TEXTE
96/2017

Coverage of environmental impacts in EU impact assessments

For our Environment

Umwelt Bundesamt

TEXTE 96/2017

Environmental Research of the
Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

Project No. (FKZ) 3714 14 103 0

Coverage of environmental impacts in EU impact assessments

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On behalf of the German Environment Agency

Imprint

Publisher:
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Study completed in:
Februar 2017

Edited by:
Section I 1.4 Economic and Social Environmental Issues, Sustainable Consumption
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Publication as pdf:
http://www.umweltbundesamt.de/publikationen

ISSN 1862-4804

Dessau-Roßlau, November 2017

The project underlying this report was financed by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear safety under project number FKZ 3714 14 103 0. The responsibility for the content of this publication lies with the author(s).

Kurzbeschreibung

Die Studie untersucht die Darstellung von Umweltwirkungen in EU Impact Assessments und entwickelt Empfehlungen für die Praxis der Gesetzesfolgenabschätzung in der EU und in Deutschland. Auf der Basis der Untersuchung von 12 umweltrelevanten EU Impacts Assessments sowie von Experteninterviews und einer begrenzten Literaturanalyse wurde untersucht, ob und wie Umweltwirkungen in EU Impact Assessments dargestellt, quantifiziert und monetarisiert werden.

Die Studie zeigt, dass die Darstellung der Umweltwirkungen sich in den letzten 15 Jahren deutlich verbessert hat und viele Umweltwirkungen im politischen Entscheidungsprozess eine wichtige Rolle spielen. Es gibt jedoch immer noch beträchtliche Lücken in der Darstellung. So werden schwer zu modellierende Umweltwirkungen (unter anderem Biodiversität) in vielen Impact Assessments und Entscheidungsprozessen weiterhin nicht adäquat berücksichtigt. Regelmäßig werden Politikoptionen analysiert, die in Bezug auf ihre Umweltwirkungen zu ähnlich sind, als dass diese entscheidungsrelevant wären. In diesen Bereichen könnten mit Investitionen in Daten und Modelle noch erhebliche Verbesserungen erzielt werden.

Abstract

The present research analyses the coverage of environmental impacts in EU impact assessments and aims to identify potential lessons for Germany and the European Union. The main focus of the study is the analysis of the way how environmental effects – qualitatively, quantitatively and in monetary terms – are taken into account in the EU impact assessment process, especially in comparison to economic and social impacts. The study is based on an in-depth review of 12 EU impact assessments of recent regulations with relevant environmental effects. Additionally, a small literature review and four expert interviews were conducted.

Overall, the formalisation of impact assessments (IAs) has improved in the last 15 years the way that environmental impacts are taken into account in the policy making process. However, significant challenges remain in the practical application of the concept that could provide important lessons. An important finding is the fact that not all environmental impacts are adequately considered in the decision making process of choosing the best option and that quantification and monetisation of some environmental impacts (eg. biodiversity) could be improved by investing in models and data to support the authors of impact assessment.

Zusammenfassung – Die wichtigsten Folgerungen

In den letzten Jahren wurden die Anforderungen an Gesetzesfolgenabschätzungen in Deutschland in mehreren Schritten kodifiziert und formalisiert. In der EU ist dieser Prozess schon weiter vorangeschritten. Diese Studie hat das europäische System der formalisierten Gesetzesfolgenabschätzung (Impact Assessments) analysiert und mögliche Folgerungen für die Systeme in der EU und in Deutschland identifiziert. Im besonderen Fokus der Studie standen dabei die Analyse und Darstellung von Umweltfolgen in der EU Gesetzesfolgenabschätzung und ob diese im Vergleich zu sozialen und ökonomischen Folgen ausreichend in die Entscheidungsfindung einfließen. Zu diesem Zweck wurden zwölf EU Impact Assessments zu Gesetzesvorhaben mit relevanten Umweltfolgen im Detail analysiert und zusätzlich eine begrenzte Literaturanalyse und vier Experteninterviews durchgeführt.

Die Darstellung und Bewertung von Umweltfolgen in EU Impact Assessments hat sich in den letzten 15 Jahren deutlich verbessert. Es gibt jedoch noch immer zentrale Lücken in der praktischen Anwendung von EU Gesetzesfolgenabschätzungen, die wichtige Folgerungen für das deutsche und das EU System der Gesetzesfolgenabschätzung bereithalten. Bei der Beurteilung von Politikoptionen spielen deutlich bessere Umweltergebnissen oft keine Rolle. Dies reduziert das Gewicht der Umweltfolgen bei der Entscheidungsfindung. Bei Gesetzesvorhaben, die eine Verbesserung der Umwelt direkt zum Ziel haben, sind die Umweltfolgen meist in der Entscheidungsfindung enthalten. Bei Vorhaben mit anderen, zumeist ökonomischen Hauptzielen, bleiben jedoch Umweltwirkungen selbst bei zu erwartenden signifikanten Folgen oft unberücksichtigt.

In den meisten der untersuchten EU Impact Assessments werden Umwelteffekte quantifiziert. Jedoch nur eine Minderheit der Impact Assessments enthält auch umfassende Monetarisierungen von Umwelteffekten (3 von 12). Die fehlende Monetarisierung kann allerdings in einigen Fällen auch methodische Gründe haben (z.B. Monetarisierung nicht möglich, Datenverfügbarkeit ungenügend). Ökonomische Folgen werden häufiger monetarisiert, was zu einem **stärkeren Einfluss der ökonomischen Folgen auf die Entscheidungsfindung führen kann.**

Die folgenden Punkte fassen die wichtigsten Ergebnisse der Analyse zusammen:

- **Auswahl der betrachteten Politikoptionen:** Im Vergleich zu vor 15 Jahren sind die betrachteten Politikoptionen wesentlich umfassender geworden. Viele der betrachteten aktuellen Impact Assessments bewerten eine umfassende Auswahl von Politikoptionen. Es gibt jedoch immer noch einige Impact Assessments, die nur Optionen betrachten, welche sich sehr ähnlich sind und deren Umweltwirkungen sich kaum unterscheiden. Die politische Entscheidung erfolgt in solchen Fällen primär auf der Basis von Kosten. Die Ausrichtung der Impact Assessments war eng verknüpft mit der Ausrichtung der federführenden Generaldirektionen, die Optionen bevorzugten, welche innerhalb der Kompetenzen der federführenden Generaldirektion lagen. Seit 2015 hat die EU jedoch ihren Prozess erweitert. Bereits zu Beginn der Arbeit an einem neuen Politikvorschlag und dem damit verbundenen Impact Assessment muss eine ressortübergreifende Arbeitsgruppe (interservice group) einberufen werden, die bereits die Auswahl der Optionen maßgeblich mitbestimmt. Von den Interviewpartnern wurde die Einberufung dieser Gruppe sehr positiv beurteilt, besonders in Bezug auf die Breite der zu bewertenden Optionen in Impact Assessments.
- **Behandlung von Umweltfolgen:** Umweltfolgen werden in der Mehrheit der Impact Assessments in adäquater Weise behandelt. Jedoch ist die Qualität der Analysen unterschiedlich. In einigen Impact Assessments (4 von 12) nehmen Umweltfolgen eine kleinere als die erwartete Rolle ein. Dies trat vor allem dann auf, wenn die Umweltfolgen nicht das primäre Ziel der Regulierung waren. Der Auswahlprozess, in dem entschieden wird, welche Wirkungen relevant genug sind, ist häufig nicht sehr transparent und könnte verbessert werden. Dies würde die Glaubwürdigkeit und die Qualität der Impact Assessments erhöhen. Transparenz könnte den

gesamten Prozess verbessern, denn um die Analyse in dem engen Zeitfenster abarbeiten zu können, müssen viele Optionen und Wirkungen ausgeschlossen werden, bevor Sie einer detaillierten Analyse unterzogen werden können.

- **Quantifizierung von Umweltfolgen:** In den meisten Impact Assesments werden die Umweltfolgen umfassend quantifiziert, besonders die Folgen der Maßnahme für Luftschadstoff- und Treibhausgasemissionen. Für diese Umweltfolgen stellt die EU bewährte Modelle und Methoden (z. B. Energiemarktmodelle) zur Verfügung, die zur Schätzung der Umweltfolgen genutzt werden können. Die Nutzung von Modellen in Impact Assessments hat auch dadurch in den letzten 15 Jahren zugenommen. Jedoch werden manche Umwelteffekte (z. B. Biodiversität) immer noch selten quantifiziert, da keine anerkannten Modelle und Datensätze zur Verfügung stehen.
- **Monetarisierung von Umweltfolgen:** Umwelteffekte werden noch relativ selten monetarisiert. Wenn überhaupt, erfolgt eine Monetarisierung von Umwelteffekten, für die anerkannte Kostensätze existieren (z. B. Luftschadstoffemissionen). Die verwendeten Kostensätze sind jedoch teilweise veraltet. Für die meisten Umwelteffekte existieren keine allgemein anerkannten Kostensätze und die Quantifizierung erfolgt auf der Basis von Indikatoren zu konkreten Umweltbelastungen (z. B. Emissionen), die dann mit den ökonomischen Folgenkosten verglichen werden. Investitionen in Modelle und Datensätze würden hier noch deutliche Verbesserungen ermöglichen.
- **Relevanz der Umweltfolgen im Vergleich zu ökonomischen Folgen:** Ökonomische Folgen werden häufiger monetarisiert als Umweltfolgen. Dadurch dominieren in der abschließenden Beurteilung von Optionen sehr häufig ökonomische Folgen gegenüber den Umweltfolgen (und sozialen Folgen).
- **Prozess und Ressourcen:** Der Einfluss der Impact Assessments scheint stark von der für die Analyse zur Verfügung stehenden Zeit abhängig zu sein. Wenn der politische Kalender eine tiefer gehende Analyse erlaubt, können Impact Assessments die Entscheidungsfindung beeinflussen. Wenn dies nicht der Fall ist, werden die Entscheidungen oft gefällt, bevor eine Ausreichende analytische Grundlage geschaffen werden konnte.

Die EU hat große Anstrengungen unternommen, die Qualität der Impact Assessments zu erhöhen. Dabei war besonders die Einführung eines unabhängigen Reviews der Qualität durch das Regulatory Scrutiny Board (früher IA Board) ein wichtiger Schritt. Es ist aus unserer Sicht wichtig, dass eine solche Überprüfung ausgewogen für alle Folgen geschieht. Wenn eine Überprüfung nur hinsichtlich ökonomischer Kosten erfolgt, werden diese Kosten die Analysearbeit dominieren. Die methodischen Vorgaben für einige Folgen sind in EU Impact Assessments (z. B. Standardkostenmodel) sehr viel detaillierter als für andere (z.B. Umweltfolgen) und die Folgen mit den umfassendsten Vorgaben sind auch die Folgen, die am detailliertesten behandelt werden.

Executive Summary – The main findings

As the system of impact assessments in Germany has undergone some major changes aimed at stronger formalisation of some parts of the impact assessment process (German: Gesetzesfolgenabschätzung), the present research study aims to identify potential lessons for Germany from the more established system of impact assessments in the European Union. The main focus of the study is the analysis of the way how environmental effects – qualitatively, quantitatively and in monetary terms – are taken into account in the EU impact assessment process, especially in comparison to economic and social impacts. The study is based on an in-depth review of 12 EU impact assessments of recent regulations with relevant environmental effects. Additionally, a small literature review and four expert interviews were conducted.

Overall, the research has shown that the formalisation of impact assessments (IAs) has improved in the last 15 years the way that environmental impacts are taken into account in the policy making process. However, challenges remain in the practical application of the concept that could provide important lessons for both Germany and the European Union. An important finding is the fact that **environmental impacts are not always adequately considered in the decision making process** of choosing the best option: In regulations where the main goal of the regulation is the improvement of environmental effects, the environmental impacts are clearly important for the choice of options and the decision making. However, in impact assessments where economic reasons are the main objectives of the legislation, but relevant environmental effects could be expected, environmental impacts did not seem to have a significant influence on the decision making process. Another important finding is the fact that the description and quantification of environmental effects are generally done comprehensively, except for certain impact assessments with mainly indirect effects. However, **the monetisation of environmental effects is covered broadly only in a minority of the impact assessment** (3 out of 12). Of course, sometimes there are methodological reasons for not including the monetization. However, the fact that economic impacts are more often monetised than environmental impacts leads to a **predominance of economic impacts** in the comparison of options stage and with that **in the decision-making**.

The following points further illustrate the main findings of the analysis:

- **Choice of options:** Over time, the choices of options have become more comprehensive and wider. Many recent impact assessments provide a wide range of options that cover the potential political choices. Some IAs, though, still provide several alternative options that are very similar to one another, which makes any distinction regarding the impacts and especially the environmental benefits very uncertain. This means that those options can only be differentiated based on their costs. An important reason for these narrow options is an institutional bias, which leads to preferred options within the existing legal framework and within the powers of the lead organisations.
  An important addition to the impact assessment process to counter that bias is the interservice group, where representatives of all relevant DGs meet early in the process to make sure that the policy problem and the policy options are developed based on a broad set of views and expertise. The recently made stricter obligation to form such a group and to use it in the early phases of the policy-making process was regarded as very beneficial to the quality of the policy options assessed.
- **Environmental effects covered:** Environmental effects are generally covered in an adequate way. However, there are substantial differences between the various DGs and the type of regulations. In some impact assessments (4 out of 12), the environmental effects are not treated as detailed as would be appropriate, mainly when the effects are indirect and when the main goals of the regulation were not environmental issues. The scoping process of deciding what

impacts are relevant and therefore included in the IA (or not) could be improved and made more transparent. This would contribute to further improve the robustness and credibility of the results.
Improving the transparency regarding reasoning for the priority decisions does benefit the overall process of the IA. As the analysis needs to be proportionate, many options, but also many potential impacts, are not analysed in detail, as they are deemed not relevant enough.

- **Quantification of environmental effects:** The quantification of environmental effects is done comprehensively in the majority of the IAs, especially in some areas like emissions of air pollutants and greenhouse gases. An important reason for this is that the EU uses many standard models (eg. Energy market models) which help the analysts to estimate the impact of policy proposals on emissions or other quantifiable indicators. The use of those models has increased significantly, which is one reason why the coverage and the quantification of environmental impacts (which very often need to be modelled) have increased significantly in the last 10 years (according to interviews and literature). On the other hand, the interviews showed that some types of environmental effects (eg. Biodiversity impacts) are usually/often not quantified, as models for such a quantification do not exist or are not universally accepted.
- **Monetisation of environmental effects:** The monetisation of environmental effects is quite rare. Similarly to the quantification, monetisation is – sometimes, but not always – done for environmental impacts where an agreed standard cost exists for the unit value of an environmental pressure (e.g., air emissions). However, the values and cost factors used are often not completely up-to-date. For many environmental impacts that lack consensus on a standard value, monetisation is not conducted. In those cases, the quantification is very often done on the environmental pressure indicator (e.g., amount of plastic waste or energy saved), which is then compared with monetised economic cost figures. Investment in data availability and models could enable real improvements in the quality of the IAs in these areas.
- **Relevance of environmental impacts compared to economic impacts:** The monetisation of economic impacts is more frequent than the monetisation of environmental impacts, which are very often benefits in terms of reduced environmental costs. The economic impacts therefore dominate in many cases the environmental (and social) impacts in the final comparison of options, based on costs-benefit or cost-effectiveness considerations.
- **Process and resources:** Generally, the influence of the impact assessment analysis seems to be very much dependent on the available time and resources for the impact assessment. In cases where the political calendar allowed some analysis before the main political decisions were made, the IA had some substantial influence, but if the political calendar was too tight, then the analysis could not influence the decision-making process.

The EU has made a lot of effort to improve the quality of the IAs, of which the introduction of an external review of the IAs by the Regulatory Scrutiny Board (or formerly IA Board) is probably the most important. However, in light of our analysis it is worth noting that the scrutiny needs to extend to all types of potential impacts. Limiting the scrutiny of such a board to only some impact areas (eg. economic impacts), will always create an even stronger focus of the assessments towards hose impact areas. In the case of the EU impact assessments that bias is visible, as the impact areas with the most detailed guidance notes are also the impact areas best covered in the impact assessments.

Inhaltsverzeichnis

1 Introduction

For over 10 years, the European Commission has committed itself to draft and publish formal Impact Assessments (IA) of any major policy initiative taken. This move has been inspired by some EU Member States (especially the UK) and other countries with similar formal processes in place. Since then, the introduction in the EU has influenced a move of many more national governments in the EU to follow that example.

Over the last 10 years, the impact assessment (German: Gesetzesfolgenabschätzung) process in Germany has gradually become more formalised. Already since the mid 1990s, any major federal legislative initiative is required to publish the reasoning and the expected impacts of the legislation. However, the content of such an assessment has been defined and codified only in the last 10 years and only step-by-step, and so the overall system can still be considered as a system in development.

As the European system for impact assessments is more established than the German system, the German Environment Agency (Umweltbundesamt) has asked the consultants to provide an overview of the current impact assessment practice of the European Union. The focus of the study was to discuss how environmental impacts are taken into account in EU impact assessments, especially in comparison to economic or social impacts. The study should thereby provide evidence and lessons for the further development of the German impact assessment system.

The study provides a short introduction into the process of impact assessment in the EU and assesses 12 current impact assessments published by different DGs with relevant environmental impacts. Each of the 12 impact assessments was analysed using a fixed set of questions. Additionally, a limited literature review and some expert interviews were conducted using similar questions.

The findings were discussed in a workshop with experts from the European Commission, European Parliament, regional governments and research institutions in Bruxelles in October 2016.

2 Methodology of the study

2.1 IA report analysis

The central component of this project is the analysis of a dozen IA reports that accompany environmentally-relevant regulations or strategies of the European Commission. The partners in the consortium set guidelines to select which reports to analyse in detail and to create a template to extract relevant information from each selected IA report.

Selection of IA reports

The first step of selection was the compilation of a list of fifty impact assessment reports published by the Commission in the last 4 years that seemed to have a link to environmental effects. The consortium used the European Parliament Research Service as a source. The EPRS publishes Briefings on IAs published by the Commission, and we searched for the 50 most recent Briefings, passing those that seemed like they would have no links to environmental issues (using expert judgment). Many IAs were led by DG ENV, but there were also environmentally-relevant proposals by other DGs, for instance in the field of transportation (DG MOVE), energy (DG ENER), climate (DG CLIMA), economy (DG ECFIN) and agriculture (DG AGRI).

The resulting list of fifty IA Briefings was analysed by the consortium in order to identify the most interesting impact assessment s for our research purposes. We used the following questions for the identification:

- Can we expect relevant environmental impacts from the legislation?
- Are environmental impacts mentioned in the Briefing (good coverage or lacking coverage)?
- Are methodologies for quantifying or valuing of environmental impacts mentioned in the briefing (good use or lacking use)?
- Does the report include any remarks on the decision relevance of environmental impacts?

With this methodology, 25 impact assessments were identified as good candidates for the more detailed assessment. This list was included in the interim report, which was submitted in July 2016.

From that list of 25 impact assessments, 12 were selected with the UBA for detailed analysis in this project (and two were identified as backups).

Template for IA report analysis

A set of criteria was defined, to make the analysis of the 12 IA reports coherent and comparable. The basis for some of the criteria was a study[1] by the European Union on the potential of IAs to support environmental goals in the context of the European Semester, in addition to discussions with UBA starting at the kick-off meeting. The study does focus on the treatment of environmental impacts in the EU impact assessments and does not review the complete IA.

The following table shows the criteria set applied for the analysis of the IAs. The UBA was consulted in advance to validate the criteria for the analysis. The final template is illustrated below.

Title, Year, Responsible DG, no. of pages
Short description of the regulation
Respond to: ▸ *What is the content of the new regulation?* ▸ *Which are the main goals of the regulation* ▸ *What measures are included (e.g., taxes, subsidies, technology ban)*
System boundaries
Respond to: ▸ *Which system boundaries have been chosen for the analysis?* ▸ *Are they appropriate?*
Stakeholder
Respond to: ▸ *Which are the relevant stakeholders involved in the regulation?* ▸ *Which are the main impact chains of the regulation?*

[1] Study on the potential of impact assessments to support environmental goals in the context of the European Semester; European Commission, Directorate General, 2015.

Options

Respond to:

- *Which options have been identified?*
- *Are there other options that should have been included (e.g., environmentally friendly alternatives)?*

Environmental effects covered

Respond to:

- *Which environmental effects / assets are covered in the analysis? (pre-defining a set of effects?)*
- *Which environmental effects / assets are missing in the analysis?*
- *Is the impact chain of the effects (not only environmental effects; DPSIR) described in detail?*
- *How is uncertainty treated (sensitivity)?*
- *How is it treated for other impact dimensions (economic / social)?*

Quantification of environmental effects

Respond to:

- *Which environmental effects are quantified in the IA?*
- *Which environmental effects could have been quantified additionally with manageable effort?*
- *Is the depth and breadth of the analysis of environmental impacts comparable to that of economic / social impacts?*

Monetisation of environmental effects

Respond to:

- *Which environmental effects are monetised in the IA?*
- *Which environmental effects could have been monetised additionally with manageable effort?*
- *Is the depth and breadth of the analysis of environmental impacts comparable to that of economic / social impacts?*

Methodologies applied (methodological toolbox)

Respond to:

- *Which methodologies have been applied/chosen for assessing the environmental effects? Are they described in the toolbox?*
    - *qualitative assessment of environmental effects*
    - *quantitative assessment of environmental effects*
    - *monetisation of environmental effects*
- *Which methodologies could have been applied additionally?*
- *How do the methods used to assess the environmental impacts compare to those used in the other dimensions?*
- *If economic impacts are monetised and environmental impacts are not – how are the different dimensions treated in the comparison of the policy options / the conclusion?*
- *Have all options been assessed in the same detail?*

Requirements of IA guidelines

Respond to:

- *Are the (methodological) requirements of the IA guidelines met?*
- *Where are any missing or weak points/aspects?*

Relevance of the results

Respond to:

- Has there been any relevant influence of the environmental impact assessment on the final assessment / decision?
- Are the results of the analysis of the environmental impacts mentioned in the comparison of options / conclusion? Are they used to justify the directive?
- Are the results of the analysis of the environmental impacts described in the summary?
- Could the result of the final assessment / decision have been different if all relevant environmental aspects were included / taken into account?

Additional studies

Respond to:

- Have any additional studies been conducted (as a basis of the IA)

The consortium partners all had to follow this template for their assigned IAs. To complete this template, they consulted several documents related to the IA. These included the regulation proposal, the IA report, the opinion of the Regulatory Scrutiny Board (formerly Impact Assessment Board), the Briefing of the EPRs, and in some cases, studies that were conducted as a baseline for the IA. Once completed with all the required information, the templates were on average five pages long. The detailed assessments are part of Annex 1.

2.2 Literature review

There is an increasing number of studies that deal with the IA process in the European Union. Some of these studies could be useful to help answer the research question and complement our own analysis of IA reports. Thus, the consortium determined, in agreement with UBA, that the following list of documents would be included in the literature review:

- De Smedt, Peter (2010): The use of impact assessment tools to support sustainable policy objectives in Europe
- Bond, Richard, et al. (2001): Integrated impact assessment for sustainable development: a case study approach
- Alan Bond, Jenny Pope, Angus Morrison-Saunders, Francois Retief, Jill A.E. Gunn. (2014): Impact assessment: Eroding benefits through streamlining
- Bäcklund, Ann-Katrin (2009): Impact assessment in the European Commission–a system with multiple objectives
- Hertin, Julia, et al. (2009): The production and use of knowledge in regulatory impact assessment
- Morgan, Richard K. (2012): Environmental impact assessment: the state of the art

Additionally, in the course of the analysis two other publications were identified, which were added to the reviewed literature.

- OECD Regulatory Policy Working Papers No. 3 Promoting inclusive growth through better regulation, THE ROLE OF REGULATORY IMPACT ASSESSMENT, Rex Deighton-Smith, Angelo Erbacci, Céline Kauffmann, 2016.
- Impact assessments in the EU Institutions: Do they Support decision making?, European court of Justice, 2010.

The documents were analysed to extract information on the inclusion and presentation of environmental effects in IA, in addition to information on why or why not they were robustly analysed. The goal of the literature review was not to conduct a thorough and all-encompassing literature review, but rather to extract information that could help answer our research question. The literature review helped to inform the results presented in this report. The specific results of the literature review can be found in Annex 2.

2.3 Interviews

The influence of environmental impact assessments on decisions cannot always be deducted through the analysis of IA reports and related documents. In order to get better insight into the process, the consortium conducted interviews with four experts. The interviews focused on the influence of impact assessments in the decision-making process and provided an opportunity to discuss the relevance of environmental effects in these decisions.

UBA suggested interviewing experts from the European Parliament and other experts. The consortium thought it would also be useful to consult national experts or scientists and consultants that work in the field of impact assessment. Finally, the list was narrowed down to the following candidates:

- Camilla Adele, University of Pretoria, South Africa, 22.09.2016
- Klaus Jacob, FU Berlin, 23.09.2016
- Marc Pirrung, DG GROW, Chief Economist Team, 14.09.2016
- Duncan Johnstone, EC Secretariat-General, Unit C2 – Impact Assessment, 27.09.2016

The list of interviewees and the focus and goals of the interviews were finalised in agreement with UBA and generally followed the questions of the IA analysis. The interviews helped inform the results presented in this report.

2.4 Analysis and recommendations

The final step of the analysis was to combine the findings of the IA analysis, the literature review, and the expert interviews to paint a general picture of the inclusion of environmental effects in IAs in the EU. An important aspect of the analysis has also been to make recommendations for policy-makers.

The consortium also determined how the German impact assessment process could benefit from the experiences of the European process. The recommendations focus on the extent to which environmental effects were considered and how these effects influenced the final decision.

3 The EU impact assessment process

Any new, 'major' Commission policy initiative that addresses a sensitive topic or is likely to have significant economic, environmental, or social impacts requires political validation from the Lead Commissioner, Vice-President, and First Vice President of the EU. Additional preparatory work cannot proceed without this validation. Furthermore, the initiative needs to be included in the Agenda Planning no later than 12 months before the planned adoption date, along with a Roadmap or an Inception IA.

The DG responsible for the initiative must decide (in a timely manner) based on the Roadmap, whether an IA is necessary and provides an explanation in case the answer is negative. However, if it turns out an IA is needed, the roadmap should be developed into an Inception IA, which identifies the problems and the possible policy options and gives an overview of the planned work schedule and stakeholder consultations. Subsequently, the IA is prepared.

The main steps in preparing an IA are:

1. An interservice group (ISG) is established, which guides the process and designs the IA report.
2. The ISG publishes the finalised Inception IA on the Commission's website, so stakeholders are able to provide feedback on for example the policy options.
3. The ISG develops a consultation strategy and organises a compulsory 12-week internet-based open public consultation, providing stakeholders with the opportunity to present their opinion on major impact-related questions.
4. The evidence, in the form of data, scientific advice, expert views etc., is collected and analysed.
5. A draft of the IA report is produced.
6. The draft IA report is submitted to the Regulatory Scrutiny Board, which reviews the quality and gives recommendations for improvement. Based on these recommendations, the draft IA report is revised.
7. With approval of the Regulatory Scrutiny Board, the IA report is subjected to interservice consultation along with the concerned initiative.[2]
8. If the initiative is adopted after going through the Commission's decision-making process, the final IA report is published.

4 Results of the study

4.1 System boundaries and stakeholders

How the system boundaries of the analysis are defined and stakeholders are described in IAs is an important methodological decision that has been roughly examined in the 12 IAs reviewed. However, these aspects have not been a main focus of the analysis and have therefore not been an issue in the interviews and the literature analysis.

Concerning the choice and definition of system boundaries, the IAs generally define geographic as well as temporal system boundaries. Overall, the system boundaries chosen seem appropriate in the IAs analysed. The geographic system boundaries generally have a strong focus on the European Union. However, third countries outside the EU are often not covered or not covered in detail, even though for environmental impacts, a broader (sometimes even worldwide) approach would have been more appropriate (e.g., in the following IAs: responsible sourcing, lightweight plastic carrier bags, review of EU waste management targets). The temporal system boundaries vary a lot and are

[2] http://ec.europa.eu/smart-regulation/guidelines/docs/swd_br_guidelines_en.pdf

chosen according to the planned and expected implementation pathway of the regulation. Generally, the description of the system boundaries could sometimes be clearer and more concentrated in an early chapter of the IA (e.g., in the regulation on new approval and market surveillance rules of motor vehicles).

The description of stakeholders is appropriate and comprehensive in the impact assessments analysed. Generally, the stakeholders and the way they are affected by the regulation are described very transparently in a separate section of the IA report. In a few cases, stakeholders indirectly affected by the regulation could have additionally been mentioned (e.g., in the regulation on the security of gas supply consumer associations or environmental stakeholders concerned with the gas pipeline investments).

Options

Question 4 of the EU's impact assessment guidelines[3] sets out instructions to follow when determining the policy options that will be compared in the IA. The Guidelines encourage practitioners to consider "the widest range of policy alternatives both in terms of content and instruments. Consider regulatory and non-regulatory means, less or more prescriptive measures, actions at national, EU and international level". The Guidelines contain a list of options to be considered:

- The option of changing nothing (also known as the "baseline"): The "baseline scenario" should always be developed and used as the benchmark against which the alternative options should be compared. As such, it should take into account both national and EU policies in place and reflect possible developments of these in the absence of new EU-level action. It should also try to anticipate important technological or societal developments such as the pervasive role of the internet and other ICTs;
- The option of improving implementation and enforcement of existing legislation; or doing less / simplifying existing legislation;
- Options that take account of new technological developments. All new initiatives should be "digital and internet ready" and operate effectively both in the digital and the physical worlds;
- Alternative policy approaches: e.g. different policy content / approaches to reach the objective;
- Alternative policy instruments: e.g. non-regulatory alternatives; self- or co-regulation; market-based solutions, regulatory alternatives; international standards, and their mix;
- Alternative scope: for instance, is the "think small first" principle taken into account; are micro-enterprises excluded from the scope of any proposed legislation.

The guidelines also mention that IA practitioners should "consult widely about alternatives, think outside the box, and give due consideration to all different options."

Our own analysis of 12 IA reports provided some insight into the practical handling of options in recent EC's impact assessments. The vast majority of the IAs we analysed considered three or four options in addition to the baseline (business as usual) scenario. In some cases, but not always, the IA report mentioned other options that had been considered but discarded from the analysis, usually with a brief justification as to why the option was not considered further.

[3] European Commission (2015) Guidelines on Impact Assessment. http://ec.europa.eu/smart-regulation/guidelines/ug_chap3_en.htm

In a few cases – for more complex regulations – there was a far longer list of options. For instance, Option 3 in the IA for the Review of EU waste management targets is subdivided into four options with different targets. The options for the IA of the Circular Economy Package were the most complex in our sample, with Option 3 being divided into nine options, and two of these being even further subdivided into "variants".

The evaluations of the Regulatory Scrutiny Board (formerly Impact Assessment Board) and the evaluations of the European Parliament research services agreed with the choice of options in most of the IAs we analysed, though in two cases in the sample it was noted that the options could have been better described and justified.

From our own analysis, the consortium found that not in all assessed IAs the selected options did show the out of the box thinking recommended in the Guidelines. Often the different options were just different intensities of one solution to the policy problem. For example, the IA on the security of gas supply provided four options (excluding the baseline scenario), but they all focused on the gas infrastructure, even though the stated objective of energy security could be reached with a mix of different policy approaches.

The interviews conducted did provide some insight into why the options selected were relatively narrow in some cases, while in others a very comprehensive set of options is analysed. It is important to note that the options published in the final impact assessment are only the last options considered, while many other options have been dropped before the final analysis stage. As stated above, in some cases, there is some evidence of this sifting process in the published IA (the mention of discarded options), while, in many other cases, that transparency is missing. Interview partners also mentioned a bias caused by the existing legislation, as officers are more likely to propose to change details of the existing acquis, instead of developing a completely new legislation.

Nonetheless, the EU has put some processes in place to counter such an institutional bias. The most important one is the obligation to form an interservice group as soon as the work on the proposal and the IA starts. In the interservice group, representatives of all relevant DGs meet and support the development of the policy proposal and the IA from the start. The interservice group is chaired by the leading DG for the proposal or, for very important proposals, by the Secretariat General. The focus on the interservice group has recently increased with the new Commission.

Our literature review revealed that in practice the selection of options is (or was, as some of the literature was 5 to 10 years old) often problematic, and that not all ideas have an equal chance of being considered as valid options. Bond et al. (2001) mention "its nature, the historical, institutional and cultural circumstances of its development and its position in the project cycle" as strong influences on the selection of options. In addition, Bäcklund (2009) highlights that "freedom to critically and seriously explore alternative policy options is limited by pressure from the Commission hierarchy or by mandates from the Council or Parliament", which directly contradicts the "thinking outside the box" principle that was mentioned in the Commission's guidelines. Similarly, Hertin (2009) found that there are "few cases where a more fundamental policy change was a realistic possibility and for which the lead ministry seriously considered fundamentally different policy options."

Interestingly, Bäcklund (2009) also notes that the fact that the IA requirement to identify progress indicators for the future regulation "suggests a mind-set that the possible policy options are anticipated to be so few already at the outset of an assessment that it is possible to outline monitoring procedures. " Question 7 of the IA guidelines is "How would actual impacts be monitored and evaluated?" and contains the instructions that "The IA report should sketch out core indicators relating to the operational objectives and the main monitoring and evaluation provisions of the preferred option (including any relevant data collection aspects)". The lack of diversity in options could thus not only be caused by political pressure, but perhaps also by the IA guidelines themselves.

Overall, it is worth noting that the results of the interviews and our own IA assessments differ from the literature and that seems to make progress over time regarding the width and quality of the options considered, which seems to be a success of the EU impact assessment framework.

4.2 Coverage of environmental impacts

The analysis and review of 12 impact assessment reports showed that the environmental impacts are covered comprehensively, or at least with only minor gaps, in the majority of the IAs. Around one third of the IAs has some substantial gaps in the analysis of environmental impacts or does not cover environmental impacts at all (two out of twelve IAs). Generally speaking, IAs of the DG ENV and DG CLIMA include a more profound analysis of environmental impacts. This is, of course, also a consequence of the fact that their regulations have a clear focus on environmental issues.

The most frequently covered environmental effects include the emission of greenhouse gases and air pollutants (mainly NO_x, PM). Additionally, energy or oil consumption, material use or the amount of waste (or marine litter) are other environmental impacts mentioned often in our sample. Generally, the focus is much more on direct environmental effects than on indirect effects.

Sometimes, there are valid reasons not to quantify or monetise indirect environmental effects, such as lack of data or uncertainties in the impact chain, as some of our interview partners pointed out and it was also quoted in the literature (Bond 2014 and European Court of Auditors 2010). However, potential and probable indirect effects should at least be mentioned to keep the process transparent. This was only done in a minority of the IAs. The impact chain of environmental effects is generally well described. However, this is mostly done in a narrative way, rather than in a systematic way by using an established framework such as the DPSIR scheme. Additionally, in many of the IAs analysed, the reason why certain environmental impacts are covered or not is not described clearly enough.

In many cases, the environmental impacts were not described in respect to their final impacts, but more in the outcomes regarding environmental pressures. For example, the IA on plastic bags described the amount of waste saved, not the biodiversity or other impacts of that saved waste. Although this is analytically sounder, as the impact chain is difficult to quantify, it means on the other hand that monetised costs will be compared with units of environmental pressures.

In comparison to the economic and the social impacts, the environmental impacts are in many cases treated adequately. In more than half of the IAs analysed, the environmental impacts have a similar importance than economic impacts. A minority of the IAs, however, had a clear emphasis on economic impacts in comparison to environmental impacts. Social impacts, however, receive the least thorough analysis in most of the IAs reviewed. The impact assessments with no adequate coverage of environmental impacts (see table 1) are all from 'non-environmental' DGs (i.e., not DG Environment or DG CLIMA). Generally speaking, the impact assessments from DG Environment and DG CLIMA have a stronger emphasis on environmental impacts than from other DGs. However, there are also examples of IA of other DGs, where the environmental effects are covered well.

The results of the interviews and the literature review support the findings from the IA analysis. Generally, the economic analysis is most developed, followed by the assessment of environmental impacts, whereas the social impacts are least developed (Bond et al. 2001, Bäcklund 2009). However, both interviewees and literature state that the integration of environmental aspects in IAs has increased in the last years (e.g., Bäcklund 2009). The experts we interviewed also underlined the fact that indirect environmental effects are often neglected, not necessarily for political reasons, but rather for analytical reasons, since it is more challenging to explain the impact chain robustly.

When looking at specific environmental impacts, the experts confirmed that greenhouse gas emissions are probably the most often mentioned environmental impact. Other impacts, such as effects on

biodiversity, are generally less common for analytical and political reasons. In the interviews, it was also stated that the scoping process of deciding what impacts are relevant and therefore included in the IA is often not transparent enough. In cases where this process is transparent, it can make a substantial contribution to the robustness of the results. Finally, some interviews highlight that despite all the shortcomings mentioned, the coverage of environmental impacts in IAs on the EU level is nonetheless more comprehensive than in most national IA systems.

Table 1: Level of how environmental impacts are covered/mentioned in the IA

	Regulation
Well/adequately covered	▸ Review of EU waste management target / SWD ▸ Circular Economy Package ▸ Fluorinated greenhouse gases ▸ Energy efficiency labelling ▸ Alternative fuel infrastructure
Covered with some minor gaps	▸ Indirect land use of biofuels/-liquids ▸ Lightweight plastic carrier bags ▸ Emissions from engines in non-road machinery
Partially covered	▸ Shipment of waste ▸ Responsible sourcing of minerals (only very roughly covered)
Not covered	▸ Security of gas supply (the effects are mainly indirect) ▸ New approval and market surveillance rules

4.3 Quantification and Monetisation of environmental impacts

According to the analysis of the 12 IAs, the quantification of environmental impacts in impact assessments is generally well established. In the majority of IAs, the relevant environmental impacts are quantified completely or with only some minor gaps. Only 3 out of 12 IAs completely lacked quantification of environmental impacts. This is most often the case in regulations with mainly indirect environmental effects, i.e. regulations from other DGs than ENV or CLIMA. In several cases, our review of the IAs identified certain environmental impacts that could have been quantified with manageable effort. The impacts quantified most often are greenhouse gas emissions, the emission of air pollutants, energy, (oil) consumption, and (raw) material use. The quantification of environmental impacts is often done on the basis of models.

Only in three out of twelve IAs, are any environmental effects monetised. The other nine IAs do not monetise any environmental impacts, although in five cases a monetisation would have been theoretically possible on the basis of existing cost factors, according to our judgement. Monetisation of environmental effects has been done for greenhouse gas emissions, the emissions of air pollutants and in one case for noise. In comparison to economic or social impacts, the quantification of environmental impacts has an adequate weight. However, the monetisation of environmental impacts in terms of costs or benefits is much less common than for economic impacts. Consequently, in the final comparison of options on the basis of cost-benefit considerations or cost-effectiveness, there is generally a bias towards economic impacts compared to environmental (or social) impacts.

The interviews and literature analysis also lead to the conclusion that economic impacts are more often covered in quantitative or monetised form, mainly due to better availability of data and methods. Generally, costs are better covered in IAs than benefits (such as environmental benefits), since costs are easier to quantify due to availability of data and adequate methods. Another reason for this is the fact that costs are often direct and benefits are rather indirect. Regulations that aim to reduce negative environmental impacts often lead to environmental benefits that are often indirect. These reasons also contribute to the fact that environmental effects are less monetised than economic effects, and therefore, the analysis of costs and benefits is often not balanced.

One paper points out that economic impacts are quantified and monetised more often than environmental impacts because environmental stakeholders (NGOs, experts) are not as deeply involved in the regulation (and IA) process than economic partners (Bäcklund 2009). Hertin et al. (2009) states that quantitative impacts are often given more focus than qualitative results: "The focus of RIA methodology on prediction and precision tends to narrow down the scope of the assessment as it carries with it a dominance of economic valuation and other quantitative methods. (...) Qualitative knowledge tends to be undervalued and few attempts are made to capture uncertainties or explore sensitivities in relation to methods and assumptions."

Concerning specific environmental impacts, emission of air pollutants and greenhouse gases are quantified much more than effects like biodiversity where data and suitable indicators are missing. According to Bäcklund (2009), in the EC IA process between 2003 and 2006 only 20-25% of the dentified environmental effects i have been quantified, compared to more than 50% of the economic impacts. However, the interviewees also stated that the quantification of environmental effects increased significantly in recent years.

Table 2: Level of how environmental impacts are quantified and monetised in the IA

	Quantification of environmental effects	Monetisation of environmental effects
Covered well	▸ Review of EU waste management target / SWD ▸ Circular Economy Package ▸ Lightweight plastic carrier bags ▸ Fluorinated greenhouse gases ▸ Energy efficiency labelling ▸ Alternative fuel infrastructure	▸ Review of EU waste management target / SWD: costs due to emission of greenhouse gases & air pollutants
Covered with some gaps	▸ Shipment of waste ▸ Indirect land use of biofuels/-liquids ▸ Emissions from engines in non-road machinery	▸ Emissions from engines in non-road machinery (air pollution costs) ▸ Alternative fuel infrastructure (noise costs; missing: air pollutants / greenhouse gases)
Only partially covered with larger gaps	▸ New approval of market surveillance rules	▸ Indirect land use of biofuels/-liquids ▸ Shipment of waste: only direct market costs (e.g., clean up costs), but not additional environmental costs ▸ Circular Economy Package ▸ Fluorinated greenhouse gases ▸ Energy efficiency labelling

	Quantification of environmental effects	Monetisation of environmental effects
Not covered due to data & methodolgical gaps	▸ Security of gas supply (effects are rather indirect) ▸ Responsible sourcing of minerals	▸ Security of gas supply (effects are rather indirect) ▸ Lightweight plastic carrier bags (only direct cleaning costs) ▸ New approval of market surveillance rules ▸ Responsible sourcing of minerals

4.4 Relevance of the identified environmental impacts for decision making

While the previous points of analysis focus on the breadth and analytical rigueur of the analysis, it is also important to understand how much and in which way the provided analysis in the IA was used in the decision making process and influenced the decision. As the IAs are published documents, which describe the endpoint of the analysis rather than the process, this cannot be fully understood from the analysis of the impact assessments. However, the "comparison of options" part and the option definition itself can provide some evidence as to what the key rationale of the decision-makers were, when deciding about the policy options in the specific case.

As mentioned in earlier chapters, two main types of IA could be distinguished in our sample in respect to the impact of the environmental considerations on the decision-making.

1. Environmental impacts as the key driver of the legislation: In some of the reviewed impact assessments, the legislation was designed to reduce a negative environmental impact, such as legislation on emission standards or legislation on illegal waste dumping. In those cases, environmental impacts were clearly decision-relevant and the comparison of options showed some evidence that the preferred options (and the options themselves) were distinguished on the merit of the environmental impacts (opposed to economic or social impacts). Examples for such legislation from our sample would be

   a) the regulation on shipment of waste, where the expected effectiveness to reduce illegal shipping of waste seemed to be decisive for the final decision on options;
   b) the energy efficiency labelling Directive, where the environmental impacts feature heavily in the justification of the Directive; and
   c) the regulation on fluorinated greenhouse gases and the regulation on plastic carrier bags, where the option with the highest emission reduction has been chosen.

2. Environmental drivers are not the key drivers of the legislation. On the other hand, there was legislation that was introduced mainly to achieve economic or social impacts, but where some relevant environmental impacts could be expected. In those cases, the options were very often formulated in a way that little difference in environmental impacts could be expected and the differences of the options regarding the environmental impacts was not analysed further. Therefore, in those cases, there is no evidence that the environmental impacts had any clear impact on the decision-making. Examples for this would be:

   a) the two reviewed IAs on the circular economy package, that are dominated by economic concerns and assessments;
   b) the IA on the security of gas supply, where environmental effects were not analysed in detail but the focus was on the economic impacts of different regulatory options; and

c) the Directive on the deployment of an alternative fuel structure, where again the economic impacts were dominant even though the original justification of the IA was an environmental reasoning (reduction of CO_2 and air pollutant emissions).

Table 3: Types of IAs in respect to the impact of environmental consideration on decision-making

Type of IA	Regulation
Environmental impacts are a key driver of the regulation	▸ Shipment of waste ▸ Energy efficiency labelling ▸ Fluorinated greenhouse gases ▸ Lightweight plastic carrier bags ▸ Indirect land use of biofuels/-liquids ▸ Emissions from engines in non-road machinery ▸ New approval and market surveillance rules
Environmental impacts are not a key driver of the regulation	▸ Review of EU waste management target / SWD ▸ Circular Economy Package ▸ Security of gas supply ▸ Alternative fuel infrastructure

It is also worth noting that the identified focus in the option definition (on measures within the responsibility of the authoring institution) meant that even within the environmental IA some impacts seem to be more important to decision-makers than others. For example, in the non-road mobile machinery directive, the focus was solely on air pollutant emissions even though greenhouse gas emissions were also affected. As mentioned in the options chapter (4.2), this could be caused by some institutional bias where policy proposals within the power of the responsible authority were favoured.

The analysed literature showed that even within the same jurisdictions the quality and the length of IAs could differ significantly (Hertin et al., 2009). Some seemed to have been done after all the major decisions have been made, while others have been crucial to the decision process all along. The differing time pressure could be an important feature in this variety of outcomes. While for some policy measures, the policy initiative from the top already determines the decisions before the analysis can start, in other cases the policy outcome is more open and leaves more room and time for the IA analysis to influence the decision.

In the interviews, the experts pointed out that the influence of IA on the policy decisions is hard to measure, subtle, and often very diffuse. Regularly, the process of the analysis for the impact assessment is more influential than what can be seen in the final IA document. In the final document, many options have already been discarded and the focus of the impacts analysed in detail has been set. The experts also mentioned that original impetus for the policy proposal also very often determines which impacts are analysed in detail and described in detail in the "comparison of options" part of the IA. If the policy measure is enacted, for example, to improve energy security, the arguments on energy security will be in the focus of the impact assessment as the public reading the impact assessment will especially look for those arguments.

The interviewed experts also suggested that the influence of an impact assessment is often determined by the timing of the political process. If due to existing legislation or strategies, the political will is already very much formed and the timeline for any further analysis is very short, the influence will be limited. In other cases, the influence of the analysis conducted for the IA can be crucial, if the analysis starts early enough and the data availability and methods allows a robust assessment. This

is one reason why the commission has introduced an obligation to start the IA process one year before the final proposals are presented, even though that timeline can be shortened for political reasons.

5 Annex 1: Summaries of Impact assessments

5.1 Review of EU waste management targets[4]

Short description of the regulation "Review of EU waste management targets"

The IA makes a clear presentation of the main problem identified, which is that improper waste management is leading to a significant amount of potential secondary raw material being lost to the EU economy. This results in missed opportunities for growth and jobs, significant dependency on imported raw material, air pollution and greenhouse gas emissions which could be reduced through improved waste management, as well as direct and indirect environmental, health and economic costs. The IA identifies the main causes as being issues relating to governance, monitoring, weaknesses in the current legislation (including unclear definitions, ambiguous measuring methods and a lack of medium term targets) and the gap between current targets and the EU vision, reflected notably in the 2020 strategy, the Raw Materials initiative and the 7th EAP (IA/1, p 21).

According to the IA, the general objective is to make progress towards the creation of a circular economy where waste is progressively used as a resource and new economic opportunities and jobs are created. The specific objectives are to simplify and clarify EU waste legislation and to improve monitoring, to ensure optimal waste management in all Member States, and to establish mid-term waste targets in line with EU ambitions regarding resource efficiency and access to raw materials.

The key instruments include: progressive landfill/incineration taxes often followed by bans on certain type of waste, extended producer responsibility schemes (EPR) transferring the costs of separate collection, sorting and recycling to those placing products on the markets, "pay-as-you-throw" (PAYT) schemes making citizens/companies directly financially responsible for the 'unsorted' waste they generate and systems of subsidies/charges to favour the development of separate collection and reuse/recycling by the competent local authorities.

Similarly, there is a large variety of extended producer responsibility (EPR) schemes in the MS notably in terms of waste covered by EPR schemes: most advanced MS have developed EPR systems for several types of waste streams. As illustrated in the fitness check for packaging waste, these EPR schemes are extremely important to unblock the possible barriers for the development of separate collection

EU funds, whether originating from the EIB or from Regional funds, have been so far mainly orientated to the lower tiers of the waste hierarchy – creation of landfills or incineration capacities. Existing funding procedures do not really fit with the type and the 'smaller' size investments needed for prevention, reuse and recycling. Additionally, mandatory landfill taxes were proposed by stakeholders.

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[4] SWD (2014) 207 final, 2014, DG Environment, 282 pages (all parts (6/6 of the IA)
IA: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0207&from=pl
Briefing: http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/528804/EPRS_BRI%282014%29528804_REV1_EN.pdf

System boundaries

Geographically, the EU Member States build the systems. However, in terms of GHG emissions, a global scale is applied. With respect to marine littering, the transboundary nature of this issue was mentioned. These boundaries seem to be appropriate, since all important issues are included. However, the export of waste in non-EU countries could have been addressed in more detail.

Stakeholders

A wide range of stakeholder consultations was undertaken, including:

- in-depth preliminary consultations of key stakeholders, which was used to ensure that the range of issues raised by the existing Directives, and the options for addressing them was as broadly-based as possible; (56 stakeholders sent their feedback to the written consultation out of which: 22 industry and industry federations, 12 Producer Responsibility Organisations (PROs), 9 treatment operators, 1 solid waste management association, 5 regional and local authorities, 2 national authorities, 1 expert and 4 NGOs.)
- an on-line public consultation, including dedicated questionnaires for both technical experts and citizens; (A total of 670 responses were received during the consultation of which 216 from industry, 54 from NGO's, 49 from public authorities –whether National or Regional/local, 325 from citizens and 26 from other organisations including academic Institutions.);
- a specific seminar focusing on SMEs; and
- specific consultations on producer responsibility and on marine litter.

More details can be found in the Annexes 3 and 4 and in Part 5 of the IA.

Options

Option 1 – Ensuring full implementation:

No additional EU action apart from compliance promotion.

Option 2 – Simplification, improved monitoring, diffusion of best practices:

This includes measures aimed at:

- Aligning definitions of key concepts (e.g., 'recycling' and 'reuse') and remove obsolete requirements
- Simplifying measurement methods (only one method to measure 'household waste and similar waste' target) and reducing reporting obligations
- Creating national registries on waste collection and management and require third party verification of key data and statistics
- Introducing an early warning procedure to monitor Member States performance and require timely correcting measures when needed
- Establishing minimum conditions for the operation of producer responsibility schemes

Option 3 – Upgrade EU targets:

No new targets will be proposed under this option; existing targets would be upgraded and clarified for some of them though obsolete targets would be removed. The current performances of the most advanced Member States and the time, which was needed to meet these targets, was taken into ac-

count to propose realistic targets and deadlines for all MS while meeting the main objectives of the 7th EAP.

Option 3.1 – Increase the recycling/reuse target for municipal waste:

Low: 60% reuse/recycling target by 2030; 50% by 2025

High: 70% reuse/recycling target by 2030; 60% by 2025

Option 3.2 – Increase the re-use/recycling targets for packaging waste:

Increased material based targets between 2020 and 2030 (80% overall reuse/recycling)

Variant: specific separate target for nonferrous metals ('metal split')

Option 3.3 – Phasing out land filling of recoverable municipal waste:

Ban on plastic/paper/glass/metals by 2025 (max 25% land filling), global ban by 2030 (max 5%)

Option 3.4 – Combination of options 3.1, 3.2 and 3.3 (with further sub-options 3.5-3.7)

These options reflect a broad range. However, the Briefing remarked that the assessment of the sub-options (under option 3) could have been developed further.

Environmental effects covered

In this IA, both direct (linked with each treatment method and waste collection system) and indirect environmental impacts (avoided emissions/impacts due to the non-use of virgin raw materials, energy produced in energy recovery facilities) are extensively covered – and "as far as possible" quantified.

However, one could criticize that an indicator system and policy focus on the share of recycled waste removes the focus from avoided waste. The impact chains of the environmental effects are described – but they were not a focus. The DPSIR scheme was not mentioned.

Uncertainties of the assessment of these effects, e.g. with respect to N_2O emissions, are treated with the help of ranges. Uncertainty with respect to Member States that are not following the guidance provided is mentioned where monitoring is discussed (as is the absence of a common interpretation on what is packaging). Costs for tourism and recreation due to marine litter were mentioned, but not discussed further. Economic and social effects seemed to receive comparable weight in the analysis.

Quantification of environmental effects

Concerning environmental effects, much emphasis is placed on greenhouse gas emissions and material demand/depletion. E.g. with regards to Greenhouse gas emissions, it was assessed, that with a combination of options 2 and 3.7, around 443 millions of tons could be avoided between 2014 and 2030. With that combination of options in the same time, secondary raw materials will be re-injected in the economy – more than doubling what was recycled in 2011 for municipal and packaging waste. Proposed measures will serve as catalyst for ensuring the implementation of all EU targets which will contribute to cover between 10% and 40% (depending of the material) of the EU total raw material demand.

Marine litter levels were also quantified. Assuming the combination of proxy 2 and 3.7, the level was assessed to be 7% lower by 2020 and by 24% lower by 2030. Additionally, landscape deterioration (due to land filling) and water pollution were mentioned, but not quantified. Most relevant environmental effects are included and the depth and breadth of their assessment is roughly comparable to the assessment of the social and economic impacts, while the economic ones are a bit more emphasised.

However, with regard to the range of environmental effects covered, environmental damages due to contaminants from landfills could have been more integrated.

Monetisation of environmental effects

Several environmental effects are monetised in the IA: Material costs (→ business turnover) of resources which could be avoided via recycling, costs due to emissions to air (greenhouse gases and pollutant emissions, incineration, organic treatment, landfill charges per ton waste, and losses in fisheries, due to littering.

One could argue that other effects, such as the contamination and its prevention (e.g., management of effluents waters from landfills) could have been also included.

Methodologies applied (methodological toolbox)

The quantitative assessment was undertaken with the help of a European Reference Model on Municipal Waste Management, which includes inter alia an Environmental Impacts Module, Resource Efficiency indicators, a Waste Prevention Module with a Mass Flow Module.

The environmental effects were monetised via listing the Material costs (→ business turnover) of resources which could be avoided via recycling, landfill charges per ton waste, losses in fisheries due to littering and cleaning costs (with a focus on beaches). The energy needed to produce the raw material, which could be avoided via recycling, could have been included but it was not. The methods to assess the environmental impacts are similar to these used to assess social and economic impacts.

Requirements of IA guidelines

On some aspects, the IA might have been expected to go further. With regard to regional impacts, a File Note prepared by external experts at the request of the Committee of the Regions warns of potential undesired effects on the territories. It also highlights that the specificities of low and very high population density areas may be a limiting factor for achieving the overall proposed recycling rates, pointing out that average national recycling and land filling rates are generally not representative of regional achievements, and that regional potential to reach targets can vary significantly within the same country, including in some of the front-running Member States.

With regard to option 2, few quantified economic cost estimates are provided. The IA acknowledges that 'meeting the proposed targets will require an increased involvement of households in prevention and separate collection at source,' but states that 'no reliable method to monetise or even quantify this impact is available due to the large number of factors to be taken into consideration and the lack of generally accepted methodologies' (IA/2, p. 5).

Some cost-benefits are expressed rather vaguely. Concerning the establishment of national waste registries, the IA explains that 'additional costs and potential savings are extremely difficult to assess for each MS' (IA/2, p.13), but concludes that in the medium term all MS should see savings as a result. Similarly, it states, that '[i]mposing a third party verification will represent a cost for Member States,' but that 'this should be compensated by the dramatic simplification of the reporting flows'. (IA/2, p. 14).

In contrast, some of the estimated benefits in terms of working days saved concerning the administrative burden implications of improved statistics and simplified reporting requirements, seem surprisingly detailed for what are described as ‘broad estimates'. However, the IA also states that they should be ‘taken with precaution: the reality could vary from one MS to another in positive or negative terms depending on the actual situation in each MS’(IA/2, p.14).

On a more general level, the IA refers to the potential positive impact on the functioning of the internal market of an increase in the transport of waste from one Member State to another, but does not assess the environmental consequences of such transport. The striking example used to illustrate the acceleration of the trend in exporting waste to energy recovery facilities, where waste exports from the UK to other EU countries 'passed from few tons in 2010 to more than 1 Million tons in 2013' (IA/2, p. 5), would suggest that this is an area which might merit further consideration beyond the internal market aspect.

Relevance of the results

The environmental impact assessment had significant influence on the discussion upon the discussion about circular economy and waste in Europe. Furthermore, the IA has a good coverage in the briefing: "Generally speaking, the IA provides an apparently thorough, objective and thoughtful assessment of the economic, social, environmental and health impacts of the key options and of the preferred combination, with a clear breakdown and presentation of costs and benefits." (briefing, page 7)

However, there is also a gap mentioned: "On a more general level, the IA refers to the potential positive impact on the functioning of the internal market of an increase in the transport of waste from one Member State to another, but does not assess the environmental consequences of such transport" (briefing, page 3).

Additional studies

Additional studies have been conducted which are available in the Commission staff working document on page 7:
http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2011598%202014%20ADD%204

5.2 Circular Economy Package[5]

Short description of the regulation

This additional analysis is provided by the Commission to complement its original impact assessment SWD (2014) 208 supporting the review of EU waste management targets (SWD (2015) 259 final), and to accompany a new package of proposals for Directives of the European Parliament and of the Council amending Directive 2008/98/EC on waste, Directive 94/62/EC on packaging and packaging waste, Directive 1999/31/EC on landfill of waste and Directive 2000/53/EC on end of live vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EC on waste electrical and electronic equipment.

[5] Review of the EU waste management targets - 'Circular Economy Package', 2016, DG Environment, 8 pages (briefing)
IA: http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2011598%202014%20ADD%208
All 6 docs of the full IA: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0207&from=EN
Briefing:
http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/528826/EPRS_BRI%282016%29528826_EN.pdf

The previous IA was criticised for being too limited concerning the apparent failure to take sufficient account of the different situations of the Member States and their capacity to perform in the future. This additional IA covers these critics by additional options and updated costs.

The regulation the Circular Economy Package includes proposals for Directives of the European Parliament and of the Council amending Directive 2008/98/EC on waste, Directive 94/62/EC on packaging and packaging waste, Directive 1999/31/EC on landfill of waste and Directive 2000/53/EC on end of live vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EC on waste electrical and electronic equipment (The new legislative proposal & implementation plan replaced the previous “Circular Economy Package”).

The main goals of that regulation are to use waste progressively as a resource, to create jobs and business opportunities as well as to avoid or reduce environmental harm. The specific goals of this regulation are to improve monitoring, to ensure optimal waste management in all Member States, to promote dissemination if best practices and key instruments, to ensure a minimum level of harmonisation of producer responsibility and to establish mid-term waste targets in line with EU ambitions regarding resource efficiency and access to raw materials.

Different measures are included (e.g., voluntary compliance and early warning systems, bans). Option 1 (Ensuring full implementation of the existing legislation) proposes to use compliance on a voluntary basis notably by ensuring a follow-up of the already launched initiatives such as the establishment of Roadmaps for MS at risk and additional follow-up initiative.

Option 2 (Simplification, improved monitoring and dissemination of best practices) includes simplifying the measurement methods, which imply some changes in the legislation and will contribute to ensure a proper implementation of the existing and future possible targets. This option also includes developing an 'Early warning' procedure and the promotion of EPR schemes and measures to improve the cost efficiency of these schemes. The option also includes measures like the alignment of definitions and removal of obsolete requirements – apart of the introduction of national registries (third party verifications).

Option 3.1 and 3.2 include changing reuse & recycling targets, while Option 3.3(Limiting land filling to residual waste) includes a ban on plastic/paper/glass/metals by 2025 (max 25% land filling), global ban by 2030 (max 5%). Additionally, landfill and incineration bans in different forms were suggested by different stakeholders (in the consultation).

System boundaries

Temporally, the analysis has the limit of 100 years. Because no emissions to land have been included other than in respect of incinerator fly ash residues, it is argued in the IA that the treatment of landfills is almost certainly too favourable. (In the case of the latter, impacts are more likely to occur over long timescales – beyond 100 years).

Some environmental impacts were not estimated in this assessment (such as impacts associated with leachate, effects of odour and bioareosols from landfilling etc., as well as the financial burden that comes with living in the vicinity of waste treatment facilities and impacts on landscape). These gaps were justified, with “a lack of methodologies”, but they could be also counted as impacts outside of the system boundaries.

Stakeholders

The new analysis builds on the stakeholder consultation already carried out for the previous impact assessment, which included:

- Industry, non-profit and academic organisations (industry trade bodies/organisations, industry representatives, non-profit/non-governmental organisations, academic institutions and other organisations),
- Public authorities (e.g., Member States, regional or local competent authorities), and
- European citizens.

In addition to the position of the European Parliament -expressed in its resolution of 9 July 2015 on 'resource efficiency: moving towards a circular economy', Member States presented their views in the Council Working Party on Environment between July and December 2014, where many called for a greater focus on better product design to promote prevention, reuse and recycling. Additional technical consultations were organised by the European Commission in June 2015 and a questionnaire was sent to Member States in September 2015 to gather information on calculation and reporting methods on how to incentivise re-use and on specific requirements for producer responsibility schemes. No new formal public consultation was organised in the context of the additional analysis accompanying the new proposals.

The chain form and interdependencies of impacts are assessed only to a very limited extent. The following impacts (which also interrelate) were identified as the main impacts:

- Costs and savings of improved waste collection and treatment (e.g., more reuse and recycling). In order to increase recycling rates, waste collection systems will have to evolve over time, e.g. away from ‘bring systems’ towards to ‘door to door’ collection. The additional investment costs that this involves will be progressively mitigated by the fact that the collection and treatment costs for mixed residual waste are expected to fall while revenues from recycled materials are expected to increase;
- Benefits related to the greater availability of (secondary) raw materials, thus mitigating the risks of future price increases of primary materials that the EU manufacturing industry is likely to face;
- Benefits flowing from enhanced waste recovery and recycling opportunities in the EU internal market (better use of existing and development of new, innovative waste treatment infrastructure, thus favouring the EU waste managing sector);
- Costs and benefits related to better monitoring reduced administrative burdens and simplification;
- Creation of jobs, owing to the fact that the upper tiers of the waste hierarchy (including separate collection, reuse and recycling) are known to be much more labour intensive than waste disposal and incineration;
- Benefits in terms of social acceptance. Infrastructure needed for the reuse and recycling of waste generally has much greater social acceptance than waste disposal and incineration facilities;
- Positive environmental impacts, both direct (better waste management, reduced littering rates including in the marine environment) and indirect (lower levels of greenhouse gas emissions and air pollution thanks to the avoided use of virgin raw materials and energy). As a result, effects on human health will also be positive. While a number of these impacts (in particular those related to better waste collection, environmental benefits and job creation) can be quantified and monetised, other aspects can only be described in a more qualitative way (for instance reduced dependency on imported raw materials).

Options

The additional analysis accompanying the new package addresses only option 3 ('Upgrade EU targets') from the original 2014 impact assessment, considering a number of new alternatives to the following seven variants initially explored:

- Option 3.1: Increase the recycling/reuse target for municipal waste:
  - low: 60% by 2030; 50% by 2025
  - high: 70% by 2030; 60% by 2025
- Option 3.2 Increase the recycling/re-use targets for packaging waste:
  - increased material based targets between 2020 and 2030 (80% overall re-use/recycling)
  - variant: specific target for non-ferrous metals ('metal split')
- Option 3.3 Phase out land filling of recoverable municipal waste - global ban (max 5%) by 2030
- Option 3.4: Combination of options 3.1, 3.2 and 3.3
- Option 3.5: Same as option 3.4 with different deadlines for different groups of countries
- Option 3.6: Same as option 3.4 with a more rapid deadline for all Member States with possible derogations
- Option 3.7: Same as option 3.4 with an extension of landfill ban to all waste similar to municipal waste

The preferred option, as elaborated in the original impact assessment, was a combination of options 2 & 3.7. The IA pointed out at the time that option 3.7 is similar to the main orientations of the Committee of the Regions' Outlook Opinion and reflects those of the 7th Environmental Action Programme as endorsed by Parliament and Council.

The additional analysis introduces the following two new variants within option 3, in order to assess the impacts of alternative target-setting approaches:

- 3.8 "progression rates": each Member State is set to achieve the proposed EU-wide targets by following a customised compliance path developed based on common average progression rates and taking as a point of departure their current performance levels. Two alternative variants have been developed and tested in the additional analysis:
- a 'moderate' variant -Option 3.8 (a) – which assumes an average annual progression rate of 2.5 percentage point until a recycling rate of 65% for municipal waste and 75% for packaging waste is achieved; and
- a 'high' variant –Option 3.8 (b) - which assumes an average annual progression rate of 3 percentage points until a recycling rate of 50% is achieved and an average annual progression rate of 2 percentage points until a final recycling rate of 70% for municipal waste and 80% for packaging waste is reached.
- Option 3.8 (c) has been developed in order to assess the added value of introducing a landfill diversion for municipal solid waste (MSW) on top of recycling targets. Under this variant, landfill reduction targets for 2025, 2030 and in some cases 2035, are calculated for each individual Member State by applying an average landfill reduction rate of 4 percentage points starting from a pre-defined baseline year (i.e., 2013) until a final reduction to 10% is reached.
- 3.9 "time derogations": all Member States are set to achieve the proposed EU-wide targets by the same deadlines, but a number of Member States would have the possibility to request a time derogation of maximum 5 years in case they prove to be unable to meet them and where they comply with certain conditions. Again, two alternative variants have been developed and tested in the additional analysis:

- a 'moderate' variant -Option 3.9(a) – which combines a 65% recycling rate for municipal waste by 2030 and 'moderate' targets for packaging waste; and
- a 'high' variant –Option 3.9(b) – which combines a 70% recycling rate for municipal waste by 2030 and the 'high' targets packaging waste derogation.

Under both of these variants, seven Member States would be eligible for a five-year derogation in respect. It seems like with the added options the major critics to the previous IA were taken into account.

Environmental effects covered

The assessment covers the direct environmental effects emissions to land, water and air, which include GHG emissions, marine litter. Indirect environmental effects, such as the "non-use" of virgin raw materials, energy produced in energy recovery facilities were also assessed. However, one could remark that energy consumption (to keep the material in the loop) and potential rebound effects could have been integrated more extensively.

The impacts chains of these effects were mentioned, but not discussed in detail. The DPSIR scheme was not applied. The environmental impacts are covered appropriately and have similar coverage to social and economic impacts, although economic impacts are slightly more emphasised.

Quantification of environmental effects

Most of the relevant environmental effects are quantified in the IA, such as greenhouse gas emissions, air pollution emissions, impacts on marine litter, soil structure and nutrient supply. However, some effects such as leakage of waste water could have been quantified additionally with some effort. The lack of such an assessment was justified with a "lack of available methodology".

The overall depth and breadth of the analysis of environmental impacts is more or less comparable to that of economic and social impacts. However, environmental impacts are more emphasised than social ones, but less than economic impacts.

Monetisation of environmental effects

The IA monetises several environmental impacts, such as cleaning costs. However, despite the monetisation of cost and benefits deriving from the new targets, the analysis does not refer systematically (or dedicate a section) to the implications for the EU budget or for Member States' finances.

The depth and breadth of the analysis of environmental impacts are roughly comparable to that of economic and social impacts. However, the economic impacts are emphasised a bit more, while the social impacts are not assessed as detailed as the environmental ones.

Methodologies applied (methodological toolbox)

As in the original impact assessment, the additional options presented are assessed for their costs and benefits, impact on employment and environmental impacts. Thus, the potential impacts of the additional two options have been assessed with the same methodology used for the initial impact assessment. However, the modelling tool for the assessment of costs and benefits of the options has been updated in various respects, including the updating of costs to 2015, the introduction of a new Net Present Value which options can be compared to and the use of updated data on packaging waste from Eurostat's latest publication at the time (2012).

A new sensitivity analysis was carried out for option 3.9 using an updated model. The analysis concluded that despite the increased sensitivity to some input factors (e.g., waste prevention effects, material losses and revenues), the results do not differ significantly from those originally elaborated (Annex 2). Similarly, calculations for each Member State have been performed based on the new targets (applicable by 2015 and 2030) by using the input to the final recycling process; in particular calculations were performed under the assumption of full implementation of the existing legislation.

A qualitative assessment of options was also performed. As to the approach to target setting, both options are deemed to guarantee similar results, although with differing benefits. A similar judgment is made with regard to the final recycling rates, where options including higher reuse/recycling targets perform better in terms of resource efficiency and level of ambition. The analysis concludes that all the options under assessment would contribute to the attainment of the objectives of the initiative. It does not identify a preferred option between the two alternatives considered. Option 2 was assessed in greater detail than option 1. Option 3 had the most detailed assessment (but Options 3 also shows numerous "sub options": Option 3.1 – 3.9, as these "sub options were the focus of this IA.

Requirements of IA guidelines

The (methodological) requirements of the IA guidelines are met (as for example the European Commission's standard 4% discount rate for inter-temporal comparisons within impact assessments was used.) Compared to the main recommendations for improvement as formulated by the Impact Assessment Board in its positive opinion of March 2014 on the original impact assessment, the additional analysis accompanying the new proposals does go some way towards addressing some of the concerns previously raised. However, some questions concerning subsidiarity and proportionality - especially as to the issue of land filling of waste - are left partially unaddressed.

Relevance of the results

The environmental effects played a big role in the decision on the best option, or the best combination of options. However, the economic factors were taken into consideration a lot as well. Compared to social impacts, environmental impacts however, were more emphasised in the reasoning for decision-making.

5.3 Regulation on shipments of waste[6]

Short description of the regulation

The new regulation aims to strengthen "the inspections and enforcement of Regulation (EC) No 1013/2006" (EPRS briefing, p. 1), which deals with shipments of waste and is commonly known as the WSR, short for Waste Shipment Regulation. A major problem afflicting the WSR is that the level of implementation varies highly between Member States since the rules for inspections and enforcement are not specified in detail in Article 50. This lack of legal harmonisation leads to 'port hopping', whereby exporters choose to transfer their waste to the Member States with the most lenient waste management system or even outside the EU in order to cut back on their costs.

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[6] Regulation on shipments of waste, 2013, DG Environment, 52 pages
IA: http://ec.europa.eu/environment/waste/shipments/pdf/sec_2013_268.pdf
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/note/join/2014/514091/IPOL-JOIN_NT%282014%29514091_EN.pdf

Illegal waste disposal poses significant health threats to citizens and the environment, and the main goal for the new regulation is to protect both of them. Other objectives include improving the implementation and enforcement of the WSR, lowering the expenditures of Member States, increasing the availability of raw materials, stimulating resource efficiency and offering all concerned parties a level playing field. Currently, those who do not comply with the WSR are obliged to pay fines.

System boundaries

The IA focuses on waste shipment between Member States but at the same time emphasises that port hopping is an international problem. Illegal waste shippers that operate within the EU often resort to third countries, located in for example Asia or Africa. Even though their operations are transcontinental in most cases, the EU and Member States (IA, 2.3.3.) are not without recourse in tackling them. The WSR is developed based on this conception, implying that the scope of the IA is appropriate.

Stakeholders

The IA distinguishes between five different groups of actors affected by the WSR. These are Member States, legal waste traders and shippers, illegal waste shippers and other criminals, recyclers and recovery operators and citizens and operators within and outside the EU. Furthermore, in 2007-2009 the Commission organised information exchanges and awareness-raising events about the WSR and allowed a public stakeholder consultation to take place. The new regulation affects the previously mentioned actors in different ways. Member State's authorities are obligated to improve the quality of inspections based on the specific requirements and guidelines set out by the EU, by for example setting up training programs to educate additional inspectors. Legal waste traders are obliged to comply with the renewed WSR and have to ensure at all times that their paperwork is in line with EU standards. Illegal waste shippers and other criminals are forced to devise more inventive ways to avoid being prosecuted, while port hopping is reduced as the negative incentive of finding the least strictly regulated ports in Member States is nullified. Recyclers and recovery operators who collect and monitor the amounts of waste collected for recycling and recovery gain a more comprehensive understanding of their product and its market, since it is more clear what is considered waste for recovery and what is not. Lastly, citizens and operators are better protected against health issues that arise as a result of the dumping or substandard treatment of waste.

Options

The IA identifies four possible and one discarded option(s) available to the EU.

- Option 1: Not undertaking any further action, thereby allowing the continuation of illegal waste transport to third countries.
- Option 2: Amending Article 50 of the WSR to include specific requirements designed to prevent illegal waste shipments. These measures include (a) inspection planning, (b) the burden of proof provisions relating to the definitions of goods, (c) controls at various stages of the shipments of waste process and environmentally sound practices in third countries, and (d) increased training for inspectors.
- Option 3: Implementing guidelines in areas as pointed out by Member States and stakeholders.
- Option 4: Combining options 2 and 3. This option was considered the most appropriate.
- Discarded option: Requiring waste shipments to be tracked electronically.

Alternative approaches to a reduction of waste shipment, like providing economic incentives for proper recycling, were not considered or not mentioned in the IA.

Environmental effects covered

The IA clearly expresses that illegal shipments of waste have a negative impact on the environment and public health, besides hurting the internal market and thus the EU economy. Environmental and health issues are predominantly expressed in economic losses, such as clean-up costs and court settlements. Moreover, the comparison of the four options is fairly short and superficial given that they only briefly address environmental effects.

The IA acknowledges that a considerable amount of uncertainty is involved when developing estimations in relation to illegal waste shipments because it is hard to verify the numbers of something that is illegal by nature. Further reinforcing this uncertainty are national authorities that fail to report relevant data and lack harmonised custom codes (IA, 2.2.1). The environmental impacts of pollution are not quantified. Clean-up cost estimates are most likely to be accurate but only have a limited use, because these highly depend on for example what, where and how much illegal waste is disposed of. The loss of resources, in particular raw materials, can be used as an indicator to compare the different options. However, it does not seem to constitute a critical factor in the comparison. The IA states that access to raw materials is important so as to ensure the competiveness of the European industry and to improve its resource efficiency (IA, 2.2.4). It is thus clear that here the economic perspective dominates the environmental one. The IA mostly deals with uncertainty for the economic and social estimations by working with averages and leaving a wide margin for errors. Generally, the IA is open about the limitations of the data used for estimations and seeks to work with the numbers available.

Quantification of environmental effects

The IA quantifies the environmental effects by specifying the amount of waste transferred or dumped illegally and the resulting costs. As previously mentioned, there are four different options. Option 1 is the baseline, namely, not undertaking any further action. According to the comparison, the other three options reduce illegal waste shipments progressively, with option 4 being the most promising. The depth and breadth of the analysis of environmental effects is for the most part in balance with their economic and social counterparts, but none of the three options are extensively described.

Monetisation of environmental effects

In the IA several environmental effects are monetised. Clean-up costs resulting from illegal waste disposals are an example, as illustrated by the Probo Kaola-case, where the responsible operator had to pay 152 million Euros. Court settlements, aimed at compensating people whose health was affected by these disposals, are another example of how environmental effects are expressed in economic loss: the same operator compensated 31,000 citizens of Ivory Coast for health concerns for a total of 33 million Euros (IA, 2.2.4).

Methodologies applied (methodological toolbox)

The environmental effects are taken into account with a qualitative assessment, just like the economic and social effects. As explained earlier, the IA uses the available data to calculate the approximate economic loss of, for example, clean-up costs or court settlements as a way to grasp the severity of the problem. The IA also uses the data of a range of inspections performed from October 2008 to November 2010 (labelled “Enforcement actions”) to argue that around 24% of shipments in the EU are illegal (IA, 7).

Requirements of IA guidelines

Overall the methodological requirement of the IA guidelines are met: the problem and the objectives are defined, the main policy options and their impacts are analysed and subsequently compared to each other, and the outline of the monitoring and evaluation process is laid down as well. However, as the EPRS acknowledges, the IA only briefly discusses why Option 4 is most suitable to achieve the pre-determined main goal. Furthermore, in some instances the Commission fails to provide sufficient evidence to support cost calculations (EPRS briefing, p. 6), This is complicated by the fact that the actual number of illegal waste shipments is far higher than numbers indicate, as a 2009 report by the EEA concluded (IA, 2.2.1).

Relevance of the results

The environmental impact of the IA clearly influences the final decision to proceed with Option 4. Furthermore, the majority of stakeholders consider specific requirements combined with guidelines by the EU the most appropriate way to counter illegal shipments of waste and thus to decrease their negative environmental effects, such as the pollution of soil, air and water (IA, 5.).

However, it should be noted that a large part of these negative impacts are expressed in economic losses such as clean-up costs or court settlements. The comparison of options touches on environmental effects though other values such as implementation costs, cost savings and economic costs are given greater attention. Additionally, the summary states that the purpose of the new regulation is to 'improve environmental protection,' but does not provide any further relevant results.

Additional studies

A significant number of studies have been conducted as a basis for the IA, among others:

- European Commission Waste shipments Commission Reports: http://ec.europa.eu/environment/waste/shipments/reports.htm
- STUDY ON INSPECTION REQUIREMENTS FOR WASTE SHIPMENTS: http://ec.europa.eu/environment/waste/shipments/pdf/report_august09.pdf
- Implementing EU Waste Legislation for Green Growth: http://ec.europa.eu/environment/waste/studies/pdf/study%2012%20FINAL%20REPORT.pdf

5.4 Lightweight plastic carrier bags[7]

Short description of the regulation

The content of the regulation is prevention measures targeting the use of single-use carrier plastic bags. The main goal of the regulation is to "limit negative impacts on the environment, encourage

[7] Lightweight plastic carrier bags, 2013, DG Environment, 75 pages
IA:
https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiZzuDKi7fPAhVBEBQKHTBCAggQFggqMAA&url=http%3A%2F%2Fwww.ipex.eu%2FIPEXL-WEB%2Fdossier%2Ffiles%2Fdownload%2F082dbcc5420d8fab0142336683960c72.do&usg=AFQjCNEgoa42cARdy8jOs-PVEZksSxcCEA&cad=rja
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/note/join/2014/514090/IPOL-JOIN_NT%282014%29514090_EN.pdf

waste prevention and a more efficient use of resources, while limiting negative socio-economic impacts" (IA summary, p. 3). To do so, the regulation specifically aims to "reduce significantly the number of single-use plastic carrier bags with a thickness of below 50 microns (0.05 mm) consumed per capita in the EU by 2015" (IA Briefing, p. 1-2). The proposal includes several possible measures, including "the use of national reduction targets, economic instruments and marketing restrictions, including bans, on such bags" (IA Briefing p. 2).

System boundaries

The analysis focuses on one specific type of plastic bags: single-use plastic carrier bags with a thickness of below 50 microns (0.05 mm) (IA Briefing, p. 1-2). The IA focuses on impacts within the European Union and does not examine third countries despite the fact that "70 per cent of single-use plastic carrier bags [are] imported from outside the EU" (Briefing, p. 5).

Stakeholders

Relevant stakeholders: public authorities, retailers, consumers, manufacturers including SMEs. The IA mentions that the impact chains described below will be similar for all policy options; only the magnitude of impacts will differ.

Public authorities will see the costs of cleaning littered bags decrease, but they will have costs associated with the "enforcement of prevention measures aimed to reduce this consumption" (IA, p.17). Retailers will see initial costs to implement measures, but ultimately these costs will be offset by selling multiple-use bags instead of giving single-use bags for free (IA summary, p. 4). Consumers will initially have higher costs due to the possibility of paying for single-use plastic bags, but they should ultimately save money by buying multiple-use bags (IA summary, p. 4). Manufacturers of single-use plastic bags will see a decrease in activity, but there will be an increase for those producing multiple-use plastic bags. The IA mentions that 70% of single-use plastic bags are produced outside of the EU (IA summary, p. 4).

The following stakeholders are also mentioned as being affected by plastic bag use (IA, p.17):

- EU citizens: impacted by pollution and unsustainable resource consumption, health impacts, impacts of littering and costs of waste collection and treatment.
- Non-EU citizens: cross-border pollution/littering (especially marine), environmental impacts of exported plastic waste from the EU.
- Plastic recyclers: a decrease of single plastic bag use would be a loss of raw material and thus loss of revenue.
- Tourism industry and local businesses: aesthetic cost of littering.
- Fishing industry: littered plastic bags lead to a loss of fish stock and damage to equipment.

Options

The IA identifies four different policy options:

Option 1: Baseline scenario, status quo maintained.
Option 2: "Voluntary commitment of a significant share of the EU retail sector not to provide single-use plastic carrier bags" leading to "a reduction of 55% single-use plastic carrier bags".
Option 3: "Setting an EU level prevention target for single-use plastic carrier bags combined with economic instruments and accompanied by the possibility for Member States to introduce market restrictions by way of derogation of article 18 of the Packaging Directive" leading to "a reduction of 80% of the EU average consumption of single-use plastic bags".

Option 4: "Introducing an EU level ban of single-use plastic carrier bags" i.e. a 100% reduction of single-use plastic carrier bags.

The IA also mentions other potential options that were discarded at an early stage in the process, and includes for each a short explanation for its exclusion:

- Full implementation of the Packaging Directive.
- Remove plastic bags from the scope of the Packaging Directive.
- Require Member States to organise awareness raising campaigns on the impacts of the use of single-use plastic carrier bags.
- Set a pricing measure on single-use plastic carrier bags at EU level.
- Voluntary agreement of the whole retail sector to phase out single-use plastic carrier bags to customers.

Environmental effects covered

The IA pre-defines a set of three environmental effects to be analysed (in this case presented as environmental benefits, i.e. positive effects):

- Reduced use of resources,
- Decline in the amount of waste arising and the number of bags littered, and
- Lower litter clean-up expenses and expenses incurred in formal waste management.

It would have been interesting to include the impacts of littered plastic bags on biodiversity, as it is one of the most well-known issues associated with plastic bags. Though it can be argued that it is covered by the second environmental benefit, as a reduction of littered bags would be tied to a reduction of the threat to biodiversity.

The impact chain of the effects is described in detail (as a literature review) in section 2.1.2 of the IA (IA p. 12-16). Uncertainty and sensitivity are not mentioned in the IA report, neither for environmental effects nor for economic/social ones.

Quantification of environmental effects

All three environmental benefits are quantified in the IA. This was done with the use of seven 'environmental impact indicators':

- Tonnes of total plastic carrier bags (% reduction)
- Tonnes of single-use plastic carrier bags (% reduction)
- Number of total plastic carrier bags (% reduction)
- Number of single-use plastic carrier bags (% reduction)
- Oil (kt saved)
- Emissions ($MtCO_2eq$ avoided)
- Littered bags' reduction (billion/2015)

(IA, p. 40)

The amount of plastic bags that end up littering the sea would have been an interesting indicator as it would help grasp the impact of plastic bags on marine biodiversity (and the potential reduction). Presently littered bags are one big category with no further indication of where this litter ends up (landfill, seas, etc.).

The depth of the analysis of environmental impacts is comparable to that of economic/social impacts, as they are also quantified using indicators. In terms of breadth, environmental effects get more coverage (seven indicators vs. five for economic effects and one for social impact).

Monetisation of environmental effects

The only monetised effects are economic effects, with the following indicators:

- Costs reduction to retailers
- Profits to EU bag manufacturers
- Cost reduction for litter collection
- Cost reduction for waste management

The two last indicators can count as the monetisation of environment, since "Lower litter clean-up expenses and expenses incurred in formal waste management" was one of the three environmental benefits as defined by the IA. Arguably, this benefit was rather economic from the start.

Social effects and other environmental effects are not monetised. It probably would have been manageable to also monetise the oil saved, one of the environmental indicators.

Methodologies applied (methodological toolbox)

The quantitative assessment of environmental effects was calculated by Bio Intelligence Service in a study commissioned by the European Commission in preparation for this IA. The effects were calculated by multiplying the current value of the environmental indicator by the percentage reduction associated with the policy option, which would provide the expected reduction for each environmental indicator (Bio Intelligence Service, 2011).

The following methodologies were applied in the studies that served as a basis for the IA report:

- Cost reduction for litter collection: "multiplying the unit cost of litter collection against the total tonnage" (Eunomia, 2012). The calculation also considered "1. A labour component, for the individual sweeping/picking up litter, or driving a mechanical sweeper; 2. A cost for the vehicle/plant expenditure and other operational costs; and 3. The cost of disposal of the litter collected." (Eunomia, 2012; Annex A.5.2). The researchers made an initial calculation using a Welsh study, and then proceeded to calculate the cost per tonne for each Member State using a 'Member State: UK Labour Cost Ratio' and and a 'Member State Specific Labour Cost Component' (Eunomia, 2012; Annex A.5.2).
- Cost reduction for waste management: This was calculated using "the waste management route taken, and the unit cost of each route [...] for the fraction of carrier bags that are not littered, we model, for municipal waste, the split between landfill33 and incineration34 by Member State35, as shown in Table 45 in Appendix A.6.0. We hold this split constant from 2010 to 2020" (Eunomia, 2012).

Not all options were assessed in the same detail, social impacts were not monetised and neither were environmental impacts except for those mentioned above, which are arguably more economic impacts.

Requirements of IA guidelines

The requirements of the IA guidelines are met in this IA. The IA Board required a revision of the first version of the IA and rated the second version positively. Nonetheless, they mentioned that further improvement was possible, for instance with "a more thorough assessment of the impacts on EU

plastic bag producers and jobs, and for clarification of the timing of the initiative in view of the comprehensive waste policy evaluation currently under way" (IA briefing, p.5-6).

Relevance of the results

The environmental impact assessment had a decisive influence on the final assessment. The IA comes to the conclusion that Option 3 ('Prevention target') is preferable because it has "the highest potential to deliver ambitious environmental results, while achieving positive economic impacts, limiting negative effects on employment, ensuring public acceptance and contributing to wider awareness on sustainable consumption" (IA summary, p. 7).

The analysis of environmental impacts is included in the comparison of options, which was done qualitatively in a comparative table in section 5.3 of the impact assessment (IA p. 44). In that table, environmental, economic and social impacts are weighed for each option in addition to other factors: flexibility to Member States, implementation, funds generation, acceptance of the measure and awareness raising on sustainable consumption.

The analysis of environmental impacts is briefly described and presented in condensed from in the IA summary (SWD(2013) 443 final).

Additional studies

Two studies were commissioned to serve as basis for the IA:

- Bio Intelligence Service, 2011. Assessment of impacts of options to reduce the use of single-use plastic carrier bags. Final Report.
- Eunomia, 2012. Assistance to the Commission to complement an assessment of the socio-economic costs and benefits of options to reduce use of single-use plastic carrier bags in the EU. Final Report.

5.5 Security of gas supply[8]

Short description of the regulation

The proposed regulation is an Amendment of the Regulation on Gas Security of Supply (Regulation 994/2010). The main objective of the regulation is "to enhance energy efficiency and diversify supplies of gas imports in order to reduce the dominance of suppliers in gas markets and hence the EU's overall vulnerability" (IA, p. 4). This main goal is divided into four specific objectives: (1) enhanced regional cooperation, (2) improved assessment and consideration of external factors, (3) improved infrastructure standard obligations, and (4) enlargement of the geographic scope (IA, p. 18).

"The IA report does not explicitly state operational objectives" (Briefing, p.3), though some measures can be assumed from the description of specific objectives. These include "improved N-1 and reverse flow obligations" and "mandatory joint gas purchasing mechanism", among several others. Annex 3 of the report presents a detailed list of proposed measures, grouped by policy options (IA, p. 62).

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[8] Security of gas supply, 2016, DG Energy, 72 pages
IA: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016SC0025&qid=1457451565381&from=EN
EP Briefing:
http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/581377/EPRS_BRI%282016%29581377_EN.pdf

System boundaries

One of the goals of the new regulation is to enlarge the geographic scope of the former regulation in order to "allow for a better level of preparedness and more efficient crisis management in the whole European territory" (IA, p. 18).

The geographical scope of the IA is the EU and some third countries, namely Ukraine and the Balkan countries:

"The impact assessment mentions Ukraine and the Balkan countries (as the Energy Community Contracting Parties) in the context of reaching the objective of expanding the geographic scope of the existing regulation. In particular, Option 2 envisages voluntary cooperation on cross-border issues between Contracting Parties and Member States. Under Option 3, this voluntary cooperation becomes further institutionalised in terms of mutual obligations between Member States and contracting parties. Under Option 4, this cooperation based on the switch-on clause remains in place, but it will cover the whole regulation" (IA Briefing, p.6) .

The IA also suggests a grouping of similar EU Member States into seven regions for Joint Assessments and Plans:

1. North-East
2. UK & IE
3. West
4. Baltics
5. South-East
6. Central
7. DK & SE (see map in IA, p. 65)

In terms of impacts, the IA focuses on economic impacts "given the administrative nature of the measures and the objectives pursued with the revision of the regulation" (IA p. 29). The fact that environmental and social impacts are dismissed from the start as negligible is questionable.

The geographic boundaries for the IA seem appropriate considering that the goal of the regulation is to reduce the EU's vulnerability and that the Ukraine and Balkan countries are relevant to energy security. In regard to the division of EU Member States into regions, the study does not provide enough information on the rationale behind that division to determine whether it was appropriate.

Stakeholders

The IA mentions different groups of stakeholders:

- SMEs (can be considered "protected consumers" in some scenarios)
- Competent Authorities
- Market participants
- Consumers
- Governments
- TSOs (transmission system operators)

In Annex 1, Chart 2, respondents of a public consultation are divided in five categories: Government, TSOs, Associations, Undertakings, Other (IA, p. 56).

The main impact chains considered are:

- Costs of the measures and impact on prices
- Impact on stakeholders, with a special focus on SMEs

- Administrative burden
- Likelihood of contributing to the completion of the internal market

Indirect effects on the environment are not considered in the impact chains. As changes in consumption patterns due to changes in the gas prices are not considered the potential impacts (environmental and social) of those measures are not discussed either.

Options

The IA identifies the five following options, including a baseline scenario:

- **Option 0**: No further action at EU level
- **Option 1**: Enhanced implementation and soft law measures
- **Option 2**: Enhanced coordination with an increased scope for tailor made solutions
- **Option 3**: Enhanced coordination with some principles/standards set at EU level
- **Option 4**: Full harmonisation at EU level (IA, p. 19)

Each option is associated with a specific set of proposed measures for the revision of the regulation. The set of measures for each option are presented in Annex 3 of the report (IA, p. 62)

It could have been interesting to have an alternative scenario where instead of focusing on gas supply, the EU implemented measures to increase the supply of renewable energy or other measures to reduce gas use in areas with the highest gas dependencies. This was not considered at all in the IA, it was rather a baseline scenario vs. different degrees of gas supply measures.

Environmental effects covered

Natural gas is a fossil fuel, and its extraction, transport and use are associated with several environmental impacts. The list below provides some of these impacts.

- Extraction: methane leakage from drilling and extraction, release of air pollutants, alteration of land use and damage to ecosystems, lowering groundwater levels, groundwater and surface water contamination, earthquakes, etc.
- Transport (pipelines): habitat loss, habitat fragmentation, air pollutant emissions, sedimentation and erosion
- Use: CO_2 emissions, NO_x emissions

Despite this, the IA did not cover environmental effects in detail. The IA pre-defines four types of impacts to be considered, and they are all economic:

- Costs of the measures and impact on prices
- Impact on stakeholders, with a special focus on SMEs
- Administrative burden
- Likelihood of contributing to the completion of the internal market (IA, p. 29)

The analysis does not cover environmental effects or assets. The authors of the study claim that because the regulation mainly suggests administrative changes, “the proposed policy options can only have an indirect, likely positive **impact on the environment** in that they are the consequence of stakeholder (e.g., competent authorities, gas undertakings, etc.) decisions on specific measures they will take” (IA, p.30).

In a few lines, the authors explain why effects would probably be positive but without truly providing evidence to substantiate that claim:

"The current Regulation provides the possibility to use preventive and emergency measures with potential environmental impact, such as fuel switch (in most cases to oil or coal) or curtailment of gas consumption. As a result of more regional cooperation, as pursued by all the options, we expect a more efficient use of such national and cross-border measures decreasing the overall impact at EU level with less switching to more polluting fuels, for example. The Regulation does not make a choice for gas as a preferred supply option, but where this has been chosen it ensures the necessary security of supply. In line with the 2030 targets, the Regulation already requests Member States to consider efficiency measures and the revised regulation will allow for the use of alternative energy sources, such as renewables, to comply with certain obligations, such as the supply standard62. Therefore, the expected environmental impact of security of supply measures introduced in case of a crisis should also overall decrease as a consequence or at least not change considerably" (IA, p.30, underlining added) .

It would have been useful to include the effect of an increase of gas use as opposed to renewable sources. The list at the beginning of this section provides environmental effects that would have been useful to consider for each of the policy options.

Because the analysis did not cover environmental effects, there is no information to provide on the impact chain or uncertainty for those effects. Uncertainty/sensitivity is not mentioned for the economic dimension, which was studied in depth in the IA. Furthermore, social impacts were not covered and were only mentioned in a paragraph, similarly to environmental impacts.

Quantification of environmental effects

As environmental effects were only briefly addressed in the IA, they were not quantified. Social impact received the same (lack of) depth and breadth in analysis. While economic effects were assessed in much greater detail, there is no quantification of the effects. They are described qualitatively in the report, with sparsely distributed numerical figures. At the end of the report, the policy options are compared using this scale: "Each policy option is rated between "---" (very negative), 0 (neutral) and "+++" (very positive)." (IA, p. 53).

Monetisation of environmental effects

As environmental effects were only briefly addressed in the IA, they were not monetised. Social impact received the same (lack of) depth and breadth in analysis, and while economic effects were assessed in much greater detail, there is no monetisation of the effects (costs are occasionally mentioned in the report but rarely and not systematically).

Methodologies applied (methodological toolbox)

The IA only briefly addresses environmental effects and thus no methodology was applied to assess them (qualitatively, quantitatively, or monetarily).

Economic impacts, however, were assessed in detail based on a stress test by the Commission and studies (referenced below). The EPRS Briefing mentions that the analysis "would have definitely benefited from more quantitative data" (IA Briefing, p.6-7).

The different dimensions were treated differently in the comparison of policy options in the sense that only the four previously identified economic impacts were considered. Environmental and social impacts as well as impacts on ICT were only briefly mentioned (and dismissed) at the beginning of the analysis.

Requirements of IA guidelines

The Commission's Regulatory Scrutiny Board issued a negative opinion on the first draft of the IA in September 2015, and then a positive opinion on the updated version in November 2015 (IA Briefing, p.7). While the second opinion[9] is positive, it mentions the following weak points that could still be improved in the IA:

1. Clarify the scope of the report.
2. Clarify options and impacts on different groups of Member States.
3. Clarify the groups of stakeholders who have expressed opinions.
4. Elaborate the monitoring indicators.

The opinion also mentions these key aspects that should be clarified:

1. To what extent has the current Regulation resulted in improved security of gas supply? Why have the current rules not resulted in a greater regional cooperation?
2. What is the impact on different groups of Member States: who will face additional investment costs and who will receive the benefits of a more secure gas supply?

The European Parliamentary Research Service's Briefing also mentions that the IA could have benefited from "more background information on how Member States are grouped into the seven regions under the preferred option and how this is linked to the existing patterns of cooperation", "more attention to the significance of environmental impacts" and a clearer explanation of key monitoring mechanisms (IA Briefing, p.8).

Relevance of the results

There was no proper environmental impact assessment and thus it did not have an influence on the final assessment / decision, and the environmental impacts were not mentioned in the comparison of options / conclusion, nor are they used to justify the directive.

The results of the final assessment could have been different if environmental aspects had been considered. The whole IA is based on the assumption that securing gas supply is the only way to provide a stable supply of energy and renewable energy sources are not considered as an alternative in any of the options. Considering the impact of natural gas use on the environment could have changed the final assessment, provided that options without natural gas had also been considered. Moreover, there is no mention of environmental impacts in the summary of the IA (SWD(2016) 26 final).

Additional studies

A stress test published by the Commission and two external studies provided a foundation for the analysis in the IA:

- Stress Test Communication analysing the effects of a possible partial or complete disruption of gas supplies from Russia http://ec.europa.eu/energy/en/news/stress-tests-cooperation-key-coping-potential-gas-disruption

[9] http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2016/sec_2016_0087_en.pdf

- Study on the role of gas storage in internal market and in ensuring security of supply, prepared by REF4E, Mercados, E-Bridge for European Commission DG Energy, 2015 https://ec.europa.eu/energy/sites/ener/files/documents/REPORT-Gas%20Storage-20150728.pdf
- Final Report: Economic analysis of costs and benefits of different approaches to enhancing the bargaining power of EU buyers in the wholesale market of natural gas, prepared by Vivid Economics for European Commission DG Energy, 2016. https://ec.europa.eu/energy/sites/ener/files/documents/Final%20report%20-%20with%20disclaimer.pdf
- Natural Gas Pipelines, Excerpt from Report 2 of the Pennsylvania Energy Impacts Assessment http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/pennsylvania/ng-pipelines.pdf

However, the EP Briefing highlights that the IA failed to incorporate several important studies on this topic. For example, the Special Report of the European Court of Auditors was not used (IA Briefing, p. 7).

Special Report Improving the security of energy supply by developing the internal energy market: more efforts needed, European Court of Auditors, 2015.
http://www.eca.europa.eu/Lists/ECADocuments/SR15_16/SR_ENERGY_SECURITY-EN.pdf

5.6 Motor vehicles: new approval and market surveillance rules[10]

Short description of the regulation

The initiative seeks to address the problem of the presence of unsafe automotive products, which constitute an endangering of the environment and present safety concerns. The initiative seeks to eliminate regulatory failures arising from non-compliant or unsafe automotive products on the market. All motor vehicles, as well as systems, components, and separate technical units intended for vehicles placed on the EU market, should fulfil the applicable requirements. Furthermore, the regulation should contribute to the general policy objectives of enhancing road safety and reducing pollutant and CO2 emissions. Regarding the EU automotive industry, the initiative aims to enhance competitiveness and ensure that a level playing field is maintained for the economic operators involved (IA, p. 4 and p. 23).

The IA established focuses on three specific objectives (IA, p. 23):

- Ensure a better enforcement of the safety and environmental requirements governing the design and construction of motor vehicles and their parts and systems.
- In accordance with the principles of smart regulation, ensure the highest degree of coherence with the recently updated type-approval legislation for motorcycles and tractors and with the reference provisions of the New Legislative Framework.
- Reduce the number of non-compliant and unsafe automotive products on the market.

[10] Motor vehicles: new approval and market surveillance rules, 2016, Growth, 39 pages
IA: http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2016/swd_2016_0009_en.pdf
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/481375/EPRS_BRI%282016%29481375_EN.pdf

The measures assessed by the regulation include awareness measures, voluntary agreements, coordination measures, training for authorities, guidelines, and also legal requirements (e.g. for traceability, interaction of authorities).

System boundaries

The regulation focuses on the automotive market in the European Union, including suppliers. Since the focus is on market approval (and surveillance), the regulation covers all motor vehicles (incl. components) traded and sold in the EU by manufacturers and suppliers (from both EU and non-EU automotive manufacturers). The IA does not focus on a specific year (at least it is not mentioned), but analyses the impacts for the time after the regulation would have come into force.

Stakeholders

The IA identifies five stakeholders:

1. European citizens: Due to the poor air quality and road accidents resulting from unsafe and non-compliant automotive products, vehicle users as well as other road users are affected.
2. Automotive manufacturers and suppliers: If the rules cannot equally be enforced upon non-EU manufacturers and suppliers, the EU manufacturers and suppliers might experience an unlevel playing field and unfair competition.
3. National enforcement authorities: The authorities will need to take action against the regulatory shortcomings to reduce non-compliant and unsafe products on their markets.
4. Technical services: The economic environment in the technical services sector is characterised by competition and economic pressure from operators in the automotive sectors who are keen in obtaining type-approval for their products in the cheapest way possible. Clear and effective criteria should be established to safeguard the independence of technical services and quality assurance of their type -approval related inspection and testing activities.
5. SMEs: Furthermore, the IA identifies the SMEs in the automotive sector as the most vulnerable parties concerned because of existing market failures and regulatory shortcomings (IA, pp. 21–22).

Options

The IA identified five main problem drivers. The IA designed and assessed various options with different measures for each of the problem areas. For most problem drivers, a business-as-usual (or 'do nothing') option was compared to two other options: a self-regulatory option and a regulatory option. For problem driver B, an additional option ('co-regulatory option') was proposed and assessed. The options are summarised in the table below.

Table 4: Options considered for the five problem drivers A – E

	Problem driver A: insufficient traceability of automotive products and lack of clarity about responsibilities of economic operators in the supply chain	**Problem driver B:** lack of clarity about the responsibilities and cooperation of enforcement authorities	**Problem driver C:** varying degrees of stringency and quality applied by technical services	**Problem driver D:** lack of clarity in safeguard measures & recall procedures	**Problem driver E:** weaknesses in the procedures for ensuring conformity of production
1: Baseline scenario	do nothing (business-as-usual)	do nothing (BAU)	do nothing (BAU)	do nothing (BAU)	do nothing (BAU)
2: Self regulation	voluntary agreements and awareness raising campaigns to improve traceability of products	awareness campaigns and/or voluntary agreements with and between enforcement authorities in the Member States	voluntary agreement of 250 technical services across the EU which clarifies their respective roles and responsibilities	awareness campaigns and/or voluntary agreements with and between enforcement authorities in the Member States	awareness campaigns and/or voluntary agreements with and between the stakeholders involved in the conformity of production (manufacturers, technical services, type-approval authorities in the MS)

	Problem driver A: insufficient traceability of automotive products and lack of clarity about responsibilities of economic operators in the supply chain	**Problem driver B:** lack of clarity about the responsibilities and cooperation of enforcement authorities	**Problem driver C:** varying degrees of stringency and quality applied by technical services	**Problem driver D:** lack of clarity in safeguard measures & recall procedures	**Problem driver E:** weaknesses in the procedures for ensuring conformity of production
3: Regulation	regulation for traceability and responsibilities of operators in the supply chain. Different levels of ambition (regulation): low, medium, high	responsibilities of enforcement authorities to be clarified	requirements entitling technical services to be clarified and strengthened	role and interaction between authorities to be specified	inspection and testing
4: Co-regulation	---	Joint actions by Commission and MS: training and guidelines on the legal provisions for type approval.	---	---	---

Source: IA (pp. 24-29), Briefing (p. 3); the preferred options are always option 3 for all Problem drivers, and option 3 and 4 for Problem driver B. The choice of options seems appropriate in terms of variety of alternatives.

Environmental effects covered

The IA does not mention the environmental impacts in the main part, but describes the effect in some detail in the annex. In the section, 'assessment of environmental effects', only the number of vehicles with 'undesirable environmental impacts' are estimated. However, the IA does not distinguish between particular effects (e.g. on the emission of air pollutants or greenhouse gases).

Summary of environmental impacts for the assessed options

	Problem driver A: (p.83)	**Problem driver B: (p.89)**	**Problem driver C: (p.94)**	**Problem area D: (p.96)**	**Problem driver E: (p.97)**
1: Baseline scenario	The presence of noncompliant motor vehicles resulting in undesirable environmental impacts would continue or even increase in the future	None identified	Approximately 180,000 to 270,000 vehicles per year result in undesirable environmental impacts and this would continue in the future	Not directly attributable	Approximately 60,000 to 90,000 vehicles per year are estimated to result in undesirable environmental impacts and this would continue in the future
2: Self-regulation	Small reduction of noncompliant motor vehicles as a result of voluntary actions will generate proportional positive environmental impacts	None identified	Voluntary agreement of 250 technical services across the EU which clarifies their respective roles and responsibilities		
3: Regulation	Reduction of noncompliant motor vehicles as a result of regulatory actions will generate associated positive environmental impacts	None identified	A 50% reduction in vehicle recalls with undesirable environmental impacts, as a result of more robust checks by technical services, is equivalent to between 90,000 and 120,000 fewer vehicles per year that impact the environment	No direct impacts identified, but indirectly the improved application of safeguard procedures against automotive products representing a serious risk to the environment may entail a reduction of the environmental harm caused by such products.	A 50% reduction in vehicle recalls with undesirable environmental impacts is equivalent to around 30,000 fewer vehicles per year creating undesirable environmental impacts.

Source: IA (Annex: pp. 43 – 53)

No DPSIR is applied and no detailed impact chain is described, except that it is stated that the regulation seeks to reduce CO2 emissions. In the impact analysis, the IA does not further describe the positive environmental effects of each option.

Overall, a more specific and detailed qualitative assessment of the main environmental impacts (emission of air pollutants and greenhouse gas) could have been expected.

Quantification of environmental effects

The IA does not quantify any environmental effects in their analysis of impacts (IA, pp. 29-37). The depth and breadth of the analysis of environmental impacts is not comparable to that of economic impacts. The focus is clearly on the economic impacts. Since the environmental effects are indirect, it is understandable that there was no detailed quantification of specific environmental effects, such as emissions of air pollutants or greenhouse gases. However, the estimations of the effects on the number of vehicles with 'undesirable impacts on the environment' could have been a starting point for some rough estimation or scenario analyses.

Monetisation of environmental effects

The IA does not monetise any environmental effects in their analysis of impacts (IA, pp. 29-37). This is comprehensible due to the fact that the quantification of environmental effects is difficult.

Methodologies applied (methodological toolbox)

The IA has not applied any specific methodology for either the qualitative assessment or quantitative assessment of environmental effects. It does not include specific environmental and social impacts in the comparison of the policy options.

Requirements of IA guidelines

The IA has a strong emphasis on economic impacts, which are the only effects to be quantified. This point has also been underlined in the Briefing (p. 8) by indicating that "the problem definition devotes limited attention to the social and environmental consequences". To some extent, this is comprehensible because of the main focus of the regulation. However, a more balanced way of also assessing environmental and social impacts, as the IA guidelines requires, would have been preferable, because the final objective of the regulation is to reduce health risks and environmental pollution of new motor vehicles.

Relevance of the results

The environmental impact does not seem to have any significant influence on the final assessment and in the comparison of options. The approximate benefits of the reduction of market distortions caused by the presence of unsafe and noncompliant products are only shown in the comparison. The IA points out that the figures "do not reflect benefits in terms of reduced accidents, loss of life, environmental damage, etc. caused by these products" (IA, p.37). However, the chosen options (for all problem areas the 'regulation' option 3 is chosen) have a beneficial impact on the environment.

Additional studies

The main basis for the IA is described in the annexes of the IA report. There is no information about more detailed base studies for the IA.

5.7 Emissions from engines in non-road mobile machinery[11]

Short description of the regulation

A significant source of air pollution, especially of nitrogen oxides (NO_x) and particulate matter (PM), are the combustion engines installed in Non-Road Mobile Machinery (NRMM).[12] The aim of the regulation is to protect human health and the environment by reducing the emissions of harmful air pollutants (NO_x, HC, PM, CO) emitted by NRMM engines. The regulation also seeks to ensure a good functioning of the internal market for NRMM engines. Furthermore, the aim should be achieved by taking into account competitiveness and compliance aspects. In order to not hamper the internal market, the regulation should be executed at EU level rather than on different national regulatory actions. Finally, the initiative seeks a reduction in the regulatory barriers resulting from diverging emission requirements and therefore should remove obstacles to external trade. The regulation has to ensure that the emissions limits for NRMM and type-approval requirements do take into account the technological advances and remediate current deficits in regulation. The considered deficits in the regulation are the lack of overall coverage of all categories of NRMM (for example engines installed in snowmobiles, stationary engines) and the risk of market distortion due to the fact that the producer has some choice to install an engine currently regulated or not. Furthermore, contrary to today, the regulation should provide more long-term guidance on emission requirements. This aspect would enable the sector to schedule the necessary investments in R&D as well as give more planning certainty to industry. In general, stricter emission limits on the current NRMM situation and monitoring provision should be implemented through the regulation (IA, pp. 17-20).

System boundaries

The focus of the regulation is on the emissions of the following air pollutants: NO_x, particulate matter (PM) and hydrocarbons (HC). Not included in the scope of the NRMM Directive are greenhouse gas emissions. As the IA points out that *"this is mainly due to the fact that the Directive targets at the emission performance of engines rather than of the machinery in which the engines are installed. Given that the GHG emission performance is, however, to a great extent influenced by the machinery (e.g. weight, design,) as well as its actual operation, the most appropriate legislative way as to how best address GHG emissions is still to be sought. For the considerations of the current review process, GHG emissions, therefore, remain out of scope."* (IA, p.17).

The data of the analysis are limited due to the fact that the data is mostly based on machinery and on fuel consumption data from 2005 for EU-15. Therefore, the IA complemented the data with the stakeholders data and information from 2013. Furthermore, the analysed and used studies have different time horizons (IA, p.21)

The time frame analysed in the impact assessments is mainly 2040; for some effects/analysis, including the overall analysis of benefits and costs, it was extended to 2050.

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[11] Regulation on Emissions from Engines in non-road mobile machinery in view of establishing a new legislative instrument, 2014, DG Enterprise and Industry, 76 pages
IA: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0282&from=EN
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/ATAG/2016/583861/EPRS_ATA%282016%29583861_EN.pdf

[12] NRMM includes a broad range of mobile machinery, from railcars, aircraft, ships to agricultural and forestry vehicles, construction vehicles and machines and other mobile machines, e.g., industry.

Overall, the system boundaries chosen seem to be appropriate to evaluate the possible impacts of the different options of the reviewed Directive on emissions of engines in NRMM.

Stakeholders

Due to poor air quality, the population of the European Union is affected through adverse effects on health. The IA specifically mentions workers, who work in the field with high concentrations of NRMM engines. Stringent emission limits as a result of the new regulation can make the adaptation or redesign of engines, machines and their components necessary and, therefore, affect engine and machinery manufacturers including component suppliers. Another affected group are the operators of NRMM. The possible increase in production costs might be passed on to the operators of NRMM. Furthermore, they could also be affected by increasing operation and maintenance costs resulting from stricter regulatory requirements. Due to their significant role in enforcing the legislation, the national public authorities have also been considered as stakeholders (IA. pp.15-16).

Although not explicitly mentioned by the IA (in the chapter "who is affected"), environmental NGOs and third countries are also affected by the new regulation. The new regulation demands new requirements on the third countries suppliers. The IA focuses their analysis on the economic relationship between EU-countries and the US, however the scope of effects on third countries could have been broader.

Options

The IA identifies three policy options and one no-policy change scenario. The latter is also called the 'business-as-usual-scenario' (option 1). In the following list, the three alternative policy options are presented in brief (IA, pp.19-21):

- **Option 2: Alignment with US standards in scope and limit values:** This option would lead to an extension of the scope of regulated engines and introduction of stricter emission limits values. The IA points out (p.20) that the option would target particle mass limits rather than particle number limits.
- **Option 3: Road sector ambition levels, for the most relevant emission sources:** For this option the main point of orientation is the Euro VI emission standard for heavy duty vehicles. This would indicate that particulate matter number limits would be introduced which currently do not exist in NRMM legislation. In the case of engines for the IWV (inland waterways vessels) transport sector, the IA identifies two options. In option 3A PN (particulate numbers), emission limits would be introduced along with an alignment with future US standards on NO_x and HC. In addition to option 3A, option 3B would set very ambitious emission reduction targets for NO_x and HC. Similarly, the IA has studied two options for rail applications: Option 3A only limits PN emission and Option 3B would add to the PN emission limits more stringent NO_x/HC limits.
- **Option 4: Extended level of ambition through enhanced monitoring provisions:** This option is a combination of option 2 and/or option 3, which would introduce more stringent emission limits, with enhanced monitoring provision. The main goal of these provisions would be the monitoring of the in-service conformity of NRMM engines. This initiative is also designed to give a more accurate picture of the specific greenhouse gas emissions and fuel consumption of NRMM engines. As a consequence, this information could be used to label engines to better inform users and buyers.

A non-legislative option was considered by the IA, but has been rejected. Consequently, the choice of options seems somewhat limited in terms of variety of policy measures. Other policy measures than emissions limits might have been proposed and assessed.

Environmental effects covered

In a first step, the analysis covers the expected reduction of PM emissions and the reduction of NO_x emissions (also HC for snowmobiles and all-terrain-vehicles) of the different options. The results of different studies were included in the evaluation.

It would have been valuable to also cover emissions of other air pollutants such as CO and maybe include HC emissions for all types of machinery. Additionally, a differentiated analysis for different particle sizes (i.e. PM2.5 and PM10) would be useful due to their possibly different health impacts.

The IA identifies the drivers such as regulatory shortcomings hindering the effectiveness of EU NRMM emission legislation. Current emission limits do not fully reflect technical progress and public health concerns are insufficiently addressed and described the chain effects. But the IA does not apply the DPSIR concept completely, since the focus of the environmental effects is clearly on emissions, whereas expositions and subsequent health effects are not quantified.

The uncertainty is treated in different ways. Different analytical scenarios are assessed for one option (base case, lower estimates). Under option 3, the cost-benefit calculations were systematically conducted on the basis of two damage cost values for PM2.5 emissions. This is implemented due to difficulties determining the exact location of the emissions considered. The very lowest estimate for an average EU-25 value referred is set as the lowest damage cost value, whereas the medium damage cost corresponds to a typical EU-25 average value that is representative for urban areas. For comparing the options similar weights are used.

The cost-benefit analysis treats the other impact dimensions as equal. However, in the corresponding description the socio-economic impacts are described in more detail. For socio-economic effects, the IA covers the compliance costs (development and production costs) imposed on the engine manufacturers and the machinery manufacturers. The operational costs imposed on the end user are also included. In a second step, the four options are compared in a multi-criteria analysis.

Quantification of environmental effects

In the analysis, the expected emission reduction of PM and NO_x (and HC for certain options) are quantified in tonnes per year for different engine categories and different ranges of engine power (kW). The reduction of both air pollutants is quantified for the three alternative options, always relative to the business-as-usual scenario (option 1).

CO (carbon monoxide) could have been quantified additionally with manageable effort (also mentioned in the Briefing, p.7). As a side-benefit, the effect on greenhouse gas emissions (including methane (CH_4) for all engine types) could have been an interesting effect (which would have been more complex to quantify and the reasons not to do so are explained comprehensibly in the IA). Indirect environmental effects such as positive effects on crop losses or material damages due to the reduced amount of PM and NO_x emissions could have been mentioned at least.

Overall, the environmental impacts have been given the same attention as the economic and social impacts.

Monetisation of environmental effects

The cost of PM and NO_x emissions (or the benefit of emission reductions) are monetised by multiplying the amount of emissions avoided (in tonnes) with a specific pollution cost factor. The pollution factor represents the monetary health benefits per unit avoided. The IA indicates as the basis for the monetisation of environmental effects the handbook on estimation of external costs in the transport sector by CE Delft (2008).

The IA focuses on the adverse health effects of PM and NO_x emissions, which is the most relevant cost category. However, emission of PM and NO_x also lead to other environmental effects that could be monetised, mainly crop losses and material and building damages. For example, the valuation of building damages using repair costs could have been an approach for monetising the impact of NO_x. There are different sources and studies available with corresponding cost factors for material and building damages as well as crop losses (e.g. 'method convention' of the German Environmental Agency).

Overall, the environmental costs and benefits are treated in an adequate depth and in a comparable way as economic impacts in the cost-benefit analysis.

Methodologies applied (methodological toolbox)

For each option, a cost-benefit analysis was applied. For comparing the options, a multi-criteria analysis was conducted for different engine categories, where the monetised air pollutant costs are compared with socio-economic effects such as whether the PN issue is addressed, technical feasibility, financial feasibility, labour market effects, competitiveness and administrative burden.

The main methods, cost-benefit analysis and multicriteria analysis, take into account environmental effects in an adequate way and have been applied in the same way for the environmental dimension as for the economic and social dimension. One point that reduces comparability of the different options is the fact that the options have not been assessed at the same level of differentiation concerning engine types. Some engine types (e.g. SI (spark ignited) engines) are only assessed for option 2.

Requirements of IA guidelines

The IA meets the requirements of the guidelines for example in the following way: all relevant impacts are quantified and monetised and the different options are compared to the same baseline. However, according to the Briefing (p.8), "improvements could still have been made in some respects, particularly in relation to (...) clarifying the options chosen and comparing the impacts of each option." The comparison between options is limited by the fact that for certain engines the provided alternative option was only the baseline (briefing, p.7). Furthermore, the Briefing (p.8) underlines the positive impression with respect to the "genuine attempt to present and quantify the potential costs and benefits of the options considered, drawing upon a wide range of research from varying sources."

Relevance of the results

The environmental impact assessment had a relevant influence on the final decision. With the preferred option, a significant emission reduction of air pollutants, and hence, the negative impact on environment and human health, will be achieved. The results of the analysis of the environmental impacts are in the focus of the comparison of options and the conclusion. Furthermore, the results are described in the summary by only mentioning the environmental impact. Due to the diversity of engines and applications in the NRMM sector as well as their expected future importance as a source

of emissions, the preferred option of the IA is a combination of the different elements cutting across all four policy options. Option 4, which introduces enhancing measures, should be applied generally. Option 2 (US alignment) is the preferred option for SI (spark ignited) engines as well as for the smallest and largest engine sizes of the CI (compression ignited) engines with constant and variable speed. The IA considers option 3 as the most appropriate option for mid strength CI constant and variable speed engines. In case of IWV (inland waterway vessels) the IA suggests option 3B, where the option 3B assumes the higher reduction in NO_x and, therefore, larger positive health and environmental effects than option 3A. Similarly, regarding the rail sector, the IA highlights sub-option 3A, whereby less air pollutants reduction will be achieved than by choosing sup-option 3B. Due to the fact that the engines of diesel locomotives will have disappeared by 2050, option 1 (baseline scenario) is chosen for CI engines for locomotives (IA, pp. 52 – 53). Trying to identify the highest benefit of environmental effect for each option was challenging in the case of SI engines by the fact that there was no comparison. In the cost-benefit analysis, the IA primarily stresses the economic benefits of option 2 for SI engines, where EU manufacturers already have the technological abilities due to their already existing engagement in the US market and, hence, no high R&D investments are needed (IA, p.25; Briefing, p.3).

Overall, the environmental impact assessment had a relevant influence on the final decision.

Additional studies

The IA builds on four external studies. The IA uses the Technical Review of the Directive by the JRC, which includes an overview of emissions inventories for NRMM. ARCADI impact assessment study assesses the impacts of the policy options developed in the Technical Review of the JRC. The RPA & ARCADIS study analyses the current contribution of the NRMM sector to greenhouse gas emissions. Furthermore, the IA includes the PANTEIA study, which explores the situation in the inland navigation sectors and assesses specific measures for reducing emissions from inland waterway transport. These additional studies are listed below (IA, pp. 9-10):

- JRC (Joint Research Centre) Report Part II (2008)
- ARCADIS impact assessment Study (2009), reviewing Directive 97/68/EC. Final report
- RPA & ARCADIS Study Module 2 (2010)
- PANTEIA, 2013: Contribution to impact assessment of measures for reducing emissions of inland navigation, http://ec.europa.eu/transport/modes/inland/studies/doc/2013-06-03-contribution-to-impact-assessmentof-measures-for-reducing-emissions-of-inland-navigation.pdf

5.8 Directive on the deployment of alternative fuels infrastructure[13]

Short description of the regulation

With regard to oil dependency, specifically the substantial supply from politically unstable regions of the world, the expected price increase of oil due to the fact that the demand is expected to exceed supply in the short term as well as the long term. This means that new reserves will become more and more costly to extract, and, as a result, the usage of alternative fuels needs to be promoted.

[13] Directive on the deployment of alternative fuels infrastructure, 2013, DG Mobility and Transport, 75 pages
IA: http://eur-lex.europa.eu/resource.html?uri=cellar:fbc30100-319d-45d6-b4d6-684edcc98a3e.0001.03/DOC_1&format=PDF
EP Briefing: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013SC0005&from=de

The need to achieve environmental goals (mainly in terms of climate change / greenhouse gas emissions) also increases the need to shift to alternative fuels. The IA shows the existence of a market failure in the provision of recharging/refuelling infrastructure, which affects in particular the deployment of three alternative transport fuels: electricity, hydrogen, and natural gas (LNG and CNG). In the case of biofuels and liquefied petroleum gas (LPG), the market failure in the provision of recharging/refuelling infrastructure is less pronounced. Obstacles to full-scale deployment and commercialisation of alternative fuels are mainly the high price of vehicles related to technological and production capabilities, poor consumer acceptance, and lack of recharging/refuelling infrastructure. The IA concludes that the network for the provision of electricity, hydrogen, and natural gas is currently insufficient compared to a network that would be necessary to enable market uptake of these fuels and, as the IA states, it is not likely to become available in the near future (IA, pp. 9-12). Therefore, the initiative seeks to "to ensure, within the current economic climate, the provision of a sufficient infrastructure network for alternative fuels" (IA, p. 32). In order to solve the problem of the non-existing connection of recharging /refuelling equipment and non-interoperability in all related alternative fuel vehicles/vessels, the initiative should ensure that recharging/refuelling equipment can be connected and is interoperable in all vehicles/vessels. Furthermore, the initiative should counteract the investment uncertainty, which hinders the deployment of recharging/refuelling infrastructure for electricity, hydrogen and natural gas (LNG and CNG), until the existing 'wait and see' attitude amongst market participants is levered. As measures, the regulation includes basic criteria in combination with binding targets.

System boundaries

The IA points out that EU legislation would not specify further requirements beyond the number and the minimum technical standards for the recharging/refuelling points. Hence, Member States' authorities are responsible for deciding on the regulatory framework, territorial localisation, and other implementation measures, in line with the principle of subsidiarity (IA, p. 38). The IA concentrates on the promotion of the deployment of recharging/refuelling infrastructure, which is only one of the various market failures (IA, p. 40). The IA points out that "the approach does not gauge the merits of a successful market uptake of vehicles and vessels, since it would be difficult to disentangle the effects of the numerous existing and forthcoming initiatives that pursue this same objective" (CO_2 standards, energy taxation, fuel quality, road pricing, etc.) (IA, p. 40). Furthermore, the IA mentioned that the model "is not capable of quantifying the greater benefits that are associated with reaching critical mass in demand/production and the subsequent improvement in the competitive position of the European industry on global markets." (IA, p. 40)

In terms of time, the IA focuses on the impacts of the regulation in 2020. The environmental impacts are analysed not only for 2020, but also for 2030 and 2050 (IA, p. 66). Furthermore, by using the PRIMES-TREMOVE transport model, the environmental impacts analysis covers all EU 28 Member-States.

Stakeholders

The relevant stakeholders involved in the regulation are described here (IA, pp. 30-31). First, the IA identifies the European citizens as stakeholders due to the fact that they are affected by the high oil prices. However, they do not feel sufficiently confident yet in switching to other technologies. The users of recharging/refuelling stations will finance the investment cost if the stations are established by market operators. Furthermore, the implementing public authorities, fuel suppliers and distributors will be affected as well, as vehicle and waterborne vessel, manufacturers and road and waterborne transport operators are also involved.

Options

The IA has identified four policy options (IA, pp. 36-38):

- **Option 1: No policy change scenario**
- **Option 2: Recommendations:** Under this option, the EU will issue recommendations to ensure the application of standards developed by international and European organisations relating to alternative fuel infrastructures. Furthermore, basic criteria and indicative targets for the deployment of infrastructure for electricity as well as hydrogen and natural gas (LNG and CNG will be recommended by the EU when addressing the Member States.
- **Option 3: Requirements & basic criteria/binding targets:** This option aims to establish essential or specific requirements for alternative fuels infrastructures for Member States and seeks to set out basic criteria for minimum infrastructure coverage in combination with binding targets for the most technologically mature fuel technologies (electricity, and LNG for waterborne transport). In the case of hydrogen and natural gas (LNG and CNG) for road transport, the targets would remain indicative.
- **Option 4: Requirements & basic criteria/binding targets:** As in option 3, option 4 will establish essential or specific requirements for alternative fuels infrastructure for Member States. The option will set out "basic criteria for minimum infrastructure coverage, together with binding targets for the electricity, hydrogen and natural gas (LNG and CNG) in road and LNG in waterborne transport, addressed to Member States" (IA, p.38). The IA does not specify these targets further, but refers for a possible formulation to Article 3(4) of Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC: "Each Member State shall ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10 % of the final consumption of energy in transport in that Member State. [...]". [14]

The choice of options seems appropriate in terms of variety of alternatives.

Environmental effects covered

The IA analyses the following environmental impacts of the options in comparison to the non-policy option 1 (IA, pp. 66-68): PM emissions, NO_x emissions, CO_2 emissions, oil consumption, noise (not emissions or expositions, but external noise costs). The analysis also includes indirect environmental effects of the above-mentioned aspects (emissions). The IA does not apply the DPSIR, but describes the impact chain of the effects in detail.

Quantification of environmental effects

The analysis quantifies five environmental effects. The results for three chosen years are shown 2020, 2030 and 2050. The following environmental effects are covered in the analysis:

- PM emissions
- NO_x emissions
- CO_2 emissions
- Oil consumption
- Noise external costs

[14] Source: OJ L 140 5.6.2009, p.16

All environmental impacts are measured in percentage reduction compared to baseline option: "the benefit of the initiative is quantified by looking at the extra utility that it brings to vehicle users with respect to baseline developments."

The IA covers the most relevant environmental effects. In the used model, namely the PRIMES-TREMOVE transport model, the impact on SO_2 could also have been integrated. However, the relevance of SO_2 emissions in transport is not significant, overall.

The IA analyses the environmental, economic, and social impacts in a balanced way. The IA assesses the 'stand-alone' costs and benefits of the deployment of infrastructure under each policy option and sensitivity analysis on investments costs regarding smart charging under each policy option. Furthermore, the IA analyses the macroeconomic impacts, impacts on competitiveness, SMEs, internal market, and on consumers. The following social impacts were assessed: impact on employment levels, on skills, on social cohesion, and on health, whereby pollutants PM10 and NO_2 are included (measured in percentage reduction compared to baseline option).

Monetisation of environmental effects

Only the external noise costs have been monetised. None of the other environmental effects are monetised in the impact analysis. However, in the comparison of options part, the overall lower impact on the environment is monetised in billions of Euros. The IA does not mention how the amount was calculated.

On the basis of the quantified PM, NO_x, and CO_2 emissions, the corresponding environmental costs of air pollution and climate change could have been monetised on the basis of existing cost factors.

Compared to the economic impacts, where various effects are monetised, only one of the environmental impacts (noise costs) is monetised. So, there is an emphasis on the economic costs (benefits) in comparison to environmental costs (benefits).

Methodologies applied (methodological toolbox)

The IA has applied the PRIMES-TREMOVE transport model for assessing the environmental effects.[15] In the appendix, the IA illustrates the analysis and assumptions in more detail.[16] Assumptions are made on energy import prices (increasing prices, based on the PROMETHEUS stochastic world energy model), on population and macro-economic aspects. The comparison of each policy option is performed in a multicriteria analysis.

All options have been assessed in the same detail. The IA presents for all options information (either quantified or monetised).

Requirements of IA guidelines

The methodological requirements of the IA guidelines are met with regard to comparing to a baseline option, quantification and monetisation of impacts and assessment of impacts from all three areas – economic, social and environmental. Furthermore, the Briefing (pp.2-6) underlines the provision of a serious analysis based on well-referenced and high quality data, as well as the precise explanation of

15 Primes-Tremove transport model: http://www.e3mlab.ntua.gr/e3mlab/PRIMES%2520Manual/The%2520PRIMES-TREMOVE%2520MODEL%25202013-2014.pdf

16 Appendix: http://eur-lex.europa.eu/resource.html?uri=cellar:fbc30100-319d-45d6-b4d6-684edcc98a3e.0001.03/DOC_2&format=PDF

the approach to methodology used and of the main challenge of the assessment. However, it criticises that "the Commission could more precisely link the types of alternative fuels to the respective types of vehicle throughout the IA (...). Also, it could better describe the difference between privately and publicly available electric vehicle charging points (...)" (Briefing, p.6).

Relevance of the results

The decision was made by comparing the various impacts of each option with the baseline and was based on six economic impacts, four social effects and one environmental impact, respectively.

The IA summarises the results of the comparison of policy options in terms of effectiveness, efficiency, and coherence. In the case of the preferred option 4, the estimated percentage change relative to policy option 1 for all environmental effects are the highest rate of reduction for the year 2030 and 2050. However, comparing the various environmental impacts in the year 2020, option 3 was estimated to achieve the highest reductions of noise and CO_2 emissions. Option 4 scored highest in respect to all the other effects. However, there was only one environmental aspect/criterion in comparison to six economic criteria and four social criteria.

Additional studies

The impact assessment uses the Prometheus assumption (described in the appendix): "These price assumptions are the result of world energy modelling using the PROMETHEUS stochastic world energy model 152, which derives price trajectories for oil, gas, and coal under a conventional wisdom view of the development of the world energy system." The description of the PROMETHEUS stochastic model can be found under:

http://www.e3mlab.ntua.gr/e3mlab/PROMETHEUS%20Manual/prometheus_documentation.pdf

5.9 Directive on indirect land-use change related to biofuels and bioliquids[17]

Short description of the regulation

Directive 2009/28/EC on the promotion of the use of energy from renewable sources (the Renewable Energy Directive) established mandatory targets to be achieved by 2020 for a 20% overall share of renewable energy in the EU and a 10% share for renewable energy in the transport sector. At the same time, an amendment to Directive 98/70/EC1 (the Fuel Quality Directive) was adopted, which introduced a mandatory target to achieve a 6% reduction in the greenhouse gas intensity of fuels used in road transport by 2020.

The main goal of the new regulation is to achieve the specified greenhouse gas savings, and the 6% reduction in greenhouse gas intensity required by the Fuel Quality Directive: "The content of Recital 65 is reflected in Article 17 of the Directive, which requires biofuels to be sustainable, and in particular Article 17(2) thereof, which in context of greenhouse gas savings requires biofuels to save at least 35% compared to fossil fuels, increasing to 50% in 2017 and 60% in 2018 for new installations" (IA, p. 30). To this end, the impact of indirect land-use change (ILUC) on greenhouse gas emissions of biofuels needs to be minimised.

[17] Directive on indirect land-use change related to biofuels and bioliquids, 2013, DG Energy, 129 pages
IA: http://ec.europa.eu/clima/policies/transport/fuel/docs/swd_2012_343_en.pdf
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/IDAN/2016/583810/EPRS_IDA%282016%29583810_EN.pdf

System boundaries

The IA mainly focuses on 2020 as a temporal boundary for analytical purposes since the National Renewable Energy Actions Plans (NREAPs) from Member States, which are often mentioned and serve as a major point of reference, do the same. Moreover, ILUC does not contain itself to the EU as its possible effects can be observed in third countries as well in most cases. Therefore, the worldwide approach the IA uses is appropriate.

Stakeholders

The Commission carried out two public consultation exercises and the Joint Research Centre organised several expert consultation meetings in 2009 and 2010. The IA identifies local communities, biofuel feedstock producers, the biofuel industry, Member States and third countries as those that will be affected by the new regulation.

Third countries and their local communities are protected from increased pressure on global food and feed markets as the demand for food based biofuels in the EU declines. However, the briefing of the EPRS explains that according to new research the promotion of biofuels does not endanger the food production as much as previously assumed (EPRS briefing, p. 1). Biofuel feedstock producers shift their attention to feedstock for advanced biofuels and thus do not result in large amounts of ILUC emissions, while the biofuel industry is incentivised to further develop and improve their efficiency. Furthermore, there is sufficient time for this industrial transition to be smooth and investors have a better idea of how stable their investments are.

Options

The IA identifies the following available options to the EU:

- Option A: Take no action for the time being, while continuing to monitor.
- Option B: Increase the minimum greenhouse gas saving threshold for biofuels.
- Option C: Introduce additional sustainability requirements on certain categories of biofuels.
- Option D: Attribute a quantity of greenhouse gas emissions to biofuels reflecting the estimated indirect land-use impact.
- Option E: Limit the contribution from conventional biofuels to the Renewable Energy Directive targets to current production levels.

The IA concludes that option E, combined with elements of B and D, is the most appropriate option because it minimises the risks of ILUC and safeguards existing investments. Moreover, with this course of action the model limitations/simplifications are adequately taken into account.

Environmental effects covered

The IA assesses whether the targets formulated in the Renewable Energy Directive are met with the available options. In this regard, greenhouse gas emissions derived from ILUC is the main environmental effect covered. Hence the analysis “does not consider any wider environmental and social impacts associated with the promotion of biofuels” (IA, p. 8) and therefore the impact chain of effects is not described in detail.

The economic and social implications of the options are discussed extensively (especially the former), but the environmental impacts are not. The IA nearly completely ignores biodiversity, the size of land holdings and farm intensity even though these are important environmental issues with possibly far-reaching consequences when it comes to the production of biofuels.

Uncertainty is extensively treated over a number of pages in Annex 3 and is also included more succinctly in paragraph 5.1.3. The IA acknowledges that there are still a lot of unidentified factors that potentially influence estimated ILUC emissions. The Commission applies the precautionary principle because of this uncertainty, which can only be resolved with more research.

Quantification of environmental effects

The review of the environmental impacts is comparable with the one of social impacts, but neither are quantified nor discussed in detail. Yet, much emphasis is put on ILUC emissions by adding separate paragraphs termed 'Effectiveness in reducing greenhouse gas emissions' when discussing the available options, because assessing them is the main goal of the IA. In addition, it is clear that besides ILUC emissions economic impacts are the most important point of focus.

Other environmental issues such as the loss of biodiversity, the emergence of large land holdings and the damaging effects of high farm intensity could have been quantified as well. For example, Annex 5 of the IA addresses the decrease of biodiversity in case option A (not undertaking any further action) is selected. In this calculation, performed with the IFPRI-MIRAGE-BioF model, the mean species abundance (MSA) is used as an indicator for biodiversity. However, as the briefing of the EPRS remarks, comparing the outcomes is complicated because the methodologies are highly diverse and there is simply not enough data (EPRS briefing, p. 4).

Monetisation of environmental effects

None of the environmental effects are monetised in the IA. ILUC emissions could have been monetised with manageable effort as the numbers are already presented in million tonnes. This could also have been done for other environmental effects, such the loss of biodiversity, the emergence of large land holdings and the damaging effects of high farm intensity. However, this requires more (technical) models and goes hand in hand with a considerable amount of speculation. The economic and social effects were not monetised either.

Methodologies applied (methodological toolbox)

The IA uses qualitative assessments in order to analyse the environmental, economic and social effects. The MIRAGE-BioF model, developed by the ATLASS consortium, is deemed the most suitable model to measure ILUC emissions even though it comes with certain limitations and uncertainties. This general equilibrium model encompasses all economic sectors and markets and their interactions at a global scale. The available options are all addressed in the same detail and the comparison is summarised in a table that is further explained in the conclusion.

Requirements of IA guidelines

The IA adheres to the methodological requirements of the IA guidelines. There is a problem that needs to be solved, and for this purpose objectives are identified together with the available options. The impacts of these options are assessed and subsequently compared to each other, although not very extensively. Lastly, the IA provides an outline of a plan on how to monitor the developments in the biofuels and bioliquids sector. Nevertheless, the impact assessment Unit for the Committee on Environment, Public Health and Food Safety is critical: '[...] the IA still appears to fall short of providing a clear picture of the key economic (for example, the industries involved), environmental and social policy issues at stake, the report mainly focusing on the technical aspects of ILUC. Insufficient focus appears to be given to the international context as the linkage with trade policies and WTO obligations is only briefly described and the effect of EU action on emission levels in third countries is

hardly discussed. In addition, very little information is provided as to where each Member State stands in meeting the targets set by the directives" (Appraisal, p. 2).

Relevance of the results

The IA's final decision to proceed with option E, combined with elements of B and D, is clearly influenced by the environmental impacts (mainly ILUC emissions) identified for the available options. The idea that greenhouse gas savings achieved by the usage of biofuels can be nullified by ILUC emissions in case they are not accounted for is deemed crucial. Besides greenhouse gas savings, the new regulation is mainly justified by the feasibility of an industrial transition and the protection of investments. The partial emphasis on these economic considerations may have prevented the selection of a stricter plan of action by the Commission. If for example biodiversity, the size of land holdings and farm intensity had been addressed more extensively, the result could have been a decision to curb the production of convention biofuels more dramatically in the short-term and thereby ignore the interests of investors and the industry.

Additional studies

Additional studies were reviewed for the IA during 2009 and 2010 in order to base it on new and reliable research:

- Global Trade and Environmental Impact Study of the EU Biofuels Mandate: http://trade.ec.europa.eu/doclib/docs/2010/march/tradoc_145954.pdf
- Impacts of the EU biofuel target on agricultural markets and land use: a comparative modelling assessment: https://circabc.europa.eu/sd/a/0a4db7fc-008c-4862-a830-2a6667a295c4/Impacts%20of%20EU%20biofuel%20target%20on%20agricultural%20markets%20and%20land%20use%20-%20JRC%20IPTS.pdf
- The Impact of Land Use Change on Greenhouse Gas Emissions from Biofuels and Bioliquids: http://www.globalbioenergy.org/uploads/media/1007_EC_-_The_impact_of_land_use_change_on_greenhouse_gas_emissions_from_biofuels_and_bioliquids.pdf

5.10 Regulation on fluorinated greenhouse gases[18]

Short description of the regulation

The aim of the regulation is to reduce F-Gases (fluorinated gas) emissions and thereby reach the climate objectives and the emission reductions in the EU for a competitive low carbon economy in 2050. The regulation is a reaction to the strongly growing F-Gases production in recent years. Consequently, the increasing F-Gases production leads eventually to considerable emissions into the atmosphere and might substantially increase the risk of global warming in the future. This problem arises because ODS (ozone depleting substances) have been replaced by the production and use of F-Gases (IA, p. 9). The specific objectives of this regulation are the prevention/discouragement of the use of F-Gases with high GWP (global warming potential) in the EU where suitable alternatives exist;

[18] Regulation on fluorinated greenhouse gases, DG Climate-Action, 2013, 52 pages
IA: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R0842&from=EN
EP Briefing: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012SC0364&from=de

the encouragement of the use of alternative substances or technologies, whereby those technologies should achieve higher market share; the prevention of leakage for equipment; the proper end of life treatment (disposal) of F-Gases; the facilitation of convergence towards potential agreement to phase down Hydrofluorocarbons (HFCs) under the Montreal Protocol in the future; the enhancement of sustainable growth; stimulation of innovation and the development of green technologies while market opportunities for those alternative technologies and gases with low GWP should be improved (IA, p. 14).

Those environmental objectives should be reached under the condition of limiting any undesirable effects on SMEs and employment, as well as a restricted increase in administrative burdens for companies and authorities. Furthermore, the regulation should be implemented while limiting the abatement costs per tonne CO_2 and preserving the competition in the internal market. On the one hand, the IA states that the operational policy objective is "to reduce F-Gases emissions in the EU by 60% in 2030 compared to 2005". On the other hand, operational objective "is to do so in a cost-effective manner by taking consistent, and cost-efficient measures (up to a maximum of 50€/t CO_2-eq), at reasonable costs to industry and with minimum administrative effort" (IA, p. 14).

System boundaries

Different policy alternatives are excluded from further analysis, such as the suspension of the current F-Gases regulation, the inclusion under the EU emission trading system, EU harmonised tax schemes as well as deposit and refund schemes. Generally, the possible effects (mainly the environmental impacts) are assessed broadly, taking into account global effects on emissions (IA, pp. 20-21). The assessment also takes into account indirect emissions (e.g. due to increased energy use of equipment). Therefore, the IA report states (IA, p. 23): "In order to reduce overall emissions, measures on direct emissions (use of F-Gases) should not lead to higher indirect emissions (...). In order to avoid such a potential trade-off, only safe and energy-efficient (i.e. at least as efficient as conventional technology) alternatives were considered as feasible replacement substances in the calculation of scenarios." The IA defines 2030 as reference year in their analysis and, in the case of environmental impacts, the estimation of effects focuses on 2030 as well.

Stakeholders

The IA identifies the following stakeholder's research (IA, pp. 12-13): The society as a whole is affected by climate change. As a possible consequence of the abatement of emissions at higher costs than possible within the F-Gases sector, the overall economy and non-F-Gases European industries may suffer a loss of price competitiveness. Furthermore, the initiative might stimulate innovation, green jobs and growth, where companies will benefit, who find it hard to distribute their products under the current market situation. Producers of F-Gas, manufacturers of equipment, electricity companies, service companies, importers and exporters, users of equipment, the retail sector and raw material sectors (e.g. metals and products) might be affected in different ways by any policy changes. The restriction will only marginally affect the producers of F-Gases and of equipment and products. However, users of F-Gases equipment are subject to the containment requirements and, therefore, those stakeholders are affected to a higher extent. Also member states will be affected by various factors: Some states implemented more stringent laws than the EU legislation. The IA consults in an online stakeholder survey NGO's, public authority/public consultation, law firms, public affairs consultancies, non-governmental organisations/associations, European Parliament, industry, trade unions. In their analysis, the IA assesses also the impact on consumers, third countries and innovation and research (IA, pp. 12-13).

Options

The IA presents five options, one of which was a non-policy option:

- **Option A: No policy change at EU level:** Option A is the baseline that includes current legislation as well as some necessary measures, for example measures of encouragement at European level through non-legislative actions such as awareness raising, to approve its application.
- **Option B: Voluntary agreements by industry:** This option considers additional or enhanced voluntary agreements in the EU to reduce F-Gases emissions. The agreements could be considered realistic in areas such as the phase-out of HFCs in commercial refrigeration, the replacement of HFC-134a in XPS (extruded polystyrene) foams, HFC-23 in fire protection, SF_6 and NF3 in photovoltaic industry, the elimination of HFC-23 emissions from halocarbon production, as well as the pursue of an enhanced agreement on the use of PFCs, NF3, HFC-23 and SF_6 in the semiconductor industry. All these agreements can only be considered since the abatement costs for these applications are estimated to be relatively low.
- **Option C: Extended scope of containment measures:** This policy option includes an extension of the current F-Gases regulation in its main provisions. In particular, the requirements on containment and recovery are foreseen to be modified. Improvements of product standards on leak tightness of applications containing F-Gases are desirable, as well as the regulation should, in order to improve containment, further pursue their improvements.
- **Option D: Establishment of a phase down mechanism for placing HFCs on the market:** This option foresees a phasing down of the supply of bulk HFC substances in the EU, whereby the policy should be complemented with measures to cover quantities imported inside of equipment (IA, p.17). “The phasedown mechanism assessed implies a gradually declining "cap" for the total placement of bulk HFCs (in tonnes of CO_2-eq) on the market in the EU with a freeze in 2015, a first reduction step in 2016 and reaching 21% of the levels sold in 2008-2011 by 2030. These levels have been determined so as to fully respect current market needs and the possibilities of replacements in all sectors (compare Annex XVI) with proven, safe and energy-efficient technologies already available today. The expected accelerated future development of alternative technologies will provide an additional safety margin.” (IA, p. 17).
- **Option E: Bans of production, use or placing on the market of F-Gases in certain applications:** From a specific date onwards, the sale of certain new appliances with F-Gases in the EU is banned. Likewise, the use of F-Gases in sectors, where a feasibility of a full market penetration of cost-efficient alternatives exists, is banned. As an example, the IA (IA, pp. 19-20) points out sectors such as commercial refrigeration (stand-alone systems, condensing units, centralised systems), industrial refrigeration, HFC-23 in fire protection and SF_6 in Magnesium die-casting <850 kg/y and recycling of die casting alloys.

The choice of options seems appropriate in terms of variety. The IA covers policy measures from voluntary agreements by industry up to bans of production. Options including financial incentives are not considered.

Environmental effects covered

The IA analyses the impact of four key environmental effects for the period from 2010 until the reference year 2030 (vs. baseline option A) (cited from IA, pp. 22-23):

- Reductions in direct F-Gases emissions (in Mt CO_2-eq).
- New direct emissions resulting from alternative substances (in Mt CO_2-eq).

- Emissions due to energy efficiency changes resulting from shifts to alternative technologies. The expected difference in annual energy consumption (kWh) between abatement technology and HFC reference technology was estimated and converted into CO_2 emissions by using a specific CO_2 emission factor per kWh of electricity consumption.
- The emissions of ecotoxicologically relevant substances were quantified in metric units of toxic substances.

The IA identifies the drivers of the problem such as the phasing out of ozone-depleting substances under the Montreal Protocol, growing markets for equipment and products containing F-Gases as well as the fact that climate effects of F-Gases are currently not factored into the price and the demand for and innovation of alternative technologies is hampered by market failures (IA, pp. 9-10). Furthermore, the IA illustrates the environmental changes because of the increasing emission of F-Gases. The IA does not apply the DSPIR framework for explaining the chain of effects.

Overall, the IA covers all relevant environmental effects associated with the issue, including the important indirect effects (mainly the possible shift to alternative substances).

Quantification of environmental effects

The IA quantifies greenhouse gas emissions (in Mt CO_2-eq), i.e. all F-Gases and other relevant greenhouse gases, based on three effects:

- Direct emission changes (in Mt CO_2-eq)
- Additional emissions from alternative (replacement) substances (in Mt CO_2-eq)
- Additional indirect emissions due to energy-efficiency changes (in Mt CO_2-eq)

Looking at all important direct and indirect greenhouse gas emissions, the IA covers the most relevant environmental effects that can be quantified. It only remains to be questioned whether possible negative side effects on the ozone depletion potential (due to shifts to alternative substances with higher ozone depletion potential) could have been investigated more in detail.

The environmental impacts of policy options in 2030 are estimated and compared relative to the baseline (option A). The IA shows the reduction of those direct and indirect emissions in Mt CO_2-eq in 2030 for each option. The sum of the greenhouse gas emission reduction in 2030 was compared to the reduction in 2005. In addition, the analysis includes the ecotoxicolgical relevance of each option, however only qualitatively. The impact of the release of different HFCs (i.e. hydrofluoric acid HF and trifluoroacetic acid TFA) as well as the effect of PFCs and SF6 on ground and aquatic systems is quantified in a range of/between low and high ecotoxicological risk. The ecotoxicity effects are based on state-of-the-art knowledge.

Although the Briefing (p. 3) concludes that the assessment is performed in a balanced way with broad range of environmental, economic and social impacts, the IA seems to focus more on the economic impact than on the environmental effects. The IA addresses a high number of economic effects: average abatement costs (as well as marginal abatement costs) for the industry in 2030 in Euro/t CO2-eq, total direct net costs to industry sectors Euro/year, direct and indirect impacts on sectors, administrative costs, impacts on region, impacts on the functioning of the internal market and competition, impacts on competitiveness trade and investment flows, impact on third countries and international relations, impact on consumer prices and impact on innovation and research. The analysed social impacts include direct and indirect employment impacts, employment effects induced through demand shifts as well as safety, occupational and health risks.

Monetisation of environmental effects

In the IA no environmental effects are monetised. The analysis only includes the CO_2 abatement costs for the industry. However, the economic benefit of greenhouse gas emission reduction is not monetised, although it would be a relevant number in a cost-benefit analysis. There are many different studies, handbooks, etc. available with recommendations on CO_2 shadow prices for estimations the benefit of greenhouse gas emission reductions. When looking at the broad range of economic impacts quantified and taken into account in the final comparison of options, an estimation of the corresponding cost reduction (benefit) due to reduced greenhouse gas emissions would have been desirable.

Methodologies applied (methodological toolbox)

The IA uses for estimating the emission scenarios of F-Gases in the EU-27 the bottom-up stock model AnaFgas. The model derives the demand and emission scenarios for F-Gases in relevant sectors and sub-sectors for the EU-27 Member States and illustrates demand for and emissions of HFCs, PFCs and SF6 for the period of 1995 to 2050. The analysis is based on market data and uses estimates of the quantity of equipment or products sold each year containing these substances, and the amount of substances required in the EU to manufacture and/or maintain equipment and products over time (IA, p. 81).

The direct and indirect economic impacts were analysed in an input-output model framework by using the EmIO-F Europe model. The EmIO-F Europe Model is a static input-output model which determines direct and indirect output and employment effects of environmental policies and measures for the EU. The analysis is complemented with a general equilibrium model GEM-E3[19], which captures price-induced effects of policies. Furthermore, the IA based their decision on a sensitivity analysis, whereby a cost estimation is implemented by using different assumptions for purchase prices on the way in which households react to increased prices by reducing their demand for goods (Briefing, p. 5).

The GEM-E3 model setup includes the energy-related and non-energy related emissions of CO_2 and other GHG. In this model, three mechanisms of emission reduction are explicitly specified. First, substitution between fuels and between energetic and non-energetic inputs, second, emission reduction due to a decline in production and consumption, and third, purchasing abatement equipment (detailed information: https://ec.europa.eu/jrc/en/gem-e3/model).

In the final section, namely the in the comparing of the options, the most important impact parameter for all policy options compared relative to the baseline were summarised.

Requirements of IA guidelines

The IA guidelines were satisfied in the way that the IA environmental impacts of the different policy alternatives are compared to the “no policy change” option. The IA based their decision on the estimations from economic models and qualitative analysis. However, no explanation was given why the monetisation of environmental impact was not feasible. According the impact analysis, the Briefing (p.5) concludes that the used models were clearly explained. Furthermore, they point out (p.4) the clear and comprehensive table in the comparison of the most important effects. However, the Briefing criticised (p. 6) that “some aspects could have been further clarified, for example concrete monitor-

[19] https://ec.europa.eu/jrc/en/gem-e3/model

ing indicators and an explanation of how the 'phase-down' in F-gases is to work in practice and how compliance will be assured".

Relevance of the results

The proposed option of the IA is the one with the highest greenhouse gas emission reduction (option D), and, hence, the IA puts much emphasis on the environmental impacts by making their decision, although the number of economic criteria is much higher than the environmental aspects. The IA concludes that "only option D is fully effective as regards the objectives, as only this option would make a sufficiently large contribution in emissions reductions to the low carbon roadmap at the levels needed to take overall cost-efficient mitigative action" (IA, p.51).

Additional studies

The IA is based on an external preparatory study named Öko-Recherche (Schwarz et al. 2011) plus a complementary study by SKM ENVIROS (2012):

- SKM Enviros (2012). "Further assessment of policy options for the management and destruction of banks of ODS and F-Gases in the EU"
- Schwarz et al. (2011) "Preparatory study for a review of Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases." Öko-Recherche et al.

The IA also used three other studies for the drafting:

- Clodic et al. (2011). "1990 to 2010 Refrigerant inventories for Europe - Previsions on banks and emissions from 2006 to 2030 for the European Union." Armines/ERIE
- TEAP (2009). "Assessment of alternatives to HCFCs and HFCs and update of the TEAP 2005 supplement report data". Montreal Protocol. Report of the Technical and Economic Assessment Panel (TEAP). UNEP, Nairobi.
- Becken et al. (2010). "Avoiding Fluorinated greenhouse gases - Prospects for Phasing Out." Umweltbundesamt. Dessau, Germany. http://www.umweltbundesamt.de/publikationen/avoiding-fluorinated-greenhouse-gases

Detailed information for AnaFgas model is available here: Annex III of Schwarz et al. 2011: http://www.consultations-publiques.developpement-durable.gouv.fr/IMG/pdf/etude_preparatoire_pour_la_revue_du_reg_fgaz-annexes.pdf#page=101

5.11 Responsible sourcing of minerals from conflict-affected areas[20]

Short description of the regulation

The regulation is implemented to combat the problems related to the responsible sourcing of minerals originating from conflict-affected and high-risk areas. The initiative seeks to contribute to reducing the funding from proceeds of minerals' extraction and trade that reaches armed groups in conflict-affected areas. Furthermore, it aims to improve the ability of EU downstream operators to comply with existing due diligence frameworks. Finally, the regulation should contribute to reducing the

[20] Responsible sourcing of minerals from conflict-affected areas, 2014, DG Trade, 85 pages
IA: http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52014SC0053
EP Briefing: http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/528797/EPRS_BRI%282014%29528797_REV1_EN.pdf

market distortion in the form of reduced demand and prices in the formal sector for minerals from the African Great Lakes Region (Democratic Republic of the Congo (DRC/COD) and other Great Lakes Region countries). The IA specified the following objectives (IA, p. 31):

- Increase the proportion of EU and global smelters/refiners that perform due diligence.
- Raise the level of public accountability for due diligence performance (and the level of compliance) by EU and global smelters.
- Increase the ability of EU downstream companies to successfully identify smelters/refiners.
- Improve the bargaining position of EU downstream companies (on due diligence) vis-à-vis companies further back in the supply chain.
- Improve awareness of due diligence, of the importance of due diligence compliance, and of ethical dimensions throughout the supply chain – both inside and outside the EU.
- Increase the uptake (performance) of due diligence practices by downstream companies.
- Offset/reduce the adverse commercial incentive created or exacerbated by US DFA.

The IA (p. 9) points out that the initiative should make a contribution to the EU foreign policy goals and development strategy of better governance, sustainable management, and law enforcement related to the exploitation of natural resources in mineral-producing conflict areas.

System boundaries

The impact assessment concentrates on the case of the Congo (DRC), which is well documented.

Stakeholders

The IA identifies the following stakeholders: governments, industry, NGOs, and stakeholders throughout the supply chain, whereas every stakeholder is affected differently. Business operators (smelters, refiners, manufacturers, traders) will be affected by higher due diligence due to a possible increase in production costs and loss of suppliers. Member State authorities are involved by accurately implementing the regulation. The industry might be affected as many industries use tin, tantalum, tungsten ('3T') and gold. Furthermore, the regulation will support the work of NGOs, whereby they probably support the achievement of objectives with complementary awareness-raising initiatives.

Options

The IA identifies seven options, whereby one option is defined as the baseline (IA, pp. 33-40):

- **Option 1: Standalone EU Communication:** This option includes measures such as the establishment of national contact points for multinational enterprises and other relevant networks to help raise awareness. EU public procurement, the financial support to the activities of OECD, i.e. further promote and develop Guidance and assistance in support of due diligence practices of EU and global smelters/refiners, "letters of intent" by the European industry and government-to-government actions.
- **Option 2: "Soft Law" approach + measures of Option 1:** This alternative combines the measures under option 1 with a Council Recommendation. This recommendation would be used as an instrument to raise awareness, and to promote the voluntary uptake by EU enterprises of the OECD Guidance for the 3Ts and gold.
- **Option 3: EU importer self-certification (voluntary), including disclosure requirements and a list of smelters/refiners + measures of Option 1:** The option would implement a regulation targeting all EU importers of tin, tantalum and tungsten ores and metals, as well as gold regardless of the origin of the products.

- **Option 4: EU importer self-certification (mandatory), including disclosure requirements and a list of smelters/refiners + measures of Option 1:** Under this option all EU importers of tin, tantalum and tungsten ores and metals, and gold are subject to the obligations defined under the Regulation.
- **Option 5: EU-listed company disclosure requirements + measures of Option 1:** A Directive targeting almost 1,000 EU-listed companies using 3Ts and gold in their supply chain would be implemented under option 5. The Directive will affect companies regardless of the origin of resources.
- **Option 6: Prohibition of imports when EU importers of ores fail to demonstrate compliance with the OECD Guidance (import ban) + measures of Option 1:** This option would require EU importers to mandatorily demonstrate compliance with the OECD Guidance. Providing evidence on compliance to Member States' customs authorities, importers will be allowed to operate in the EU market.

The choice of options seems appropriate in terms of variety of alternatives.

Environmental effects covered

The IA considers that option 1 and 2 have no environmental impact (IA, p.43 and 44). As the Briefing (Briefing, p.6) points out, the IA does not give any information about how the conclusion was reached. Due to the fact that 7% of 330 respondent to the consultation state that option 3 would strengthen environmental aspects, the IA concludes with a positive environmental effect for option 3. In the case of option 4 and 5, potential negative impacts on the environment could be triggered to the extent that mineral flows could be diverted towards other companies with lower environmental standards and norms. This negative impact, however, only arises if companies have direct business links to or are physically established in conflict and high-risk areas. The IA does not give any further explanation. The IA does not present any environmental impact in option 6. The IA performed an effectiveness analysis for each option and, in the case of the economic impacts, a cost and benefit analysis.

Although a limitation of reliable information on the potential impact pathways exists, indirect environmental impacts could have been covered and potentially assessed in more detail, at least qualitatively. As indirect environmental impacts, the IA could have included environmental pollution such as toxic emissions, water contamination as well as the degradation of ecosystems (e.g. due to deforestation).

The general impact chain is well described, for example, in a problem tree showing main problems, consequences, and underlying drivers. However, no environmental impact was included.

Quantification of environmental effects

In the analysis, no environmental effects are quantified. In contrast, some economic impacts are quantified in a cost and benefit analysis.

The depth and breadth of the analysis of environmental impacts is not comparable to that of economic impacts. The focus of this IA is clearly on the economic effect of each alternative. Due to the high level of uncertainty, it seems reasonable not to quantify the potential environmental effects.

Monetisation of environmental effects

No environmental effects are monetised. The depth and breadth of the analysis of environmental impacts is not comparable to that of economic impact. However, due to the high level of uncertainty, it seems reasonable not to monetise the potential environmental effects.

Methodologies applied (methodological toolbox)

The IA bases the decision on stakeholder consultation, effectiveness, and cost-benefit analysis. For assessing the environmental effects, the IA considers the stakeholder consultation.

Requirements of IA guidelines

The requirements are met by the provision of a baseline, the comparison of options, and the inclusion of all three effects – environmental, economic and social. However, the IA does not meet the requirements of the guidelines in terms of the explanation of negative or positive environmental impacts in a certain level of detail.

Relevance of the results

Although the environmental impact is mentioned in the comparison of options, its assessment has no influence on the final decision. The IA states that "concerning the expected social impacts on the livelihood of people and the environment in conflict zones, it might be expected that Option 3 delivers the better results relative to Option 4." (IA, p. 62). The IA expects the preferred option 3 to have a positive environmental impact.

Additional studies

No additional studies were considered with regard to the analysis of environmental impacts.

5.12 Energy efficiency labelling[21]

Short description of the regulation

The new regulation reviews the Energy Labelling Directive in order to further exploit the potential of energy efficiency for the moderation of energy demand and consequent reduction of the energy dependency of the European Union. The regulation aims to address problems that have evolved under the existing framework of the Energy Labelling Directive[22] and the Ecodesign Directive[23]. Difficulties for consumers distinguishing between different models of household and other appliances arise because most products are now in the top classes of the energy label. Therefore, the regulation seeks to restore the A-G scale for energy labelling and to create a mechanism for rescaling products that can accommodate further improvements in energy efficiency. Another problem is the non-compliance

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21 Energy efficiency labelling, 2015, DG Energy, 65 pages
IA: https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_impact_assessment_part1_v7.pdf
EP Briefing: https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_impact_assessment_part1_v7.pdf

22 Source Regulation: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0030

23 Source Regulation: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0125

with ecodesign and labelling requirements. This is partially related to weak enforcement by national market surveillance authorities. As a consequence, the regulation establishes a product database on energy efficiency and introduces a safeguard procedure to improve national market surveillance. Detailed legislation on energy labelling of household appliances would be adopted as delegated acts. According to the IA (IA, p. 28), this update should be relevant, useful, cost-effective, in line with international obligations and easy to understand for consumers, as well as easily and appropriately enforceable.

System boundaries

The IA focuses on the specific problems that have arisen in the implementation of the energy labelling and ecodesign, such as effectiveness of energy labels and enforcement. Seeing that the overall political objective is the reduction of power use and with that the reduction of the environmental impacts of power use, policy measures other than labelling and ecodesign could potentially also increase the efficiency of energy-related products. Furthermore, the evaluation concerns energy-related products and does not consider the question of whether energy savings are more or less cost-effectively achieved in other sectors. In addition, the IA focuses on the framework directives and not on the individual implementing regulations, which are subject to their own consultation and impact assessment process (IA, p. 13). The geographic scope of the IA covers the EEA EFTA states and Turkey (through the Customs Union) (IA, p. 27). The IA chooses the time boundary between 2015 and 2030 for their estimations.

Stakeholders

The IA identifies seven stakeholders and explains in what ways they are affected. The involved stakeholders are consumers, retailers, manufacturers, society, Member States, third countries and standardisation organisations. Objective information on use of energy and other resources is provided to the consumers by the energy label. Consumers are affected because the policies should lower their utility bills and the overall life cycle cost of buying and using appliances. The regulation influences retailers through the obligation to ensure proper display of the label. The IA points out that all retailers should be affected including micro-enterprises because if the micro-enterprises should not be subject to the same rules, the energy label would not be useful for consumers. European manufacturers producing in the EU and manufacturers exporting to the EU are affected as well. As a consequence of the regulation they have to take the requirements of the regulations into account when designing new products. Furthermore, the competition not only occurs in price but also in energy efficiency. The environmental benefits of the policy affect society at large. All member states as well as EEA EFTA states and Turkey (through the Customs Union) have to ensure compliance through market surveillance and inform consumers about the label. Another group of key stakeholders identified by the IA are third countries. They are affected because the A-G energy labelling scheme has established a basis in many different countries and some countries have also implemented EU ecodesign regulations. Another effect on third countries is identified through the Agreement on Technical Barriers to Trade. Finally, the IA report mentions the standardisation organisations, which are affected, because they need to develop the detailed testing and measurement methods (IA, pp. 26–27).

Options

The IA identifies five options: one non-legislative option, three legislative options representing varying degrees of the extent of reform and one option representing the baseline (IA, pp. 39-42).

- Option 1: The non-legislative option includes improvements within the existing regulatory framework. This option contains all measures that require no changes to the Energy Labelling Directive or the Ecodesign Directive.
- Option 1+: This option combines non-legislative measures with changes to the Energy Labelling Directive to address the layout of the label and requiring registration prior to placing labels on the market. The problem related to the increase in size of appliances could be tackled by requiring a higher efficiency to reach a certain label class for larger appliances. The suggested product registration database would only apply to products falling under energy labelling. This option further envisages aligning the Energy Labelling and the Ecodesign Directives with the proposal for the market surveillance for products regulation.
- Option 2: This option implies significant reform of both Ecodesign and Energy Labelling Directives. It adds to the former registration of products covered by Ecodesign and requires the product to be third-party tested instead of in-house. This option supposes significant reform of both Ecodesign and Energy Labelling Directives except for the following three points: changing the least lifecycle cost requirement; introducing an EU market surveillance authority; and extending the scope to non-energy related products.
- Option 3: This option concludes a comprehensive reform of Ecodesign and Energy Labelling Directives extending the scope to non-energy related products and centralising by means of an EU market surveillance authority. Energy Labelling would cover all lifecycle phases and all environmental impacts.
- Sub-options to Options 1+, 2 and 3: These sub-options would merge the Ecodesign and Energy Labelling Directives into one legal instrument and, therefore, would address the incoherencies between the Ecodesign and Energy Labelling Directives (such as the lack of a working plan and a stakeholder forum for energy labelling) by merging the two directives and revising them into one regulation.

The choice of options seems appropriate in terms of variety of alternatives. As mentioned above the options focus on the Energy Labelling Directive or the Ecodesign Directive, and there is no analysis of different options on reducing energy use.

Environmental effects covered

The focus of the analysis is on the negative impact of products on the environment depending on how they are made, used and disposed. The labelling should encourage consumers to buy more energy efficient products and, therefore, environmental protection is ensured through the reduction of energy consumption and other significant environmental impacts. In this context, the following environmental effects are covered by the IA (IA, pp. 44-49):

- The IA report shows *energy savings* of each option compared to the baseline broken down by product sector.
- The IA also gives information on the impacts of the different options on *greenhouse gas emissions*, *water use* and *nitrogen oxide (NO_x) emissions,* quantifying the environmental impacts in comparison to the baseline.

Although the IA does not use a DPSIR framework for describing the interactions between society and the environment, the impact chain of the effects is described in detail. For example, the authors (IA, p. 49) noticed that Ecodesign and energy labelling affects NO_x emissions directly through energy saving for product groups without explicit direct NO_x emission-limits and indirectly through electricity savings (NO_x from power plants). The environmental impacts of different waste streams caused by the different products are not mentioned in the IA.

Other effects covered (socio-economic effects) (IA, pp. 50-64):

According to the IA, the main economic impact is on *consumer expenditure*. The IA also specifies the expected revenue for the year 2030 for each option and breaks down the short- and long-term consumer expenditure and savings. Overall consumer expenditure/savings are calculated on the basis of two assumptions for future energy price developments (the first assumption envisages an increase in energy prices of 4 percent per year; the second assumption envisages an increase in energy prices of 4 percent per year up to 2020 and of 0.5 percent from 2020 onwards). Furthermore, the *commercial revenues* (billion Euros per year) are counted as an economic impact. In addition, as a social impact the IA gives information on the expected *job creation*.

The IA evaluates the environmental, economic and social impacts for each option overall in a balanced manner (IA, pp. 44-64). The briefing[24] states that the IA might have been expected to provide somewhat more detailed information (briefing, p. 4). For example, the analysis could also cover the territorial/regional impacts (briefing, p. 4) as well as the potential indirect environmental effects relating to the job creation. Additionally, the effect of the emission of other air pollutants (e.g. particulate matter (PM), volatile organic compounds (VOC)) could have been analysed, too.

Quantification of environmental effects

The IA report quantified the following environmental effects, which are estimated for each option and compared to the baseline:

- energy savings or energy use (TWh primary energy/y) broken down by product sector
- greenhouse gas emissions GHG (Mt CO_2-eq/y)
- direct nitrogen oxide emissions (kt NO_x/year)
- water use (million m^3/year)

The environmental effects quantified cover both direct effects during the use of the appliance as well as indirect effects of the production, maintenance and disposal phase.

The environmental impacts on energy savings and greenhouse gas emissions in 2030 for the different label layouts compared to the baseline are estimated. The focus of the IA is on the environmental and economic impacts of the regulation. This is reflected in the depth and breadth of both analyses. Whereas the environmental effects are assessed in quantifying higher energy use, greenhouse gas emissions, nitrogen oxide emissions and water use for each option; the economic impact is measured by consumer expenditure for each option and compared to the baseline and consumer expenditure/savings broken down by product sector for two different assumptions for future energy price developments as well as commercial revenues of energy-related products (IA, pp.44-64).

Monetisation of environmental effects

In this IA none of the environmental effects are monetised. The IA points out the difficulties and impossibility in monetising and quantifying the costs of environmental as well economic impacts with the extension of the scope in option 3 to product groups other than energy-related ones due to the vastness of diversity of what would be classified as a product (IA, p. 50).

From a methodological point of view, some of the environmental effects quantified in the IA would have allowed the estimation of environmental costs/benefits. There are, for example, well-established methodologies and cost factors for estimating the environmental costs of NO_x emissions

[24] Source : http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/528821/EPRS_BRI(2015)528821_EN.pdf

(mainly health costs, but also crop losses and material and building damages) as well as the climate costs due to greenhouse gas emissions. Possible sources are the 'method convention on estimating environmental costs' for the German Environment Agency or the EU handbook on the estimation of external costs of transport (Ricardo-AEA 2013, CE Delft 2008).

Methodologies applied (methodological toolbox)

The IA uses for the impact analysis study the ecodesign impact accounting model developed by Van Holsteijn en Kemna B.V. (VHK). This model incorporates the data from all preparatory studies and impact assessments done for ecodesign and energy labelling measures on the energy consumption, the socioeconomic situation, the industrial competitiveness (revenues) and the technology development. The accounting covers projections for the period of 2010 until 2050. Studies of 33 product groups with over 180 base case products were harmonised and complemented to fit the methodology. The model addresses the EU as a whole and applies EU averages for parameters that vary across the EU (electricity prices, fuel, purchase prices, etc.) (for more detail, see Report Ecodesign Impact Accounting Final - Status May 2015)[25]. The monetised economic impacts and the non-monetised environmental impacts are treated in the same way in the comparison of the policy option.

The overall comparison of the options is based on a multicriteria analysis focusing on the effectiveness of meeting the different objectives. Two out of eight criteria (objectives) are environmental issues (energy consumption, other environmental impacts).

Requirements of IA guidelines

The methodological requirements of the IA guidelines are met in terms of assessing the impacts of policy options as net changes compared to the baseline, explaining the non-feasibility of quantification and monetisation, and also, for instance, assessing the administrative burden. As the briefing (briefing, p. 8) points out, the assumptions made and the conclusions drawn in the IA appear overall reasonable and coherent as well as indicating uncertainties and instances where no data is available. According to the briefing (briefing, p. 8), the IA could perhaps have elaborated more on the specific impacts on individual products, and on the future of the Ecodesign Directive. Moreover, the IA could have provided more information on the cost-effectiveness of energy labelling and ecodesign measures in comparison to other initiatives contributing to energy efficiency targets (briefing, p. 8).

Relevance of the results

The environmental impact assessment has a relevant influence on the final assessment. In the final assessment, two out of eight criteria (objectives) cover environmental issues. The goal of all options is to ensure the environmental and consumer protection through the reduction of energy consumption and other significant environmental impacts. The environmental impacts are mentioned in the comparison of options as well as in the conclusion and they are used to justify the directive. The preferred option (option 1+) achieves a significant progress in further energy savings. This is achieved in a cost-effective way by saving consumer money. Significant support from stakeholders for option 1+ was essential for the proposal (IA, pp. 61-65). However, it has to be stated that some other options (options 2 and 3) would have had a more positive environmental impact than the preferred option.

[25] Source: https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20final%2020151217.pdf

Additional studies

Two studies have been commissioned as basis of the IA:

- Ecofys, Waide Strategic Efficiency, University of Coimbra, SEVEn7, SoWatt & Öko-Institute, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive, 2014.
- London Economics & Ipsos Mori, A study on the impact of the energy label – and of potential changes to it – on consumer understanding and on purchase decisions 2014.

For the impact analysis the IA uses the ecodesign impact accounting model:

- ECODESIGN IMPACT ACCOUNTING Final – Status May 2015: https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20final%2020151217.pdf

6 Annex 2: Overview of literature review

6.1 Reviewed Literature

- Morgan, R.K. (2012) Environmental impact assessment: the state of the art, impact assessment and project appraisal
- De Smedt, P. (2010) The Use of impact assessment Tools to Support Sustainable Policy Objectives in Europe, Ecology and Society
- Bond, R., Curran, J., Kirkpatrick, C., Lee, N., Francis, P. (2001) Integrated impact assessment for Sustainable Development: A Case Study Approach, World Development
- Bond, A., Pope, J., Morrison-Saunders, A., Retief, F., Gunn, J.A.E. (2014) Impact assessment: Eroding benefits through streamlining, Environmental impact assessment Review
- Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives, Environmental Science and Policy
- Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis, Forest Policy and Economics
- Deighton-Smith, R., Erbacci. A., Kauffmann, C. (2016) Promoting inclusive growth through better regulation: the role of regulatory impact assessment, http://www.oecd-ilibrary.org/governance/promoting-inclusive-growth-through-better-regulation_5jm3tqwqp1vj-en;jsessionid=1mzetrw4ap431.x-oecd-live-02
- European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?, http://ec.europa.eu/smart-regulation/impact/docs/coa_report_3_2010_en.pdf

6.2 Purpose of the publication and connection to impact assessments

Morgan, R.K. (2012) Environmental impact assessment: the state of the art
This publication reviews progress in the Environmental Impact Assessment (EIA) in the last 40 years with a focus on the following specific topics; origin and development, theory, practice and effectiveness. The paper deals with a wide variety of subjects associated with different types of EIAs. However, the focus is on project-oriented (or programme) EIAs (in German called "Umweltverträglichkeitsprüfung UVP" and "Strategische Umweltprüfung SUP") rather than on impact assessments of regulations and directives. Hence, there is no direct link of the publication to the impact assessment of the European Commission.

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe
The focus of the publication is on the use of tools in the impact assessment (IA) process and their role in supporting sustainable policy. There is no specific focus on environmental issues because they are covered, being a part of the three dimensions of sustainability. The use of IA tools is analysed based on three main criteria:

- Relevance: how useful are IA tools as aid to policy making, with regards to sustainability goals/strategy? Are the three dimensions of sustainable development evaluated in a balanced way?
- Accuracy: what types of data and models are applied? In addition, does the degree of detail fit with the scope of the IA?
- Legitimacy: do the IA (tools) meet the requirements of standards and guidelines? Is there a balance between qualitative and quantitative approaches? Are external consultants or researchers involved?

Bond, R., Curran, J., Kirkpatrick, C., Lee, N., Francis, P. (2001) Integrated Impact Assessment for Sustainable Development: A Case Study Approach

The authors state that there are two positions when it comes to integrated appraisal approaches, and that those can be categorised as 'weak' and 'strong'. With the former, a decision maker has relative autonomy on how to integrate separate appraisals when making a decision. With the latter, the economic, social, and environmental appraisals are combined in order to enable a decision maker to judge based on an overall appraisal. It is stated that both approaches tend to be more on the weak side of the spectrum and that stakeholder involvement is underdeveloped. The article's main goal is to define several integrated appraisal approaches and to see how and by what these are influenced, with the additional goal to provide information on how to improve integrated appraisals in the future. The authors believe that key influences on proposed policy options in integrated appraisals are associated with the latter's nature, historical, institutional, and cultural circumstances and position in the project cycle. They recommend that each integrated appraisal should take into account the earlier mentioned key influences, but also acknowledge that more case studies are required to consolidate this conclusion. A checklist of questions for future research is provided in Appendix A for this purpose.

Bond, A., Pope, J., Morrison-Saunders, A., Retief, F., Gunn, J.A.E. (2014) Impact assessment: Eroding benefits through streamlining

The authors state that their article aims to determine whether streamlining of IAs reduces expected benefits, because the time and cost savings achieved by doing so may not outweigh cancelled benefits. Their hypothesis corresponds with this idea, which they test by analysing the practice in recent years in four countries: Canada, South Africa, the United Kingdom (UK) and Western Australia. They describe the four benefits of EIAs identified by Timothy O'Riordan; consistency and fairness, early warning, environmental and development and public involvement, in order to create the theoretical framework for the analysis. The underlying thought is that the key principles of EIA apply to IAs more generally as well. The authors mainly address the effect of streamlining on the four benefits of EIAs that O'Riordan established. For example, the UK removed a stage of public involvement in Sustainability Appraisal in order to save time, allowing the public only to participate when the preferred options already had been identified. Moreover, there were cases in which the shortened timelines of EIAs had a similar effect by indirectly excluding isolated communities from the consultation process, because they simply did not have the logistical capacity to participate on a short notice. Their conclusion is that streamlining IAs indeed negatively affects expected benefits, but to what extent remains to be seen.

Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives

The aim of the study is to "demonstrate how the form and content of the IA work of the European Commission is shaped by the multiple objectives and the political context in which it is situated" (p. 1078). In 2005 and 2007, a total of 30 interviews were conducted to understand how the IA system sets out to reach its objectives, namely: estimate economic, environmental, and social impacts, promote integration between sectors, serve as communication and information tools and support decision-making. The introduction of this new policy tool was predominantly met with scepticism by DGs in 2005 since they felt it would be impossible to assess such a wide variety of future impacts of several policy options. Due to initially poor performance, guidelines were established by the Secretariat-General. These guidelines, among others, require an inter-service group to be set up in order to stimulate integration between policy sectors. Additionally, the Impact Assessment Board was founded in 2006 to provide leadership. Bäcklund identifies several flaws in the IA system, such as the sparse use of advanced tools and the lack of external expertise that endanger the quality of IAs. As a result, these remain a policy tool that merely supports the outcome of the Commission's proposals and are not an independent source of knowledge. This attitude mainly originates from the desire to control

the political process without the proper organisational capacity. Nevertheless, increased communication between DGs seems to be the greatest achievement of the IA system, which can only be a success with a high rate of transparency and accurate knowledge presented in a legitimate manner (p. 1084).

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis

The authors want to explore the relationship between Regulatory Impact Assessment (RIA), policy making, and politics. They state that policy documents generally view RIAs as a "fact-finding process", devoid of political interests since it is merely based on the view of neutral experts (p. 417). There are two orientations, the technical-rationalist orientation and the post-positivist orientation. Each constitutes a different view on this matter. The former assumes that the RIA is associated with linear decision-making performed by a rational actor, which the latter rejects due to three inadequacies as identified by Owen et al.; theoretical, political, and practical inadequacies. The authors agree with this rejection and to this end provide the five "illusions of rational policy analysis". These are:

- The illusion of linearity
- The illusion of "neutral" and "objective" analysis
- The illusion of a unitary decision-maker
- The illusion of analytical "closure"
- That relevant knowledge is exclusively held by experts (p. 418-419)

They are convinced that RIAs can be of more use to the policy making process when these limitations are taken into account and therefore recommend to assess the political, legal, and administrative context of the concerned RIA. Furthermore, "By identifying the limits of rationalists approaches, by reframing the expectations of the potentials of RIAs from this perspective, assessments can be made more robust and more relevant to the policy process." (p. 420)

Deighton-Smith, R., Erbacci. A., Kauffmann, C. (2016) Promoting inclusive growth through better regulation: the role of regulatory impact assessment

"This paper examines the potential contribution of RIAs to better incorporate the inclusive growth perspective in regulatory decision-making. It does this by reviewing current RIA policies and guidance documents in a range of OECD countries, by reviewing the literature on the use of RIAs to address social and environmental issues and by sampling a number of recent RIAs from leading countries. Building on the available evidence, the paper proposes a number of principles and considerations for decision-makers to design appropriate systems and mechanisms for addressing inclusive growth in RIA." (p. 3)

European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?

The goal of the European Court of Auditors' report is to see whether IAs support EU decision-making and to give recommendations based on their findings.

6.3 Options

Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives

"In response to awareness that the IAs instrument is at a developmental stage and that quality has to improve, an ''independent'' evaluation of the IA system was commissioned by the Impact Assessment Board (EC, 2007). The analysis and conclusions of this quite detailed report agree to a surprising extent with those of previous more limited external evaluations. Concerning quality, two types of difficulties were made visible. The first is political in nature, namely that the freedom to critically and

seriously explore alternative policy options is limited by pressure from the Commission hierarchy or by mandates from the Council or Parliament (EC, 2007, p. 5). The second difficulty is ascribed to operational circumstances, with a lack of sufficient tools and expertise." (p. 1081)

"Different types of stakeholder consultations serve different types of political purpose. If the assessment concerns a proposal that has long been under way in the political process and the range of policy options is perceived to be limited and apparently obvious, it is likely that the assessment work will be rather limited, and that stakeholder consultation will occur only towards the end of the process." (p. 1083)

"It is worth noting that already in the roadmap – before the different policy options are assessed – the assessment leaders are asked to identify progress indicators of the possible future regulation. As pointed out by respondents this suggests a mind-set that the possible policy options are anticipated to be so few already at the outset of an assessment that it is possible to outline monitoring procedures, which contrasts with the very open mandate where a range of possible policy options should be assessed." (p. 1079)

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis

"On the other hand, we also found – sometimes in the same country – excellent pieces of analysis carried out in parallel with the policy development process, analysing rigorously the major intended and unintended effects of different options which led to considerable instrumental learning on policy design." (p. 417)

"While guidance documents tend to describe RIAs in terms of a rational problem-solving process, the reality observed in practice often corresponds to a process in which the objectives and problems are continuously reframed and re-interpreted. Policy development often takes place under constraints which leave little room for manoeuvre due to the need to find consensus and political support. Accordingly, policy change is largely path dependent and incremental. There were few cases where a more fundamental policy change was a realistic possibility and for which the lead ministry seriously considered fundamentally different policy options." (p. 418)

"Desk officers feel at times obliged to describe a fictitious process of problem definition and options appraisal which has not taken place and would not have been realistic to expect." (p. 419)

European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?

"The audit also showed that, in particular for recent years, IAs are becoming broader in terms of the number of alternative options analysed and that resources are targeted to the assessment of initiatives according to their importance [...]" (p. 19)

"It was found that, throughout the period audited, the number of alternative options presented in the IA reports increased." (p. 19)

6.4 Environmental effects covered

Morgan, R.K. (2012) Environmental impact assessment: the state of the art

The focus of the publication is on the theory and process of project- and programme-oriented environmental impact assessment. However, the paper does not cover methodological issues about which environmental effects could be covered or how to assess or quantify environmental effects.

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe

The article does not focus on the type of environmental effects covered. However, it states that tools

are often applied for the assessment of environmental impacts. Concerning the balance of the three dimensions of sustainable development, the paper states the following: “Science has effectively accepted concepts and data for a broad range of economic and environmental indicators. However, some of the social indicators are lacking sound concepts or monitoring initiatives to provide qualitative data.” Furthermore, the authors state in the conclusion, “However, the existing tools are biased toward economic and environmental models [...]”

Bond, R., Curran, J., Kirkpatrick, C., Lee, N., Francis, P. (2001) Integrated Impact Assessment for Sustainable Development: A Case Study Approach
The article briefly mentions that uncertainty is an important factor in integrated appraisal when it comes to estimating economic, social, and environmental effects.

“Economic analysis is the most developed at the strategic level, environmental assessment is much less developed (though growing), and social appraisal is the least developed form of strategic assessment.” (p. 1012)

Bond, A., Pope, J., Morrison-Saunders, A., Retief, F., Gunn, J.A.E. (2014) Impact assessment: Eroding benefits through streamlining
Uncertainty is not treated extensively in the article, although the authors acknowledge that it remains a challenge to define the expected benefits of EIAs and to subsequently come to a conclusion about the cost effectiveness of streamlining IAs in general. More research would be helpful in this regard.

“For environment and development, the relationship of IAs to better outcomes for the environment (as a check and balance for development) appears to be weakening: Canada's new act constrains EIAs to a process that has an insufficiently broad focus to make the links between environment and development; in South Africa, overly prescriptive legislation serves to reduce the opportunities for environmental and development imperatives to be evaluated in an integrated way; in the UK, new presumptions in favour of ‘sustainable development’, which is not defined but used synonymously with economic development, has the potential to subordinate the findings of IA; in Western Australia, efforts have been made to align the two agendas but development continues to dominate discourse.” (p. 52)

Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives
Bäcklund states that IAs more often quantify economic impacts rather than environmental (most frequently ignored of all) and social impacts because “NGOs and experts from the environmental sector are not as deeply involved as business partners; the framing is too restricted and the lead departments do not include the concerns of other sectors and alternative policy options are neglected.” (p. 1082)

“However, later work has shown that when the assessments are compared over time, there might be an indication of increased integration of environmental aspects (Franz and Kirkpatrick, 2007; Lee and Kirkpatrick, 2006).“ (p. 1082)

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis
“Overall, however, unintended effects and distributional implications were typically not given much attention. While the framing of the analysis was often coherent and thought through, it also seemed clear that alternative framings could be envisaged, for example with regard to problem definition, policy options, types of impacts, methods and timescales.” (p. 418)

“The focus of RIA methodology on prediction and precision tends to narrow down the scope of the assessment as it carries with it a dominance of economic valuation and other quantitative methods.

While this often increases the depth of the assessments, the trade-offs in relation to the breadth of impact areas are not sufficiently acknowledged. Qualitative knowledge tends to be undervalued and few attempts are made to capture uncertainties or explore sensitivities in relation to methods and assumptions." (p. 419)

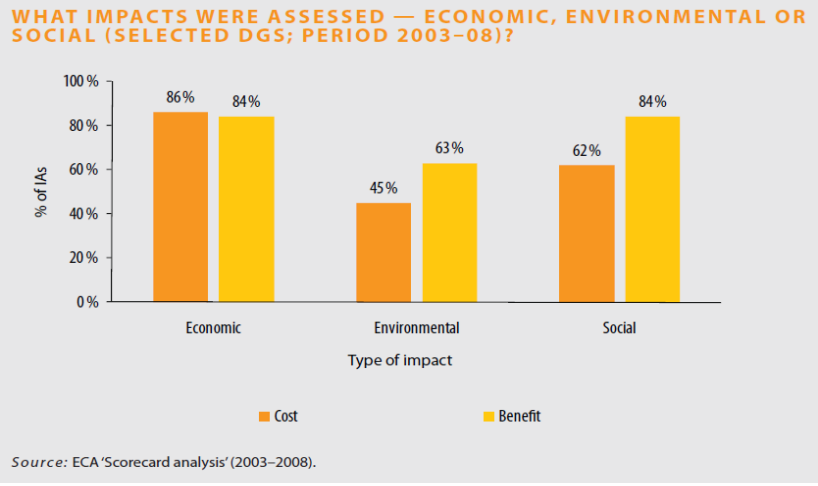
Deighton-Smith, R., Erbacci. A., Kauffmann, C. (2016) Promoting inclusive growth through better regulation: the role of regulatory impact assessment

"Historically, RIAs has been criticised as a focusing decision-making on economic factors, at the expense of social and environmental values." (p. 19)

"Supporters of using separate tools to address social/environmental impacts frequently argue that integrated approaches may lead to the analysis of social and environmental considerations being downgraded, whether because the "economic" RIA is given greater priority, or because the assessment process becomes "overloaded", or unduly complex, in an environment of inadequate resources and expertise. Conversely, however, an integrated approach necessarily provides better opportunities for explicit consideration of the trade-offs between the various policy objectives and a more coherent approach to policy making." (p. 35)

"Few individual regulatory interventions have identifiable and measurable macroeconomic impacts, while macroeconomic tools are arguably not well adapted to assessing the impacts of individual, micro-economic interventions. Moreover, RIAs are subject to significant resource constraints in most countries, while macroeconomic analysis is a highly resource intensive exercise. There are, therefore, both theoretical and practical limitations on the use of macroeconomic analysis in the RIA context. These factors necessarily limit, to some extent, the role of RIAs in relation to the inclusive growth agenda and imply that, while RIAs are a potentially important tool in this regard, it will necessarily be complemented by others." (p. 4)

European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?



6.5 Quantification of environmental effects

Morgan, R.K. (2012) Environmental impact assessment: the state of the art

The focus of the publication is on the theory and process of project- and programme-oriented environmental impact assessment. However, the paper does not cover methodological issues about which environmental effects could be covered or how to assess or quantify environmental effects.

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe

Concerning the quantification of (environmental) effects in the IA process, the paper states that impact assessments generally have a strong focus on quantitative information: "The guidelines also recommend the use of quantitative information. Indeed, the scoping study revealed that most of the knowledge generated, analysed, and presented has a strong quantitative origin, including official statistics and numeric models. Most of the models used were developed by standing research organisations, had been peer reviewed, and had been applied in policy development for many years. In general, most researchers and policy-makers perceive the quantitative knowledge as accurate. However, most quantitative knowledge is often fragmented because of sector-specific models, is based strongly on assumptions of the past, and ignores the high levels of uncertainty of such a complex and cross-cutting issue as sustainable development."

Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives

In less than 20% of the IAs, the quantification of impacts can be deemed comprehensive, based on a sample with 150 IAs as the test group.

The article provides an interesting table regarding the quantification of impacts in IAs from June 2003 until September 2006:

Table 1 – Quantification of impacts in EC IAs, June 2003–September 2006.

	Economic	Environmental	Social
Extensive	33%	11%	12%
Minimal	21%	12%	21%
No quantification	46%	77%	67%

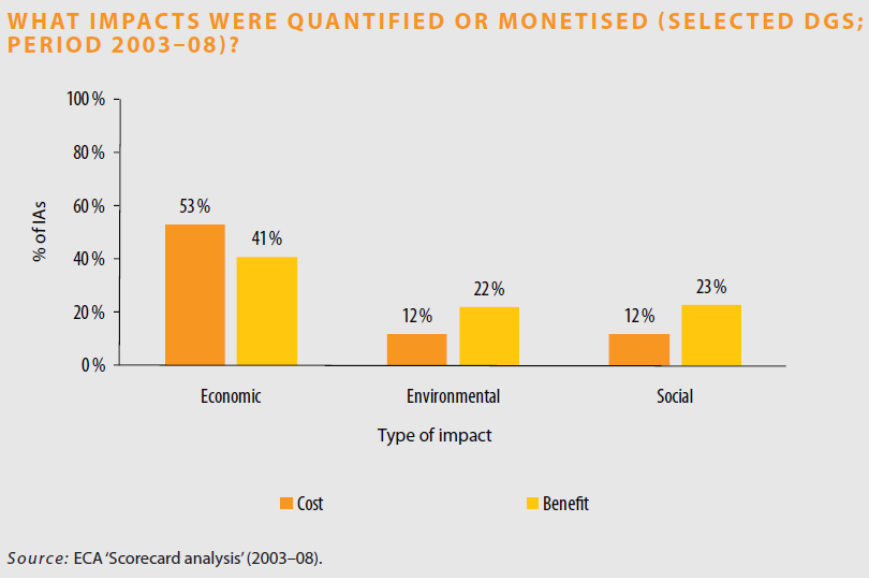
Source: Data extracted from EC (2007, p. 92).

6.6 Monetisation of environmental effects

Bond, A., Pope, J., Morrison-Saunders, A., Retief, F., Gunn, J.A.E. (2014) Impact assessment: Eroding benefits through streamlining

Monetising expected benefits proves to be difficult: "[...] although we cannot comment on the relative change in costs and benefits and therefore no conclusion can be reached on whether such streamlining can be seen as cost effective or not." (p. 46)

European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?
"Problems with quantifying and monetising impacts can be traced back to the availability of data." (p. 7)



6.7 Methodologies applied (methodological toolbox)

Morgan, R.K. (2012) Environmental impact assessment: the state of the art
The methodology of assessing, quantifying, or monetising environmental impacts is no issue in the publication. The overall methodology of environmental impact assessment is mentioned. It is stated that EIAs generally include the following five steps: screening, scoping, impact prediction (assessment), evaluation of significance, monitoring and follow-up.

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe
The article takes a close look at the use of tools in the IA process. However, it does not analyse specific tools but rather the contribution of any IA tools to the IA process and their role in supporting sustainable policy options: "The scoping study confirms the importance of using sound scientific tools such as sustainable development indicators and quantitative models to strengthen the analytical base of the policy objectives. Indeed, using IA tools can provide researchers and policy-makers with a relevant and legitimate assessment and decision support process. The scoping study provides some evidence of effective close, long-term collaboration between researchers and policy-makers." Additionally, the article concludes on the use of IA tools: "Finally, the focus on design and use of scientific tools will contribute to a better understanding of what hinders the tools from being relevant, accurate, and legitimate. For example, while being simplifications of reality, many scientific models remain so complex that they are seen as black boxes instead of transparent analytical tools. Consequently, research outcomes do not fully reach policy-makers."

Bäcklund, A.K. (2009) Impact assessment in the European Commission–a system with multiple objectives
"A number of evaluations have questioned the quality of the assessments carried out. Some have evaluated the general quality of the IA performance, others more specifically how sustainability aspects are considered (EEAC, 2006; Franz and Kirkpatrick, 2007; IEEP, 2004; Renda, 2006; Wilkinson et al., 2004). The number and extent of faults highlighted is vast: costs are not estimated or

not quantified; benefits are not quantified; costs and benefits not compared; methodology used overly simplified; environmental and social impacts not assessed and results difficult to interpret (Renda, 2006, pp. 63–65)." (p. 1081)

"The European Parliament (EP) has signed the Inter-Institutional Agreement on Better Lawmaking as well as an agreement on a common methodology for impact assessment (EC, 2003, 2005b)." (p. 1082)

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis
"The focus of RIA methodology on prediction and precision tends to narrow down the scope of the assessment as it carries with it a dominance of economic valuation and other quantitative methods." (p. 419)

"If RIA is to be developed towards a more discursive practice, reflection on methodology has to be seen as an important step in the scoping of the assessment. It should not just be seen as a purely technical matter, but needs to be discussed with key actors (in particular relevant ministries and stakeholders)." (p. 420)

"It is not uncommon that procedures use concepts and terminology stemming from an economic methodology – for example 'expected net benefit' or 'cost–benefit-ratio'." (p. 416)

6.8 Requirements of IA guidelines

Morgan, R.K. (2012) Environmental impact assessment: the state of the art
The publication does not make any link to the impact assessment of the European Commission. Hence, the requirement of the IA guidelines is no issue.

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe
There is no specific statement about how the requirements of the IA guidelines are met. It only states (as mentioned before) that the use of quantitative IA tools is supported by the IA guidelines: "The guidelines also recommend the use of quantitative information. Indeed, the scoping study revealed that most of the knowledge generated, analysed, and presented has a strong quantitative origin, including official statistics and numeric models."

European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making? "[...] the Commission's impact assessment reports generally provided a sound description of the problem at stake and specified the objectives pursued. These and other mandatory sections of impact assessment reports were found to comply with the Commission's guidelines. However, the main results and messages of IA reports are not always easy to gather and comparing the impacts of the various policy options presented in an IA report is sometimes difficult. [...] Finally, implementation and enforcement costs and the potential administrative burden of proposed legislation were not always sufficiently quantified." (p. 7)

"Within the Commission, each Directorate-General (DG) is responsible for preparing its IAs in line with the Commission's guidelines. Following the first version of 2002, this guidance material has been updated on three occasions, with the latest update taking place in January 2009." (p. 10)

"In the European Parliament and Council, it is recommended practice to discuss the Commission's IA whenever a proposal is submitted. However, current practice observed in both the Parliament and Council falls significantly short of this recommended approach [...]." (p. 21)

6.9 Relevance of the results

Morgan, R.K. (2012) Environmental impact assessment: the state of the art
In a broader view (not focusing on the IAs on EU level), the publication makes some statements about the EIAs effectiveness and the relevance of EIA results for the decision process (on project or programme level): "The use of EIA at different levels of decision-making is growing significantly, as is the range of decision-types for which it is now used." Beside this strength of the EIA, other threats are mentioned, e.g.: "As governments look to stimulate economic growth and create employment in response to the current financial crisis, many are promoting a major expansion of physical infrastructure, encouraging resource development projects, and generally seeking to speed decision-making about development projects. Both EIAs and SEAs should be even more important in such circumstances, yet the moves taken in some countries to speed up decision-making may weaken the provisions for environmental protection, including impact assessment."

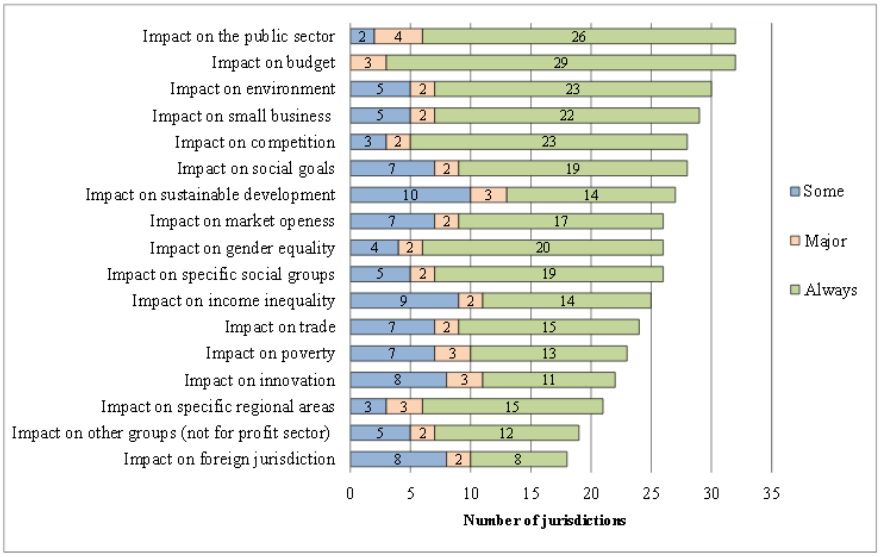
De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe
The author draws a conclusion about the use of IA tools and their contribution to a better regulation in terms of sustainable development: "My findings indicate that the IA system in the EC is regarded by researchers and policy-makers as a system of tools that operates effectively to support a deliberative decision-making process within the guiding principle of sustainability. In particular, the combination of various successive and complementary initiatives to enhance the use of scientific tools provides a strong potential for effectiveness."

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis
"Although RIA produced in some cases robust and useful insights that were taken into account in policy formulation (especially in the EU), in other cases the analysis only played a marginal role due to conflicting political commitments." (p. 418)

"The most striking observation when analysing the practice of RIA is the large variability of process and outcome, not just between but also within jurisdictions. The variability concerns the process, the timing, the type and quality of knowledge produced, and the function of the knowledge in the policy process: *we found superficial RIAs done after all major decisions were taken*, with the only objective of complying with an administrative procedure. On the other hand, we also found – sometimes in the same country – excellent pieces of analysis carried out in parallel with the policy development process, analysing rigorously the major intended and unintended effects of different options which led to considerable instrumental learning on policy design." (p. 417)

Deighton-Smith, R., Erbacci. A., Kauffmann, C. (2016) Promoting inclusive growth through better regulation: the role of regulatory impact assessment

Figure 3. Different types of impacts integrated into RIA conducted on primary laws (2014)



European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?

"On balance, particularly in recent years, the audit has shown that impact assessment has been effective in supporting decision-making within the EU institutions. In particular, it was found that the Commission had put in place a comprehensive impact assessment system since 2002. Impact assessment has become an integral element of the Commission's policy development and has been used by the Commission to design its initiatives better. The Commission's impact assessments are systematically transmitted to the European Parliament and Council to support legislative decision-making and users in both institutions find them helpful when considering the Commission's proposals. However, the Commission's impact assessments were not updated as the legislative procedure progressed and the European Parliament and Council rarely performed impact assessments on their own amendments." (p. 6)

In the interinstitutional agreement on better law-making in 2003, the European Parliament, the Council and the Commission agreed "*... on the positive contribution of IAs in improving the quality of Community legislation, with particular regard to the scope and substance thereof*". (p. 11)

"IAs contribute to the decision-making processes by systematically collecting and analysing information on planned interventions and estimating their likely impact." (p. 14)

"The Commission rather uses IAs to gather and analyse evidence that, during the policy development process, is used to improve its proposed initiative." (p. 18)

"During the audit, users interviewed at the European Parliament and the Council generally indicated their support for IA. A large majority of respondents to the Council WP survey (68%) felt that the IA reports they had reviewed had a positive effect on the quality of the final legal act." (p. 23)

6.10 Additional information

De Smedt, P. (2010) The Use of Impact Assessment Tools to Support Sustainable Policy Objectives in Europe

"[...] there is still a potential gap between the contributions of researchers and the types of assessment tools that policy-makers seem most able or willing to use. Consequently, research outcomes do not fully reach the policy-makers. Specific initiatives are needed to shape the collaboration between science and policy. Further initiatives on IA tools should therefore include a joint collaboration between researchers and policy-makers to develop a shared understanding of what constitutes a satisfactory assessment, i.e., relevant, accurate, and legitimate, using the appropriate combination of scientific tools. To be effective, such initiatives should include a dialog between the two communities of practice during the phase of formulating the research agenda on IA tools. If collaboration between researchers and policy-makers evolves in such a way, using IA tools can be considered a frontline practice connecting science and policy in making sustainable development operational."

Bond, R., Curran, J., Kirkpatrick, C., Lee, N., Francis, P. (2001) Integrated Impact Assessment for Sustainable Development: A Case Study Approach

"At the procedural level it has been difficult to coordinate the timing of separate appraisals, to synchronise these with the timings of decisions in the planning cycle, and to incorporate participation in each stage of appraisal and decision making". (p. 1013)

Hertin, J., Jacob, K., Pesch, U., Pacchi, C. (2009) The production and use of knowledge in regulatory impact assessment – An empirical analysis

"Broadly, the concept of RIA follows a rationalist idea: the assessment is perceived as a value-free effort, objectives are provided either by the policy itself or they are lying outside the scope of RIA. It is meant to inform decision-makers who are separate from those involved in the assessment process." (p. 415)

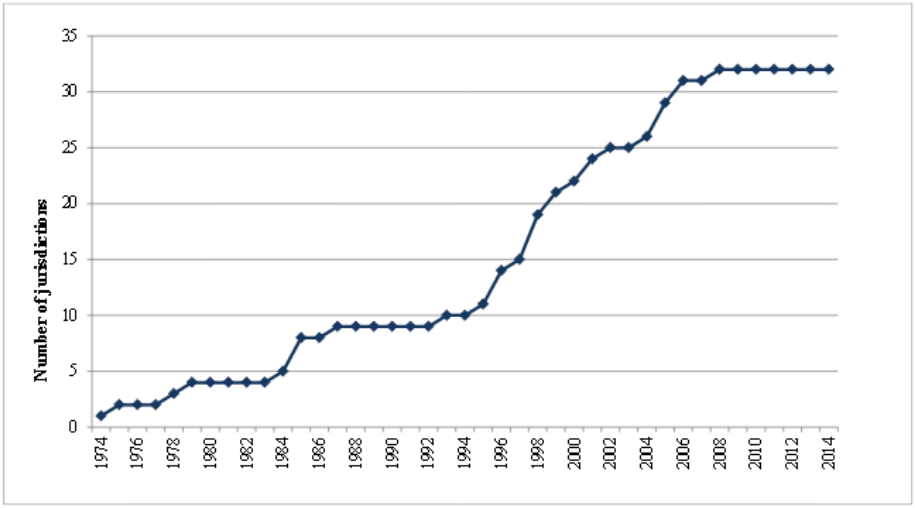
"In general, the prevailing view is that RIAs are largely an internal administrative process that does not require the active involvement of other institutions." (p. 416)

"Few countries have set up interdepartmental units that share the responsibility for the process, e.g. in the Netherlands, with the ministries of Justice, Environment and Economy responsible for the RIA. There were no cases where a ministry of the environment or social affairs is given the main responsibility." (p. 416)

Deighton-Smith, R., Erbacci. A., Kauffmann, C. (2016) Promoting inclusive growth through better regulation: the role of regulatory impact assessment

The use of RIA has spread rapidly across the OECD membership, over the past twenty years in particular (see Figure 1), and RIA requirements are consequently now almost universal. According to the 2014 OECD *Regulatory Indicators Survey*, 32 of 35 OECD member countries have now adopted a formal RIA requirement.

Figure 1. Trend in RIA adoption across OECD countries



European Court of Auditors (2010) Impact assessments in the EU institutions: do they support decision making?

COUNCIL WORKING PARTY SURVEY: MAIN OBSTACLES TO AN EFFECTIVE USE OF COMMISSION IMPACT ASSESSMENTS

Note: 93 responses.
Source: ECA Council working party survey (2009).