

Study

# Quantifying the benefits of regulatory proposals

International practice

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# 1 Introduction

## 1.1 Background

The formal requirement to conduct Regulatory Impact Assessments (RIAs)<sup>1</sup> is now a common feature of the rules of policymaking in almost all OECD countries as well as in the European Commission. RIAs are a form of ex-ante evaluation, used to systematically assess the negative (costs) and positive impacts (benefits) of regulatory proposals.<sup>2</sup>

In practice, RIAs focus more frequently on the costs than on the benefits of regulation. Two underlying drivers can be identified for this development: On the one hand it is driven by the methodological challenges of quantifying and monetising the benefits of regulation. On the other hand, it is the result of recent initiatives to cut red tape for businesses and citizens. For this purpose, new tools to assess the costs of regulation (for business, citizens and public administrations) have been developed and implemented. These include the introduction of the administrative burden measurements with the use of the Standard Cost Model (SCM) as well as the more recent initiatives to calculate the compliance costs of new regulation.

These developments have however led to a certain “cost bias” of most RIA-systems, which undermines the ambition to provide a rational, balanced assessment of the costs and benefits of new regulatory proposals. Hence, questions are raised concerning an adequate assessment of benefits in regulatory proposals.

## 1.2 Objectives and research questions

Against this background, the National Regulatory Control Council (*Nationaler Normenkontrollrat*) has commissioned Prognos to conduct a study into international practice of quantifying and monetising the benefits of new regulatory proposals. For the purpose of this study we differentiate between **quantification**, i.e. the numerical counting of impacts and **monetisation**, i.e. the attribution of monetary values to impacts.

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<sup>1</sup> For the purpose of clarity we use whenever reasonable, the widely used “RIA” as the uniform abbreviation for Regulatory Impact Assessments, rather than using the country specific abbreviations: IA = Impact Assessment (EU, UK), RIS = Regulatory Impact Statement (AUS), GFA = Gesetzesfolgenabschätzung (GER).

<sup>2</sup> For an overview of countries that have formally adopted the requirements to conduct Impact assessments see e.g. OECD (2009).

Methodological and practical challenges are most likely to occur in quantifying and monetising **intended and non-intended “societal” impacts of regulation (social and environmental)**. This is however independent from whether regulatory impacts are positive (benefits) or negative (costs). Usually, economic impacts are much more easily quantified and monetized, independent from the direction of the impact. This depends among other reasons on the lack of a market value for public goods but also on the higher methodological complexity of the assessment of societal impacts. Thus, this study focuses on the methodologies used to quantify and monetize the “societal” (social, health, environmental) impacts of regulation

More specifically, the following research questions, organised into three dimensions, have been addressed for this study:

### **1. Design and institutionalisation of RIA systems**

- Which (legal) rules, guidelines, etc. exist and what do they contain?
- Which organisation is responsible for conducting the quantification of benefits?
- How and where are the results of the assessment presented? Are they part of the regulatory proposal/draft regulation?

### **2. Current practice in assessing benefits of regulation**

- How are the benefits of regulatory proposals quantified?
- Which methods for quantifying and monetising the benefits of regulation are used?
- How are intangible /non-market benefits like improved water quality, improved health, social inclusion and a reduction of risk of death presented and quantified? The quantification should be explained using exemplary cases, also highlighting the data sources used.

### **3. Impacts and consequences**

- What are the costs of quantifying/monetising the benefits of regulation?
- Which impact does quantification/monetisation have on the political decision-making process?
- Which of the identified methods and approaches would be suitable for inclusion into the German policymaking process?

In addition to these research questions, Prognos understands this study as a scoping exercise to assess whether standardised

approaches, that have proven effectiveness for assessing the costs of regulation, can also be developed for the benefit side of regulation.

## 1.3 Approach

To address these research questions Prognos carried out a study of four international RIA systems (Australia, European Commission, United Kingdom, USA) and compared them to current practice in Germany. For each RIA system, information was collected following a standard template of research questions. The evidence was collected from three main sources:

1. **A review of relevant documents and academic literature.** The review focused on publications by the responsible agencies for RIAs and external reviews and assessments of the RIA processes by other bodies within the systems (e.g. Audit Offices, independent boards). The review was supplemented by publications from additional sources such as international organizations (e.g. OECD) and recent academic publications.
2. **An assessment of a sample of RIAs.** To analyse the assessment of benefits in practice and to generate examples of interesting practice Prognos selected and reviewed a sample of 20 RIAs from the five countries.
3. **Research interviews** with country experts. A total of 10 semi-structured interviews had been conducted with experts from all five countries. The interviews were in particular used to validate the findings from the document review and to gather assessments of the actual practice of assessing benefits in the countries.

Further details about the chosen methodologies can be found in the respective chapters of this report. The research underlying this report was undertaken in two phases between November 2012 and January 2013.

## 1.4 This report

This report constitutes the second and final report on the quantification and monetisation of benefits in assessing new regulatory proposals. This second report builds on and incorporates the findings of the first report.

The report consists of six parts. This introduction is followed by chapter 2, which presents the institutional frameworks in which RIAs are conducted in five selected jurisdictions. Chapter 3 then introduces common approaches for quantifying and monetising benefits and social impacts, based on available guidance and handbooks. Based on the analysis of a sample of RIAs the

following chapter 4 illustrates, how these methods are applied in practice in the four international jurisdictions. The overview of the methods is subsequently contrasted with an assessment of the wider practice of quantifying benefits in the respective jurisdictions (Chapter 5). We first provide a system-wide overview of the level of quantification and monetisation of RIAs, before discussing the resources required for quantification and the actual use of RIAs in policy making in the respective countries. Finally, chapter 6 summarises the key findings of the research and develops recommendations for Germany.



## 2 The institutional background of RIA

### 2.1 Selection of RIA systems

For the present study, four international Impact Assessment systems were selected, in order to analyse the practice of quantifying and monetising benefits of regulation, as well as to compare them with the current system in Germany. Those four systems were selected on the basis that all of them offer some form of good practice for dealing with benefits and social impacts in RIAs. These systems are:

1. Australia (Commonwealth and COAG)
2. European Commission
3. United Kingdom
4. United States

This chapter provides an overview of key institutional features of the selected systems as well as Germany. For each of the cases we present short country<sup>3</sup> profiles, before comparing some of the key institutional features of the RIA systems in which the assessment of benefits takes place.

### 2.2 Country Profiles

#### 2.2.1 Germany

The German RIA system dates back to the development of a list of “test-questions on the necessity, effectiveness and comprehensibility of Federal Government legislative plans“ in 1984.<sup>4</sup> The introduction of a mandatory RIA system followed in 2000, which was developed further in 2006 and 2011. The main legal foundation for the preparation of a RIA are the Joint Rules of Procedure of the Federal Ministries (Gemeinsame Geschäftsordnung der Bundesministerien/GGO). According to the GGO, a RIA is to be prepared for all legislative proposals of the Federal Government, all ordinances and administrative regulations.

Currently, a number of guidelines developed by the Federal Ministry of the Interior are available to support ministries with the

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<sup>3</sup> For the remainder of this study, we consider the term country to also include the RIA-System of the European Commission.

<sup>4</sup> This list contained ten questions each having several sub-questions, which, for each legislative draft, had to be taken into account by the relevant ministry in charge.

preparation of an RIA: “Leitfaden zur Gesetzesfolgenabschätzung“ (2000), “Handbuch Gesetzesfolgenabschätzung“ (2001) and “Arbeitshilfe zur Gesetzesfolgenabschätzung“ (2009).

The GGO prescribes an integrated approach to assessing the impacts of regulation, requiring an assessments of all major intended and unintended consequences of a regulatory proposal (GGO § 44). The RIA Handbook recommends the use of cost-benefit analysis, cost-effectiveness analysis or multi-criteria analysis. In addition, further impact tests have to be conducted within the RIA. These include for example the specific sustainability impact assessment introduced in 2009,<sup>5</sup> the estimation of compliance costs and administrative burden, the assessment of further costs for business and SMEs as well as an assessment of the financial implications for the Länder and local government.

With the introduction of a special requirement to assess the compliance costs and administrative burden (as defined in the Standard Cost Model) of new regulation, and the creation of the National Regulatory Control Council (NKR) - as a body to support the German support its deregulation policies as well as to support better regulation - the focus of the German system lies very much on the costs of regulation. Specific guidance has been published for this purpose<sup>6</sup> and the NKR regularly reports on the development of compliance costs, progress in reducing bureaucratic burden and improvements of the compliance cost methodology.

The NKR is the central advisory and reviewing body for de-bureaucratization and better law-making of the German federal government. It was established as an independent body (members are appointed for five years) in 2006 by the law for the implementation of a National Regulatory Control Council (NKRK). The NKR is commissioned to review draft legislation with regard to the presentation of the compliance costs in legislative drafts. Furthermore, the NKR may also “examine the methodologically appropriate implementation and comprehensible presentation of the aspects laid down in Section 4(2) NKRK”.<sup>78</sup> The NKR has however no mandate for monitoring compliance with the wider RIA

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<sup>5</sup> The sustainability impact assessment requires an assessment whether the objectives of the National Sustainability Strategy will be affected by the regulatory proposal. There exists, however, no further guidance on such an assessment so far. For an example of how such guidance could look like see Tiessen et al. (2011). The Federal Ministry of the Environment has recently initiated a research project to develop such a methodology.

<sup>6</sup> See: Statistisches Bundesamt [Hrsg.] (2006) and Statistisches Bundesamt [Hrsg.] (2011).

<sup>7</sup> Nationaler Normenkontrollrat (2012).

<sup>8</sup> These additional aspects are found in Section 4(3) of the GGO: Objective and necessity of the regulation; other possible solutions (alternatives); time of entry into force, time limit, and evaluation; simplification of legal and administrative procedures; one-to-one transposition of directives or other legislative acts of the EU into national laws (so-called gold planting).

standards, e.g. the estimation of budgetary effects of planned regulations or questions of sustainability.

As the NKR is, according to the GGO, involved in the legislative process in the same way as a ministry, all ministerial drafts are to be submitted to the NKR by beginning of the coordination process within the Federal Government at the latest. Upon its completion, the NKR submits a formal opinion to the ministry in charge of the regulation, which will be part of the cabinet bill submitted to parliament. This way the NKR statement is published.

Past its reviewing role, the NKR has been very much engaged in several projects intended to reduce existing burdens by examining different procedures, for example the procedure for receiving a grant under the Federal Training Assistance Act (BAföG).<sup>9</sup> The NKR and the German government developed the “Guidelines on the Identification and Presentation of Compliance Costs in Legislative Proposals by the Federal Government (2011)” and encouraged the OECD to create an international guideline for estimating compliance costs.

A further important body in Germany is the Federal Statistical Office.<sup>10</sup> It supports, on standby demand, the Federal Government, the Bundestag and Bundesrat especially through data analysis and the estimation of compliance costs.<sup>11</sup> Furthermore, the Office is commissioned to establish and to maintain those databases that are necessary for the reporting and monitoring set out in the NKRK.

## 2.2.2 Australia

Australia has a long tradition in the preparation of RIAs in its legislative process, both on the Commonwealth and the state level. Yet, between 1985 and 1997 a RIA had to be conducted only in certain circumstances. Currently, a number of different RIA-systems exist in Australia, two RIA systems at the federal level and additional systems at the state/territory level.<sup>12</sup>

The Australian RIA system was strengthened in the late 1990s. The basis for the preparation of a RIA on the federal level in Australia is administrative in nature – there is no legal basis as such. The Legislation Handbook defines rules and procedures of government in drafting legislation. According to the Legislation

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<sup>9</sup> Nationaler Normenkontrollrat (2012).

<sup>10</sup> The tasks of the Federal Statistical Office are laid down in § 8 of the German National Regulatory Control Council Act.

<sup>11</sup> Compare § 8 NKRK (2011).

<sup>12</sup> The first requirements for RIAs were actually introduced at the state level, today all ten Australian jurisdictions (The Commonwealth, each state and territory, and the Council of Australian Governments (COAG)) have established RIA processes. For an overview see Productivity Commission (2012).

Handbook a RIA is “to be prepared for all proposed new or amending legislation which directly affects business or which has significant indirect effect on business”. This includes even (international) treaties.

The rules and procedures on how to conduct a RIA are established in handbooks and government guidelines. The “Best Practice Regulation Handbook” (2010) applies to all Australian Government departments, agencies, statutory authorities and boards on the federal level reviewing or making regulations that have the abovementioned impact. For regulatory proposals introduced by the Council of Australian Governments (COAG)<sup>13</sup>, Ministerial Councils and intergovernmental standard-setting bodies, the “COAG Best Practice Regulation Guidelines” (2007) apply. For COAG all significant regulatory proposals have to be accompanied by a RIA.

With regard to the methodological approach, both abovementioned systems, involving the federal level, are very much committed to the use of cost-benefit analysis. When it is difficult to monetize the most important impacts, a cost-effectiveness analysis is to be pursued.

In both systems, the central body for assisting governmental bodies in the preparation of a RIA is the Office of Best Practice Regulation, a unit in the Department of Finance and Deregulation. Its central responsibility is to decide, whether a RIA needs to be prepared, to provide advice in the preparation process of the RIA and to assess if a prepared RIA meets the quality standards of the respective guidelines. Yet, it has no veto power to block a regulatory proposal, if the relevant RIA is to be assessed non-compliant with the guidelines.

The Australian RIA-system knows two more advisory and review bodies on regulatory policy: the Deregulation Policy Division and the independent Productivity Commission. The first is part of the Department of Finance and Deregulation and advises the Government on deregulation policy especially on the measurement and minimization of costs. Furthermore it serves as secretariat and provides support to the COAG Business Regulation and Competition Working Group.<sup>14</sup> The Productivity Commission is the Australian Government's independent research and advisory body and advises, broadly speaking, on a range of economic, social and environmental issues affecting the welfare of Australians. It does not assess RIAs on a regular basis, but evaluates existing regulatory regimes.

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<sup>13</sup> Members of COAG are the federal government, the governments of the six states and two mainland territories as well as the Australian Local Government Association.

<sup>14</sup> Compare OECD (2010).

### 2.2.3 European Commission

In line with the agreements of the Gothenburg and Laeken Summits of the European Councils, the European Commission (EC) reformed the standards for RIA in 2002, replacing a RIA-system, which used to follow a single-sector type assessment approach. The current integrated Impact Assessment system has been introduced in 2003, and has been further strengthened as an element of the Lisbon Strategy for Growth and Jobs (2005). Its key characteristic is the assessment of all significant economic, social and environmental impacts in one integrated analytical exercise.

Currently, the “Impact Assessment Guidelines (2009)”<sup>15</sup> serve as general guidance to the Commission and its services for assessing potential impacts of policy proposals. According to the guidelines, Impact Assessments are required for all Commission initiatives that are likely to have significant impacts. However, the final decision on which initiatives an Impact Assessment needs to be prepared by the lead services, is taken each year by the Secretariat-General and the respective departments on the basis of the information that the services need to make public in the Roadmaps<sup>16</sup>.

With regard to the methodological approach for conducting an Impact Assessment, the European Commission requires the assessment of all relevant costs and benefits. It is committed to the use of cost-benefit analysis, cost-effectiveness analysis and multi-criteria analysis. Quantification should always be used to the extent possible. If this is not possible or proportionate in a particular Impact Assessment, it always needs to be explained.

The key quality assurance body within the system is the Impact Assessment Board (IAB). The IAB has to issue an opinion on every Impact Assessment report, before the (revised) Impact Assessment report together with the IAB opinion may be introduced into inter-service consultation. The IAB Opinion contains recommendations for the improvement of the IA that need to be addressed before the next stages in Commission decision making. Furthermore, the IAB may instruct the lead services to resubmit the revised IA, in cases where it feels that the quality of the report falls so far short of the requirements laid out in the guidelines, that it wishes to review the case and issue a new Opinion on the revised IA. In the course of preparation, the IAB may also provide the lead services with support and advice. Although the IAB is not charged with a formal right to veto a proposal due to an insufficiently robust IA, the President of the EC

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<sup>15</sup> EU-Commission (2009b).

<sup>16</sup> [http://ec.europa.eu/governance/impact/planned\\_ia/planned\\_ia\\_en.htm](http://ec.europa.eu/governance/impact/planned_ia/planned_ia_en.htm)

stated in 2010 that “in principle a positive opinion from the IAB is needed before a proposal can be put forward for decision.”<sup>17</sup>

## 2.2.4 United Kingdom

The United Kingdom introduced comprehensive Impact Assessments in 1998 to assess the influence of new and existing regulations on business, the public administration and the third sector (earlier approaches focussed on compliance costs for business). Relevant laws guiding the better regulation efforts in the UK are the *Legislative and Regulatory Reform Act* of 2006 and the *Regulatory Enforcement and Sanctions Act* of 2008. The former replaced the *Regulatory Reform Act* of 2001 in order to simplify the process necessary to reduce regulatory burdens. The latter is mainly seeking to advance a risk-based, proportionate and effective regulatory system both on national and local level, inspired by the so-called Hampton Report. However, the process of Regulatory impact assessment is not part of these laws and does not have a formal legal basis.

Recently, the current Coalition Government shifted the attention towards a new approach of cutting back regulations and administrative burdens, called “One-In, One-out Rule”, introduced in 2010 and applying to regulations from January 2011 onwards.<sup>18</sup> The underlying idea is that increases in the cost of regulation for business must be offset by finding deregulatory measures of at least an equivalent value. Thus for every new regulation (“IN”) an Equivalent Annual Net Cost to Business (EANCB) is calculated,<sup>19</sup> which must be offset by a reduction of costs of at least equivalent size (“OUT”). Every 6 month, the government reports on departments’ performance against this target.<sup>20</sup> This approach will be strengthened in early 2013 and be changed into “One-In, Two-Out Rule”.

According to the relevant guidance, “*Impact Assessments are generally required for all UK Government interventions of a regulatory nature that affect the private sector, civil society organisations and public services. They apply regardless of whether the regulation originates from a domestic or international source*”.<sup>21</sup> In a recent attempt to streamline the RIA system, a fast track option, requiring a “light” RAI only, was introduced for

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<sup>17</sup> EU-Commission, Impact Assessment Board [IAB] (2011).

<sup>18</sup> For details see on the methodology see BIS (2011b).

<sup>19</sup> The EANCB represents the annualized direct net cost to business, incorporating direct recurring costs and transition costs, direct recurring benefits, and direct transitional benefits, spread out over the lifetime of the policy.

<sup>20</sup> See the latest report BIS „Fifth Statement of New Regulation“ (December 2012): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/36833/12-p96c-fifth-statement-of-new-regulation.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/36833/12-p96c-fifth-statement-of-new-regulation.pdf)

<sup>21</sup> A detailed description of when RIA is required can be found in the Impact Assessment guidance of BIS (2011c).

regulations with an impact of fewer than 1 million pounds of cost to business per year.<sup>22</sup>

In 2009, the responsibility for quality control of RIAs was shifted from the Better Regulation Executive (BRE) to the Regulatory Policy Committee (RPC). Additionally, until 2010 the National Audit Office (NAO) provided annual in depth evaluations of the capacity of government departments to conduct Impact Assessments. The last NAO report was issued in 2010, analyzing a random sample of RIAs of the years 2008 to 2009.

RPCs task is to provide independent quality control of all RIAs, apart from those that fall under the fast track option and are not part of the one-in, one-out rule. However, its power in the policy-making process is limited to issuing opinions that are then reviewed together with the RIA by the Regulation Reduction Committee (RRC), which was founded as a cabinet sub-committee in 2010 and has to give its clearance before proposals are sent to the Cabinet for final decision. RPC established a system of green (fit for purpose), amber (fit for purpose with limitations that should be addressed) and red (not fit for purpose) flags to show the quality of RIAs. Those opinions are only published when the Government proceeds with a regulation that was judged with a red flag.

The preferred analytical tools for RIAs are cost-benefit and cost-effectiveness analysis; however, in case of non-monetary benefits and costs, a multi-criteria analysis is also regarded as a possibility.<sup>23</sup>

## 2.2.5 United States

The first Impact Assessments with systematic cost-benefit analysis were introduced in the US in 1974. Subsequently the system was expanded and firmly institutionalised. The administrative framework for today's RIAs is given by Executive Order 12866 (*Regulatory Planning and Review*) of 1993 directing agencies to *“assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider”*.<sup>24</sup> President Obama reaffirmed those principles in 2011 by Executive Order 13563 (*Improving*

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<sup>22</sup> However, RPC continues to validate the impact on business of all policies that are in the scope of “One-In, Two-Out”.

<sup>23</sup> Compare BIS (2011) and HM Treasury (2003): p. 58.

<sup>24</sup> US Office of the President (1993): EO 12866 Sec 1 (a).

*Regulation and Regulatory Review*) and additionally highlighting the need for retrospective analysis of existing regulations.<sup>25</sup>

Impact assessments are required for all “economically significant” regulatory proposals issued by regulatory agencies.<sup>26</sup> Economically significant regulations are those with an impact of more than 100 million dollar per year or an expected adverse impact on the economy.

Quality control is embodied in the Office of Information and Regulatory Affairs (OIRA) which is part of the Office of Management and Budget (OMB). OIRA exhibits a veto position in the legislative process as regulatory proposals need to be approved by OIRA before being published in the Federal Register and proceeding in the legislative process.

According to Circular A-4, the guidance document for RIAs issued by the OMB, a primary tool for regulatory analysis is a cost-benefit analysis. However, an additional cost-effectiveness analysis is recommended for rulemakings for which the primary benefits are improved public health and safety (Circular A-4). In case of non-monetary impacts, a qualitative discussion is required. Each year, OMB publishes a Report to Congress on the Benefits and Costs of Federal Regulations showing costs and benefits of each RIA and providing an aggregate sum of costs and benefits being associated with regulations in the fiscal year.

## 2.3 Comparison of key institutional features

### 2.3.1 Legal basis and scope

None of the countries we reviewed has specific requirements to assess the benefits of regulatory proposals; instead the assessment of benefits is integral part of the general requirement of conducting RIAs for new regulatory proposals.

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<sup>25</sup> US Office of the President (2011): EO 13563, Sec. 1b highlights the commitment to relieve business and civil society from regulatory requirements. The order was explicitly formulated as a complement to EO 12866 and emphasises - inter alia - the importance of public involvement, promotion of innovation and integration of proposed regulation across departments as well as improvement of methods of quantification. The introduction of retrospective assessment is its most important supplement (compare EO 13563, Sec. 6). Within 120 days after its execution, all federal authorities had to develop a retrospective plan in order to introduce a continuous ex-post assessment of regulations within their authorities. The aim is to identify and to abolish obsolete, inefficient and superfluous regulations. For more detailed information, see: <http://exchange.regulations.gov/exchange/topic/eo-13563>

<sup>26</sup> However, IAs by independent agencies are not part of OMBs evaluation. Those are revised by GAO and as stated in the OMB Report Draft of 2012, none of those monetized costs or benefits.



RIA procedures are usually regulated in internal rules of procedures (Australia, Germany, USA, UK) or in the form of commitments (EC) (Table 1).<sup>27</sup>

The scope of the RIA systems is fairly comprehensive i.e. the requirement to conduct RIAs covers a wide range of government activities in Australia, the European Commission, the United Kingdom and Germany. For the United States it is important to note that the RIA system reviewed here only covers the federal agencies<sup>28</sup>, not legislative bills of the Congress. The United States and United Kingdom use thresholds. Therefore only economically significant proposals with an expected annual impact of more than \$100 million or £5 million respectively have to be reviewed.<sup>29</sup>

All systems under study, except for the US, follow the practice of attaching the RIA to the regulatory proposal. In the US, the process differs because RIAs are only conducted for regulations of federal agencies and not for Congress acts. Hence, RIAs are not part of the legislative process but regulations and RIAs are published in the Federal Register and RIAs can be found on [www.regulations.gov](http://www.regulations.gov). This is the central U.S. government site that provides access to agency regulations and allows all members of the public to submit comments electronically on proposed regulations. After the consultation and OIRA approval, the final version is once again published in the Federal Register.

RIAs are also published in the other countries under study in one publicly accessible Impact Assessment register, except for Germany. In Germany, RIAs and NKR's formal opinions are publicly available after the official publication by Parliament.

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<sup>27</sup> The requirements to assess standard and compliance costs in Germany are however on a statutory basis (Gesetz zur Einsetzung eines Nationalen Normenkontrollrates).

<sup>28</sup> US Office of the President (1993): EO 12866 Section 1 a.

<sup>29</sup> Unless other reasons make it a significant proposal, like substantive negative health effects etc. (see Table 2).

Table 1: Legal basis and scope

Feature	Australia	European Commission	United Kingdom	USA	Germany
<b>Legal basis or administrative guidelines for conducting RIA</b>	Administrative guidance: Best Practice Regulation Handbook (2010) COAG Best Practice Regulation Guidelines (2007)	The EC has committed itself to the use of RIAs in several communications: Better Regulation for Growth and jobs in the European Union COM(2005) 97 final Communication of the Commission on Impact Assessment COM(2002) 276 final Action Plan "Simplifying and Improving the Regulatory Environment" COM(2002) 278	Broader Legal Framework Legislative and Regulatory Reform Act (2006) Regulatory Enforcement and Sanctions Act (2008) RIA itself does not have a legal basis Requirement for RIA are derived from several guidance documents and handbooks.	Administrative requirement: EO 12866 Regulatory Planning and Review (1993) EO 13563 Improving Regulation and Regulatory Review (2011)	§§ 43 and 44 Joint Rules of Procedure of the Federal Ministries (GGO, 2011) Law for the implementation of a National Regulatory Council (2011)
<b>Scope of ex ante assessments</b>	RIAs are "to be prepared for all proposed new or amending legislation which directly affects business or which has significant indirect effect on business" After consultation of the OBPR, the latter decides whether RIA needs to be prepared.	RIAs are to be prepared for all Commission initiatives that can be expected to have significant economic social or environmental impacts, According to the Impact Assessment guidelines, encompassing: • all legislative proposals of the Commission's Legislative and Work Programme (CLWP); • all non-CLWP initiatives and legislative proposals having significant impacts. • For all remaining initiatives the need to carry out an Impact Assessment is decided each year by the Secretariat-General, and the services concerned.	Impact Assessments are generally required for all UK Government interventions of a regulatory nature that affect the private sector, the third sector and public services. In particular, if they: • "impose costs or reductions of costs of more than £5m (equivalent annual costs) or "which are contentious in some way". <sup>30</sup> • Impose administrative or reporting burden • Cause some form of redistribution in the public, private or third sector • Or that require a agreement on UK negotiating positions on EC proposals or other international agreements" <sup>31</sup>	RIA is mandatory for "economically significant regulatory action", referring to "any regulatory action that is likely to result in a rule that may: • "Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities" <sup>32</sup>	All legislative proposals prepared by the federal government.
<b>Use in legislation and Publication</b>	RIA (and one page summaries) are part of the preparation of	The RIA accompanies the regulatory proposal	RIAs accompany the regulatory proposal at all stages:	RIAs accompany publications of regulations after OIRA concludes its	Impacts ( <i>Gesetzesfolgen</i> ) are to be presented in the

<sup>30</sup> Compare: HM Treasury Website 2012

<sup>31</sup> Compare: HM Treasury Website 2012

<sup>32</sup> See: US Office of the President (1993): EO 12866, Section 3(f)

Feature	Australia	European Commission	United Kingdom	USA	Germany
	<p>government decisions; RIA is attached to bills and legislative proposals.</p> <p>A central register on the OBPRs webpage lists all RIAs, including those assessed as non-compliant as well as OBPRs assessments.</p>	<p>of the Commission. All RIAs and IAB's opinions are published once a proposal has been adopted by the Commission. They follow a standard structure.</p>	<ul style="list-style-type: none"> <li>Part of the consultation document</li> <li>attached to the Government bill;</li> <li>attached to the final Act</li> </ul> <p>Since 2007 uniform template for RIAs, all RIAs are published online in the IAlibrary.</p>	<p>review under Executive Order 12866.</p> <p>A uniform structure is required by Circular A-4, published in the Federal Register and <a href="http://www.regulations.gov">www.regulations.gov</a></p>	<p>statement of legislative intent (<i>Gesetzesbegründung</i>)</p> <p>There is no central, publicly accessible register of RIAs, but parliament publishes government bills.</p>

### 2.3.2 Organisation

The organisation of the RIA systems in the five compared systems follows broadly similar organisational patterns. In all systems the organisation developing the regulatory proposal is also responsible for drafting the RIA assessing the impacts of the proposal. In some systems (e.g. UK and EC), specific impact assessment units within the departments/agencies provide support to the responsible unit within the organisation.<sup>33</sup> In all systems but Germany the RIAs are reviewed by a specific body responsible for ensuring the quality of RIAs. In Germany the review by the NKR covers only the specific aspects of compliance cost and the Standard Cost Model. However, these bodies are not necessarily independent. In Australia this body is part of the Department of Finance and Deregulation, the Impact Assessment Board of the European Commission is an independent body operating under the direct responsibility of the President of the European Commission.

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<sup>33</sup> In the USA a Regulatory Policy Officer within each agency is responsible for the compliance with the principles of EO 12866 (EO 12866 Sec. 6 a (2))

In terms of setting standards and providing guidance on how to conduct RIAs, the level of centralisation varies. While the European Commission, alongside the BRE and the OBPR provide extensive guidance for conducting RIAs, the agencies in the US develop guidance documents on their own. An overview of key organisational features is provided in Table 2.

*Table 2: Organisational features of RIA systems*

Feature	Australia	European Commission	United Kingdom	USA	Germany
<b>Responsibility for drafting RIAs (and assessment of benefits)</b>	Department, agency, statutory authority, council or committee standard-setting body	DG, assisted by IA units within the DGs, in cooperation with other DGs in a formal Inter-service Steering Group	Department/ agency assisted by Better Regulation Units (BRUs) within each department	Agencies and Departments	Departments
<b>Quality assurance</b>	Office of Best Practice Regulation (OBPR), within the Department of Finance and Deregulation	Impact Assessment Board (IAB), an independent body under the direct responsibility of the President of the European Commission	Regulatory Policy Committee (RPC)	Office of Information and Regulatory Affairs (OIRA) within Office of Management and Budget (OMB)	Nationaler Normenkontrollrat No external quality assurance of the RIA process (except for administrative costs and compliance costs)
<b>Responsibility for standard setting and guidelines</b>	The Office of Best Practice Regulation (OBPR), within the Department of Finance and Deregulation	Secretariat-General (after consultation with other Commission services)	Better Regulation Executive within the Department for Business, Innovation and Skills; HM Treasury	Each agency produces own guidance documents, OMB issues general guidance.	Non-binding guidance published by Federal Ministry of the Interior

### 2.3.3 Guidance and stakeholder specific requirements

All international systems we reviewed have developed substantial guidance documents/handbooks to support the lead units in drafting impact assessments. These documents outline the requirements for the structure, analytical approach and key procedural steps to be taken. Although not necessarily legally binding, these documents might develop a strong factual effect (quasi-law) like in the UK, because a department might not be able to proceed with a regulatory proposal unless it complies with the rules set out in the guidance. The guidance documents also provide summaries and explanations of methods and approaches to be used in assessing impacts, quite often explicitly also providing guidance on how to assess social/environmental impacts. In addition, specific tools and guidance are available for specific aspects of RIAs, such as a Business Cost Calculator (AUS), or guidance on how to conduct an equality assessment (UK).

The RIA systems reviewed here all have a strong focus on costs and the impact of regulation on business and the economy. This is

shown by specific assessment requirements, e.g. special impact tests for small and medium enterprises (SME) or specific compliance and business cost calculations. This focus is probably strongest in Australia and the United Kingdom, however this does not exclude an ambition to also include social, health and environmental impacts in the analysis. As an integrated impact assessment system, the EC provides for the most balanced focus on types of impacts and stakeholders.

Table 3: Guidance and stakeholder specific requirements

Feature	Australia	European Commission	United Kingdom	USA	Germany
<b>Guidance and Handbooks</b>	Federal Level: Best Practice Regulation Handbook (2010); COAG: COAG Best Practice Regulation Guidelines (2007) Further Guides e.g.: Business Cost Calculator User Guide (2009) or Guidelines to Annual Regulatory Plans (2010)	Impact Assessment Guidelines and its Annexes 1-14 (2009) Further, specific guidance provided by certain DGs, for example: DG Employment and Equal Opportunities: Guidance for Assessing Social Impacts (2009)	HM Treasury's Green Book (2003) BRE Impact Assessment Toolkit (2011)	Circular A-4 (2003) and Primer (2011) Agency Checklist for RIA (2010) Bulletin for Agency Good Guidance Practices (2007)	<i>Leitfaden Gesetzesfolgenabschätzung (2000)</i> <i>Handbuch Gesetzesfolgenabschätzung</i> (only available as hard copy book) (2001) <i>Arbeitshilfe Gesetzesfolgenabschätzung (2009)</i>  Further guides: Einführung des Standardkosten-Modells - Methodenhandbuch der Bundesregierung (2006), Guidelines on the Identification and Presentation of Compliance Costs in Legislative Proposals by the Federal Government (2011)
<b>Level of obligation of guidance and handbooks</b>	The Best Practice Regulation Handbook (2010) requirements have to be met. It sets out key procedural steps. The COAG Best Practice Regulation Guidelines (2007) should serve as the first source of direction while preparing a RIA. It sets out key procedural steps.	The Impact Assessment Guidelines and its Annexes 1-14 (2009) are binding for Commission staff preparing impact assessments. They set out key analytical steps.	The Green Book and the IA Toolkits and Guidance are not "legally" binding, however they are so de facto. There is also a uniform structure for all Impact Assessments, laid out in the IA Template.	Agencies and OMBs guidance documents are not legally binding.	Guidelines concerning Gesetzesfolgenabschätzung (RIA) are not binding. The review of the presentation of compliance costs is conducted according to Guidelines of the Federal Government.
<b>Focus on stakeholder specific impacts</b>	Impacts on all affected stakeholders should be assessed. Special impact tests for business and compliance costs for SMEs.	Impacts on all affected stakeholders should be assessed. Specific impact assessments for business, SMEs, administrative costs. etc.	Assessment of influence on private sector, third sector and public services. Specific impact tests for: Competition, Small Firms, Legal Aid, CO2 etc.	Impacts on all relevant stakeholders should be assessed. Specific impacts to be regarded: economic, environmental, public health, safety, distributive impacts, human dignity, fairness and equity.	Impacts of the regulation ( <i>Gesetzesfolgen</i> ); Compliance costs for Business, Citizens and Administration. Other costs for business, in particular SMEs and consumers. Sustainability impact assessment.
<b>Links</b>	<a href="http://www.finance.gov.au/obpr/proposal/gov-requirements.html#handbook">http://www.finance.gov.au/obpr/proposal/gov-requirements.html#handbook</a>	<a href="http://ec.europa.eu/governance/impact/key_docs/key_docs_en.htm">http://ec.europa.eu/governance/impact/key_docs/key_docs_en.htm</a>	<a href="http://www.bis.gov.uk/policies/bre/assessing-impact">http://www.bis.gov.uk/policies/bre/assessing-impact</a> <a href="http://www.hm-treasury.gov.uk/data/greenbook_impact_assessments.htm">http://www.hm-treasury.gov.uk/data/greenbook_impact_assessments.htm</a>	<a href="http://www.whitehouse.gov/omb/circulars_a004_a4">http://www.whitehouse.gov/omb/circulars_a004_a4</a> <a href="http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/RIA_Checklist.pdf">http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/RIA_Checklist.pdf</a> <a href="http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2007/m07-07.pdf">http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2007/m07-07.pdf</a>	<a href="http://www.bmi.bund.de/DE/Themen/OeffentlDienstV/erwaltung/Buerokratieabbau/Gesetzesfolgenabschaetzung/Bund/gesetzesfolgeabschaetzung_bund_no_de.html">http://www.bmi.bund.de/DE/Themen/OeffentlDienstV/erwaltung/Buerokratieabbau/Gesetzesfolgenabschaetzung/Bund/gesetzesfolgeabschaetzung_bund_no_de.html</a>

## 3 Methodological approaches for quantifying and monetizing non-market impacts of regulation

### 3.1 Introduction

This chapter provides an overview of the methods for quantifying and monetising the societal/non-market impacts of regulation. This review is based on the methods and approaches suggested in the handbooks and guidance documents of RIA systems under study. Thus, it does not necessarily reflect, and might go beyond, the methods which are actually used in practice. This review differentiates between two types of methods:

1. **Analytical frameworks** used to structure an analysis
2. **Methods for quantification and monetisation of non-market impacts**

The assessment of impacts of a regulatory proposal usually consists of the analysis of not one, but a number of specific impacts. To structure the analysis, different analytical frameworks are used, which ease the comparison between positive and negative impacts of a regulatory proposal and which allow for a comparison between policy alternatives. Specific methods are however required to assess the different impacts within these broader frameworks.

### 3.2 Analytical frameworks

The commonly recommended frameworks introduced here differ by the extent of monetisation and quantification required, as well as the comprehensiveness of impacts included in the analysis.<sup>34</sup>

#### 3.2.1 Cost-Benefit analysis (CBA)

Cost-benefit analysis is the most challenging technique from the methodological perspective for assessing the expected impacts of a regulatory proposal because CBA requires that all significant impacts are to be expressed in monetary terms.

CBA aims to express all the impacts, positive or negative, in monetary terms and to identify the net-benefit, i.e. the sum of all costs and benefits of a regulatory proposal. The underlying idea is that regulatory proposals should only be pursued as long as they

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<sup>34</sup> Tiessen (2010).

provide a net-benefit to society. If not all costs and benefits can be monetized, the validity of the CBA will be limited.

In calculating the net-benefit CBA considers that costs and benefits can occur at different times. Costs are often incurred immediately, while benefits accrue over a longer time period. However, as today's costs and benefits are valued higher than those that occur later, the costs and benefits of future benefits have to be discounted, usually by applying standard (annual) discount rates.<sup>35</sup>

Having conducted the discounting exercise, all costs and benefits can be expressed as their net present value (NPV).

### 3.2.2 Cost-Effectiveness Analysis (CEA)

When the benefits of a regulation are difficult to monetise a cost-effectiveness analysis (CEA) can be conducted. In a cost-effectiveness framework the monetised costs are compared to one or several quantified (but not monetised) effectiveness measures. CEA thus requires a full monetisation of costs and a quantification of the expected benefits. A CEA could for example compare the cost-effectiveness of different measures to reduce traffic fatalities. As a result of the analysis different costs per avoided road fatalities could be compared and the most cost effective measure chosen. However this method does not attribute a monetary value to the benefit, i.e. life saved.

### 3.2.3 Multi-Criteria Analysis (MCA)

Multi-criteria analysis (MCA) is finally the “softest” approach of comparing the costs and benefits of a policy. MCA is a way of systematically comparing the positive or negative impacts of a regulatory proposal in a structured way. In a MCA specific criteria are defined to compare policy options. Quantitative as well as qualitative information is then analysed according to these criteria and the impact on each of the criteria is estimated. These assessments can then be made comparable by conducting a scoring exercise. In such an exercise, qualitative information is made more comparable by scoring each impact according to its severity on a scale (e.g. from 1 to 5, or from “very weak” to “very strong”).

MCA does not require a full quantification or monetisation of costs or benefits; however it does not allow an optimal or best option to be clearly identified, as different types of information – monetary,

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<sup>35</sup> The main reasons for discounting costs and benefits are: Firstly to account for time preference, i.e. individuals place a higher value on a benefit they obtain today than on a benefit they will obtain in the future, secondly to reflect the uncertainty of future benefits, and thirdly to adjust for price inflation over time. Compare e.g.: OECD (2008).



quantitative and qualitative – have to be weighed against each other.<sup>36</sup>

### 3.2.4 Analytical approaches in the countries

CBA analysis has been consistently promoted by OECD as the desirable standard for conducting RIAs<sup>37</sup> and CBA is the preferred method for RIAs in Australia, UK and the USA. The EU Impact-Assessment guidelines encourage “cost-benefit thinking” CBA is however presented as only one approach for comparing impacts.

Nevertheless, all systems acknowledge the difficulty in monetising and quantifying all impacts of a regulatory proposal and thus also allow for partial CBA, CEA or even multi-criteria analysis to be conducted.<sup>38</sup>

## 3.3 Methods for quantification and monetisation of non-market impacts

On the first glance, there is a wide variety of methods for quantification and monetisation of non-market impacts described in the handbooks and guidelines of the cases under scrutiny. However, the most common underlying principle guiding those methods is to simulate or infer a market price of a good by assessing peoples’ behaviour and choices. Some of the more sophisticated methods to estimate health and environmental impacts presented exemplarily here differ in their ability to monetise benefits. The following overview draws substantially on the main guidelines and handbooks of the countries under study.<sup>39</sup>

### 3.3.1 Willingness to pay / Willingness to accept

In order to measure benefits without a monetary market value, the most common approach is to simulate a market price based on utility functions. Similarly to estimate benefits and costs of market goods, the methods applied to simulate market prices for non-market impacts is to estimate peoples’ **Willingness to Pay (WTP)** or **Willingness to Accept (WTA)**. Willingness to pay is considered to be more easily measurable and is described as the maximum amount of money a person is likely to pay to receive a certain good. In contrast, WTA is defined as the minimum amount of money a person would accept for being compensated not to

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<sup>36</sup> Tiessen (2010).

<sup>37</sup> See e.g.: OECD (2008).

<sup>38</sup> See also: Jacob et al. (2008).

<sup>39</sup> See also Table 3. European Commission (2009a), COAG (2007); Australian Government (2010); OMB (2003);BIS (2011).

receive a good or give it up. The amount of money a person is willing to pay or to accept is heavily biased by their level of income. Hence, those values are calculated by averaging across income groups.

### 3.3.2 Revealed Preferences and Stated Preferences

The two methods used to estimate the WTP and WTA in case of non-monetary impacts are revealed preferences and stated preferences techniques.

The one preferred by analysts are **Revealed preferences** techniques, as they are considered to be more reliable. The implicit price that a consumer attributes to a good is inferred by the price of a similar good in a similar or related market (“hedonic pricing”). Consumers thus “reveal” their preferences through real market choices they make. For example, the willingness to pay for less road traffic noise can be calculated by comparing house prices in a quiet neighbourhood with those in a noisy neighbourhood, keeping all other factors similar.

**Stated preferences** techniques are used to estimate the value of a good for individuals who make no direct use of it. In contrast to the former technique, individuals are directly asked to select hypothetical choices within a hypothetical market by means of a specifically constructed questionnaire. They thus “state” the preferences they have. There are different survey techniques used in the countries under scrutiny included in the stated preference method, such as **contingent valuation, choice modelling, conjoint analysis** and **risk-trade-off analysis**. Contingent valuation studies assess WTP and WTA by asking people how much they would pay for a certain good, whereas choice modelling studies ask respondents to select their most preferred alternative from a range of given choices.

### 3.3.3 Value of Statistical Life (VOSL) and Value of a Statistical Life Year (VOLY)

The Value of Statistical life (VOSL) and Value of a Statistical Life Year (VOLY) are both methods used to estimate the monetary value individuals place on a lower risk of mortality, as it may be caused by improvements in health, traffic safety, the environment etc. Usually, VOSL rely on identification of the individuals’ willingness to pay to reduce the risk of death. The premium people are willing to pay for a car with additional safety equipment (like an airbag) for example, would constitute the value people place on reducing the risk of mortality for driver and passenger.

In general both VOSL and VOLY follow the same principle. Yet, whereas VOSL represents the marginal monetary value people are willing to pay for of a human life, VOLY represents the marginal monetary value of a healthy life year.

Therefore neither VOSL nor VOLY place a “value” on individual lives, by trying to express life in monetary terms, but represent methods to identify the monetary value placed on changes in risk faced by individuals.

### 3.3.4 Quality Adjusted Life Years (QALY) and Disability Adjusted Life Years (DALY)

**Quality Adjusted Life Years (QALY)** represents the arithmetic product of the quality of life and length of life. One year of perfect health is the equivalent to 1, whereas years in less perfect health are given a score of less than 1. Death counts as 0; yet some health states may be considered worse than death and are therefore given a negative score. Usually, the attributed values of a certain health state are generated by relying on the use of stated preferences (surveys of doctors, patients) and different scores are obtained for different social groups. Through the aggregation of QALYs, usually considering a discount factor, obtained by a specific regulatory proposal, benefits of different regulatory proposals may be assessed and compared to each other.

Contrary to QALY, **Disability Adjusted Life Years (DALY)** measure the number of life years lost by premature death and the years lived with disability. It is therefore modelled as the gap between the current health status and an ideal health status of perfect health.

Quality Adjusted Life Years (QALY) and Disability Adjusted Life Years (DALY) are both methods for a standardised quantification (not monetisation) of health impacts of regulatory and other interventions. They are thus frequently used in cost-effectiveness studies. By attributing a monetary value to a QALY or DALY, using for example, the VOLY, they can be also used in cost-benefit analysis.

### 3.3.5 Healthy Life Years (HLY)

**The Healthy Life Years (HLY)** approach is very similar to QALY also measuring the quality of life. Yet, it measures how many years a person is expected to live without disability. According to the European Commission it is a “*solid indicator to monitor health as a productivity/economic factor*”.<sup>40</sup> The HLY indicator is part of the European structural indicators set out in the Lisbon Strategy.

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<sup>40</sup> EC Website (Last accessed 05/12/2012) [http://ec.europa.eu/health/indicators/healthy\\_life\\_years/hly\\_en.htm](http://ec.europa.eu/health/indicators/healthy_life_years/hly_en.htm)

### 3.3.6 Cost of Illness

The **Cost of Illness (COI)** method measures the direct health care costs or medical expenses, for example home or hospital care, associated with an illness. If a regulatory proposal is likely to lower such direct costs, by reducing the occurrence of an illness, the saved costs can be interpreted as benefits. Contrary, in cases where a regulatory proposal increases the occurrence of an illness, the negative impact of this proposal can also be monetised.

In some cases, this method is to be used with caution, as it may be possible, that time spent in hospital is, according to COI, less beneficial than the death of an individual.

It is also possible to try to measure indirect costs resulting from the occurrence of an illness, e.g. loss of productivity. This however is more a measurement related to the Human Capital approach.

### 3.3.7 Human Capital

The **Human Capital** approach interprets death, disability or lower productivity as a loss of future earnings. According to the OECD Human Capital can be measured by considering human capital investment, its quality adjustment through international comparison of academic achievement and the performance of educational investment after postsecondary education. Yet, this approach is not uncontested.<sup>41</sup>

When using this method one should be aware, that depending on the projected future earnings of different persons, different values of life may be calculated depending on peoples' life situation, e.g. for elderly who are not part of the working population anymore. In its guidelines the European Commission therefore recommends to use average values "to lessen these concerns or if the individuals affected by an option cannot be identified precisely enough".<sup>42</sup>

### 3.3.8 Subjective Well-Being Approach

The **Subjective Well-Being Approach** was recently added to the British Green Book as a new method that is still under development and far from being a robust estimate but recommended to be further developed for the estimation of the value of non-market goods. The approach, sometimes called **Life satisfaction approach**, looks at peoples' reported life satisfaction in the Household Survey of the Office of National Statistics since April 2011. This new data allows the use of econometrics to infer

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<sup>41</sup> Kwon (2009).

<sup>42</sup> European Commission (2009a): p. 42.

life satisfaction gained from a certain non-market good and attribute a monetary value to it by estimating the effect of income on life satisfaction.

### 3.3.9 Valuing the costs of carbon emission

In order to compare several options of emitting more or less carbon dioxide and other greenhouse gases the **costs of carbon emissions** can be estimated by the following steps, exemplary for the European Commission: First, quantify additional emissions expected to be caused by the new measure. Second, to ensure comparability between different emissions that have different impacts, they are expressed in a single unit (e.g. Carbon dioxide equivalent (CDE). Third, quantified and standardised emissions are monetised, i.e. a monetary value is attributing to each ton of CO<sub>2</sub>. In practice, different approaches to monetise carbon emissions are used:<sup>43</sup>

1. Use of **Market prices** from traded CO<sub>2</sub> (e.g. from the EU Emissions Trading System);
2. Estimates of the **marginal abatement costs (MAC)**, i.e. the cost of avoiding the emission of one additional unit of carbon.
3. The **social cost of carbon (SCC)** is an approach that incorporates all externalities of carbon emissions into the price of a carbon unit. It represents the global costs of one incremental unit of emissions today plus the full costs of the damage over all its life in the atmosphere. This is an estimate of what society should be willing to pay today to avoid future damage. A variant of the SCC, defined as the **shadow price of carbon** has been used in the UK from 2007 to 2009 which takes into accounts the practical challenges in calculating the SCC.<sup>44</sup>

### 3.3.10 Life Cycle Assessment Approach

The **Life Cycle Assessment Approach** is a common method to assess environmental impacts aligned to the life cycle of a product from its production to its final stage as a recycling or waste product. Both the environmental impact of the use or the function of the product can be assessed to ensure a maximum of resource-use efficiency by evaluating different options available to reduce impacts and to ensure the accurate estimation of its impact in each life cycle.

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<sup>43</sup> See e.g. Department of Energy and Climate Change (2009).

<sup>44</sup> For the comparison of the different approaches to monetize the effect of carbon dioxide emissions, see e.g. the specific guidance provided by the British Department for Environment, Food and Rural Affairs (DEFRA). DEFRA (2007).

### 3.4 Summary

A summary of the methods contained in the guidance documents is provided in Table 4 below.

*Table 4: Summary of methods for quantification and monetisation contained in guidance documents*

Method/ Approach	Australia	European Commission	United Kingdom	USA	Germany
<b>Analytical frameworks</b>					
Cost Benefit analysis (CBA)	X	X	X	X	X
Cost-Effectiveness Analysis (CEA)	X	X	X	X	X
Multi criteria analysis (MCA)		X	X		X*
<b>Methods for quantification and monetisation</b>					
Willingness to pay / Willingness to accept	X	X	X	X	
Revealed Preferences	X	X	X	X	
Stated Preferences	X	X	X	X	
Value of statistical Life (VOSL) and Value of a Statistical Life Year (VOLY)	X	X		X	
Quality Adjusted Life Years (QALY)	X	X	X	X	
and Disability Adjusted Life Years (DALY)	X	X			
Healthy Life Years (HLY)		X			
Cost of Illness		X		X	
Human Capital Approach		X			
Subjective Well-Being Approach			X		
Costs of carbon emission and social costs of carbon		X	X	X	
Life Cycle Assessment Approach		X			

\* Nutzwert-Analyse similar to multi-criteria analysis, see Böhret/Konzendorf (2001): Handbuch Gesetzesfolgenabschätzung (GFA): Gesetze, Verordnungen, Verwaltungsvorschriften, pp. 152.

## 4 Case studies: Methods in action

To supplement the analysis of guidance documents, the research also included the analysis of a sample of RIAs of the systems under study. The main aim was to gather additional insights into which methods for monetisation and quantification are chosen and how they are applied in practice.

### 4.1 Analysis of RIAs

For this analysis, a sample of 21 RIAs from Australia, the European Commission, Germany, the United Kingdom and the United States were selected (see overview in Table 5).

*Table 5: Number of selected RIAs by country*

	Australia	European Commission	United Kingdom	USA	Germany
Number of RIAs analysed	6	4	6	4	1

Given the overall relative low level of quantification and monetisation of benefits and social impacts in RIAs, the selection of RIAs followed pragmatic considerations to ensure that all selected RIAs contained at least some form of quantification.<sup>45</sup> Selection criteria included:

- **Quantification and monetisation:** The RIA contains at least one quantified or monetised social impact/benefit;
- **Policy field:** The focus is on public health and environmental policy;
- **Date of publication:** We selected the most recent RIAs possible;
- **Best practice:** If best practice examples were mentioned in the countries, we included at least one of them in our sample;

The selected sample is thus neither randomly selected nor representative for the RIA practice in the respective system, it should however allow for the identification of interesting practice. The selected RIAs were then analysed using a standard template, containing questions about the methods applied, the benefits

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<sup>45</sup> An exception was the Australian Benefit cost analysis of Country of Origin Labelling. Despite being listed as good practice for CBA on OBPR's website, it did not contain any quantified benefits (see: <http://www.finance.gov.au/obpr/cost-benefit-analysis.html>)

identified and monetised. An overview of the analysed cases can be found in the annex.<sup>46</sup>

In a second step, 10 cases were selected for further presentation in this study on the basis that they offer interesting examples to demonstrate how methods are applied in practice. These cases are presented in the following section.

## 4.2 Case studies

### 4.2.1 Measuring benefits by the method of avoided health costs (Australia)

The Australian Department of Infrastructure and Transport (DIT) prepared this RIA<sup>47</sup> in order to compare costs and benefits of the implementation of Euro 5 and 6 emission standards for light vehicles in Australia as well as to reduce air pollution, in particular from particulate matter. The cost-benefit analysis was conducted by the Bureau of Infrastructure, Transport and Regional Economics (BITRE), an agency of DIT. Basically two options were compared – do nothing and the introduction of Euro 5 or 6 for different vehicles and timeframes (which was further split up into 5 implementation options). Other options like voluntary standards were not considered as feasible due to a lack of market incentives.

To be able to estimate the impact for a 20 year period, a base case scenario was defined by ten assumptions, including among others: a fixed oil price, a mid-range population growth inferred from recent projections, a certain income growth and new vehicle sales growth.<sup>48</sup>

The overall cost-benefit analysis relied mostly on estimates from other countries/systems, especially the European Commission's RIA on the new standards and (scientific) studies on other relevant parameters. The costs regarded are foremost manufacturer's compliance costs (using, amongst other sources, estimates of an European Commissions RIA).

The benefits of more stringent emission standards were monetised using an **“avoided health cost approach”**. Essentially, this approach attributes a monetary value to each ton of pollutant emissions prevented. The first step is to quantify the latter for the different options and estimate tonnes of emission saved for each pollutant (relative to the base case). The second step is then to

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<sup>46</sup> However, this does not constitute a full scale “score card approach” as for example pioneered by Hahn and applied by other researchers (Ellig et al. (2011)).

<sup>47</sup> Complete name: Final Regulation Impact Statement for Review of Euro 5/6 Light Vehicle Emissions Standards (Australia).

<sup>48</sup> DTI (2010): p. 42f.



establish a value for an average health cost (\$ per tons of pollutant emissions) from existing studies. Finally, the total health benefit by (or health cost avoided) is calculated by multiplying tons of pollutant emissions saved by the health costs per unit (Emissions saved x Unit health costs = Total health cost avoided).

This calculation was based on existing estimates due to time shortage and lack of data.<sup>49</sup> The health costs associated with one unit of emission were gathered by comparing 8 scientific as well as agencies studies. Those studies showed a considerable range of variation and latest estimates were higher than those published before the year 2000. Those differences stem from different assumed values for a statistical life included in the analysis.<sup>50</sup> For this specific RIA, estimates were taken from the three latest studies. To adjust for uncertainty, an upper and lower bound on studies observations was established. Furthermore, the estimates were updated to 2009 prices and discounted by 7% until 2029 (in line with the OBPRs Best Practice Regulation Handbook). From the description within the RIA it is however not transparent, which factors are included into the calculation of avoided health costs. At least one study appears to have use avoided health costs from hospital treatment and a VOSL for reduced mortality.

By this analysis, DIT was able to calculate a cost-benefit ratio and a net benefit value for all six options considered, showing net benefits for all of them. The estimated net benefit ranged from \$579 million to \$604 million for the whole light vehicle fleet (depending on the start date for the standards). The high net benefits from avoided health costs are especially attributed to reduction of PM emission by diesel vehicles.

However, DIT states that the factor accounting for most uncertainty in this CBA is the estimate of avoided health costs, largely depending on the used value of a statistical life. Further uncertainties are the timely length of analysis, the start date of standard introduction and the discount rate.

Overall, the IA showed that the largest benefit is derived from applying the higher standards on diesel vehicles only. However, recommending this option is inconsistent with Australian law. As a result of public comments (mostly by industry companies such as Toyota<sup>51</sup>), DIT modified one option regarding the implementation

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<sup>49</sup> DIT acknowledges that ideally, another approach would have been applied, comprised by the estimation of air pollution in each city and quantification and valuation of each taking into account technology effects. DTI (2010): p. 98.

<sup>50</sup> E.g. The study by Coffey Geosciences 2003 assumed \$ 5million Dollar. The whole study is available at: <http://www.environment.nsw.gov.au/resources/air/airpollution05623.pdf>

<sup>51</sup> The submissions were made transparent and grouped as follows: 1. Vehicle/component manufacturers (FCAI, Ford, Holden, Toyota, VW, Skoda, Nissan, Ferrari, Bosch) 2. Industry groups with vehicle or vehicle component focus (Australia Automotive Aftermarket Association [AAAA], Motor Trades Association of Australia [MTAA]) 3. Fleet managers (Australian

date (delay of Euro 6 introduction) and recommends its implementation.

#### 4.2.2 Conducting cost-benefit analysis with limited data: Possibilities and Limitations (Australia)

Safe Work Australia<sup>52</sup> commissioned Deloitte Access Economics to conduct a cost-benefit analysis on the impact of the harmonization of work health and safety legislative framework across Australia.<sup>53</sup> The Council of Australian Governments (COAG) agreed that work health and safety legislation (WHS) should be harmonized across Australia aiming to achieve more consistency across jurisdictions, to reduce compliance costs on businesses, to reduce restrictions on competition and to reduce distortions in resource allocation in the economy.

First of all, the content of the proposal for the WHS Regulations and Code of Practice was modelled on the basis of broad consultation.<sup>54</sup> Then, the revised WHS Regulations and Code of Practice were assessed in this Decision RIA<sup>55</sup> concerning their impact on workers, employers, government and society. The options compared in this RIA are Option 2: adopting the WHS Regulations and Codes of Practice and Option 1: maintaining the status quo.

The expected benefits from regulation are reductions of compliance costs for multi-state businesses (having to comply with different WHS rules in different states), avoidance of redundant regulatory work for governments and potential safety improvements benefitting workers, employers and society. Due to the scope of this study, the discussion will focus on the measurement of potential safety improvements.

Methodological this cost-benefit analysis reflects typical problems in conducting RIAs, in particular the lack of good quality data on the policy problem and the most important impacts. Thus the analysis has to be based on a series of (more or less reasonable) assumptions and finds creative approaches to assess regulatory

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Fleet Managers Association [AFMA]) 4. Fuel producer/supplier groups (AIP, LPG Australia) 5. Motoring Associations (Australian Automobile Association (AAA), NRMA) . DIT (2010): p.70.

<sup>52</sup> Safe Work Australia is an independent Australian Government statutory agency in place since 2009. It is jointly funded by the Commonwealth, state and territory governments. See: <http://www.safeworkaustralia.gov.au/>

<sup>53</sup> Complete name: Regulation Impact Statement for National Harmonization of Work Health and Safety Regulations and Codes of Practice (Australia).

<sup>54</sup> Consultation included: Five Safe Work Australia Members' meetings (including representatives of government, employer and employee organizations), Twenty-seven Strategic Issues Group for Occupational Health and Safety meetings, consultative forums with Australian Chamber of Commerce and Industry, the Australian Industry Group, the Australian Council of Trade Unions , 1343 public submissions on the release of the Consultation RIS, feedback from focus groups, online survey.

<sup>55</sup> In Australia the two-level process comprises the publication of a Consultation RIA and in after successful consultation the development of the Decision RIA.

outcomes. In this study this concerns in particular the results of a survey with very poor response rates, but which were however of particular importance for estimating the effects.

In brief the authors used following steps to arrive at a quantitative estimate of the potential safety improvements benefitting workers, employers and society.

1. To assess the impact of the new regulations, a survey was conducted, asking whether the regulation had **no**, a **minor**, or a **significant** (positive) impact on different dimensions on safety at work, the web-based survey was sent to 4.500 firms of which 73 responded.
2. The responses recorded in an ordinary scale (no impact, minor, significant) than translated into numbers (0, 1, 2). This implicitly assumes that a significant impact is twice the size of a minor impact.
3. In a third steps the average effect (i.e. a number between 0 and 2) was calculated, and translated into a percentage change of health and safety at work. It was assumed that a significant improvement in health and safety would be equivalent to a 5% change. An average score in the survey of for example 1,5 points would thus mean a 3,75% change in health and safety.
4. This estimate of the effect (a change of 3,75%) was then applied as a reduction to existing cost estimates for workplace illness and injuries, which was defined as the measures of benefit.
5. Further complicating the matter, the RIA than accounts for the fact that the survey only covers responses from businesses, and thus does not cover benefits to workers and the government. To calculate those, previous estimates of the distribution of benefits between these groups are used to estimate the actual benefits for workers and the government. They use estimates that show that only a quarter of the benefits accrue to business, and that overall benefits for society are thus four times the benefits for firms and calculate respective numbers.

Overall, the methodology of this CBA is challenging to understand and draws heavily on assumptions, which are not further justified. The authors discuss alternative approaches to the quantification of the size of the effect using econometric studies (correlations between regulatory changes and changes in health, for example) and methods to monetize the positive effects via WTP, but state that these methods could not be applied due to methodological difficulties and lack of appropriate data.

#### 4.2.3 Using quality adjusted life years (QALYs) to compare the effectiveness of investment in the health system (United Kingdom)

The RIA<sup>56</sup> looks at measures to improve neonatal services in the UK, especially in terms of staffing per newborn, aiming to reduce neonatal mortality rates.

Babies who need complex treatment after birth are normally treated by a neonatal unit. Neonatal units provide care to prematurely born babies, with low weight, and other babies requiring complex treatment. Studies showed that there were shortages of staff, especially of neonatal nurses, and thus the RIA focuses on increasing the staff as well as on the provision of special training and other measures to improve survival rates of newborns within neonatal units.

Two options were investigated plus the option of business as usual (“do nothing”). Basically, those two options differ only in terms of how the additional workforce needed is calculated; but result in the same outcome of monetary costs and benefits. The benefits are calculated using the QALY method. “A QALY gives an idea of how many extra [...] years of life of a reasonable quality a person might gain as a result of treatment.”<sup>57</sup> It is thus a method to compare the outcomes of different medical interventions. By attributing a monetary value (60.000 Pound in this RIA) to a QALY, this method can also be used for a monetisation of the benefit. The application of the quality adjusted life year in combination with a monetary value of one additional life year might however create certain unease from an ethical perspective, as it can be interpreted to attribute different values of life to different groups of patients, as illustrated in this example.

The two groups of babies who are supposed to benefit from the regulatory action are babies with a low birth weight and babies with a very low birth weight. According to studies used in the RIA they, when surviving, have a different risk of disability and a different life expectancy. The different risk of disability is accounted for by using the QALY method. The value of a life year is adjusted using a coefficient, which would be 1 for a normal weight baby, while a low weight baby will get a coefficient of 0.75 and a very low weight baby gets a coefficient of 0.38. The different values of the coefficient reflect the difference in the severity of disability both groups have to face. Thus, from the start of the calculation on, a low weight baby’s life year is attributed a higher value than a very low weight baby’s life year.

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<sup>56</sup> Complete name: Impact Assessment of Principles for Quality Neonatal Services (UK).

<sup>57</sup> See: National Institute for Health and Clinical Excellence: “Measuring effectiveness and cost effectiveness: the QALY” <http://www.nice.org.uk/newsroom/features/measuringeffectivenessandcosteffectivenessstheqaly.jsp>

An additional correction is made in the calculation following the application of the QALY method. The QALY for each group is multiplied with the respective life expectancy to obtain the life value of one neonatal. Because life expectations also differ between these two groups (13.1 years for very low weight vs. 58.8 years for low weight), the calculation results in a benefit of the survival for one very low weight neonatal of £785k, and a benefit for a low weight neonatal of £3.5 million – certainly a significant difference. At the same time the costs for a baby belonging to the very low birth weight group are assumed to be higher due to a longer period of hospitalisation and higher treatment costs.

This IA shows that the QALY method certainly provides a logical way of evaluating the benefits of health related regulatory actions, following the question where best to invest scarce resources to improve health outcomes, but also puts ethical questions on the table. If the benefits are calculated using the QALY method the assumption is intrinsic that the life of a human being with a low risk of being disabled is valued higher than the life of a human being with a higher risk.

#### **4.2.4 The price of noise (EU Commission)**

The EU Commission conducted this RIA<sup>58</sup> in order to assess the costs and benefits of measures to reduce railway noise in Europe. They investigate the promoting of retrofitting of freight wagons with low-noise brakes.

Noise is a source of health impairment, especially in industrialised countries. The contribution of rail transport to noise pollution is significant. Since freight wagons and their braking technology is the most important source of railway noise, the RIA focuses on ways to reduce such noise. This focus is also justified by the stated fact, that other noise abatement measures such as noise barriers are quite costly and are not as effective as reducing the noise at the very source.

The RIA describes the different ways to bring wagon owners to retrofit their wagons, which include subsidies, legal measures and incentives such as differentiated track access charges based on the noise of the wagon stock, or operating restrictions for certain times of the day depending on the noise of the wagons. The possible options and variations are described, and then the most effective options are selected and put together into two options, each of them being a bundle of the most effective variations. The RIA relies on a study conducted for the purpose of the IA by Price-waterhouseCoopers.

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<sup>58</sup> Complete name: Rail noise abatement measures addressing the existing fleet (European Commission).

The key assumption of the RIA, based on findings of a project which focused on this problem (cited in the RIA), is that wagons equipped with low-noise blocks have an overall noise reduction of 8 dB on an average track. Thus, the total average noise reduction achieved by retrofitting only depends on two factors – number of vehicles retrofitted and the point in time of the actual retrofitting. The level of noise reduction will be the same for all options. Thus it is the different point in time by which different benefits can actually be realised. The PWC study calculates which option first reaches the maximum noise reduction and the levels reached within the investigated time period up to the year 2024.

The calculation of the costs is made by looking at how many wagons are in which year retrofitted, and by which brake system (there are two scenarios for each option at different costs, depending on the brake system).

The basic benefit considered in this RIA is the reduction of number of people affected by rail noise and a monetisation of the health benefits for those people. The number of people currently exposed (based on a threshold of 55 dB) is derived from a study on the external costs of transport. This number is then applied to the noise reductions based on the same parameters as in the cost calculation: how many wagons are retrofitted in which year and when are 100 per cent of the wagons retrofitted.

The interesting aspect of the RIA is the method of monetization. As the number of people affected is now known, and also the reduction of dB, a value for the reduction is now needed. The PWC study assigns a monetary value of 10 € to a reduction of 1 dB of noise exposure per person and year. This value is derived from the available literature concerning the willingness to pay for a reduction in annoyance and sleep disturbance. The benefit for each option and scenario is then calculated by assigning the estimated number of people affected to the year the effect of lower rail noise is realized. The specific calculation is not shown in the RIA itself but in the PWC study. The difference in benefits from each option only comes from the different points in time when the reduction takes place.

The cost benefit analysis shows considerable net benefits for all options and scenarios (ranging from 2,720 million € to 8,241 million €).

#### 4.2.5 Partial quantification and the use of multi criteria analysis (EU Commission)

The Directorate for Health and Consumers (DG SANCO) of the European Commission conducted this Impact Assessment<sup>59</sup> to support a directive and an action plan to improve organ donation in the European Union. The action plan and the directive were designed to introduce standards for the quality and safety of organ donation, and to promote best practice in organ donation, particularly at the organisational level of the Member States. The policy options formulated are a combination of a non-mandatory action plan and a binding directive. Each option consisted of a variety of different measures and actions.

Methodologically, this RIA follows a broadly understood MCA framework, systematically comparing different options and applying a scoring mechanism to compare the size of effects. The categories used for scoring are listed in Table 6.

*Table 6: Scoring mechanism of IA on Organ donation*

Symbol	Category
++	Evidence of substantial additional health /economic/ social benefits compared to the status quo
+	Evidence of some additional health /economic/ social benefits compared to the status quo.
≈	Evidence of no additional health /economic/ social benefits compared to the status quo.
-	Evidence of some reduction in health /economic/ social benefits compared to the status quo.
--	Evidence of substantial reduction in health /economic/ social benefits compared to the status quo.
?	There is no available evidence to assess changes in health /economic/ or social benefits compared to the status quo.

*Source DG SANCO (2008)*

Impacts are however only partially quantified within this framework. For the MCA, the RIA provides a set of comparative tables, one each for economic, health and social impacts and a fourth one distinguishing the impact on specific (health) Stakeholders. Two of these tables, taken from DG SANCO's Impact assessment, are reproduced below to illustrate this approach (see Table 7 and Table 8).

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<sup>59</sup>Complete name: Impact Assessment to support a directive and an action plan to improve organ donation in the European Union (European Commission).

*Table 7: Example of comparative table on health impacts, selected policy options only*

Impact	Option 1: Baseline		Option 2: Action Plan		Option 3: AP + flexible approach	
<b>Donation rates</b>	Donation rates will continue to be too low to meet rising demands for organs; thus leading to growing waiting lists	≈ to -	Depending on Member State (MS) commitment, zero to substantial increases are possible: - 0 to between 7,908 and 21,006 organs	≈ to ++	Medium to high increase possible: - lower estimate 2,636 and 4,983 - upper boundary 7,908 to 21,006 organs	+ to ++
<b>QALYs and life years saved</b>	No major change expected, but longer waiting lists and waiting times might reduce the medical outcomes of transplantation	≈ to -	Estimates of donation rates will lead to a range in MS from no change to significant change: - lower predictions show no major change - up to 119,314 to 231,006 life years saved - up to 113,348 to 219,456 QALYs gained	≈ to ++	Estimates of donation rates will lead to: - lower estimate of 39,771 to 54,320 life years saved - lower estimate of 37,783 to 51,604 QALYs gained - up to 119,314 to 231,006 life years saved - up to 113,348 to 219,456 QALYs gained	+ to ++
<b>Risk to patients</b>	No changes to the currently diverse regulatory landscape of Quality and Safety standards	≈	Better knowledge about organ transplantation outcomes will improve future transplantations for patients	+	Common Quality and Safety standards will ensure equal health protection in all MS Adverse event-reporting systems will improve the quality of donation and transplantation	++
<b>Living donation</b>	No change expected	≈	Will encourage more living donation May increase knowledge about medical outcomes Increases trust in system	+	Legal standards will supplement measures under the Action Plan and make them less uncertain to occur	+
<b>Health benefits of cross-border exchange</b>	Currently only very few organs are exchanged outside Eurotransplant and Scandiatransplant area, but potential for substantial health benefits	≈	Improved processes and removal of barriers to exchange of organs may increase exchange of organs and benefit small MS and difficult-to-treat patients	+	Common Quality and Safety standards will supplement measures under the Action Plan, which may increase organ exchange and make it safer	+
<b>Health Inequalities</b>	Evidence suggest health inequalities in the practice of organ transplantation and donation along lines of gender, ethnicity and certain specific diseases	≈	Anticipated benefits from improved processes and removal of barriers to exchange of organs will not include reduced health inequalities	≈	Anticipated benefits from improved processes and the removal of barriers to exchange of organs will not include reduced health inequalities	≈

Source: DG SANCO (2008)



*Table 8: Example of comparative table on economic impacts, selected policy options only*

Impact	Option 1: Baseline		Option 2: Action Plan		Option 3: AP + flexible approach	
<b>Costs for national infrastructure and better processes</b>	Status quo will continue at no additional cost	≈	Low to medium costs for voluntarily investing in more transplant coordinators Low to medium cost for voluntary measures to designate or accredit establishments	-	No to very low cost for setting up competent authorities Low to medium costs for designating or authorising establishments Medium costs for running national quality systems	-
<b>Costs of setting up and running national registers and traceability systems</b>	Status quo will continue with separate, incompatible reporting systems	≈	Possible cost saving through standardised reporting of medical outcome information	+	No to very low costs for establishing a national register of establishments Medium to high costs for introducing or adapting national traceability and adverse event-reporting systems	-
<b>Reporting obligations and administrative burden</b>	Status quo would continue with already extensive data collection through international bodies	≈	Low cost of reporting requirements under the OMC would result in small burden for MS	-	Low cost of reporting of activities at transplantation centres. Data can be expected to be readily available	-
<b>Treatment costs</b>	Status quo, with possible increasing long-term costs if waiting times increase	≈	Savings in treatment costs of €458 million to €1.2 billion possible for best-case scenario, if MS commit themselves fully	≈ to ++	Savings of €132 million and €152 million as a result of modest increase in donation rates Savings of €458 million and €1.2 billion in the best-case scenarios	+ to ++
<b>Productivity Impact</b>	Status quo, loss of productivity if more people have to wait longer for an organ	≈	Potential productivity impact of €2.6 billion to €5 billion under best-case scenario, no gains if MS commitment is low	≈ to ++	Productivity gains of €460 million and €882 million as a result of modest increase in donation rates Productivity gains of €2.6 billion and €5 billion for best-case scenarios	+ to ++
<b>Economic Impact on living donor</b>	Living donors are currently exposed to economic risk through need for healthcare and loss of income in case of reduced ability to work	≈	Option will reduce economic risks related to healthcare Option does not tackle other economic risks	+	Option will reduce the economic risks related to healthcare Option does not tackle other economic risks	+

Source: DG SANCO (2008)

Quantitative information is only provided for the impact on donation rates, as well as for the improvement in health (QALYs). Monetised information is provided under the economic impacts by assessing the savings in treatment costs as well as the productivity impact of lives saved. For the former, estimates of treatment cost savings from the literature and a UK Impact Assessment are multiplied by the number of additional organs transplanted. For the latter, average employment rates for patients after receiving a transplant were identified in the scientific literature, and then multiplied by the number of additional transplantations and national average wages.

The chosen approach demonstrates how a systematic assessment of impacts can be conducted without extensive quantification and

monetisation of impacts. It allows a comparison between different policy options and illustrates tradeoffs between them. At the same time it also shows some of the difficulties related to the use of a multi criteria framework. It does not provide a clear decision-making rule like a full CBA or CEA.

Besides the use of an MCA framework, this RIA demonstrates some of the common difficulties of assessing the future effect of policy options, which combine a large number of single measures and need to be implemented by other levels of government.

The chosen approach combines the development of scenarios and benchmarking the options against a similar case, i.e. Spain. The policy options proposed in this RIA closely follow the experiences and institutional arrangements in Spain. Thus a scenario was developed in which all European Countries would achieve Spanish transplantation rates, and a more modest one, in which all countries achieved at least the average European rate. Based on estimates in the literature on how improvements could increase donation rates two additional scenarios were developed. In a second step then the options were compared against how closely they can be compared to the Spanish model, and the likely effect qualitatively assessed. The study had however been criticised for this approach by the IAB.<sup>60</sup>

#### **4.2.6 Monetising environmental impacts using a stated preference approach and a calculation of saved costs (United Kingdom)**

This RIA<sup>61</sup> assess the costs and benefits of a ban on phosphorus in domestic laundry cleaning products (DLCPs) to promote environmental issues especially the water quality of rivers in England and Wales.

Two options were considered at first, one being a voluntary ban on sales of DLCPs containing significant amounts of phosphor and one being a ban on sales of all DLCPs containing more than 0.4 per cent phosphorus by 2015. Since it had become clear, after discussions with the respective industry, that the voluntary ban would not be accepted by the industry, this option was not further considered. Thus, only two options were considered: “do-nothing” or implementation of the regulatory ban.

The key benefits identified were savings to water companies and the improvement of the quality of the rivers. Savings to water companies are based on the fact that they use energy and chemicals in order to remove phosphorus from sewage. The

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<sup>60</sup> See IAB (2008).

<sup>61</sup> Complete name: EU Directive to limit Petrol Vapour Emissions from Fuelling of Service Stations (United Kingdom).

detergent industry provided figures of the amount of phosphorus used in DLCPs. To confirm these figures, a simple calculation was made, which we consider to be an interesting and innovative way of confirming data: Assuming a 36 per cent UK ownership of dishwashers and the fact that 96 per cent of dishwashers use phosphorus-based detergents, the result is a figure which corresponds closely to the industry information. The figures of the industry were used, and applied to the English and Welsh industry only (based on the population). The result is a figure of 3,070 tons of phosphorus from the use of dishwashers per year in England and Wales. Adjusting for people who are not connected to public sewer, 2,780 tons phosphorus from dishwashers enter the sewage plants, which is 7.5 per cent of all phosphorus entering the sewage plants. Once the proportion of phosphorus was established, the cost savings were calculated using data from 41 sewage treatment works where phosphorus removal is undertaken.

Besides the cost saving for sewage works, another benefit was identified: The benefit to the environment in meeting the Water Framework Directive. To assess this benefit, an existing river model called SIMCAT was used, which simulates the water quality and can be used to predict the effects of effluents from sewage works on the rivers. The model covers all rivers in England and Wales. Assuming the same percentage of the DLCPs on phosphorus in sewage plants and applying this to the model (only considering the plants which have no phosphorus treatment – in the calculation above, of course, only plants with such a treatment were considered), the total length of river which improves from low to good quality because of the regulatory action is calculated (250 km at the first calculation of the Environment Agency; since they used another percentage of DCLP contribution to phosphorus pollution, this number was corrected to 190 km).

While developing the Water Framework Directive, the Environment Agency commissioned a study to estimate the value placed by households in England and Wales on improvements to the water environment, based on different survey techniques. This stated preference approach arrived at a value for this change, which is £22.45k per km/yr. This value is now multiplied with the 190 km which will improve from bad to good status. The result here is a benefit of £4,265,500 per year. This benefit was added to the water companies' savings to get the total benefit of the regulatory action.

This RIA shows a combination of a cost saving calculation and a stated preference approach used to arrive at a monetary value of the benefit of a regulatory action. Also it shows how data which could be biased (in this case industry data) can be confirmed by logical consideration of known facts (number of dishwashers, amount of phosphorus used for a dishwasher).

#### 4.2.7 Shadow Price of Carbon (United Kingdom)

DEFRA commissioned Entec (consultancy) to conduct a RIA<sup>62</sup> on the costs and benefits of introducing a new Directive on Petrol Vapour Emissions at Gas Stations. This RIA was originally prepared in order to inform a UK position in EU negotiations on the topic.

The aim of this legislation is to reduce petrol vapour emissions produced when refuelling motor vehicles. These volatile organic compounds (VOCs) such as benzene contribute to ground level ozone have global warming potential and adverse health effects.

The interesting method of consideration here is the use of a shadow price of carbon (SPC) for the estimation of the monetary impact of emissions instead of the social cost of carbon (SCC) (for the use of SCC in a RIA, see section 4.2.9). DEFRA underlines that the UK does not use SCC approaches anymore because setting an SCC for the UK makes both assumptions about global emissions, hence about the actions of other countries, and because of uncertainty issues.<sup>63</sup> The SPC is also based on the SCC but with the advantage of being adjustable to the marginal abatement cost<sup>64</sup> and other factors that can affect UKs willingness to pay for reductions of emissions, such as political desire.

Two options were considered: Status Quo (“Do nothing”) or compliance with the extended Directive on Petrol Vapour Emissions (preferred option). The impacts identified are: costs for service operators to invest in new equipment, labour, power, maintenance and compliance checking; benefits are avoided damage costs from VOC emissions, avoided greenhouse gases, the value of recovered petrol and certain health effects. These health effects are considered to be too uncertain too be monetized. Further benefits mentioned that are not monetized are: benefits for the suppliers of the new equipment and UK maintaining its credibility as an EU Member State.

The analysis follows a similar approach to the calculation of SCC. For both options the following calculations are made. First of all, the reduction vapour emissions were estimated using: functions provided by the Institute of Petroleum on how much vapour is produced during fuelling, the increase of CO<sub>2</sub> due to the new equipment that needs more electricity and the total number of gas stations which leads to a number for the total reduction of VOC emissions in tonnes per year. To apply a value to VOC emission

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<sup>62</sup> Complete name: EU Directive to limit Petrol Vapour Emissions from Fuelling of Service Stations (United Kingdom).

<sup>63</sup> For further information see: DEFRA (2007).

<sup>64</sup> Compare DEFRA (2007): S 2.

on the basis of SPC, VOC emissions were translated into an equivalent in CO<sub>2</sub> emissions. Then, estimates for SPC were taken from calculations of the Interdepartmental Group on Costs and Benefits - Air Quality (IGCB)<sup>65</sup> and EU CAFE studies and compared. These estimates differ significantly because of different pollution metrics, UK population estimates and because IGCB uses YLL (years of life lost)<sup>66</sup> whereas CAFE uses YLL and VSL (value of statistical life). YLL is a measure for premature mortality, estimating the years one would have lived longer and giving a greater weight for younger deaths than for older ones. Hence, CAFE estimates are higher due to the additional measure. The final SPC value was calculated with an increase by 2% a year, adjusted to 2008 prices and a discount rate of 3,5%. The net present value for the introduction of the extended regulation was then calculated using both ICGB and CAFE measures: IGCB 9 to 13 million pounds and CAFE: 58 to 87 million pounds. Hence, implementation was recommended.

#### 4.2.8 Cost-Benefit-Analysis of tobacco policies (United States of America)

The Food and Drug Administration (FDA) conducted this RIA<sup>67</sup> to estimate the costs and benefits and the effectiveness of an amendment of pictorial warning labels on cigarette packages and cigarette advertisements<sup>68</sup>, as required by the Tobacco Control Act.<sup>69</sup>

To apply the requirements of the Tobacco Control Act, FDA extensively analysed the impact of the proposed regulations by the following analytical steps.<sup>70</sup> The main part of analysis is the **Cost-Benefit Analysis** monetizing the following individual **benefits**:<sup>71</sup> smoker's life-years saved, health status improvements, medical expenditure reduction, and as estimate for other financial effects of the individual: fire loss averted. The estimated **costs** are divided into those for the private sector: Label change, market testing, point-of-scale advertising, continuing administration and recordkeeping and into the estimated costs to government: FDA implementation and recordkeeping of the rule. Moreover mixed benefits and costs of smoking cessation on the general public are monetized. Those are mostly identified as being transfers in the social system from one part of society to another: Social security

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<sup>65</sup> IGCB now archived webpage: <http://archive.defra.gov.uk/environment/quality/air/airquality/panels/igcb/>

<sup>66</sup> This measure is included in the calculation of DALYs.

<sup>67</sup> Complete Name: Required Warnings for Cigarette Packages and Advertisements (USA).

<sup>68</sup> Federal Register / Vol. 76, No. 120 / Wednesday, June 22, 2011 / Rules and Regulations: p. 36628-36777.

<sup>69</sup> Complete Wording: Family Smoking Prevention and Tobacco Control Act.

<sup>70</sup> Before the actual analysis, FDA conducted an internet based consumer research study to select the most efficient 9 images. The study analyzed the efficacy of 36 proposed colour graphic images in demonstrating the dangerous effect of smoking on 3 age cohort target groups (age 13 to 17; age 18 to 24; 25 and older) with over 18.000 participants.

<sup>71</sup> Due to the lack of data not quantifiable but discussed impact include: reduce of child mortality and morbidity rates due to the decrease of mothers smoking, reductions in costs of cleaning and maintenance due to smoking.

outlays, income taxes on social security-taxable earnings, defined benefit private pension outlays and life insurance outlays. All estimates are discounted at both a 3% and 7% rate, as required by OMB Circular A-4. A brief **cost-effectiveness analysis** provides for the quantification of the sum of saved life-years and QALYs. Furthermore, the specific impact on small business entities was calculated.<sup>72</sup> Other options assessed consisted of quasi regulatory alternatives: “an otherwise identical rule” with a 24-month compliance period and a 6-month compliance period as well as a brief discussion of alternative graphic images.

This RIA demonstrates some of the difficulties in assessing the effect of a policy measure on the problem to be addressed. In this case the authors of the RIA used Canadian data on the effect of graphic warnings on smoking rates and adjusted it to the American case.

Canada implemented graphic warnings as early as in 2000 and this provides observations of actual consumer behaviour in the form of smoking rates. In a step by step approach, FDA estimated pre-2001 smoking rate trends in the USA and Canada, corrected for the effect of tax changes on cigarette consumption (higher prices tend to reduce smoking rates). Then smoking rates for both countries were predicted up to 2009 and a difference calculated. This difference was subtracted from the actual differences observed in the data. This is described by the FDA as rudimentary approach that might be influenced by confounders and makes calculation rather uncertain. On this basis, FDA calculates that this unexplained average difference between the American and Canadian smoking rates is 0,088 % higher for 2001 to 2009 than for 1994 to 2000 which accounts for the influence of Canadian graphic warnings. This number is then multiplied with population predictions till 2030 and summing over all age groups accounts for a reduction of 213.000 in US smoking population in 2013 and for 246.000 in 2013.

The actual monetary benefits are then inferred by two different ways, estimating the WTP of smokers for participation in cessation programs,<sup>73</sup> and measuring the value of health improvements. Health improvements include the monetized value of life extensions, from improved health status and reduced medical costs. As exemplary calculation, the largest benefit of the rule is used which is the increased life expectancies for individuals who are detained from smoking. Using estimates of VSLYs from the literature and previous analysis (\$100.000, \$200.000, \$300.000)

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<sup>72</sup> Another big part of the publication in the Federal Register is the response of FDA to over 1700 comments on the first publication of the RIA.

<sup>73</sup> FDA criticizes its own approach because it assumes that the value for cessation is the same as the higher value of avoided initiation of smoking.

as estimates of WTP for a year of life saved in the present. This value is multiplied by the expected amount of dissuaded smokers. This yields estimates of rule-induced mortality benefits between \$1.45 and \$22.56 billion.

The result of the RIA is an annualized net benefit of \$601.4 million at a 3% discount rate and \$184.5 million at 7% discount rate. The regulation thereby satisfies the requirement that the benefits justify the costs.

#### 4.2.9 Social costs of carbon (United States of America)

The U.S. Department of Energy (DOE) assessed in this RIA<sup>74</sup> that the amendment of existing energy conservation standards for residential water heaters, gas-fired direct heating equipment and gas-fired pool heaters results in significant energy savings and that the regulations overall benefits outweigh the costs.

DOE conducted a cost-benefit analysis focusing on costs and benefits of consumers and the national level on the basis of a social cost of carbon value inferred from an interagency research process.

The benefits and costs that are faced by purchasers of the three heating products<sup>75</sup> are estimated by calculating the average life-cycle cost savings that is the net benefit or cost of a more efficient product after considering both the increased installed price and the lifetime operating cost savings. Thereby a positive monetary consumer effect was shown.

The key calculation of benefits in this IA is the use of social costs of carbon values. To calculate the national benefits of the new higher standard products DOE first **quantified** the different energy savings. The total amount of savings is 2.81 quads (quadrillion or 10<sup>15</sup>) British thermal units (Btu) over a 30 year period which is an equivalent to energy consumption of 15 million American households a year.

In a next step a **monetary value** was attributed to the cumulative CO<sub>2</sub> emissions reductions by the use of a social cost of carbon value set up in an interagency process, leading to an estimate of \$2.861 billion. The national net present value (NPV)<sup>76</sup> of consumer benefits is \$1.98 billion at 7% discount rate and \$10.11

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<sup>74</sup> Complete Name: Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters (USA).

<sup>75</sup> On the basis of interviews with manufacturers they conclude that the impact on manufacturers will not be significant and hence not assessed in the RIA.

<sup>76</sup> NPV is the estimated present value of future operating cost savings minus the estimated increased costs of purchasing and installing the three types of heating products discounted to 2010.

billion at 3% discount rate from 2013 to 2045 (2015 to 2045 for water heaters) in 2009 prices. The overall net benefits versus costs are estimated as \$391.1 million per year (3% discount) or \$771.2 million a year (7% discount).<sup>77</sup>

In this RIA DOE used the latest set of values for social costs of carbon (SCC) that were developed in an interagency process comprised of technical experts from different agencies<sup>78</sup> that met on a regular basis to review research and public comments in key areas and discuss model assumptions and inputs. Social cost of carbon is an estimate of the monetized damages associated with an incremental increase in carbon emission in a given year. It is intended to “estimate changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change” (but not limited to those areas).<sup>79</sup>

The interagency workgroup selected four values from integrated assessment models. One value is a 95<sup>th</sup> percentile estimate across all models at 3% discount rate as a “higher-than-expected impact” estimate from temperature change. The central value that DOE applied in this IA is the average SCC across the three models at a 3% discount rate.

The DOE however states, that the SCC value is still characterised by a number of uncertainties and the models used are “imperfect and incomplete”. The U.S. Government is reviewing estimates of SCC regularly to increase the reliability of this new measure.

DOE also provided for a discussion of impacts that they are not able to monetize, such as the benefit from energy conservation standards on the prices of emissions allowances or the reduction of mercury emissions due to lack of reliable estimates.

#### **4.2.10 Break even analysis<sup>80</sup> with a difference between calculated costs and benefits (United States of America)**

##### **4.2.11**

The RIA<sup>81</sup> assesses measures which aim to adopt enforceable accessibility standards under the Americans with Disability Act

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<sup>77</sup> DOE states that it should be taken into account that the level of national cost savings is a domestic value whereas the CO2 reductions are global values.

<sup>78</sup> Participants among others: EPA, Department of Agriculture, Commerce, Energy, Transportation and Energy.

<sup>79</sup> Federal Register / Vol. 75, No. 73 / Friday, April 16, 2010 / Rules and Regulations : 20177

<sup>80</sup> This is not referring to a breakeven analysis in the economic sense. Rather, it is described as a threshold method when quantification and monetization are not feasible, answering the question, “How large would the value of the non-quantified benefits have to be for the rule to yield positive net benefits?” OMB (2011b): p.13.

<sup>81</sup> Complete Name: Americans with Disabilities Act Titel II Regulations. Nondiscrimination on the Basis of Disability in State and Local Government Services (USA).



(ADA) that are consistent with minimum guidelines and requirements issued by the Architectural and Transportation Barriers Compliance Board. These accessibility standards aim at non-discrimination on the basis of disability by public accommodations and in commercial facilities. In short, this means access for disabled people to public restrooms, without being dependent on other peoples help. This is achieved by building toilets equipped for the disabled.

The RIA considers two main benefits. The first one is a standard benefit when monetisation is needed: the time saved because of a certain measure is transferred into a monetary value using average hourly wages. The second are benefits of independence, safety, and avoided stigma and humiliation as a result of the requirement's application, which however cannot be directly quantified. Nevertheless they are used for justifying the final policy decision, in a rather pragmatic usage of the results of the cost-benefit-analysis. The costs are well-analysed and thus known. When comparing costs with the benefits calculated from the time saved, the costs outweigh the benefits. The IA finds a way to deal with this by asking if the value disabled people put on increased independence, safety, and avoided stigma and humiliation when going to the restroom at least equals this difference in monetary values between calculated costs and benefits.

To monetise the time savings, first the number of people which will benefit from the regulatory action under investigation was needed. This includes people with any type of mobility-related disability (people using wheelchairs, walkers, braces). Recent census figures estimated that 11.9 per cent of Americans aged 15 years and older have such a disability, which comes to a figure of 35 million people. The second number needed is how often a person uses a toilet which is affected by the rule. A difference is made between toilets with in-swinging and those with out-swinging doors, so figures had to be estimated for both groups. The approach was the same. An expert panel with members from the Department itself and the external contractor HDR, Inc. estimated how often a toilet would be used by disabled persons (for toilets with out-swinging doors slightly less than once every other visit, or once every two hours spent in a facility with such a toilet). The expert panel also estimated the time saved per toilet visit (for toilets with out-swinging doors five and a half minutes due to greater flexibility in terms of access to the toilet, and thus reducing the time having to wait for assistance). The time savings are valued according to the average hourly wage rate of just under \$10 compiled by the U.S. Department of Labor. The life time of a toilet was estimated to be the same as the lifetime of a building, which is 40 years. Knowing these numbers, the calculation is basically just a multiplication of the figures: visits per year x time saved x value of time savings. This needs to be done for both groups of toilets.

After discounting the value to the net present value, the benefit calculation is completed.

When comparing the costs of the regulatory action (made up of costs for building the new facilities) and the benefits calculated so far, the costs outweigh the benefits by \$266.3 million over the life of the regulation, or approximately \$19.14 million per year. The net present value of the regulation, without further analysis, would be negative; however this did not include any monetised estimate of the value of “independence, safety, and avoided stigma and humiliation”. Now an innovative way to deal with this problem comes into play: The difference in value between costs and benefits is known, and the number of visits per year is estimated (8.7 million). Dividing \$19.14 million (difference between costs and benefits so far) by 8.7 million annual visits, the value a disabled person should put on the non-humiliation per visit is \$2.20. And, “based on its experience and informed judgement”, the Department concludes that this figure probably even underestimates the value a disabled person would place on the avoidance of humiliation (and the safety and independence which comes with it) per visit. Thus, a break-even between costs and benefits is reached.

The RIA concludes that the final rules under investigation increase social resources because monetized benefits exceed monetized costs.

### 4.3 Overall observations

In analysing the complete sample of 21 international impact assessments some general observations can be made about the chosen approaches of RIA and the presentation of the results. The sample analysed is however not representative, but rather has a bias towards good practice.

- As the selection criteria included at least some monetised benefits, it is not surprising that in most RIA **a cost-benefit analysis was conducted** or at least attempted. While not all RIAs succeed in quantifying and monetising the impacts, most of the selected RIAs are able to monetise costs and benefits and show a net present value (15/21). Three impact assessments used a multi-criteria analysis instead. In one selected case study costs and benefits are monetised, but not weighed against each other and no net present value is calculated (“partial CBA”). In another case study, the benefits are described in a qualitative way only.
- A **wide range** of different and unique approaches and research designs is used to assess the impact of the proposed regulation on the policy problem, i.e. the initial effect of the

policy. These include specific models to simulate changes in pollution, the use of scientific studies to get an estimate of the effect, stakeholder consultations, benchmarking against comparable cases or simply “educated guesses”. Even within a single policy field like tobacco control, different approaches are chosen and different strands of scientific literature have to be referred to (e.g. effect of warnings on purchasing behaviour, influence of vending machines on smoking rate, prevalence and impact of second hand smoke on health);

- As could be expected from the available impact assessment guidance, there is however a certain convergence in the **methods employed to monetise or standardise** non-market impacts. Similar methods or variations of the same methods are used in the selected sample. An example is the use of QALYs as a measure for reporting health benefits. They are used in three UK RIAs and one EC RIA, while Australia employs a similar measure (DALY). Other examples of similar methods employed is shown when it comes to carbon dioxide emissions (SCC (2x), SPC (1x)). Finally the concept of willingness to pay (as revealed or stated preference) is used in some of the studies.
  
- Throughout the RIAs analysed, **difficulties in finding data** of suitable quality are mentioned, and alternative data has to be generated e.g. by collecting data from the respective industry or other stakeholders, by using academic studies or even by informed guesses. This might be in so far problematic, as in some cases sophisticated calculations and far reaching conclusions are based on these foundations.
  
- The **success in quantifying and monetising benefits** varies. In one case benefits are not quantified at all, in other cases it is stated for certain benefits that they cannot be quantified. A lack of quantified impacts does not necessarily mean that the assessments failed in its purpose. Depending on the specific impact it can be more reasonable to leave the impact non-quantified than to employ a method, which lacks reliability. Within the sample only selected and the most important benefits are monetised and quantified.
  
- There are substantial differences in the **presentation of RIAs**. In particular United Kingdom’s RIAs stand out as being shorter, more concise and following a clearer structure than those of the other systems. This leads to a better readability and a better understanding of the actual findings. The objectives and the chosen approach for the cost-benefit analysis are more transparent than in the other cases. The other countries’ RIAs are much longer and lack the structure of RIA’s of the United Kingdom. The European Commission’s

RIAs follow a stringent common structure and format, but are nevertheless lengthy.<sup>82</sup>

- Most of the RIAs reviewed reach a considerable **level of detail**. Having in mind that most of the assessments are based upon assumptions which might be reasonable, but are certainly not a perfect measure, it does not seem necessary to calculate problems in every detail. Length, lacking structure and the detailed level which is sometimes found in these RIAs might prevent the reader to identify the main objectives and understand the key assumptions and the idea behind the assessment of the main impacts.
- For all systems except the United Kingdom at least one example of seeking **external expertise** was found. The Australian RIA's used external expertise in four cases. All European Commission assessments used external expertise, although in one case the expertise was ordered not specifically for this assessment but for the same topic. The United Kingdom RIAs do not state the use of external expertise besides the use of existing studies. One RIA of the United States uses external expertise.

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<sup>82</sup> In December 2012 the European Commission announced, that Impact Assessments will be accompanied by a standardised, two page summary. See European Commission (2012)

## 5 The practice of quantification and monetisation

The analysis of guidance documents and RIA handbooks shows a wide range of recommended approaches and methods for quantifying and monetising non-market impacts of regulatory proposals. This chapter now focuses on the wider practice of monetisation and quantification of benefits. We first provide an overview of how common quantification and monetisation in the analysed jurisdictions are, before discussing the costs of quantification and monetisation and looking at the impact of RIAs on the policy making process.

### 5.1 The degree of quantification and monetisation

In judging the practicability of specific approaches and instruments of RIAs it is also important to see how common quantification and monetisation in practice are. In this section we thus provide information about the degree of quantification and monetisation in the four international case studies.

For **Australia** a recent review of the RIA system conducted by the Productivity Commission analysed the extent of quantification of costs and benefits in RIAs across the different levels of jurisdiction in Australia. For RIAs at the federal level (Commonwealth and COAG) the Commission reports the following results (For details please see Figure 1):<sup>83</sup>

- In the majority of Commonwealth RIAs (53%), benefits are solely discussed in qualitative terms. Extensive quantification occurs in only (9%). This compares against a somewhat higher degree of the quantification of costs.
- For COAG RIA the share of RIA with no quantification is far lower (4% for cost, 13% for benefits) and a higher share of RIA contains an extensive quantification of benefits (17%).
- In both federal RIA systems the quantification of benefits is less common than the quantification of costs.

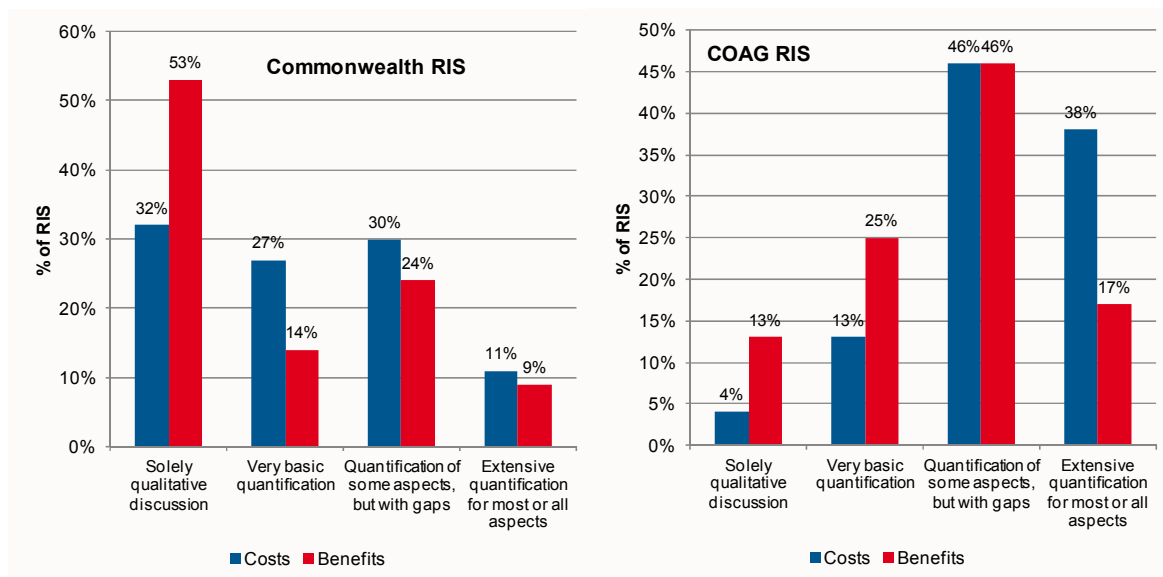
The Productivity Commission thus concluded (for all levels of Australian government) that *“based on its analysis of RISs produced by jurisdictions in 2010 and 2011, the Commission found that in practice comprehensive assessment of costs and benefits*

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<sup>83</sup> Productivity Commission (2012) Regulatory Impact Analysis: Benchmarking, Research Report, Canberra. Available at: [http://www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0003/120675/ria-benchmarking.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0003/120675/ria-benchmarking.pdf)

relatively infrequent. Further, benefits and costs were directly compared in only one-quarter of all examined RISs.<sup>84</sup>

Figure 1: Australia: Level of quantification of RIAs (Commonwealth and COAG)



Source: Productivity Commission (2012), pp. 175-176.

A survey conducted among agencies and departments to support the Productivity Commission’s study identifies data constraints as one of the key problems for quantification.<sup>85</sup> The lower rate of quantification of benefits and societal impacts is attributed to the greater methodological challenges related to the quantification and monetisation of benefits. However, the Productivity Commission sees a strong link between a well (and quantitatively) formulated problem definition and the quality of the assessment of regulatory benefits.<sup>86</sup>

Overall, the Productivity Commission sees substantial scope for improvements and “a clear gap between RIA requirements (which largely conform to internationally recognized leading practice) and what is observed in practice.”<sup>87</sup>

The RIA system of the **European Commission** has been evaluated by the European Court of Auditors (ECA) in 2010.<sup>88</sup> Based on a sample of RIAs conducted between 2003 and 2008,

<sup>84</sup> Productivity Commission (2012), p. 174.

<sup>85</sup> Productivity Commission (2012a): p. 5.

<sup>86</sup> Productivity Commission (2012), p. 176.

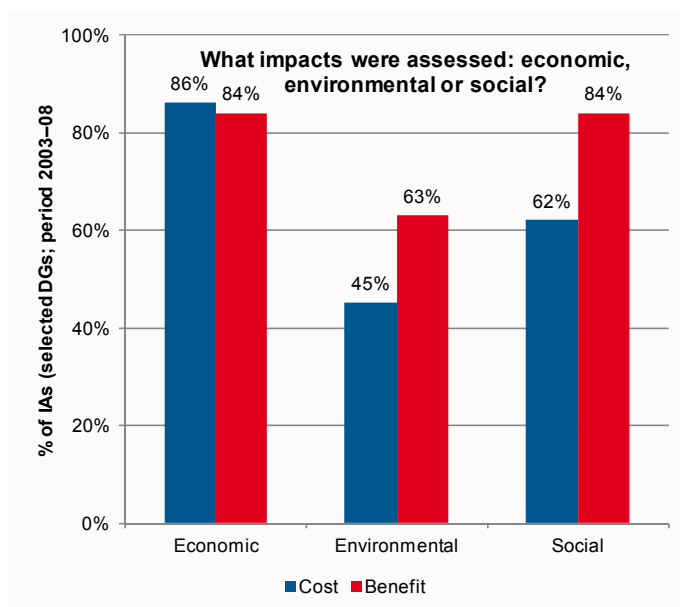
<sup>87</sup> Productivity Commission (2012), p. 177.

<sup>88</sup> European Court of Auditors (2010): Impact Assessments in the EU institutions, Impact assessments in the EU institutions: do they support Decision-Making?, Special Report No. 3/2010, Luxembourg.

ECA reports on both the type of impacts analysed and the degree of quantification of impacts.

According to the ECA, “the analysis showed that in practice the commission’s RIA work was asymmetric between the three pillars and between costs and benefits.”<sup>89</sup> Figure 2 shows, what type of impact has been qualitatively or quantitatively assessed in a sample of RIAs. 84% of RIAs contained for example a discussion of positive social impacts (benefits), and 63% a discussion of positive environmental impacts. These numbers reflect the different nature of proposals, not all proposals have for example significant environmental impacts and are thus not assessed.

Figure 2: Types of impact assessed (qualitatively or quantitatively) in European Commission’s Impact Assessments



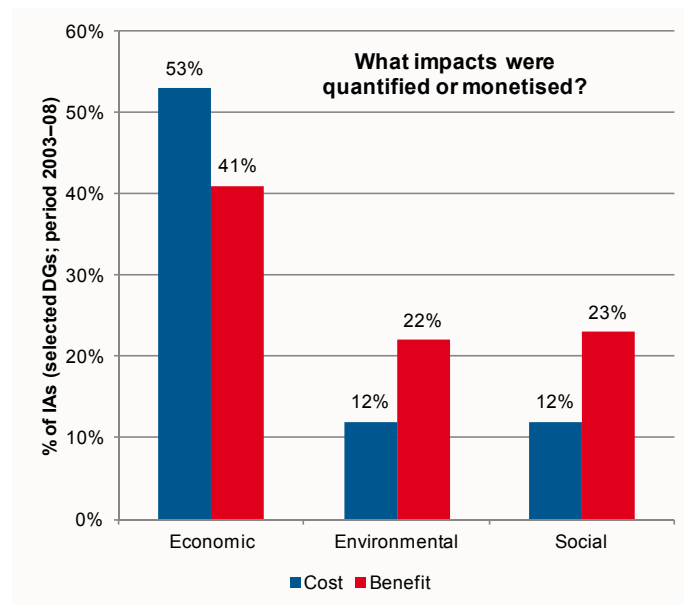
Source: European Court of Auditors (2010), p. 37-38

In terms of quantification and monetisation of costs and benefits the analysis shows large differences between economic and social or environmental impacts. Environmental and social benefits are quantified in less than a quarter of all RIAs,<sup>90</sup> while around half of the RIAs contain at least some quantitative discussion of the economic impacts (see Figure 3 for details). If you compare Figure 2 and Figure 3, the level of quantification becomes more obvious. While around 86% of RIAs contain a discussion of social benefits, only 23% of RIAs contain a quantitative discussion of social benefits.

<sup>89</sup> European Court of Auditors (2010), p. 36; three pillars refers to economic, environmental and social impacts.

<sup>90</sup> The data source does not allow for a further differentiation between social impacts, eg. into health impacts.

Figure 3: Quantification and monetisation of impacts in European Commission's Impact Assessments by type of impact



Source: European Court of Auditors (2010), p. 37-38

Not meeting the RIA guidelines requirements for quantification of costs and benefits as well as an insufficient level of analysis and assessment of social impacts have also been repeatedly identified as weaknesses of submitted draft RIAs by the Impact Assessments Board.<sup>91</sup>

The ECA cites the timely collection of standardised and comparable data, compounded by differences in the availability and reliability of data between Member States as a key impediment to further quantitative and monetised assessment of both costs and benefits. Earlier evaluations have pointed to the lack of methodologies as a reason for the insufficient assessment of social impacts: “Social impacts tend to be difficult to quantify or even monetize, as appropriate methodologies for impacts other than health and employment typically do not exist.”<sup>92</sup>

In the **United Kingdom**, the National Audit Office (NAO) used to conduct regular evaluations of the impact assessments practice. In 2010, the last year for which a report is available, the NAO reported an improvement in the use of quantification for RIAs.<sup>93</sup> In the randomly selected sample reviewed by the NAO, 86 % contained some quantification of the costs of their preferred option and 60 % contained some quantification of benefits (see Figure 4).

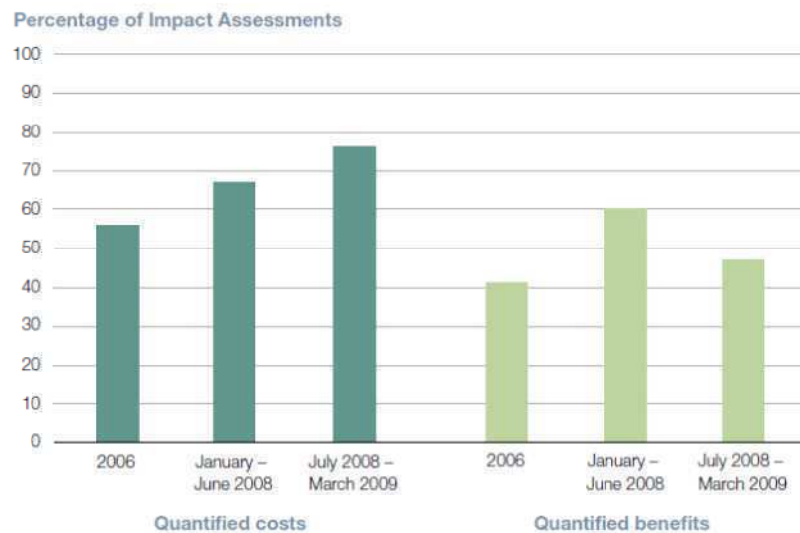
<sup>91</sup> See e.g. European Commission, Impact Assessment Board (2012).

<sup>92</sup> The Evaluation Partnership Ltd (TEP) (2007): p. 16.

<sup>93</sup> National Audit Office (2010): p. 19.



Figure 4: Comparing quantification levels in UK over time



Source: NAO (2010), p. 19.

The introduction of the one-in-one-out provision is likely to increase the pressure for monetising the cost impacts for those regulations falling under the scheme, there is however no recent data available to estimate this effect.

Since the reform of the RIA system of the United Kingdom in 2009, the *Regulatory Policy Committee* (RPC) is responsible for scrutinizing all RIAs published by departments and agencies. Key findings from the assessment of RIAs are published in biannual reports of the RPC.<sup>94</sup> In both 2010 and 2011, the RPC criticized the lack of accurate measurement of benefits and costs in the impact assessments submitted by departments. In relation to the application of cost-benefit analysis, the RPC sees particular weaknesses in the monetisation for cost and benefits as well as in the qualitative assessment of non monetised costs and benefits.<sup>95</sup>

In 2011, the *failure to produce reliable estimates of costs and benefits* has been identified as the main reason for negative opinions of the RPC.<sup>96</sup> Interestingly however, this does not only concern the monetisation of benefits. In 2012 the Department of Health has, for example, been praised for its efforts to quantify complex health benefits of tobacco policy, but has been criticised

<sup>94</sup> The RPC reports published so far are: RPC Report – Assessing Regulation November 2012, RPC Report – Improving Regulation March 2012, RPC Report – Rating Regulation July 2011, RPC Report – Challenging Regulation February 2011, RPC Report – Reviewing Regulation August 2010

<sup>95</sup> Regulatory Policy Committee (2010).

<sup>96</sup> Regulatory Policy Committee (2011).

for its lack of properly assessing the economic impacts on tobacco manufacturers and retailers.<sup>97</sup>

Analysing and **comparing the RIA practice of the European Commission and the UK** a recently published study compares the quality of a large sample of RIAs.<sup>98</sup> Fritsch et al. found broadly comparable levels of monetisation and quantification of benefits and costs, in fact they observed a rapid catching up of the European Commission as compared to the United Kingdom (See Table 9). Looking specifically at the monetisation of benefits, the authors state however, that *“as for benefit monetisation, the data confirm that this remains a difficult task in IA, both for the EU and the UK.”*<sup>99</sup> For 2009, benefits were monetised in 60,1% of UK RIAs and 51,2% EC RIAs.

*Table 9: Share of IAs (%) that identify, quantify, and monetize costs and benefits.*

	Identified costs		Identified benefits		Quantified costs		Quantified benefits		Monetised costs		Monetised benefits	
	UK	EU	UK	EU	UK	EU	UK	EU	UK	EU	UK	EU
<b>2005</b>	90,6%	82,9%	88,2%	97,6%	67,1%	46,3%	44,7%	24,4%	57,6%	46,3%	34,1%	19,5%
<b>2006</b>	89,2%	97,1%	84,9%	100,0%	66,7%	54,3%	53,8%	37,1%	61,3%	51,4%	36,6%	34,3%
<b>2007</b>	96,3%	98,0%	86,4%	100,0%	77,8%	81,6%	58,0%	67,3%	69,1%	79,6%	42,0%	53,1%
<b>2008</b>	91,5%	98,8%	86,2%	98,8%	78,7%	91,6%	71,3%	74,7%	76,6%	89,2%	67,0%	62,7%
<b>2009</b>	97,6%	100%	89,0%	98%	85,4%	93%	62,2%	61%	81,7%	86%	60,1%	51%
<b>2010</b>	97,6%	n.a.	88,1%	n.a.	78,6%	n.a.	50,0%	n.a.	71,4%	n.a.	52,4%	n.a.
<b>Average</b>	93,3%	96,0%	87,0%	98,8%	75,3%	77,3%	57,4%	57,4%	69,4%	74,5%	48,6%	47,8%

Source: Fritsch et al. (2012) p 7.

Further data from the same study show however, that this quantitative and monetised information is compared in a formal and standardised way using a cost-benefit or cost- effectiveness analysis much more often in the UK than the European Commission. While in 2009 61,0% of RIAs in the UK contained a calculation of net benefit or cost effectiveness, this number was only 18,6% for the European Commission (see Table 10).<sup>100</sup> At the same time, however, the European Commission RIAs tend to be more comprehensive in the sense that they more frequently evaluate (qualitatively or quantitatively) social and environmental impacts.

<sup>97</sup> Regulatory Policy Committee (2012).

<sup>98</sup>Based on an analysis of 477 UK RIAs and 251 EU RIAs, see: Fritsch et al (2012).

<sup>99</sup> Fritsch et al. (2012): p.8.

<sup>100</sup> Fritsch et. al (2012), p. 8

Table 10: Share of IAs calculating net benefit/cost effectiveness, Type of impact evaluated

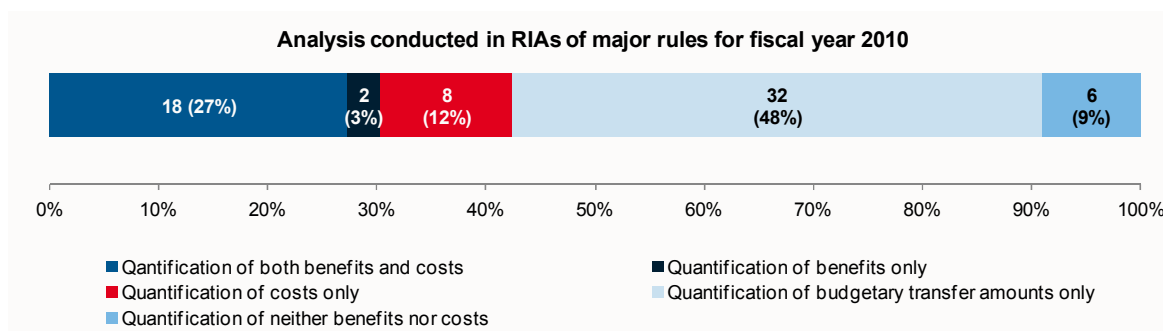
	Calculated net benefits or cost effectiveness		Evaluated economic impacts		Evaluated social impacts		Evaluated environmental impacts	
	UK	EU	UK	EU	UK	EU	UK	EU
2005	3,5%	9,8%	95,3%	80,5%	77,6%	85,4%	23,5%	39,0%
2006	3,2%	14,3%	94,6%	80,0%	69,9%	74,3%	26,9%	42,9%
2007	16,0%	26,5%	93,8%	100,0%	59,3%	89,8%	28,4%	61,2%
2008	54,3%	27,7%	88,3%	100,0%	67,0%	90,4%	30,9%	78,3%
2009	61,0%	18,6%	90,2%	97,7%	80,5%	93,0%	34,1%	60,5%
2010	50,0%	n.a.	90,5%	n.a.	78,6%	n.a.	33,3%	n.a.
Average	30,0%	21,1%	92,2%	93,6%	71,5%	87,6%	29,1%	60,6%

Source: Fritsch et al. (2012) p 9.

In the **United States** the Office of Management and Budget (OMB) annually publishes a “*Report To Congress On The Benefits And Costs Of Federal Regulations And Unfunded Mandates On State, Local, And Tribal Entities*”, providing an overview of all significant regulations reviewed by OMB and summarising all identified costs and benefits.

An analysis of the OMB of the 66 major rules promulgated by executive agencies and scrutinized between October 1 of 2009 and September 30 of 2010 is shown in Figure 5.<sup>101</sup>

Figure 5: USA: Type of analysis conducted in RIAs of major rules



Source: OMB (2011)

Figure 5 indicates that quantification of both costs and benefits is conducted in just over a quarter (27%) of all RIAs reviewed.

For the largest number of RIAs (48%) the budgetary transfer amounts are used as the key estimate of significant economic

<sup>101</sup> See: OMB (2011). OMB provides more detailed figures for the 66 major final rules for which OMB concluded review during the 12-month period beginning October 1, 2009, and ending September 30, 2010 because these account for the majority of the total benefits and costs of all rules subject to OMB review. These represent approximately 20 percent of the 328 final rules reviewed by OMB.

impact of the regulation. In 2011 regulations for which a budgetary transfer amount was used to indicate the impact included for example regulation and programmes in areas like student loans and grants, changes to payments in the Medicare and Medicaid schemes, or support for dairy farmers.<sup>102</sup>

OMB sees the lack of quantification and monetisation as the result of a number of factors, including absence of relevant information needed for quantification and monetisation, the significant challenge that the quantification and monetisation of non-market impacts poses, as well as the substantial uncertainty about the likely consequences of a regulation, which might make quantification highly speculative.<sup>103</sup>

**To summarise the evidence** on the level of quantification and monetisation presented here, we can identify a number of common themes across jurisdictions:

- The overall level of quantification and monetisation of benefits is substantially lower than corresponding guidelines would suggest. (Even in countries which strongly promote the use of CBA in RIA).
- As expected from the outset, the costs and economic impacts of regulatory proposals are more frequently quantified and monetised than benefits and social impacts of regulatory proposals.
- Reasons given for the lack of quantification and monetisation often centre on data availability and methodological difficulties in assessing and monetising social impacts.

Overall there appears to be a substantial gap between the RIA standards set in the respective handbooks and guidelines and the types of analysis actually conducted in the RIAs. This is in line with previous research from within the European Union, Jacob et al. (2008) state for example, that within the RIA systems of EU-Member States “quantification is far less comprehensive than the guidelines would suggest”.<sup>104</sup>

Nevertheless the overview presented here has to be interpreted with care: Firstly, most of the data presented has been drawn from national sources and follows own definitions of what counts as sufficiently quantified, and can thus not be compared readily between jurisdictions. Secondly one must be aware, what the

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<sup>102</sup> See eg, OMB (2011) pp.102

<sup>103</sup> OMB (2011), pp. 4-5.

<sup>104</sup> Jacob et al. (2008).

required/appropriate level of quantification in each country is. All RIA systems we looked at apply for example some form of proportionality principle in assessing impacts. It can thus be reasonable and within the spirit and scope of the RIA guidelines, not to monetise or quantify specific impacts when they are thought of as being small/insignificant and or the assessment would require a substantial additional analytical investment.

## **5.2 Cost of assessing the benefits and further impact assessment**

Conducting full or substantive quantification and monetisation of costs and benefits comes at a cost. This section presents available evidence on the costs of assessing benefits and conducting RIAs in the jurisdictions under study. Overall the available evidence on the costs of conducting RIAs is fairly patchy and it is not possible to arrive at a separate estimate for the quantification of benefits only. This is in so far not surprising, as the assessment of benefits is integrated into a wider analysis and not a distinct step of the RIA process. Prior to presenting some of the quantitative estimates that are available it is worth reflecting on some of the reasons why the estimation of costs might be challenging.

First of all one must clarify which additional costs can be attributed to RIA as compared to a “normal” policy making process. RIA guidance outlines a systematic, rational, evidence based (“good”) policy-making process and does not limit itself to conducting a cost-benefit analysis at some stage in the process. Even in the absence of formal RIA requirements one should assume that policy-makers analyse available evidence, consult with relevant stakeholders and think about the consequences of a regulatory proposal. It is thus difficult to separate, what the additional cost of a RIA is.

On a more practicable level, it is secondly fairly impossible to frame a “standard RIA” which could be used to assess the costs of the process. The range of costs can diverge significantly due to the differences in complexity of policy areas, proposals and the range and scope of impacts.

In analysing the costs of RIA one can also distinguish between direct costs incurred by government, and indirect costs such as the costs of a delay in policy making and costs incurred by stakeholders participating in consultations. The focus of this study is on the direct costs. The types of direct costs that can be associated with RIAs are summarised in Table 11, differentiated between the costs for the lead agency responsible for the drafting of a RIA and the costs for the oversight body responsible for providing guidance and quality assurance.

*Table 11: Types of direct costs for government associated with the RIA process*

Agency costs	Oversight cost
<ul style="list-style-type: none"> <li>▪ Staff time</li> <li>▪ Contracting costs associated with the selection and management of external analysis (see paragraph on consultants)</li> <li>▪ Other expenses</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide training and advice</li> <li>▪ Examination on adequacy of RIA</li> <li>▪ Reporting compliance with RIA requirements</li> </ul>

*Source: Productivity Commission (2012) p. 74, GAO (2009), p.20*

Quantitative estimates for some of these costs are available for certain jurisdictions analysed in this study.

The Australian Productivity Commission<sup>105</sup> provides different estimates of agencies concerning the **staff time needed for a RIA**. One agency claimed that in general, a middle-level manager needs 6 weeks, whereas a more complex RIA requiring consultation would need between 15 to 20 weeks, a more straightforward proposal between 2 and 4 weeks. The European Court of Auditors provides an estimate a range between 4 to 8 person-months (16 to 32 weeks) to conduct a European Commission RIA, depending on the type and complexity of the proposal.<sup>106</sup>

**Cost estimates** of RIAs have a very wide range according to a survey conducted by the Productivity Commission. Agencies provided estimates for the cost of a single RIA between \$ 2.500 (approx. 2.000 €) and \$ 450.000 (approx 350.000 €). An average value was not provided, as the PC considered such a number as not very meaningful.

The only costs found for the US are exemplary numbers for two major EPA rules, including extensive research and consultation exercise, accounting for 13 Million Dollar (approx. 10 million Euro)<sup>107</sup> However, these estimates refer to lengthy research projects and processes that take years to be developed. In comparison to two non-major EPA rules with a cost of 880.000 Dollar (approx. 670.000 Euro).<sup>108</sup>

The cost of running the Australian OBPR for independent oversight of Commonwealth and COAG RIS have been estimated for 2011 as being approximately 3,8 million Australian Dollar (approx. 3

<sup>105</sup> Compare Productivity Commission (2012). Estimates of the Productivity Commission include all RIA systems in Australia.

<sup>106</sup> European Court of Auditors (2010), p. 19 Figure 4.

<sup>107</sup> GAO (2009). The costs comprise expert advisory panels, public meetings, travel expenses, and regulatory analyses.

<sup>108</sup> GAO (2009).

million Euro).<sup>109</sup> The costs of running the Better Regulation Executive in the United Kingdom in 2009 to 2010 were almost 6 million pounds (approx. 7 Million Euro) and for the first six months of running the RPC in 2010 the costs summed up to 240.000 pounds (almost 300.000 Euro). The Better Regulation Units in each agency amounted for a further 2,2 million pounds (2,7 million Euro).<sup>110</sup>

An important source of external costs beyond agency staff time is the extent, to which **external consultants** are used to conduct (parts of) the analysis. In all systems we analysed external expertise is used to conduct (parts) of the analysis. However the extent of the involvement differs.

The Australian Productivity Commission conducted a thorough analysis on RIA and found that 38 per cent of policy staff across the Australian jurisdictions reported the contracting of consultants,<sup>111</sup> of which 80 per cent conducted the cost-benefit analyses and 50 per cent conducted the RIA as a whole. The median cost of a RIA increased by \$37.000 Dollar (approx. 30.000 €) for agencies that had used consultants (for the year 2010-11).<sup>112</sup> Use of consultants varies however substantially between jurisdictions in Australia. The Productivity Commission found that while most RISs prepared under the COAG RIA process used a consultant, very few prepared in most other jurisdictions (including Australian Govt proposals) used consultants.

For the UK, NAO reported for 2010 only two cases of contracting out with costs of 34.000 and 4.000 Pounds. According to our interview partners, direct involvement of external consultants in RIAs is not common in the UK, not least due to the strong position of the better regulation units within the departments. For both the US and the European Commission no data was found on the use of consultants.

Overall the evidence on the actual costs of conducting RIAs as a whole and assessments of benefits in particular remains patchy. Reports by independent oversight and audit bodies in the countries under study show that most agencies are not tracing the costs associated with a single RIA.<sup>113</sup> Acknowledging such thin evidence base, observers of the RIA processes are nevertheless carefully optimistic about the cost effectiveness of RIAs, pointing out that the overall costs of conducting RIAs are “*small compared with both*

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<sup>109</sup> Productivity Commission (2012).

<sup>110</sup> NAO (2011): p. 34.

<sup>111</sup> This statement does not refer to the period between 2010 and 2011, as the question posed by the Productivity Commission did not contain a time-specific horizon. Please see, Productivity Commission (2012): p.87.

<sup>112</sup> Productivity Commission (2012): p. 87.

<sup>113</sup> Compare NAO (2011): p 5; GAO (2009); Productivity Commission (2012): pp.74-75.

*the benefits and costs created by regulations themselves”, and that even an incremental improvement to a specific regulation as a result of RIA can thus justify the costs related to RIA.<sup>114</sup> The cost effectiveness is however dependent on the actual impact RIAs have on the policy making process.*

### 5.3 The impact of RIA on policy making

As for the estimation of costs, no evidence is available on the impact of the quantification of benefits on the political process. Thus we will need to look at the RIA systems as a whole to get an impression of how the systematic assessment of new regulatory proposal might change the policy-making process. The introduction of RIAs has been linked to four main objectives.<sup>115</sup>

1. Improve **understanding of the real-world impacts of government action**, including both the **benefits and the costs of action**.
2. **Integrate multiple policy objectives**.
3. Improve **transparency and consultation**.
4. Improve **government accountability**

The underlying concept is to improve the quality of policy making by improving the evidence base for decisions and increase the openness of the policy process. Furthermore, RIA should ensure that the economic, social and environmental benefits justify the costs, the distributional effects are considered and [that] net benefits of regulation are maximised.”<sup>116</sup>

So far it has however been difficult to demonstrate, that the introduction of RIAs had these desired effect. Overall there is little conclusive evidence that RIA substantially influence policy-making process.<sup>117</sup> This can however, be partially attributed to methodological difficulties in observing such an impact. The effectiveness of RIAs can usually not be observed against a counterfactual case without RIA, and it can be assumed that some impacts (like redrafting and improving a proposal and the informal provision of support and guidance) occur hidden from outside observers. Therefore most evidence in scientific research and reports by the countries is either anecdotal in nature and focuses on specific case studies or relies on surveying stakeholder’s perceptions of the impact.

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<sup>114</sup> Ibid.

<sup>115</sup> OECD (2007).

<sup>116</sup> Compare OECD (2012).

<sup>117</sup> Compare the summary of recent evidence in Productivity Commission (2012)



Improvements in the process of policy formulation have frequently been mentioned as one of the key observable impacts of RIAs.

One impact of RIA that was consistently expressed in the expert interviews for this study is that agencies undergo a **learning process**. They “sit down and think” about the actual problem that is tackled and the desired impacts they want to achieve in society. However as the interviews we conducted were with regulation experts, this might not necessarily reflect the experience of policy staff as well.

A survey conducted by the NAO in the United Kingdom among staff members from Better Regulation Units, Economists and Policy teams showed that the perceived benefits of RIAs are the added structure for the formulation of policies, a comprehensive process and a clear framework to analyse costs and benefits.<sup>118</sup> However half of the policy lead staff replied that they did not find RIAs useful in developing policy because the political reality of decision-making is interfering with the requirements of RIAs, like the need for quick responses.

For all four systems we conducted expert interviews in, respondents claimed that the RIAs process helped to **avoid badly designed proposals**. This works in two directions: Either because oversight bodies signal that a proposal would not pass scrutiny and agencies therefore do not proceed with it, or by improving the quality of the proposal with help of the oversight bodies.

Regarding the **influence of RIAs on the final policy decision**, the most positive view is reflected by the European Court of Auditors survey where 53% of Council and Parliament respondents stated that RIAs had an important impact on decision-making. Within the European Commission, 85% of the experts for better regulation claimed that RIAs helps to improve regulations, whereas 68% of delegates in the Council agreed on the view that RIA improved the quality of final legislative acts. The same report however shows that from over 12.000 European Parliament Committee documents from 2004 to 2009 only one document explicitly refers to a Commission RIA and from the Council Register of the same period only four documents refer to RIAs.<sup>119</sup>

Another NAO survey showed that only 26% of Chief Economist staff in the agencies see RIAs as central to the decision-making process. 56% disagreed with the statement that “Impact

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<sup>118</sup> National Audit Office (2010): p. 34.

<sup>119</sup> European Court of Auditors (2010).

Assessments usually play a pivotal role in spending decisions/ policy and regulation”.<sup>120</sup>

While listing some examples of cases where RIAs had an impact, and reviewing survey evidence that points towards an improvement in the policy making process (better understanding of the policy problem and impacts) the Productivity Commission *concludes that there is, “however, little concrete evidence on the effectiveness of RIA in Australia in improving regulatory decision making or the quality of regulation”*.<sup>121</sup>

Scientific evidence, country reports and expert interviews underline the impression that a RIA rarely enters into **public debates** and is rather use **behind the scenes** as a source for additional information when needed.<sup>122</sup>

Concerning the aim of improving **transparency, accountability and credibility**, RIAs seem to offer better insights into policy-making for outsiders. RIAs are seen as a useful communication tool with externals, offering the possibility of challenging and scrutinizing proposals for interest groups before the final regulation has been passed by the decision-makers. RIAs can therefore increase the overall transparency of the decision-making process.<sup>123</sup>

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<sup>120</sup> National Audit Office (2010): p. 20.

<sup>121</sup> Productivity Commission (2012), pp.74-75

<sup>122</sup> Hertin et al. (2007).

<sup>123</sup>See: NAO (2010): p. 33; Radaelli, Claudio M./ Meuwese, Anne C.M. (2010): p. 144.

## 6 Findings and Conclusions

### 6.1 Key findings

This report into international practice of quantifying the benefits of regulation has provided an overview into the institutional background in which RIAs of regulatory proposals take place, introduced key methodologies for conducting such assessments and finally looked at the current practice of assessing benefits in the relevant countries. The key findings are:

**1. Quantification and monetisation of benefits takes place within integrated Impact Assessment systems and a wider cost-benefit-framework.**

The quantification and monetisation of benefits takes place within the standard Impact Assessment procedures in Australia, the European Commission, the United Kingdom and the United States. None of the systems has specific rules or requirements for a specific, stand-alone, standardised assessment of benefits. Instead, the assessment takes place as part of the attempts to provide a balanced assessment of costs and benefits, mostly within CBA frameworks.

**2. Responsibility for assessing impacts lies with the policy units, but with strong central support, quality assurance and oversight.**

Responsible for assessing the impacts of new regulatory proposals in general and the quantification and monetisation of impacts are the responsible policy units within the departments. In some systems, notably the UK, they receive additional support from within their departments by specific support units (e.g. better regulation units). All jurisdictions analysed have central quality assurance mechanisms through a central oversight body, providing support, assessing the quality of RIAs and annually reporting about the compliance with impact assessment rules by the departments. This is comparable to the role of the German NKR within the more limited realm of assessing compliance costs.

**3. Detailed guidance is provided centrally.**

Detailed guidance is provided centrally in all jurisdictions, either by the oversight body itself or other departments like the department of finance. The guidance documents contain information about the key procedural steps of RIAs, the format of presentation as well as guidance on applicable methodologies and techniques. Even if not legally binding, the guidance develops a strong factual effect, as the guidance is also used as the quality standard for the oversight

bodies. More specific, additional guidance can be published by departments, for example on assessing climate change impacts.

**4. Recommended methods for the quantification and monetisation of benefits focus on the concept of willingness-to-pay.**

Methods to quantify and monetise the impacts provided for in the available guidance documents focus on the concept of willingness to pay (WTP) and methods to derive the WTP through the analysis of revealed or stated preferences. They are supplemented by quantifying health and environmental impacts in a standardised way, through e.g. QALYs or the social cost of carbon. The methods suggested in the guidance documents focus on the last step of assessing benefits (standardised quantification and monetisation respectively), specific guidance on how to assess the initial effect of a policy on the problem under study is not provided.

**5. A variety of tailored, policy and case specific methods and approaches is used for assessing the initial impact of a regulatory proposal.**

The assessment of the impacts of a policy proposal (for example: developing estimates for the change in the number of organs donated due to a change in regulation, or estimating the impact of pictorial warnings on cigarette packages on smoking rates) requires policy and often case specific methodological approaches. These initial estimates of the effect of a single proposed regulation on complex, multi-causal societal problems tend to be methodological far more challenging than the actual monetisation and quantification of benefits once the effect can be specified. The analysis of a sample of RIAs for this study shows, that the methods and approaches used to generate the estimate of the effect are very much tailored to the specific RIA and technical in nature, i.e. specific to the subject area and particular research area. The assessment of benefits relies on subject specific (scientific) expertise, and requires tailored, creative approaches to identify the best way to generate a quantitative estimate. These are not part of centrally provided guidance.

**6. There is a substantial gap between actual quantification and monetisation of impacts and the standards set by guidelines and regulatory policies.**

In practice, the extent and level of quantification and monetisation is far lower than the guidelines and the commitment to cost benefit analysis would suggest. In the jurisdictions under study only between less than a quarter and just about half of the RIAs contained substantive monetisation and quantification of impacts. More specifically, the costs and economic impacts of regulatory proposals were more frequently quantified and monetised than

benefits and social impacts of regulatory proposals. Only the United States regularly publish a summary of total benefits and costs across different (major) regulations.

The reasons given for the lack of quantification and monetisation often refer to problems in data availability and methodological difficulties in assessing and monetising social impacts. However, all countries we looked at also apply some form of proportionality principle, which allows for a reduction of analytical depth when the effort for quantification would be disproportionately high.

**7. There are no reliable estimates available for the costs of conducting RIAs in general and quantifying and monetising benefits in particular.**

Estimating the costs of conducting thorough ex-ante assessments of new regulatory proposals has proven difficult so far. Agencies and departments do not regularly report on the cost of RIAs, not least because it is challenging to separate the additional costs of RIA from the costs of normal policy development. Available cost estimates give a very broad range of costs for a single RIA, there are no average values provided in the available literature

**8. There is only patchy and anecdotal evidence that RIAs have a positive impact on the policy making process.**

The ambition of RIA is to improve policy making through a more systematic use of evidence, consultation and increased transparency. There is however only patchy and anecdotal evidence, that RIAs actually change the policy making process. However, RIAs seem to have an impact on the bureaucratic/administrative part of the policy formulation process, through a more systematic approach, transparency and openness. The impact on political decision-making and on politics seems to be fairly limited. The impact is thus more on the process quality of policy making than on the quality of the outcome of the process.

## 6.2 Lessons for Germany

To conclude this study, we can now reflect on the potential lessons for Germany arising out of the observations made. Those are especially related to the methodology and analytical approach of impact assessments, but also discuss the institutional preconditions of conducting RIAs. Furthermore we reflect on the question of potential target groups for impact assessments and the effectiveness of RIAs.

## Methodology and analytical approach

There are two plausible methodological options conceivable to further strengthen the assessment of benefits of a new regulation:

- 1) The introduction of a stand alone, **standardised benefit assessment**, modelled accordingly to the SCM, or
- 2) A strengthening of the **benefit assessment within an integrated approach to impact assessment**. “Integrated approach” refers to an assessment of economic, social and ecological impacts in one common analytical framework.

The analysis of the four international cases shows that there is no easy to apply, standardised methodology available to assess, quantify and monetise the benefits of regulation in general and to assess social impacts of future regulation in particular. There are no stand alone instruments for a benefit assessment available and – in light of the international experience – the development of such a comprehensive instrument does not seem to be a realistic option. If there is scope for methodological advances, than it lies more with sector specific instruments and tools which could cover aspects of benefits partially. One example would be an instrument to assess the impact of a regulation on climate change, for example a quick test on carbon emissions. Such tests could serve as a proxy for specific impact types, but could not reflect all environmental impacts. However, even such a “small solution” to benefit assessment would need substantial methodological development.

Against this background we consider a strengthening of benefit assessment within an integrated approach as the more feasible option. This approach does not require a central and consistent definition of methods to assess the impacts of regulations. As already mentioned above, the key methodological challenge for defining a more standardised approach for integrated impact assessment lies in the estimation of the effect itself. This estimation relies on subject specific (scientific) expertise, and requires tailored, creative approaches. Once the size of the effect can be quantified, monetisation can be done relatively straightforward.

Following the option of an integrated approach to impact assessment, the methodological competence to assess impacts remain within the departments and policy units. Scope for further standardisation would lie in the process of conducting RIAs, the choice of analytical concepts and the methods of monetisation:

- The definition of **key procedural steps**, such as the problem definition, the identification of the policy objectives, the definition of options, the analysis of impacts, the comparison of options, consultation requirements etc.
- The definition and **uniform application of methods for the comparison of options, monetisation and CBA**; such as the use of standard discount rates, uniform values for a statistical life, the use of sensitivity analysis etc.
- The consistent **application of methods within specific policy areas**, i.e. using methodologies and assumptions to assess effects consistently within policy fields. Responsibility for this would rest within the competent department.

In addition to embedding the quantification and monetisation of benefits into the framework of cost-benefit analysis, as observed in the countries studied in this report, there are other feasible methodologies for an integrated impact assessment. Those are especially those methods used for systematic comparison of options that do not require a full quantification and monetisation of impacts, such as a multi-criteria analysis. Despite not offering a clear cut decision rule such as cost-benefit- and cost-effectiveness-analysis, multi-criteria analysis can be very valuable in structuring policy decisions.

### **Institutional preconditions**

In order to strengthen benefit assessment and impact assessment as a whole, international experience offers insights into a range of institutional prerequisites that enable a deeper embedment of impact assessments into the policy making process:

- There must be sufficient **political commitment** for a further monetisation of the existing RIA. This concerns the introduction of new rules, their enforcement and most importantly a commitment to use the quantitative information in the decision making process.
- Quantitative analysis requires specific **analytical capacities and competences** on the part of departments and the central quality ensuring body. The provision of skills and capacity should be organised in a way that allows for institutional learning and the build up of knowledge and experience. The provision of comprehensive guidance documents, the creation of a support unit within the federal statistical office and the provision of training to implement the requirements for compliance cost estimates could serve as example for how such a system can be supported.

- **Integration of RIA into the policy making process.** The actual effect of RIAs depends on the timing of the impact assessment process. Impact assessment should be understood as an integral part of the policy making process and be included at all stages of the process. Understanding RIA simply as an add-on and the drafting of the RIA report would not be sufficient. A positive impact of RIAs, in the sense of an incremental improvement of policy proposals can best be ensured at the early stages of policy making.
- **Independent quality assurance and oversight.** The experience with the NKR in Germany and independent oversight bodies in the international examples point to the importance of strong independent scrutiny and enforcement. Important is sanctioning of non-compliance by the oversight body, through e.g. delaying a policy proposal.
- Finally, it would require an **acceptance** - both within and outside government - for far reaching monetisation of every aspect of societal impacts like health and life or the environment as a basis for decision-making. “Putting a monetary value on a life” appears however not to be widely accepted in Germany.

### Effectiveness and target groups

Any (political and financial) investment into further quantification should however carefully consider what the desired benefits should be. The available evidence provides mainly examples of subtle and incremental changes due to impact assessments, which focus more on improvements of the policy making process by providing a more structured and transparent approach, while improvements to the policy content are less common. These effects primarily concern the process of “administrative” policy making within departments and agencies, while impact assessments are rarely used in politics. At the same time it is worth considering, whether the technical and methodologically sophisticated information provided in RIA reports can actually contribute to transparency for non-experts.<sup>124</sup>

Strengthening the assessment of the benefits of regulation by the departments might furthermore affect the balance between proponent of new regulation in the policy fields and the promoters of better (and less) regulation. Instruments like the SCM and compliance cost calculations have strengthened the central role of horizontal, better regulation units which “own” the methodologies.

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<sup>124</sup> See e.g. Wegrich, Kai (2011).



A strengthened, integrated RIAs process would however relocate the development and application of methods to the policy units. This might lead to a strengthening of their possibilities to justify and defend new regulatory proposals.<sup>125</sup>

Ultimately, the challenge for moving to a more stringent impact assessment system will be to reconcile these requirements, with the practice of German political decision making characterised by inter-institutional bargaining and consensus seeking.

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<sup>125</sup> Vgl. Jann, Werner und Wegrich, Kai (2008)

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## **8 Appendix**

### **8.1 Summary case studies**

Table 12: Summary of analysed cases

Country	Department/ Agency	Policy	Title	Year	Type of Analysis	Methods used/quantification conducted
AUS	Food Standards Agency	Consumer	Benefit cost analysis of Country of Origin Labelling	2005	None benefits are not monetised/ quantified)	qualitative
AUS	Department of Health and Ageing	Public Health	Cost-Benefit Analysis of Proposed New Health Warnings on Tobacco Products	2003	CBA	DALY
AUS	Safe Work Australia	Health and Safety	Regulation Impact Statement for National Harmonisation of Work Health and Safety Regulations and Codes of Practice	2011	CBA	willingness-to-pay
AUS	Equipment Energy Efficiency Committee	Environment	Minimum Energy Performance Standards for Air Conditioners: 2011	2010	CBA	avoided consumer electricity purchase costs
AUS	COAG standing council on environment and water	Environment	Packaging impacts consultation regulation impact statement	2011	CBA	Avoided landfill operating costs, Avoided landfill externalities, avoided regulatory costs, willingness-to-pay
AUS	Department of Infrastructure and Transport	Environment	Final Regulation Impact Statement for Review of Euro 5/6 Light Vehicle Emissions Standards	2010	CBA	avoided health costs
EC	DG ENV	Environment	Proposal for a directive on batteries and accumulators and waste batteries and accumulators as regards the placing on the market of portable batteries and accumulators containing cadmium intended for use in cordless power tools	2012		life cycle analysis (LCA)
EC	DG TREN	Environment/ Transport	Rail noise abatement measures addressing the existing fleet	2008	CBA	Monetary value on one dB per person
EC	DG SANCO	Public Health	Directive of the European Parliament and of the Council on standards of quality and safety of human organs intended for transplantation	2008	multi-criteria	QALYs avoided health costs, avoided productivity losses
EC	DG SANCO	Public Health	Proposal for a Recommendation on smoke-free environments	2009	multi-criteria	QALY
UK	DEFRA	Environment	Impact Assessment of Environmental Noise Action Plans	2009	CBA	willingness-to-pay
UK	DEFRA	Environment	Impact Assessment of Ban on Phosphorus In Domestic Laundry Cleaning Products	2009	CBA	savings to water industry; a river quality model called SIMCAT



Country	Department/ Agency	Policy	Title	Year	Type of Analysis	Methods used/quantification conducted
UK	DEFRA	Environment	EU Directive to limit Petrol Vapour Emissions from Fuelling of Service Stations	2011	CBA	Avoided damage costs from reduced emissions, shadow price of carbon
UK	DH	Public Health	Impact Assessment for the prohibition on the sale of tobacco from vending machines	2012	CBA	QALY
UK	DH	Public Health	Impact Assessment of Principles for Quality Neonatal Services	2009	CBA	QALY
UK	DH	Public Health	Impact Assessment of National Screening Programme for Abdominal Aortic Aneurysms	2008	CBA	QALY
GER	Gesundheitsministerium	Public Health	Entwurf eines Sechzehnten Gesetzes zur Änderung des Arzneimittelgesetzes	2012	benefits are not quantified	Benefits are not quantified
USA	Department of Health and Human Services		Required Warnings for Cigarette Packages and Advertisements	2011	partial CBA (without NPV), CVA	VSLY
USA	Department of Justice	Equality	Americans with Disabilities Act Title II Regulations	2010	CBA	Monetised time-saved
USA	Department of Energy	Environment	Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters	2010	CBA	energy savings, and resulting CO2 savings, social cost of carbon (SCC)
USA	EPA	Environment	Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards	2010	CBA	social cost of carbon (SCC), quantification of fuel savings

Source: Prognos AG, based on various publicly available RIAs

## **8.2 Analysis case studies**

**Impact Assessment Profile**

General Information	
Country	EU
Departement/ Agency	
Title of Impact Assessment	Amending Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators as regards the placing on the market of portable batteries and accumulators containing cadmium intended for use in cordless power tools
Year	2012
Source	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2012.0066%2852%29.FIN:EN:PDF

Analytical Framework used	
1. Cost-Benefit	
2. Cost-Effectiveness	
3. Multi-Criteria	x
4. Other: Impact assessment matrix	

Additional Information	
An on-line public stakeholder consultation, and a stakeholder workshop was conducted	3 options, BaU and two different times when the policy actions is taken; options which were discarded at an early stage are mentioned with the reason why they are not included

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?		Additional information
								Additional information	Additional information	
Minimise environmental impacts from portable batteries intended for use in cordless power tools (CPT).		no	The amounts of cadmium introduced in the EU economy coming from CPT batteries are measured.	Life cycle analysis (LCA)	The aggregated environmental impacts are measured based on the amount of cadmium introduced in the EU economy by the different CPT battery types and the conclusions of the comparative Life-Cycle Assessment of the different CPT battery types.  The result is measured in inhabitant-equivalent (eq) - 100 inhabitant-eq benefit means, that the environmental impact caused by 100 people regarding this indicator is saved.		- 4 studies, which are specified in the introduction  - For the quantitative analysis: based on the best available data and information collected from stakeholders, Member States and the literature.  - The social and economic impacts are based on mainly unverified data submitted by CPT manufacturers.  However, <b>data remains incomplete</b> regarding some aspects; in particular for economic costs for CPT manufacturers (either not reported or unverifiable)	BIO Intelligence Service conducted the LCA study.		
<b>Summary</b>		0	1							

**Impact Assessment Profile**

General Information	
Country	EU
Department/ Agency	Commission of the European Communities
Title of Impact Assessment	Rail noise abatement measures addressing the existing fleet Impact Assessment report
Year	2008
Source	<a href="http://www.ipex.eu/PEXL-WEB/dossier/files/download/082dbcc530b1bf490130bc8d11556424.do">http://www.ipex.eu/PEXL-WEB/dossier/files/download/082dbcc530b1bf490130bc8d11556424.do</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional information	
	2 options with 2 scenarios each plus "do-nothing"

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Health effects due to reduction of sound pressure levels		1	The total average noise reduction achieved by retrofitting is calculated by looking at the number of vehicles retrofitted and the time when retrofitting takes place. The reduction of the population affected by rail noise is calculated based on the noise emission reduction and the assumption on the distribution of citizens along main rail lines.	Put a value on one dB per person	The value of 10 Euros is chosen based on values available in literature concerning annoyance and sleep disturbance. The aim was to keep the analysis simple, thus a value of 10 Euro per dB and person was chosen (and verified by a sensivity analysis).	- The geographical scope is limited to EU Member States with a 1435 mm standard gauge system  - Distribution of citizens along main rail  - Wagon lifetime=35 years	- Population calculated on the basis of data from Entec report for DG-EN  - Population according to the INFRAS-IWW report  - Further studies	PWC (Multiple Framework Contract for exante Evaluation and Impact Assessment)	
<b>Summary</b>		1							



**Impact Assessment Profile**

General Information	
Country	EU
Departement/ Agency	DG Sanco (Directorate General Health and Consumer Protection)
Title of Impact Assessment	Accompanying document to the Proposal for a council recommendation on smoke-free environments Impact Assessment
Year	2009
Source	http://www.uni-mannheim.de/edz/pdf/sek/2009/sek-2009-0894-1-en.pdf http://www.uni-mannheim.de/edz/pdf/sek/2009/sek-2009-0894-2-en.pdf

Analytical Framework used	
1. Cost-Benefit	
2. Cost-Effectiveness	
3. Multi-Criteria	x
4. Other:	

Additional information	
Consultation of experts and stakeholders included	They calculated costs and benefits for each member state separately
5 options including status quo	

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Reduced morbidity and mortality from active and passive smoking		1	Based on the assumptions about the potential of the actions to reduce the prevalence of ETS (environmental tobacco smoke) exposure the number of people who are not exposed anymore was calculated.	Avoided health costs, avoided productivity losses	First, the estimates for the prevalence of ETS (i.e. the number of people exposed to ETS in different venues) across all 27 member states were obtained (based on a survey - see data). Second, the estimates on the expected effect of each of the five policies on ETS prevalence were obtained. Third, the relative risk estimates were obtained from the literature for four diseases for which ETS is a known risk factor. Fourth, the burden of the four diseases was estimated in terms of mortality and costs, across all 27 member states. The fifth and final step consisted in calculating the burden of ETS for each member state under each of the five policies.	- expected effect of the policies	- The most recent data (field work Oct-Nov 2006) from the Eurobarometer survey was used to estimate the fraction of the population exposed to ETS.  - Heart disease costs - data from the British Heart Foundation  - Lung cancer and chronic lower respiratory disease - data from the US National Cancer Institute  (because costs were not available in the EU)		
Summary		1							

**Impact Assessment Profile**

General Information	
Country	UK
Departement/ Agency	Department for Environment, Food and Rural Affairs (Defra)
Title of Impact Assessment	Impact Assessment of Environmental Noise Action Plans
Year	2009
Source	<a href="http://archive.defra.gov.uk/environment/quality/noise/environment/documents/actionplan/ia-noise-action-plan.pdf">http://archive.defra.gov.uk/environment/quality/noise/environment/documents/actionplan/ia-noise-action-plan.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional Information	
3 options considered	

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Reduce sound levels		1	Noise maps were used to determine, where certain thresholds will be reached; the actions taken are assumed to have a certain sound reduction.	Willingness-to-pay	Different sound reduction levels are given a certain price per dwelling; they identify (with noise maps) the areas where the noise is above a certain threshold, identify the number of households affected and then calculate the three options.	- The marginal impact of mitigation measures is constant across the different locations.	- Noise mapping data  - "Sound level prices": the source given is a study by the European Commission	PWC study	
<b>Summary</b>		1							

**Impact Assessment Profile**

General Information	
Country	UK
Departement/ Agency	Department for Environment, Food and Rural Affairs (Defra)
Title of Impact Assessment	Impact Assessment of Ban on Phosphorus In Domestic Laundry Cleaning Products
Year	2009
Source	No link available, yet download of the IA possible

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

**Additional information**

Types of benefits (social impacts) Identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Savings to water companies - they will use less energy and chemicals in the removal of phosphorus from sewage effluent.		1	Educated guesses about phosphorus emission from dishwashers based on the number of private dishwashers .	Cost savings to water industry	They calculated estimates of the reduction of phosphorus discharged based on the number of dishwashers and other known figures. Based on these numbers and the data about the costs of the water plants the cost reductions (of phosphorus removal requirement in sewage treatment plants) were calculated to get the benefits (=cost savings).		- Cost data from 41 United Utilities sewage treatment works  - Number of dishwashers in the country		
Environmental quality of rivers will improve		1	River quality model called SIMCAT	Each km of river in good status has a value	SIMCAT simulates the water quality; a reduction of phosphorus was applied to the model which calculated how many kilometers of river switch to the status "good" due to the reduction. Each km is given a value (see assumptions)	- 7.5% of phosphorus in raw sewage entering sewage works is from DLCP  - Benefits to rivers based on Water Framework Directive Good Ecological Status=€22.45k/km/yr (based on NERA calculations)		NERA Economic Consulting	
<b>Summary</b>		<b>2</b>	<b>2</b>						



**Impact Assessment Profile**

**General Information**

Country	UK
Departement/ Agency	Lead department or agency: Defra - Atmosphere and Local Environment Other departments or agencies: Welsh Assembly Government - Radioactivity and Pollution Prevention
Title of Impact Assessment	EU Directive to limit Petrol Vapour Emissions from Fuelling of Service Stations
Year	2011
Source	<a href="http://www.lalibrary.bis.gov.uk/uploads/d/DEFRA1253%20Final%20IA%20PVRII.pdf">http://www.lalibrary.bis.gov.uk/uploads/d/DEFRA1253%20Final%20IA%20PVRII.pdf</a>

**Analytical Framework used**

1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

<b>Additional information</b>	2 options including do nothing	Interesting: avoiding the failure to comply with EU law is listed as a benefit
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Types of benefits (social impacts) identified	Monetised	Method used to assess the desired effect of a policy option		Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
		Quantified	option						
Reductions in impacts caused by VOCs, particularly those related to ozone exposure		1	1	Damage cost functions; Avoided damage costs from reduced VOC emissions				Entec report	In the IA itself detailed information about the calculation is missing.
Reductions in climate change effects caused by the global warming potential of the VOCs released		1	1	Shadow price of carbon (SPC)				Entec report	In the IA itself detailed information about the calculation is missing.
<b>Summary</b>		2	2						



**Impact Assessment Profile**

**General Information**

Country	UK
Departement/ Agency	Department of Health
Title of Impact Assessment	Impact assessment of principle for quality neonatal services
Year	2009
Source	<a href="http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_115846.pdf">http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_115846.pdf</a>

**Analytical Framework used**

1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

**Additional information**

3 options including "do nothing"	
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Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Improve clinical neonatal outcomes with reductions in neonatal mortality		1	The number of additional survivors is calculated based on the assumed surviving rates.	QALY	Estimate of the lifetime benefit of neonates saved using quality adjusted lifetime measure. The number of additional survivors is multiplied with the "value" of the new born (dependent on the expected years he lives survival rate x life expectancy), using the QALY-method; different levels of birth weight get different coefficients (dependend on the severity of disability).	- QALY valued at 60,000 pound  - Assumption about the rate of additional survivors (for two groups of new born)	- Different studies, National Office of Statistics  - Data from the Department of Health		
<b>Summary</b>		1							

**Impact Assessment Profile**

General Information	
Country	UK
Department/ Agency	Departement of Health
Title of Impact Assessment	Impact Assessment of a National Screening for abdominal aortic aneurysms
Year	2008
Source	<a href="http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_086044.pdf">http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_086044.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional information	
4 options including do-nothing	At first stage a much broader variety of options was considered

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Increase the detection of AAA's		1	The study shows that the increase of the detection of AAA's, the provision of information about AAA's to doctors and patients etc. decrease mortality rates.	QALY	Assuming different mortality rates then convert this into QALYs by using an estimate of the mean age of a men undergoing such a surgery	- 1 QALY=40,000 pounds  - Differential mortality rates and average life years gained	A medical study about the subject	The study, although it seems, that they just use it, it was not specifically done for the IA.	
Summary		1							



**Impact Assessment Profile**

General Information	
Country	USA
Department/ Agency	Department of Justice: Disability rights section of the civil rights division
Title of Impact Assessment	Americans with Disabilities Act Title II Regulations Nondiscrimination on the Basis of Disability in State and Local Government Services
Year	2010
Source	<a href="http://www.ada.gov/regqs2010/titleII_2010/titleII_2010_regulations.pdf">http://www.ada.gov/regqs2010/titleII_2010/titleII_2010_regulations.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	The negative value (benefits minus costs) is put into relation with the willingness to pay method; interesting approach!

Additional information	
	Very detailed supplement with all types of buildings for the calculation of the costs.

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
Time saved for affected disabled persons		1	Effect is calculated based on the assumptions (number of people affected, number of times a toilet is used, saved time per toilet use)	time saved*hourly wage	The monetized benefits are basically calculated from the assumptions: # of disabled*# toilet use*saved time*hourly wage	- Number of people affected - Number of times a toilet is used - Saved time (i.e. waiting for assistance) - Hourly wage	- Studies - Information from other departments (such as hourly wage from the Department of Labor)	HDR/HLB Decision Economics, Inc. (HDR)	
Increase in one's personal sense of dignity/decrease in possibly humiliating incidents due to accessibility barriers.		1	Using only time saved as a benefit no break-even was reached between costs and benefits. Thus, the IA calculates the value of one non-humiliating toilet visit.	willingness to pay	To break even, a toilet visit without humiliation and with safety for disabled people should be worth \$2.20 (difference between costs and benefits calculated divided by the number of toilet visits). The study states, (based on the authors experience/knowledge) that this figure approximates, and probably understates, the value wheelchair users place on safety, independence, and the avoidance of stigma and humiliation in this context. Thus the benefits outweigh the costs.	- The calculated difference from the benefit above and the costs - Number of people affected - Number of times a toilet is used	- See above		
<b>Summary</b>		2							

**Impact Assessment Profile**

**General Information**

Country	USA
Departement/ Agency	Office of Energy Efficiency and Renewable Energy, Department of Energy.
Title of Impact Assessment	Energy Conservation Program: Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters; Final Rule
Year	2010
Source	<a href="http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/htg_products_finalrule_notice.pdf">http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/htg_products_finalrule_notice.pdf</a>

**Analytical Framework used**

1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

**Additional information**

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Reduction of CO2		1	The energy savings for three different heating products are calculated based on the better efficiencies that will result from the energy conservation program.	Social cost of Carbon (SCC)	The Social Cost of Carbon (SCC) measures the full cost of an incremental unit of carbon (or greenhouse gas equivalent) emitted now, calculating the full cost of the damage it imposes over the whole of its time in the atmosphere.	- Energy savings, and resulting CO2 savings	- Data from the Air Conditioning, Heating, and Refrigeration Institute (AHRI)		
<b>Summary</b>		1							

**Impact Assessment Profile**

**General Information**

Country	USA
Departement/ Agency	Assessment and Standards Division Office of Transportation and Air Quality U.S. Environmental Protection Agency
Title of Impact Assessment	Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards  Regulatory Impact Analysis
Year	2010
Source	<a href="http://epa.gov/oms/climate/regulations/420r10009.pdf">http://epa.gov/oms/climate/regulations/420r10009.pdf</a>

**Analytical Framework used**

1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

**Additional information**

	Types of benefits (social impacts) identified		Method used to assess the desired effect of a policy option	Method used for quantification/monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?		
	Monetised	Quantified						Additional information		
Summary	Reduction of CO2 emissions	1	1	A simulation model is used to calculate the effect of the new standards (published and accepted simulation models)	Social cost of carbon (SCC)	The Social Cost of Carbon (SCC) measures the full cost of an incremental unit of carbon (or greenhouse gas equivalent) emitted now, calculating the full cost of the damage it imposes over the whole of its time in the atmosphere.	- Fleet composition in the US  - Projected car sales	- EPA data about the fleet composition  - Historic vehicle sales/registration data		



**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	Food Standards Australia New Zealand (FSANZ)
Title of Impact Assessment	COOL Revisited Benefit cost analysis of Country of Origin Labelling
Year	2005
Source	<a href="http://nzier.squeeze.egressive.com/sites/nzier.org.nz/files/COOL%20revisited.pdf">http://nzier.squeeze.egressive.com/sites/nzier.org.nz/files/COOL%20revisited.pdf</a>

Analytical Framework used	
1. Cost-Benefit	
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	no quantification/monetising of the benefits

Additional information	
- It is a revision of a previous cost-benefit analysis - 2 options analysed	

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Health and safety benefits	no	no	Quantifying the costs and benefits of the current proposal is made difficult by limited information about the current market behaviour and changes that will result from the new standard. In such cases CBA can proceed by quantifying what it can, and seeing how large the unquantifiable benefits would have to be to justify proceeding with the proposal. This is the approach adopted here.	No method used - see left and right column for reasons	A cost benefit analysis would normally calculate costs and benefits to compare them. In this case the value of the benefits is difficult to calculate, as there are no readily available values to apply to such benefits as the "right to know". The analysis therefore concentrates on the costs which are more readily quantifiable, and uses these as a basis for estimating how big the benefits would have to be to justify incurring such costs.	Benefits should outweigh costs, but cannot be calculated as usual.	Only costs are considered in figures.	NZIER (a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia (self description))	
<b>Summary</b>		0	0						

**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	Commonwealth Department of Health and Ageing
Title of Impact Assessment	Cost-Benefit Analysis of Proposed New Health Warnings on Tobacco Products
Year	2003
Source	http://archive.treasury.gov.au/contentitem.asp?ContentID=794

Analytical Framework used		
1. Cost-Benefit		x
2. Cost-Effectiveness		
3. Multi-Criteria		
4. Other:		

**Additional information**

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
								Additional information	
<p>Consumers: Benefits of longevity and improved health</p> <ul style="list-style-type: none"> <li>- Value of increased length of life</li> <li>- Value of increased quality of life</li> </ul> <p>(2 specific benefits, both are quantified and monetised)</p>	1	1	The effect of health warnings is calculated based on the assumption (reduction of 3%). Effects on health and life expectation are provided by researchers.	Disability-adjusted life year (DALY). One DALY is equivalent to one lost year of full health.	<p>Personal health benefits are a function of length and quality of life. The effect of tobacco consumption on lifetime and DALYs are calculated.</p> <p>The basic value needed is the value of a life year. Premature deaths results in the loss of an average number of years of life. The cost of these lost years can then be factored up to account for the associated loss of quality of life before the early death occurs.</p>	<ul style="list-style-type: none"> <li>- They assume a value for a healthy life year to be \$87,500 (DALY - disability-adjusted life year). They derive the value from the literature (different studies, and then they choose this value as it seems reasonable).</li> <li>- The proposed health warnings will reduce tobacco consumption by 3 per cent compared with status quo</li> </ul>	<ul style="list-style-type: none"> <li>- Different literature (tobacco amount, percentage of smokers, ) ; www.quit.org.au</li> <li>- Studies about quitting, which asked about the impact of warning signs.</li> </ul>	<ul style="list-style-type: none"> <li>- Estimates of mortality and morbidity impacts of changes of tobacco consumption are provided by researchers of the University of Queensland for this report.</li> </ul>	
Summary	1	1							

**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	Safe Work Australia
Title of Impact Assessment	Decision Regulation Impact Statement for National Harmonisation of Work Health and Safety Regulations and Codes of Practice
Year	2011
Source	<a href="http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/617/Decision_RIS_%20National_Harmonisation_WHS_Regs_Codes.pdf">http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/617/Decision_RIS_%20National_Harmonisation_WHS_Regs_Codes.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional information	
2 options (1 being the status quo)	Rankings from a survey are transformed into dollars, see key assumptions

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Reducing compliance costs for business		1	Qualitative description based on a consultation process, survey for the quantitative part	Willingness to pay	There is a large part of qualitative results, based on consultations. The quantitative part is based on a survey, where companies had to rank both costs and benefits on a scale of zero (no change), one (minor) and two (significant). These rankings were then assigned to dollar values.	- Dollar values can be assigned to the different rankings. The typical respondent is assumed to have used consistent weights for costs and benefits.	Consultation, online survey	Deloitte Access Economics	
Improving efficiency for regulatory agencies		1	Same methods (qualitative results came from the consultation process, quantified results from the survey)	see left				Deloitte Access Economics	
Improving safety outcomes		1	Same methods (qualitative results came from the consultation process, quantified results from the survey)	see left				Deloitte Access Economics	
<b>Summary</b>		<b>3</b>							

**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	Equipment Energy Efficiency Committee under the auspices of the Ministerial Council on Energy
Title of Impact Assessment	Decision Regulatory Impact Statement: Minimum Energy Performance Standards (MEPS) for Air Conditioners: 2011
Year	2010
Source	<a href="http://www.ret.gov.au/Documents/mce/documents/AC%20MEPS%202011%20Decision%20RIS%20Final%2017%20December%202010.pdf">http://www.ret.gov.au/Documents/mce/documents/AC%20MEPS%202011%20Decision%20RIS%20Final%2017%20December%202010.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

<b>Additional information</b>	Other options to meet similar objectives were already analysed in a former RIS; here only one regulatory action is considered (which already exists - the standards are to be adjusted); 4 options of an adjustment to the existing level are analysed.	A summary of all submissions (statements from industry etc.) is included in the study.
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Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)? Additional information	
Reduce energy consumption and greenhouse gas emissions from air conditioners		1	To calculate the energy consumption under the BAU and MEPS scenarios, a detailed and elaborate stock model of air conditioner units installed and operating was developed. The number of operating units in a particular year is a function of existing stock, replacements and new sales.	Avoided consumer electricity purchase costs	The difference between the energy consumption is then monetised.	- Estimates of stock and sales were made for all Australia.  - The life span of typical air conditioners  - Emission costs are integrated in the energy prices		The entire study is conducted by energy consult, Australia.	
<b>Summary</b>		1							

**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	COAG Standing Council on Environment and Water
Title of Impact Assessment	Packaging Impacts Consultation Regulation Impact Statement
Year	2011
Source	<a href="http://www.ephc.gov.au/sites/default/files/Packaging%20Impacts%20Consultation%20RIS%20-%20December%202011_ISBN%20updated%20201211.pdf">http://www.ephc.gov.au/sites/default/files/Packaging%20Impacts%20Consultation%20RIS%20-%20December%202011_ISBN%20updated%20201211.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional information	
4 options, some options contain sub-options - each option and list implications is described in detail	After this document submissions by interested parties were still to be send to the Standing Council on Environment and Water Secretariat
Consultation of stakeholders was done	

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Increase packaging recovery rates		1	Based on the assumptions and the effects of the different options the projected higher recovery rates are calculated (see external support).	Avoided costs (f.e. for landfill operating, for operating landfills, for litter clean up)  Market value for the recovered material	The avoided costs (see left) and the market values were calculated by PwC based on the recovery rates for the different options calculated by Wright Corporate Strategy.	- Evaluation period: 24 years  - The packaging consumption projections are the same for all options and are based on population projections and historical packaging consumption growth rates.  - Due to the lack of data on actual litter quantities at a national level, litter projections are an estimate based on the proportion of packaging that could be available to be littered.		PricewaterhouseCoopers (PwC) undertook the cost-benefit analysis  For recycling performance: Wright Corporate Strategy	
Summary		1							

**Impact Assessment Profile**

General Information	
Country	Australia
Departement/ Agency	Department of Infrastructure and Transport
Title of Impact Assessment	Final Regulation Impact Statement for Review of Euro 5/6 Light Vehicle Emissions Standards
Year	2010
Source	<a href="http://ris.finance.gov.au/files/2011/07/02/RIS-Euro-5-6.pdf">http://ris.finance.gov.au/files/2011/07/02/RIS-Euro-5-6.pdf</a>

Analytical Framework used	
1. Cost-Benefit	x
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	

Additional information	
	6 options

Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	Additional information
Improve urban air quality		1	1	Avoided health costs	The step after measuring the emissions is to establish a value for an average health cost (\$ per tonne of emissions) from existing studies. The final step is to calculate the total health benefit (or health cost avoided) by multiplying tons of emissions saved by unit value(s) for health costs.  The methodology employed to estimate the health benefits is described by the following formula: Avoided Health Cost (\$) = Emissions Saved (tons) x Unit Health Cost (\$)	- Average fleet travel behaviour remains roughly the same as now  - The average vehicle life was assumed to be 17 years.  - Monetary values (measured as \$/ton) can be assigned to individual pollutants. (The dollar values are derived from an assessment of human morbidity and mortality.)	- BITRE Estimates  - EC (European Commission) estimates serve as a source  - different studies about health costs	The RIS incorporates a cost-benefit-analysis undertaken by the Bureau of Infrastructure, Transport and Regional Economics (BITRE). DIT also acknowledges the assistance of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) and a number of State environment agencies in the preparation of the RIS.	
Summary		1	1						

**Impact Assessment Profile**

**General Information**

Country	GER
Departement/ Agency	Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz
Title of Impact Assessment	Entwurf eines Sechzehnten Gesetzes zur Änderung des Arzneimittelgesetzes
Year	2012
Source	please specify

**Analytical Framework used**

1. Cost-Benefit	
2. Cost-Effectiveness	
3. Multi-Criteria	
4. Other:	Erklärung der einzelnen Gesetzesänderungen

<b>Additional information</b>	Die Kosten sind quantifiziert (Erfüllungsaufwand), und das umfangreich/detailliert; Nutzen hingegen nicht.
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	Types of benefits (social impacts) identified	Monetised	Quantified	Method used to assess the desired effect of a policy option	Method used for quantification/ monetisation	Method specified	Key assumptions	Data source	External support: Does the assessment draw on external support (contracted research)?	
									Additional information	
<b>Summary</b>	Begrenzung des Risikos der Entstehung und Ausbreitung von Antibiotikaresistenzen		nein	nein						
			0	0						

### **8.3 Exemplary impact assessment templates**



## Summary: Intervention & Options

Department /Agency: Defra	Title: Impact Assessment of Ban on Phosphorus In Domestic Laundry Cleaning Products	
Stage: Final	Version: 21	Date: 21th Sept 2009
Related Publications: Consultation on options for controls of phosphorus in domestic Laundry cleaning products in England. February 2008		

Available to view or download at:

Contact for enquiries: Andrzej Nowosielski

Telephone: 0207 238 5864

### What is the problem under consideration? Why is government intervention necessary?

Almost half of the rivers in England and Wales do not meet the Water Framework Directive phosphorus standard for Good Status. Phosphorus pollution can cause eutrophication. The most significant sources of phosphorus are sewage works, agriculture and diffuse pollution such as misconnections, storm overflows and small scale sewage treatment. Domestic laundry cleaning products contribute 3-4% of phosphorus pollution load to the freshwater environment. A ban will contribute to the reduction of phosphorus pollution and reduce the energy and chemicals used by the water industry in phosphorus removal from sewage effluent. The impacts on the water environment and the costs imposed on water companies to deal with phosphorus from detergents are external costs imposed by domestic laundry cleaning product manufacturers on society. Intervention is needed address these costs.

### What are the policy objectives and the intended effects?

The objective of the policy is to contribute to the reduction of phosphorus in the WFD aquatic environment in the most cost-effective manner. The reduction of phosphorus from this policy alone will not significantly alter compliance with phosphorus objectives but together with other phosphorus reduction measures is an important step in improving water quality. The resultant reduction in the use of resources for sewage treatment will reduce costs and the environmental impact of the treatment process. The policy would also apply the 'polluter pays principle' in stopping pollution at source.

### What policy options have been considered? Please justify any preferred option.

Policy options: 1) Reference case, 2) Voluntary ban on sales of DLPS containing significant amounts of phosphate 3) Ban on sales of all DLCPs containing more than 0.4% phosphorus by 2015.

The preferred option is (3) as this will reduce phosphorus pollution at source and implement the polluter pays principle. The voluntary option was rejected by industry and was therefore not considered in detail in this impact assessment.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects? 2020 - to allow time for environmental effects to be confirmed by Environment Agency monitoring.

**Ministerial Sign-off** For final proposal/implementation stage Impact Assessments:

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:



## Summary: Analysis & Evidence

<b>Policy Option: 3</b>	<b>Description: Regulation on the phosphorus content of domestic laundry cleaning products</b>
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<b>COSTS</b>	<b>ANNUAL COSTS</b>	Description and scale of <b>key monetised costs</b> by 'main affected groups' the affected groups are manufacturers of domestic laundry cleaning products containing phosphorus and their customers who will bear the costs of the change. These costs assume reduction to at least 0.4% of phosphorus for all DLCPs.		
	<b>One-off</b> (Transition) <b>Yrs</b>			
	<b>£ 10-15 million</b>	15		
	<b>Average Annual Cost</b> (excluding one-off)			
	<b>£ 5-8 million</b>		<b>Total Cost (PV)</b>	<b>£ 68-107 million</b>
Other <b>key non-monetised costs</b> by 'main affected groups'				

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>	Description and scale of <b>key monetised benefits</b> by 'main affected groups' Savings to water companies - they will use less energy and chemicals in the removal of phosphorus from sewage effluent. Environmental benefits - less phosphorus will be discharged to rivers reducing phosphorus pollution and allowing more WFD objectives to be achieved (See Annex 3 on Cost Benefit for details of source of figures).		
	<b>One-off</b> <b>Yrs</b>			
	<b>£ 3 million</b>	15		
	<b>Average Annual Benefit</b> (excluding one-off)			
	<b>£ 5 – 10 million</b>		<b>Total Benefit (PV)</b>	<b>£ 59-123 million</b>
Other <b>key non-monetised benefits</b> by 'main affected groups' A reduction in phosphorus pollution in most rivers and still waters. It is not possible to monetise this benefit but it will certainly contribute towards improving the aquatic environment and achieving water quality objectives. Some sites not specifically monitored for phosphorus will benefit significantly.				

**Key Assumptions/Sensitivities/Risks** Industry costs are difficult to determine due to commercial confidentiality - the costs are estimates based on figures provided by the water industry. The benefits to the environment are difficult to determine because of the unpredictable way that phosphorus can affect rivers.

Price Base Year 2008	Time Period Years 15	<b>Net Benefit Range (NPV)</b> <b>£ -48 to £56 million</b>	<b>NET BENEFIT (NPV Best estimate)</b> <b>£ 4million</b>
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What is the geographic coverage of the policy/option?				England and Wales	
On what date will the policy be implemented?				2015	
Which organisation(s) will enforce the policy?				To Be Finalised	
What is the total annual cost of enforcement for these organisations?				£ Negligible	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				No	
What is the value of the proposed offsetting measure per year?				£	
What is the value of changes in greenhouse gas emissions?				£	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off)		Micro	Small	Medium	Large
Are any of these organisations exempt?		No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)					(Increase - Decrease)
Increase of	£	Decrease of	£	<b>Net Impact</b>	£

Key: Annual costs and benefits: (Net) Present

## Summary: Intervention & Options

Department /Agency: Department of Health	Title: Impact Assessment of Principles for Quality Neonatal Services	
Stage: Final Proposal	Version: 11.0	Date: 22 September 2009
Related Publications: Toolkit for Quality Neonatal Services		

Available to view or download at:

<http://www.>

Contact for enquiries: Allison Binns

Telephone: 020 797 24143

**What is the problem under consideration? Why is government intervention necessary?**

In 2007, the total number of registered neonatal deaths in England and Wales was 2,282, a decrease of two per cent since 2000. However, demand for neonatal services has continued to increase with admissions increasing by nine per cent between 2006-07 and 2007-08.

A joint DH and NHS taskforce was set up following an NAO review of neonatal services in England. It is envisaged that national quality principles developed by the taskforce will enable health authorities to work together to implement recommendations made by the NAO and address workforce shortages to reduce neonatal mortalities.

**What are the policy objectives and the intended effects?**

The policy objectives are to improve clinical neonatal outcomes with reductions in neonatal mortality and ensure equity in service provision across the neonatal networks.

The role of the taskforce will be to support and facilitate the development of principles to improve neonatal services for premature and sick newborn babies and their families. National quality principles will address and improve issues concerning workforce, transfers, surgery and data collection. It will also develop a commissioning framework to increase the quality of perinatal and specialist neonatal care across the NHS.

**What policy options have been considered? Please justify any preferred option.**

The following options have been considered:

1. Do nothing - no additional recruitments to add to existing workforce.
2. Preferred option: develop a neonatal toolkit, which includes a set of principles (the Principles) and commissioning guidance, which allow local implementation to meet the needs of the local population and the means to monitor services to determine where improvements are made at a local level.
3. Provide national quality principles for implementation at the national level.

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?**

There will be staged costs which will develop following implementation in 2010. Data collections will begin to inform in 2011 and benefits achieved each year with reductions in neonatal mortality.

**Ministerial Sign-off** For SELECT STAGE Impact Assessments:

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:



Date: 27.10.09.

## Summary: Analysis & Evidence

Policy Option: 2

Description: Develop commissioning framework, supported by national quality principles, allowing local implementation to improve clinical outcomes

<b>COSTS</b>	<b>ANNUAL COSTS</b>		Description and scale of <b>key monetised costs</b> by 'main affected groups' One-off costs include training costs for workforce expansion and backfilling. This is accrued over a period of 3 years. Annual costs include paybill costs and other overheads to deliver workforce measures recommended in the national quality principles, and non-pay costs to the health service to treat additional survivors.
	<b>One-off</b> (Transition)	<b>Yrs</b>	
	£ 102.4m	3	
	<b>Average Annual Cost</b> (excluding one-off)		
	£ 89.4m	<b>Total Cost (PV) £ 996.7m</b>	
Other <b>key non-monetised costs</b> by 'main affected groups' Cost of communicating the Principles and commissioning tools to neonatal networks, Primary Care Trusts and Strategic Health Authorities.			

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>		Description and scale of <b>key monetised benefits</b> by 'main affected groups' Estimate of the lifetime benefit of neonates saved using quality adjusted life years measure (based on a 10 per cent annual reduction in mortality rates for neonates with very low birthweight and low birthweight). The value of a life saved is treated as a wider societal benefit rather than a saving to the NHS in this IA.
	<b>One-off</b>	<b>Yrs</b>	
	£ nil		
	<b>Average Annual Benefit</b> (excluding one-off)		
	£ 21.3m	<b>Total Benefit (PV) £ 1.4 billion</b>	
Other <b>key non-monetised benefits</b> by 'main affected groups' Reduced neonatal mortality rates; achievement of greater equity across the neonatal networks in the provision and level of care given to neonates; and attainment of recommended workforce levels to minimise transfers of neonates outside their home unit when the reason for doing so is staff shortage.			

Key Assumptions/Sensitivities/Risks QALY's valued at £60k. The adjusted costs are inflated to 2009-10 prices using the Consumer Price Index to reflect changes over time.

Price Base Year 2009	Time Period Years 10	Net Benefit Range (NPV) £	<b>NET BENEFIT (NPV Best estimate)</b> £ 380.5m
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What is the geographic coverage of the policy/option?	England			
On what date will the policy be implemented?	2010			
Which organisation(s) will enforce the policy?	N/A			
What is the total annual cost of enforcement for these organisations?	£ N/A			
Does enforcement comply with Hampton principles?	No			
Will implementation go beyond minimum EU requirements?	No			
What is the value of the proposed offsetting measure per year?	£ N/A			
What is the value of changes in greenhouse gas emissions?	£ N/A			
Will the proposal have a significant impact on competition?	No			
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)			(Increase - Decrease)		
Increase of	£	Decrease of	£	<b>Net Impact</b>	£

Key: Annual costs and benefits: Constant Prices (Net) Present Value

## Summary: Analysis & Evidence

Policy Option: 3

Description: Provide national quality principles for implementation at the national level.

<b>COSTS</b>	ANNUAL COSTS		Description and scale of <b>key monetised costs</b> by 'main affected groups' One-off costs include training costs for workforce expansion and backfilling. This is accrued over a period of 3 years. Annual costs include paybill costs and other overheads to deliver workforce measures recommended in the national quality principles, and non-pay costs to the health service to treat additional survivors.
	One-off (Transition)	Yrs	
	£ 102.4m	3	
	Average Annual Cost (excluding one-off)		
	£ 89.4m		<b>Total Cost (PV) £ 996.7m</b>
Other <b>key non-monetised costs</b> by 'main affected groups' Implementing principles at a National level will be difficult since they are not mandatory.			

<b>BENEFITS</b>	ANNUAL BENEFITS		Description and scale of <b>key monetised benefits</b> by 'main affected groups' Estimate of the lifetime benefit of neonates saved using quality adjusted life years measure (based on a 10 per cent annual reduction in mortality rates for neonates with very low birthweight and low birthweight). The value of a life saved is treated as a wider societal benefit rather than a saving to the NHS in this IA.
	One-off	Yrs	
	£ nil		
	Average Annual Benefit (excluding one-off)		
	£ 21.3m		<b>Total Benefit (PV) £ 1.4 billion</b>
Other <b>key non-monetised benefits</b> by 'main affected groups' Reduced neonatal mortality rates; greater equity across neonatal networks in the provision and level of care given to neonates; and attainment of recommended workforce levels to minimise transfers of neonates outside their home unit when the reason for doing so is staff shortage.			

Key Assumptions/Sensitivities/Risks QALY's valued at £60k. The adjusted costs are inflated to 2009-10 prices using the Consumer Price Index to reflect changes over time.

Price Base Year 2009	Time Period Years 10	<b>Net Benefit Range (NPV)</b> £	<b>NET BENEFIT (NPV Best estimate)</b> £ 380.5m
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What is the geographic coverage of the policy/option?		England		
On what date will the policy be implemented?		2010		
Which organisation(s) will enforce the policy?		N/A		
What is the total annual cost of enforcement for these organisations?		£ N/A		
Does enforcement comply with Hampton principles?		No		
Will implementation go beyond minimum EU requirements?		No		
What is the value of the proposed offsetting measure per year?		£ N/A		
What is the value of changes in greenhouse gas emissions?		£ N/A		
Will the proposal have a significant impact on competition?		No		
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline</b> (2005 Prices)		(Increase - Decrease)	
Increase of £	Decrease of £	<b>Net Impact</b>	£

Key: Annual costs and benefits: Constant Prices (Net) Present Value