementation of CISE takes time and so both costs and benefits increase over time.

The table shows that all CISE policy options are expected to deliver high benefit-cost ratios. This ratio is as high as 4.65 for Option 2.2: voluntary cooperation via joint undertaking, slightly higher than that for the policy mix. However, the highest benefits are assessed to come from the policy mix – which also in absolute terms has the largest difference between benefits and cost. The policy mix is therefore considered the preferred option. The lowest benefit-cost ratio is expected for the "White Paper" option – since a major part of the cost here is a fixed cost that needs to be covered equally by the benefits of all policy options.

There is an almost even distribution among economic, social and environmental benefits – although with the highest benefits in the social domain. However, it must in this context be emphasised that the estimates only include the benefits that were selected by the Cooperation Project and only those that could be quantified. Hence, other economic benefits; such as higher income to the shipping industry from safer EU waters, additional social benefits; such as local job opportunities, and environmental benefits; such as reduced chemical pollution, should be kept in mind when assessing the added value of CISE. This said, the calculations call for the implementation of CISE even without considering these additional benefits.

Total costs, cost savings and impacts [other benefits] (in MEUR, from 2014-2023) of policy options, and performance ratios

	Policy Option 1: No EU action	"White Paper"	Option 2.1	Option 2.2	Option 3.1	Option 3.2	"Technical Regulations"	Policy mix: "White Paper" + 2.1 + 2.2 + 3.1
Key measures (MEUR)								
Total cost (TCO)	0	60	75	106	86	86	86	133
Cost saving	0	37	75	122	94	94	94	151
Impact	0	114	228	373	286	286	286	460
Total benefit	0	151	303	495	380	380	380	611
- economic benefit	0	45	90	146	112	112	112	181
- social benefit	0	50	101	165	126	126	126	203
- environmental benefit	0	56	112	184	141	141	141	227
Performance ratios								
Cost-saving/TCO	0	0.62	1.00	1.15	1.09	1.09	1.09	1.14
Impact/TCO	0	1.88	3.05	3.51	3.34	3.34	3.34	3.47
Total benefit/TCO	0	2.50	4.05	4.65	4.43	4.43	4.43	4.61

Source: COWI calculations.
Note: The two options: "White Paper" and "Technical Regulations" which are included in the Impact Assessment produced by DG MARE have for consistency been included in the presentation of the calculations. Hence, for a description of these please consult the DG MARE IA report.

Conclusion: the study results support the establishment of CISE

In conclusion, the impact assessment study supports the establishment of CISE. The assessment of the current situation in the EU maritime domain and the legal analysis conclude that there is a reason for EU to act to improve the sharing of maritime surveillance information – and there is a right to act. Hence, it is concluded that it is feasible to define and implement policy options that will create a functioning environment for CISE. Furthermore, all relevant CISE policy options are assessed to deliver high benefit-cost ratios. Finally, it is concluded that the preferred policy option for CISE is a mix of voluntary and legal measures.

1 Introduction

Purpose of Part 2

The purpose of Part 2 of the impact assessment study is to present in detail the likely impacts of establishing a Common Information Sharing Environment (CISE) for the surveillance of the EU maritime domain.

Hence, Part 2 can be said to be written for the reader who wants to understand in detail how the impacts of CISE have been measured.

Structure of Part 2

Part 2 is structured according to the requirements of the EC (2009) Impact Assessment Guidelines; although it starts with a description of the methodology applied for assessing the impacts:

- Chapter 2 provides insight into how we have got from the problem definition to assessing the impact of CISE policy options – i.e. the intervention logic. Furthermore, we explain how we have measured the impacts either quantitatively or semi-quantitatively, but also some impacts in a more qualitative manner.

- Chapter 3 comprises the first actual section in an impact assessment report – i.e. a description of procedural issues and results from consultation of interested parties. Here, it should be emphasised that most of these activities have taken place outside this impact assessment study, e.g. the Technical Advisory Group (TAG) and the Member State Expert sub-Group (MSEsG) meetings have been taken care of by DG MARE. Hence, we focus here on how we have been engaged in supporting this consultation process.

- Chapter 4 contains the problem definition, where it should be emphasised (as also presented in Part 1) that much work on describing the background for the CISE initiative has already been done or is on-going. Hence, the refinements of the problem definition made concern mainly the formulations of the problems so that they are suitable for the formulations of objectives and of policy options.

- Chapter 5 presents the objectives for CISE – i.e. the overall objectives of ensuring the fundamental conditions for sustainable growth and the protection of EU maritime interests and the more specific and specific objectives that stem from the problems and that are directly addressed by the policy options.

- Chapter 6 then presents the different policy options for the implementation of CISE – i.e. the different ways for the EU to act to achieve the objectives and thus to overcome existing limitations to the sharing of maritime surveillance information.

- Chapter 7 is the most comprehensive chapter of the report. It presents the calculations of the likely impact measures – i.e. costs and benefits – of the different CISE policy options.

- Chapter 8 then compares the impacts of the CISE policy options in order to point out the option with the highest benefit/cost ratio.

- Chapter 9 finally suggests brief directions for how to carry out monitoring and evaluation of the CISE implementation – i.e. the core indicators to measure and the possible monitoring and evaluation arrangements to do so.

2 Methodology

Intervention logic and impacts of CISE

The description of the methodology applied for assessing the impacts of CISE is divided into two sections. In the first section, we briefly describe the intervention logic method of how we progress from defining the problems to analysing the impact of CISE in reducing these problems. In the second section, we explain how we have measured the impacts of CISE.

The implementation of the two pieces of methodology is, however, highly interlinked. This is because the assessment of the impacts of CISE is largely based on a bottom-up-approach where the benefit estimates, but also some cost estimates, draw on the analysis of different use cases/situations where CISE is considered to deliver high benefits. This angle has been chosen because it has shown to be infeasible to rely only on measures based on macro-based data/information sources. In addition, this approach ensures that the description of the intervention logic method reflects the variety of impacts that CISE may have.

2.1 Intervention logic

Intervention logics for impact assessment and for use cases

With the chosen angle of analysing use cases as part of assessing the impacts of CISE, we have in practice worked with two logics of intervention – one for the overall impact assessment and one (or in principle more) for the different use cases that shows the benefits of CISE. However, the two logics are mutually consistent.

The method of two logics is illustrated in Table 2-1, while the actual results of implementing the different elements of the method are presented in the respective chapters – i.e. the respective items of an impact assessment. We have not included the item of procedural issues and results from the consultation of interested parties separately in the logics because this item is included in the other items.

The table shows, obviously, that the descriptions of the elements are more general for the overall impact assessment than for the use cases. Hence, the overall problem of risks of events/threats related to maritime surveillance is for the use cases narrowed down to one or a few risks. Similarly, the general notion of lack of information sharing and cooperation is narrowed down to concern specific information flows.

Table 2-1 Intervention logics

Element in intervention logic	Impact assessment	Use case/situation
Problem definition	Risks of events/threats related to maritime surveillance are in general high and likely to change over time. Lack of information sharing and cooperation across user communities and borders between relevant authorities acting for the surveillance of the EU maritime domain – due to technical, legal and/or cultural limitations. EU added value from EU action is not fully exploited.	Specific maritime risk(s) covered by the use case. Gap between demand and supply regarding information flows within the case, - hereunder across user communities and borders – due to technical limitations of the applied maritime information services, but also due to legal and/or cultural limitations.
Objectives	Overall objective of sustainable growth and protection of EU maritime interests. General objective of boosting information sharing, of improving the effectiveness and the cost-efficiency of integrated maritime surveillance, and of enhancing cooperation between maritime surveillance authorities. Specific objective of legal certainty and reducing legal and other limitations, of defining an appropriate organisational and IT environment, and of establishing a new culture of purpose-oriented information sharing.	Overall objective of reducing the specific risk(s) and so achieve wider economic, social and environmental benefits. General objective of cost-savings in information gathering and sharing, of cost-savings in the use of maritime surveillance assets, and of enhancing response capabilities and surveillance outcomes. Specific objective of overcoming technical, legal and cultural limitations.
Policy options	Policy option 1 of no EU action. Policy option 2.1 of measures based on voluntary cooperation: recommendation ("CISE Handbook"). Policy option 2.2 of measures based on voluntary cooperation: joint undertaking. Policy option 3.1 of legally binding measures: removing legal limitations. Policy option 3.2 of legally binding measures: introducing a binding legal framework. Policy option 3.3 of legally binding measures: imposing a set of binding obligations.	Requirements to CISE in order to reduce the technical, legal and/or cultural limitations and so to (partly) close the gap between the demand and supply regarding the specific information flows and to improve cooperation.
Analysis of impacts of policy options	Assessment of the likely economic, social and environmental impacts of the policy options, hereunder of the administrative complexity – in an EU-wide perspective, but with specification of particular user communities or regions being affected.	Assessment of how CISE by reducing the technical, legal and/or cultural limitations may lead to outputs such as cost-savings and enhanced surveillance outcomes, that in turn may lead to wider economic, social and environmental benefits.
Comparing the options	Ranking of the policy options according to their benefit/cost ratio.	Discussion of which of the six policy options would be the best suited way to deal with the specific technical, legal and/or cultural limitations.

The objectives presented in the two columns of the table should be and are very similar – i.e. that the general objectives focus on the wider economic, social and environmental benefits, that the specific objectives focus on effectiveness and efficiency, and that the specific objectives focus on overcoming technical, legal and cultural limitations.

In turn, the descriptions of how CISE may be implemented to achieve the objectives differ between the two columns. While the impact assessment (study) analyses the impacts of a number of policy options that contain different degrees of

non-binding and binding requirements, the use cases are more specific regarding the need for CISE to reduce concrete technical, legal and/or cultural limitations.

However, these differences in the descriptions of how CISE may improve the sharing of maritime surveillance information have no serious consequences for the use of the assessments of impacts for the use cases within the overall impact assessment. The minor challenge has just been to assess which of the policy options would be the right way to deal with the concrete technical, legal and/or cultural limitations identified for a given use case.

2.2 Measuring impacts

Ensuring consistency in practice

The use of different angles for assessing impacts and so the application of different ways of measuring impacts gives rise to a need to ensure consistency in practice. In this section, we describe how we made this feasible, partly by applying a consistent framework for specifying and linking outputs and impacts of improved information sharing and partly by measuring the outputs and impacts in a way so that the measures from the different angles can be combined.

2.2.1 Measuring costs and benefits

Information sources

The first part of the methodology for measuring the costs and benefits of CISE concerns the establishment of a consistent analytical framework. A large part of this framework was already established in the methodology for the baseline – presented in Part 1 of this impact assessment study. Hence, these results together with the EC (2009) Impact Assessment Guidelines comprise the main information sources.

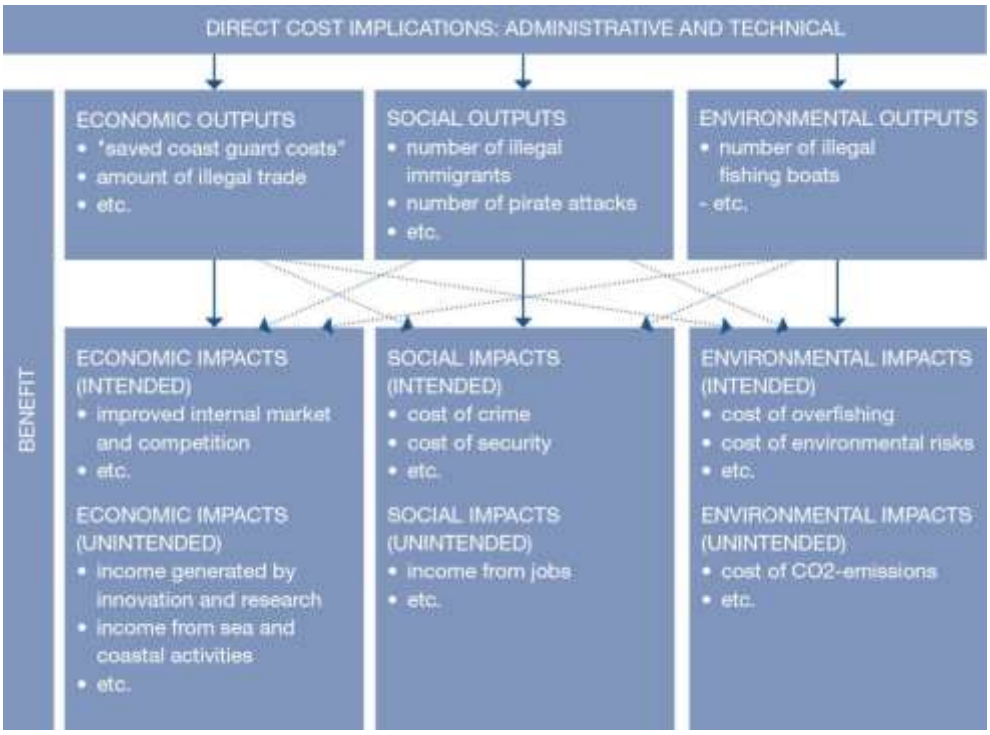
Furthermore, the analytical framework has been inspired by other comparable analyses in the literature, such as the EC (2011) Impact Assessment behind establishing EUROSUR.

Cost and benefit indicators

As presented in Part 1, we distinguish for the cost and benefit indicators between outputs and impacts. This is because improvements to maritime surveillance – due to CISE – will imply that the user communities will improve the performance of their maritime functions, which will lead to both direct and indirect results.

The economic, social and environmental outputs are the changes that may occur, as CISE will improve the performance of maritime functions through more adequate, more relevant, more reliable and timelier information. For example, the maritime functions may become better at avoiding: illegal trade (economic dimension), illegal immigration (social dimension), and illegal fishing (environmental dimension). The selection of these outputs has been steered by the results of the risk assessment and the baseline analysis in general that was presented in Part 1. These outputs may further lead to impacts such as improved market conditions, lower cost of crime, and lower cost of overfishing. Figure 2-1 serves to illustrate different examples of outputs and impacts.

Figure 2-1 Outputs and impacts



Efficiency and cost-effectiveness

The outputs can be divided into improvements with respect to efficiency and with respect to cost-effectiveness. Efficiency concerns the fact that better information sharing may enhance the response capabilities of the relevant maritime authorities by creating a better overview of maritime information available, by interconnecting information systems from various sectors and thus ensuring adequate and secure data exchange, and by creating fundamental interoperability conditions. Efficiency concerns also the enhancement of surveillance outcomes, such as enhancing the success rate in preventing, detecting and intervening on risks such as illegal trade, illegal immigration, and illegal fishing. It also concerns improving the basis for better policy-making, i.e. that enhanced maritime knowledge will allow for more sound political decisions such as law-making in anti-smuggling and trafficking activities, maritime traffic monitoring, marine environment protection, fisheries control, etc.

Cost-effectiveness concerns cost savings in information gathering and sharing – e.g. a reduction of data duplication resulting from cross-sectorial information sources, and cost savings in the use of assets – e.g. information exchange and better coordination between maritime authorities may lead to a rationalisation in the deployment of assets such as ships and aircrafts.

Intended and unintended impacts

Figure 2-1 shows that we distinguish between intended and unintended impacts in line with the EC Impact Assessment Guidelines:

› Intended impacts are those we measure to assess the success in pursuing goals that are closely linked to the EU maritime domain and that are directly affected by the achievement of the outputs.

- Unintended impacts are i.e. (major) indirect positive or negative changes from improved maritime functions (surveillance) that should be considered when choosing the CISE policy option – e.g. in terms of reducing illegal immigration, the unintended impacts could be lower costs of immigrant-related crime and job market distortions.

Furthermore, as indicated in Figure 2-1, we have monetary measures (i.e. Euro) in mind when assessing impacts. This makes them comparable with the cost measures. As discussed in more detail below, it is not always feasible to provide monetary impact measures, and so alternative measures are pursued.

Baseline

The measuring of changes to the above cost and benefit indicators, due to the improvements CISE will bring, takes as its starting point the baseline presented in Part 1. As presented below, the baselines for the bottom-up-approach measures are more specific and targeted to the use cases and consequently need to be further developed.

Limitations to information sharing

Similarly, the improvements from CISE will emerge as a consequence of policy options and technical investments that will reduce limitations to information sharing – i.e. the analysis takes as its starting point the technical, legal and cultural limitations introduced in the baseline in Part 1. Again, this limitation analysis is more specific and targeted to the situations/use cases, but is respecting the binding data protection requirements ensured by the Charter of Fundamental Rights. This issue is also illustrated by the intervention logics presented in Table 2-1.

Impacts of CISE

In all the analysis approaches, the assessment of impacts involves assessments of how CISE (policy options) changes the baseline values of one or more output indicators, and how these in turn will lead to changes in the baseline values of one or more impact indicators. Furthermore, all angles will - to the extent feasible - focus on the output and impact indicators presented in Part 1.

The change in the value of a given output indicator depends on the potential improvement in the output – i.e. if all technical, legal and/or cultural limitations are removed, and so depends also on the number of limitations actually removed by a given CISE policy option. A percentage change in an output value will vary in between situations/use cases – depending on the potential for improvement and the success of CISE in reaping the benefits of this improvement. Note that in practice, a percentage change in an output value may be determined as a combination of the likelihood of the output occurring and the size of the output if it occurs.

The changes in the values of the impacts indicators that are linked to the given impact indicator are simply assumed to resemble that of the output indicators – e.g. if CISE implies an increase in the value of the given output indicators by 10%, the linked impact indicator values are also assumed to increase by 10%. In practice, this approach requires that we have monetary measures (i.e. Euro) of the impact indicators in the baseline – i.e. also for the specific baselines for the situations/use cases. This is not always feasible and therefore we make use of a scoring system for these impact indicators, comparing the performance in the baseline, i.e. without CISE, with the performance with CISE. Actually, for comparison reasons, we do apply scores for the measurable impact indicators. In practice, the assessment of

the impacts is a combination of quantitative and semi-quantitative measures, and in many cases these are complemented by more qualitative views.

2.2.2 Measuring bottom-up

Information sources

The second part of the methodology for measuring the cost and benefits of CISE describes how to derive bottom-up estimates – i.e. via the analysis of use cases. The strength of the bottom-up approach is that it is considered the best way of obtaining good and understandable estimates of the many different and specific benefits of CISE. The main information source for this is the Cooperation Project, supplemented with findings from our own interviews with maritime stakeholders. Hence, a large part of information consists of expert assessments made by maritime experts from most of the EU coastal Member States.

Through the involvement of numerous maritime surveillance experts, the Cooperation Project provides a number of use cases where CISE in particular is envisaged to give high benefits by improving sharing of maritime surveillance information. In addition, these use cases have been subject to concrete cost benefit analyses using our guidance (EC, 2013a), and in this way the Cooperation Project has directly provided estimates of impacts of CISE used in this Impact Assessment study. It should be emphasised that the estimates – made use of in Chapter 6 – are based on preliminary findings because the Cooperation Project has continued its work beyond the timing of this report.

Our own interviews with maritime stakeholders can rightly be argued to resemble the approach of the Cooperation Project in the sense that a central part of the interviews focuses on obtaining the assessment of the interviewees of the situations/use cases where CISE may give the highest benefits. Again, the reason for the approach is its envisaged strength in obtaining good and understandable benefits.

In addition to the above two information sources, we try to learn from similar bottom-up experiences in the literature. For example, the BluemassMed and MARSUNO pilot projects present some specific cases, although we do consider them as "mini-CISEs" and so their experiences are more useful for the top-down approach presented in the next section.

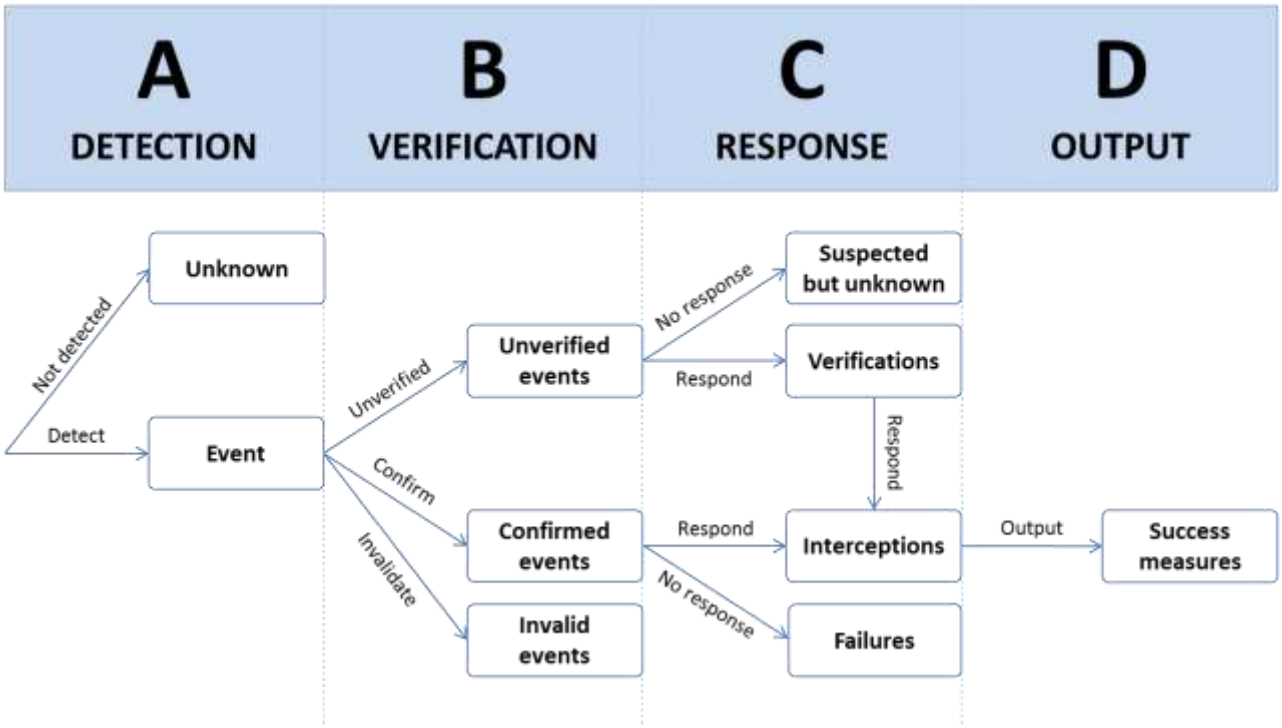
Cost and benefit indicators

Being specific use cases, the output and impact indicators analysed are limited to the relevant ones, but they are still a subset of the overall list of indicators presented for the baseline in Part 1. The use cases will relate to the risk assessment of the likely evolution of maritime surveillance related events/risks – also presented in Part 1– in order to represent issues of high importance.

The maritime experts involved in the Cooperation Project as well as those being interviewed do have specific insights into maritime surveillance performance in the context of detecting and verifying events at sea. This insight is exploited within the analysed use cases to understand the performance without and with CISE respectively, and through this, the implications of the change in performance for the other output and impact indicators.

Figure 2-2 attempts to illustrate such a generic approach to measuring maritime surveillance performance – an illustration that is also useful for understanding which elements of maritime surveillance and so which limitations to information sharing that CISE may address – and that has not least been valuable as a basis for the information gathering in stakeholder interview process. For clarification, it should be noted that the figure attempts to capture performance increases not only with respect to i.e. number in detected or confirmed events, but also with respect to the processes (arrows); e.g. improved risk analysis leading to detections/confirmations and better targeting of inspections.

Figure 2-2 Generic approach to measuring maritime surveillance performance



Note: The notation "event" in the above figure should be seen as a broad representation of events at sea, i.e. including suspicious activities, incidents, threats, etc.

Baseline

To continue from above, a specific baseline for a use case thus takes its starting point in the relevant maritime surveillance performance and in a description of maritime surveillance information exchanged/shared at present (or could be so with benefit).

The representativeness/frequency of the different use cases are specified in order to understand which part of the EU maritime domain they represent and so how the results can be used in the process of estimating EU-level results. This involves the specification of the values of the output – and if feasible the impact – indicators for the given part of the EU maritime domain.

Limitations to information sharing

The next step is to specify the existing technical, legal and/or cultural limitations to inadequate information sharing in the baseline. Although, the use cases developed by the Cooperation Project (Work Package 2) specify a number of failures in maritime operations and the outcomes of these failures and the conditions leading to them, there has been a need within Work Package 3 to translate them into

technical, legal and/or cultural limitations so that they can be addressed by the CISE policy options.

Regarding our own interviews with maritime stakeholders, we acknowledged that it was difficult for such stakeholders to put forward situations where they do not experience that performance is optimal at present. Hence, we have adopted an approach with the following two legs. Firstly, we ask for situations where the sharing of maritime surveillance information have led to benefits and where certain limitations have been reduced – i.e. situations that CISE may be able promote in areas not directly covered by the given situation. Secondly, we confront the interviewees with a number of hypotheses where we believe that there is a potential for improving information sharing, in particular across user communities and across borders.

Impacts of CISE

Table 2-2 illustrates the types of information sharing hypotheses that were presented to the interviewees in order to get estimates of the possible impacts of CISE. The table below focuses on the performance indicators introduced in Figure 2-2 above.

Table 2-2 Output/performance indicators and information sharing hypotheses

Output/performance indicator	Information sharing hypothesis
Unknowns	The number of **unknowns** is by definition unknown. However, anticipations or guesstimates can provide a ballpark figure as to the magnitude of the problem. › Better information sharing can enhance the awareness picture and lower the unknowns.
Events	The number of **events** provides a measure of the "scope of surveillance." › Better information sharing can increase the range of events to survey for suspicions, as well as the speed by which such suspicions can be detected.
Unverified events	The number of **unverified events** provides a measure of the "likely but unknown" problem, which surveillance information has not been able to verify and where additional action/response is required. › Better information sharing can lower the number of unverified events.
Invalidated events	The number of **invalidated events** provides a measure of the efficiency of maritime surveillance functions in verifying the number of confirmed events. › Better information sharing can lead to quicker and surer invalidations.
Confirmed events	The number of **confirmed events** provides a measure of the "known and visible" problems as well as the basis to which the surveillance function must be able to respond. › Better information sharing can lead to an increase in the number of detected events.
Interceptions	The number of **interceptions** provides a measure for assessing how well the surveillance function is currently dealing with the risk. › Better information sharing can lead to an increase in the number of interdictions.
Outputs (success measures)	The **output** indicator provides measures for the performance of interceptions; such as number of saved (and alive) illegal immigrants, drug seizures, etc. › Better information sharing can lead to higher performance measures, i.e. due to quicker response times.

Thus for a given situation of maritime surveillance/operation, interviewees have been confronted with the above possible better information sharing elements, and asked whether there is a role for CISE in making this information sharing feasible. Furthermore, they were asked to assess the impact of improved information sharing on the other relevant output indicators (and possibly impact indicators) such as illegal trade, illegal immigration, illegal fishing, etc.

For the use cases analysed by the Cooperation Project, each of the specified output indicators was assessed in terms of potential if all limitations to information sharing were eliminated. This assessment was combined with an assessment of how much of this potential is likely to be realised via the different CISE policy options.

2.2.3 Measuring top-down

Information sources

The third part of the methodology for measuring the cost and benefits of CISE explores how more general information and views on the added value of CISE can be utilised – i.e. the derivation of estimates top-down.

The strength of the top-down approach is that it provides higher-level findings than the above lower-level (bottom-up) findings from the situations/use cases and so the benefit measures are more comparable with the cost estimates provided by Gartner. Furthermore, these higher-level findings are valuable for the scaling up of the situation/use case results to EU-level estimates.

Information sources comprise – in addition to the risk assessment and the official statistics and literature presented in Part 1– a Member State questionnaire survey, interviews with the maritime stakeholders that also contributed to the bottom-up approach, and results of the pilot projects: BluemassMed and MARSUNO (Maritime Surveillance in the Northern Sea Basins).

Cost and benefit indicators

To a large extent, the cost and benefit indicators analysed are those presented in Part 1, which are also mainly those addressed in the bottom-up approach.

The main new indicators are the cost indicators coming from the Gartner technical costing study. These include the capital and operational expenditures for the different CISE architecture visions – in particular the costs for the selected vision in combination with the different policy options. The time profiles of the technical costing estimates are also provided. Furthermore, the Gartner study provides some insight into technical difficulties regarding the implementation of the visions in practice.

From the questionnaire survey, we have also some – although limited in amount and quality – information on the cost of maritime surveillance. Furthermore, the survey covers the potential benefits in Member States from improved routine tasks, targeted operations, and response operations respectively, and it distinguishes between better response capabilities, better surveillance outcomes, and better policy-making, and between cost-savings with respect to information gathering and with respect to the use of assets. Finally, the survey covers indicators for the wider potential economic, social, and environmental impacts.

Baseline

We acknowledge that the CISE is not a ‘greenfield’ investment, but that Member States and the EU have invested – and are continuing to do so – in maritime surveillance, and that integration across user communities within borders is becoming a reality as is the interconnection with EU systems. Indeed, some EU agencies already play a considerable role in facilitating inter and intra user community exchange of information. Furthermore, integration across user communities, across borders is emerging as legal, cultural and technical limitations are being reduced.

In any case, even without CISE – given the evolution of risks – Member States will have to invest and do more.

In practice, we work with three broad categories of Member States that are expected to connect to CISE differently. Some Member States have already established an environment for information sharing across sectors ('national CISE') – these are likely to connect to CISE via one single interface. Other Member States have a few systems (2-3) that already cover many/all user communities, albeit without being fully integrated – these may opt for connecting its few main systems to CISE via interfaces. Finally, in some Member States maritime surveillance is carried out via several separate systems – these may be connected to CISE either through a national node or through as many interfaces as there are systems.

Limitations to information sharing

The legal analysis presented in Part 1 provides our overall analysis of the legal limitations to information sharing. This analysis has been complemented by the Gartner report, which mainly addresses the technical limitations to information sharing, and by the results of the questionnaire survey and the workshops/ interviews.

The questionnaire survey sheds in particular light on the limitations to the information sharing across user communities – both across borders and within borders. The survey distinguishes between legal, cultural, and technical limitations, and between limitations to receive or provide maritime surveillance information.

Similarly, the workshops/interviews distinguish between legal, cultural, and technical limitations, but they go more into detail about reasons for the limitations, such as protection of personal data or of commercially sensitive data, and explore the possible effects of these limitations.

Impacts of CISE

As described above, the assessment of the impacts of CISE starts from the analysis of use cases/situations within the bottom-up approach. In this context, the top-down information is particularly valuable for the scaling up of the results to EU-level estimates. This said more overall findings in the literature on the value of information sharing are also useful. Furthermore, as presented in Part 1, the valuation of the quantifiable impacts is made using widely acknowledged unit values for economic, social, and environmental impacts.

2.2.4 Combining cost and benefit measures

Information sources

The information sources used when combining the measures derived from the bottom-up and top-down approaches are those presented above. This combination of the cost and benefit measures are presented when comparing the options in Chapter 8.

However, it should be emphasised that, as part of the collaboration with the Cooperation Project, we carried out an expert survey among all Cooperation Project participants (i.e. participants of all work packages), partly to gather information that helps assess to which extent the events described in the use cases can be related to specific maritime risks, partly to see how these events and risks are distributed across the different sea basins.

Cost and benefit indicators

Hence, the cost and benefit indicators are the same as those analysed through the above two approaches.

Baseline

The additional survey results combined with the information sources described above comprise the combined baseline information.

Limitations to information sharing

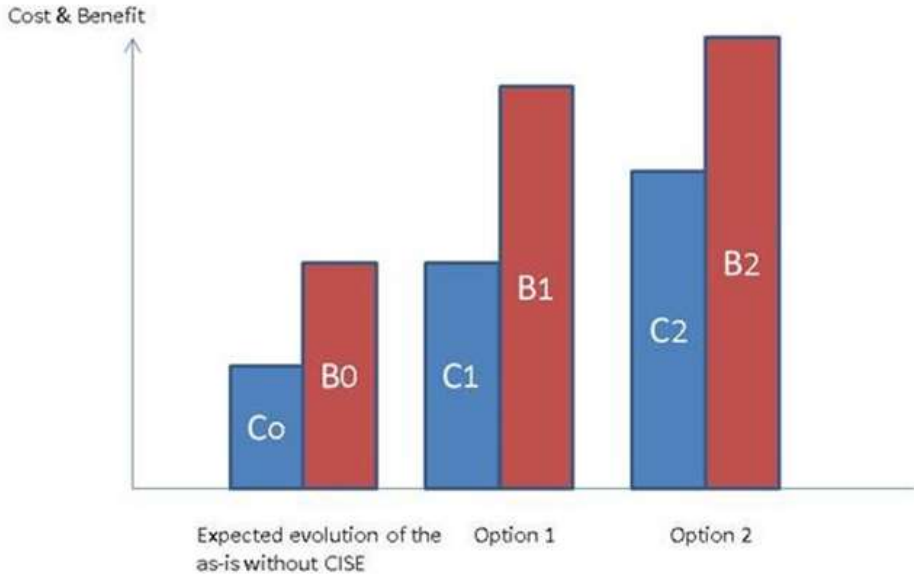
Similarly, the analysis of the limitations to information sharing are combined in order to provide an overall estimate of the extent of the limitations – i.e. an estimate made by looking at the limitations from a number of different angles.

Impacts of CISE

The combined analysis of the impacts of CISE differs, somewhat from the above two approaches. While we relied on the views of the maritime experts and on facts and figures, we have - in order to get to an overall or single estimate of the cost and benefits - had to judge for ourselves which estimates would best serve the project.

Again, it should be emphasised that we make much use of an example-based approach where we assess how much of the different examples of the added value of CISE contributes to the coverage of the cost of CISE. Hence, if we can find a sufficient number of such additional values to cover the cost of CISE, then the recommendation will be to establish CISE. However, as illustrated in Figure 2-3, it is not that straightforward – partly because cost and benefits of the sharing of maritime surveillance information will evolve even without CISE, and partly because there are different options for the establishment of CISE, with different cost and benefit profiles.

Figure 2-3 Illustration of cost and benefits without and with (two options) CISE



Furthermore, we do acknowledge that both the cost and benefit estimates are connected with much uncertainty, and so we carry out a number of sensitivity analyses in order to assess how much these estimates may change.

Finally, we do acknowledge that a number of the benefits can only be assessed in a qualitative manner. We do also discuss these and explain how they may contribute to a recommendation of the establishment of CISE.

3 Procedural issues and results from consultation of interested parties

3.1.1 Identification

Impact Assessment supporting study

This is a study carried out by COWI in support of the Impact Assessment on "a common information sharing environment for the EU maritime domain" carried out by DG MARE. Hence in practice, many of the consultation activities have been taken care of by DG MARE but with input from us, e.g. the Technical Advisory Group (TAG) and the Member State Expert sub-Group (MSEsG). Furthermore, this report is not a complete impact assessment, but it follows the structure of an impact assessment report.

Objective of the impact assessment

The objective of this impact assessment is to provide an analysis of the options for EU action to implement CISE aiming at:

- analysing the need for EU action
- determining the most suitable policy option and delivery instrument for this action.

3.1.2 Organisation and timing

Contract between DG MARE and COWI

The contract between COWI and the Commission DG MARE was signed on 19 September 2012 for an initial duration of 12 months. The scope of the study was extended by a contract amendment signed on 16 June 2013 and the duration of the assignment subsequently extended until February 2014 to accommodate for this change in scope.

Organisation in DG MARE

An Impact Assessment Steering Group was created in the Commission in June 2012 and has met on regular basis following both this study and the overall Impact Assessment. The steering group met with COWI for the meeting as defined in the ToR, and it was consulted for the approval of respective deliverables.

The Impact Assessment Steering Group was composed of following DGs: Legal Service (SJ), Secretariat-General (SG), Directorate-General for Mobility and Transports (MOVE), Directorate-General for Home Affairs (HOME), Directorate-

General for Justice (JUST), Directorate-General for Taxation and Customs Union (TAXUD), Directorate-General for Humanitarian Aid (ECHO), Directorate-General for Communication Networks, Content and Technology (CNECT), Directorate-General for Informatics (DIGIT), European Anti-Fraud Office (OLAF), Joint Research Centre (JRC) and European External Action Service (EEAS).

3.1.3 Consultation and expertise

The study has been implemented and coordinated in the context of several other parallel activities initiated by the European Commission (DG MARE) and in consultation with the European Council, European Parliament the Member States and relevant stakeholders in the maritime surveillance domain.

The Commission has initiated specific studies on issues related to CISE in support of this impact assessment, inter alia a study on the IT cost of implementing CISE by Gartner and this study to assess the overall impact of CISE. In addition, the DG MARE carried out internally a study in close cooperation with DG DIGIT on CISE architecture visions and possible governance structures.

The Technical Advisory Group (TAG) and the Member States Experts sub-Group (MSEsG) on the integration of maritime surveillance were also established in the CISE context and widely consulted during the execution of this study as well as the later established Cooperation Project.

Stakeholders were closely involved in the process both prior to this study and after its implementation. The following is an outline of the involvement of the different stakeholders.

EU institutions

The Council of the European Union, the European Parliament and the European Economic and Social Committee have provided support to the CISE project through inter alia the following initiatives:

- In 2012, European Ministers called for the CISE project to be operational by 2020 in the so called "Limassol declaration".
- Since 2008, the Council has issued a number of Council conclusions in support of the CISE project.
- In 2010 and 2012, the European Parliament called on the European Union to create a common information sharing environment in a Resolution on the Integrated Maritime Policy of the EU and to invest meaningfully in further developing the CISE framework, in a report on the maritime dimension of the Common Security and Defence Policy.
- European Economic and Social Committee issued a favourable Opinion on the 2010 Communication by the Commission on CISE referred to above.

Public consultation

The purpose of the public consultation process is to receive opinions, inputs and comments from the public. The target groups were citizens, organisations and

public authorities that in one way or another consider that they have an interest in maritime surveillance.

The Commission conducted the public consultation using the Interactive Policy-Making (IPM) tool. This system facilitates the stakeholder consultation process with a user friendly interphase and online questionnaires. The questionnaires were made available on the web portal "Your voice in Europe" being the single access point for European Commission consultations.

The three-month public consultation was launched on 14 June 2013 ending on 14 September 2013. Observations from the public consultation have been reviewed when presenting the final impacts assessment study results, but have also been documented in a separate report.

MSEsG

The Member State Expert sub-Group (MSEsG) on Integrated Maritime Surveillance was established in September 2009 and met 11 times to date (October 2013). The purpose of this expert group is to discuss and provide political guidance on maritime surveillance in general and on the CISE project in particular. This group involves representatives from all EU and EEA Member States. All relevant EU Agencies are also invited to participate in this work: the European Maritime Safety Agency (EMSA) (transport), the European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the EU (FRONTEX), the European Environmental Agency (EEA), European Police Office (EUROPOL), the European Fisheries Control Agency (EFCA), the European Satellite Centre (EUSC) and the European Defence Agency (EDA).

TAG

The Technical Advisory Group (TAG) on integrated of maritime surveillance was established in November 2010 and met 15 times to date (October 2013). The purpose is to obtain technical guidance from the different user communities on the CISE project. TAG is composed of national experts representing the seven sectorial user communities, as well as representatives from all the above mentioned European agencies. Each TAG member has the task to liaise with counterparts from all involved countries inside his/her sector, to ensure as wide representation as possible.

A team of experts from COWI have presented and discussed preliminary findings of this study with TAG and MSEsG several times.

Two pilot projects

Two CISE pilot projects: BluemassMed and MARSUNO were launched in 2010 and finalised in 2012. The purpose of these pilot projects was to test the feasibility of CISE in practice, in two sea areas, the Mediterranean Sea including its Atlantic approaches and the Northern Sea basins. Together these projects involved 14 EU Countries, Norway, and Russia as an observer, with 61 participating authorities representing all seven sectors. Both projects provided encouraging final conclusions which have been taken into account in this impact assessment.

Cooperation project

The Cooperation Project is a follow up project to BluemassMed and MARSUNO, involving 43 public authorities from 12 Member States and Norway. Five EU Agencies are associated to this project. The project work focus on a number of practical use cases, aiming at examining a number of operational, technical,

economic and legal issues of relevance for the establishment of CISE. The stakeholder participation in this project continues to be high. COWI experts have been extensively involved in all relevant Cooperation project work packages.

Member States survey

In addition to the public consultation mentioned above, a specific survey targeted the Member States was conducted. The survey served as input to the impact assessment and took place between May 2013 and June 2013.The questionnaire was sent to participants of the MSEsG who, for the purpose of this survey, were identified as contact points for Member States and participating EEA States. Of 23 coastal states 13 provided responses.

Member State interviews and workshops

To support the impact assessment study, and substantiate the answers provided to the MSEsG survey, we also conducted a number of interviews/workshops with both Member States and EU agencies. The meetings typically took place as full-day focus groups with representatives from all user communities. However, not all user communities were represented in all Member States. The focus group format of the meetings nonetheless led to good discussions between the sectors on the questions that were addressed, and many of the participants knew the other (non-represented) sectors quite well. A total of 7 Member States were interviewed, namely: Finland, France, Germany, Portugal, Italy, United Kingdom and Spain (nine Member States were approached, Sweden and Romania have not materialised in country visits).

4 Problem definition

4.1 Policy context

The policy context of CISE is a mixture of sectorial initiatives directly targeting the maritime area and horizontal initiatives targeting the overall growth and job creation in Europe. This also includes e.g. the Digital Agenda for Europe launched as one of the 7 flagships initiated by the Europe 2020 strategy.

The CISE project is intended to be built on current achievements and the existing mechanisms for information sharing which have already been developed at sector level. The purpose will be to ensure the interoperability of sector systems without reinventing any wheels but to streamline over time and reduce administrative burden. This is to realise the full potential of existing resources primarily in terms of sectorial policy achievements, but also better cross-sectorial knowledge of occurrences in particular sea basins and to create new business opportunities.

Blue Growth initiative

Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. It recognises that seas and oceans are drivers for the European economy with great potential for innovation and growth. It is the Integrated Maritime Policy's contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth.

The 'blue' economy represents 5.4 million jobs and a gross added value of just under EUR 500 billion a year. However, further growth is possible in a number of areas which are highlighted within the strategy.

The strategy consists of three components:

1. Specific integrated maritime policy measures

2. Sea basin strategies to ensure the most appropriate mix of measures to promote sustainable growth that take into account local climatic, oceanographic, economic, cultural and social factors;

3. Targeted approach towards specific activities: (aquaculture, coastal tourism, marine biotechnology, ocean energy and seabed mining).

The specific integrated maritime policy measures are substantiated in three concrete initiatives where CISE is one of them.

- Marine knowledge to improve access to information about the sea
- Maritime spatial planning to ensure an efficient and sustainable management of activities at sea
- Integrated maritime surveillance to give authorities a better picture of what is happening at sea (CISE).

The concrete initiatives are all interlinked and the linkages are described in detail in the Blue Growth Communication (COM(2012) 494 final).

Marine Strategy Framework Directive

The aim of the European Union's ambitious Marine Strategy Framework Directive (adopted in June 2008) is to protect more effectively the marine environment across Europe. It aims to achieve good environmental status of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. The Marine Strategy Framework Directive constitutes the vital environmental component of the Union's future maritime policy, designed to achieve the full economic potential of oceans and seas in harmony with the marine environment.

The Marine Strategy Framework Directive establishes European Marine Regions on the basis of geographical and environmental criteria. Each Member State - cooperating with other Member States and non-EU countries within a marine region - are required to develop strategies for their marine waters.

Especially the concrete obligations to cooperate are a building block in CISE where the exchange of information facilitates a better operational and strategic execution of tasks.

Horizontal EU-wide initiatives - ICT

Furthermore, the project is fully in line with a number of other EU wide initiatives such as the Digital Agenda for Europe (one of the flagship initiatives of the Europe 2020 Strategy) where seamless cross-domain and cross-border information exchanges are a priority for the EU.

The CISE initiative facilitates Pillar I - Digital Single Market, Pillar II - improving standard-setting procedures and increased interoperability and Pillar VII - IT-enabled benefits for the EU society. The Digital Agenda for Europe contains 101 concrete actions of which many have already been accomplished. However what is extremely relevant for almost all future activities in the ICT sector is the innovative use of data. CISE holds the potential to act as a “pilot” case for how large quantities of data can be used both in direct operations but also for an overall improvement of the quality of services that maritime authorities offer to the commercial operators in the maritime domain.

The ISA Programme aiming at fostering interoperability between public administrations. The CISE project has been funded as relevant action in the Trusted Information Exchange area.

Last but not least, the CISE initiative is in line with the European Interoperability Framework (EIF), which is promoting and supporting the delivery of European public services by fostering cross-border and cross-sectorial interoperability. Especially the EIF will play a significant role in an efficient implementation of the CISE Architecture Vision.

Complex maritime surveillance operations …

Every day, tens of thousands of activities take place in the EU waters. To ensure that these activities take place in a safe manner and to assess and manage their impact on security, economy, marine environment and beyond, there is a critical need for surveillance of the activities. This need – and hereunder the need for improvement – gives rise to a complex daily reality for the maritime surveillance authorities as illustrated by the following examples:

- A sailing ship smuggling drugs and arms is approaching the EU from the Atlantic Ocean. It may enter the EU at any place along its coastline reaching from the Gulf of Finland, the Baltic Sea, the North Sea, the Irish Sea, the Atlantic, and the Mediterranean to the Black Sea. Customs authorities along these coasts may be in a difficult position to detect the smuggling unless receiving appropriate hints from partner authorities as to the nature of the smuggling, the name of the ship, her destination and her time of arrival. Customs need to communicate with authorities from different sectors across the EU to increase their efficiency. While today communication works very well between customs authorities of different countries, communication between customs and other sectors, such as police, border guards, transport authorities and navies, however, needs to be improved or even established.

- Commercial cargo ships, carrying about 70% of the trade between the EU and the rest of the world, are under regular threat of pirate attacks and need protection. At high seas, away from European coasts, this protection can mainly be provided by navies. However, cooperation between navies and the commercial transport community needs to be developed. The operation 'Atalanta' at the Horn of Africa protecting commercial vessels from pirate attacks is, however, a promising example of cooperation, on which to build in the future.

  Irregular migrants are often abandoned with almost no fuel or drinking water in vulnerable boats that are difficult to detect in the middle of the (Mediterranean) sea. These people may either enter the EU illegally or may lose their lives at sea if not detected and saved by combined efforts through radar and satellite images, patrol planes and vessels from border guards, navies, coast guards and even fisheries or environmental control authorities. However, communication and cooperation possibilities between authorities from different sectors are in certain cases even partially forbidden by law.

… give rise to a need for sharing of maritime surveillance information …

The actors of maritime surveillance consist of about 400 public authorities, mainly at Member State level but also at EU level, carrying out seven maritime surveillance-related functions. Great efforts have already been made with respect to the collection and exchange of maritime surveillance information (position of ships, cargo data, etc.) by control authorities and within specific maritime surveillance user communities – of which we distinguish between the following

seven: Maritime safety, Fisheries Control, Marine Pollution, Customs, Border Control, General Law Enforcement, and Defence – and to increasing the efficiency of surveillance activities with the existing means available, including cross-border cooperation.

However, the sharing of surveillance data *between* user communities has not taken place to the same extent. This has led to situations where data which would be useful to other user communities are not shared or where the same data are collected by several authorities.

… and so rise to EU encouraging sharing of maritime surveillance information

Although progress has been made in this direction since the launch of EU's **Integrated Maritime Policy** (IMP) in 2007 (EC, 2007), which has highlighted integrated maritime surveillance as an important cross-cutting tool, more needs to be done. The IMP targets safety and security at sea alongside sustainable growth. In this context, it pursues synergies among the maritime user communities, e.g. via the development of cross-cutting policy tools. In EC (2007), the Commission actually committed itself to taking "steps towards a more interoperable surveillance system to bring together existing monitoring and tracking systems used for maritime safety and security, protection of the marine environment, fisheries control, control of external borders and other law enforcement activities".

The IMP commitment was followed up by the "**Guiding principles Communication**" (EC, 2009a), which spells out the principles for the development of a Common Information Sharing Environment (CISE), and so it launched a process towards its establishment. The Communication states the need for a clear legal framework and provides, as presented in Box 4-1, an understanding of what CISE stands for.

Box 4-1 Common Information Sharing Environment (CISE)

The different components of the Common Information Sharing Environment (CISE) should be understood as follows:

'Common': As the information is to be shared between the different user communities, data used for this information should be collected only once.

'Information' must enable user-defined situational awareness. Coming from disparate user communities, information should be identifiable, accessible, understandable and usable. Processing such information with the appropriate security safeguards must be ensured.

'Sharing' means that each community receives but also provides information based on previously agreed standards and procedures.

'**Environment'** refers to interconnected sectorial information systems that allow users to build up their specific situational awareness pictures, which enable them to identify trends and detect anomalies and threats.

Guiding principles and recommendations to act according to them are developed in the Communication. These are briefly mentioned here together with their respective recommendations in order to emphasise that they are applied as important and basic working principles:

Guiding principles	***Recommendation***
Interlinking	No data duplication; interoperability across EU user communities; national coordination; international and regional cooperation.
Technical framework	Technical framework; interoperability and common standards; EU agencies.
Civilian-military	Enhanced coordination; better use of surveillance tools; space-generated data
Legal provision	Clear legal framework defining the nature of data, the capability of data provider, the purpose of exchange and the potential recipient; safeguards and protection of personal data and take into account legal provisions at EU level; the data for military, state security and criminal law enforcement may be addressed on an ad hoc basis, consequently, additional safeguards will be required.

Sources: EC (2009a), EC (2009b).

As already mentioned, in parallel, two **pilot projects** to test how maritime surveillance information sharing can take place in practice were launched in 2009. BluemassMed (FEI, 2012) tested information sharing in the Mediterranean and the Atlantic sea basins, while MARSUNO (2011) covered the Northern European sea basins.

In 2010, the Commission (EC, 2010) presented a **Draft Roadmap** on the establishment of a Common Information Sharing Environment for maritime surveillance. As presented in Table 4-1, this Roadmap sets out six steps deemed indispensable to establish CISE.

Table 4-1 Draft Roadmap: steps and status towards development of CISE

Step	Description	Status
1	Identify user communities	User communities have been identified according to seven maritime "functions": maritime safety, fisheries control, marine pollution, customs, border control, general law enforcement and defence. About 400 potential members (public authorities) have been identified.
2	Map data sets and identify gaps in information exchange	Members from Step 1 have identified available data sets. Some 500 data sets have been identified. Between 40-90% of these data sets are not made systematically available.
3	Establish common grounds for data exchange	It has been identified that most data should be exchanged at a non-classified level, but with special arrangements for data that are of sensitive nature. Only little data needs to be classified.
4	Develop supporting technical framework for exchange	A preliminary study is in progress that investigates existing data exchange technologies. A solid understanding of the diversity of the different existing and forthcoming IT tools provides the basis for proposing possible IT choices that allow for the interlinking of these systems in a decentralised manner.
5	Establish data access rights of users	Undergoing investigations of the relevance of structuring data into "purpose oriented data package services" with pre-defined access rights based on the maritime missions across the seven user communities.
6	Ensure respect of legal provisions	Mapping of requirements for necessary legal provisions to allow lawful data exchange is being conducted.

Source: EC (2010).

The next Commission step was to initiate an **Impact Assessment** – with input from this impact assessment study – prior to submitting a proposal to the Council and the European Parliament for the implementation of CISE. Hence, it is envisaged that the Impact Assessment will support a **White Paper,** which will define the role of the various institutional players in setting it up and proposing suitable instruments for this purpose.

4.2 Problems

Baseline and policy context

The problems addressed by this impact assessment study via its analysis of objectives and policy options below have been discussed in detail in Part 1; and they are also reflected upon in the policy context description presented above. The following problem formulation is therefore largely a concise version of this analysis.

4.2.1 Problem formulation

Potential for CISE added value

The problem formulation is based on the analysis of the current situation of maritime surveillance, and the risks that Member States are facing; along with the expected future developments in these risks. As presented in Box 4-2, there is room for improvement of present limitations to information sharing.

Box 4-2 Problem formulation

The assessment of **risks** shows that the risk picture differs both across risk sources but also across basins. Different basins appear (in general) to be affected by different types of risk at varying levels (ranging from low to high). Security-related factors appear to show higher diversity, while environment-related ones seem more homogenous. At the same time, the same can be said about the possible impact of the risk to the EU, which however tends to be more in the medium range. When using these parameters to estimate "danger" levels, the experts seem to be inclined towards a "medium to high" risk picture.

The analysis of **maritime surveillance systems and cooperation** reveals a complex daily reality for the maritime surveillance authorities where many illegal activities in the EU waters could be better responded to – particularly if the sharing of maritime surveillance information and cooperation across the seven user communities and across borders was improved.

It has been assessed that there is presently a gap of between 40% and 90% between the supply and the demand for additional data exchange across the various user communities depending on the area, that 45% of the currently collected information is collected by more than one user community, and that about 80% of the existing information is in national ownership. Moreover, almost half of the information that is gathered today is owned by two sectors, namely defence and maritime safety, and it should be emphasised that not all data are exchanged on a regular basis.

However, it should also be emphasised that the sharing of information across user communities, as well as across borders, is no "greenfield" as a significant and evolving information sharing infrastructure is already in place on which CISE can be built. This said the Member States are on different levels regarding the design and extensiveness of their national maritime surveillance setups – and so on different levels of preparedness for connecting to CISE. Furthermore, there are differences in limitations to data access between user communities, although they all experience technical, legal and cultural limitations, and although these limitations are higher across Member States than with Member States.

The **legal** analysis revealed that the legal conditions for the sharing of maritime surveillance information are at EU level fragmentised and rely on a sectorial (vertical) approach. The vast majority of the legal provisions of sectorial legislation provide for the sharing of information only within the sectors and there are very few provisions allowing expressly for the sharing of information across functions. This does not necessarily exclude the sharing across sectors, provided that the sharing is not excluded by the applicable personal data protection legislation, national rules governing confidentiality, IP rights, etc. The legal complexity however often results in legal uncertainty as to what information may be shared, with whom and for what purpose.

In conclusion, currently a number of problems need to be addressed by CISE, including **technical, legal and cultural limitations** that need to be overcome.

4.2.2 Accelerating and decelerating factors for information sharing and cooperation

Changing problem situation

The problem formulation described above – or rather the problem situation – is not static and may evolve over the coming years. Due to various trends, some problems may increase and others may decrease. This could have an effect on the added value potential that can be ascribed to the CISE, and could also affect the choice and appropriateness of the different policy options.

Changing information sharing and cooperation

It is anticipated that the sharing of maritime surveillance information and cooperation will develop even without the establishment of CISE. In other words, it is likely that the uptake of information sharing and cooperation activities will increase – across user communities and across borders – even without CISE, which will help solve some of the above problems. It is important to consider this when analysing the cost and benefits of the different policy options.

A number of accelerating and decelerating factors for such uptake of information sharing and cooperation are summarised in the following. The findings are derived from a number of workshops attended by maritime authorities in selected Member States and by EU agencies, as well as from reviewing the literature such as the BluemassMed (FEI, 2012) and MARSUNO (2011) reports.

Table 4-2 shows rough scores – provided by COWI – for the identified accelerating and decelerating factors influencing information sharing and cooperation. It shows that there are more decelerating factors than accelerating ones. However, as these factors and their scores cannot be directly related to each other, and as some factors could be argued to be interlinked with others, this does not mean that the sharing of information and cooperation will decrease. Nonetheless, it strongly indicates that full uptake of information sharing and cooperation will not happen in the current situation; meaning that the above problems not will be adequately solved.

Table 4-2 Accelerating and decelerating factors for uptake of information sharing and cooperation

Accelerating factors		**Decelerating factors**	
Information sharing trends and awareness	++	Lack of common rules, standardisations and definitions	---
National Resource constraints	+++	Traditional thinking, limiting habits and unawareness	---
Shared data needs	++	Lack of common understanding, goals and language	-
Emergence of an information sharing culture	++	Lack of trust	---
Technical developments	++	Uncertainties regarding future funding of EU systems	--
		Lack of will in politics and processes	--
		Organisational differences	---
		Protection of personal data	--
		No legal obligation to share across sectors	---
		Lack of connections between EU systems	--

Source: Assessments by COWI.
Note: -/+: minor factor; --/++: moderate factor; ---/+++: significant factor.

Accelerating factors

Information sharing trends and awareness

Currently, there is a trend of establishing cross-sectorial information sharing environments within Member States; some have already done this, others are working towards this end – albeit with some Member States still having far to go. Implementing a national CISE is a lengthy process, particularly with respect to establishing the underlying framework, governance and responsibility structures.

There is also growing awareness that data gathering and maritime surveillance are entering a new era. A central driver for this development has been resource constraints and so the seeking of efficiency gains. Furthermore, in some countries increased cooperation and willingness to share information has started a move away from response-oriented surveillance to anticipation and prediction systems. i.e. forcing authorities to do "smart surveillance" that involves the sharing of information – both information which may already be recorded but not shared, and information that are not yet recorded - in formats for easy sharing and usage.

National resource constraints

So far, the above trend of increasing information sharing has been very much driven by increasing national resource constraints. With limited and even dwindling resources, authorities have been forced to find ways of saving money while still doing their job. In many cases, this has resulted and continues to result in the sharing of both surveillance information, and physical assets and equipment.

Shared data needs

National authorities have specific functions and competences and work traditionally independently towards their goals; also in terms of fulfilling data needs. This still tend to limit the amount of data sharing that potentially could take place; i.e. by combining systems and databases. Increasing awareness of other authorities' data needs will probably trigger data sharing with the most obvious overlapping interests– even without CISE, but CISE would enhance and quicken the process.

Emergence of an information sharing culture

Although detections and responses are often local, there is growing awareness that the impacts of non-detecting or non-responding locally tend to have global impacts. Pilot projects such as the BluemassMed and MARSUNO have demonstrated that the efforts undertaken to share information have not stopped with the end of the projects. User communities have for instance been increasingly connected both within and across Member States, and systems have been connected, e.g. the Spanish and French navies. Malta and Greece connected through the Portuguese node.

Technical developments

At present, the maritime surveillance authorities (e.g. border control authorities) in some Member States have basic IT equipment, limited software and, in several cases, no internet connection and are thereby limited in their means of communication with other surveillance authorities. This is, however, likely to improve in the future independently of whether CISE is implemented.

Decelerating factors

Lack of common rules, standardisation and definitions

Many issues regarding information sharing across national environments relate to lack of rules, standardisations, and definitions and generally also to the lack of a common language. In some Member States, these limitations have largely been overcome (such as in Finland and the UK). In other countries such as Italy, significant efforts have been put into paving the way; but much work is still needed.

There is an unfulfilled need for Member States to work together at the international level. Many Member States, however, feel that they cannot go the extra mile. As just mentioned, this is both due to the lack of rules standardisations and definitions in an EU setting; but it is also a question of the resources at the disposal of the various authorities. From this perspective, there is a need for CISE to build an environment from which Member States can proceed; and it is be anticipated that additional cross-sectorial information exchanges across Member States will be limited without CISE.

Traditional thinking, limiting habits and unawareness

Many authorities state that they are content with the maritime surveillance systems that they are using. However, this is not necessarily a reflection of the fact that the systems work well. In many cases, it reflects the fact that the authorities do not

know – or do not want to know – about other options, i.e. by being open towards other authorities and sharing information.

Lack of common understanding, goals and language

According to some Member States, one of the challenges of going beyond national CISE environments to cross-border CISE is the lack of a common vision, objectives and goals. Without such commonality, it will be more difficult to establish a common language and a culture which can drive the political will and foundation for cross-sectorial and cross-border data sharing. It may be easier to establish such commonalities for regions/sea basins than for the EU as a whole because the Member States adjacent to sea basins have common interests.

Lack of trust

Trust is a key issue for information sharing. Surveillance authorities are generally protective of the information collected within their own community. Historical domination of specific areas, such as defence controlling the sea, can bring difficulty in accepting that other organisations have responsibilities in the same areas.

Uncertainties regarding future funding

There are uncertainties about the future development of existing or planned information sharing initiatives and platforms on both national and EU level (e.g. EUROSUR). In the coming years, these initiatives and platforms may face a drop in funding, which would have a significant impact on their development.

Lack of will in politics and processes

There are examples where the political will is not strong enough to overcome the limitations which hinder the establishment of a new system, or cooperative sharing arrangement, even if there is a need for it. One example is an authority using a system developed by another authority, with great benefits. Political issues within the authority, however, meant that the system was abandoned with the result that the authority reverted to email and phone to exchange information.

Also, maritime surveillance is often associated with strict job/task roles. The authorities allocate often little effort in going beyond these, which can hinder the sharing of information. Broad interpretation of legal limitations (e.g. classification of information, commercial confidentiality, etc.) to information sharing often leads to a refusal to share information. A change in attitude is required to overcome this; i.e. the establishment of the principle of responsibility to share maritime surveillance information.

Organisational differences

Currently, differences in organisational setups between Member States make it more difficult to establish a system for efficient data sharing between some authorities. This was demonstrated in the BluemassMed project where Italy's information exchange collaboration mainly took place with Spain (and to some extent Portugal). Only little information was shared with France because of a very complex organisation on the French side.

Furthermore, differences in competences among information sharing partners make it difficult to share information beyond "basic data". In these cases, time and efforts are needed to establish a foundation for sharing more sensitive data. This was demonstrated in the BluemassMed project with the result that only fake sensitive data was shared for testing purposes, and where some authorities did not participate with their main information exchange systems.

Generally, it is difficult to reach common ground on legal issues as the law allows for many different interpretations.

Protection of personal data

The sharing of personal data is subject to specific limitations imposed by the data protection legislation. The data protection legislation is based on the *need to know* principle and in effect limits the possibilities to share personal data across-functions. Also the principle of purpose-limitation restricts the processing (i.e. any operation or set of operations which is performed upon personal data unless there is a specified, explicit and legitimate purpose (Art. 6(1)(b) of Directive 95/46/EC) and limits the further processing of such data. These limitations are established in relation to the fundamental rights of the citizens in Europe, and it is unlikely that the on-going revision of the data protection legislation will bring any changes to the current regime as regards a less restrictive interpretation of personal data. Measures to comply with the data protection legislation may nonetheless be introduced, but it is unlikely that this will happen without CISE.

No legal obligation to share across sectors

The current EU legislative framework has virtually no obligations to share information across sectors, and there are no indications of the establishment of such obligations without CISE.

As of January 2010, Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fishery policy opened the possibility to share VMS, AIS and VDS data with four other user communities. So far, this legislative example has not been followed by other user communities, and there are no indications that similar initiatives will follow in the future. The recent proposal for a EUROSUR Regulation foresees cooperation with e.g. other relevant EU agencies (i.e. also across sectors), but only provides a formal legal framework for the sharing of information between the national coordination centres.

Lack of connections between EU systems

Despite of certain sector and data interconnection developments, the majority of EU systems such as SafeSeaNet, LRIT, CleanSeaNet, EUROSUR, etc. remain sectorial and unconnected. Also, they are not seen as being able to accommodate data needs; but they are part of the solution. The level of services remains low, and expanding the current systems will be very expensive. Also, there are many data gaps, and they are not necessarily good systems for exchanging data; e.g. some Member States see SafeSeaNet more as a system that they provide information to rather than a system from which they gather information.

5 Objectives

EU policy objectives and EU action

The analysis in the previous chapter concludes that there are problems regarding the lack of sharing of maritime surveillance information that call for EU action – in particular across user communities and across borders. In this context, it is assessed that CISE will become an integral part of the EU Integrated Maritime Policy, based on the recognition that all matters relating to Europe's waters are interlinked, and that sea-related policies must develop in a joined-up way.[1] As part of the policy, the improvement and optimisation of maritime surveillance activities and interoperability at European level are important for Europe to meet the challenges and threats relating to safety of navigation, marine pollution, law enforcement and overall security.

Drivers, problems and objectives

As presented in Table 5-1, the above problem definition has, been transformed into objectives that can be interpreted as future solutions to the problems (see also the intervention logic presented in Table 2-1).

The **drivers** behind the technical, legal and cultural limitations give rise to the focal problem of lack of information sharing and cooperation across user communities and across borders. This focal problem is underpinned by the assessment that risks of events/threats related to maritime surveillance in general are high and likely to change over time, and that EU added value from EU action is not fully exploited.

The **specific objectives** of CISE are also directly linked to the drivers. Hence, it is a direct objective to (i) reduce the technical limitations via the establishment of an appropriate IT environment, (ii) reduce the legal limitations and promote legal certainty, and (iii) reduce the cultural limitations via the establishment of a new culture in purpose-oriented information sharing. The specific objectives are directly addressed by the policy options (see the next chapter).

[1] Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee and the Committee of the Regions, An Integrated Maritime Policy for the European Union, COM(2007) 574 final.

These specific objectives also relate to the **general objectives** of establishing the preconditions for the Member States to connect to CISE and so to boost information sharing for the surveillance of the EU maritime domain, which will lead to efficiency and cost-effectiveness via integrated maritime surveillance, hereunder via enhancing cooperation between maritime authorities.

The resulting improvement in the performance of maritime surveillance activities will finally contribute to the **overall objective** of sustainable growth and protection of EU maritime interests.

Table 5-1 Drivers, problems and objectives and how they relate to each other

Drivers	Problems	Objectives	Description
Administrative **cultures** and traditions are dominated by sectorial thinking. Many **technical** solutions are user community specific and not always suited for immediate integration with the systems of other functions or countries. **Legal** limitations constrain restrain the ability of Member States to provide the legal conditions to enable information sharing across sectors and vis-à-vis other countries. ***Increased demands on surveillance and increased budgetary constraints.***	**Lack of information sharing and co-operation** across user communities and borders between relevant authorities acting for the surveillance of the EU maritime domain. Risks of events/threats related to maritime surveillance are in general high and likely to change over time. Added value from EU action is not fully exploited.	**Overall objective** of sustainable growth and protection of EU maritime interests.	**Relation to the problem** Through CISE, maritime surveillance can respond to increased future surveillance needs in an efficient and cost-effective manner, and harvest possible synergy effects; and thereby contribute to sustainable growth and protection of the EU maritime interests.
		General objective of boosting information sharing for the surveillance of the EU maritime domain of the efficiency and the cost-effectiveness of integrated maritime surveillance of enhancing cooperation between maritime authorities.	**Relation to the overall objective** Through closing information gaps – via CISE – the effectiveness of maritime surveillance will be enhanced thereby contributing to sustainable growth and better protection of EU maritime interests. Through CISE, overlaps in information collection and excess parallel purchase and operation of equipment can be avoided thereby improving cost-effectiveness and contributing to better use of surveillance resources.
		Specific objective of reducing technical limitations of reducing legal limitations of reducing cultural limitations.	**Relation to the general objective** The specific objectives all specifically address the different drivers: The legal and the operational (IT) environment are necessary conditions for the CISE: - Establishing legal certainty and the appropriate enabling environment in legal terms is a pre-conditions for Member States to connect to CISE - An appropriate IT environment provides for the necessary operational/implementation environment Whereas the establishment of a new culture in information sharing provides for the awareness, incentives and/or obligations that are to ultimately generate the demand for the system and the data to feed it.

6 Policy options

6.1 Policy measures

Operational objectives and policy measures

The previous chapter presented the specific objectives to be addressed by policy options. A first step in the process of designing these policy options is to identify appropriate policy measures in order to make CISE a functioning environment for information sharing. Table 6-1 lists these policy measures organised according to the specific objectives, which they mostly support – i.e. they may also relate to the other objectives, but to a lesser degree.

The table shows that a broad set of policy measures, having the potential to address the specific objectives, has been drafted. These policy measures incorporate a broad range of policy instruments that can be implemented at EU level from softer instruments, such as recommendations or guidelines, to legally binding acts (Section 6.4). None of the measures presented would be able to tackle all the various problems/drivers/objectives in a satisfactory manner alone. Accordingly, the policy measures are combined into policy options (see below), which constitute viable policy alternatives for achieving the objectives. This does not, however, exclude the possibility of combining the different policy options into viable policy packages.

Table 6-1 Specific objectives and policy measures

Specific objectives	Policy measures
Reduce legal limitations and promote legal certainty	Remove legal limitations by allowing the transfer of maritime surveillance information to certain enumerated functions Safeguard the protection of personal data, confidentiality, IP rights and the use of data when data is being shared through the CISE environment Establish the principle of responsibility to share as a legal obligation
Reduce technical limitations via the establishment of an appropriate IT environment	Define a common information exchange model Provide for common data classification levels and access rights Provide for a catalogue of datasets and information services Define a messaging protocol and potentially the service discovery specifications and correlation and fusion rules Provide framework for semantic and technical interoperability agreements Provide financial support to establishment of IT environment
Reduce cultural and administrative limitations via the establishment of a new culture in purpose-oriented information sharing	Define CISE principles based on responsibility to share and need to know principles Support the entering into agreements between maritime surveillance authorities regarding terms and conditions of information sharing Provide financial support to facilitate cooperation and joint operations

6.2 Selected policy options

Selection process …

The policy options presented here have been selected through a stepwise process. In the first step, a broad range of policy options was developed. In the second step, some of these policy options were discarded from further analysis. In developing and screening the policy options for CISE, the following criteria were employed:

a) **Effectiveness** criterion includes two perspectives: the problem statement and the objective. From the problem statement perspective, the development of CISE policy options entails the assessment of the ability of the different options to achieve the specific objectives and to meet stakeholder requirements. Hence, the options should address the CISE objectives: reduce legal, technical, administrative and cultural barriers.

b) **Efficiency** focuses on the ease of implementation of each of the policy options and includes the various requirements to realise the policy option. This also includes the level of political/administrative resistance, but also considerations of transposition and compliance.

c) **Coherence with general EU law principles and fundamental rights** includes the assessment of the proportionality and subsidiarity of the policy

options employing the proportionality and subsidiarity test, the assessment of compatibility with fundamental rights[2] and the coherence of the options with overarching EU policy objectives.

… leading to three overall policy options

Deploying the methodology outlined above, the following policy options have been developed and assessed in detail: Option 1: no EU action, Option 2: options based on voluntary cooperation, and Option 3: legally binding options. All of these options aim at achieving the specific objectives, as described above. They differ, however, in the intensity of intervention and the degree of prescriptive detail.

6.2.1 Option 1: No EU action

The no EU action contains in principle two sub-options: the discontinuation of existing EU action and the no further action at EU level, i.e. the no policy change (baseline scenario).[3] However, since the former option (discontinuation of existing EU action) would be *ineffective* to achieve the objectives outlined in Chapter 5 and even runs counter to the developments already made and the existing national trends towards cross-sectorial information sharing, it was not selected for further consideration.

Policy Option1: No EU action (baseline scenario)

This option would leave the current approach unchanged. The baseline scenario is described in detail in Part 1. The CISE EU framework will be based on the existing non-binding policy instruments as described in section 6.4.1. The future development of CISE would depend on the Member States' and EU agencies' initiatives towards integrating marine surveillance information sharing systems primarily at national, regional or international levels.

Should no further coordinated action at EU level be taken, the different steps identified in the 2010 CISE Roadmap[4] would continue to be implemented in a non-coherent manner. The existing problems, as identified in Chapter 4 would remain insufficiently addressed since no clear rules would exist on the criteria for the implementation of the individual steps as well as the scope of the principle of responsibility to share maritime surveillance information.

6.2.2 Option 2: Options based on voluntary cooperation[5]

The success of the voluntary measures in pursuing the objectives depends on the willingness and facilitation of the different actors to participate. Voluntary measures, unlike legislation, may provide more responsiveness and flexibility as

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[2] Communication from the Commission, Compliance with the Charter of Fundamental Rights in Commission legislative proposals, COM(2005) 172 final.
[3] Impact assessment guidelines, SEC(2009) 92, section 7.
[4] COM(2010) 584 final.
[5] The following section refers to legal measures, which are adopted via binding procedures, however when referring to voluntary measures what is meant is the CISE related implementation as voluntary and not necessarily the adoption of the measure.

they can be established and altered more quickly than legislation. On the other hand, there is a limit to what can be achieved by measures based on voluntary cooperation. This applies in terms of overcoming existing legal limitations, assuring coherent implementation, but also as to the degree of uptake on information sharing. This policy option can be divided into the following sub-options:

Option 2.1: Recommendation for the implementation and management of CISE ("CISE Handbook")

A "handbook" for the implementation and management of CISE may provide recommendations, best practices on information sharing and technical and operational guidelines. Such handbook may be formally adopted by the Commission in the form of a Recommendation, relying on the legal basis of Article 292 TFEU. The handbook may:

- encourage Member States' maritime surveillance authorities to exchange information across borders and across user communities. This may in effect increase cooperation among authorities on a voluntary basis
- define best practices for information sharing
- provide a standard form for the conclusion of a Memorandum of Understanding (MoU) among the Member States' maritime surveillance authorities regarding the conditions for information sharing and the use of the data shared[6]
- address administrative practice in a coordinated manner by providing guidelines to help Member States and other CISE stakeholders to interpret and apply specific provisions of EU legislation. This may, in turn stimulate changes in national legislation in situations, when such contains provisions, which are more stringent in comparison with the legislation on EU level
- provide technical and operational guidance.

Option 2.2: Joint undertaking

The voluntary approach may be formally founded as a joint undertaking (Art. 187 TFEU). Such undertaking may provide a framework for further activities, encourage and, when appropriate, assist EU Member States to increase maritime surveillance information sharing among user communities and to achieve a more effective and coordinated information sharing. A joint undertaking is typically established by a Regulation. Such Regulation is adopted on a proposal from the Commission and after consulting the European Parliament and the Economic and Social Committee, relying on the legal basis in Art. 188 TFEU.

A joint undertaking may be formally introduced e.g. by a Communication from the Commission setting the goals for the next phase of the CISE initiative. Such Communication may include a commitment to propose amendments to the existing

[6] Examples of MoUs and agreements are described in detail in the individual analysis (part 1) sections 4.4.5-4.4.12

sectorial legislation: to make such legislation in line with the CISE Principles and to remove limitations to maritime surveillance information sharing when the need for such amendment is substantiated by the members of the joint undertaking. This policy sub-option may therefore also be perceived as a step in the overall CISE development; contributing, on the one hand, to overcoming cultural limitations and, on the other hand, to providing a basis for future legislative changes.

The advantage of a joint undertaking is the flexibility such arrangement offers. This includes the scope, governance, funding (regarding both the Member States' and EU's contribution) and the duration of the undertaking. It would also allow defining the individual Members' roles in specific agreements, which may be for that purpose concluded with the joint undertaking. This would allow taking into account specific national prerogatives or other interests at both the Member State and the user community levels. The formal functioning of the undertaking would be governed by the undertaking's internal statutes, which could be amended according to the procedure agreed between the undertaking's Members.

A joint undertaking would, however, not provide for a mandatory legal regime governing CISE nor be able to remove existing legal limitations to cross-sector or cross-border information sharing. However, it could allow for a formal agreement between the signing parties to proceed with sharing of information and collaboration in addition to what is already foreseen at the present time. In any case, it would have the potential of stimulating cross-sectorial and cross-border information sharing in the areas, where the sharing of information is not excluded.

6.2.3 Option 3: Legally binding options

This policy option seeks to address the CISE objectives by applying legally binding provisions. It includes the following sub-options:

Option 3.1: Removing legal limitations in sectorial legislation to cross-border and cross-sector information sharing

In this sub-option, the identified legal limitations will be removed by legislative acts amending the existing sectorial legislation to the extent necessary for the effective implementation of CISE This may include the possibility to transfer personal data to certain enumerated functions under the condition that such data are safeguarded in accordance with the principles of protection of the fundamental rights of an individual.

It is envisaged that the amending acts will rely on the existing sectorial mandates and include an express delegation to the Commission (Art. 290 TFEU) to supplement certain non-essential elements of the amended act to, in particular, overcome technical limitations.

The major drawback of this policy option lies in the lack of coordination regarding the adoption of the sectorial legislative acts and delegated acts and the administrative complexity associated with the process. This complexity can be simplified by grouping the sectorial legislative amendments depending on their legal basis and further distinguishing depending on the type of the legislative act amended (i.e. a regulation amending regulations adopted on the same legal basis, directive amending directives adopted under the same legal basis).

Option 3.2: Introducing a binding CISE legal framework

This sub-option seeks to introduce a binding legal framework encompassing multiple user communities depending on their legal basis, applicable legislative procedures, and constitutional opt-ins and opt-outs from the EU Treaties. From a legal perspective, it is foreseen that such legal framework, split into several umbrella packages, would rely on multiple legal bases. In contrast with the previous policy option, this option offers a greater potential for harmonisation, but, on the other hand, suffers from a considerable degree of complexity. The binding legal framework would for example:

- set out the CISE principles in a coherent manner for multiple user communities;
- define the concept of purpose-oriented information
- remove existing legal limitations in sectorial legislation (annex)
- introduce common data standards for exchange (relying possibly on the legal basis in Art. 170 TFEU- trans-European networks).

Option 3.3: Imposing a set of binding obligations

The final sub-option would add to the previous sub-option by obliging Member States to ensure that the relevant parts of defined information collected in accordance with the EU sectorial legislation is made available to other Member States via the CISE environment. At the same time, the legal framework would impose the obligation to, in accordance with the applicable legal acts of the Union or national legislation, take necessary measures to ensure the confidentiality of commercial and other confidential information made available in accordance with CISE framework and safeguard the compliance with the applicable personal data protection legislation.

6.2.4 Combination of policy options

Combinations of voluntary and legal options

A combination of the some of the different policy options outlined above is also possible. This is the case in particular with respect to Option 2 and the sub-option, in which legal limitations in sectorial legislation are removed by legally binding acts (Option 3.1).

6.2.5 Interlinking policy measures and policy options

Table 6-2 summarises the assessment of the effectiveness, efficiency and coherence of the policy measures presented in Table 6-1 above with the different policy options. "Effectiveness" in this connection refers to the extent to which the particular CISE measure is implemented through the policy option. "Efficiency" describes how efficient the policy option is in realising the policy measure. Finally, "coherence" refers to the degree to which the measure, if implemented through a particular policy option, conforms to general EU law principles and fundamental rights and is coherent with overarching EU policy objectives.

These various aspects of the policy options are assessed with respect to each of the policy measures. They are evaluated on a scale of: “Not addressed” by the policy

option; 1: very minor factor, 2: minor factor, 3: moderate factor, 4: significant factor, 5: very significant factor.

Assessment of subsidiarity and proportionality of the policy options

Problems to solve …

Chapter 4 concludes that there are a number of problems, which will not be solved by current trends because of a number of **technical, legal and cultural limitations**.

… via EU action

The question is whether it is appropriate to address these problems and limitations through EU action; that is, can it be argued that the EU has the right to act, and is the EU added value evident?

The legal analysis in this impact assessment study concludes that the EU has, indeed, the right to act. One reason for this is that CISE is part of the EU regulatory trend based on transnational information networking. The transnational nature of CISE is characterised by the horizontal interaction among national administrations driven primarily by the synergies of networking. Such an approach corresponds to the European transnational tendencies in information networking as already employed. It encourages the direct interaction among national administrations, and it is a good case of the practical application of the principles of subsidiarity. The regulatory network approach is actually already on-going in several EU sectors:

- EU Agencies represent a mix of operational networking and EU institutional facilitation within specific sectors. Based on an individual EU legal mandate – set out in EU Regulations – the now more than 30 EU agencies are useful drivers for information exchange within the EU.
- Several EU agencies, and their related information networking, are directly relevant for the CISE, such as the EMSA, the FRONTEX, the EDA and the EEA.
- In addition, strong incentives already exist for data sharing within sectors.

Furthermore, the EU transnational approach respects and utilises the existing national competences, legislation and administrative behaviours, and at the same time the EU transnational approach ensures the need for coordination and network facilitation at European level. Without the overall EU coordination, the various national differences could result in dysfunction. The role of the EU is actively to utilise and apply the national differences in a coordinated manner. The EU may provide the overall legal and institutional framework needed for successful CISE implementation.

However, the CISE process is not simple; it allows for significant diversity and individual approach by Member States and even user communities within and between Member States. As mentioned, such a process also requires an overall direction, an overall management of diversity in order to ensure that lessons and information are gained and distributed within the CISE among the stakeholders. The point is that diversity should be managed and shared productively; as such diversity represents a potential source of immense information and learning for actors all over Europe.

Such advantages are not only for a further integration of EU integrated maritime policy, but also to allow the individual Member States obtain further knowledge and offer incentives for their own development of own policy and administrative approach. In addition, encouragement of increased transnational activities will also eliminate many of the current cultural barriers over time. However, such a management should not be based on traditional supranational methods; CISE is transnational and horizontal by nature and requires coordination and facilitation at European level. The EU may facilitate such needed overall transnational coordination and direction.

The legal analysis and the interview workshops carried out with the CISE stakeholders in EU Member States also indicate that without targeted action at EU level, significant differences among Member States are likely to persist.

Proportionality of the policy options

As outlined above, each of the policy option seeks to achieve the objectives of CISE. To do so, Policy option 2 foresees voluntary cooperation between the maritime surveillance authorities of the EU Member States. This option does not envisage the imposition of binding obligations upon Member States. It is limited to positive encouragements, the definition of common approaches and the provision of technical standards and operational guidance. The option allows for a gradual implementation and for specific national circumstances to be taken into account and leaves considerable scope to national decision. As such, the option does not go beyond what is necessary to achieve the CISE objectives satisfactorily.

Option 2.2 can be perceived as slightly more intrusive in comparison to Option 2.1 as this sub-option foresees the introduction of legally binding legislation establishing the CISE joint undertaking. The decision whether to participate in the work of the joint undertaking will, however, be for the individual Member State to make and, accordingly, this option satisfies the requirements of the proportionality test.

Option 3.1 seeks, similarly to Policy option 2, to harmonise the conditions for maritime surveillance information sharing. Unlike Policy option 2, Option 3.1 focuses on reducing existing legal limitations and on the establishment of legal certainty, which is one of the key objectives of the CISE initiatives. The option does not envisage the introduction of new legislation, but merely aims to amend the existing sectorial acts so as to boost cross-sectorial and cross-border information sharing. The option does therefore not go beyond what is necessary to achieve the CISE objectives.

In contrast, Option 3.2 foresees the introduction of a CISE legal framework and targets effectively all three CISE objectives: reducing legal, technical and cultural barriers. However, the analysis indicates that there is room for addressing cultural and administrative limitations through non-binding measures and accordingly, the proportionality of this option can be questioned. The same applies with respect to Option 3.3. Additionally, Option 3.3 seeks to impose information sharing as a legally binding obligation. The objective of reducing legal obligation may, however, be achieved through providing for the possibility to share, rather than imposing this as a legal obligation. On these grounds, Option 3.3 will be discarded from further analysis.

These consideration are reflected in the scoring of the policy measures and options provided in Table 6-2.

The arguments behind the choice of a particular policy instrument for the implementation of the individual policy options are included in a separate section 6.4.

Assessment of compliance with fundamental rights

Assessing compliance with fundamental rights

The following sections explains the methodology and outlines the conclusions made as to the impact of the different policy options on fundamental rights, in particular the protection of personal data (Art. 8 of the Charter of Fundamental Rights). This assessment is carried out in accordance with the Operational Guidance on taking account of Fundamental Rights in Commission Impact Assessments.[7]

Identifying fundamental rights affected

CISE aims to reduce existing limitations so as to boost information sharing. As analysed in the legal baseline, some of the information, which are expected to be exchanged through the CISE environment, may constitute personal data. The assessment carried out by TAG indicates that this would be approximately 5% of the data sets included in the maritime data matrix. This percentage, however, includes the cases in which the information may relate to a legal person (e.g. the owner of the vessel) and, as analysed in Part 1, such information will normally not constitute personal data unless, for example, the name of the legal person derives from the name of an individual who owns that legal person. Moreover, it is foreseen that in some situations additional technical and organisational measures may be introduced to ensure functional separation of the personal data part to minimise the impact of CISE on fundamental rights.

Impact on fundamental rights

Since the collection, use or other form of processing of personal data by public authorities amounts formally to a limitation of the right to protection of personal data and effective implementation of CISE is expected to increase the sharing of information, which may include, in justified cases, the sharing of personal data, an impact on fundamental rights is foreseen. It should nonetheless be emphasised that none of the policy options foresees the introduction of additional purposes for the processing of personal data. Rather the impact on the right to protection of personal data relates to processing following the original collection for the purposes specified in the applicable legislative framework. In any event, in order to ensure that the impact on fundamental rights would not amount to an infringement of fundamental rights, effective safeguards need to be in place to secure the protection of personal data.

The majority of sectorial legislation already includes provisions regarding the protection of personal data and refers to the applicable legislative rules, which should be adhered to whenever personal data is being processed in the framework

[7] Commission Staff Working Paper, Operational Guidance on taking account of Fundamental Rights in Commission Impact Assessments, SEC(2011) 567 final.

of the legislation. If new legislation is adopted (as envisaged by Options 3.2 and 3.3), safeguards should be introduced to guarantee, among other things, that personal data is processed fairly and lawfully, collected for specified, explicit and legitimate purposes and not further processed in a way incompatible with those purposes and that the processing of personal data is adequate, relevant and not excessive in relation to the purposes for which they are collected and processed.

Impacts of various policy options on fundamental rights

Policy option 2 does not foresee any changes to the current legislative framework governing the sharing of information. As will be elaborated on below, the option would be particularly effective in reducing the existing cultural and, to some extent, technical limitations and as such increase the sharing of non-sensitive information (i.e. data not falling within the category of personal data). The sharing of personal data, if any, will be subject to the existing legal framework. To guide the interpretation of existing sectorial legislation, the option foresees the introduction of interpretation and administrative guidelines. This may lead to a more coherent application of the existing rules and the establishment of legal certainty. In conclusion, the impact of the option – both in negative and positive terms - on fundamental rights is expected to be low.

In Options 3.1 and 3.2, the conditions for the sharing of information across functions would be clarified. This may include a positive specification of the purposes deemed as "not incompatible" with the original purpose for which personal data may be shared with other CISE functions. It is foreseen that this may contribute to the establishment of legal certainty and, in turn, to an increase in the sharing of data, in justified instances also of personal data, across functions. The sharing would be subject to the existing legal framework. On these grounds, the impact of these sub-options – both in negative and positive terms - on fundamental rights is expected to be higher than that of Policy option 2, but given the extent to which personal data is expected to be shared in the overall CISE environment (see above), this impact is unlikely to be substantial.

Option 3.3 envisages the imposition of an obligation to share information across functions. However, since the assessment of whether personal data may be shared has to be made on an individual basis, taking into account various factors (Part 1 of the analysis), this option appears unsuitable to exclude negative impact on fundamental rights. Accordingly, this option is excluded from further consideration.

These considerations are reflected in the scoring of the policy measures and options provided in Table 6-2.

6.2.6 Summary of analysis

For each specific objective, Table 6-2 subsequently summarizes how the specific objective is addressed through the policy option. Further, it highlights the policy options' strengths and weaknesses in achieving the objective.

Specific objective: Reduce cultural and administrative limitations via the establishment of a new culture in purpose-oriented information sharing	For the specific objective: Reduce cultural and administrative limitations, we assess that the policy option most suitable for its implementation is Policy option 2; i.e. the option based on a voluntary cooperation. Its strength lies particularly in its ease of implementation, flexibility, adaptability and coherence with general EU law principles (subsidiarity and proportionality) and fundamental rights. Policy option 3 offers a great potential for effectiveness in achieving the first specific objective since it foresees the introduction of legally binding instruments. This applies in particular with respect to Options 3.2 and 3.3. This potential will, however, likely be outweighed by the difficulties in implementing the option, its legal complexity and administrative complexity associated with the implementation of the policy option.
Specific objective: Reduce technical limitations via the establishment of an appropriate IT environment	The second specific objective of reducing technical limitations may be more effectively implemented through Policy option 3; i.e. through legally binding options. Some difficulties in implementing the option, its legal complexity and administrative complexity are nonetheless foreseen also in connection with the second specific objective. Still, these are expected to be of lower magnitude than in the context of implementing specific objectives 1 and 2. Although the effectiveness of Policy option 2 would be somewhat lower, its strength would be in its ease of implementation, flexibility and coherence with general EU law principles (subsidiarity and proportionality) and fundamental rights.
Specific objective: Reduce legal limitations and promote legal certainty	For the third specific objective, Policy option 3 would be most suitable since the effectiveness of Policy option 2 in addressing specific objective would be relatively low. The effectiveness would be higher with Option 2.2. On the other hand, there would be a considerable degree of legal complexity and administrative complexity associated with the implementation of this option.
Overall assessment	Each of the policy options has its strengths and weaknesses. To some degree, these differ depending on the specific objective sought to be achieved through the policy option. *Since Option 3.3 raises concerns as to its compliance with the principle of proportionality and as to its effectiveness in safeguarding the protection of personal data, confidentiality, IP rights and the use of data, this option is discarded from further consideration.* Our analysis indicates that Policy option 2 would be most suitable in achieving the first specific objective and Policy option 3 most suitable for addressing the third specific objective. A combination of the two options (in particular if the two options are implemented consecutively) would therefore be the preferred option for implementing CISE.

Table 6-2 Interlinking policy measures and policy options

<table>
<tr><th rowspan="2">Policy options

Policy measures</th><th colspan="3">Policy option 1
No EU action</th><th colspan="6">Policy option 2
Options based on voluntary cooperation</th><th colspan="9">Policy option 3
Legally binding options</th></tr>
<tr><th colspan="3">No policy change
(baseline scenario)</th><th colspan="3">Option 2.1
Recommendation
("CISE Handbook")</th><th colspan="3">Option 2.2
Joint undertaking</th><th colspan="3">Option 3.1
Removing legal limitations</th><th colspan="3">Option 3.2
Introducing a binding legal framework</th><th colspan="3">Option 3.3
Imposing a set of binding obligations</th></tr>
<tr><td>a: effectiveness
b: efficiency
c: coherence</td><td>a</td><td>b</td><td>c</td><td>a</td><td>b</td><td>c</td><td>a</td><td>b</td><td>c</td><td>a</td><td>b</td><td>c</td><td>a</td><td>b</td><td>c</td><td>a</td><td>b</td><td>c</td></tr>
<tr><td colspan="20">Specific objective 1: Reduce cultural and administrative limitations via the establishment of a new culture in purpose-oriented information sharing</td></tr>
<tr><td>Define CISE principles based on respon-sibility to share and need to know principles</td><td rowspan="5">This is the baseline scenario as described in the Part 1 report. Assumptions of the evolution of the baseline scenario if CISE is not implemented were identified in Section 4.2.2 (accelerating and decelerating factors for information sharing and cooperation).</td><td colspan="3">2</td><td colspan="3">4</td><td colspan="3">5</td><td colspan="3">3</td><td colspan="3">3</td><td colspan="3">4</td><td colspan="3">3</td><td colspan="3">2</td><td colspan="3">3</td><td colspan="3">4</td><td colspan="3">1</td><td colspan="3">2</td><td colspan="3">4</td><td colspan="3">1</td><td colspan="3">2</td></tr>
<tr><td>Support the entering into agreements between maritime surveillance authorities regarding terms and conditions of information sharing</td><td colspan="3">3</td><td colspan="3">4</td><td colspan="3">5</td><td colspan="3">4</td><td colspan="3">3</td><td colspan="3">4</td><td colspan="3">Not addressed</td><td colspan="3">Not addressed</td><td colspan="3">Not addressed</td></tr>
<tr><td>Provide financial support to facilitate cooperation and joint operations</td><td colspan="18">To be assessed depending on the amount of funding allocated.</td></tr>
<tr><td>Description</td><td colspan="9">Policy option 2 addresses the first specific objective through measures based on voluntary cooperation.</td><td colspan="9" rowspan="2">Policy option 3 addresses the first specific objective indirectly through legally binding instruments. As such, they would generally be effective in achieving the first specific objective, but would at the same time suffer from the same drawbacks in terms of their ease of implementation, high administrative complexity and the willingness to implement (Options 3.1 and 3.2). These drawbacks are described under the two remaining specific objectives.</td></tr>
<tr><td>Assessment of the policy options: (+) strengths and (-) weaknesses</td><td colspan="9">+ ease of implementation (both at EU and national level); adaptability, subsidiarity, proportionality
- overall low effectiveness in achieving the objective in short term</td><td colspan="9">+ ease of implementation (both at EU and national level); subsidiarity, proportionality; high potential to overcome cultural limitations, flexibility, adaptability and progressivity</td></tr>
</table>

Policy options **Policy measures**	**Policy option 1** No EU action			**Policy option 2** Options based on voluntary cooperation						**Policy option 3** Legally binding options								
	No policy change (baseline scenario)			**Option 2.1** Recommendation ("CISE Handbook")			**Option 2.2** Joint undertaking			**Option 3.1** Removing legal limitations			**Option 3.2** Introducing a binding legal framework			**Option 3.3** Imposing a set of binding obligations		
a: effectiveness b: efficiency c: coherence	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**
Specific objective 2: Reduce technical limitations via the establishment of an appropriate IT environment																		
Define a common information exchange model				Since the establishment of an appropriate IT environment is the backbone of CISE, the policy measures seeking to achieve this objective are included in each policy option. The **effectiveness** of each of the policy measures, implemented through a particular policy option, in attaining the specific objective depends largely on the architecture vision chosen for the implementation of (see Section 6.5). Accordingly, no individual scoring is provided. Overall, since Policy option 2 seeks to achieve the second specific objective through measures based on voluntary cooperation, while Policy option 3 seeks to employ legally binding instruments, the overall effectiveness of Policy Option 3 would be slightly higher than of options based on voluntary cooperation (Policy option 2). On the other hand, the efficiency of Policy option 3 would be lower than of Policy Option 2 as described under the first and the third specific objective.												
Provide for common data classification levels and access rights																		
Provide for a catalogue of datasets and information services																		
Define a messaging protocol and potentially the service discovery specifi-cations and correla-tion and fusion rules																		
Provide framework for semantic and technical interoperability agreements																		
Provide financial support to establishment of IT environment																		
Assessment of the policy option: (+) strengths and (-) weaknesses				+ ease of implementation, subsidiarity, proportionality - lower effectiveness in achieving specific objective			+ ease of implementation, subsidiarity, proportionality - lower effectiveness in achieving the specific objective			+ effectiveness in achieving the specific objective - ease of implementation			+ effectiveness in achieving the specific objective - ease of implementation			+ effectiveness in achieving the specific objective - ease of implementation		

Policy options **Policy measures**	**Policy option 1** No EU action			**Policy option 2** Options based on voluntary cooperation						**Policy option 3** Legally binding options								
	No policy change (baseline scenario)			**Option 2.1** Recommendation ("CISE Handbook")			**Option 2.2** Joint undertaking			**Option 3.1** Removing legal limitations			**Option 3.2** Introducing a binding legal framework			**Option 3.3** Imposing a set of binding obligations		
a: effectiveness b: efficiency c: coherence	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**
Specific objective 3: Reduce legal limitations and promote legal certainty																		
Remove legal limitations by allowing the transfer of maritime surveillance information to certain enumerated functions				Not addressed			Not addressed			4	2	3	4	1	3	4	1	1
Safeguard the protection of personal data, confidentiality, IP rights and the use of data when data is being shared through the CISE environment				2	4	5	3	3	4	3	2	3	4	1	3	2	1	1
Establish the principle of responsibility to share as a legal obligation				Not addressed			Not addressed			Not addressed			Not addressed			5	1	1
Description				Policy option 2 seeks to establish legal certainty and reduce legal limitation through encouraging cooperation between MS' maritime surveillance authorities and by providing the necessary framework and guidance to such cooperation. As such, it addresses the third specific objective only indirectly, through addressing the first specific objective.						Policy option 3 targets the third specific objective directly through legally binding measures. The different sub-options of the Option differ mainly in terms of the intensity of intervention and the degree of prescriptive detail and, in turn, in the degree of their coherence with general EU law principles.								
Assessment of the policy option: (+) strengths and (-) weaknesses				+ subsidiarity and proportionality - very low effectiveness in terms of reducing existing legal limitations			+ subsidiarity and proportionality - low effectiveness in terms of reducing existing legal limitations			+ high effectiveness in reducing existing legal limitations - legal complexity, high administrative complexity, ease of implementation both at			+ high effectiveness in reducing existing legal limitations, legal certainty - legal complexity, high administrative complexity, ease of implementation both at			+ high effectiveness in reducing existing legal limitations, legal certainty - legal complexity, high administrative complexity, ease of implementation both at		

Policy options **Policy measures**	**Policy option 1** No EU action			**Policy option 2** Options based on voluntary cooperation						**Policy option 3** Legally binding options								
	No policy change (baseline scenario)			**Option 2.1** Recommendation ("CISE Handbook")			**Option 2.2** Joint undertaking			**Option 3.1** Removing legal limitations			**Option 3.2** Introducing a binding legal framework			**Option 3.3** Imposing a set of binding obligations		
a: effectiveness b: efficiency c: coherence	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**
										EU and at national level, low flexibility, lack of horizontal coordination			EU and at national level; low flexibility			EU and at national level subsidiarity, proportionality and conformity with fundamental rights; low flexibility		
Preferred combination of policy options	Policy option 2 and Option 3.1 can be effectively combined into a policy package.																	

Source: COWI assessments.

6.2.7 Preferred Policy Option (MS Survey, interviews and public consultation)

MSEsG questionnaire

The questionnaires sent out to the Member State Expert sub-Group (MSEsG) identified as preferable **the combination of Policy option 2 and Option 3.1.**

It should, however, be noted that the answers in the questionnaire depart from the overview of the policy options as presented by the Commission in November 2012 in the Commission's Roadmap for a White Paper on Integrating Maritime Surveillance: the Implementation of the Common Information Sharing Environment. Since then, policy options were further elaborated on and refined. In particular, Option 2.2 (joint undertaking) has been taken into consideration. Accordingly, the possible preference for Option 2.2 is not as such captured in the results of the MSEsG questionnaire. Former policy option 4 ("remove barriers to information exchange (by legislative acts) and find cooperative way to voluntary but effective data exchange") may nonetheless correspond to either combination between Options 2.1 or 2.2.

As far as the remainder of policy options is concerned, Option 2.1 corresponds broadly to former policy option 2, Option 3.1 to the former policy option 3, a combination of Policy option 2 and Option 3.1 to the former policy option 4 and Option 3.3 to former policy option 5. Finally, Option 3.2 is a hybrid between former policy options 4 and 5.

The table below depicts the Member States' answers to the question about the preferred policy option for the implementation of CISE:

Table 6-3 Interlinking policy measures and policy options

Preferred policy option	Corresponds to option	Number of MS
"remove barriers to information exchange (by legislative acts) and find a cooperative way for voluntary but effective data exchange"	Combination of Policy option 2 and Option 3.1	6
"recommendations to overcome barriers to information exchange"	Option 2.1	2
"recommendations to overcome barriers to information exchange" in alternative to another option[8]	Option 2.1 in alternative to Policy option 1, Options 2.1, 3.1 or 3.2.	3
"remove barriers to information exchange and impose exchange of information (by legislative acts)"	Option 3.3	3
Total amount of answers received		**14**

Source: MSEsG questionnaire.

[8] Either "no EU action" (1 reply), "recommendations to overcome barriers to information exchange" (1 reply) or "remove barriers to information exchange or remove barriers to information exchange and impose exchange if information (by legislative acts)" (1 reply).

Interview workshops

The interview workshops with stakeholders in the selected Member States did not provide a clear candidate for a preferred policy option. Rather, different alternatives and their pros and cons were discussed among the participants. Out of these, three options stood out:

- a step-by-step building up of CISE based on voluntary cooperation between the different stakeholders (Policy option 2)
- a combination of removing existing limitations with finding a way for voluntary but effective data exchange (combination of Options 2.1 and 3.1)
- introduction of a binding legal framework for CISE (Options 3.2 and 3.3).

6.3 Substantiation of the administrative burden

No significant additional administrative burden foreseen

According to the Impact Assessment guidelines the description of all policy options should provide details of the information obligations for businesses, for citizens and administrations that are likely to be added or eliminated if the option was implemented. Hence, when an administrative burden resulting from EU legislation is likely, the analysis should begin with a full mapping of information obligations for each of the options.

The purpose of CISE is actually to exchange information across user communities, Member States and agencies, and so information exchange and obligations to do so are key elements of the initiative. It is, however, central to distinguish any administrative burden from CISE from the additional costs such as the technical costs of enabling the information exchange. These latter costs are included in the cost estimates provided by Gartner.

EU Standard Cost Model

Furthermore, when using the principle of the EU Standard Cost Model – provided in the Impact Assessment guidelines – the starting point is the overall administrative cost, which consists of two different components: the business as usual costs and administrative burdens. The business as usual costs correspond to the costs resulting from collecting and processing information even in the absence of legislation, the administrative burdens stem from the part of the process which is done solely because of a legal obligation.

The core of CISE and the preferred mix of policy options build on already existing legislative measures, agreements and voluntary cooperation between relevant authorities. This implies that the administrative activities related to CISE will be business as usual costs. Only in relation to policy option 3, which is not a preferred option, would new legislative measures be imposed. However when looking at amending existing legislation (policy option 3.1), the administrative activities will be minimal and can therefore not be considered to be significant as defined in the Impact Assessment Guidelines.

Conclusively, CISE does not envisage imposing significant new information obligation as such. Our analysis implies that none of the policy options will impose

significant administrative burdens, which is why the analysis is not using the EU Standard Cost Model.

Policy options

By deploying the methodology for the IA, three broad policy options were defined: Option 1: no EU action, Option 2: options based on voluntary cooperation, and Option 3: legally binding options. All of these options aim at achieving the specific objectives of CISE.

Policy option 1

Policy option 1 (**No EU action: the baseline scenario**) leaves the current approach unchanged. The CISE EU framework will be based on the existing non-binding policy instruments and the future development of CISE would depend on the Member States' initiatives towards integrating marine surveillance information sharing systems at national, regional or international levels.

Administrative burden

For Policy Option 1, the administrative burden remains as it is currently given in the relevant legislation, guidelines and administrative culture. This means that initiatives within Policy Option would not constitute any new administrative burdens for businesses, citizens or public administration. However, if efforts initiated under Policy Option 1 are successful, this has the potential to ease the administrative burdens on public administrations.

Policy option 2

Policy option 2 (**Options based on voluntary cooperation**) seeks to implement CISE by employing instruments that stimulate voluntary cooperation between Member States. The option is divided into two sub-options:

- Sub-option 2.1 (**Recommendation for the implementation and management of CISE**) would provide recommendations, best practices and guidelines on information sharing, administrative practice and cooperation, and technical and operational guidelines. These may be adopted in the form of Recommendation from the Commission, relying on the legal basis of Article 292 TFEU.

- Sub-option 2.2 (**Joint undertaking**) seeks to institutionalise the voluntary cooperation into a formal structure, which would provide a framework for further activities, encourage and, where appropriate, assist EU Member States to increase maritime surveillance information sharing among user communities and to achieve a more effective and coordinated information sharing. A joint undertaking is typically established by a Regulation, relying on the legal basis in Art. 188 TFEU. This policy sub-option may be perceived as a step in the overall CISE development; contributing, on the one hand, to overcoming cultural limitations and, on the other hand, to providing a basis for future legislative changes.

Administrative burden

When analysing the additional administrative burdens related to policy option 2, the results of the analysis are much in line with Policy Option 1 given that the initiatives are built on voluntary participation, and the imposed administrative burdens are therefore very limited. Moreover, as mentioned above the initiatives are based on already existing information obligations. However, in relation to sub-option 2.2, the participation for a public administration would require

administrative effort, but given the fact that participation is voluntary, the administrative burden cannot be considered to be imposed.

Policy option 3

Policy option 3 (**Legally binding options**) seeks to address the CISE objectives by applying legally binding provisions. It includes the following sub-options:

- Sub-option 3.1 (**Removing legal limitations in sectorial legislation to cross-border and cross-sector information sharing**). In this sub-option, the identified legal limitations will be removed by legislative acts amending the existing sectorial legislation to the extent necessary for the effective implementation of CISE. This may include the possibility to transfer personal data to certain enumerated functions under the condition that such data are safeguarded in accordance with the principles of protection of the fundamental rights of an individual.

- Sub-option 3.2 (**Introducing a binding CISE framework**) aims to introduce a binding legal framework encompassing multiple user communities depending on their legal basis, applicable legislative procedures, and constitutional opt-ins and opt-outs from the EU Treaties. From a legal perspective, it is foreseen that such legal framework, split into several umbrella packages, would rely on multiple legal bases.

Administrative burden

Regarding the binding measures, the investigated policy options (legislative measures) would imply that information could be shared with more functions than today. However, that would be done using the CISE environment, which will depend on extracting the information from existing systems more than it would require administrative effort/impose information obligations on the public administrations, which collected the information in the first place.

On the other hand, CISE would allow the specific entity to access information from more sources and in a more structured way than today. It has then the potential to ease the administrative burden for the participating entities by giving them direct on-line access to relevant information.

One concrete example is Art. 12 of the Fisheries Control Regulation, which states that data collected in the framework of the Regulation, may be transmitted to some user communities. If concrete steps were taken to amend the legislation to include all user communities and even oblige the fishery control agencies to share, it would not be a significant administrative burden/information obligation since all the information in question are already collected automatically, and the sharing can therefore be done with a minimal effort.

Conclusion

Generally, none of the policy options introduces new obligations to collect information but facilitates enhanced sharing of information already collected. This applies to both the voluntary measures and the binding measures.

6.4 Policy instruments

Large number of policy instruments

There are a large number of different policy instruments available in order to reach the specific objectives outlined in Chapter 1. As a corollary, the policy measures identified above incorporate a broad range of policy instruments that can be implemented at EU level. These range from softer instruments, such as recommendations and guidelines, to legally binding acts. The following identifies and proposes concrete policy instruments for the implementation of CISE. This proposal reflects the analysis of the principles and limitations for establishing CISE (the principles of conferral, subsidiarity and proportionality and compliance with fundamental rights) and the conclusions in Part 1.

Under the principle of conferral of powers, the Union should act only within the limits of the competences conferred upon it by the Member States in the Treaties to attain the objectives set out therein (Arts. 5(2) and 7 TEU). The principle of conferral is decisive not only for granting the Union's institutions authority to take action in certain matters, but also for the form of the specific acts.

Art. 288 TFEU enumerates three binding and two non-binding acts of the Union's institutions.[9] The strict principle of conferral is applicable only in cases of legally binding acts (Regulations, Directives and Decisions), it applies to the two non-binding acts (Recommendations and Opinions) likewise since such acts constitute legal acts within the meaning of Art. 288. Accordingly, these types of acts may only be issued by the institutions if the Treaty specifically confers a power to act. With respect to non-binding acts not mentioned within the range of legal acts in Art. 288 TFEU, the strict principle of conferral is not applicable and the general power to adopt such non-binding acts lies with the Union's institutions.

In identifying suitable policy instruments for the implementation of CISE, consideration has been given to both the traditional forms of regulation (i.e. legislative acts within the meaning of Art. 289(3) TEU et seq.) and their various alternatives. Instruments not including legislative acts differ in the degree of their formalisation in EU Law. They include, but are not limited to non-binding legal acts (Recommendations and Opinions, as provided for in Art. 288 TFEU). The suitability, advantages and disadvantages of each of the available instruments and the combination thereof is analysed with respect to each of the policy options proposed as a viable solution for the implementation of CISE.

6.4.1 Policy option 1: No EU action (the baseline scenario)

Non-binding policy instruments

At the present time, CISE is founded on several policy instruments of non-binding nature (Communications from the Commission). These instruments lay down the aim of CISE and identify the guiding principles and steps towards its

[9] Several other instruments are provided for within the Common Foreign and Security Policy (Arts. 23 et seq. TEU).

establishment. The further steps in the CISE development will build upon the existing initiative, namely:

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 10 October 2007 on an Integrated Maritime Policy for the European Union, COM(2007) 575 final

- Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – Towards the integration of maritime surveillance: A common information sharing environment, COM(2009) 0538 final

- Communication from the Commission to the Council and the European Parliament on a Draft Roadmap towards establishing of the Common Information Sharing Environment for the surveillance of the EU maritime domain, COM(2010) 584 final.

6.4.2 Policy option 2: Options based on voluntary cooperation

Characteristics of the option

The defining feature of Policy option 2 is that this policy option seeks to implement CISE by employing instruments that stimulate *voluntary cooperation* between Member States. As a rule, such instruments will be of non-binding nature or, in the alternative, be formally legally binding, but abstain from imposing binding legal obligations on Member States.

Out of the broad range of instruments, the following should be highlighted as potential candidates for the implementation of policy option 2:

Communication from the Commission

A Communication is a policy instrument with no binding legal effect. A Communication is typically adopted by the Commission, but may also be adopted jointly, e.g. by the Commission and the High Representative of the Union for Foreign Affairs and Security Policy (HR). No specific legal basis in the Treaties is required for the adoption of a Communication.

Communications are flexible instruments, which allow for the accommodation of various types of content: e.g. opinions, proposals to the Member States, but also commitments by the Commission to take action to further the objectives of the Communication. A CISE Communication may, for example, be the first step in the creation of a new EU policy (e.g. a policy seeking to harmonise the rules regarding

maritime surveillance information sharing)[10] or propose concrete EU action in order to implement CISE (in the form of a White Paper).

A Communication would also be a follow-up to the ›Communication from the Commission to the Council and the European Parliament on a Draft Roadmap towards establishing of the Common Information Sharing Environment for the surveillance of the EU maritime domain, COM(2010) 584 final. Most of the actions listed in the roadmap have been accomplished and a new roadmap in the form of a communication would be a logical next step.

As an instrument, the Communication is a suitable instrument for setting the frame for several policy initiatives of a voluntary nature but also preparing the ground for legislative measures in future initiatives[11].

(Technical) Guidance documents

Guidance documents are non-formal documents adopted by the Commission. Such guidelines are typically adopted in order to guide the interpretation and application of specific provisions of existing EU legislation. A guidance document may also seek to identify best practices in information sharing among maritime surveillance authorities or provide specific or technical guidance. Such guidance may, in principle, also take the form of a Communication from the Commission.

Recommendation

A more formalised instrument encouraging voluntary cooperation is a Recommendation. Pursuant to Art. 288 TFEU, Recommendations have no binding force and in that respect they differ from Regulations, Directives and Decisions. Though without binding force, they do have political weight.

Legal basis and procedure for adoption

Art. 292 TFEU provides the general competence to adopt Recommendations. Recommendations are adopted either by the Council (acting on a proposal from the Commission in all cases where the Treaties provide that it should adopt acts on a proposal from the Commission) or by the Commission.[12] A proposal for a Council Recommendation must link its content to a policy area of the Treaty. Accordingly, the Recommendation would be based on Art. 292 TFEU, together with the appropriate legal basis for the substance of the proposal.

Content

As an instrument, a Recommendation is sufficiently flexible to accommodate various types of content. It could be adopted either separately or in the context of a non-legislative policy package ("a CISE Handbook"). The latter would allow a more coherent approach to the implementation of CISE.

A CISE Recommendation may recommend/encourage Member States to:

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[10] MARSUNO Final Report, Recommendation 5.
[11] E.g. the Digital Agenda for Europe launches several policy initiatives in the same communication where more than 30 legislative initiatives are initiated
[12] And in the specific cases described by the Treaties by the European Central Bank.

- implement CISE Principles
- share information through the CISE environment
- take necessary measures to safeguard the protection of personal data, commercial confidentiality and any further restrictions on the use of information
- cooperate among each other to achieve the goals described in the Recommendation (this may even include the establishment of e.g. regional programmes in which the EU may choose to participate).

Additionally, a CISE Handbook (adopted either as one package in the form of a Recommendation from the Commission or separately depending on the content of each of the components) may provide:

- guidelines to interpret specific provisions in EU legislation
- technical and specific guidance (including a common data exchange standard)
- best practices for information sharing, including a standard form for the conclusion of agreements among Member State surveillance authorities regarding the terms and conditions of information sharing.

Transposition and compliance aspects

A Recommendation is a non-binding instrument, but which has considerable political weight. This follows from the general principle of loyalty imposed by Art. 4(3) TEU. Still, taking into account the factors decelerating the information sharing and cooperation among Member States (Section 4.2.2), a Recommendation is unlikely to achieve a high level of compliance among Member States or voluntary transposition of the principles laid therein into Member States' legal orders, particularly in short term. Additionally, given also the administrative complexity of the maritime surveillance information setup in the Member States, it would be extremely difficult to monitor the degree of compliance in the various Member States, least to say, achieve a coherent implementation in the Member States.

A Recommendation would, on the other hand, allow the accommodation of all of the seven CISE user communities in accordance with the CISE Principles. It would not encroach upon the special status of the Common Security and Defence Policy or national military authorities, since these would be free to follow the Recommendation to the extent they find appropriate.

Administrative complexity and simplification potential

The process for the adoption of a CISE Recommendation is relatively straightforward. The adoption of a Recommendation is not subject to the ordinary legislative procedure and, accordingly, does not involve the European Parliament. Moreover, as a Recommendation is non-binding, it does not impose any obligations on the Member States requiring the implementation or transposition of the Recommendation into their national, legal orders.

Alternative instruments – formal structures for cooperation

MARSUNO Recommendation

Alternative instruments for the establishment of CISE include formal structures for the cooperation between Member States. Such structures are expressions of the 5th Recommendation from the MARSUNO Pilot Project, i.e. the Recommendation to create a designated policy, which would seek a coherent and comprehensive adaptation of all the relevant legislation at EU and national level and of agreements. As part of this policy MARSUNO envisages the establishment of joint platforms. Within such joint platforms user communities would be organised in working pools, where they would work towards producing common gap-and-solution proposals in accordance with the policy's objectives.

Formal structures for cooperation

A joint undertaking, or a similar structure, would allow for a progressive implementation of CISE. It would, on the one hand, contribute to a progressive uptake of information sharing and, on the other hand, stimulate and justify the sequential amendments to the current legislative framework necessary in order to arrive at a full CISE potential.

The structures, which may be utilised for the implementation of CISE include:

- Structures created by Member States for the execution of research and development programmes (e.g. an EEIG). The EU may participate in such programmes. This requires a decision by the European Parliament and Council acting in accordance with the ordinary legislative procedure after consulting the Economic and Social Committee (Art. 188, 2nd paragraph TFEU)

- Joint undertaking established under Art. 187 TFEU. A joint undertaking is established by a Regulation, adopted by the Council on a proposal from the Commission and after consulting the European Parliament and the Economic and Social Committee under Art. 188 1st paragraph TFEU, and is open to other public or private undertakings or bodies (including e.g. EU agencies) to join.

EEIG

A possible alternative to the instruments described above may be the formation of a European Economic Interest Group (EEIG) by the maritime surveillance authorities of EU Member States.

Legal basis and procedure for adoption

The formation of an EEIG as such does not require a legal act of the Union. Instead, Regulation (EEC) No 2137/85 on the European Economic Interest Grouping provides a basis for the establishment of such entities. These may be formed for the purpose of facilitating or developing the economic activities of its members and to improve or increase the results of those activities (Art. 3(1)). The purpose of the EEIG should not be to make profits for itself; the activity of an EEIG should nonetheless be related to the economic activities of its members and must not be more than ancillary to those activities.

An EEIG is formally established by a contract between its members, which specifies, among other things, the EEIG's objectives. The EEIG is then formally

registered in the Member States of its seat and has a legal personality. EEIG appoints its manager or a group of managers and may establish other organs.

BONUS EEIG

An example of an EEIG in the maritime domain is the Baltic Organisations' Network for Funding Sciences EEIG (BONUS EEIG). The EEIG was founded by the key research organisations in the eight Baltic Sea States[13] and subsequently joined by Russia, acting as associated member. The aim of the BONUS EEIG is to manage the Joint Baltic Sea Research and Development programme (BONUS). The specific goal of the programme is to contribute to the creating of the scientific basis for sustainable development of the Baltic Sea and for the better management of Baltic Sea environmental issues. The EEIG tasks in this context range from the selection of the projects to be funded, setting up Stakeholder Consultation platforms, preparation of implementation modalities, including legal and financial rules and procedures. It consists of the Steering Committee (the General Assembly of Members), the Executive Director and the Financial Manager.

By its decision from 2010[14], the EU participates in BONUS. This includes a financial contribution up to EUR 50 million. The detailed arrangements for the management and control of the Union's funds are specified in a set of agreements concluded between the Commission and the BONUS EEIG.

Joint undertaking

Legal basis and procedure for adoption

Pursuant to Art. 187 TFEU (ex-Art. 171) the Union may set up joint undertakings or any other structure necessary for the efficient execution of Union research, technological development and demonstration programmes.

Until now, the form of a joint undertaking has been utilised to implement joint technological initiatives (JTIs). Such JTIs were set up as part of the EU's Seventh Framework Programme for research, technological development and demonstration activities (FP7),[15] which provides for a Community contribution to the establishment of long-term public-private partnerships. The scope of Art. 187 is, however, not strictly limited to JTIs, but to our knowledge, no precedent exists in which the legal basis in Art. 187 TFEU has been invoked for other purposes. The only condition provided for in the article in question is, that the setting up of a joint undertaking is necessary for the "efficient execution of Union research, technological development and demonstration programmes". This entails that

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[13] Denmark, Germany, Estonia, Latvia, Lithuania, Poland, Finland and Sweden.

[14] Decision No 862/2010/EU of the European Parliament and of the Council of 22 September 2010 on the participation of the Union in a Joint Baltic Sea Research and Development Programme (BONUS) undertaken by Several Member States. The decision was adopted under Arts. 185 and 188 TFEU (Research and technological development and space).

[15] Decision No 1982/2006/EC concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013). Additionally, a proposal for a joint undertaking in Bio-Based Industries, under Horizon 2020, is currently pending.

should Art. 187 be invoked as a legal basis for the implementation of CISE, the CISE joint undertaking would have to incorporate these objectives as one of its main objectives. This does nonetheless exclude that the joint undertaking would seek to attain other objectives, such as the ones formulated in Chapter 5.

Existing joint undertakings[16] have formally been established in the form of a Regulation. Such Regulation is adopted by the Council, on a proposal from the Commission and after consulting the European Parliament and the Economic and Social Committee (Art. 188 TFEU).

Content

The Regulation establishing the CISE joint undertaking may specify:

- the aim of the joint undertaking (e.g. to manage the activities of its Members, as described e.g. in a Communication from the Commission, towards the harmonisation of the technical and legal conditions for the sharing of maritime surveillance information among them)
- specific tasks and activities (e.g. to organise and coordinate activities of the joint undertaking and its working groups, ensure the involvement of stakeholders, define and update the work programme for the joint undertaking, etc.)
- duration of the joint undertaking
- seat, legal status and liability
- source of financing
- evaluation
- reference to the Statutes of the joint undertaking, which would constitute an integral part of the Regulation establishing the undertaking.

The Statutes of the joint undertaking may define, e.g.:

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[16] Regulation (EC) No 521/2008 setting up the Fuel Cells and Hydrogen Joint Undertaking (as amended by Regulation 1183/2011); Regulation (EC) No 74/2008 on the establishment of the ARTEMIS Joint Undertaking to implement a Joint Technology Initiative in Embedded Computing Systems; Regulation (EC) No 73/2008 setting up the Joint Undertaking for the implementation of the Joint Technology Initiative on Innovative Medicines; Regulation (EC) No 72/2008 setting up the ENIAC Joint Undertaking; Regulation 219/2007 on the establishment of a joint undertaking to develop the new generation European air traffic management system (SESAR) (as amended by Regulation (EC) No 1361/2008); Regulation (EC) No 71/2007 setting up the Clean Sky Joint Undertaking; Regulation (EC) No 876/2002 setting up the Galileo Joint Undertaking (as amended by Regulation 1943/2006).

- members of the joint undertaking: i.e. founding members (the EU, represented by the Commission and, eventually, EU institutions), a specification of who may become member to the joint undertaking (e.g. other EU institutions and public bodies having responsibilities for maritime surveillance tasks), the procedure for acceding to the joint undertaking and, eventually, for becoming an associated member
- organs of the joint undertaking (e.g. Administrative board), their responsibilities and the procedure for reaching decisions
- provision regarding the conclusion of agreements between the joint undertaking and its members defining the roles of the individual members
- provision governing the setting up a number of working groups to carry out the working tasks of the joint undertaking
- financial provisions, budget, control of the budget
- provisions regarding the drawing up of a work programme and periodical reporting on the progress.

Transposition and compliance aspects

The existing joint undertakings have performed well[17], and the lessons learnt from those undertakings may be taken on board. This applies in particular with respect to the progress made towards enhancing civil-military cooperation and interoperability made in the SESAR Joint Undertaking. Still, the willingness of the Member States' maritime surveillance to accede to the joint undertaking is expected to, at least at the initial stages of the project, be rather modest. However, the positive experience of many Member States with the MARSUNO and the BlueMassMed pilot projects and the growing awareness in the EU Member States that data gathering and maritime surveillance are entering a new era that are expected to contribute greatly to the growth of the undertaking's member base.

The joint undertaking would allow for the accommodation of all of the seven CISE user communities and fully respect the various Member States' opt-outs from the Treaties. It would, additionally, provide an opportunity for the participation of maritime surveillance authorities of third states (e.g. as associated members) and even for the inclusion of private stakeholders.

Administrative complexity and simplification potential

The Regulation establishing the CISE joint undertaking would not impose an obligation upon Member States to implement or transpose the provisions of the Regulation in their legal orders.

[17] E.g. Second Interim Evaluation of the ARTEMIS and ENIAC Joint Initiatives, Final Report prepared for the European Commission DG Communications Networks, Content & Technology.

Inter-governmental agreements and alternatives

The GMES Programme

The GMES programme (Global Monitoring for Environment and Security - in the future renamed to Copernicus) was established by the Regulation (EU) 911/2010 and covers various activities for ensuring an uninterrupted provision of accurate and reliable data and information on environmental issues and security matters to users in charge of policy making, implementation and monitoring, in the EU and the Member States. It is based on the general principle that the access to those data should be full, open and free of charge. The establishment of the GMES programme relies on an express legal basis in the TFEU: Art. 189 (2) TFEU (i.e. necessary measures for the promotion of joint initiatives, support to research and technological development and coordination of efforts needed for the exploration and exploitation of space). While no such express legal basis exists in the Treaties for CISE, the various alternatives for the possible funding solutions for the GMES programme provide useful examples of additional instruments which may be employed for the implementation of CISE.

In order to provide financing for the GMES programme for the upcoming years of 2014-2020, the Commission has explored several alternatives for the possible funding solutions for the GMES programme:

- enhanced cooperation (which would involve Member States with a strong interest in the programme)
- industry participation, where responsibilities and funding would be shared with economic actors
- the setting up of a specific GMES fund.

The two latter options were eventually rejected as solutions for GMES on the grounds that the former could put the EU-27 dimension at risk and the latter was difficult to implement in the short term.[18] Instead, the Commission proposed the setting up of an intergovernmental fund[19] with financial contribution from all 27 EU Member States based on their GNI. Such fund was envisaged to be established by an intergovernmental agreement between the EU Member States meeting within the Council. The proposal for the funding outside of the multi-annual financial framework was eventually rejected by the Parliament,[20] but a new governance model for the GMES programme was eventually proposed in Proposal for the new GMES Regulation.[21] This model entails the possibility to delegate the various

[18] COM (2011) 831 and COM(2012) 218 final.
[19] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the establishment of an Intergovernmental Agreement for the operations of the European Earth monitoring programme (GMES) from 2014-2020, COM(2012) 218 final.
[20] Resolution P7_TA(2012)0062 of 16 February 2012.
[21] 2013/0164(COD).

components of GMES operations to various operating entities through public procurement schemes, service level agreements etc.

Enhanced cooperation

Arts. 326 et seq TFEU provide a legal basis for enhanced cooperation in one of the areas covered by the Treaties. Such enhanced cooperation is however excluded in the areas of the Union's exclusive competence (Art. 329(1) TFEU, Art. 20(1) TEU). Since customs fall within the Union's exclusive competence (Art. 3(1) TFEU), the customs user community would – in contradiction to the CISE principles- be effectively excluded from the enhanced cooperation and, accordingly, it is concluded that the establishment of an enhanced cooperation would not as such be a suitable option for the overall implementation of CISE. The possibility of establishing enhanced cooperation in the field of common foreign and security policy is analysed below.

Industry participation

The alternative corresponds essentially to the setting up of a joint undertaking, or similar structure, as explored in more detail above.

Inter-governmental agreement

Finally, the Commission may encourage Member States to negotiate (an) intergovernmental agreement(s) between themselves. Such agreements would amount to international agreements and fall outside the scope of EU law.

6.4.3 Policy option 3: Legally binding options

Characteristics of Policy Option 3

Policy option 3 is characterised by introducing legally binding legislative instruments as provided under Art. 289 (3) TFEU. As described in Part 1 of the analysis (legal baseline), the rights and responsibilities are fragmentised and the regulation relies on a sectorial (vertical) approach, expressly allowing the sharing of information across these sectors on very few occasions. A possible EU legislative action seeking to achieve the specific objectives as described in chapter 5, can therefore be directed in two ways: it could, when addressing the existing limitations to information sharing:

- retain the existing sectorial approach by amending legal acts to address limitations within the current sectorial approach to maritime policy, based on the existing sectorial mandates, or
- move towards a horizontal approach towards CISE to ensure horizontal coordination amongst sectorial legislation and thereby provide a comprehensive EU regulatory framework for integrated maritime policy.

The choice of the appropriate policy instruments to implement CISE builds upon this distinction. It departs from the following legal principles, which impose several conditions upon the EU legislative action.

Resort to multiple legal bases

As a matter of principle, a measure should be founded on a single legal basis. Recourse to multiple legal bases for an obligatory measure is nonetheless possible,

but should be resorted to exceptionally, that is when the measure pursues a number of objectives or has several components, which are inseparably linked without one being incidental to the other [22]. In other words, **the content and the purpose of each of the measure's objectives and components must be of equal gravity** in the context of the measure as a whole.

Compatible legal bases

As a matter of principle, TFEU and TEU competences may not be combined to provide a multiple legal basis for a single measure even if the measure pursues a number of objectives or has several components falling respectively within the policies governed by the TFEU and TEU, and where neither one of those components is incidental to the other.[23] This follows from the fact that the two systems have substantially different general characteristics: they provide for divergent legal instruments and envisage different decision-making procedures. Decision-making under the TFEU is often under co-decision, while the TEU provides for unanimous voting in the Council with minimal participation of the European Parliament. In order to comply with the principle established in the ECJ jurisprudence regarding the compatibility of TFEU and TEU competences[24] **a potential CISE measure could be split in several (at least two) legal measures** so that one part of the measure would cover the user communities embraced be TFEU, while the other would embrace the defence community, which is governed by TEU;

Compatible legislative procedures

Recourse to multiple legal bases is furthermore excluded, where the procedures laid down for each legal basis are incompatible with each other (e.g. when one requires a co-decision procedure, while the other provides for unanimous voting in Council). **A potential CISE measure could therefore be split in order to accommodate different legislative procedures** prescribed for measures within different sectorial policies.

Compatible legislative instruments

The Joint Practical Guide[25] recommends for **an amending act to be of the same type as the act being amended**. Examples nonetheless exist, where a Directive has been amended by means of a Regulation.[26] On the other hand, it is not recommended to amend a Regulation by means of a Directive.[27]

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[22] Case C-211/01 *Commission* v *Council* [2003] ECR I-8913, para. 40, and Case C-91/05 *Commission* v *Council*, para. 75).
[23] Case C-91/05 Commission v Council, judgment of 20 May 2008. The ECOWAS case was decided under the former three-pillar structure, but its reasoning remains applicable after the entry into force of the Treaty of Lisbon.
[24] Case C-91/05 Commission v Council, judgment of 20 May 2008.
[25] The Joint Practical Guide of the European Parliament, the Council and the Commission 2003.
[26] Directive 80/217 introducing Community measures for the control of classical swine fever.
[27] The Joint Practical Guide of the European Parliament, the Council and the Commission 2003, Guideline 18.7.

Opt-outs from the Treaties

Additional conditions follow from particular Member States' opt-outs and opt-ins from the TFEU (border control, cooperation in criminal matters and police cooperation) and TEU (common foreign and security policy). These do not constitute barriers to the implementation of CISE, but rather require differentiated approach to rights and responsibilities.

Subsidiarity and proportionality of EU action, conformity with fundamental rights

Finally, the principles of subsidiarity and proportionality and the necessity for the EU action to be in conformity with fundamental rights were taken in to account when assessing the suitability of different policy instruments as measures to implement CISE.

In the areas where the Union and the Member States share competence (agriculture and fisheries, environment, transport, border control and general law enforcement),[28] the principle of subsidiarity establishes a presumption in favour of the Member States taking action.[29] The Union should only act if Member States cannot achieve the objectives sufficiently and if, by reason of the scale or effects, the Union can achieve them better.

In contrast, in the area, where the Union has exclusive competence in a particular area (customs union),[30] it is the Union which may act. The common foreign and security policy is subject to specific rules and procedures. The adoption of legislative acts is excluded within that area.

The principle of proportionality

As far as the form and content of Union action are concerned, such action must not exceed what is necessary to achieve the objective of the Treaties. Any decision must be taken in favour of the least restrictive option.

Break-down of the existing legal framework

The following table breaks down the existing legal framework for the implementation of CISE, depending on legal basis, applicable legislative procedure, opt-outs from the TFEU and TEU, the conducive environment for information sharing (i.e. taking into account the differences in cultural behaviour and regulatory approaches common to multiple user communities) and the legal instruments which constitute the legal framework in each of the user communities.

[28] Article 4 TFEU.
[29] Report from the Commission on subsidiarity and proportionality, COM (2011) 344 final
[30] Article 3 TFEU.

Table 6-4 Break-down of the existing legal framework for the implementation of CISE

user community	**Marine pollution**	**Maritime safety and security**	**Customs**	**Fisheries control**	**General law enforcement**	**Border control**	**Defence**
legal basis	*TFEU*						*TEU*
legislative procedure	*ordinary legislative procedure*				*ordinary and special legislative procedure*[31]		*unanimity*
opt-outs	*no opt-outs*				*Opt-outs from TFEU and TEU*[32]		
conducive environment[33]	*high*	*medium*					*low*
current framework	*primarily Directives*		*primarily Regulations*		*Council decisions*	*primarily regulations*	*no legislation (Council decisions)*

[31] Special legislative procedure is prescribed for measures to ensure administrative cooperation between the relevant departments of MS in the area of freedom, security and justice (i.e. border control and general law enforcement). Additionally, the special legislative procedure applies for measures concerning operational cooperation between law enforcement authorities.

[32] UK, Ireland and Denmark opted-out from Title V TFEU.Denmark opted-out from common security and defence policy.

[33] First interim report (legal) pp. 16-20.

Removing legal limitation in sectorial legislation to cross-border and cross-sector information sharing

Legal basis and legislative procedure

As outlined above, the rights and responsibilities with respect to the sharing of maritime surveillance information are fragmentised in a great number of sectorial legislative acts. Accordingly, in order to remove existing legal limitations to information sharing multiple policy instruments (amending acts) rather than a single instrument would be necessary. The type of such instrument (i.e. Regulation, Directive or Decision) is determined in accordance with the legal principles described above. It is envisaged that such instruments would rely on existing sectorial legal mandates. This presupposes that the aim and purpose of such amending acts is formulated so as to have its "centre of gravity" in the aim of each of the sectorial mandates.

The table below provides an overview of the current legal bases, the aims for which action may be pursued by the EU legislator (aim of the action) and prescribed legislative procedure.

Table 6-5 Mapping of legal bases and legislative procedures

user community	main legal base	aim of the EU action	legislative procedure
fisheries control	Art. 43(2) TFEU	the pursuit of the objectives of the common agricultural policy and the common fisheries policy	ordinary legislative procedure after consulting the Economic and Social committee (EESC)
maritime safety and security	Art. 100(2) TFEU	appropriate provisions for sea and air transport	ordinary legislative procedure after consulting EESC and the Committee of Regions (CoR)
marine pollution	Art. 192(1) TFEU	actions to achieve the objectives of the Union policy on the environment	ordinary legislative procedure after consulting the EESC and CoR
customs	Art. 33 TFEU	measures to strengthen customs cooperation between MS and between MS and the Commission	ordinary legislative procedure
	Art. 114 TFEU	measures for the approximation of the provisions laid down by law, regulation or administrative action in MS, which have as their object the establishment and functioning of the internal market	ordinary legislative procedure after consulting EESC
	Art. 207(2) TFEU	measures defining the framework for implementing the common commercial policy	ordinary legislative procedure (legal acts limited to Regulations)
border control	Art. 77(2) TFEU	measures concerning the pursuit of the border control, asylum and immigration policy	ordinary legislative procedure
	Art. 74 TFEU	measures to ensure administrative cooperation between the relevant departments of the Member States, as well as between those departments and the Commission	special legislative procedure - EP consultation (Council measures)
general law enforcement	Art. 87 (2) TFEU	measures concerning the collection, storage, processing, analysis and exchange of relevant information	ordinary legislative procedure
	Art. 87(3) TFEU	measures concerning operational cooperation between law enforcement authorities	special legislative procedure – EP consultation (Council measures)
defence	Art. 42 TEU	decisions relating to the common security and defence policy	Council acting unanimously on a proposal from the High Representative of the Union for Foreign Affairs and Security Policy or an initiative from a Member State

Content

The mapping of existing rights, responsibilities and legal limitations in first interim report legal identified the specific limitations in sectorial legislation. These barriers may be removed depending on the type of the limitation (cross-border, cross-sectorial), but also depending on whether the information at hand is subject to legal limitation and upon the character of such limitation (personal data protection, commercial confidentiality and secrecy, IP rights, classified character, other limitation). This may include:

- insertion of a provision in the relevant sectorial legislation providing for the possibility to transfer personal data to certain enumerated functions under the condition that the protection of the personal data is safeguarded in accordance with the applicable personal data protection legislation. Such provision may be modelled on Art. 12 of the Council Regulation 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, taking due regard to the Opinion of the Data Protection Supervisor.[34] In this context, the Final Report of Work Package 2: Use Cases and Information Services Identification,[35] Annex 2 may provide guidance on the formulation of purposes for information sharing.

- insertion of consent clauses on unambiguous consent to the processing of personal data for different purposes than those, for which the data has been originally collected. This has to follow closely the course taken during the on-going process of revision of the current personal data protection legislation.

- insertion of a provision allowing the transfer of commercially sensitive data between maritime surveillance authorities having similar functions under the condition that national legislation governing the confidentiality of such data is respected.

- insertion of consent clauses on unambiguous consent to the sharing of commercially confidential data with additional functions.

- introduction of common classification levels including guidelines for the categorisation of information.

Delegated acts

Delegated acts (in the form of technical annexes) may specify e.g. the list of CISE participants, their corresponding access rights and technical details for the information sharing. Delegated acts are adopted pursuant to Art. 290 TFEU. Their adoption requires an express delegation to the Commission in the legislative acts specifying the objectives, content, scope and duration of the delegation power.

[34] Published in OJ 2012/C 37/01.
[35] Test Project on Cooperation in execution of various maritime functionalities at sub-regional or sea-basin level in the field of integrated maritime surveillance (CoopP), Final Report of Work Package 2.

Transposition and compliance aspects

The implementation margins existing in current horizontal (in particular the data protection legislation) and sectorial legislation inevitably lead to a certain divergence in national implementation among EU Member States. In some cases, this includes the introduction of conditions for information sharing, which are even more stringent than required by EU legislation. This is likely to reflect upon the transposition and compliance with any future legislative initiative in the future.

Administrative complexity and simplification potential

The major drawback of this approach lies in the lack of coordination regarding the adoption of the different sectorial legislative acts and delegated acts and the administrative complexity associated with the process. To some extent, this complexity can be simplified by grouping the sectorial legislative amendments depending on their legal basis and further distinguishing depending on the type of the legislative act amended (i.e. a Regulation amending Regulations, relying on the same legal basis, Directive amending Directives adopted under the same legal basis). A similar model has been successfully utilised in Directive 2010/78/EU (Omnibus I Directive),[36] which amended 11 existing Directives in the financial sector to ensure the development of a single rule book and relied on the same legal bases as the Directives it amended (in that case the sum of the legal bases). The following table illustrates this simplification potential.

[36] Directive 2010/78/EU of the European Parliament and of the Council amending Directives 98/26/EC, 2002/87/EC, 2003/6/EC, 2003/41/EC, 2003/71/EC, 2004/39/EC, 2004/109/EC, 2005/60/EC, 2006/48/EC, 2006/49/EC and 2009/65/EC in respect of the powers of the European Supervisory Authority (European Banking Authority), the European Supervisory Authority (European Insurance and Occupational Pensions Authority) and the European Supervisory Authority (European Securities and Markets Authority).

Table 6-6 Simplification potential (Removing sectorial limitations)

Fisheries control	Marine safety and security		Marine pollution	Customs		Border control	General law enforcement	Defence
Amending Regulation	Amending Directive	Amending Regulation	(Amending Directive)[37]	Amending Regulation	Amending Decision	Amending Regulation	Amending Directive[38]	N/A
Delegated legislation	Delegated legislation	Delegated legislation	(Delegated legislation)	Delegated legislation	Delegated legislation	Delegated legislation	Delegated legislation	

Introducing a binding CISE legal framework

The second alternative of a legally binding option is a horizontal approach to CISE. In order to respect the legal principles of EU law governing resort to multiple legal bases as described above, the horizontal CISE measure would have to be split in several umbrella packages, embracing multiple user communities depending on the applicable legal basis, legislative procedure, etc. as outlined in Tables 6-4 and 6-5.

Legal basis and applicable legislative procedure

The legal basis for adopting the different umbrella legislative packages would be the aggregate of legal bases upon the existing sectorial legislation relies.

Within Common Security and Defence Policy (CSDP), the adoption of legislative acts is excluded (Art. 31 TEU), instead the instruments available under CSDP lie in the grey zone between legislation and political cooperation. TEU conceptualises Common Foreign and Security Policy (CFSP) instruments into four types of decisions. As a general rule, decisions under CSDP are taken by the European Council and the Council acting unanimously, except when provided otherwise.

[37] No limitations were detected in the marine pollution user community.
[38] Council Framework Decisions have been abolished by the Lisbon Treaty.

Such unanimous decisions are taken on a proposal from the High Representative of the Union for Foreign Affairs and Security Policy or an initiative from a Member State (Art. 42(4) TEU).

As outlined above, such decisions under CSDP can be categorised in four types:

- **Decisions on strategic objectives and interests of the EU** (also referred to as CSDP Principles and guidelines), i.e. decisions which shape the framework of EU policies and actions either with respect to the Union's relations with a specific country or region or may be thematic in approach (e.g. weapons of mass destruction, terrorism, etc.). Such decisions, agreed at the highest political level, include high level strategies such as the European Security Strategy, the EU Internal Security Strategy or the EU Counterterrorism Strategy. These types of decisions may subsequently trigger the adoption of common positions or joint actions, which apply the concepts defined in the strategies more specifically and concretely.

- **Decisions on common positions**; i.e. decisions which as a rule reiterate the EU's objectives and define a collectively agreed diplomatic approach to a particular country or region (e.g. Cuba, North Korea and Zimbabwe).

- **Decisions on joint actions**, i.e. decisions which often provide for the launching or extending a civilian or military operation under CSDP, or e.g. appoint EU Special representatives, provide financial or other support to the activities of an international organisation engaged in peace building. For example, the European Defence Agency (EDA) was established by a Council Joint Action following an endorsement of the establishment of EDA in the European Security Strategy.

- **Decisions on the implementing arrangements** for common positions and actions, which as their titles indicate, implement common positions and actions.

Out of the acts available under CSDP, joint actions appear most suitable. However, considering the *sui generis* character, the overall orientation and the complexity of the procedure for their adoption, we conclude that alternatives should be explored in parallel. Such alternatives include the possibility for enhanced cooperation under Art. 20 TEU.

Enhanced cooperation under TEU

Member States may establish enhanced cooperation between themselves within the framework of the Union's non-exclusive competences. Decisions authorising such cooperation in the field of the common foreign and security policy (CFSP) are taken unanimously by the Council, following the opinions of the High Representative of the Union for Foreign Affairs and Security Policy and the Commission (HR) (Art. 329(2) TFEU). The conditions for such cooperation are that (1) the cooperation aims to go further than the objectives of the Union, to protect its interests and to reinforce this integration process, (2) those objectives cannot be attained within a reasonable period by the Union as a whole and (3) at least nine Member States participate in it.

The enhanced cooperation may adopt acts which will be binding only on its members. Also, any Member State may at any time decide to participate in the enhanced cooperation. In such a case the Member State's participation has to be confirmed by the Council, after consulting the HR. The Council may also adopt any transitional measures with regard to the application of the acts already adopted within the framework of enhanced cooperation (Art. 331(2) TFEU).

Trans-European networks

Additionally, it may be considered to rely on the legal basis in Art. 170 TFEU (ex-Art. 154 TFEU) for the adoption of a Decision, establishing the technical infrastructure for CISE. Art. 170 TFEU provides a legal basis for the establishment and development of a trans-European network in the areas of transport, telecommunication and energy infrastructures. Such networks may be set up to help achieve the establishing or ensuring the functioning of the internal market (Art. 26), to strengthen the Union's economic, social and territorial cohesion (Art. 174) and to enable the citizens of the Union, economic operators and regional and local communities to derive full benefit from the setting-up of an area without internal frontiers.

Art. 170(2) TFEU provides specifically that within the Union, action should aim at promoting the *interconnection and interoperability* of national networks as well as *access* to such networks. In order to achieve the objectives outlined above, the Union should, *inter alia*, implement any measures that may prove necessary to ensure the interoperability of networks, in particular in the field of technical standardisation.

A precedent exists in the EDICOM Decisions that where the aim of the measure has been to ensure the interoperability of national networks by means of *operational measures of technical nature*, Art. 170 (ex-Article 154 TEC) has been employed as a legal basis.

EDICOM

The EDICOM I and II programmes aimed at encouraging a modern, rational and effective organisation of the trans- European collection, treatment and distribution network for intra and extra-Community statistics, accompanied by the improvement and harmonisation of statistical methods. The goal was to produce information that is more reliable, less expensive for providers and administrations, and available more quickly as well as being able to satisfy user needs in a more relevant way.

Council decision 96/715/EC on inter-administration telematics networks for statistics relating to the trading of goods between Member States (EDICOM) established a set of measures to facilitate "the conversion of regional, national and Community systems towards interoperable systems at European level, as a first stage, for the collection of returns on the trading of goods between Member States from business, the validation and pre-processing of such returns and the dissemination of the statistics derived therefrom." The interoperability of the

systems was guaranteed by the development and use of harmonised standards and communication procedures.

Following a report from the Commission on the implementation of Edicom as between 1997-99,[39] the programme has been extended for a further five years[40] . The budget for the programme for the period from 2001-05 has been EUR 51,2 million.

Legal basis for EDICOM

Initially, the EDICOM Decision was based on ex-Art. 235. Art. 235 allowed the Council to adopt appropriate measures concerning the operation of the common market where the Treaty did not provide necessary powers. The Decision was subsequently annulled by the ECJ[41] on the grounds that the measure should have been based on the Treaty provision governing the establishment of trans-European networks.

In the decision, the ECJ reasoned that any Community measure seeking to ensure interoperability of the nation networks does not necessarily have to be preceded by the establishment of guidelines in accordance with the first part of the provision and that "this will be so in particular where, as in this case, it is merely a question of the adoption of operational measures designed to ensure the interoperability of the existing national networks in order to make them technically compatible for the purpose of integrating them into a trans-European network."[42]

Although the EDICOM decision also serves objectives of the internal market, the ECJ held that those objectives were merely ancillary in relation to the main objective, i.e. to ensure the interoperability of national networks by means of operational measures. This is also reflected in the wording of Art. 170 "to help achieve the objectives". It follows that as long as the measure (1) seeks to ensure the interoperability of the networks, in particular in the field of technical standardisation and thereby (2) help to achieve the establishing or ensuring the functioning of the internal market and strengthen the Union's economic, social and territorial cohesion and (3) enable to derive full benefit from the setting-up of an area without internal frontiers, Art. 170 TFEU may in principle be used as an appropriate legal basis for such a measure.

Guidelines for trans-European telecommunications networks – projects of common interest

At the present time a proposal for a Regulation on guidelines for trans-European telecommunications networks is pending in the legislative process.[43] The Regulation would provide for the objectives of the projects of common interest and the conditions upon which such projects may be eligible for financial assistance.

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[39] COM (2003) 88 final.

[40] Decision No 507/2001/EC concerning a set of actions relating to the trans-European network for the collection, production and dissemination of statistics on the trading of goods within the Community and between the Community and non-member countries (Edicom).

[41] Case C-271/94.

[42] *Ibid*, para. 26.

[43] COM(2011) 657 final, as amended on 28.5.2013.

The projects of common interest should pursue the general objectives of the Connecting Europe Facility (CEF),[44] i.e. contribute to smart, sustainable and inclusive growth by developing modern and high performing trans-European networks, and, additionally, pursue economic growth and support the completion of the Digital Single Market in support of the competitiveness of the European economy and/or improve the daily life for citizens, business and governments through the promotion of interconnection and interoperability of national, regional and local telecommunication networks as well as access to such networks.

The guidelines also introduce the so called "digital service infrastructures". Such infrastructures enable networked services to be delivered electronically (typically over the Internet) and provide trans-European interoperable services of common interest for citizens, business and/or governments.

Administrative complexity and potential for simplification

In conclusion, applying the principles outlined above, one could envisage the following instruments for the implementation of this policy sub-option:

- Directive covering the marine pollution and the marine safety and security user community, adopted by ordinary legislative procedure after consulting the EESC and CoR, relying on the legal basis in Arts. 100(2) and 192(1) TFEU
- Regulation covering the customs and the fisheries user community, adopted by ordinary legislative procedure after consulting the EESC, relying on the legal basis in Arts. 43(2) and 114 TFEU
- Regulation covering the border control and general law enforcement user community adopted by ordinary legislative procedure, relying on legal basis in Art. 77(2) and 87(2) TFEU
- Council decision adopted on the basis of Art. 40(4) TEU or a Council decision authorising enhanced cooperation within the field of the common foreign and security policy based on Art. 20 TEU.

There is a potential to merge the two instruments (the Directive and the Regulation) into one, a Regulation, relying on four legal bases. This may ensure greater coherence between the sectors, but following this course would be considerably more demanding in aligning the objectives and content of the measure, so that such are of equal gravity, without one being incidental to the other. Furthermore the marine safety and security user community is at the present time regulated primarily by Directives and, considering that the umbrella act would in principle, also seek to amend the existing legislation within the sector to remove the existing legal limitations, a Directive would be generally preferable to introduce such amendments.

[44] COM(2011) 665 final.

The following table illustrates the potential for the practical implementation of this policy sub-option, utilizing the policy instruments described above.

Table 6-7 Simplification potential (Binding CISE legal framework)

Maritime safety and security	Marine Pollution	Fisheries control	Customs	Border control	General law enforcement	Defence
Decision establishing the technical infrastructure for CISE						
umbrella Directive		umbrella Regulation		umbrella Directive		Council decision/ enhanced cooperation
delegated legislation		delegated legislation		delegated legislation		

Content

The umbrella acts would:

- set out the CISE principles
- define the concept of purpose-oriented information
- remove existing legal limitations in sectorial legislation (annex)
- introduce common data standards for exchange (relying e.g. on the legal basis in Art. 170 TFEU- trans-European networks).

Delegated acts

The umbrella legislative acts could be accompanied by delegated acts, which would specify, among other things, the list of CISE participants, their corresponding access rights and technical details applicable to the information sharing. The mandate for adopting such delegated acts would be laid down in the individual umbrella acts.

Transposition and compliance aspects

Similarly to the previous sub-option, the instruments utilized to employ this sub-option would require the transposition/implementation (depending on the type of the instrument) in the Member States national legal orders. This would put a considerable administrative complexity upon the Member States. On the other hand, the horizontal coordination, although limited, would allow for a more coherent application in the various sectors, in line with the CISE principles and in principle a potential for higher compliance levels.

6.5 Architecture visions

Legal implications of CISE architecture visions

The implications of the technical setup for CISE are discussed in the present section. This setup, comprised within the different architecture visions, will have different implications for what is needed of legal and cultural changes and the other way around.

The CISE architecture visions are closely linked to the policy options for implementing CISE and the policy instruments necessary for the implementation of each of the policy options. An understanding of how a CISE policy option might be differently supported by different CISE architecture visions improves the understanding of the policy options. Architecture visions can also be considered as a separate building block. Accordingly, this section provides an overview of the visions and, subsequently, combines the analysis of CISE architecture visions and policy options and sub-options for implementing CISE.

6.5.1 CISE architecture visions

Architecture visions

Five CISE architecture visions were presented to the MSEsG on 25 April 2013. These include the core vision, visions A, B, C and a variant of vision C. Following the comments received from the Member States, in June 2013 the Commission proposed to simplify the architecture visions by joining together visions A, B and C in one hybrid vision and to remove the variant of vision C. The updated architecture visions thus consist of two visions: **the core vision**, based on multiple providers of CISE services at national level, and **the hybrid vision**, based on multiple providers of CISE services coordinated by MS and user communities.

The core vision

The core architecture vision is the minimum viable architecture, i.e. the minimum collection of building blocks required for CISE to fulfil its most essential requirements. Therefore the CISE core vision does not prescribe a governance model. The building blocks in the core vision are also present in the hybrid and the original A, B and C visions.

The hybrid vision

Visions A, B, C are envisaged to be merged by merging the interoperability agreements of each of the visions. The main challenge in this context is the merging of the three visions at organizational level. The organisational level of the interoperability agreements determines how CISE services will be governed, how CISE services will be delivered and how a common integrated maritime awareness model can be used.

6.5.2 Legal implications of architecture visions

From a legal viewpoint, two dimensions of architecture visions should be highlighted:

- measures that need to be put in place or changed in order to ensure that information can be exchanged through the CISE environment, and
- measures that need to be put in place or changed to ensure a sufficient governance structure of the CISE environment.

Measures that need to be put in place to ensure that information can be exchanged

Each maritime surveillance authority operates within its own national framework, which it must observe when maritime surveillance information is being processed. When information is exchanged between Member States through the CISE environment, the legal validity of such information must be maintained across borders and the legislation in both the originating and the receiving country must be respected.

The question of what measures need to be put in place or changed in order to ensure that information can be exchanged through the CISE environment is closely linked to the analysis of the legal limitations to the sharing of information, as presented in Part I of the analysis. In a nutshell, the legal analysis revealed that the legal conditions for the sharing of maritime surveillance information are at EU level subject to a fragmented approach, which suffers from a considerable degree of legal complexity. While at national level, a few Member States have already taken initial steps towards exploring ways to harmonise the legal conditions for information sharing, at EU level this complexity persists.

Measures to ensure that information can be exchanged through the CISE environment must take this complexity into account and allow for a differentiated approach depending on the legal limitations attached to the information shared. Specifically, it should be secured that each provider of CISE services is able to, with respect to each of the information to be shared through the CISE environment, assign **a protection level** (according to the commonly agreed access profiles) and be able to **control** the data it has made available, including correcting/amending it. The specific conditions to information sharing should be further specified in cross-sectorial information sharing agreements between maritime surveillance authorities (possibly forming part of the interoperability agreements).

Measures that need to be put in place or changed to ensure a sufficient governance structure of the CISE environment

Since in the core vision no governance structure is prescribed and the authorities collaborate bilaterally, this second issue is relevant for the hybrid vision only.

The hybrid vision proposes a two-level governance model:

- 1st level: CISE Contact Points at Member State level to manage the catalogue of CISE services of each Member State. These are the services belonging to, and provided by, Member States
- 2nd level: CISE Contact Points at EU level to manage the catalogue of CISE services of each user community. These are the services belonging to the user communities and provided by EU led initiatives, usually under the supervision of EU agencies. The Member States are involved in the governance of these initiatives.

Accordingly, the hybrid version will require the appointment of 27 CISE contact points at Member State level (one per Member State) and seven CISE contact points at EU level (one per user community).

It follows that from a legal viewpoint, measures need to be introduced to:

› encourage or oblige (depending on the choice of policy option) the EU Member States to appoint their CISE contact points

› vest the existing EU agencies with the task to act as a CISE contact point.

The type of instrument needed in order to implement the above described measures would depend on the policy option chosen to implement the measure as such.

6.5.3 Comparison of architecture visions

Each of the architecture visions has its advantages and drawbacks. These are outlined in the table below.

Table 6-8 Drawbacks and benefits of architecture visions

	Core vision	Hybrid vision
Establishment of trust and the potential to overcome cultural barriers	-	+
Improvement to legal certainty	-	+
Integration	-	+
Correlation/aggregation of data	-	+
Ease of implementation	+	-

The effectiveness of the visions

The effectiveness of the visions in improving maritime awareness; i.e. the extent to which these option fulfil the CISE principles and requirements, has been estimated to be **77%** for the core vision.[45] The effectiveness of the hybrid vision has as of yet not been assessed. However, as the vision merges visions A, B and C, it is assumed that the effectiveness of this vision would be the average of the effectiveness of the three options; i.e. **95%.**

Gartner study

To the requirements used by the Commission in assessing the effectiveness of the architecture visions, the Gartner Study,[46] added an assessment of the effectiveness of each of the visions in terms of addressing the existing technical barriers. It concluded that the hybrid vision was more effective in addressing the barriers.

[45] CISE Architecture Visions Document version 2.01, Annex 4.
[46] A Draft Report for the European Commission- Directorate General Maritime Affairs: Sustainability and Efficiency of visions for CISE, 30 August 2013.

Specifically, out of the nine identified barriers, the hybrid vision addresses seven of the barriers fully and two partly, while the core vision addresses only three of the barriers fully, three partly and leaves two unaddressed. Moreover, the two technical barriers identified in the study as having the strongest impact on the effectiveness of the architecture visions were addressed fully by the hybrid vision, but only partly by the core vision.

Initial assessment

Taking into account our assessment of advantages and drawbacks of each of the visions, the outcomes of the Commission's evaluation of the visions and the contribution from the Gartner study, **the hybrid vision** appears to be the preferable vision. The two visions will be analysed further in combination with each of the CISE policy options.

6.5.4 Combining architecture visions and policy options

This section describes how the CISE policy options may be supported by the different architecture visions and identifies the most viable combination of the two based on how effectively the different combination furthers the CISE objectives, as identified in Chapter 5.

Policy option 2 combined with core vision

Policy option 2 seeks to implement CISE by employing instruments that stimulate voluntary cooperation between Member States. As assessed above, the major strength of the policy option lies in its flexibility and ease of implementation. It is anticipated that this policy option would be particularly effective in achieving the first specific objective, i.e. reducing cultural and administrative limitations.

Addressing drivers

The most significant drivers to cultural and administrative limitations are the lack of trust and the organisational complexity of the maritime surveillance authorities of the various Member States. We conclude that the core vision is not particularly suitable to address either of these drivers.

The core vision does not prescribe any governance model. Instead, the different public authorities offer services to other CISE participants independently. In other words, the authorities' systems are all potential providers of CISE services. The organisation complexity undermines trust as no clearly defined structure for communication exists (there is no national CISE contact point). The core vision improves maritime surveillance by encouraging public authorities to share information with others through commonly defined semantic and technical building blocks. However, there is a little incentive for the different authorities to do so. The vision does envisage agreements neither regarding the discovery of services nor the rules for fusing and the majority of maritime user authorities see at the present time little benefit in having access to uncorrelated and not fused data.

Policy option 2 combined with the hybrid vision

As outlined above, Policy option 2 seeks to implement CISE by employing instruments that stimulate voluntary cooperation between Member States through non-binding instruments. The hybrid vision prescribes a two-level governance: at national and at EU level. At national level, this entails the nomination of one CISE

contact point per Member State. At EU level, seven contact points would be nominated. These would be organised according to the seven CISE user communities.

Addressing drivers

The governance model provided by the hybrid vision is considered to be more suitable to address the lack of trust among maritime surveillance authorities and, at the same time, contribute to overcoming the difficulties stemming from the organisational complexity of various maritime surveillance authorities in the EU Member States. Such solution would also promote legal certainty and thereby stimulate Member States to share information through the CISE environment.

Implementation

As far as the implementation of the hybrid vision through Policy option 2 is concerned, this may be done through a recommendation to the Member States (in the form of a Recommendation or a Communication from the Commission) to appoint their national CISE contact points. In turn, the mandate for the existing EU agencies to act as CISE contact points may be found in the Regulations founding the agencies, which as a rule vest the agencies with the task to coordinate the cooperation between Member States.

Policy option 3 combined with the core vision

Addressing drivers

Policy option 3 is characterised by introducing legally binding legislative instruments. In Option 3, the specific objective to reduce cultural and administrative limitations is for the most targeted indirectly through policy measures to address the third specific objective, i.e. to reduce legal limitations. The changes to the existing legislative framework provide an incentive to the different maritime surveillance authorities to share information and thereby addresses the lack of trust and other administrative barriers. However, as the core vision is better suited to, in addition to addressing the existing cultural and administrative limitations, address the existing technical limitations (see above), we conclude that the hybrid vision is more suitable for the implementation of Policy option 3.

Conclusion

Based on the finding presented above, the impacts of the different policy options will be assessed with respect to each of the options supported by the **hybrid architecture vision.**

7 Analysis of impacts of policy options

Analysis from different angles

The analysis of the impacts of the CISE policy options – presented in the previous chapter – is done from different angles. It is mainly done bottom-up via preliminary findings by the Cooperation Project and findings from our interviews with maritime surveillance stakeholders, but also top-down via the MSEsG questionnaire survey, Member State interviews, as well as reviews of the literature – hereunder the two pilot projects: BluemassMed and MARSUNO.

7.1 Bottom-up analysis of impacts

From potentials for improved performance to impacts of CISE

Having presented the characteristics of the use cases analysed within the Cooperation Project, the bottom-up analysis of impacts continues with the analysis of the potential for improving the maritime surveillance performance. It then looks at the technical, legal and/or cultural limitations to achieving this potential, and on how the CISE policy options may help to reduce the limitations and thus achieve part of the potential. Finally, it looks at the economic, social and environmental impacts of improving the maritime surveillance performance via CISE.

7.1.1 Characteristics of Cooperation Project use cases

Nine Cooperation Project use cases …

The maritime experts who were involved in the Cooperation Project have on the basis of a mapping of the demand and supply for maritime surveillance information (see Garnier and Oliveri, 2012) selected nine use cases where there is a particular potential for improved maritime surveillance performance via CISE. Hence, we assume that these nine use cases analysed cover areas where CISE has the highest potential for adding value via improving the sharing of information and via improving cooperation through such sharing. Furthermore, we assume that the selected use cases are sufficiently general to cover most of the benefits from CISE, and do so in a balanced way. As such we base the analysis around these nine general use cases, and supplement the analysis via more specific Member States evidence/views obtained via the interviews with maritime stakeholders.

… that together cover the different elements of maritime surveillance

Combined, the nine Cooperation Project use cases cover the different elements of maritime surveillance; namely (A) detection; (B) verification, and (C) response (i.e. see Figure 2-2). The output of maritime surveillance (D) is regarded as a result of these elements. The coverage of the use cases across the maritime surveillance

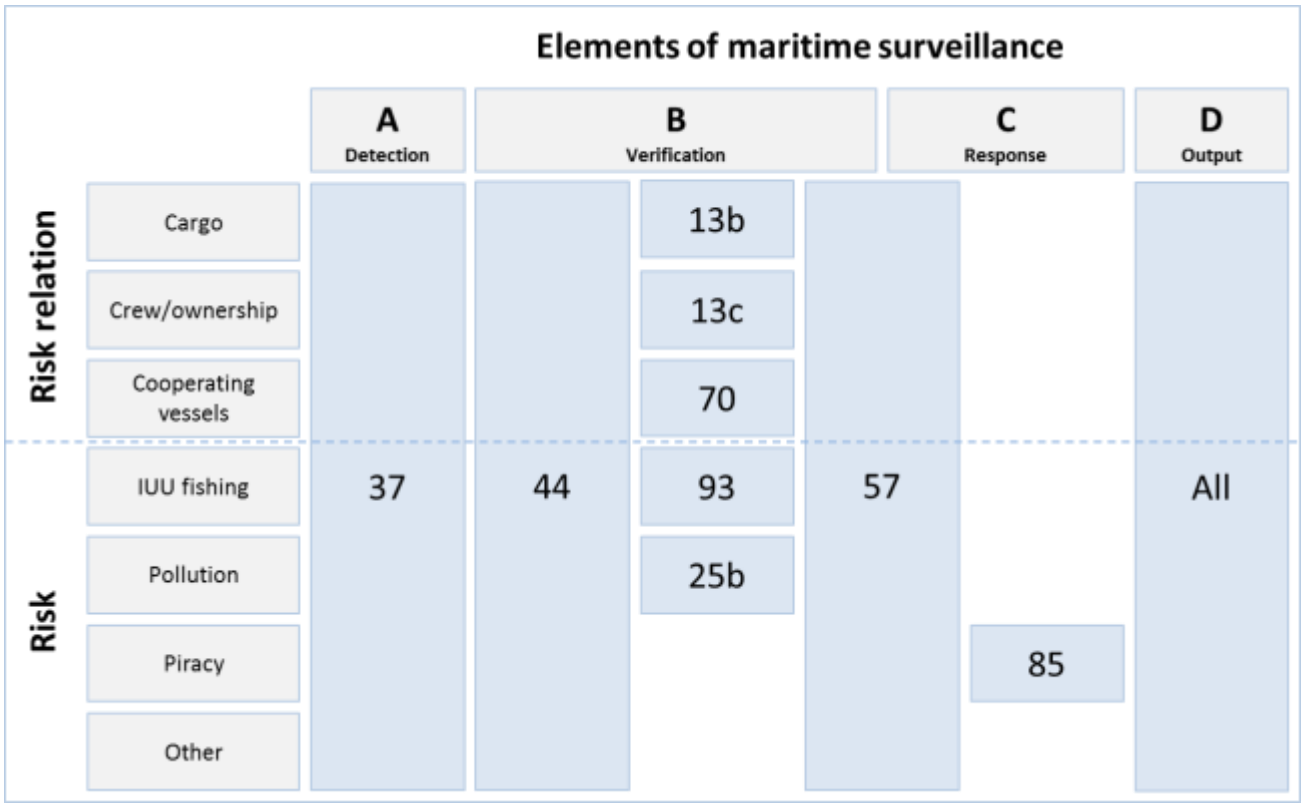
elements is illustrated in Figure 7-1. Table 7-1 contains the IDs and goals (titles) of the use cases, where the IDs refer to the original numbering made by the TAG/JRC. In addition, a short description of the operational situation/trigger is provided for each of the use cases, while they are presented in detail in the reporting of the Cooperation Project (2013a) – in particular in version 3.0 of the list of use cases for baseline maritime environment developed by Work Package 2 of the Cooperation Project. It should, however, be emphasised that the Work Package 3 participants of the Cooperation Project have allowed themselves to refine the narrative descriptions of these use cases to make them more suitable for the assessment of cost and benefits.

Please note that although some of the use cases in practice may cover more than one of the maritime surveillance elements, they are in the figure placed where they are considered most relevant; and hence where they are assessed to provide particular evidence of the added value of CISE. Furthermore, it should be noted that it during the analysis has shown to be difficult to distinguish between the benefits of use cases 37 and 44 – i.e. between the benefits of daily monitoring of events and the benefits of daily information requests regarding vessels of interest. Hence, the assessments for these two use cases have been merged. Furthermore, it has shown too difficult to quantify the added value from CISE regarding anti-piracy maritime surveillance and free navigation control.

Table 7-1 Overview of use cases (IDs, goals and operational situation/triggers)

ID	Goal	Operational situation/trigger
13b	Inquiry on a specific suspicious vessel (cargo related)	Intelligence driven information reveal that a ship's cargo is illegal, dangerous or in other ways in breach of rules and regulations.
13c	Inquiry on a specific suspicious vessel (crew and ownership related)	Intelligence sources alert that persons on board a vessel could be illegal or have criminal backgrounds. Uncertainty over the ownership of the vessel.
25b	Investigation of antipollution situation (law enforcement)	A vessel is suspected of polluting. Sighting is made by satellite, aircraft, surface vessel, from coast line, by vessel polluting, or by other sources.
37	Monitoring of all events at sea in order to create conditions for decision-making on interventions	Sensor information e.g. coastal radars and cameras, aerial sensor information and AIS) relaying information in real time or delayed), and other information services (anomaly detection services, data bases) and systems such as EUROSUR or MARSUR.
44	Request for any information confirming the identification, position and activity of a vessel of interest	Member State authorities have an interest in knowing the current position of a vessel, its activity, identification, etc. The information could be requested because: - The vessel is subject to police investigation - The vessel is suspected of involvement of irregular migration, drug smuggling or other cross border crime - There is evidence of pollution from the vessel - The vessel owner is subject to an adverse legal judgement - The vessel is subject to an investigation from an intelligence agency.
57	Knowledge of surveillance capacities of partner authorities in a given sea area to plan basic tactical surveillance	Need for enhancing or complement surveillance in areas where surveillance is poor or there is a specific surveillance need. Support for decisions where to deploy additional surveillance assets.
70	Suspect fishing vessel/small boat is cooperating with other type of vessels (m/v, container vessel etc.)	A fishing vessel / small boat is suspected to have suspicious activity with another vessel.
85	Anti-piracy maritime surveillance and free navigation control: merchant vessel at sea (outside territorial waters) sends an alert that it is under piracy attack	An alert is received by a Member State designated authority regarding a piracy attack of a ship entitled to fly its flag outside territorial waters.
93	Detection and behaviour monitoring of IUU listed vessels	Surveillance of EU waters and ports, increased behaviour monitoring when target is found to be listed as IUU vessel.

Figure 7-1 Overview of use cases according to elements of maritime surveillance performance



Source: COWI

The use cases cover current and future risks situation in EU waters

Figure 7-1 also illustrates that some use cases are more specific than others with respect to certain types of risks. For three of the use cases 13b, 13c and 70, the relevant risks are those that have relation to the specific types of ships and/or certain pieces of information, while 93, 25b and 85 are directly linked to a specific risk. Use cases 37, 44 and 57, on the other hand, are of a more general character and could in principle be dealing with aspects related to all risks/events. Generally, however, most of the nine use cases cover several maritime risks.

To facilitate the work of the Cooperation Project in assessing the potential added value of CISE in each of the nine use cases (or in practice seven use cases – since 37 and 44 have been merged, and 85 has shown to too difficult to put numbers on), the WP3 participants have focused their efforts on those sea basins where they have the most knowledge and experience. In order to establish expert judgements about the frequency/occurrence to which each use case can be attributed to dealing with specific maritime risks across *all* sea basins, a survey of *all* Cooperation Project participants has therefore been conducted. These additional survey results have been used to link the use cases to the risk assessment baseline presented in the Part 1 report across sea basins; and consequently establish a wider "EU-level" perspective of the use cases – including the anticipated CISE outputs and impacts. The results have also been used to verify the selection and analysis of the economic, social and environmental indicators covered by the uses cases.

Table 7-2 summarises the relative frequencies by which each use case can be attributed to different maritime risks, as well as how the events of the use cases (as

a whole) are distributed across the sea basins. It shows, for example, that general use cases such as 37+44 and 57 on average are more frequent for all risks and sea basins than the more specific ones like 93, 25b and in particular 85.

Although the different nature of the use cases – in particular the more specific ones – implies a varying coverage of maritime risks, the table shows that environmental issues such as environmental destruction and degradation but also maritime accidents and IUU fishing are relatively frequent; and this is also the case for the trafficking problems.

With respect to sea basins, there is a tendency that the risks covered by use case on average are more frequent in the Mediterranean sea than elsewhere. There is also such slight tendency for the Baltic sea, the Black sea and the Arctic ocean, while e.g. the Channel and the Celtic sea are assessed to be below average regarding the frequency/occurrence of maritime risks. Note that we in this analysis have concentrated on the nearby EU waters and so have not included the outermost regions and external waters.

To provide some insight into the detailed assessments made behind the averages presented in Table 7-2, Table 7-3 presents the assessed frequency/occurrence of events regarding the different risks for the combined use case 37+44. It shows, for example, that when it comes to trafficking of human beings and irregular immigration, it is particular in the Mediterranean sea where there is a potential for CISE to improve maritime surveillance/operations via improving daily monitoring of events and supporting daily information requests regarding vessels of interest. Trafficking of drugs is also in focus in the Mediterranean sea, but this is also high on the agenda for the Celtic sea, the Bay of Biscay and Iberian coast, and the Channel.

The CISE potential for reducing environmental destruction and degradation is as presented above on average high for the EU waters but assessed to be particularly so for the Baltic sea and the Arctic ocean. At the other end, there appears in most sea basins to be a limited scope for reducing the risks of terrorism, piracy and armed robbery within such use case that focuses on daily maritime surveillance activities.

Finally, it should be emphasised that the assessments made by the Cooperation Project participants are much in line with the risk assessment provided in Part 1 even if the focus is on the different use cases.

Table 7-2 Assessment by the Cooperation Project participants of the use case frequency/occurrence with respect to maritime risks – average by risk and sea basin

Risks and sea basins	UC 37+44	UC 13b	UC 13c	UC 70	UC 93	UC 25b	UC 57	UC 85
Terrorist threats	1	1	1	0.5	0	0	1.5	1.5
Piracy and armed robbery	1	0.5	0.5	0.5	0	0	1	2
Environmental destruction and degradation	3	2	2	1	1	3	2.5	1
Trafficking of human beings and irregular immigration	2	1.5	2	2	0.5	0.5	2.5	0.5
Trafficking of firearms and explosives	2	2	1	2	0.5	0.5	2	1
Trafficking of drugs	2.5	2.5	2	3.5	0.5	1	2.5	0.5
Maritime accidents	2.5	2.5	2	1	1	2	3	1
IUU fishing	2.5	2	2	1.5	4	0.5	3	0.5
Smuggling and counterfeit	2	2.5	1.5	2.5	1	0.5	2	0.5
Baltic sea	2	1.5	2	2	1	1	3	0.5
North sea	2	1.5	1	1.5	0.5	0.5	3	1.5
Celtic sea	1	1.5	1	1	0.5	0.5	1	0
Bay of Biscay and Iberian coast	1.5	1.5	1.5	1.5	1	1	2	1
The Channel	2	1.5	1	1	0.5	0.5	1.5	0.5
Mediterranean sea	3	2.5	2	2.5	2	2	3	2.5
Black sea	2	2	2	1.5	1.5	1.5	1.5	0.5
Arctic ocean	2.5	2	2	n.a.	n.a.	n.a.	2.5	0.5
Average	**2**	**2**	**1.5**	**1.5**	**1**	**1**	**2**	**1**

Note: Scores: 0 = very low, 1 = low, 2 = medium, 3 = high, 4 = very high (hence, e.g. 2.5 means that the risk lies between "medium" and "high").

Source: Expert assessments via survey with Cooperation Project participants.

Table 7-3 Assessment by the Cooperation Project participants of the use case frequency/occurrence with respect to maritime risks – Use case 37+44

Risks and sea basins	Baltic sea	North sea	Celtic sea	Bay of Biscay and Iberian coast	The Channel	Mediterra-nean sea	Black sea	Arctic ocean	**Average**
Terrorist threats	1	2	0	1	1	2	1	1	**1**
Piracy and armed robbery	1	1	0	0	0	2	1	1	**1**
Environmental destruction and degradation	4	3	2	3	3	3	2	4	**3**
Trafficking of human beings and irregular immigration	2	1	0	1	2	4	2	2	**2**
Trafficking of firearms and explosives	2	2	0	1	0	2	2	2	**2**
Trafficking of drugs	2	2	3	3	3	4	2	2	**2.5**
Maritime accidents	3	3	2	2	3	2	2	3	**2.5**
IUU fishing	3	2	2	3	2	3	2	4	**2.5**
Smuggling and counterfeit	2	2	1	1	2	3	2	2	**2**
Average	**2**	**2**	**1**	**1.5**	**2**	**3**	**2**	**2.5**	**2**

Note: Scores: 0 = very low, 1 = low, 2 = medium, 3 = high, 4 = very high (hence, e.g. 2.5 means that the risk lies between "medium" and "high").

Source: Expert assessments via survey with Cooperation Project participants.

Use cases have different characteristics

In continuation of the above table, Table 7-4 summarises a number of other characteristics of the selected use cases that are important to have in mind when analysing the impacts of CISE.

It shows firstly that the use cases allow the analysis of the added value from CISE with respect to day-to-day routine maritime surveillances/operations as well as the more targeted operations and the less frequent response operations where each successful operation may lead to large benefits.

Secondly, all seven user communities are satisfactorily covered by the nine use cases. The three routine operation oriented use cases are relevant for all user communities, while the six remaining use cases each involve at least three user communities.

Thirdly, the use cases have overall a high focus on the sharing of maritime surveillance information across user communities, and anticipate so from the outset that this is an area where CISE will provide added value.

Fourthly, the use cases also focus on information sharing across borders, and so the potentials for improved sharing of information both across user communities and across borders must be said to be central for the analysis within the Cooperation Project.

Fifthly, there is hardly any specific sea basin focus in the way the use cases are formulated. In other words, the events taking place within most of the use cases may take place within any of the EU waters – although to a varying degree.

Finally, the Cooperation Project participants have via the survey carried out assessed the frequency of the use cases by sea basin. These assessments reemphasise to a large extent the above findings that the analyses of the general use cases 37+44 and 55 are central for analysing the potential added value of CISE. Furthermore, it confirms that events going on in the Mediterranean sea, the Arctic ocean, the Baltic sea and the North sea should be analysed in the search for benefits.

Table 7-4 Characteristics of the selected use cases

Characteristics	**UC 37**	**UC 44**	**UC 13b**	**UC 13c**	**UC 70**	**UC 93**	**UC 25b**	**UC 57**	**UC 85**	**Summary across use cases**
Routine, targeted and/or response operation	Routine	Routine	Targeted	Targeted	Targeted/ response	Targeted	Targeted/ response	Routine	Response	Good coverage of operation types
User communities involved	All user communities	All user communities	Border control, customs, general law enforcement, defence	Border control, customs, general law enforcement	Fisheries control, general law enforcement, customs, defence, maritime safety	Fisheries control general law enforcement, customs, border control	General law enforcement, maritime safety	All user communities	Defence, maritime safety, general law enforcement	All user communities satisfactorily covered
Information sharing across user communities	High	High	High	High	High	High	Medium	Low	High	Overall high focus
Information sharing across borders	High	High	Medium	Medium	Medium	High	Low	Medium	Medium	Overall medium focus
Geographical coverage of EU waters	All EU waters	All EU waters	All EU waters	All EU waters	All EU waters	All EU waters	All EU waters	All EU waters	Outside territorial waters	Good coverage of sea basins
Frequency of use case										
average	**3**		**2**	**2.5**	**2.5**	**2**	**3**	**3**	**0.5**	**2.5**
- Baltic sea	4		3	3	2	2	4	3	0	**2.5**
- North sea	3		2	3	2	2	4	3	0	**2.5**
- Celtic sea	3		1	1	3	2	3	4	0	**2**
- Bay of Biscay and Ic	2		2	2	2	1	2	2	1	**2**
- The Channel	3		2	2	2	2	2	3	1	**2**
- Mediterranean sea	4		3	3	3	3	3	3	1	**3**
- Black sea	2		1	2	2	2	2	2	1	**2**
- Arctic ocean	4		3	3	3	4	2	2	1	**3**

Note: Scores for frequency: 0 = very low, 1 = low, 2 = medium, 3 = high, 4 = very high (hence, e.g. 2.5 means that the risk lies between "medium" and "high").

Source: Cooperation Project (2013a) and expert assessments via survey with Cooperation Project participants.

7.1.2 Potentials for improving maritime surveillance performance

Assessments have been made based on a conservative scenario perspective

Before diving into the assessment results, it should be re-emphasised that the assessment of the costs and benefits of CISE is a very demanding task. Generally, it has been recognized that there is no way of providing solid, quantitative estimates of the performance improvements of CISE, and the WP3 experts have therefore focused on providing various "scenario" perspectives on the basis of their best judgement. Moreover, to increase the robustness of these assessments, the experts were asked only to provide conservative estimates.

Scenarios are based on a *minimum benefit* approach

To make WP3's task of assessing the CISE potentials operational, it was furthermore decided to focus on specific cases/events within each use case. This approach was deemed particularly important in order to deal with the high degree of generality of the use cases; particularly for use cases 37+44 and 57, which can cover a multitude of risks and events. Without such a case/event focus, the task of providing cost/benefit assessments would be next to impossible. The case/event focus also means that the assessment of potentials for improving maritime surveillance is based on a *minimum benefit* approach. That is, the assessments are based on a subset of relevant cases, and therefore only cover a fraction of what the full benefits of CISE could be. This said, we do assume that the use cases in general represent the main maritime surveillance situations where there is a potential for CISE to add value.

Simple estimates but substantial work

Behind the simplicity of the final use case assessments presented in this report is substantial work. For instance, to provide figures for the CISE scenarios the experts of the WP3 have engaged in substantial consulting with relevant user communities within their respective Member States.

Assumptions

In an effort to utilize the work of WP3 as much as possible, we have added a number of our own assumptions. These mostly concern additional scenario assumptions as well as unit values for the various maritime surveillance outputs. To keep the validity of the overall analysis, the assumptions have nevertheless been kept conservative relative to demonstrating CISE benefits and honour the minimum benefit approach.

Assessment steps

To provide as full a picture of the CISE potential on the basis of the WP3 input; that is, across the EU, the following assessment steps have been carried out.

Step 1: identify performance cases

We took an outset in the specific use case and risk associated events to which WP3 has provided input. In essence, the input consists of the following elements presented in Table 7-5.

Table 7-5 WP3 input on use case assessments

Input	Description
Use case ID	Identification number and use case/event description
Sea basin	Name of sea basin for which the assessment has been made
Baseline values	Definition and value of performance measure as of today (2014) and the expected future development (2024)
CISE potential	Value of expected performance measure (2024) in terms of reaching the full CISE potential
Unit value	Unit value of performance improvement (if value of performance is not already measured in EUR)

Note: In addition to the above information, the WP3 has also provided information on relevant information flows and barriers to realizing the potential. This input will be utilized when comparing the performance of the different policy options.

Source: COWI

Step 2: determine potentials across sea basins

As already mentioned, the assessments provided by WP3 have been based on specific sea basins to focus the analysis and increase the overall validity. Performance increases are, however, also likely to be realized in other sea basins, for which no assessment necessarily has been made. To provide such an estimate, CISE performance assessments for other sea basins are established on the basis of the survey mentioned above; i.e. where all Cooperation Project participants have provided input on the relative probability that a given use case is relevant for dealing with each risk across all sea basins.

For simplicity, we assume that there is a linear relationship between the probabilities and the rates by which performance will improve with CISE (see Table 7-6). This means, for example, that if the WP3 assesses that there is a CISE performance increase of 20% in a sea basin rated 4 for drug smuggling, then there will be a CISE performance increase of 10% in sea basins rated 2 for dealing with drug smuggling (corresponding to 50% of 20%). Or, if the WP3 assesses the CISE improvement potential to be 10% for a sea basin and risk that is rated 3, then the corresponding improvement potential for a sea basin/risk that is rated 4 will be 13.3%.

Table 7-6 CISE performance potential relationships across sea basins

Probability score for use case to be relevant for risk/sea basin relationship	Assumed improvement percentage of the CISE performance potential
0 = very low	0
1 = low	25%
2 = medium	50%
3 = high	75%
4 = very high	100%

Source: COWI assumptions.

Step 3: determine and apply baseline values for other sea basins

Establishing the above improvement potentials across the various sea basins is, however, not enough. The next step is therefore to identify baseline values of the cases/events in those sea basins where the WP3 did not provide input. For instance, while drug smuggling may receive a score of 2 in some sea basins, the actual benefit could be either small or large depending on what the baseline score of drug smuggling in that sea basin is.

Step 4: determine unit values for performance measures

In this step, the aim is to make the potential CISE improvements comparable across use cases by applying unit values or cost to the performance measurement. While some performance measurements already are calculated in EUR, such as the value of drugs intercepted or cost savings, other performance measurements are denoted in avoided collisions, groundings, accidental oil spills, irregular immigrants, and so on. For each of these, unit values are estimated and applied to arrive at EUR figures.

Step 5: calculate final assessment

Finally, the EUR performance potentials of CISE are added for all the sea basins to arrive at a final EUR measure of the full CISE potential. In this regard it should nonetheless be repeated that the *full* CISE potential only adheres to the full potential of a selection of specific cases/events given the *minimum benefit* approach described before.

Assessment results

Performance increase due to CISE

As already emphasised several times, the impact assessment study looks into specific maritime surveillance areas where CISE in particular may improve the performance and so add value. Hence, the analysis focuses on a limited number of economic, social and environmental indicators. Furthermore, the different WP3 participants have focused their different analyses on the CISE potentials in the sea basins which they have most insight into. This implies that for many indicators the assessed potential performance increases for some sea basins are based upon assessments for other sea basin combined with the assessment made by the Cooperation Project participants of the use case frequency/occurrence with respect to maritime risks (see for example Table 7-3). This also means that we directly have linked the indicators and the risks – e.g. the indicator: value of seized goods is linked to the risk: smuggling.

Table 7-7 provides insight into the central indicators that have been selected and assessed by WP3. These are described in detail in the following. It shows, for example, that the potential for CISE to increase the number (value) of seized goods is around 3% in most EU waters – meaning that CISE is expected every year in the coming years to lead to 3% more seizures compared with a future situation without CISE. The potential for performance increase is assessed to be highest in the Mediterranean Sea with 5% and lowest in the Celtic sea and the Bay of Biscay and the Iberian coast with 2%. In this context, it must of course be emphasised that the absolute potential for increasing the seizure of goods depends on the actual amount (value) of seized goods in the baseline in the different EU waters. The potential for CISE to add value is assessed to be somewhat higher for the ability to intercept counterfeit goods – with an average of around 10% in increased performance. The assessed sea basin pattern follows that of the previous economic output indicator – i.e. highest for the Mediterranean Sea.

For the social output indicators, the Mediterranean Sea is also where there in general is assessed to be the highest potential for CISE in improving performance. This is the case for the indicators: saved lives of irregular immigrants and irregular immigrants refrained from entering EU-waters. For both indicators, we do – not least in the light of the recent many deaths of immigrants e.g. close to Lampedusa in Italy – acknowledge that it is a sensitive area to address and to claim that CISE may help to reduce the problem of irregular immigration. This said, better information sharing may increase the ability of maritime operators to rescue immigrants in EU waters from their often unsafe ships before or when accidents happen; and better surveillance and cooperation may reduce the number of immigrants actually entering the EU waters. The relatively high Mediterranean sea potential is also the case for the value of drug smuggling interceptions, and the value of seized drugs in ports. For maritime accidents and Search And Rescue, the potential is assessed to be relatively higher in the more northern EU waters.

To some degree this seems also to be the case for the environmental output indicators where, for example, the highest potential for CISE performance regarding the avoidance of accidental oil spills is found for the Baltic Sea. While there is assessed to be a significant added value from CISE in actually reducing the number of oil spills, the performance potential is even higher when it comes to the validation and solving of pollution cases. Note that the performance estimates for the detection of pollution are based on experiences for the Baltic Sea during 2002 to 2012 where close CISE-like cooperation has been established in this specific field through HELCOM. Hence, while CISE is unlikely to repeat the effect for this sea basin, it can be applicable for other sea basins.

Table 7-7 Potential CISE performance compared with baseline [2]

Indicators	Baltic sea	North sea	Celtic sea	Bay of Biscay and Iberian coast	The Channel	Mediterra-nean sea	Black sea	Arctic ocean
Economic output indicators								
Value of seized goods	3%	3%	2%	2%	3%	5%	3%	3%
Interception of counterfeit goods	10%	10%	5%	5%	10%	14%	10%	10%
Social output indicators								
Saved lives of irregular immigrants	3%	1%	0%	1%	3%	5%	3%	3%
Irregular immigrants refrained from entering EU-waters	7%	4%	0%	4%	7%	15%	7%	7%
Maritime accidents	-5%	-5%	-3%	-3%	-5%	-3%	-3%	-5%
Value of seized drugs (sea)	13%	13%	19%	19%	19%	25%	13%	13%
Value of seized drugs (ports)	4%	4%	6%	6%	6%	8%	4%	4%
Smuggling of small arms/light weapons	-5%	-5%	0%	-3%	0%	-5%	-5%	-5%
Search And Rescue	-8%	-8%	-5%	-5%	-8%	-5%	-5%	-8%
Environmental output indicators								
Detection and interception of IUU fishing	8%	5%	5%	8%	5%	8%	5%	10%
Total amount of illegal oil discharges	-12%	-9%	-6%	-9%	-9%	-9%	-6%	-12%
Accidental oil spills	-10%	-8%	-5%	-8%	-8%	-8%	-5%	-10%
Number of positive validations of suspected oil spills	19%	19%	10%	10%	10%	19%	14%	0%
Number of solved pollution cases of confirmed oil spills	52%	52%	26%	26%	26%	52%	39%	0%
Detection of pollution (1)	*-51%*	*-39%*	*-26%*	*-39%*	*-39%*	*-39%*	*-26%*	*-51%*

Note: [1] The performance estimates for the detection of pollution are based on experiences for the Baltic sea during 2002 to 2012. Hence, CISE is unlikely to repeat this for this sea basin, but it might be applicable for other sea basins.

[2] If the value of the indicator in the baseline is zero, CISE will have no impact: e.g. it is claimed that there are no irregular immigrants drowning in the Black sea, and so the 3% potential performance increase has no impact in practice.

Source: Preliminary results of WP3 use case analysis, combined with expert assessments via survey with Cooperation Project participants.

Improvements in output indicator values

The estimated improvements in the output indicator values (see Table 7-8) are then calculated using the full potential CISE performance estimates (see Table 7-7) combined with the particular baseline values established by the WP3 participants for each of the use cases. This implies – in line with the *minimum benefit* approach – that we focus the calculations on the cases – and so the sea basins – where the highest benefits from CISE are expected. This said; we assume that the use cases in general represent the main potentials for CISE added value.

Table 7-8 reveals that it has been difficult to distinguish fully between the use cases regarding their contributions to the improvements in the different output indicator values. Hence, only the assessed total full improvements from CISE are presented, while it is just indicated which use cases have contributed to this total.

Lastly, it should also be highlighted that most of the figures for the different sea basins represent *national* figures of the providing WP3 participants. Hence, almost all figures are *not* representative of the associated sea basin, which leads to an underestimation of the CISE outputs.

Table 7-8 Potentials for improving maritime surveillance by use case – annual change in output indicator values from baseline

D: Output	Full CISE potential		Detection	Verification					Response
	Value and unit		UC 37+44	UC 13b	UC 13c	UC 70	UC 93	UC 25b	UC 57	UC 85
Economic output indicators										
Cost-savings in information gathering and use of assets	26.6	MEUR	X	X	X	X	X	X		X
Value of smuggled goods	4.2	MEUR	X	X						
Interception of counterfeit goods	4.1	Cases	X	X		X				
Social output indicators										
Saved lives of irregular immigrants	1502	Number of people	X		X	(X)			X	
Irregular immigrants refrained from entering EU-waters	225	Number of people	X		X	(X)			X	
Maritime accidents	-65	Number of accidents	X	X	X			X		
Maritime accidents (saved HELO costs)	-0.03	MEUR	X	X	X			X		
Maritime accidents (casualties at sea)	-3	Number of people	X	X	X			X		
Maritime accidents (lives lost at sea)	-1	Number of lives lost	X	X	X			X		
Value of seized drugs (sea)	313	MEUR	X	X		X			X	
Value of seized drugs (ports)	27	MEUR	X	X		X				
Smuggling of small arms/light weapons	-3	Number of weapons	X	X		X				
Search And Rescue	-424	Cases	X		X	(X)			X	
Environmental output indicators										
Interceptions of IUU fishing	0.2	Cases	X				X		X	
Total amount of illegal oil discharges	-3	Cases	X					X	X	
Accidental oil spills	-1	Cases	X					X	X	
Number of positive validations of suspected oil spills	8	Cases	X					X	X	
Number of solved pollution cases of confirmed oil spills	8.5	Cases	X					X	X	
Detection of pollution	-43	Cases	X					X	X	

Source: COWI calculations on the basis of WP3 assessments.

Cost savings of information gathering and better use of assets

Efficiency gains rather than "cost savings"

The WP3 participants fully acknowledge that CISE will enable them to save costs regarding information gathering and the use of assets – e.g. a reduction of data duplication resulting from cross-sectorial information sources, and a rationalisation in the deployment of assets such as ships and aircrafts.

However, it has shown to be very difficult for the WP3 participants to assess such long-term cost saving potentials at the use case level. The main reason is that the focus has been on analysing the effect of CISE on improving actual maritime operations; which implicitly assumes that resources freed up can be used elsewhere to increase overall efficiency of maritime surveillance. From this perspective, "cost savings" have mostly been regarded as a tool for improving maritime surveillance activities.

Cost savings from knowing location of others assets (use case 57)

That being said, it is clear that efficiency gains stemming from collaborative information gathering or shared use of assets carry a price tag. On this basis, it was decided to let use case 57 focus on assessing the value added from CISE with respect to better use of assets – i.e. a focus on direct cost savings from knowing the location of other sector assets.

Other cost savings

Cost savings as regards the shared use of experts, patrol vessels, aerial means, land detection means as well as the conduct of maritime surveillance operations were, however, also indicated in connection with use case 37+44; i.e. with very preliminary figures having been provided for the Mediterranean Sea. Unfortunately, baseline figures for the other sea basins were not obtained; yet given the notion that there is a potential for similar savings in the other sea basins it has been assumed that baseline cost for the other sea basins, on average, would amount to half of the Mediterranean cost. The extent to which performance in the other sea basins would resemble that of the Mediterranean was furthermore assumed to follow the average performance across all risks (Table 7-3). On this basis, the total annual cost saving potential from CISE as regards shared use of experts, patrol vessels, aerial means, land detection means, and the conduct of maritime surveillance operations was estimated at MEUR 26.6 (see Table 7-8 and Table 7-9) – allowing for more efficient maritime surveillance.

Cost savings have also been discussed in the top-down approach (see Section 7.2).

Interception of smuggled and counterfeit goods

The WP3 anticipates that CISE will lead to an increase in the interception of illegal goods compared to the baseline. Figures have been provided for the seizures of counterfeit goods in the Baltics, and smuggled goods in the Mediterranean. Baseline figures for the other sea basins have, however, not yet been provided.

Smuggling

For smuggling, it is estimated that CISE will lead to a reduction of smuggled goods worth EUR 700,000 per year in the Mediterranean Sea. Hence, the total figure of MEUR 4.2 for all sea basins assumes a similar, relative potential in the rest of the EU waters. For simplicity, we assume that this allows for the additional sales of corresponding legal goods worth i.e. EUR 700,000 and MEUR 4.2 respectively.

As presented in Part 1, the entry of smuggled goods – both by sea and by land – concerns cigarettes and alcohol.

Counterfeit goods

Another type of smuggled goods are counterfeit goods which are goods that infringe on intellectual property rights (IPR) such as trademarks, copyrights and patents.

Estimating the effect of CISE on an increase in interception of counterfeit goods is somewhat trickier. This is due to the fact that the CISE performance increase has been provided in terms of how many more interceptions will take place, and not the economic value of these interceptions. Counterfeit interceptions may vary substantially from case to case, both in terms of the types of goods that are intercepted as well as the quantify; and therefore also values. That being said, interceptions of counterfeit goods with relevance to maritime surveillance are likely to be of a substantial size due to the bulk transportation used in maritime transport.[47] Using the average value of counterfeit seizures from sea shipments from 2010 to 2012 of about EUR 190,000, and assuming that a corresponding amount of legal goods would be sold in absence of the counterfeit items, CISE could lead to an increase in sales of legal goods worth EUR 780.000 every year. This figure, however, only pertains to the Baltics, and could easily be the same, on average, across all relevant sea basins; i.e. amounting as shown in Table 7-9 to some MEUR 4.7.

Irregular immigration

Number of irregular immigrants

The EU and the Member States have the task to secure the borders of the EU, among which one of the tasks is to avoid irregular migration. Every year, however, thousands of irregular migrants arrive at the EU coasts; particularly in those Member States facing the Mediterranean Sea, as indicated in the risk assessment and Table 7-3. And while the wider societal impacts of irregular immigration concerns every Member State in the EU, Member States facing the Mediterranean Sea incur several costs in their efforts to intercept the migrants. Moreover, if irregular migrants are intercepted in EU waters, Member States carry the responsibility of providing adequate housing, food, medical care, etc. as long as the migrants reside in the country (typically 30 to 60 days). Sending irregular immigrants back to their respective countries also carries substantial costs.

Saved lives of irregular immigrants

As already emphasised, we do – not least in the light of the recent many deaths of immigrants e.g. close to Lampedusa in Italy – acknowledge that it is a sensitive area to address and to claim that CISE may help to save lives of irregular immigration. However, not many will question that more timely surveillance information and better cooperation among maritime operators will lead to faster and better actions of the operators.

Hence, in this impact assessment study we maintain the assumption that CISE may improve the assistance to the many irregular immigrants that manage to enter EU

[47] TAXUD (2013) Report on EU customs enforcement of intellectual property rights.

water do so under often dangerous conditions. It is assessed that with the full potential for information sharing and cooperation, around 1500 additional irregular immigrants will be saved by the coast guard (mainly in the Mediterranean Sea, but also building on assessments for the Baltic Sea and the Black Sea) – and done so at an earlier stage that before. A conservative estimate is that an additional 0.5% (i.e. 7.5 persons – in the Mediterranean Sea) of these 1500 persons would have died without CISE. Using an average value of MEUR 1.5 of a life (according to the EC Impact Assessment guidelines) this leads to an additional socioeconomic benefit of MEUR 11.3 per year.

We do acknowledge that many will claim that it is not proper to put such value on a life. However, we would also like to emphasise that the final conclusions regarding the high benefit-cost ratio for CISE are not significantly affected by the exclusion of this CISE benefit.

Irregular immigrants refrained from entering EU-waters

Also in the light of the recent tragedies, it is a sensitive issue to claim that CISE may prevent irregular immigrants from entering EU waters. This may be due to a deterrent effect or due to that better maritime surveillance and cooperation among operators – hereunder in non-EU countries – may lead to potential irregular immigrants being hindered at an earlier stage.

However, in any case it cannot be questioned that the interception of irregular immigrants in EU waters infers costs on EU Member States. Although it has not been possible to find an official figure for the average costs of intercepting an irregular immigrant in EU waters, discussions at the WP3 meetings suggest that it could be around EUR 60,000 per person, on average. Costs could however be higher; especially considering that removal of irregular immigrants in some cases can be prolonged for years, or not happen at all. In these cases, the migrant may also end up in a situation where he/she has no legal immigration status, is liable to removal at some unspecified time, may not work, and is excluded from subsistence rights.[48]

Today, it is assessed that only a maximum of 5% of all potential irregular immigrants are refrained from entering EU-waters, and therefore do not become the responsibility of EU Member States. From the use cases, full information sharing suggests to bring this number up to 15% (an increase of some 225 people) and thus lead to cost savings of MEUR 13.5 million per year.[49] There are no baseline figures on irregular migration for the other sea basins, but here the corresponding cost savings from CISE are assessed to be relatively small given the fact that seaborne irregular migration is primarily a problem in the Mediterranean Sea.

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[48] Council of Europe (2007) The human rights of irregular migrants in Europe, CommDH/IssuePaper(2007)1

[49] This number is based on the estimate that there is an average of some 30.000 irregular migrants crossing the Mediterranean Sea every year, and that the removal and associated cost will amount to EUR 60,000.

Maritime accidents

Material (and environmental) damage

The WP3 use case analysis looks into different types of possible benefits from reduced maritime accidents from improved maritime surveillance. A first one is the sheer reduction in material (and environmental) damage from maritime accidents – hereunder ship collisions and grounding of ships. The use case analysis – based on information for several sea basins – suggests that there at least is a potential for a reduction of 65 maritime accidents. Assuming damage costs of around MEUR 0.5 per accidents[50], this amounts to annual saved costs of MEUR 32.6.

Maritime accidents (saved HELO costs)

The use case analysis does also highlight the potential for saving actual maritime surveillance costs related to maritime accidents. While there is a cost to having helicopters in standby, a conservative estimate provided by WP3 for saved costs of helicopter flight-time amounts to EUR 30,000 per year. Although this is a small number, it highlights the direct cost-saving potential of CISE.

Maritime accidents (casualties at sea)

The potential reduction in maritime accidents will also lead to a reduction in casualties at sea. An also conservative estimate is here a reduction in 3.5 casualties per year, and using a very rough estimated of health and other related costs of EUR 50,000 per casualty – this leads to an annual cost saving of EUR 180,000.

Maritime accidents (lives lost at sea)

Similarly, fewer maritime accidents mean fewer lives lost at sea – here assessed to be 0.8 fewer lives lost per years, and using the value of MEUR 1.5 per life, this leads to a benefit of MEUR 1.2 per year.

Drugs

Value of seized drugs (sea)

As highlighted in the baseline analysis, drug trafficking is a major problem in Europe; particularly with respect to entry from the Mediterranean Sea. It has been assessed, both by the consultation process conducted in connection with the risk analysis, as well as by theWP3 participants that CISE has a potential for reducing the trafficking of drugs into Europe. More specifically, the WP3 participants assessed that there is a potential for CISE to increase interceptions of drugs at sea of between 20 to 30%.

Last year (2012), Italy alone intercepted drugs at sea to a value corresponding to EUR 1.252 billion. This value has been measured in terms of foregone profits to drug traffickers. In terms of street values, the figure would therefore have been substantially larger. Applying a potential for CISE to increase such interceptions would yield a benefit worth some MEUR 313 annually. Drug seizures in ports are smaller and were in 2012 valued to MEUR 274. Assuming a stable baseline and that CISE could lead to a 5% higher performance would add some MEUR 13.7 amounting to a total of MEUR 326.7 annually.

Drugs carry substantial costs to society and an increase in the removal of drugs from the market therefore has wider societal impacts. Regarding productivity,

[50] Estimate by http://efficiensea.org/files/mainoutputs/wp6/d_wp6_4_1.pdf

adverse health effects lead to reduced or lost earning while impaired or unemployed, and to lost earnings due to premature death or institutionalisation. For the individual, it leads to pain and suffering and to psychosocial development impairment among alcohol and drug abusers and their children, and to out-of-pocket cost such as transportation, child care, and other factors associated with health care use. There are also lost earnings as crime victims cannot work.

We have, however, assessed that such health and crime impacts are difficult to put value on and to attribute directly to CISE. Hence, they should be considered as possible additional benefits that have not been included in the overall calculations.

Smuggling of small arms/light weapons

Minor CISE potential

Such attribution issue is also relevant for the smuggling of small arms/light weapons. Furthermore, WP3 has looked into the potential for reducing the smuggling of small arms/light weapons, and the potential is very small. Hence, no efforts have been made to calculate the very uncertain cost of e.g. crime.

This said, it should be emphasised that trafficking in firearms has been on the political agenda of the EU for the past decade. The following quote from Cecile Malmström, EU Commissioner for Home Affairs, in a November 2012 conference on arms trafficking, shows that illegal trafficking of weapons is considered the source of several social problems in the EU.

> *"Firearms still cause widespread death and bodily harm in the EU; they spread (more than ever before, it seems to me)* ***fear****, and* ***undermine citizens' feeling of security,*** *as they are highly visible symbols of the power of criminal groups, and they generate large* ***profits*** *for criminal groups, increasing their economic power and ability to commit other crimes."*

The Organisation for Security and Cooperation in Europe (OSCE) and the United Nations Office on Drugs and Crime (UNODC) gather data. According to the UNODC, more than 5,000 murders were committed with firearms in 2011 in the EU.[51]

Search And Rescue

Cost savings potential

In addition to the above general cost savings potential, the WP3 participants have specifically looked into the specific cost savings potential in relation to Search And Rescue (SAR). Their estimate is as shown in Table 7-9, that 424 SAR cases can be avoided every year if there are no limitations to the sharing of maritime surveillance information. Assuming that the average costs of a SAR case amounts to EUR 3,350 this gives an annual cost saving of MEUR 1.4.

[51] http://www.unodc.org/documents/data-and-analysis/statistics/Homicide/Globa_study_on_homicide_2011_web.pdf

However, it should be emphasised that there is a risk of overlap of this cost-saving potential with that of the above cost-savings in information gathering and use of assets.

Interceptions of IUU fishing

Pressures on fish stocks from IUU fishing

The tackling of IUU fishing largely relies on the effective detection of suspect vessels in international or EU waters and the potential to monitor and intercept such vessels whilst performing illegal activities. Exchange of information during fisheries inspections is part of the normal practice in this regard. Cross-border information sharing on the position of fishing vessels enables a more effective planning, risk mapping, and increases the efficiency of the inspections[52].The Regulation 1224/2009 allowed the exchange of information on Vessel Monitoring System (VMS) between different sectors and facilitated the exchange of data between different Member States[53]. Further, the European Fisheries Control Agency (EFCA) is currently developing the network Fishnet to enhance the information sharing related to the Joint Deployment Plan Activities.

Uncertain benefits from CISE

At the finalisation of this report, the WP3 participants had not identified major benefits for further information sharing efforts in terms of IUU fishing. This is however not in line with the findings of MARSUNO, as stated in the thematic report on fisheries control[54]; and nor is it the view of EFCA. According to EFCA, for instance, the sharing of any information regarding the movement of IUU vessels would be valuable (port authorities, customs, etc…). Moreover, not all IUU involved vessels are fishing vessels but also include reefers, factory vessels, container vessels, etc. In addition, IUU also relates to the illegal import and export of fishery products on the EU market (Transport community, Customs, etc….). From these observations, better information sharing could indeed lead to significant performance gains with respect to combatting IUU fishing.

Unfortunately, no figures are available to substantiate these perspectives and the benefits from CISE therefore remain uncertain in this area. It should nevertheless be emphasized that the socio-economic benefits of stopping IUU fishing and protecting coastal fisheries are deemed substantial. As such, if better information sharing from CISE could lead to improvements in this regard—which is the position of EFCA—the impact could be significant.

Oil spills and detection of pollution

Number of cases

Environmental outputs are all measured using the unit “case”. This is mainly because this unit was chosen by WP3 to be most appropriate to delimit an incidence – as the maritime surveillance is more about spotting e.g. oil spills than

[52] MARSUNO (2011), Thematic report, Fisheries control
[53] MARSUNO (2011), Thematic report, Fisheries control
[54] MARSUNO (2011) Thematic report, Fisheries control, available from http://www.marsuno.eu/PageFiles/598/FC1_tryck.pdf

determining their sizes. Hence, we have to get to the valuation of the cases made use of average impact values for such cases.

Note also that there in practice can be some – unavoidable – overlaps between the below-described cases.

Total amount of illegal oil discharges	The operational oil spills can be tracked through a combination of satellite and aerial observation that respectively detect and confirm such illegal operations. The use cases suggest that CISE potentially can create a better knowledge of the actual situation and to coordinate action by several countries concerned – i.e. improved information sharing and cooperation through CISE can facilitate the verification process of the possible spills detected by CleanSeaNet. The assessed additional benefits with no limitations to information sharing are, however, not that large amounting to MEUR 0.3 per year – assuming that CISE will lead to the deterrence of three cases of illegal oil discharges per year.
Accidental oil spills	It is assessed that improved information sharing via CISE for accidental oil spills can lead to a more effective use of the intervention means (e.g. oil spill clean-up ships) and can enhance the planning of the required action across the various actors including EMSA. This improvement can be achieved through the improved availability of information and the establishment of common operating procedures that are put forward through CISE. Further, CISE might allow the development of new (or the improvement of the existing) common services across sectors and borders for a more effective and efficient response to accidents. The WP3 participants assess that there is a potential on average to avoid one accidental oil spill per year. Data shows that the average amount of oil spills of 200 to 830 tonnes corresponds to a cost of MEUR 5.2 to 21.7. This includes clean-up costs, environmental costs and socioeconomic costs. Average fine values amount EUR 2,000 to 10,000,000– depending on the size of the ship and the damage caused. Based on this, a cost estimate of MEUR 20 per case has been used in the calculations.
Number of positive validations of suspected oil spills	Furthermore, the WP3 participants highlighted that improved information sharing may increase the number of positive validations of suspected oil spills. However, the socioeconomic benefits from this have been infeasible to put values on, and in any case we envisage that there is an overlap between this output indicator and that of the above total amount of illegal oil discharges.
Number of solved pollution cases of confirmed oil spills	It is assessed that there is a large potential for solving pollution cases of confirmed oil spills. The unit value of this is substantial at MEUR 5 per case, and with the expectation of solving 8-9 cases more per year through improved information sharing, the total annual benefits amount to MEUR 42.5.
Detection of pollution	Finally, it is assessed that there is a potential to improve the detection of pollution in general. The deterrence effect from this is assessed to lead to 43 fewer cases per year – with the avoidance of MEUR 0.1 per case.

Total impacts

Grand total

The above included impact calculations lead to a total estimate of impacts (benefits) of MEUR 162.7 per year if there were no limitations to the sharing of maritime surveillance information. This is also what in the following will be referred to as the *full* CISE potential.

This estimate is of course connected with much uncertainty. However, since the calculation is based on the *minimum benefit* approach, the estimate is considered a conservative estimate. Indeed, the "correct" estimate is likely to be higher and possibly lie in between MEUR 162.7 and MEUR 179 (if we assume that the higher end of the impact range is 10% higher than the minimum estimate).

Furthermore, it should be emphasised that there are other types of benefits and impacts from information sharing that have not and cannot be quantified.

Cost savings and other impacts

Table 7-9 also shows that the grand total of impacts (benefits) - roughly - can be divided into cost savings directly related to the maritime operations activities – and so directly comparable with the additional cost of CISE (MEUR 40.1 per year), and into other impacts (MEUR 122.6 per year). The following box shows how these figures compare to the final results of the Cooperation Project WP3.

Box 7-1 Comparison with final results from the Cooperation Project WP3

Since the completion of the cost and benefit estimations within this impact assessment study report, the WP3 of the Cooperation Project has also finalised its results. WP3 operates with three different scenarios regarding the benefits of CISE, which include cost-savings as well as economic, environmental and social impacts. Their results are outlined in the below table:

	WP3 final CISE benefit scenarios		
	Minimum	Conservative	Medium
Potential value added	5%	8%	12%
Value per year in MEUR	176	282	423

Source: Cooperation Project, final report of Work Package 3

Compared to the final results by the WP3, this impact assessment study report estimates the total potential benefit of CISE to be in the order of magnitude between MEUR 162.7 and 179 per year – which do reflect a high benefit/cost ratio, i.e. a high potential return from investing in CISE. As emphasised, these figures are based on preliminary findings of the WP3 and illustrate the full potential benefit of a *minimum benefit* scenario. This benefit estimate is therefore also very similar to the WP3's minimum benefit scenario.

We do appreciate that WP3 has ventured into assessing other – even more optimistic – CISE benefit scenarios. We do, however, also acknowledge that these benefit estimates are likely to be connected with even more uncertainty.

Nevertheless, the possible even higher benefits from CISE as suggested by WP3 underline the case for investing in CISE put forward by this impact assessment study.

Table 7-9 Potential impacts from improved maritime surveillance – annual change in MEUR from baseline

	Output		Impact	
	Value and unit		Unit values	MEUR
Economic				
Cost-savings in information gathering and use of assets	26.6	MEUR	Greater efficiency and general improvement of maritime surveillance.	26.6
Value of seized goods	4.2	MEUR	Estimate for all sea basins based on an assessment for the Mediterranean sea. Impact is assumed to amount to a similar value of foregone legal sales.	4.2
Interception of counterfeit goods	4.1	Cases	Average value of sea-borne counterfeit interception case is EUR 190,000 (2010 to 2012). Similar interception increase assumed for other relevant sea basins. Value of foregone legal sales.	4.7
Social				
Saved lives of irregular immigrants	1502	Number of people	Assumption that 0.5% of the additionally saved irregular immigrants would have died – using the value 1.5 MEUR per life.	11.3
Irregular immigrants refrained from entering EU-waters	225	Number of people	Saved interception costs per immigrant: EUR 60,000.	13.5
Maritime accidents	-65	Number of accidents	Material (and environmental) damage at MEUR 0.5 per accident.	32.6
Maritime accidents (saved HELO costs)	-0.03	MEUR	Benefit = saved costs.	0.03
Maritime accidents (casualties at sea)	-3.5	Number of people	Health and other related costs of EUR 50,000 per casualty.	0.18
Maritime accidents (lives lost at sea)	-0.8	Number of lives lost	MEUR 1.5 per life.	1.2
Value of seized drugs (sea)	313	MEUR	*Socioeconomic benefits – e.g. lower health and crime costs*	*n.a.*
Value of seized drugs (ports)	27	MEUR	*Socioeconomic benefits – e.g. lower health and crime costs*	*n.a.*
Smuggling of small arms/light weapons	-3	Number of weapons	*Socioeconomic benefits – e.g. lower crime costs*	*n.a.*
Search And Rescue	-424	Cases	EUR 3,350 per SAR case.	1.4
Environmental				
Interceptions of IUU fishing	0.2	Cases	MEUR 0.1 per case.	0.02
Total amount of illegal oil discharges	-3	Cases	MEUR 0.1 per case.	0.3
Accidental oil spills	-1	Cases	MEUR 20 per case.	20
Number of positive validations of suspected oil spills	8	Cases	*Socioeconomic benefits have here been infeasible to put values on.*	*n.a.*
Number of solved pollution cases of confirmed oil spills	8.5	Cases	MEUR 5 per case.	42.5
Detection of pollution	-43	Cases	MEUR 0.1 per case.	4.3
Total cost savings				**40.1**
Total other impacts				**122.6**
GRAND TOTAL				**162.7**

Source: COWI calculations on the basis of WP3 assessments.

7.1.3 Limitations to maritime surveillance performance

Limitations and policy options

The previous chapters – and Part 1 – have already discussed the limitations to maritime surveillance performance and presented the appropriateness of the different policy options in dealing with the limitations. The purpose is here not to repeat this analysis at the use case level, which in any case is considered to be infeasible – i.e. it is difficult to say that one policy option is more appropriate for one use case than another.

Instead, the WP3 participants have assessed whether it is technical, legal, and/or cultural limitations that at present put a damper on the sharing of maritime surveillance information within the different use cases. It should be repeated that the above potentials for CISE added value are regarded as *potentials* because they are not expected to be fully achieved due to the assessment that some technical, legal and/or cultural limitations will remain even with CISE. Hence, the assessments are used across the use cases as contribution to the evaluation of how the different policy options may help to reduce the limitations. The assessments made apply, as presented in Table 7-10, semi-quantitative scores, which distinguish between the importance and the intensity of the given limitation:

- Importance refers to how important the limitation is (relative to the other limitations) in terms of being an obstacle to better information exchange and higher surveillance performance.
- Intensity refers to how easy (or costly) the limitation is to overcome.

Table 7-10 Scoring of limitations to information sharing

Score	Importance	Intensity
1	The limitation is of minor importance; and while it can be an annoyance to information exchange, it is not of considerable significance in terms of surveillance performance.	The limitation is considered easy to overcome, and although it will require some efforts these are considered doable and non-costly.
2	The limitation is of importance. It is considered a significant hindrance to information exchange and prevents higher surveillance performance noticeably.	Overcoming the limitation will require significant efforts and will carry noteworthy costs.
3	The limitation is of high importance. It is a major obstacle to information exchange and prevents higher surveillance performance to a significant degree.	The limitation is very hard to overcome, and will require that extensive and costly steps be taken.

Source: COWI.

Limitation experienced within all use cases (that have been assessed)

Table 7-11 summarises the analysis of limitations for each of use cases assessed by the different WP3 participants. While several WP3 participants have carried out this assessment for use case 37+44, only few have until now done this for the remaining use cases, and none for three of the use cases.

The limitations inherent in use case 37+44 are in general of high importance, and the overcoming of the limitations will require significant efforts and will carry noteworthy costs. The technical limitations mentioned are centred around the lack

of an interoperable information environment – e.g. a lack of common/joint databases or IT services and so too few usable secure collaborative tools. The legal limitations concern both the issue of restricted access to data and the fact that bureaucracy often involves too many steps for obtaining information via official and legal permissions. Cultural limitations are due to a geographically and functionally dispersed user community and so different priorities, to a lack of common standards and definitions of functional business processes, and to a lack of trust.

The limitations are somewhat lower for use case 13c than for 37+44. The technical limitations concern primarily that all data are not available as information services, while the legal limitations concern the fact that some of the information is considered confidential and is not available to all user communities. The main cultural barrier is a lack of trust.

For use case 70, the technical limitations concern the lack of common databases or IT services and so a lack of standard interfaces to provide/receive data. Data protection is the main legal limitation, while a lack of trust again is mentioned as the main cultural limitation.

The limitations are in general low for use case 25b. From the technical side, this concerns primarily that data are not always available as standard information services, while it from the legal side concerns that some information is considered confidential and so not available to all user communities. Cultural limitations seem to relate from a lack of active communication of information.

Finally, for use case 57, the technical limitations both relate to that some information is not available in an electronic format and that that there is a lack of standard interfaces. The legal limitations concern some confidentiality issues, while the cultural limitations concern the fact that information about own surveillance capacities is not actively communicated outside own user communities.

Table 7-11 Limitations to maritime surveillance performance – by type of limitation and use case

Limitations	UC 37+44	UC 13b	UC 13c	UC 70	UC 93	UC 25b	UC 57	UC 85
Technical limitations								
- importance	2-3	n.a.	2	3	n.a.	1	3	n.a.
- intensity	1-3	n.a.	1	2	n.a.	1	1	n.a.
Legal limitations								
- importance	3	n.a.	2	3	n.a.	1	3	n.a.
- intensity	2-3	n.a.	2	3	n.a.	1	2	n.a.
Cultural limitations								
- importance	1-3	n.a.	3	3	n.a.	2	3	n.a.
- intensity	1-2	n.a.	1	1	n.a.	1	2	n.a.
Average across limitations								
- importance	**2-3**	**n.a.**	**2**	**3**	**n.a.**	**1**	**3**	**n.a.**
- intensity	**2**	**n.a.**	**1**	**2**	**n.a.**	**1**	**1**	**n.a.**

Source: Assessments by WP3 participants.

7.2 Top-down analysis of impacts

CISE Impact potentials seen from the top-down

Similarly, to the bottom-up approach, the top-down approach aims to establish a number of potentials for the CISE to deliver benefits. However, whereas the bottom-up approach is based on different use cases of information sharing, the top-down approach is based on various pieces of information that can point to CISE impacts from a higher level, such as qualitative responses from Member States about general CISE impacts or national cost savings from the establishment of national information sharing environments.

The top-down approach provides a more general picture of the CISE impacts. However, because the approach is based on different and separate pieces of information, certain assumptions are needed to provide EU-level impacts. This introduces uncertainty, and estimates should only be seen as indicatory.

7.2.1 Overall effects from CISE on maritime surveillance tasks/operations

In the work of the Cooperation Project, three so-called "high-level" use cases were defined to capture the functions of maritime surveillance more generally. The high-level use cases are summarised below:

Table 7-12 High-level use cases (maritime surveillance tasks/operations)

Name of operation	**Short description and purpose**
Baseline (or routine) tasks	*Description:* Everyday surveillance and information sharing. *Purpose:* To ensure the lawful, safe and secure performance of maritime activities. Further, to detect anomalies (detection of possible non-compliance) and other triggers/ intelligence to improve decision making for the use of response capabilities. (E.g. targeting of inspections).
Targeted operations	*Description:* Targeted surveillance and information sharing for targeted operations. *Purpose:* To react to or to confront specific threats to sectorial responsibilities as discovered in risk analysis/ intelligence gathering processes. Will give support to operational decision-making when employing operational assets.
Response operations	*Description:* Response to major incidents, events or accidents. *Purpose:* To respond to events affecting many actors and with a potentially huge impact on e.g. environment and economy.

Source: Cooperation Project, WP2

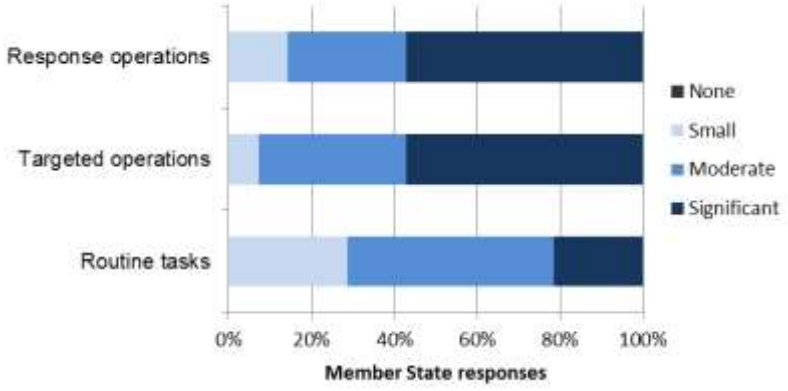
The high-level use cases were not naturally fit for the Cooperation Project's WP3 to provide cost and benefit estimates; however, they were fit for giving a picture of how Member States anticipate the CISE to deliver benefits (as regards maritime surveillance functions) on a broader scale. For this reason, the MSEsG survey

included questions about the scale of the expected benefits for each of the high-level use cases – at Member State level.

Member States anticipate significant benefits from the CISE

All 14 responding Member States provided answers to the question on how the CISE is expected to improve maritime surveillance functions. Of these, eight (57%) anticipate *significant* benefits in both response and targeted operations. Overall, these operations are also the ones where Member States expect to see the largest benefits (moderate + significant benefits). A total of seven (50%) Member States have, however, also indicated that they expect moderate benefits from the CISE as regards routine operations. The full distribution of answers on the scale of benefits from the CISE is illustrated in Figure 7-2.

Figure 7-2 Expected scale of benefits in maritime surveillance functions from the CISE



Source: COWI, based on MSEsG survey

No Member State believes that the CISE will have no benefits

From the above chart, there appears to be a clear sentiment among Member States that the CISE can improve the effectiveness of each of the three types of maritime surveillance operations. Indeed, one Member State highlighted that cross-sector and cross-border information sharing is paramount to the mitigation of national risks in the maritime domain. In this regard, it is also worth emphasising the fact that no Member State indicated that the CISE will have no benefit in any of the three types.

One of the reasons that the CISE benefits on routine tasks is scored relatively low compared with the other types of surveillance activities could be that those countries, which have come far in establishing a national information sharing environment, also have progressed in sharing routine information packages across sectors. As a result, they could therefore also see a relatively lower benefit. Other Member States highlight that the organised cross-border and cross-sector sharing of information could facilitate routine operations.

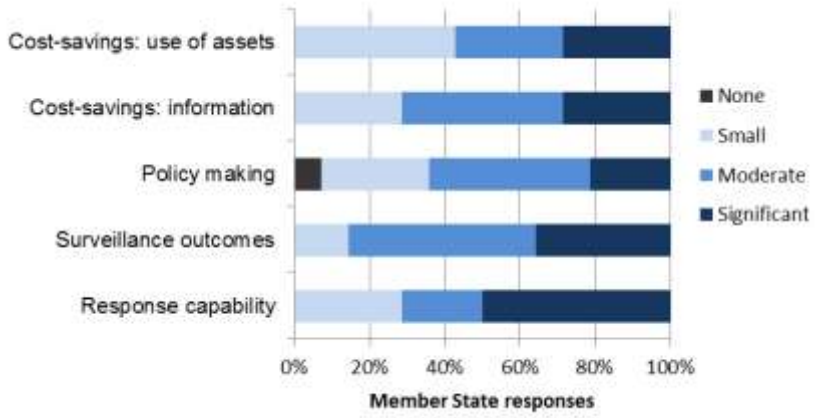
7.2.2 Output and cost estimates based on MSEsG results

The nature of CISE benefits

In connection with the more general CISE benefits addressed above, Member States were also asked to provide more specific information about the nature of these benefits; i.e. referring explicitly to the cost-efficiency and effectiveness of maritime surveillance.

Considering benefits such as cost-savings (in terms of both the use of assets and in information gathering), better surveillance outcomes, improved response capabilities and stronger foundations for better policy making more than half of all respondents anticipate that the CISE will deliver moderate to significant benefits in all areas. The distribution of answers is depicted in Figure 7-3.

Figure 7-3 Different types of benefits from the CISE and their expected scale of benefits



Source: COWI, based on the MSEsG survey

Largest benefits expected in response capability and surveillance outcomes

The most significant gains from the CISE anticipated by the Member States are those related to improved response capability. Indeed, half the respondents expect significant benefits in this area, and 21% expect moderate benefits. Otherwise, expectations are more or less similar across the other types of benefits; albeit with a few differences. Anticipated improvements in surveillance outcomes, for instance, appear particularly strong, and there are generally lower expectations with respect to improving the foundation for better policy making. The latter may reflect that better policy making depends on the multiplier result of knowledge, which only can be achieved by applying the criterion of responsibility for data sharing between member states. CISE can nonetheless be a good way to put in place the necessary policy measures for preventing illegal activities (Good surveillance could prevent irregularities and reduce the risk of damage to interests of the Member States and Europe).

Cost savings could be more than moderate

From the above, there is clearly agreement that CISE could lead to cost savings in maritime surveillance. Input from the Cooperation Project participants as well as from interviews with maritime surveillance experts from various user communities in different Member States nevertheless suggests that estimating such overall figures is extremely challenging. This is also reflected by the difficulty in providing estimates of the *current* total cost of maritime surveillance, which was included as a question in the MSEsG survey. Indeed, very sparse information was collected in this regard—even if MSEsG respondents only were requested to provide rough estimates on the cost of investments, operations, as well as the number of personnel working with maritime surveillance.

Weak foundation for estimating cost of surveillance

Of the 14 respondents, six Member States provided no information on operational costs while nine did not provide information on investment cost. Moreover, many of the respondents who did provide information only included figures for one or a few of the relevant user communities. Hence, the cost information from the MSEsG survey cannot be regarded as accurate and is likely to underestimate actual costs. Also, the large differences that exist between the costs as reported by Member States suggest other differences. Some of these could perhaps be explained by the fact that some respondents have included cost of personnel in their figures while others have not. In conclusion, providing an accurate overall estimate on the cost of maritime surveillance based on the MSEsG survey is not possible.

That being said, it may be possible to establish a ballpark figure. For instance, it could be argued that expenses on maritime surveillance would be of similar relative significance in the larger EU Member States, such as France, Germany, Greece, Italy, Spain and the United Kingdom, as it would in the smaller Member States. This has also been the view of the Cooperation Project WP3 participants. Hence, relating the maritime surveillance expenses from the MSEsG survey to the coastal zone GDP (based on NUTS3) of the reporting Member States can provide a reasonable measure by which a total cost for the EU can be gauged.

Cost of maritime surveillance probably higher than EUR 5.9 billion per year.

When applying the above method on 2010 figures the maritime surveillance *operational* expenses amount to some 0.06% of coastal zone GDP, on average, across the 23 coastal Member States, while maritime surveillance *investment* costs amount to 0.05%. As such, total maritime surveillance operational expenses amount to EUR 3.3 billion, while total maritime surveillance investment expenses amount to EUR 2.6 billion. This gives a grand total of maritime surveillance cost of EUR 5.9 billion for the coastal Member States.

However, given the data foundation on which the total cost of maritime surveillance in the EU was derived there is good reason to believe that the figure has been underestimated, at least as regards operational expenses. For instance, considering the relatively high fraction of coastal GDP that Italy spends on maritime surveillance compared with the reported average of 0.06%, the reported average is unlikely to be applicable to the other major EU Member States. It is moreover highly likely that several of the respondents have left out personnel costs from their operational cost estimates, which further suggest that the reported average of 0.06% is too low.

As for the reported investment costs, these are likely to be unbalanced compared with the reported operational cost estimates. Yet, as their absolute value may be of a reasonable level, this strengthens the argument that the reported operational costs are underestimated.

Operational cost could be EUR 5 billion per year.

Hence, assuming in light of the above that Member States on average spend between 0.075% and 0.1% of coastal zone GDP, instead of the reported 0.06%, the total maritime surveillance *operational* expenditures would amount to between EUR 4 or 5 billion.

Potential cost savings of CISE could be substantial

Considering that *all* MSEsG respondents expect CISE to deliver cost savings, and that about 80% of them expect those savings to be either moderate or significant, it is worth mentioning that even a 1% cost saving effect from CISE on the cost of operations, could amount to between EUR 40-50 million annually. A more significant impact from CISE, say a cost saving effect of 5%, would correspond to between EUR 200-250 million in operational cost savings.

7.2.3 Estimates from National CISE

Indications on the savings that can be realised from CISE through cooperative information gathering can also be gauged from national information sharing initiatives; or what could resemble national common information sharing environments.

In Finland, for example, a national information sharing environment (FIMAC) has been put in place to allow authorities to share various pieces of equipment and hardware, and use it together in a coordinated fashion through an interconnection of systems; i.e. on a system of systems basis. Moreover, since the vendor of the systems in operation is the same for all authorities, everybody benefits from individual enhancements.

So far, the primary benefits of FIMAC have been related to cost savings, and these have been estimated in terms of both investments and maintenance of shared information equipment. These estimates, which only denote *minimum* savings, are presented in the below table.

Table 7-13 Estimated minimum cost savings attributed to FIMAC

Shared assets	Minimum savings	
	Maintenance costs (EUR / year)	Investment costs (EUR / 15 years)
Cooperative use of sea cable network	212,000	12,000,000
Sea fibre optic network	600,000	1,500,000
Cooperative use of radars	600,000	12,000,000
Cooperative use of radio communication networks for GMDSS	200,000	700,000
Cooperative software system development	100,000	4,000,000
Cooperative use of surveillance cameras	75,000	2,400,000
Cooperative use of AIS shore stations	200,000	1,500,000
Cooperative use of VHF radio communication network	40,000	1,100,000
Joint use of sensor sites	300,000	
Joint use of technical systems	300,000	
Total	**2,627,000**	**35,200,000**

Source: METO (2011) METO yhteistyön kustannusvaikutusten arviointi.

Cost savings have been moderate to substantial

The above table illustrates that Finland has achieved substantial savings; and while it has not been possible to obtain cost savings figures as a percentage of total costs, there are indications that the savings have been in an order of magnitude of between 20-60% for some of the elements.

Other Member States are on track of establishing national common information sharing environments. However, it has not been possible to obtain cost savings or performance improvement estimates from these initiatives. This is either because the initiatives are fairly new and that estimates simply do not exist, or because the estimates currently are being kept confidential.

From the above, it may be possible to conjecture that savings of a similar nature could be obtained through the establishment of CISE in the longer run. However, not all of the above savings may be applicable when looking to harness potentials between Member States.

7.3 Cost of CISE

The cost of implementing CISE depends on a number of elements.[55] For the purpose of this impact assessment study, however, the most important are (i) the choice of architecture vision; (ii) how the Member States will connect to the environment; and (iii) the number of information services that will be provided in the environment.

Architecture vision

Based on the discussion in Chapter 6, this study assumes that CISE will be implemented using the hybrid vision.

Connection to the CISE environment

Member States have several options for connecting their maritime surveillance systems to the CISE. For example, those Member States that have already established a national centre for sharing maritime surveillance information could connect through a single interface. Member States without such a national centre could connect by applying an interface to each of their main maritime surveillance systems. Member States could, however, also build a national node and connect this node through an interface.

The question of how Member States will connect to CISE therefore depends on the context of the maritime surveillance setup in each country; i.e. how many maritime surveillance IT systems are in place, the current degree of cross-sectorial connections, as well as the political standpoint on the national information sharing environment in relation to sharing information through CISE. To inform these variables, the MSEsG survey sought to uncover the number of maritime surveillance IT systems currently in place in the Member States; and information obtained from interviews with stakeholders in different Member States were also used to obtain additional information about the most likely connection options. These sources of information gave rise to the following connection assumptions.

[55] For a full specification, please see Gartner (2013) Sustainability and efficiency of visions for CISE, 13 October 2013.

Table 7-14 Categorisation of Member States based on interviews and IT systems

Category	Number of MS in category	Description	Assumption
National CISE	4	Member States with a national CISE are those countries who have already established an environment for information sharing across sectors.	In as far as a country's systems already are integrated through a national information sharing environment (such as Finland's FIMAC or the UK's NMIC), the assumption is that these countries will connect to CISE via 1 single Interface.
Few main systems	12	Member States with 2-3 main systems are those countries where a few number of systems already covers many/all user communities.	If there are only a few systems in the country, and if these systems already are integrated across sectors (although not part of a national information sharing environment), it is unlikely that the country will establish a National Node. Instead, the country will opt for connecting its few main systems to CISE via separate Interfaces.
Many separate systems	12	Member States with many separate systems are those countries where Maritime Surveillance is separated into several separate systems.	Many separate systems can either be connected to CISE via a National Node or up to as many Interfaces as there are systems. Some countries would use CISE as an opportunity to also connect systems in a national environment and therefore build a Node. Others would only connect their systems via Gateways. It is difficult to predict the investment path a country will take, therefore it is assumed that 50% will build Nodes and the rest will install Interfaces (one for each system).

Number of information services

The number of information services that will be provided through CISE also affects the total cost of CISE. However, the degree to which currently unshared data sets, (identified in the TAG/JRP data matrix) will be shared through CISE depends on the chosen policy option for implementing CISE.

Total cost of CISE

It is anticipated that the policy options described in Chapter 6 at the least will facilitate the sharing of 10% of those datasets that are currently not being shared. However, due to a number of legal limitations and constraints, none of the policy options are assessed to be able to facilitate more than 50% of the datasets that are currently not being shared. Given this span of provided information services, the total cost of CISE is estimated to be between MEUR 67.6 and MEUR 115.7; aggregated over a 10-year period.[56]

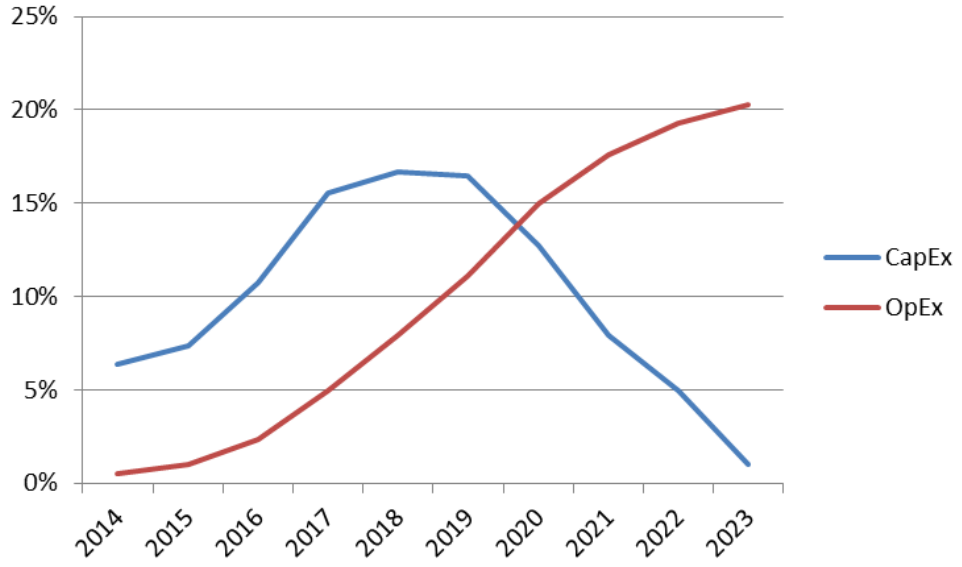
It should here be emphasised that CISE is expected to have a lifetime beyond the 10-year period adopted for the cost and benefit calculations within this impact assessment study, and so in the longer run the closure of the data gap is expected to be even higher. Furthermore, we have – as shown below – assumed a higher closure of the data gaps via a combination of the policy options.

[56] Gartner (2013) Sustainability and efficiency of visions for CISE, 13 October 2013.

The estimates include investment, operation, and non-IT costs

The above cost estimates, which have been provided by Gartner, are to be regarded as the Total Cost of Ownership (TCO). This means that they combine both one-off capital investment expenditures (CapEx) as well as annual operational expenditures (OpEx) over a 10-year period. As such, they cover the development and maintenance of the necessary information exchange standards and IT components, and the interconnection of existing EU sector-specific systems as well as Member State systems (including all 28 Member States). The estimates moreover include non-IT elements such as electricity, floor space, personnel, etc. depending on the dataset sharing scenario mentioned above, Gartner estimates that the distribution of the total CapEx and OpEx cost will follow a distribution corresponding approximately to the one depicted in Figure 7-4.

Figure 7-4 Distribution of total CapEx and OpEx cost of CISE (hybrid vision) over 10 years



Source: Based on Gartner estimates

EU and Member State cost of CISE

The central cost of CISE at the EU-level differs from the cost of CISE incurred by Member States. Specifically, the central cost amount to MEUR 21.1, regardless of the number of datasets being shared. This is not the case for the cost to Member States. The difference in TCO, CapEx and OpEx can be seen in the below table.

Table 7-15 Cost of CISE (MEUR) to the EU and Member States across sharing scenarios

	EU cost	**Member State cost**				
Scenario	*All*	*10%*	*20%*	*30%*	*40%*	*50%*
CapEx	11.0	21.8	28.1	34.4	40.7	47.1
OpEx	15.1	19.7	25.4	31.2	36.9	42.6
TCO	**21.1**	**41.5**	**53.5**	**65.6**	**77.6**	**89.7**

Source: Based on Gartner estimates.

The above table reveals that the average total cost of CISE per year is approximately MEUR 2.1 for the EU and between EUR 140,000 and 320,000 per year for each Member State; over a 10-year implementation period.

7.4 Cost and benefits of policy options

7.4.1 Policy options and realization of potential benefits

The costs and benefits of the different CISE policy options discussed in Chapter 6 will of course depend on how much of the potential benefits will be realised via the different options – and how much it will cost to do so.

Policy options and policy objectives

We concluded in Chapter 6 that Policy option 2 would be most suitable in achieving the first specific objective and Policy option 3 would be most suitable for addressing the third specific objective. Further, that a combination of the two options would be the preferred option for implementing CISE, as the combination of the options covers all the policy measures and thereby all the specific objectives.

Policy option 2 vs. 3

We assess that Policy options 2 and 3 would, over a period of time, be essentially equally effective in addressing existing cultural and administrative limitations. While Policy option 2 addresses these limitations directly, through measures supporting voluntary cooperation between Member States' maritime surveillance authorities, Policy option 3 (in particular Option 3.2) does so indirectly, through reducing existing legal limitations. It is assumed that the reduction/removal of existing legal limitations would contribute to the change of the information sharing culture, which is the crucial step in overcoming the traditional sectorial thinking. Expressly allowing for the sharing of information across sectors would reduce the uncertainties regarding the possibility to share and thereby contribute to reducing existing cultural and technical limitations. Such changes may take effect relatively shortly after the implementation of the option. However, a legislative measure would likely meet with a certain degree of administrative resistance and this may to some degree undermine the effectiveness of the measure and thereby of Policy option 3 in overcoming the existing administrative and cultural barriers.

Policy option 2, on the other hand, seeks directly to stimulate voluntary cooperation between maritime surveillance authorities. As such, the option would more easily achieve acceptance. Moreover, this option would allow for the progressive implementation. Once the CISE principles have been implemented in some of the Member States/user communities, it would be easier to demonstrate the benefits of CISE to those who as of yet do not participate, and a progressive building up of the base of CISE participants would likely take place.

On its own, Policy option 2 is, however, unlikely to achieve the full potential. The option would not be able to remove the existing legal limitations, so as to achieve a high uptake on the information sharing. This in turn would to some extent limit the potential to create services of necessary quality to satisfy the needs of the user communities making information demands through the CISE environment. This is because such services would be built up from different data records/data sets, shared through the CISE environment, which may not be available to the CISE customers demanding the service due to existing legal limitations.

Combining Policy option 2 and 3

Accordingly, the consecutive or parallel implementation of Policy option 3 would maximise the effectiveness of the policy options in terms of achieving the specific

objectives. Since Policy option 2 and Option 3.2 incorporate the same policy measures, the preferable sub-option for the combination with Policy option 2 would be Option 3.1[57].

Policy options and closure of information sharing gap

It is assumed that Policy option 2 will offer an increase in information sharing, which will increase along with the successfulness of the implementation. The same assumption applies for Policy option 3, however, with a higher starting point due to the instant effects of legislative measures. In terms of numbers, the increase in information sharing will to some extent overlap. Accordingly, measures only arising from Policy option 2 can in principle have the same effect as minimal implementation of Policy option 3.

About 30% of the identified datasets from the TAG data matrix have no legal limitation. Voluntary measures alone would therefore be able to ensure a full sharing of 30% of all maritime datasets. This calculation is, however, done at the dataset level. A similar count on the specific data record level would amount to a much higher level of data without legal limitations. This is also seen in the EUROSUR Regulation, where it is described how the same dataset can contain several pieces of information that can be shared depending on the level of access rights. Such a dataset would be considered to have legal limitation but would still be able to be addressed with voluntary measures. However, the potential for closing the information gap increases further if measures from Policy option 3 are implemented.

Policy options and realization of benefits

The realization of the full CISE potential benefit, as estimated in Table 7-9, is related to the amount of datasets that will be shared via the different policy options. However, it cannot be assumed that there is a one-to-one relationship between the percentages of data sets that will be shared (the data gap closure) and the degree to which the full benefit of CISE will be realised. One of the reasons for this is that the information contained in certain datasets are so specific to user communities that other user communities will not derive much benefit from these; even if they had access to them. On the other hand, indications from stakeholders suggest that much could be achieved by a relatively modest amount of sharing.

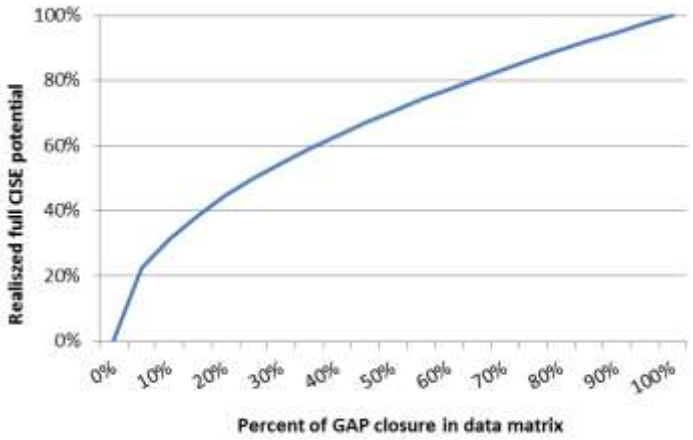
The above observations imply that there is a diminishing marginal effect from closing the data gap and the realisation of the full CISE benefit. The exact relationship between data sharing and the realisation of benefits is nonetheless unknown, and not easy to establish. Hence, to operationalise the estimation of both the cost and benefits across the policy options we assume that the relationship takes the form described by $f(x) = x^k$ where $f(x)$ is the percentage of the full CISE benefit that is realized by the policy option's potential for closing the data gap, here denoted by x. The k parameter denotes the degree to which the sharing of datasets lead to the achievement of the potential. For instance, if $k = 0$ a minimum of data

[57] Note that we in the below calculations for a policy mix also have included the voluntary action of producing a White Paper. This is because this voluntary action is included in the Impact Assessment developed by DG MARE.

sharing will achieve the full CISE potential, and if $k = 1$, the degree of achieving the full CISE potential is directly proportional to the percentage of datasets being shared.

In the following – illustrated in Figure 7-5 – we assume that $k = 0.5$. This results in the following assumption about the data gap closure and full CISE benefit realization.

Figure 7-5 Assumed relationship between data gap closure and realization of full CISE potential



Source: COWI assumptions.

Policy option assumptions

Given the assumed relationship between data gap closure and realization of full CISE benefits, Table 7-16 provides a rough estimate of how the different policy options – hereunder a policy mix – will address (i) the closing of the information sharing gap, and (ii) the potential for realizing the full CISE benefit. Apart from giving an overview estimate based on numbers from the TAG data matrix, interviews, inspired by surveys and correlating the qualitative and quantitative findings, the table is mostly an illustration of how the implementation of the policy options will overlap in terms of effectiveness and efficiency.

Table 7-16 Data gap closure and realization of full CISE benefit for policy options

	PO 1: No EU action	**Policy Option 2**			**Policy Option 3**			**Policy mix**
Potential data gap closure	0%	4-50%			15-90%			20-95%
Option		"White Paper"	Option 2.1	Option 2.2	Option 3.1	Option 3.2	"Technical Regulations"	"White Paper" + 2.1 + 2.2 + 3.1
Assumed data gap closure	0%	4%	16%	42%	25%	25%	25%	64%
Assumed realisation of full CISE benefit potential	0%	20%	40%	65%	50%	50%	50%	80%

Source: COWI assessments.
Note: The two options: "White Paper" and "Technical Regulations" which are included in the Impact Assessment produced by DG MARE have for consistency been included in our presentation of the calculations. Hence, for a description of these please consult the DG MARE IA report.

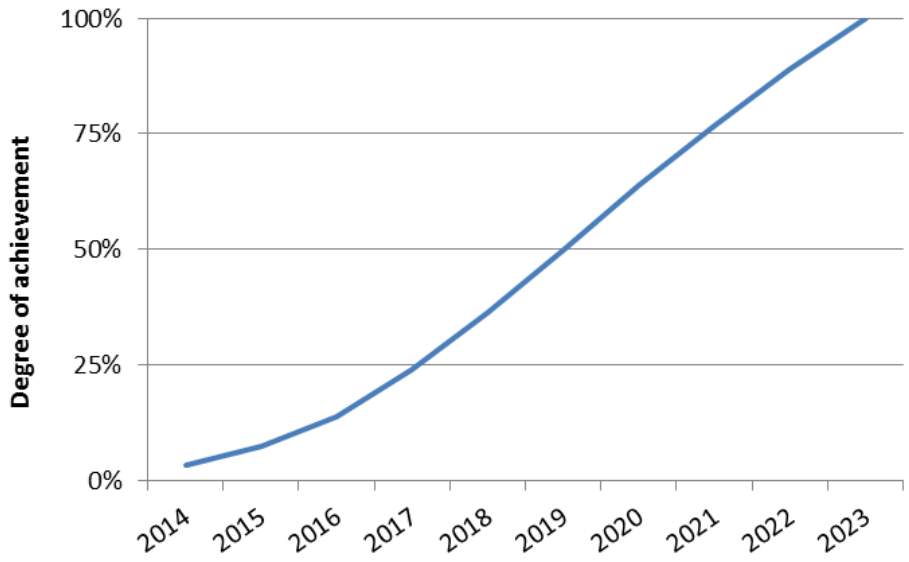
From the above, the full annual CISE potential that was estimated (see Table 7-9) will not be reached by any of the policy options. Indeed, it is assumed that the "White Paper" will only be able to realise 20% of the potential, while the policy mix will realize 80%. The other policy options are expected to realise potential benefits in between these figures.

7.4.2 Cost and benefits

Timing of cost and benefits

The realisation potentials of the policy options in Table 7-16 will take time. These benefits, as implied in Section 7.3, will also come at a cost. From Figure 7-4, it is assumed that the achievement of the cost-savings and impacts will follow the accumulated CapEx and OpEx expenditures – i.e. as the investment and operation expenditures occur, the closer the policy options will come in terms of achieving the assumed realization of the full CISE benefits from Table 7-16. The degree of achievement across policy options follows a very similar pattern, illustrated in the below figure.

Figure 7-6 Annual degree of achieving CISE benefits by policy options



Source: COWI assumptions.

Total cost and benefits

Given the above assumptions, cost savings, impacts and the total cost of the implementation of CISE have been calculated for each of the policy options. The estimates are presented in Table 7-17. It shows that **all CISE policy options are expected to deliver high benefit-cost ratios**. This ratio is as high as 4.65 for Option 2.2: voluntary cooperation via joint undertaking, slightly higher that for the policy mix. However, the **highest benefits are assessed to come from the policy mix** – which also in absolute terms has the largest difference between benefits and cost. The lowest benefit-cost ratio is expected for the "White Paper" option – since a major part of the cost here is a fixed cost that need to be covered equally by the benefits of all policy options.

The calculations show also that **cost-savings cover the total cost for almost all options** – i.e. except the "White Paper" and just for Option 2.1.

Although, there is much uncertainty connected with the point estimates in the table, the benefit-cost ratio estimates are so high that a use of a large range of ratio estimates would suggest that we should expect an added value from CISE that exceeds its costs. Actually, as already underlined, since the calculations are based on the *minimum benefit* approach and they are in general considered as **conservative estimates**. Hence, the "correct" estimates are likely to be higher than those shown in the table.

Table 7-17 Total cost, cost-savings and impacts (in MEUR, from 2014-2023) of policy options, and performance ratios

	Policy Option 1: No EU action	"White Paper"	Option 2.1	Option 2.2	Option 3.1	Option 3.2	"Technical Regulations"	Policy mix: "White Paper" + 2.1 + 2.2 + 3.1
Key measures (MEUR)								
Total cost (TCO)	0	60	75	106	86	86	86	133
Cost-saving	0	37	75	122	94	94	94	151
Impact	0	114	228	373	286	286	286	460
Total benefit	0	151	303	495	380	380	380	611
- economic benefit	0	45	90	146	112	112	112	181
- social benefit	0	50	101	165	126	126	126	203
- environmental benefit	0	56	112	184	141	141	141	227
Performance ratios								
Cost-saving/TCO	0	0.62	1.00	1.15	1.09	1.09	1.09	1.14
Impact/TCO	0	1.88	3.05	3.51	3.34	3.34	3.34	3.47
Total benefit/TCO	0	2.50	4.05	4.65	4.43	4.43	4.43	4.61

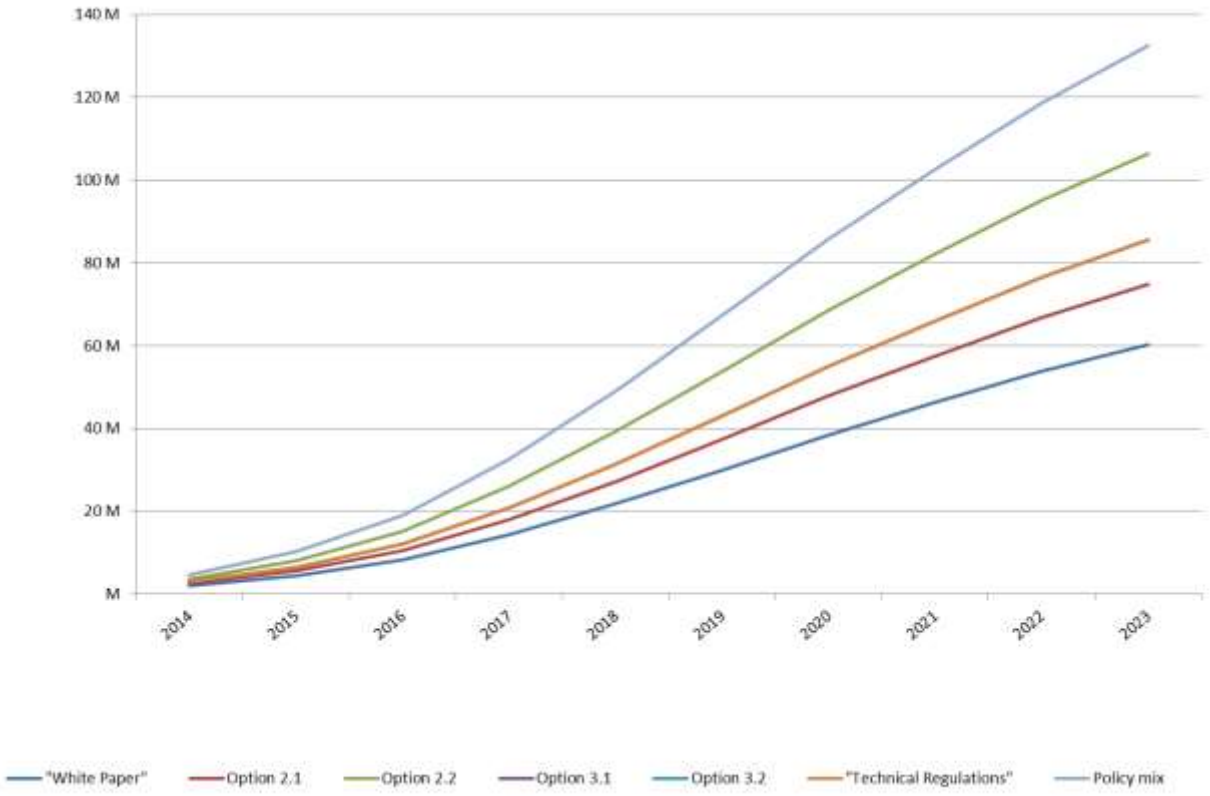
Source: COWI calculations.
Note: The two options: "White Paper" and "Technical Regulations" which are included in the Impact Assessment produced by DG MARE have for consistency been included in our presentation of the calculations. Hence, for a description of these please consult the DG MARE IA report.

Table 7-17 shows, in line with the assessments provided in Table 7-9, that there is an **almost even distribution among economic, social and environmental benefits** – although with the highest benefits in the social domain. However, it must in this context be re-emphasised that we have only included the benefits that have been selected by the Cooperation Project and only those that can be quantified. Hence, there are, as discussed in Part 1 additional economic benefits – such as higher income to the shipping industry from safer EU waters, additional social benefits – such as local job opportunities, and environmental benefits – such as reduced chemical pollution, that also should be kept in mind when assessing the added value of CISE. This said, the above calculations call for the implementation of CISE even without considering these additional benefits.

Comparing total cost

While Table 7-17 shows the total cost of implementing CISE over a 10-year period, Figure 7-7 shows how these costs have cumulated over these years for the different policy options. The result is not in itself that informative, but is so when it is compared with the benefit side below.

Figure 7-7 Cumulative total cost (EUR) of policy options

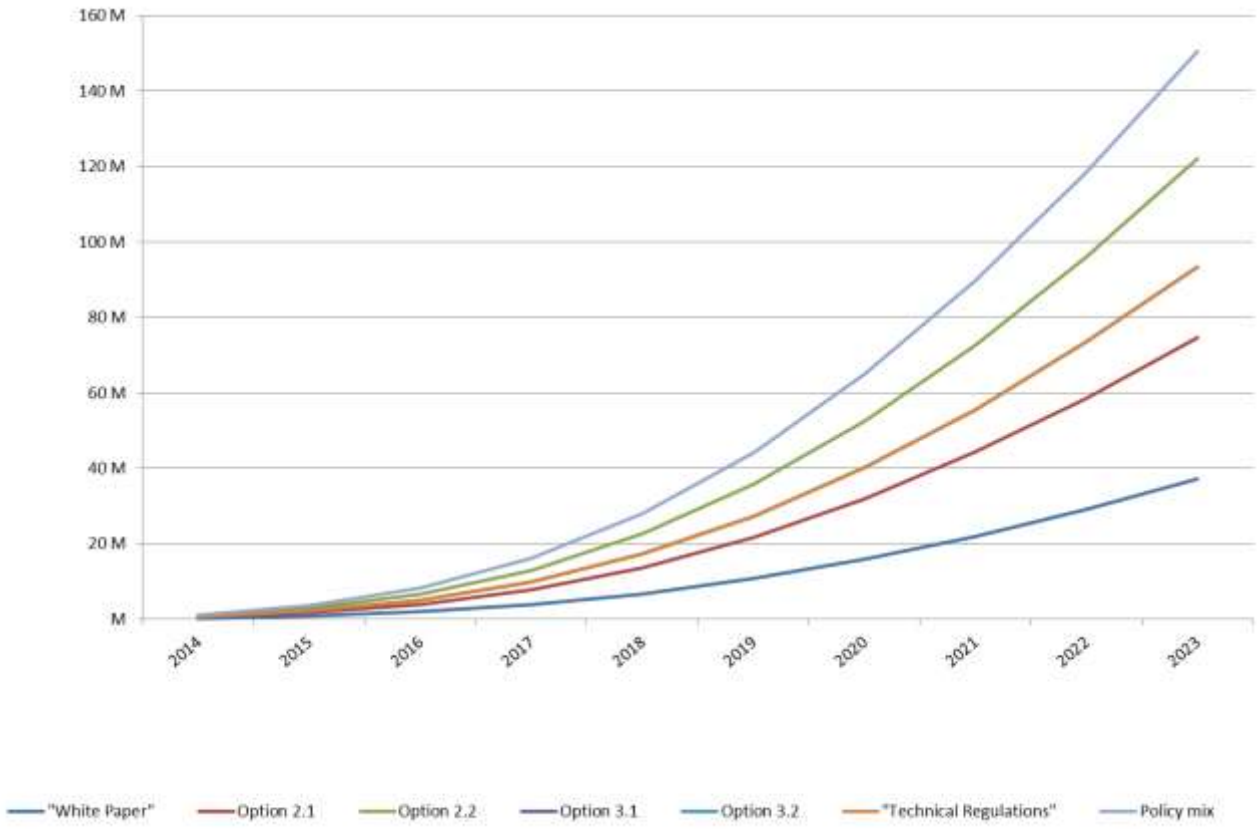


Source: COWI calculations.
Note: Since the figures for Option 3.1, Option 3.2 and "Technical Regulations" are similar the graphs overlap.

Comparing cost-savings

However, before making such comparison of the cost and benefit time profile, it is useful, as shown in Figure 7-8, to underline that the cost-savings potential vary much across the policy options – from fairly low figures for the "White Paper" option to high figures for the policy mix option.

Figure 7-8 Cumulative cost-savings (EUR) of policy options

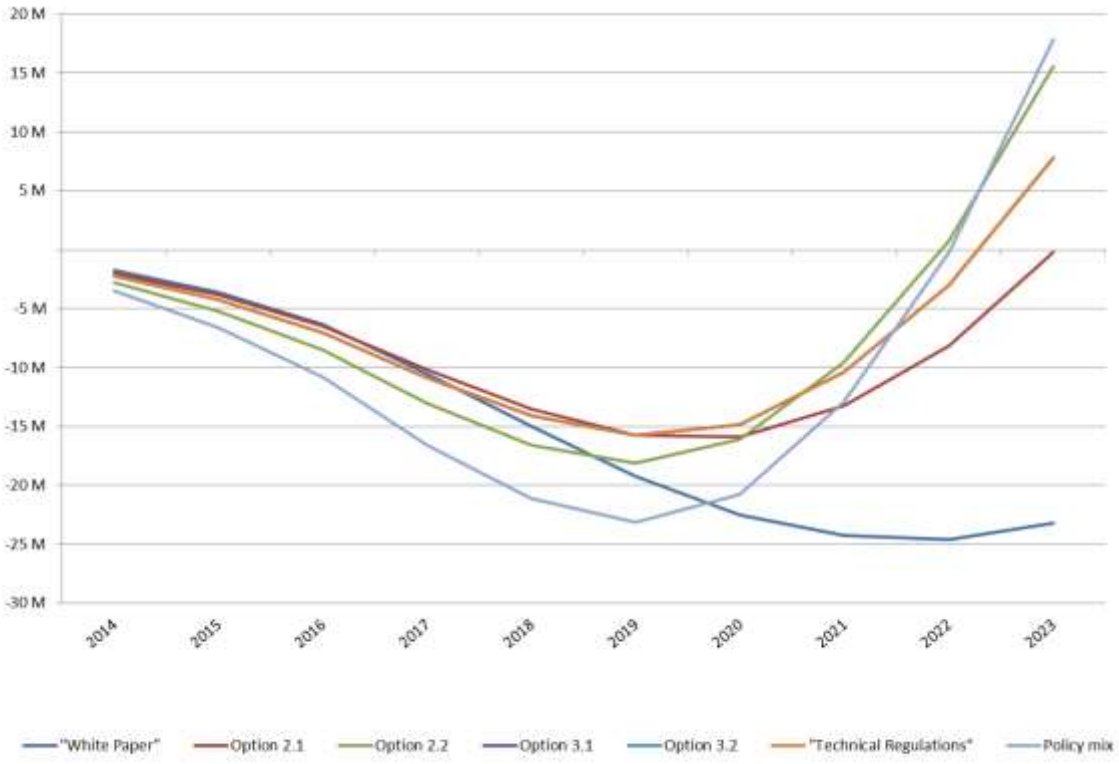


Source: COWI calculations.
Note: Since the figures for Option 3.1, Option 3.2 and "Technical Regulations" are similar the graphs overlap.

Comparing break-even

Figure 7-9 shows when the costs of implementing CISE are covered by direct cost-savings within the different policy options. It shows firstly that this is not the case for the "White Paper" options – at least not within the first 10 years. For Option 2.1, it is the case right at the end of the 10-year period, while it for the remaining options is expected to happen between 2021 and 2022 (assuming that implementation starts in 2014).

Figure 7-9 Sum of cumulative total cost and cost-savings (EUR) of policy options

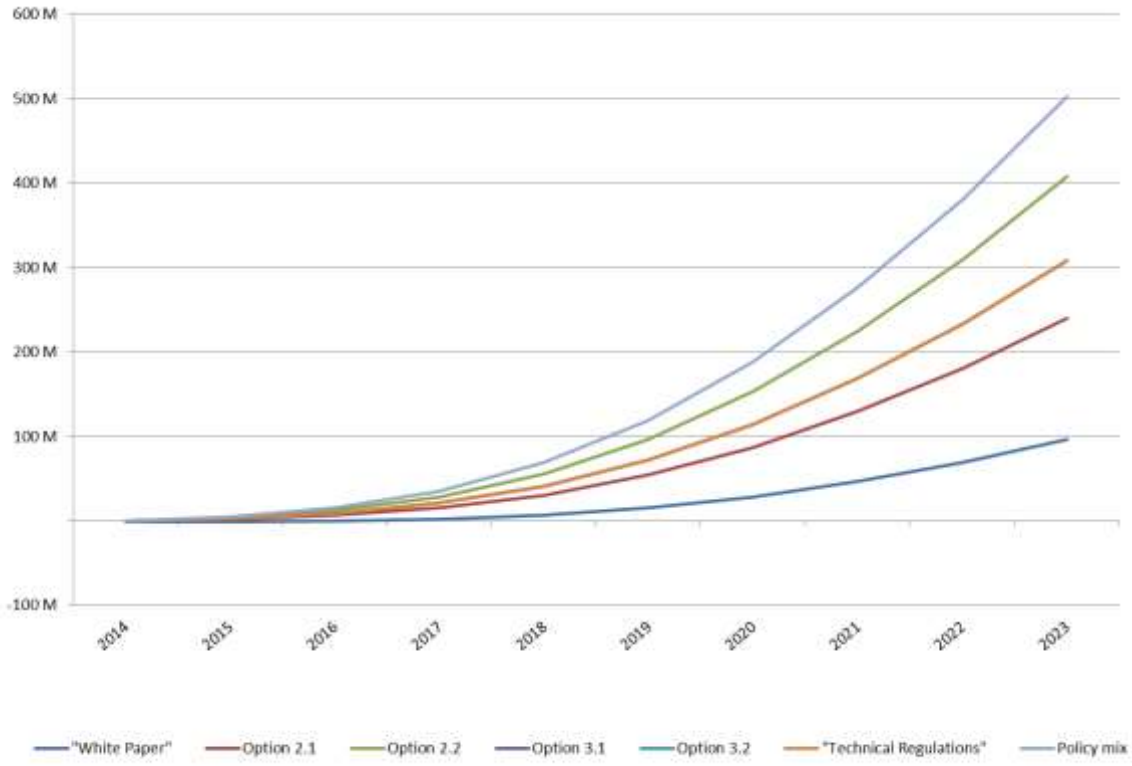


Source: COWI calculations.
Note: Since the figures for Option 3.1, Option 3.2 and "Technical Regulations" are similar, the graphs overlap.

Finally, Figure 7-10 shows that when considering all the calculated CISE benefits, there is in general a break-even regarding total costs in the first or early years of implementation. For the "White Paper" option this happens, however, only in the fourth year.

Hence, the conclusion is that **the pay-back period of a CISE investment is very short**, and so this should not be a limitation to its implementation.

Figure 7-10 Sum of cumulative total cost and total benefits (EUR) of policy options



Source: COWI calculations.

Note: Since the figures for Option 3.1, Option 3.2 and "Technical Regulations" are similar the graphs overlap.

8 Comparing the policy options

Methodology for comparing the options

The previous two chapters have already to a large extent compared the CISE policy options with respect to their ability to achieve the policy objectives and with respect to achieving benefits that cover the cost of the CISE implementation. This chapter should therefore be seen as a brief summing up of these findings.

Firstly, we compare the effectiveness properties of the CISE policy options – i.e. an assessment of the extent to which the different policy options achieve the objectives of the proposal. This is done by addressing the cultural and technical limitations and by a qualitative assessment of the policy options, strongly emphasising the interconnection between the options and also given that policy "packages" are possible. The analysis builds on previous descriptions of the policy options and it focuses on the dependencies between the options.

Secondly, we provide some final considerations regarding the ranking of the CISE policy options.

8.1 Effectiveness of policy options

Criteria for effectiveness comparison

The different policy options are compared in terms of the extent to which they address the drivers behind the technical, legal and cultural limitations and thereby help to achieve the CISE policy objectives.

8.1.1 Legal limitations

Addressing legal limitations

Legal limitations are limitations deriving from legislation. It follows that a legislative change would in principle be necessary to reduce such limitations. However, as described in the legal baseline, while the existing sectorial legislation does in the vast majority of cases set down a regime for the sharing of information within sectors only, the sharing across sectors is not necessarily excluded. An uncertainty exists regarding the scope of the possibility to share. This uncertainty may be minimised without introducing legislative changes. This would not amount strictly speaking to removing limitations, but would lie in the grey zone between legal and cultural limitations.

Policy option 3 is the most effective regarding legal limitations

The analysis shows not surprisingly that **Policy option 3** with legal measures is assessed to be the most effective regarding reducing legal limitations and promoting legal certainty. However, there is expected to be a considerable degree of legal complexity and administrative complexity associated with the implementation of this option.

8.1.2 Cultural and administrative limitations

Addressing cultural and administrative limitations

The conclusion from the below observations is that it would require a change in attitude of the maritime surveillance authorities, a turn towards a common interest in the sea, in order to establish a new information sharing culture and to thereby overcome the existing culture and administrative limitations. This is to a large extent an on-going maturity journey.

Strictly defined roles

Maritime surveillance authorities will normally have well defined roles and pursue the objectives decided in their mission. Their competences are defined so as to match these missions. To carry out these missions the different authorities collect information that is very specific to the competences of the user community they represent.

Lack of information sharing culture

As a consequence of this traditional sector-oriented organisation, maritime surveillance authorities are often fully or partly unaware of the activities and the needs of the other user communities. Moreover, an understanding of how and for what purposes cross-sector information can be used by them is often missing. At the same time, the authorities have little will to take the effort to go beyond their specific roles.

Organisational complexity

The organisational complexity of the maritime surveillance authorities in different Member States results in the lack of knowledge on how to obtain relevant and needed information and how to get knowledge about where the information is to be found. Without a personal connection or a prior knowledge that the information in question exists and which authority has it in its possession, it is difficult to obtain the information needed.

Lack of resources

Lack of resources is another important limitation to information sharing. The success rate of the maritime surveillance authorities' operations is related to the missions of the authorities, and it is therefore normally linked to activities within the user community. It is also related to the amount of information these authorities hold. The lack of resources stimulates a competition among the different authorities and this often results in the authorities being protective of the information collected by them.

Lack of trust and confidence

When it comes to sharing of sensitive information the maritime surveillance, there is regularly a lack of confidence and trust in that the shared information would be handled in a responsible way; i.e. that the information will not be disclosed to unauthorised subjects or more generally not handled by the same standards as applied by the authority sharing the information. This is the case in particular in situations in which the information in question is the result of careful analysis and

intelligence work that would be too valuable to lose before the competent authority can use it for coordinating a response.

Lack of legal foundation and standards for information exchange

The legal foundation for information sharing, including standards for routine work and for information exchange and definitions, has primarily been developed for the sharing of information within specific sectors. The foundation for the sharing across sectors is lacking. When information is shared across sectors, the decisions whether to share are as a rule made on an ad hoc basis, in the absence of a guiding methodology to determine the appropriates of the sharing. Occasionally, this results in over-classification of information or simply in the decision not to share the information since there uncertainties regarding whether the information may or may not be shared.

Overlap between cultural and legal limitations

There is to some extent an overlap between what the different maritime surveillance authorities perceive as legal limitations and as administrative and cultural limitations. The two types of limitations often coincide in one, one strengthening the effect of the other. Moreover there is a difference between "actual" and "perceived" legal limitations; i.e. cultural/administrative limitations disguised as legal limitations. In the latter situation, it is not the legal limitation as such, which prevents the information from being shared, but the lack of willingness to do so.

Policy option 2 is the most effective regarding cultural and administrative limitations

To reduce cultural and administrative limitations, we assess that the policy option most suitable for its implementation is **Policy option 2** – i.e. the option based on a voluntary cooperation. Its strength lies particularly in its ease of implementation, flexibility, adaptability and coherence with general EU law principles (subsidiarity and proportionality) and fundamental rights.

8.1.3 Technical limitations

Addressing technical limitations

Overall, technical limitations are less preponderant than cultural and administrative barriers. This is the conclusion made in the Gartner study and it is also consistent with our findings made through the stakeholder interviews. At the same time, once identified, technical limitations can be reduced more easily than the legal and cultural barriers.

Mapping of technical limitations

The identification of technical limitations departs from the findings of the Gartner Study,[58] the MARSUNO and BluemassMed pilot projects reports and the interviews carried out with the CISE stakeholders.

The Gartner study has identified two groups of technical barriers:

› varying capacity of source systems to exchange surveillance and monitoring information; and

[58] Gartner (2013), Sustainability and Efficiency of visions for CISE, 13 October 2013.

› lack of interoperability of current systems' landscape.

Lack of interoperability

Both of these limitations are rooted in the current design of authorities' information systems. As far as interoperability is concerned, this is considered to be a cross-fertilizing barrier within a certain government tier/Member State or across tiers/Members states, which jeopardises the interoperability of the overall system. The barrier includes the lack of common information models, common technical protocols, immature and/or diverging definition of metadata between user communities, different languages of data and metadata and the lack of integration of the existing nodes' models.

All CISE policy options support the reduction of technical limitations

The hybrid vision selected to pursue for the implementation of CISE addresses each of the above described limitations to interoperability fully. And, as has been concluded in Chapter 6, the hybrid vision was considered capable of supporting **each of the CISE policy options**. The difference lies then in the instruments employed to implement the policy option (e.g. a Recommendation, a Decision relying on Art. 170 TFEU, etc.).

8.2 Ranking of policy options

While the above summarised the effectiveness properties of each of the different policy options, we summarise here the strengths and weaknesses of the policy options and so also rank them according to these properties.

Policy option 2 is easier to implement than Policy option 3

Firstly, our assessment concludes that **Policy option 2 is considerably easier to implement than Policy option 3**. This applies both to EU and to national level implementation. The ease of implementation of the different sub-options decreases from Option 2.1 to Option 3.2. The detailed analysis of the procedure for the adoption of the different policy instruments, which may be employed for the implementation of the different policy options, is presented in Section 6.4.

Option 2.2 has a higher degree of intervention than Option 2.1

Apart from the ease of implementation, the two sub-options of Policy option 2 differ in the degree of legislative intervention (the former foresees the introduction of a non-binding legal act, the other an adoption of a Regulation setting up a formal structure for cooperation), coordination of the activities of the participating Member States/user communities, the degree to which the sub-options facilitate the monitoring of sub-sequent implementation in the Member States, but also in how effectively they implement the different policy measures formulated to achieve the CISE objectives. **Each of these factors increases from Option 2.1 to Option 2.2**.

Option 3.2 has a higher degree of intervention than Option 3.1

Similarly to what was described above in connection with the analysis of the differences between the different sub-options of Policy option 2, the sub-options of Policy option 3 differ in the degree of legislative intervention (the former foresees amending existing sectorial legislation, the latter the introduction of (a) CISE horizontal measure(s)) and in the degree to which the sub-options implement the different policy measures (the definition of CISE principles). **Each of these factors increases from Option 3.1 to Option 3.2**.

In addition, Option 3.2 allows for more effective horizontal coordination between the different sectors and as a result more coherent implementation of CISE across the different CISE user communities. This advantage is, however, to a large degree outweighed by the high degree of legal complexity associated with this sub-option and the difficulties likely to be encountered in the process of implementing the option.

Highest total benefit from policy mix, but highest benefit-cost ratio from Option 2.2

As presented in the previous chapter and shown in Table 7-17, all CISE policy options are expected to deliver high benefit-cost ratio. This **ratio is as high as 4.65 for Option 2.2**: voluntary cooperation via joint undertaking, slightly higher that for the policy mix. However, the **highest benefits are assessed to come from the policy mix** – which also in absolute terms has the largest difference between benefits and cost. The lowest benefit-cost ratio is expected for the "White Paper" option – since a major part of the cost here is a fixed cost that needs to be covered equally by the benefits of all policy options.

The analysis concludes also that there is much uncertainty connected with the point estimates calculated. However, the benefit-cost ratio estimates are so high that a use of a large range of ratio estimates would suggest that we should expect an added value from CISE that exceeds its costs. Actually, we underline that they are in general considered as **conservative estimates**. Hence, the "correct" estimates are likely to be higher than those presented.

9 Monitoring and evaluation

The ambition of this final chapter of this impact assessment study is solely to provide a few ideas to a subsequent monitoring and evaluation arrangements for CISE. They will of course in practice depend upon the policy option chosen.

Monitoring

Overall, we envisage that a CISE monitoring system will focus on:

- implementation at Member State level (e.g. transposition of Directives or voluntary initiatives)
- compliance with national maritime safety and security structures (e.g. having structures and personnel in place, procedures, etc.)
- enforcement costs for public authorities;
- Member States' costs for complying with CISE requirements (whether voluntary or compulsory) and not least
- accomplishment of improved efficiency and cost-effectiveness of the sharing of maritime surveillance information and of cooperation between maritime authorities, and so of improved quality of the provided maritime safety and security services.

Regarding the last focus, it will be necessary to revisit the cost, output and impact indicators assessed as a part of this impact assessment study and used for the calculation of cost and benefits. Hence, the CISE monitoring system should include procedures to gather and analyse such indicator values relating to:

- inputs/resources consumed (e.g. rate of consumption of budget; compliance with project costs programmed)
- the implementation process (e.g. milestones achieved and timeliness)
- outputs (e.g. research and development phase, pilot phase, deployment phase and eventually running cost)

- results (e.g. monitoring of marine security and safety indicators)
- context (e.g. monitoring of prevention and responses to emergencies).

Evaluation

According to the Commission's evaluation rules, all programmes and (ABB) activities have to be evaluated on a regular basis. Multi-annual programmes are evaluated periodically to support renewal, modification or suspension of the programmes and financed activities have to be evaluated at least every six years[59].

We suggest that when developing the CISE monitoring system, it should contain criteria for whether or not developments of the monitoring indicators suggest that CISE is on track towards achieving its objectives. These criteria can then be built upon in an evaluation exercise.

[59] Impact Assessment Guidelines, 15 January 2009. European Commission, SEC(2009)92.

Appendix A Literature

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Appendix B Abbreviations

Abbreviation	Full name
ABB	Activity Based Budgeting
AIS	Automatic Information System
BluemassMed	Blue Maritime Surveillance System Med, Pilot project on integration of maritime surveillance co-financed by the European Commission (COM(2010) 584 final)
CBA	Cost Benefit Analysis
CEF	Connecting Europe Facility
CFSP	Common Foreign and Security Policy
CHEN	Chiefs of European Navies
CISE	Common Information Sharing Environment for the EU maritime domain (COM(2010) 584 final)
CooP	Cooperation Project
COR	Committee of the Regions
CSDP	EU Common Security and Defence Policy
ICMPD	Centre for Migration Policy Development
DG	Directorate General
DG CNECT	Directorate-General for Communication Networks, Content and Technology (CNECT)
DG DIGIT	Directorate-General for Informatics (DIGIT)
DG ECHO	Directorate-General for Humanitarian Aid (ECHO)
DG HOME	Directorate-General for Home Affairs (HOME)
DG JUST	Directorate-General for Justice (JUST)
DG MOVE	Directorate-General for Mobility and Transports (MOVE)
DG TAXUD	Directorate-General for Taxation and Customs Union (TAXUD)
DG SJ	Legal Service (SJ)
EC	European Commission
ECJ	European Court of Justice
EDA	European Defence Agency
EDICOM	Inter-administration telematics networks for statistics relating to the trading of goods between Member States
EEAS	European External Action Service (EEAS)

Abbreviation	Full name
EESC	Economic and Social committee
EEZ	Exclusive Economic Zone
EMSA	European Maritime Safety Agency
EP	European Parliament
EU	European Union
EUMS	European Union Member State
EUR	Euro
EUROPOL	European Law Enforcement Agency
EUROSUR	European border surveillance system
FAO	Food and Agriculture Organisation (United Nations)
FRONTEX	European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union
GMES	Global Monitoring for Environment and Security
HR	High Representative of the Union for Foreign Affairs and Security Policy.
IMB	International Maritime Bureau
IMO	International Maritime Organisation
IMP	Integrated Maritime Policy
IP	Intellectual Property
IPM	Interactive Policy-Making
ISO	International Standards Organisation
IT	Information technology
IUU	Illegal, Unreported or Unregulated (Fishing)
JRC	Joint Research Centre
JTI	Joint Technology Initiative
JU	Joint Undertaking
LEA	Law Enforcement Agency
LRIT	Long-Range Identification and Tracking
MARSUNO	Maritime Surveillance in the Northern European Sea Basins, Pilot project on integration of maritime surveillance co-financed by the European Commission
MDA	Maritime Domain Awareness
MEUR	Million Euro

Abbreviation	Full name
MoU	Memorandum of Understanding
MSA	Maritime Situational Awareness
MSEsG	Member State Expert sub-Group
MSSIS	Maritime Safety and Security Information System
N/A	Not Available
NATO	North Atlantic Treaty Organisation
NGO	Non-Governmental Organisation
OLAF	European Anti-Fraud Office
PT MARSUR	Project Team Maritime Surveillance - EDA project on 'maritime surveillance network' (COM(2010) 584 final)
RMP	Recognised Maritime Picture
SafeSeaNet	Safe Sea Network; A European Platform for Maritime Data Exchange between Member States' maritime transport authorities.
SAR	Search and Rescue
SatAIS	Satellite-based AIS
SEIS	Shared Environmental Information System
SG	Secretariat-General
SOLAS	International Convention for the Safety of Life at Sea
TAG	Technical Advisory Group - Composed of representatives of all relevant maritime surveillance user communities
TEU	Treaty of the European Union
TFEU	Treaty of the Functioning of the European Union
ToR	Terms of Reference
TTW	Territorial Waters
UC	User case
UNCLOS	United Nations Convention on the Law of the Sea
USD	United States dollar
VAT	Value added tax
VDS	Vessel Detection System
VMS	Satellite-based Vessel Monitoring System used in the Fisheries sector (COM(2010) 584 final)
VSL	Value of Statistical Life
WMD	Weapons of Mass Destruction

Abbreviation	Full name
WP	Work Package
WPT	Wise Pen Team