A methodology for assessing regulatory failure risks

Final report for Defra

June 2012

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1 Executive summary

Defra commissioned Economic Insight to develop a methodology for assessing regulatory failure risks. The overall objective of the study was to provide a methodology that Defra could apply on a forward-looking basis for the purposes of policy design and evaluation. In addition to this core objective, the research aims of the study also included: helping to build awareness of the need to consider regulatory failure risks within Defra; and making clear recommendations as to how Defra might apply the methodology in the context of the regulatory reform agenda.

The scope of the study was focused on the development of the aforementioned methodology, and on its application to Defra policies. The study was not, therefore, intended to specifically address the question of *whether* regulatory failure risks have materialised historically. Consequently, we have not undertaken detailed empirical evaluations of Defra's existing policy areas.

Consistent with the above, the analysis we undertook was largely qualitative in nature; drawing on academic literature, the existing analytical evidence base and economics first principles. Primary research was not within the scope of our work.

This is our Final Report to Defra, following the completion of our study. The Report is structured as follows:

- Understanding regulatory failure risks and their importance.
- A methodology for assessing regulatory failure risks.
- How Defra can apply the methodology.
- Key messages and recommendations.

Understanding regulatory failure risks and their importance

There is an extensive academic economics literature on the subject of regulatory failure risks. In addition, various sectoral regulators have proposed definitions for the purpose of evaluating the risk of specific failure types. For the purpose of our study, we define regulatory failure risk as: ***"The risk that the economic costs of regulation outweigh the benefits, arising from regulation having unanticipated and/or unintended effects."*** The forward-looking dimension to the definition is particularly important, as it reflects the possibility that, at the time of policy design, the full costs of proposed regulation may not be fully understood (and could therefore be under-estimated). In addition, it is the focus on the unanticipated or unintended effects of regulation that differentiates regulatory failure risk analysis from alternative analytical approaches, such as cost benefit analysis.

A consideration of regulatory failure risk matters because, without it, there is greater scope for the economic costs of regulation to outweigh the benefits. In particular, when evaluating policy options, an agency or regulator is likely to choose between those options based on a cost benefit analysis framework. If that framework does not consider, on a forward-looking basis, the scope for

regulatory failure there is clearly an increased chance of choosing an option which is either: (a) less net beneficial than other alternative options; or (b) is itself simply not net beneficial.

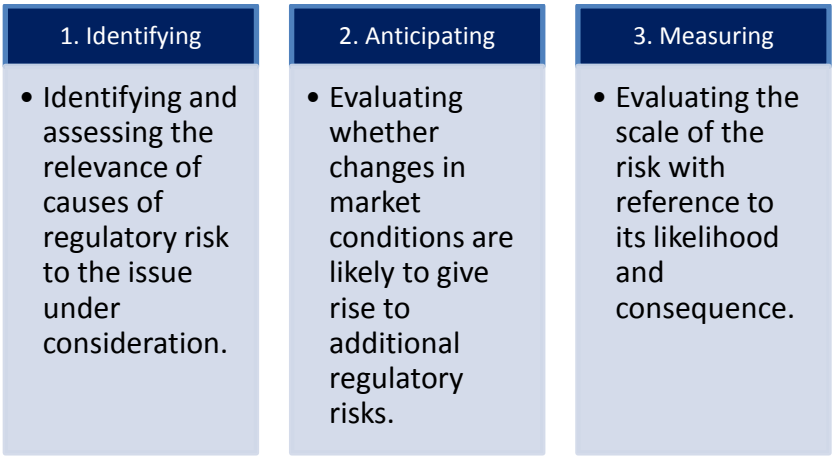
The Government's regulatory reform agenda, and in particular the Better Regulation Strategy and Red Tape Challenge, accentuate the importance of considering regulatory failure risks. This is because such analyses can help in the identification of the most proportionate approach to issues that might require a regulatory response.

Although an analysis of regulatory failure risks can be an important tool for agencies and regulators, it is important that it is seen in proper context. In particular, even where regulatory failure risks are identified, this does not (in and of itself) imply that regulation of some form is not net beneficial. Rather, in many cases it may be that an assessment of regulatory failure risks forms part of the evidence base that allows stakeholders to choose between alternative regulatory solutions.

A three stage methodology for assessing regulatory failure risks

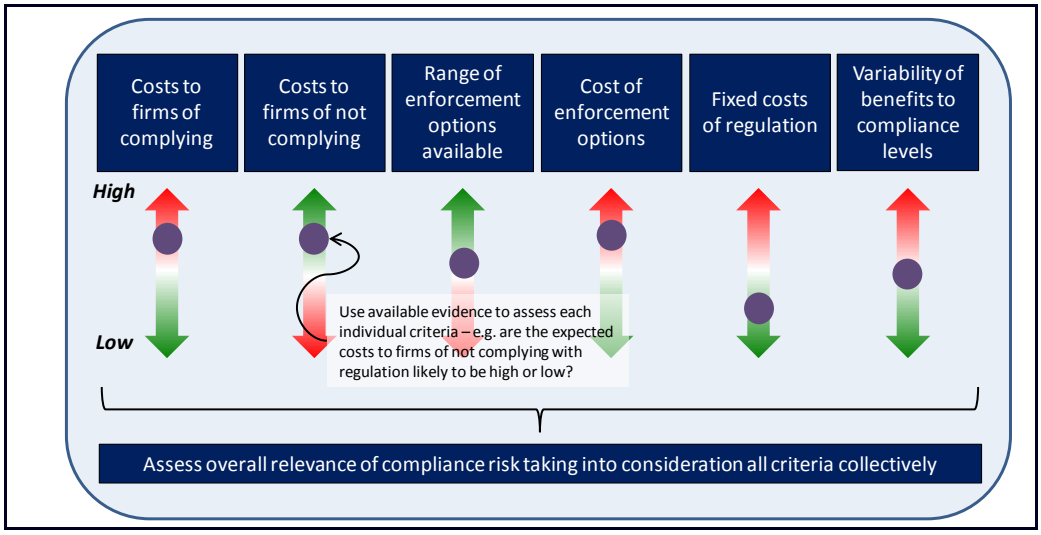
We have developed a three stage methodology for the assessment of regulatory failure risks, as shown below.

Figure 1 The three stages of our methodology



The *identification* stage of the methodology firstly addresses the 'in principle' causes of regulatory failure risk: lack of compliance, regulatory capture, problems of regulatory design or implementation and lack of regulatory solution. It then sets out how the relevance of these to specific issues can be determined. We do this through a 'risk dashboard' approach, whereby we identify the critical issues that need to be considered in making the assessment. For example, our risk dashboard for compliance is shown below.

Figure 2 Compliance risk dashboard



Source: Economic Insight

The *anticipation* stage of our methodology describes how future potential risks can be identified by considering trends and changes in market conditions. We do this by setting out a checklist of key questions that need to be addressed, relating to both demand and supply side issues. Having considered these questions, our methodology suggests revisiting the risk dashboards from the identification stage in order to evaluate whether the assessment of the relevance of risks is likely to change on a forward-looking basis.

The third and final stage of our methodology relates to the measurement of regulatory failure risk, with regard to both its likelihood and consequence. Here, in an economic sense, we are seeking to address the impact of failure risk with regard to total social welfare. Put simply, the assessment needs to take into account the impact on both consumers and producers in the markets of relevance. A key finding is that there is no single analytical approach for measuring impact that would be suitable in all circumstances and, as such, it is not possible to propose specific analytical steps that should be adopted universally.

Given the above, the methodology for the measurement stage is inherently higher level, whereby we have set out the key issues that need to be assessed in determining likelihood and consequence. In addition, we find that attempting a detailed quantification of regulatory failure risk is likely to be impossible, or disproportionate in most circumstances. Therefore, our methodology focuses on techniques that can be used to assess the 'order of magnitude' of the risk. This approach is consistent with how regulators in other (non-Defra) sectors seek to evaluate regulatory failure risk.

How Defra can apply the methodology

In setting out how Defra can apply the methodology, we emphasise the need to take a proportionate approach. In particular, in many cases it may be that seeking to undertake any detailed analysis of the likely risks of regulatory failure is simply disproportionate to the overall impact of the policy. In other instances however, the consequences of regulatory failure could be sufficiently large that a more detailed assessment is appropriate. This approach is consistent with BIS' wider guidance on impact assessments, which explicitly states that the effort expended should be proportionate to potential policy impact. We identify some specific criteria, which when met

would indicate that no assessment of regulatory failure risk would be appropriate. When these criteria are not met, we suggest that *some* form of assessment should be made, but that the level of detail of the assessment should be proportionate. In addition, we consider the 'timing' of regulatory failure assessments within the context of Defra's Policy Cycle. We consider that they are most appropriate at the *'develop and appraise options'* stage.

To illustrate how Defra can apply the methodology we set out case studies, both for other non-Defra related sectors and for four specific regulations that are within Defra's remit. With regard to non-Defra sectors, we examine how regulatory failure risks have been assessed in post (the deregulation of Royal Mail Group), telecoms (the design of the 4G spectrum) and financial services (the FSA's approach to assessing regulatory failure risk). The case studies indicate that other sectoral regulators adopt a similar approach to that proposed in our methodology, making pragmatic assessments of failure risk when making policy decisions, but without attempting to precisely quantify it.

The Defra specific cases studies are structured around the main stages of our methodology: *identify, anticipate and measure;* and on illustrating the application of a proportionate approach to assessing regulatory failure risk. Across these stages we examine the issues relating to four regulations/regulatory topics within Defra's remit: the implementation of the EC Nitrates Directive; the Producer Responsibility Obligations (Packaging Waste) Regulations; the introduction of sheep and goat electronic identification (disease control); and the Seed Marketing Regulations. It is important to note that the purpose of these case studies is simply to illustrate the relevance and application of the methodology, rather than to undertake a detailed empirical assessment as to whether there have been historic failures. Consequently, the choice of the case studies does not indicate any prioritisation of these policy areas, nor any assessment that they carry more or less risk than other policy areas. Here the key insights are:

- That an assessment of whether there was a compliance risk of regulatory failure would have been a relevant consideration when evaluating Defra's proposed 2008 changes to the implementation of the Nitrates Directive. This is due to the way in which the regulation drives a need for capital investment by farmers.

- That the volatility of recycling markets means that the 'anticipation' stage of the methodology is particularly relevant to evaluating and setting packaging waste recycling targets and to the functioning of Packaging Recycling Notes in the UK model.

- The uncertainty regarding the incremental impact of electronic tagging in sheep and goats illustrates the importance of considering the likelihood of regulatory failure in the measurement stage.

- The small incremental impact of reforms to the Seed Marketing Regulations demonstrates the importance of adopting a proportionate approach to the methodology.

Our recommendations

We have five recommendations for Defra on the basis of this study.

1. Defra should seek to explicitly consider regulatory failure risks as part of its policy design and evaluation processes (as appropriate), and in doing so, follow the three stages of the methodology set out in this report.

2. The most appropriate point in the Policy Cycle for Defra to consider its application would be at the *'develop and appraise options'* stage. Here the goal would be to ensure that, at the inception of policy design, an assessment of regulatory failure risk is used to: (i) help determine whether a regulatory response is appropriate; (ii) help support strong policy design, by ensuring that options are developed in a way that explicitly takes failure risks into account; and (iii) inform an evaluation as to what the most appropriate form of response might be (i.e. to choose between the different options). The methodology could also be used to inform the *'implement and monitor'*; and *'evaluate and adapt'* stages of the Cycle. However, we would not recommend that Defra adds further process to formalise or mandate the assessment of regulatory failure risks; but rather, uses judgement to determine when it is, and is not, appropriate (see recommendation 4).

3. Stepping back from the Defra Policy Cycle context, regulatory failure risk analysis could also be viewed as a useful tool with which to influence the design and reform of EU legislation, where Defra has scope to do so (i.e. it could be used to help influence the regulatory framework at a stage prior to the implementation or amendment of UK legislation).

4. We further recommend that Defra should seek to apply this methodology in a proportionate way, rather than mandating detailed analysis in a uniform manner across all policy areas and regulatory issues. This is particularly important given that (i) much of the regulation of which Defra has oversight emanates from the EU, which reduces Defra's ability to determine whether and how it is implemented; and (ii) in instances of reforms to existing regulations, the likely incremental impact may be so small that it would be disproportionate to require detailed analysis. Specifically:

    a. No assessment of regulatory failure risk is appropriate in circumstances where:

        i. Defra has no discretion as to how a particular regulation or policy is implemented.

        ii. The changes in regulation/policy under consideration are so minor that their expected incremental impact is trivial.

    b. In other circumstances, Defra should undertake *some* assessment of regulatory failure risks, but should do so in a proportionate way, balancing the effort expended against the overall impact of the regulation/policy in question. We suggest that Defra is best placed to make this assessment of proportionality, as it will need to take into consideration its own internal resources and prioritisations in making any decision.

5. Without adding additional prescriptive process, Defra should consider developing high level internal guidance as to when a consideration of regulatory failure risks would be appropriate and communicate this to relevant internal teams and stakeholders.

2 Introduction

This report for Defra sets out a methodology for assessing regulatory failure risks for the purpose of supporting policy design and analysis. The methodology encompasses both:

- a conceptual approach to assessing regulatory failure risks (i.e. a description of how to undertake regulatory failure risk analysis); and
- practical steps that Defra can apply to integrate regulatory failure risk assessments into existing policy design and evaluation processes (without adding material additional burdens).

Our report is structured as follows:

- In section 3 we set out a background discussion of regulatory failure risks and the context for our study. This includes setting out the overall aims and objectives of our work for Defra.
- In section 4 we set out our methodology for assessing regulatory failure risks.
- In section 5 we describe how Defra can practically apply the methodology and set out a number of illustrative case studies.
- The final section contains our key messages and recommendations.

3 Understanding regulatory failure risks and their importance

In order to establish a methodology for assessing regulatory failure risks, it is first important to have a shared understanding as to how these risks are defined, their relevance to Defra; and consequently, how this relates to the objectives and scope of the present study. In this section therefore, we address in turn:

- how regulatory failure risks are defined;
- why regulatory failure risks matter;
- the overall aims and objectives of our study; and
- the scope of our work for Defra.

3.1 What are regulatory failure risks?

In 1962 Averch and Johnson published a seminal paper that set out how rate of return regulation could lead to incentives for firms to over-invest, leading to economically sub-optimal outcomes: *"If the rate of return allowed by the regulatory agency is greater than the cost of capital but is less than the rate of return that would be enjoyed by the firm were it free to maximize profit without regulatory restraint, then the firm will substitute capital for other factors of production and operate at an output where cost is not minimised."*[1]

In essence, Averch and Johnson had identified a particular *form* of regulatory failure risk; in that case the potential for regulation to create unexpected investment incentives, with resulting economic costs. It is now understood that regulatory failure risk is much broader than a pure incentive problem relating to rate of return regulation. Rather, it relates more generally to circumstances under which the economic costs of regulation outweigh the economic benefits. Academic literature and regulatory guidance provides a range of definitions of regulatory failure, which are summarised overleaf.

[1] 'The Behaviour of the Firm Under Regulatory Constraint.' Averch and Johnson, American Economic Review (1962).

Figure 3 Definitions of regulatory failure

"By regulatory failure we mean either that the regulatory intervention fails to achieve the outcome intended, or that there were unintended consequences. It can be thought of as the counterpart of market failure." Ofcom.

"It (regulatory failure) refers to an intervention whose economic costs were higher, or economic benefits lower, than was originally expected such that the net effect is harmful or more harmful than it need have been." EU Lamfalussy Committee.

"[regulatory failure is where interventions] produce results worse than those they are attempting to correct." Alleman and Rapport.

"When regulation generates more economic costs than benefits." The Economist.

"Circumstances where the regulation of markets might reduce rather than increase economic welfare." Kirkpatrick and Parker.

"Regulatory failure [is when economic costs outweigh economic benefits]… This typically happens where regulation has unforeseen and unintended effects arising from interaction with a specific characteristic of the market affected." Financial Services Authority.

"Extensive regulatory inefficiency can be viewed as regulatory failure. This occurs when regulation simply makes the situation worse than it would have been in the absence of regulation." Crew and Parker.

"…regulatory failure occurs when regulation is effective in reaching its goal… but is inefficient, that is, it is achieved at too high [a] cost to society… If such costs are so high that the regulation produces net costs to society, there is a 'regulatory failure'." Pelkmans.

Full references are provided in Annex A.

Unsurprisingly, there is a general consensus that circumstances under which (ex-post) the economic costs of regulation outweigh the benefits should be deemed a 'regulatory failure.' However, this definition alone is not particularly insightful. This is because, as the practice of policy design and evaluation has evolved, the need to consider the potential costs of regulatory interventions has become widely understood and implemented. For example, the BIS Impact Assessment Toolkit makes explicit the need to capture regulatory costs (both administrative burdens and policy costs) within impact assessments.[2]

When considering regulatory costs however, the challenge for government agencies and regulators is that regulation can have unintended and/or unanticipated effects. This means that (particularly at the time of policy design) the *true* economic costs of certain interventions *may not be fully taken into consideration*, thus leading to a future risk of regulatory failure. This is likely to arise for one of three reasons:

1. **Relevant existing factors are not identified.** At the time of policy design, it may be that a regulator simply fails to identify all of the potential issues associated with the regulation

[2] 'IA Toolkit How to do an Impact Assessment.' BIS (2011).

that could result in economic costs. For example, with regard to rate of return regulation, prior to Averch and Johnson's research, regulators may not have considered the scope for economic costs arising from an investment bias caused by the design of the regulatory framework.

2. **Relevant factors emerge over time, leading to unanticipated economic costs.** Even if a regulator or agency identifies the existing sources of economic costs arising from regulation (and is able to quantify them) there remains the possibility that *new* factors emerge over time, leading to additional costs. This is most likely to arise from changes in the characteristics of the market(s) in which the regulation is applied. For example, if demand in a market becomes highly uncertain, the application of standard regulatory instruments becomes more difficult.

3. **The economic costs of relevant factors are under-estimated.** Even if a relevant factor is identified (or anticipated) and taken into consideration by a regulator, the implications of that factor may be misunderstood and therefore its true economic costs under-estimated. For example, a regulator could identify a lack of compliance as a relevant risk with associated economic costs, but due to a lack of information might under-state the significance of those costs.

Given the above, regulators and government agencies need a framework and methodology that allows them to better identify, anticipate and assess the potential sources of regulatory failure *on a forward-looking basis.* The existence of such a methodology allows stakeholders, at the time of policy design, to look ahead and consider:

- *What is the scope for regulatory failure in this space?*
- *What are the implications for outcomes were those failures to arise?*
- *What can be done to mitigate those risks?*

For the purpose of our study therefore, we take regulatory failure risk to mean: ***"The risk that the economic costs of regulation outweigh the benefits, arising from regulation having unanticipated and/or unintended effects."***

Whilst, like cost benefit analysis and impact assessments, regulatory failure risk analysis ultimately consists of a consideration of costs and benefits, there are two key differentiating factors that set it apart from those analytical tools. Firstly, the focus of regulatory failure risk analysis is on the potentially unanticipated or unintended effects of regulation (i.e. potential sources of cost that might not otherwise be considered); and secondly, (as we discuss subsequently) regulatory failure risk analysis is rarely used to provide formal quantitative estimates of costs and benefits.

3.2 Why regulatory risks matter

In simple terms, considering the risk of regulatory failure matters because, without such consideration, there is greater scope for the economic costs of regulation to outweigh the benefits. In particular, when evaluating policy options, an agency or regulator is likely to choose between

those options based on a cost benefit analysis framework. If that framework does not consider, on a forward-looking basis, the scope for regulatory failure there is clearly an increased chance of choosing an option which is either: (a) less net beneficial than other alternative options; or (b) is itself simply not net beneficial.

Regulatory failure risk assessments can, therefore, provide regulators and government agencies with a powerful tool, which helps them make decisions – particularly in circumstances where a standard cost benefit approach yields results which are inconclusive (for example, where two policy options have very similar cost/benefit ratios and a choice must be made). For this reason, it is unsurprising that:

- the need to consider regulatory failure risk has been emphasised in a range of regulatory assessment guidelines; and
- that an assessment of regulatory failure risk has played a pivotal role in a number of significant recent regulatory decisions.

With regard to the former, for example, both the OECD's and FSA's guidelines on undertaking impact assessments set out the need to consider regulatory failure risks. Indeed, the OECD explicitly states that such assessments are critical to helping policy makers identify circumstances under which formal regulation is unlikely to meet its intended objectives, stating that *"in such cases, policy-makers must look to alternative tools to achieve their objectives."*[3]

With regard to the latter, there are numerous examples as to how regulatory failure risk has influenced policy making:

- Ofcom's decision to largely de-regulate Royal Mail Group reflected (in part) the regulator's view that there were material regulatory failure risks: *"The risk of regulatory error [associated with continuing to apply formal ex-ante regulation] is very high given the exceptional nature of the circumstances of the postal market."*[4]
- The liquidity crisis of 2008 has resulted in intense academic debate as to the extent to which its causes were predominantly due to market or regulatory failures.
- In the water industry, an important feature of Ofwat's consultation on a future regulatory framework is the debate as what approaches are most likely to minimise regulatory failure risks when considering both historic and future cost recovery.[5]
- In telecoms regulation, the approach to setting appropriate termination charges reflects a detailed assessment of the regulatory risks associated with the various economic methodologies (for measuring costs and setting prices) that could be applied.

[3] 'Handbook for Undertaking Regulatory Impact Analysis.' OECD (2008).

[4] 'Securing the Universal Postal Service: Summary.' Para 1.29, Ofcom (2011). Note, Ofcom consultation process was on-going at the time of our study.

[5] Ofwat specifically focused on the issue of whether there might be capex bias in the regulatory framework; and thus on evaluating whether alternative approaches might reduce or remove the risk of that occurring.

The way in which these failure risk assessments are used by regulators – and the implications of this for Defra – is considered further in Section 5 of this report, where we set out case studies from other (non-Defra related) sectors.

From Defra's perspective, the importance of considering regulatory failure risks is accentuated by the government's regulatory reform agenda – and Defra's commitment to supporting it

The Coalition Government wishes to remove and/or reform regulation that is overly burdensome and detailed. In this context the government set out its Better Regulation Strategy, which specifically aims to: (i) remove or simplify existing regulations that unnecessarily impede growth; (ii) reduce the overall volume of new regulation by introducing regulation only as a last resort; (iii) improve the quality of any remaining new regulation; and (iv) move to less onerous and less bureaucratic enforcement regimes where inspections are targeted and risk-based.[6]

The main policies and initiatives that make up the government's Better Regulation Strategy include: the one-in, one-out rule; sunsetting regulations; exemptions for mico-businesses; the Red Tape Challenge; revised interpretation of European regulation; and a reformed approach to enforcement that recognises regulation as being a last resort.

Defra is committed to supporting the government's regulatory reform agenda by focusing on how public policy objectives can be met in ways that encourage sustainable growth and minimise the burden on those affected by regulation. To this end, in 2010 Defra established a Better Regulation Programme to lead and report on actions by Defra. The stated objective is: *"to create the environment in which Defra's policies contribute to green economic growth in ways that are least burdensome on those affected, intervening only when necessary and preferably through non-regulatory approaches."*[7]

Against this background Defra has already begun work to build up a complete picture of its regulatory stock and the cost benefit ratio of that stock.[8] In particular, in August 2011 Defra published its emerging findings from an assessment of the costs and benefits of its regulatory stock. The key finding of this work was that, for regulations where the benefits to wider society could be monetised, the overall cost-benefit ratio is 2.4:1; meaning that for every £1 spent on regulation there is a £2.40 benefit to society.

Defra's cost benefit analysis represents an important step in building an evidence base for regulatory reform and provided a number of important insights. However, Defra themselves noted that – as is the case in any cost benefit analysis – there were a number of inherent uncertainties. These uncertainties mean that it is important for Defra to have complementary analytical frameworks and evidence to draw upon as it seeks to ensure that regulation is targeted and proportionate on a forward-looking basis. Thus in the current context of seeking to support the government's reform agenda, the need for Defra to consider regulatory failure risks becomes greater. In particular, by having a framework that allows Defra to more explicitly consider these risks, it will be able better

[6] http://www.bis.gov.uk/policies/bre; and http://www.bis.gov.uk/assets/biscore/better-regulation/docs/r/10-1155-reducing-regulation-made-simple

[7] 'Defra's Approach to Regulatory Reform.' (May 2011).

[8] 'The Costs and Benefits of Defra's Regulatory Stock: Emerging Findings from Defra's Regulation Assessment.' Defra (2011).

able to make policy choices in circumstances where the results of alternative methodologies are inconclusive.

The need to think about regulatory failure risks on a forward-looking basis means that the analysis is complementary to backwards looking appraisals

Defra's cost-benefit analysis of its regulatory stock (described above) *"most often"* took input data on costs and benefits from *"Impact Assessments (or their predecessors: Regulatory Impact Assessments and Compliance Cost Assessments) where available."*[9] This is likely to be the most pragmatic and robust way of compiling the input data necessary to provide a view of the overall costs and benefits of Defra's regulatory stock. Nonetheless, by using existing evaluations as a start point, this meant that Defra's analysis implicitly took as given the specific types of direct and indirect costs of regulation identified in those studies, rather than considering them afresh.

As set out previously, the key issue for government agencies and regulators with regard to regulatory failure is the extent to which these agencies are able to identify, assess and mitigate the risk of it occurring when designing and evaluating policy *on a forward-looking basis.* For this reason, there is clear merit in stepping back from historical impact assessments and analyses and considering from an economics first principles perspective what the potential regulatory failure risks might be. For this reason, the methodology for assessing regulatory failure risks set out in this report is differentiated from (and complementary to) Defra's existing work programme relating to assessing the costs and benefits of its regulatory stock.

The need to consider regulatory failure risks should be understood in context: (i) it is only one tool that Defra can use in policy design and evaluation; and (ii) the existence of regulatory failure risks does not imply that regulation is not net-beneficial

Although an analysis of regulatory failure risks can be an important tool for agencies and regulators, it is important that it is seen in proper context. In particular, the need to consider the scope for regulatory failure risks arising on a forward-looking basis in no way undermines the usefulness and importance of existing cost benefit analyses or policy appraisals. Furthermore, even where regulatory failure risks are identified, this does not (in and of itself) imply that regulation of some form is not net beneficial. Rather, in many cases it may be that an assessment of regulatory failure risks forms part of the evidence base that allows stakeholders to choose between alternative regulatory solutions.

3.3 Objectives and aims of our study for Defra

The overall objective of our study was to provide Defra with a methodology for identifying and assessing regulatory risks for the purpose of policy design and evaluation. The methodology encompasses both:

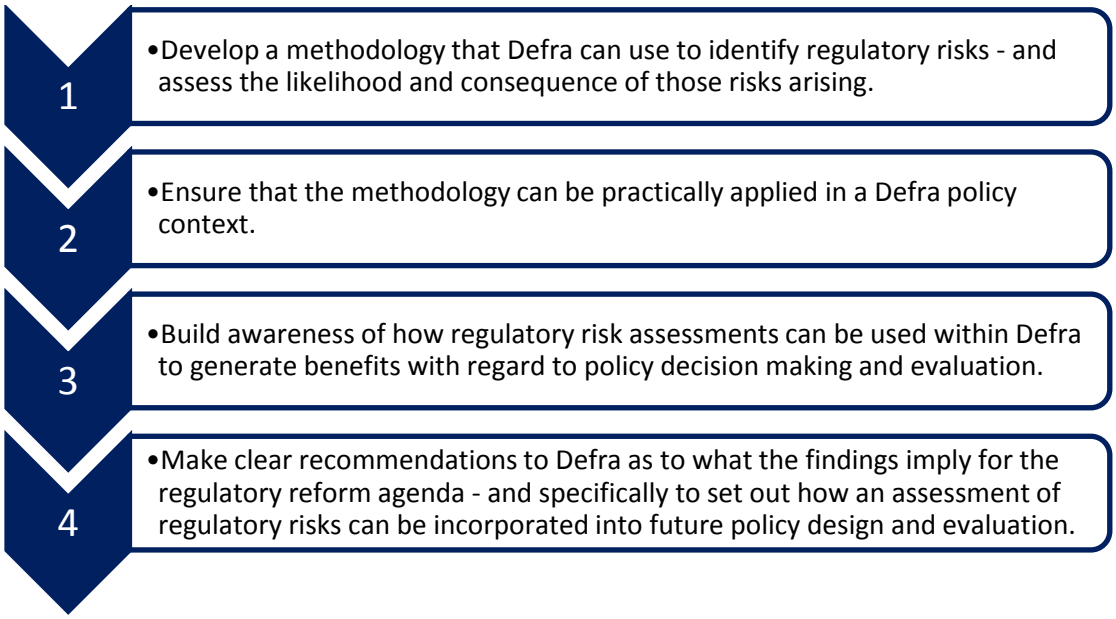
- a conceptual approach to assessing regulatory failure risks (i.e. a description of how to undertake regulatory risk analysis); and

[9] 'The Costs and Benefits of Defra's Regulatory Stock: Emerging Findings from Defra's Regulation Assessment.' Defra (2011). Page 7.

- practical steps that Defra can apply to integrate regulatory risk assessments into existing policy design and evaluation processes (without adding material additional burdens).

The study had a number of specific research aims that underpinned the overall objectives.

Figure 4 Study aims



3.4 Scope of the study

The focus of our study was very much on providing Defra with a methodology that it can apply on a forward-looking basis, so that it is able to incorporate an assessment of regulatory failure risks into policy design and evaluation (as appropriate). The study did not, therefore, specifically address the question of *whether* regulatory failure risks have materialised historically; and therefore we have not undertaken detailed empirical evaluations of Defra's existing policy areas. Consistent with this, the analysis on which this report is based is qualitative in nature, drawing on academic literature, the existing analytical evidence base and economics first principles. Primary research was not within the scope of our work.

Finally, it is important to note that Defra's policy landscape is both broad and diverse, including: (i) the need to develop British farming and encourage sustainable food production; (ii) to help enhance the environment and biodiversity; and (iii) to support a strong and sustainable green economy that is resistant to climate change. In addition to this breadth, Defra's responsibilities relate to the oversight and implementation of both domestic and European statute, which further complicates the development of regulatory reform strategies. As the primary purpose of our study was to deliver a methodology, it was neither necessary (nor practically possible) for us to examine specific regulations across the entirety of Defra's policy areas. Where we subsequently present case studies relating to Defra policy areas, these are intended only to illustrate how the methodology can be applied and the issues it raises. They do not in any way imply any prioritisation of certain policy areas, nor any assessment that those policy areas are more or less likely to be subject to regulatory failure risks.

3.5 Our approach to undertaking the study

As outlined above, there were four specific aims for our study. Our approach to meeting these is set out in the following.

1. Develop a methodology that Defra can use to identify regulatory risks - and assess the likelihood and consequence of those risks arising.

In the first instance we developed an *analytical framework* for assessing regulatory failure risks across Defra's policy areas. This was based on a range of evidence, including:

- relevant academic economics literature on regulatory risk assessments;
- a review of the methodology and frameworks used by regulators in other sectors when assessing regulatory failure risks; and
- existing Defra or third party evidence (in particular, impact assessments and other policy evaluations) in which issues linked to regulatory risks have been addressed.

The second element of our methodology focuses on the practicalities of when and how Defra should consider regulatory failure risks. The development of this was largely informed by a review of Defra's existing Policy Cycle and its internal processes for policy design and evaluation.

2. Ensure that the methodology can be practically applied in a Defra policy context.

In order to meet the overall project objectives, it is important that our methodology can be practically applied to Defra policy areas and regulations. To ensure that this is the case, we developed a number of short case studies that seek to illustrate how the methodology can be applied to specific Defra regulations/regulatory topics.

3. Build awareness of how regulatory risk assessments can be used within Defra to generate benefits with regard to policy decision making and evaluation.

Whilst this aim did not have any associated analytical steps for us to undertake, we actively sought engagement from Defra during the study to ensure that the context and objectives were clearly communicated, understood and supported. In addition to this, as part of developing our methodology, we have set out case studies from other regulated sectors, which help to illustrate the importance of regulatory failure risk assessment to policy design.

4. Make clear recommendations to Defra as to what the findings imply for the regulatory reform agenda - and specifically, to set out how an assessment of regulatory risks can be incorporated into future policy design and evaluation.

Our final research aim was to draw out the implications of our findings for the regulatory reform agenda. Consequently in the final section of this report we have made recommendations as to how Defra could integrate the methodology we have developed into future policy design and evaluation.

4 A methodology for assessing regulatory failure risks

In this section we set out a conceptual approach to assessing regulatory failure risks. The methodology has three key components, which are discussed in turn:

- identifying regulatory failure risks;
- anticipating regulatory failure risks; and
- measuring regulatory failure risks.

Subsequent sections of this report set out how Defra could practically apply the methodology, with reference to its overall Policy Cycle and individual case study examples.

A proportionate approach

It is important to emphasise that Defra should seek to apply the methodology we have developed in a proportionate way. In the following, we provide a detailed description of the relevant issues and analytical steps that *could* be undertaken for the purpose of assessing regulatory failure risks. However, in many instances, it would simply not be proportionate for Defra to undertake detailed risk assessment work, given the scale of the potential issues under consideration. In Section 5 of this report we describe how Defra might utilise the methodology outlined here, which includes giving consideration to proportionality.

4.1 Methodology objectives

In developing a methodology, it is important to have clarity as to the problem it is seeking to address. Consequently, it is worth re-capping our definition of regulatory failure risk: ***"The risk that the economic costs of regulation outweigh the benefits, arising from regulation having unanticipated and/or unintended effects."***

As we described in Section 3, the need to ensure that regulatory interventions are only implemented in circumstances where the associated economic benefits outweigh the costs is well understood. Therefore, the critical issue for regulators and policy makers, such as Defra, relates to the risk that, ex-post (i.e. once an intervention has been made) the actual costs outweigh the benefits for *reasons that were not considered prior to the intervention.* Indeed, it is the focus on the unanticipated or unintended effects of regulation that differentiates regulatory failure risk analysis from alternative analytical approaches, such as cost benefit analysis. As summarised in the figure below, we suggest that there are three reasons as to why, ex-post, unintended or unanticipated consequences could result in economic costs exceeding benefits.

Figure 5 The challenges facing regulators

1. Identifying	2. Anticipating	3. Measuring
• Risk of regulators not *identifying* existing relevant factors that could give rise to regulatory costs.	• Risk of regulators not *anticipating* certain events which could give rise to *future* regulatory costs.	• Risk of regulators *understating* the significance of regulatory costs.

Consistent with the above, the goal of our methodology is to provide Defra with a framework and set of analytical steps that will better help it: (i) identify, (ii) anticipate and (iii) measure regulatory failure risks. By addressing the above issues, the intention is that the methodology will also assist in the mitigation of future regulatory risks.

4.2 Identifying causes of regulatory failure risks

The first component of our methodology is to set out the steps that one would need to undertake in order to identify potential regulatory failure risks. There are two dimensions to this:

- identify the "in principle" factors that could give rise to regulatory failure risks; and
- determine whether those factors are likely to be relevant to the regulation / regulatory issue at hand.

> ***Causes of regulatory failure***
>
> "There are several sources of regulatory failure. Most obviously, the regulatory process can be subverted by lobbying from the regulated group, so that the regulations made serve their interests instead of those of the broader society. This is termed **regulatory capture**. Second, problems with regulatory design, implementation and/or enforcement can mean that there are **low levels of compliance** with the regulation. Third, **poor regulatory design** may mean that it does not properly address the problems initially identified. Perhaps most importantly, the behaviours that give rise to the market failure may not be capable of being addressed effectively by regulation – that is, there may be **no feasible regulatory design** that will resolve the problem." OECD.

Identifying the 'in principle' causes of regulatory failure

The economics literature provides a comprehensive description of the types of factors that can give rise to regulatory failures. There is a general consensus on the forms of 'in principle' causational factors, which are summarised by the OECD as follows: *"There are several sources of regulatory failure. Most obviously, the regulatory process can be subverted by lobbying from the regulated group, so that the regulations made serve their interests instead of those of the broader society. This*

is termed regulatory capture. Second, problems with regulatory design, implementation and/or enforcement can mean that there are low levels of compliance with the regulation. Third, poor regulatory design may mean that it does not properly address the problems initially identified. Perhaps most importantly, the behaviours that give rise to the market failure may not be capable of being addressed effectively by regulation – that is, there may be no feasible regulatory design that will resolve the problem."[10]

Pelkmans (2000) identifies a similar set of causational factors to those set out by the OECD. The author pays particular attention to problems that arise at the implementation stage of regulation: *"bad implementation and compliance constitute [an] important, and often overlooked, regulatory failure... Lack of implementation and compliance is costly, in terms of market failure that goes uncorrected."*[11]

James (2000) also categorises the causes of regulatory failure in a similar manner to the OECD, citing: (i) regulatory capture; (ii) regulation that serves to sustain the regulator; and (iii) the transaction costs inherent in regulatory interventions.[12]

Carpenter and Ting (2007)[13] discuss the causes of regulatory error with respect to approval regulation, such as the approval of pharmaceutical products, or the award of social welfare benefits. In these cases, the authors identify the risks of: (i) type I errors – e.g. failing to license to safe product; and (ii) type II errors – e.g. licensing an unsafe product. These risks primarily arise from information asymmetries between the regulator and regulated firm (e.g. the regulator may be at an information disadvantage regarding the true effectiveness of a pharmaceutical product, relative to the firm that developed it). Thus the regulator must trade off the potential upside of licensing a drug that could benefit its recipients (and the cost inherent in delaying or withholding the licensing of that drug) against the risks of licensing a product which proves to be ineffective and/or unsafe. These "type I and type II" errors could, in actual fact, arise as a result of any of the four wider causational factors referenced above. For example, regulatory capture could mean that firms successfully influence the type of analysis undertaken by a regulator in order to maximise the chances of approval (leading to type II errors). Equally, design failings in the approval process itself could lead to either type I or type II errors being made.

Defra example – seed certification

The seed marketing regulations (2011) mean that seed can only be marketed in the UK if (i) the variety has been officially certified; and (ii) the seller is registered to market the seed. As a form of approval regulation, the seed certification process could, in principle, be subject to either the type 1 (failing to certify an appropriate seed); or type 2 (certifying an inappropriate seed) regulatory errors described here.

In summary, the economics literature identifies four primary 'in principle' causes of regulatory failure, which are shown in the figure below.

[10] 'Handbook for Undertaking Regulatory Impact Analysis.' OECD (2008).
[11] 'Regulatory Reform and Competitiveness in Europe: Horizontal issues.' Pelkmans (2000).
[12] 'Regulation inside government: public interest justifications and regulatory failures.' James (2000).
[13] 'Regulatory errors with endogenous agendas.' Carpenter and Ting (2007).

Figure 6 The 'in principle' causes of regulatory failure

Regulatory capture	Compliance	Problems of regulatory design	Lack of regulatory solution
•Where the regulatory process is subverted by stakeholders, so that it serves their own ends rather than meeting its intended goals.	•Where stakeholders do not behave as intended, so that regulatory objectives are not met.	•Where the specific way in which regulation is designed and implemented means that it will not meet its objectives.	•Circumstances where there simply is no appropriate regulatory design that would meet the intended objective in a way that was net beneficial.

Determining the relevance of causational factors

With the 'in principle' causes of regulatory failure risks established, the next step in the methodology is to consider how one assesses the *relevance* of those causational factors to specific regulatory issues. For example, in a Defra policy context, one would need to consider the relevance of the above factors to specific regulations relating to animal welfare, waste, water quality (and so on). In the following therefore, we set out a conceptual approach for determining the relevance of the four 'in principle' causes of regulatory failure.

1. Regulatory capture

In a narrow sense regulatory capture is often considered only in terms of utility price regulation, whereby it refers to *"the process through which regulated monopolies end up manipulating the state agencies that are supposed to control them."*[14] However, of more relevance to Defra is a broader definition, which has been increasingly recognised in the economics literature, which relates to the ability of any special interest group or stakeholder to influence state intervention (in any of its forms) to their own ends.

Stigler (1971) concluded that in order to assess the likelihood of regulatory capture, one needs to understand what drives the demand for regulation in the first place.[15] This means (i) identifying which group(s) would benefit from the regulatory intervention; (ii) determining whether the beneficiary group(s) are large; and (iii) whether the group has a large stake in the regulation. One might imagine that, the larger the beneficiary group(s), the greater the risk of regulatory capture. However, whilst this may be generally true, Stigler highlighted the difficulty that larger group(s) might have in seeking to effectively coordinate action in a mutually beneficial way.

In order to evaluate whether the risk of regulatory capture is relevant to a particular regulation we suggest that a number of issues need to be considered (described in the following). In practice, whether all of these issues need to be evaluated (and the detail of the associated analysis) must be assessed in the context of the specific issue at hand, with the emphasis on deploying the methodology in a way that is proportionate to the potential impact.

[14] 'Regulatory capture: a review.' Oxford review of Economic Policy, Vol 22, No. 2, Ernesto Dal Bo (2006). Page 203.
[15] 'The Theory of Economic Regulation.' Journal of Economic Perspectives, 19(3), 19-41, Sigler, j (2005).

- ***Identify the agents affected by the regulation.*** In order to ascertain whether there is a risk of regulatory capture, it is first necessary to understand which agents are affected by the regulation in question. In many cases, this step would have already been undertaken within any associated impact assessments or cost benefit analyses (and in such cases, our methodology would not require any additional analysis). If, however, the affected agents have not been identified, we would suggest the following activities.
    - Undertake desk research to identify: (i) the firms that supply services; and (ii) the firms/intermediaries/consumers that purchase services, in the market(s) affected by the regulation. For example, review industry reports and studies, responses to consultations, investigations by regulatory or competition authorities.
    - Beyond sellers and buyers, seek to identify whether there are any interest groups (e.g. industry lobby groups, consumer interest groups, or other special interest groups) that are likely to be affected by the regulation in question.
- ***Assess which affected agents have the most to lose/gain from the regulation.*** Having identified the affected agents, it is next necessary to evaluate which of them are likely to have the most to lose and gain from the regulation, as this provides an indication of their incentives to try and influence the regulatory framework. As in the above, it may well be that in some cases, the relevant evidence and analysis has already been collated as part of existing appraisals. However, where this is not the case, we would suggest undertaking a high level review of both the likely financial and non-financial impacts of the regulation on the identified agents.
    - With regard to financial impacts, one should consider:
        - *The potential impact on input costs for suppliers.* (i) What costs would be affected and by how much?; (ii) what is the relative importance of those input costs to the overall cost base of suppliers?; (iii) given steps i and ii, which suppliers in particular are most likely to face a material cost impact?
        - *The potential impact on the price paid by buyers.* (i) Is the regulation likely to directly or indirectly affect prices in the market?; (ii) if so, what is the 'order of magnitude' impact likely to be?; (iii) given steps I and ii, would some buyers be affected more than others?
        - *Whether the regulation generates transactional costs.* (i) what is the relative scale of these costs likely to be?; (ii) which agents are likely to bear them?; (ii) are they likely to impact some agents more than others?
    - With regard to the non-financial impacts of regulation, the key consideration is the externality impact. (i) Does the regulation reduce any existing negative externalities – for example, does it reduce the environmental impact of

firms/markets? (ii) which agents are most likely to benefit (or be adversely affected by) the externality effect?

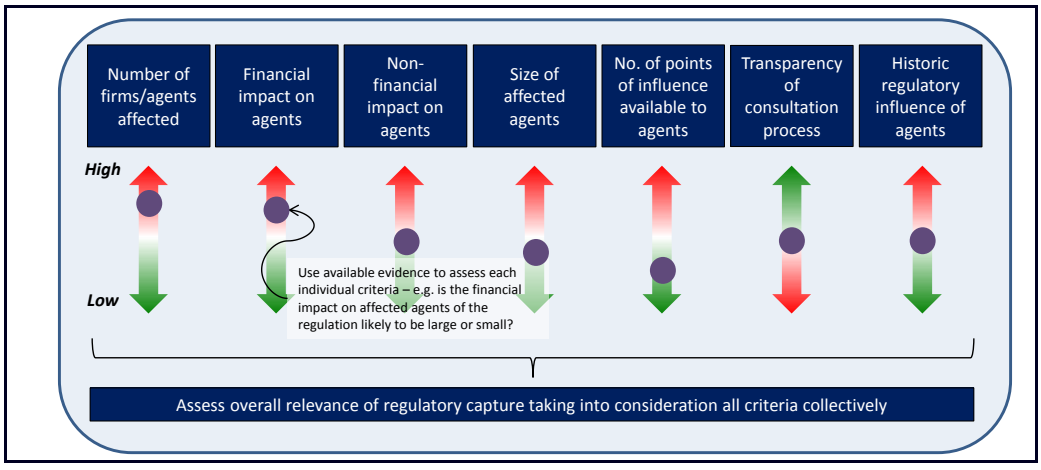
- ***Assess the size of agents and their ability to coordinate.*** On average, it may be that larger firms/lobby or interest groups have a greater degree of influence. In addition, the ability of individual agents to coordinate their strategies with each other will also impact the extent of their collective influence. It is therefore necessary to assess these issues in order to determine the extent of regulatory capture risk. In this regard, we would suggest considering the following.
    - Of the agents that are most affected by the regulation (identified in the previous step) what is their relative size? For firms, one could review their turnover and profit. For groups, one could assess the size of their underlying membership (e.g. for groups representing firms, what is the combined turnover of their members? For groups representing consumers, what is their membership base?)
    - Assess the extent to which the interests of agents are likely to be aligned and whether there are mechanisms in place that allow them to coordinate lobbying. For example, is there shared membership of industry groups/forums?
- ***Determine the points of influence available to agents.*** In order to influence regulatory outcomes, agents need "contact points" at which they can exert that influence. In this regard, we suggest considering the following issues.
    - With regard to the agents most affected by regulation, assess how many active points of influence they have established that could in principle shape regulatory outcomes. For example, determine whether the agents have: (i) access to political stakeholders; (ii) engagement with key civil service departments; (iii) an active regulatory engagement strategy; (iv) a pro-active public relations strategy.
    - Undertake a qualitative assessment of the relative strengths and weaknesses of agent's influencing strategies in the above dimensions.
- ***Transparency of consultation process (where relevant).*** Regulatory capture risk is likely to be greater in circumstances where consultation processes (where they apply) are less transparent, as this increases the scope for decision making to take account of special interests. In assessing the relevance of regulatory capture risk to a particular regulation, we would therefore suggest considering: whether the policy/regulation in question was subject to a consultation process and, if so, whether that consultation was (in whole or in part) public; and whether the process for evaluating consultation responses was itself transparent and objective.
- ***Review evidence of the historic influence of agents.*** Assessing whether an agent has been able to influence regulatory policy on a historic basis may provide a further indication of their likely ability to influence the regulatory issue under consideration. We would therefore suggest that Defra undertakes a qualitative analysis of historic influence. In the

first instance, Defra should log any known instances of where agents have successfully influenced policy outcomes in the areas of relevance to the issue under consideration.

- Historic influence can also be informed by a review of consultations on other related regulatory or policy issues. These should be reviewed against a checklist of key questions, which are as follows:
  - *To what extent were the initial regulatory proposals themselves shaped by the influence of particular agents?*
  - *What was the process for reaching a final regulatory decision; and to what extent were agents able to influence that process?*
  - *To what extent did the final regulatory decision differ from the initial proposals; and to what extent did that reflect the influence of agents?* Here we would suggest paying particular attention to whether: (i) evidence or argumentation put forward by agents was key to any deviation; (ii) the regulator or policymaker specifically acknowledged the influence of evidence provided by a particular agent; and (iii) whether the weight attached to certain agent's submissions appears to be disproportionate to the substance of those submissions.

In summary, we have identified a range of criteria that we would suggest Defra use to consider the relevance of regulatory capture risk to specific regulations/regulatory issues. Below is a *regulatory capture risk dashboard*, which illustrates how these criteria fit together and can be used to inform an assessment of relevance.

Figure 7 Regulatory capture risk dashboard



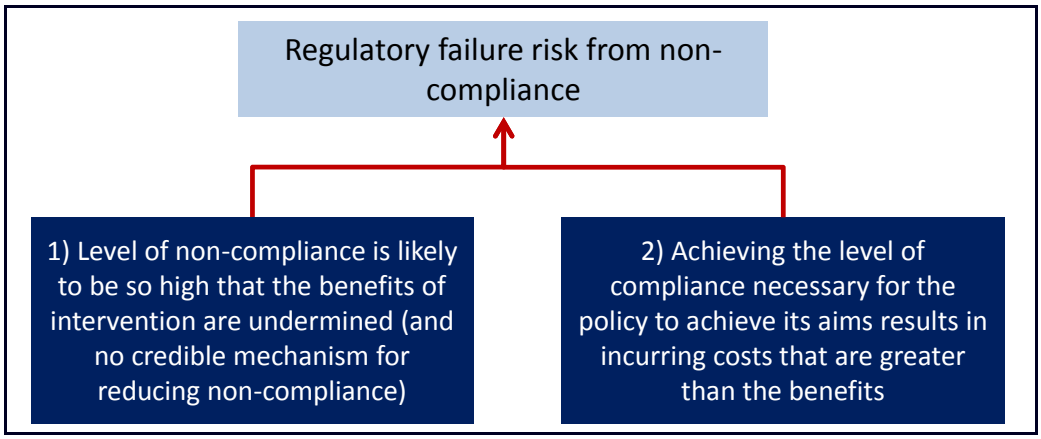
Source: Economic Insight

The 'in practice' approach to assessing the above individual criteria depends primarily on data availability and the proportionality of undertaking detailed analysis.

2. Compliance

In considering whether non-compliance is likely to be a relevant cause of regulatory failure risk in a particular regulatory issue or policy area context, it is important to understand that achieving full compliance is rarely possible, nor is it necessarily economically efficient. In many cases the costs of achieving full (or near full) compliance are likely to be prohibitive. Thus for policy-makers and regulators, compliance becomes a question of cost effectiveness – and this is an issue that is widely understood. Consequently, non-compliance regulatory failure risks arise in two particular circumstances, as summarised in the figure below.

Figure 8 Circumstances where non-compliance can lead to regulatory failure risk



Source: Economic Insight

In order to determine whether either of the above situations are likely to arise in practice, one needs to consider:

1. Given the proposed regulation, what is the likely level of compliance going to be? What policy instruments are available to influence the level of compliance? (For example, monitoring and sanctions).

2. How does the overall expected net benefit of the regulation vary depending on the likely compliance level and associated regulatory enforcement measures used? For example, what are the regulatory costs associated with implementing policy instruments – if applicable – to influence the level of compliance? (i.e. what are the implementation costs of monitoring and sanctions?)

Understanding the likely level of compliance

With respect to understanding the *'likely level of compliance'*, a paper by the OECD (2000) offers some guidance.[16] In particular, the paper includes a discussion of the analytical steps that one would need to undertake in order to assess the likely scope for compliance. Amongst other things, the paper identifies the need to consider the incentives for individuals and organisations to comply with regulations; and we would suggest that this is the appropriate issue for Defra to focus on when considering the likely level of compliance.

[16] 'Reducing the risk of policy failure: challenges for regulatory compliance.' OECD (2000)

With regard to assessing the incentives of agents to comply with regulation, the academic literature sets out a number of conceptual frameworks. Kagan and Scholz (1984) put forward three motivating factors for non-compliance by corporations.[17] The first is one of an 'amoral calculator', whereby an agent simply assesses the costs of complying with regulation and weighs these against the costs associated with the risks of being caught and the associated penalties. Under this model, the motivation for non-compliance is one of profit maximisation. The second model is the corporation as a 'political citizen', where the firm has a principled disagreement with the regulation and therefore refuses to implement it. The third model is one of organisational incompetence, where key figures within a firm are simply ignorant of what is required in order to comply with the regulation.

Whilst all three of the above models provide useful insights, for practical purposes we would suggest that Defra primarily focuses on the first of these – i.e. Defra should assume that firms will choose non-compliance *when it is profitable for them to do so.*[18] Taking this as given, Defra should seek to:

- estimate the likely costs to firms (or other agents) of complying with the regulation in question;
- evaluate these against the expected cost of non-compliance; and
- estimate the likely level of compliance based on the number of firms (or other agents) for whom the costs of non-compliance outweigh the expected cost of compliance.

With regard to the first point, both the academic literature and regulatory studies provide views as to how the likely costs of compliance should be defined and estimated. For example, Alfon and Andrews (1999) use the following definition: *"Compliance costs are the costs to firms and individuals of those activities required by regulators that would not have been undertaken in the absence of regulation. Thus the term 'compliance costs' as used here refers to the* ***incremental costs*** *of compliance caused by regulation, not to the total cost of activities that happen to contribute to regulatory compliance. Examples of compliance costs include the costs of any additional systems, training, management time and capital required by the regulator."*[19]

The 'incremental' part of the above definition is critical, as the compliance costs of relevance relate to the costs firms incur *over and above* those that would naturally arise in the absence of regulation. Therefore, to estimate these incremental compliance costs, one must first define a counterfactual against which the 'status quo' of costs can be assessed. This can be done by answering the following questions:

- what activities do firms undertake *as a direct result* of the regulation in question – and which would be avoided altogether were that regulation to be removed?

[17] 'Criminology of the Corporation and Regulatory Enforcement Strategies' RA Kagan and JT Scholz (1984).

[18] In relation to SMEs and micro firms, we understand that evidence indicates that that non-compliance may also be driven by ignorance of regulatory requirements, and thus this should also be taken into consideration.

[19] 'Cost-benefit analysis in financial regulation — how to do it and how it adds value.' FSA Occasional Paper Series 3. Alfon and Andrews (1999).

- What activities do firms undertake that are *in part* driven by the need to meet regulatory requirements? What proportion of these would be avoided if the regulatory requirements in question did not exist?

Once a counterfactual (or 'baseline') has been defined, the next step is to measure the *incremental cost of compliance* relative to that baseline. There are two broad methodological approaches that Defra could adopt in order to do this.

1. **Qualitative analysis.** Scoring the likely compliance cost impact as "low", "medium" or "high" based on a judgement about the nature of compliance related activities that are truly incremental versus the counterfactual.

2. **Quantitative analysis.** Estimating the £s cost of compliance. This would primarily be done either by: (i) undertaking bottom up cost modelling based on assumptions regarding the likely costs (both operating and capital) associated with the activities defined as being 'incremental'; or (ii) undertaking surveys of firms, whereby senior executives responsible for compliance matters are asked directly for an estimate of incremental compliance costs.

Defra example – Cross Compliance

In March 2009 Defra published an 'Evaluation of Cross Compliance.' The Cross Compliance policy was launched in 2005 and consisted of a range of measures that set a baseline farmers had to meet in order to receive their Single Payment. The 2009 evaluation included a quantification of the compliance costs associated with policy, which were primarily gathered through the Farmers' survey. Farmers were asked as to whether they had made any changes as a result of the policy and, if so, what the direct and indirect costs were likely to be. As a result of the study, recommendations were identified regarding potential improvements, where either environmental benefits could be delivered without additional compliance costs, or where the same level of environmental benefit might be achieved at lower cost.

Using surveys to estimate compliance costs – an example from financial services regulation

In 2002 the Practitioner Panel carried out a survey of the FSA's regulatory performance. The survey was targeted at c. 4,000 executives in regulated financial services firms and specifically asked about compliance costs. Around half of all respondents estimated their compliance costs to be between 2 and 10% of their total costs.

In practice, whether Defra should deploy qualitative or quantitative methods in assessing compliance costs depends on the particular characteristics of the regulation in question (and on how proportionate the effort of undertaking empirical work is relative to the overall impact of the regulation in question). It is also important to note that, as we are primarily concerned with assessing the risks of regulatory failure on a forward-looking basis (which tend to be most relevant at the point of policy design or reform) there may be practical difficulties in undertaking quantitative surveys to assess incremental

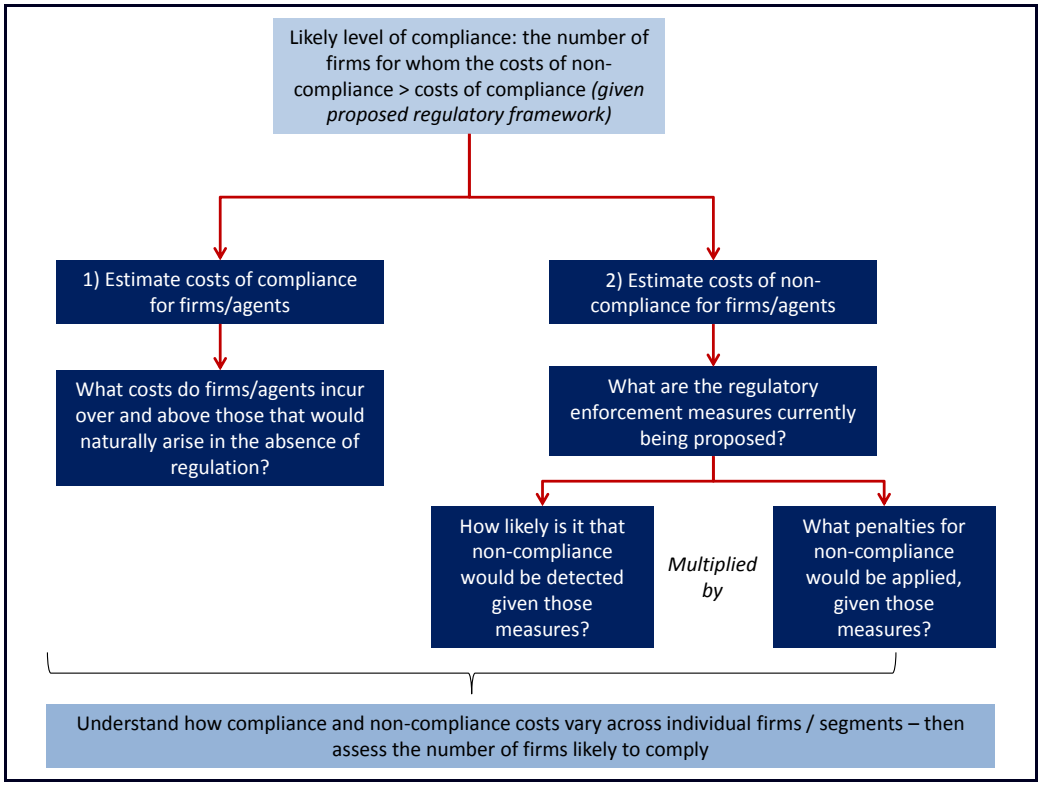
costs (as by definition the regulation in question might not yet exist). Therefore, in such cases the survey would need to ask firms (agents) about the *likely* incremental costs, rather than asking about the actual costs being incurred. There would therefore be a relatively high degree of subjectivity inherent in such analysis.

A further important consideration is that the costs of compliance will not be the same for all firms. Consequently, regardless of whether qualitative or quantitative techniques are used, Defra should seek to understand how incremental compliance costs are likely to vary across different 'segments' of firms. This is critical, as it will help inform Defra as to:

- which firms have the strongest incentive (and are therefore more likely) not to comply with the regulation in question; and therefore
- the likely total impact of non-compliance.

Once the incremental costs of compliance have been estimated (as above) Defra needs to evaluate these against *the expected costs of non-compliance* (to firms/agents). Here the expected cost of non-compliance is simply the likelihood of detection multiplied by the financial penalty that would be applied. Estimating non-compliance costs to firms/agents should be relatively straightforward, as both the potential penalties for non-compliance and likelihood of detection are issues that the regulator/policy maker should have a clear understanding of (and indeed, the penalties would themselves be a feature of the regulatory design). The framework for assessing the likely level of compliance is summarised below.

Figure 9 Summary of analysis for establishing the likely level of compliance



Source: Economic Insight

Having understood the likely compliance level, given the proposed policy parameters, the next step is to identify whether there are any policy tools/levers that could be used to influence that compliance level. In particular, it may be that the regulation in question already has proposed monitoring and enforcement mechanisms designed to encourage compliance. Here the relevant questions are (i) whether alternative mechanisms might be available; and (ii) how the likely level of compliance might vary depending on exactly which mechanisms were used (for example, higher penalties for non-compliance might lead to increased compliance). Having done this, one would then have a good understanding as to how the likely level of compliance would vary, depending on the precise monitoring and enforcement mechanisms used.

Understanding how overall net benefit varies with the compliance level

Having established the likely level of compliance (under a range of monitoring and enforcement mechanisms) the next step is to evaluate how the overall expected net benefit of the regulation might be affected. There are two dimensions to this:

- how the compliance level itself can drive the overall expected costs and benefits of the intervention; and
- the direct costs of the enforcement measures used to achieve a particular level of compliance.

With regard to the first of the above issues, in many cases it is likely to be difficult and/or disproportionate to attempt to precisely estimate how the overall net benefit of the regulation is impacted by the compliance level. However, Defra should be able to reach an indicative view by taking the following issues into consideration:

- Which costs and benefits associated with the regulation are most likely to vary depending on the number of firms/agents that comply with that regulation? (For example, one might anticipate that certain regulatory costs are likely to persist regardless of compliance levels; but benefits will, in most instances, vary with compliance).
- To what extent do the delivered benefits of the regulation vary by firm type? For example, in some industries, the role of a small number of firms may be critical to delivering the overall benefits. Therefore, the compliance of these firms is more important than the compliance of others. In other cases, the delivered benefits might be driven proportionally across all firms.
- To what extent do the costs of the regulation vary by firm type? (As per benefits above).

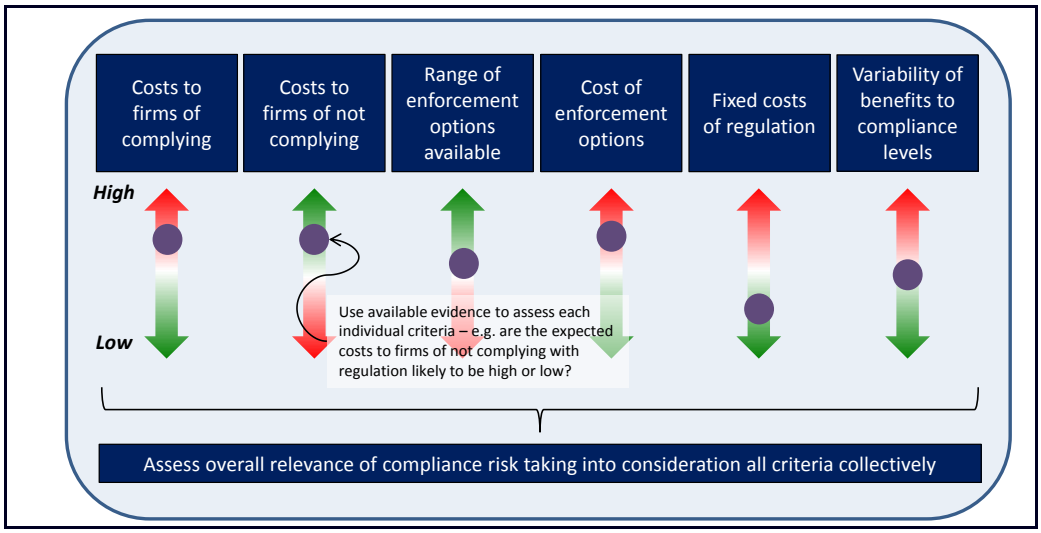
With regard to the second issue, the direct costs of the enforcement measures themselves relate primarily to the costs incurred in administrating those measures. Consequently, Defra (or the regulatory body in question) should be well placed to provide estimates of the on-going costs associated with those options.

Having undertaken work to understand (i) the likely level of compliance under a range of monitoring and enforcement mechanisms; and (ii) how the expected net benefit varies with the compliance level, the final step is to bring those two components together. In particular, the task is to

determine (a) if a level of compliance necessary to achieve the intended objectives can be delivered; and (b) if so, whether it is cost beneficial to achieve that level of compliance.

Below is our proposed *compliance risk dashboard*, which provides a visual summary of the criteria we suggest should be used to determine the relevance of compliance risk.

Figure 10 Compliance risk dashboard



Source: Economic Insight

3. Problems of regulatory design and implementation

The third 'in principle' cause of regulatory failure is when the way in which regulation is both designed and implemented means that it will not meet its objectives (or even if the objectives are met, design or implementation problems might give rise to unintended and detrimental consequences, which offset the expected benefits of the regulation). There are three dimensions to this:

1. **Design challenges with the regulatory framework.** Essentially using "the wrong tools for the job" – for example, using command and control regulation where incentive based regulation would be more effective.

2. **Design challenges with the regulatory tools**. Where the overall framework is sound, but where

Defra example – choosing between 'command and control' and 'incentive based' regulation

Across its policy areas Defra uses a mix of 'command and control' and 'incentive based' regulatory tools. Consequently, there is an 'in principle' risk of selecting the wrong tool for the issue at hand. One example of this was the Defra Economic Research Project that examined the relative cost-effectiveness of the Environmental Stewardship Scheme and Nitrate Vulnerable Zones. Both policies are used to support the provision of agri-environmental goods and to reduce nitrate pollution, but one (stewardship) is an example of an incentive based tool, whereas the other is command and control).

there are problems in *how* the specific tools are designed – for example, identifying the correct mechanism to provide waste reduction incentives, but then designing that mechanism in a way so that it does not deliver the desired outcome.

3. **Errors in implementation**. Where both the regulatory framework and tools have been designed appropriately, but the actual implementation is flawed, so that the intended objectives are not met.

The economics literature and recent regulatory cases provide a number of examples of this:

- In commenting on regulatory problems in infrastructure industries in Malaysia, Cook et al (2004) conclude that the government: *"failed to design an effective regulatory framework… [failed] to set efficiency targets, or to monitor performance* [of firms]."[20]

- The example of potential capital investment bias in rate of return regulation discussed in Section 3 is a further example of how regulatory frameworks themselves can create unintended incentives that lead to economic costs.

- Setting the appropriate level of regulatory capital requirements in the financial services industry raises a number of challenges; and there are costs associated with either setting the level "too high" or "too low". This is an example of problems with regulatory tools (i.e. imposing a minimum required level of capital might be an appropriate regulatory tool, but the regulator can still get the amount wrong).

The goal of our methodology is to assist Defra with identifying circumstances where the 'risks of design or implementation failure' are likely to be pronounced, so that ultimately potential pitfalls can be anticipated and mitigated. The literature provides a range of evidence regarding the factors that contribute to a risk of poor regulatory design and/or implementation.

Key issues identified in the literature

Cook et al (2004) suggest that problems of regulatory design are likely to arise in circumstances where (i) there are competing social objectives; and (ii) where there is substantial political influence. In both cases, the risk is that the potential design options that a regulator could consider are artificially restricted – or worse still – the regulator is compelled to consider particular design options that, without the above factors, it would not. Crew and Parker (2006) highlight the role of the implementation agents themselves: *"How effective… regulation is depends critically on the effectiveness of the regulatory agency."*[21]

Of particular relevance to Defra is a paper by Gunningham and Sinclair (1998) which sets out some core principles of good regulatory design in the context of environmental regulation.[22] These principles are:

- **Principle 1. Prefer policy mixes incorporating instrument and institutional combinations**. The authors suggest that: *"there are very few circumstances where a single regulatory*

[20] 'Leading issues in competition, regulation and development.' Cook, P; Kilpatrick, C; Minogue, M; Parker, D (2004).
[21] 'International handbook on economic regulation.' Crew, M; Parker,D (2006). Page 11.
[22] 'Designing smart regulation.' Gunningham, N; Sinclair, D. Oxford University Press (1998).

instrument is likely to be the most efficient or effective means of addressing a particular environmental problem." Consequently, good regulatory design is likely to incorporate a range of regulatory tools that function in a complementary way (or are designed to work in conjunction with other existing tools).

- **Principle 2. Prefer less interventionist measures**. The authors suggest that robust regulatory design starts from a presumption that less intervention is better. *"Command and control regulation has the virtues of high dependability and predictability (if adequately enforced), but commonly proves to be inflexible and inefficient."*

- **Principle 3. Escalate up an instrument pyramid to the extent necessary to achieve policy goals.** It may be that an initial regulatory tool does not function as well as was originally anticipated. In such cases, good regulatory design will facilitate the ability to adapt regulation (for example, by escalating regulatory enforcement). Consistent with this, regulators themselves need to be willing to adapt their approach.

- **Principle 4. Empower participants which are in the best position to act as surrogate regulators.** The authors suggest that there are inherent limitations in any regulatory body's ability to implement and monitor the regulation for which they are responsible. Consequently, regulation is more likely to be successful in cases where it is possible to make use of industry stakeholders to help achieve regulatory outcomes. *"For example, farmers are far more accepting of commercial imperatives to reduce chemical use than they are of any government mandated requirements."*

The issues of regulatory design and implementation are particularly important due to the inter-dependencies with other factors, which ultimately give rise to regulatory failure risks. For example, poorly designed regulation could increase compliance costs, increasing the likelihood of compliance related regulatory failures. Similarly, the design of a regulatory framework can also influence the extent to which regulatory capture could occur. These interdependencies have been noted by the OECD: *"People cannot comply with regulations if they do not understand what is required. In regulatory design and development, policymakers often feel pressure to issue new rules or expand existing ones to cover unforeseen circumstances, to close loopholes, and to address new problems. The cumulative effect of reacting to such pressure can lead cumulatively to a loss of simplicity and therefore the loss of the ability in the target groups to understand what compliance with the resulting regulatory structure involves."*[23]

Methodological steps for Defra

Unlike the causational factors discussed previously, problems of regulatory design and implementation are, by definition, a function of regulatory decisions and actions, rather than any external factors per se. Consequently, it is at the design stage itself where it becomes critical for Defra to consider whether and how the design of regulation/policy could give rise to economic costs that could ultimately result in regulatory failure.

[23] 'Reducing the risk of policy failure: challenges for regulatory compliance.' OECD (2000). Page 14.

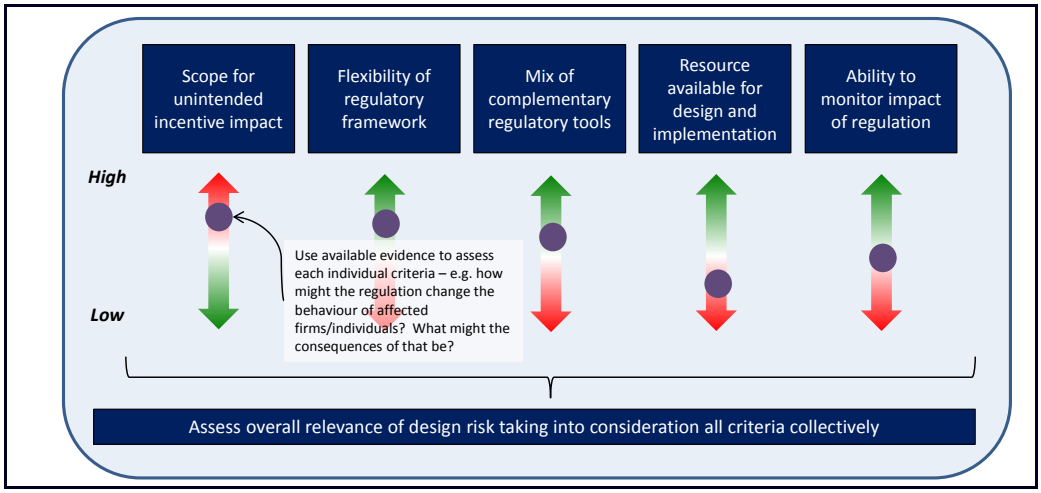
In the following table we set out the criteria Defra might wish to consider when determining whether there is scope for problems of regulatory design or implementation in a particular regulation/policy area.

Table 1 Checklist for regulatory design and implementation

Criteria for assessing relevance	***Definition of criteria***	***Key questions to assess relevance***
1. The scope for unintended incentives	Beyond any change in behaviour intended by the regulation, whether the regulation has further implications for the incentives of firms or individuals – and, if so, what these are.	(a) Beyond any intended effects, will the regulation change the costs or revenues of firms in the affected market(s)? How might firms' behaviour change given this? (For example, if there is a negative financial impact, what might firms do in order to avoid or reduce it?) (b) Beyond any intended effects, will the regulation have any financial impact on individuals/other groups in the affected market(s)? As above, how is their behaviour likely to change as a result? (c) Could the regulation have an impact on incentives in related markets (i.e. in markets other than those directly affected by the regulation)?
2. Flexibility of the regulatory framework	Whether the regulation/framework itself is robust to: (i) changes in the external market environment; (ii) changes in the behaviour of affected agents; and (iii) whether the regulation can be adapted to meet its objectives without having to be fundamentally re-designed.	(a) Does the regulation/framework design explicitly include factors that allow for a tolerance in market/firm assumptions? (b) If the market assumptions on which the regulation was based differed from expectations, would the regulatory framework still achieve its intended outcomes? (c) How much regulatory discretion is there within the framework? At what point would new regulation/legislation be required?
3. Mix of complementary regulatory tools.	Whether (i) the regulation itself contains a mix of tools that collectively support the objectives; and (ii) whether there are existing regulations that also help meet the objective and whether they are complementary.	(a) What specific tools are being deployed within the regulation? To what extent is there complementarity across those tools? (b) What existing regulations are there within the space that contribute towards meeting the stated objectives? Has the functioning of those existing regulations been considered as part of the policy design process? (c) If elements of the regulation were to function less effectively than intended, could the reduction in expected benefit be mitigated through complementary tools?
4. Resource available for design and implementation	The financial, infrastructure, institutional and human capital input available to both design and implement the regulation.	(a) Which agents - e.g. regulators etc - have responsibility for design and implementation? (This may be shared). (b) What resources do these agents have? Are any of these ring-fenced against the regulation in question or are they shared?
4. Ability to monitor the impact of regulations	The conceptual and practical ability to assess what impact the regulations have had.	(a) What is the 'cause and effect' between the regulation and its objectives? (b) What monitoring of stakeholder behaviour is in place? What data is collected?

Below is our suggested *regulatory design and implementation dashboard*.

Figure 11 Regulatory design and implementation risk dashboard



Source: Economic Insight

4. Lack of regulatory solution

As set out previously, a 'lack of regulatory solution' refers to circumstances where there simply is no appropriate regulatory design that would meet the intended objectives in a way that was net beneficial. In essence, this requires an overall assessment of wider costs and benefits, where one needs to balance:

- the benefit of addressing the problems the regulation is designed to solve; against
- the downsides of the regulation resulting in (unintended) adverse outcomes that have significant economic costs – and the probability of this occurring.

As the potential benefits would be captured within a standard cost benefit framework, the key issue is how regulators can consider the overall size of the downsides associated with regulation itself. We discuss the analytical steps for making such assessments within the: *"measuring the scale of regulatory failure risks"* section of the methodology.

4.3 Anticipating regulatory failure risks

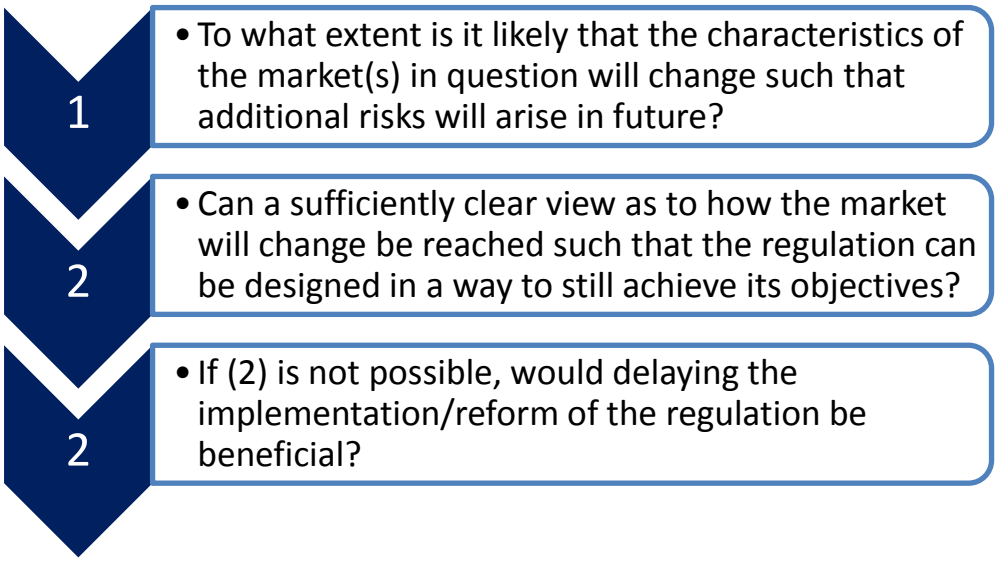
Even if one undertook analysis and found that there were no *current* material regulatory failure risks of relevance to a particular regulation, it is still possible this could change in the future. In particular, it could be the case that either:

- existing potential sources of regulatory failure risk become more pronounced over time; and/or
- new sources of regulatory failure risk emerge, which were not previously relevant to the issue under consideration.

In both cases, changes in regulatory failure risk are most likely to arise due to changes in the characteristics of the market(s) in which the regulation would be applied. For example, technological change can lead to rapid changes in both the level and nature of competition within markets with implications for price, service quality, investment and innovation. Consequently, even if – based on the existing characteristics of a market – a regulator can accurately identify and quantify the economic costs associated with regulation, there remains a risk that additional costs may arise in future. Barker (2008) highlights that: *"[where there is uncertainty regarding markets] there are inherent risks of regulatory error arising from, for instance, incomplete information, limited time, resources and ability to process the available information."*[24]

Given the above, the second stage of our methodology is to anticipate future sources of regulatory failure risk. To address this, there are three key questions Defra needs to ask.

Figure 12 Questions for anticipating regulatory failure risks



Source: Economic Insight

Assessing changes in the characteristics of markets and the implications for regulatory risks

The first step is to consider, at a high level, whether the characteristics of the markets in question are likely to change materially over time. Here it is important that the time period in question is bounded in order to make the assessment practical. We would suggest taking a five year view as (i) the uncertainty of trends increases over longer periods of time; and (ii) one reaches a point where the regulation could be fundamentally re-designed (or even removed). Taking a five year view, we would then suggest that Defra considers the following issues:

- Trends in demand in the market – is it growing or shrinking, and how fast?
- Volatility of demand in the market – how stable is demand?
- Changes in product/service offering – are significant innovations likely to occur?

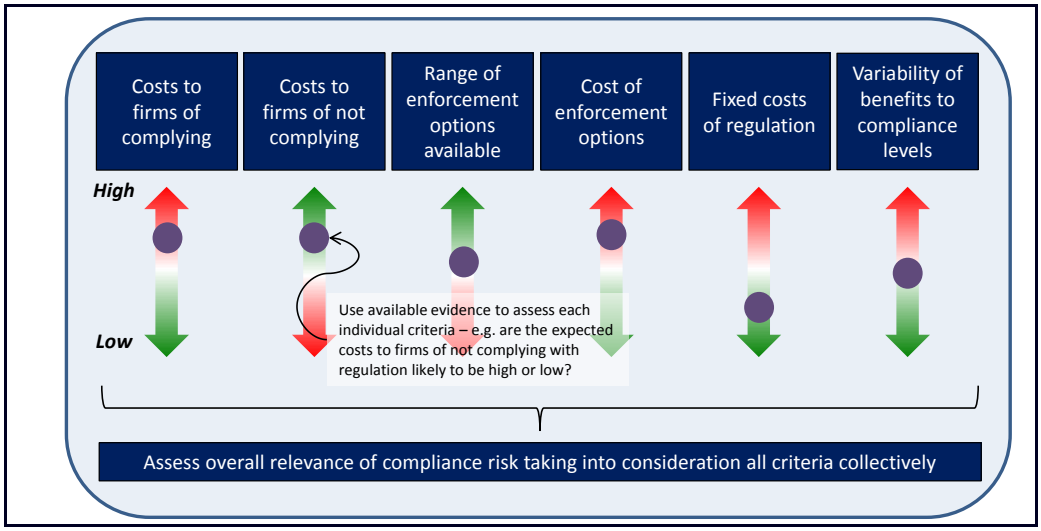
[24] 'A framework for regulatory decision-making under uncertainty.' Barker (2008).

- Trends in the supply base in the market – is there likely to be entry, exit and/or consolidation?

- Changes in the cost base – are production costs likely to increase or decrease?

Having assessed whether the characteristics of markets are likely to materially change over a five year period, the next step is to consider whether those changes have any implications for regulatory failure risks. This means returning to the causational 'dashboards' set out previously and re-evaluating whether the changes are likely impact the 'as is' assessment of regulatory failure risk. Rather than repeat those analytical steps here, we have set out an example relating to compliance risks – as summarised below.

Figure 13 Compliance risk dashboard



Source: Economic Insight

Examples of the types of issues one would need to consider are as follows:

- If there was likely to be a significant increase in the cost of making certain investments over time – and if the regulation itself drove the need to make those investments (for example, nitrates regulations requiring storage investment) then the relative cost of compliance for firms could increase, increasing the risk of non-compliance.

- If demand was expected to fall significantly, and the regulation drove significant compliance costs that were fixed with demand, the relative cost of compliance for firms would increase.

- If there was rapid entry into a market, enforcement costs could increase – but on the other hand, the probability of detecting non-compliance could also fall.

The option value of delaying interventions, or delaying reform to existing regulations

If, in undertaking the first step above, one found that market changes *could* be expected to increase regulatory failure risks, the next obvious question is whether the regulatory framework itself could be adapted to mitigate those risks. To assess this, one would need to examine the individual

elements of the regulation in question and consider how these might be amended to reflect the changing circumstances.

If one concluded that the regulatory framework could not be easily adapted to mitigate future risk, the final step is to consider whether it would be beneficial to delay the proposed regulation or regulatory reform. This can be thought of as an 'option value' to policymakers, which arises in circumstances of uncertainty. The benefit of this option value flows from the regulator being able to obtain more relevant information, or being able to observe directly the changes in market characteristics, which better allows the most effective policy solution to be identified. However, balancing against the 'option value' of delaying are the associated costs of the problem that the regulation is seeking to address, which will most likely persist in the absence of intervention. Consequently, as stated by Barker (2008) *"The quicker new information emerges, and the lower the foregone benefits of not regulating… during the time of waiting, the higher the option value of waiting."*[25]

In simple terms, the cost of not regulating needs to be weighed against risk that – in a rapidly changing market with information uncertainty – regulation may quickly no longer be fit for purpose; giving rise to a risk of regulatory failure. Of course, it is often the case that some regulation is already in place. Therefore the question is not whether one should delay the decision as to *whether* to regulate at all; but rather, whether there is merit in *delaying the redesign* of existing regulation. In these cases, the option value to agents of waiting may be greater, because the benefits of reducing regulatory failure risks are more likely to offset the economics costs of the delay (as the 'market failure', or other underlying problem, will at least be mitigated by the prevailing regulation, even if its effectiveness is reduced by the changing market conditions).

It would rarely be practical to quantify this option value in any detailed sense. However, Defra should be able to assess (using a qualitative approach) the issues described above, which would allow it to determine when the option value is likely to be material.

4.4 Measuring the scale of regulatory failure risks

The third and final stage of our methodology is to measure the potential scale of regulatory failure risks. Here it is important to note that one would only undertake this stage if relevant regulatory failure risks had either been identified or anticipated in stages 1 and 2 of the methodology.

On the assumption that potential regulatory failure risks are identified, an assessment of their likely scale becomes critical. In particular, if the impact of a particular regulatory failure is likely to be so low that, were it to occur, the economic costs would be minimal, then it may not be necessary to factor that risk directly into policy design or evaluation. On the other hand, if the impact of a certain regulatory failure was likely to be large, then it would be unwise to make any regulatory/policy decision without taking under consideration the risk of that failure occurring. Assessing the overall impact of a form of regulatory failure means reaching a view on two things:

- the consequences (in terms of economic costs) of the risk were it to emerge; and

[25] 'A framework for regulatory decision-making under uncertainty.' Barker (2008).

- the likelihood of the failure occurring.

It is unlikely to be practical to reach a precise quantitative measure of either the likelihood or consequence of any particular form of regulatory failure risk. In our view therefore, it would be more beneficial for Defra to adopt a pragmatic approach, where it evaluates the range of available qualitative and quantitative evidence it can draw upon to reach indicative views as to (i) the overall scale of regulatory failure risks; and (ii) how risks might vary across policy options, so as to inform the ranking of those options. The advantage of this approach is that it makes maximum use of the available data and evidence, which is often sufficient to a reach a relatively informed view as to the 'order of magnitude' of the impact.

This approach is consistent with that typically adopted by economic regulators, which tend to use regulatory failure analysis as an overlay to policy and regulatory design. In particular, when considering regulatory failure risks, it is unusual for regulators to forward quantitative estimates as to the impact of those risks. However, they do set out views as to the likely overall scale of the risks, which are then taken into consideration when making regulatory decisions.

Determining the appropriate measure of consequence

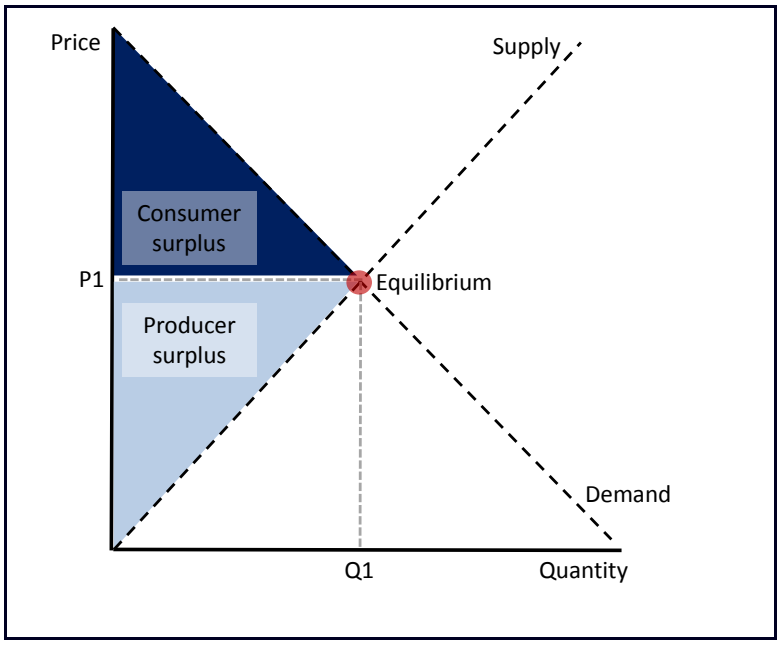
Before addressing *how* one might measure the consequences of regulatory failure risk, it is first necessary to consider *what* the appropriate conceptual measure is. From an economics perspective it would be appropriate to consider the impact on total social welfare, which is made up of:

- **Consumer welfare.** Where the value consumers place on (or the utility they derive from) the consumption of a good/service exceeds the price they pay for it.

- **Producer welfare.** Where the price producers receive for supplying a good/service exceeds the price at which they would be willing to supply it.

Consumer and producer welfare are commonly referred to as 'consumer and producer surplus', and the definitions set out above can be illustrated within a market demand and supply framework, as shown below.

Figure 14 Illustration of consumer and producer surplus



Source: Economic Insight

Techniques for measuring consequences

Having explained above that we are, conceptually, interested in assessing the impact of regulatory failure on consumer and producer surplus, we need to consider how such impacts can be assessed. In principle, there are a range of economic tools and analytical frameworks that could be used to assess the impact of an adverse regulatory outcome on consumer and producer surplus. These include, but are not limited to:

- **Analyses of consumer outcomes:** customer purchasing surveys, behavioural studies, consumer satisfaction measures.
- **Analyses of producer outcomes:** producer business surveys, supply base analysis.
- **Theoretical economic market models:** models that provide a framework for assessing the likely behaviour of firms and consumers within markets.[26]
- **Benchmarking analysis:** Price comparisons across firms and industries, efficiency benchmarking, qualitative comparisons of innovation rates.

There are two key difficulties associated with the above techniques. Firstly, in many instances they can, at best, only provide *information* as to the likely welfare impact of a policy (rather than a robust quantitative measure). Secondly, there is no one technique or methodology that is appropriate to all circumstances. Indeed, this was the finding of a Europe Economics study on behalf of DG SANCO (the European Commission) in 2007. Asked to review the potential techniques for assessing the welfare impact of policies and regulations, Europe Economics concluded: *"None of the specific approaches [evaluated] can be applied sufficiently widely to be useful to the [European] Commission*

[26] For example, Cournot, Bertrand or Stakleberg models.

as a simple generic tool to assess the impact of policy [on welfare]. This is because each individual methodology can only deal with certain specific sources of detriment and/or is only applicable under certain limited conditions."[27]

Given the above, it is neither practical, nor feasible, to set out a specific analytical methodology for quantifying the consequences of regulatory failure risks. Rather, instead, we suggest that the best pragmatic approach is to (i) identify the key questions that Defra should consider in order to evaluate the likely scale of the risk; and (ii) deploy whatever qualitative and quantitative information is available in order to inform answers to those questions.

Key questions for evaluating the scale of risk

To assess the consequences (i.e. the likely scale) of the regulatory failure risk, one needs to start from the nature of the risk identified and consider the following key questions.

1. What are the specific adverse outcomes that could occur if the risk were to emerge?
2. With regard to producers in the market:
    - Would the producer's costs be affected?
    - Would the level of supply be affected?
    - Would the nature of what is being supplied be affected? (For example would the quality of goods or services be affected? Would firms change what they are supplying?)
    - Would there be an impact on market entry or exit – or on the nature of rivalry between existing firms in the market?
3. With regard to purchasers (consumers) in the market:
    - Would the utility (satisfaction) derived from consuming goods or services be affected?
    - Would the extent to which the goods/services are regarded as 'a necessity' or 'discretionary' be affected?
    - Would the cost of switching between suppliers be affected?
4. Given the potential impacts identified in (2) and (3), how many agents (producers or consumers) would be affected by the outcomes?
5. Given all of the above, what is the likely 'order of magnitude' effect of the risk were it to emerge?

[27] 'An analysis of the issue of consumer detriment and the most appropriate methodologies to measure it.' Europe Economics (2007). Page 225.

Deploying available evidence to inform the questions

With regard to each of the above questions, Defra should seek to make use of whatever qualitative and quantitative data there is available – and this is likely to vary by policy area. Examples of the types of data sources and evidence likely to be of most use include:

- **Data on consumer spending and behaviour in the relevant market.** For example, the ONS Family Expenditure Survey (FES) provides information on family spending across a range of goods and services. These kinds of data can be used to get a sense of the 'proportionality' of the goods/services in question to consumers – and can therefore provide an indication of the likely overall consumer impact of changes in costs and prices.

- **Data on producer profits, revenues and costs.** For example, the Annual Business Survey (ONS) contains information on the size (turnover, number of firms, employment and capex) across industries, by SIC code. Of specific relevance to Defra is the Farm Business Survey, which provides detailed data on: farm business income, net farm income, cash income, and family farm income. Data on the financial performance of producers can be used to provide an indication of the overall impact on producers of changes to input costs.

- **Market analysis of consumer and supply base.** For example, surveys on the size and makeup of consumers and suppliers in the affected markets. In Defra's policy space, the June survey of agriculture and horticulture, which provides data on land usage, livestock populations and labour, would be an example of this. Evidence on the number of consumers and producers can be used to help inform the overall number of agents likely to be affected by the regulatory risk.

Illustrating a 'pragmatic approach' to assessing the impact of regulatory failure risks – how regulation can effect investment costs

In practice, the 'pragmatic approach' we are suggesting for measuring regulatory failure risks is commonly applied by regulators (and this is discussed further subsequently). In order to illustrate how an indicative view of the 'order of magnitude' of a regulatory failure risk might be assessed, we have considered the case as to how regulation can influence financing costs for businesses.

This is most obviously the case in industries where rate of return/price control regulation applies (such as in water or energy markets). In such circumstances, the regulatory framework itself not only directly sets a return on capital for firms, but also influences the actual rate at which firms can borrow due to the way in which investors perceive the risks of the regulatory regime itself. In such circumstances, the obvious regulatory failure risks would be in either (i) the regulator setting the allowed return at an economically sub-optimal level; and/or (ii) the nature of the regulatory framework itself giving rise to additional risks that increase the cost of capital for firms. In either case, it is relatively straightforward to get a sense of the 'order of magnitude' of the regulatory failure risk. In particular, one would only need to know (a) the overall size of capital invested in the industries in question; and (b) the potential impact on capital costs to firms to get a sense of the potential scale of the impact.

In Australia a study by Ergas et al (2001)[28] looked at exactly this issue, by illustrating the potential annual impact (in $bn aus) of changes to the cost of capital linked to regulation. The results of this are shown in the table below to illustrate the practical information that can be used to inform a sense of the scale of regulatory error risks. Based on the data reported by Ergas etc al, if the regulatory framework resulted in the cost of capital being 1% higher than is economically efficient, the annual cost to regulated industries would be $1.3bn.

Table 2 Example of how regulatory failure risks can be scaled – cost of capital in Australia

Regulated industry	*Indicative regulated asset base ($bn)*	*Depreciation ($bn)*	*Cost of capital ($bn)*	*Total capital charge ($bn)*	*Increase in capital charge due to 1% increase in cost of capital ($bn)*
Electricity	$32.0	$1.6	$3.2	$4.8	$0.3
Gas	$13.0	$0.3	$1.3	$1.6	$0.1
Water	$39.0	$0.6	$3.9	$4.5	$0.4
Telecoms	$28.0	$2.3	$2.8	$5.1	$0.3
Rail	$16.0	$0.4	$1.6	$2.0	$0.2
Ports	$3.0	$0.1	$0.3	$0.4	$0.0
Airports	$3.0	$0.1	$0.3	$0.4	$0.0
Total/average				$18.8	**$1.3**

Source: Adapted from Figure 1 of Ergas et al (2001).

In the above example, the greatest uncertainty relates to determining *whether* and by how much regulation might impact the cost of capital. However, the absolute amount of capital invested in the asset base of the industries is a known and observable figure. Consequently, in this instance, it is clear that if one believed that the regulatory framework *might* be raising the cost of capital to a sub-optimal level, the impact of that risk could be large and therefore, this would be an important issue to take into consideration. In simple terms, it shows how data – if used pragmatically - can be used to get a good sense of the overall scale of the risk in question, which can be used to help inform a regulator's or policy maker's decision making process.

Assessing the likelihood of regulatory failure risks

It is unlikely that, when considering the consequences of identified regulatory failure risks, one would be in a position to know, with certainty, as to whether and when those risks might emerge. Consequently, the second important methodological step in measuring the scale of risk is to take into consideration the *probability* of it occurring.

The need to address the issue of uncertainty is consistent with the analytical framework set out in the Green Book for undertaking cost benefit analysis. The Green Book highlights the need to undertake qualitative and/or quantitative analysis to reflect uncertainties; and in particular suggests:

- Sensitivity analysis – understanding 'by how much' key inputs would need to vary in order for the result to change.

[28] 'Regulatory risk: the ACCC Regulation and Investment Conference.' Ergas, Hornby, Little and Small (2001).

- Scenario analysis – calculating costs and benefits under a range of plausible outcomes or policy solutions.
- Monte Carlo analysis – a risk modelling technique that presents both the range, as well as the expected value, of the collective impact of various risks.

For the purpose of probability adjusting the risk of regulatory failure, the choice of technique should reflect a pragmatic assessment of the proportionality of undertaking analysis. In most cases, the use of sensitivity and/or scenario analysis is likely to be sufficient for Defra's purposes.

5 How Defra can apply the methodology

As set out in Section 3 of this report, a key objective of our study is to ensure that the methodology can be applied in a Defra policy context. In this section we therefore address the practical application of the methodology, discussing in turn:

- how regulatory failure risk is assessed in non-Defra sectors (learning lessons from elsewhere);
- understanding proportionality (considering when detailed risk assessments are appropriate and when they are not);
- when to use the methodology (considering at what points in the Defra Policy Cycle it is most beneficial to examine the issues set out here); and
- examples of applying the methodology in a Defra policy context (some short case studies).

5.1 How regulatory failure risk is assessed in non-Defra sectors

Useful insights as to how Defra might seek to apply the methodology can be drawn from reviewing how other regulators both (i) evaluate regulatory failure risks; and (ii) how this influences their regulatory decisions. In the following therefore, we provide a short description of a number of recent examples.

Ofcom's decision to largely de-regulate Royal Mail Group

In 2011 Ofcom announced its proposal to largely deregulate Royal Mail Group.[29] Ofcom's rationale for deregulation rested, to a significant degree, on there being material risks of regulatory error (failure) were formal price regulation to continue, rather than on economic arguments relating to the degree of competition in markets, market failures, or any formal cost-benefit analysis. Ofcom confirmed this proposed decision in March 2012.[30]

Of particular note, the requirement to consider regulatory failure risk was one of Postcomm's guiding principles when the consultation process for reforming postal regulation began (a consultation process which Ofcom subsequently inherited). Indeed, "principle 4" of Postcomm's approach was as follows: *"**Ensuring that the regulatory framework minimises the risk of regulatory failure** – In particular, interventions should be the minimum necessary; proportionate and targeted in addressing the issues identified; transparent and as simple as possible; and practicable to implement and to ensure compliance with."*[31]

The above illustrates that a consideration of regulatory failure risks was deemed to be a central criterion for designing and evaluating the new regulatory framework for postal markets, rather than just being a supplement to existing analytical frameworks. Furthermore, and consistent with the

[29] 'Securing the Universal Postal Service: Proposals for the future framework for economic regulation.' Ofcom (2011). The consultation sets out Ofcom's proposal to largely remove all ex-ante price and efficiency regulation from Royal Mail Group.

[30] 'Securing the Universal Postal Service: Decision on the new regulatory framework.' Ofcom (2012).

[31] 'Securing the Universal Postal Service: Proposals for the future framework for economic regulation.' Ofcom (2011). Page 53.

approach set out in this report, Ofcom explicitly considered both the *likelihood* and *consequences* of making regulatory errors.

With regard to likelihood, Ofcom focused on how the rapid rate of change in postal markets undermined the reliability of historic information (such as price elasticity estimates and customer preference surveys) for the purpose of making forward-looking decisions. This led Ofcom to conclude that *"the likelihood of substantial regulatory error is significant."*[32]

With regard to consequence, Ofcom considered the potential financial implications for Royal Mail Group of making errors when setting price controls. In this regard, Ofcom found that there was significant scope to make errors that could have a *"very significant effect on Royal Mail's overall financial viability."*[33]

In assessing both likelihood and consequence, Ofcom did not seek to undertake any detailed quantification. Rather, the regulator made a pragmatic assessment of the issues and evidence 'in the round' and used this to reach a conclusion. This is an important point because it illustrates how regulators can make significant reform decisions on the basis of there being risks of regulatory failure, but without attempting to quantify that failure risk. In our view this pragmatic approach is the only viable methodology in most cases. It reflects the importance of the issue, whilst accepting that (in most instances) formal, detailed quantification would be either impossible, or so subjective as to render its results meaningless.

The FSA's approach to assessing regulatory failure risks

The FSA's guidelines for cost benefit analysis include an explicit requirement to consider both market and regulatory failures. The FSA describes the process of undertaking regulatory failure analysis as follows: *"We need to analyse at a high level in what ways one would expect the incentives and therefore, in principle, the actions of the actors/potential actors in the relevant market to have been changed by all aspects of FSA regulation that are likely to bear on the economic market(s) in which the RTO [risk to the FSA's objectives] has been identified. Most importantly, we need to consider whether those changes are a cause of the RTO that we observe. Thus we need to isolate the aspects of the market – behaviours or product characteristics, etc – that characterise the RTO and then form a view about whether they are caused by regulation."*[34]

Consistent with the previous Ofcom/Royal Mail Group example therefore, the FSA considers the need to evaluate the possibility of regulatory failure as being a core component of policy evaluation, rather than being something that is discretionary. In undertaking regulatory failure risk analysis, the FSA's guidelines highlight the need to determine both whether:

- there is a causative link between the risk to the FSA's objectives and the identified regulatory failure; and
- the magnitude of that regulatory failure is sufficient to justify [corrective] action.

[32] 'Securing the Universal Postal Service: Proposals for the future framework for economic regulation.' Ofcom (2011). Page 58.
[33] 'Securing the Universal Postal Service: Proposals for the future framework for economic regulation.' Ofcom (2011). Page 58.
[34] 'A guide to market failure analysis and high level cost benefit analysis.' The FSA (2006) Page 24.

The FSA's guidance highlights a number of examples of potential areas where regulatory failure risks could arise – and of these we would suggest that the two most topical examples would be:

- **Regulatory capital requirements.** Set these too high and consumers ultimately end up being charged a higher price for financial services than would strictly occur in an efficient market. Set these too low and there could be excessive risk taking.

- **Misbuying/selling.** Regulatory criteria regarding the menu of financial advisor's commission charges could lead to competition around 'false focal points'.

What is interesting about the above potential regulatory failure risks in financial services is that both have, arguably, crystallised in recent years. For example, the 2008 liquidity crisis has provoked substantial academic debate as to whether its causes were due to market or regulatory failures (and indeed, to what degree).[35] With regard to potential regulatory failures, both the nature of the oversight regime and the capital requirements themselves, are reasonable 'in principle' sources of error. Similarly, with regard to misbuying/selling, there have been numerous examples (such as payment protection insurance) where concerns have led to significant regulatory scrutiny. These examples serve to illustrate that regulatory awareness of the need to consider failure risks does not, by itself, necessarily mitigate those risks.

Regulatory failure risk issues in telecoms

The issue of regulatory failure risk has played an important role in shaping telecoms regulation in the UK over recent years, influencing both the detail of regulatory decisions and the design of the regulatory framework itself. A good example of the latter relates to Ofcom's proposed design for the license of 4G spectrum.

In its consultation regarding the *'assessment of future mobile competition and proposals for the award of 800MHz and 2.6GHz spectrum and related issues'* (the auction of 4G spectrum) Ofcom explicitly considered regulatory failure risks. In particular, when considering whether measures to promote competition might be necessary, the regulator stated that it would apply the following analytical framework. *"What are the risks of regulatory failure if we take a measure? By regulatory failure we mean either that the regulatory intervention fails to achieve the outcome intended, or that there were unintended consequences. It can be thought of as the counterpart of market failure."*[36]

Having made the above assessment when considering the design of 4G auction rules, Ofcom concluded: *"that the risk of regulatory failure is lower with the promotion of at least four national wholesalers* [network operators] *compared to at least three."*[37] At the time of writing, Ofcom's latest proposals for the design of the 4G auction include a guarantee for a fourth network operator in the UK to be reserved an amount of spectrum.

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35 For example see: 'Market Failures and Regulatory Failures: Lessons from Past and Present Financial Crises.' Acharya et al (2009).

36 'Consultation on assessment of future mobile competition and proposals for the award of 800MHz and 2.6GHz spectrum and related issues: Annex 6: Competition Assessment.' Ofcom (2011). Page 4.

37 'Consultation on assessment of future mobile competition and proposals for the award of 800MHz and 2.6GHz spectrum and related issues: Annex 6: Competition Assessment.' Ofcom (2011). Page 71.

Summary of lessons from other regulated sectors

Based on our review of how regulatory failure risk analysis is undertaken in other sectors, we would suggest the following lessons for Defra.

1. That regulatory failure risk is a core issue in policy and regulatory design; and regulators frequently take it into consideration.

2. That regulatory failure risk assessments have played an important role in shaping major regulatory decisions in recent years in other sectors.

3. That in many cases, quantification of regulatory failure risks is not possible – but regulators are nonetheless able to gauge the 'order of magnitude' with respect to likelihood and consequence.

4. That a consideration of regulatory failure risk does not necessarily mitigate risk.

5.2 Understanding proportionality

In considering how Defra can apply a regulatory failure risk methodology, it is important to start from the principle of proportionately. In particular, in many cases it may be that seeking to undertake any detailed analysis of the likely risks of regulatory failure is simply disproportionate to the overall impact of the policy. In other instances however, the consequences of regulatory failure could be sufficiently large that a more detailed assessment is appropriate. This approach is consistent with BIS' wider guidance on impact assessments, which states that: *"The effort applied at each step of completing an Impact Assessment, in particular the estimation of cost and benefits, should be proportionate to the scale of the costs and benefits, outcomes at stake, sensitivity of the proposal and the time available. A less detailed Impact Assessment may be adequate where a regulatory proposal is likely to affect only a few firms or organisations, or many firms or organisations but only to a negligible degree, where the costs and benefits are likely to be negligible and can be captured within a lighter touch evidence base. By the same token, more data and analysis is required where the impact is expected to be substantial."*[38]

We therefore recommend that Defra should practically consider the issue of regulatory failure risk within a wider framework of proportionality, whereby any resource invested in assessing regulatory failure risks is proportionate to the issue under consideration. In applying a proportionate approach, the first step is to consider whether *any* regulatory failure risk assessment is required. We suggest that there are two circumstances where this might be the case:

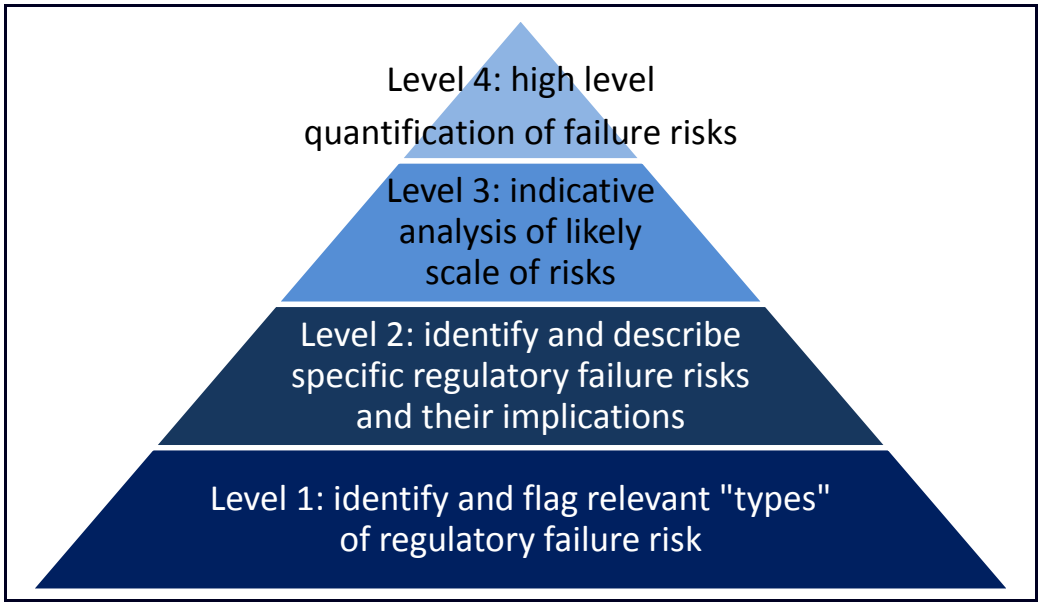
- Instances where Defra simply has no discretion as to how a particular regulation or policy is implemented. (For example, discretion is likely to be more limited with regard to existing regulations emanating from the EU. However, in some cases Defra may have scope to influence the form of the EU regulation. In such instances, regulatory failure analysis could be viewed as a useful tool that Defra could deploy for the purpose of influencing).

[38] 'Impact Assessment Guidance: When to do an impact assessment.' BIS (2011), para 17.

- Instances where the changes in regulation/policy under consideration are so minor that their expected incremental impact is trivial.

Where neither of the above hold, we would suggest that *some* consideration of regulatory failure risks is likely to be appropriate; but that the level of detail of the analysis should be tailored such that it is proportionate to the issue in question. The figure below sets out a suggested hierarchy of analysis, with four different levels for Defra to consider.

Figure 15 Hierarchy of methodological approaches



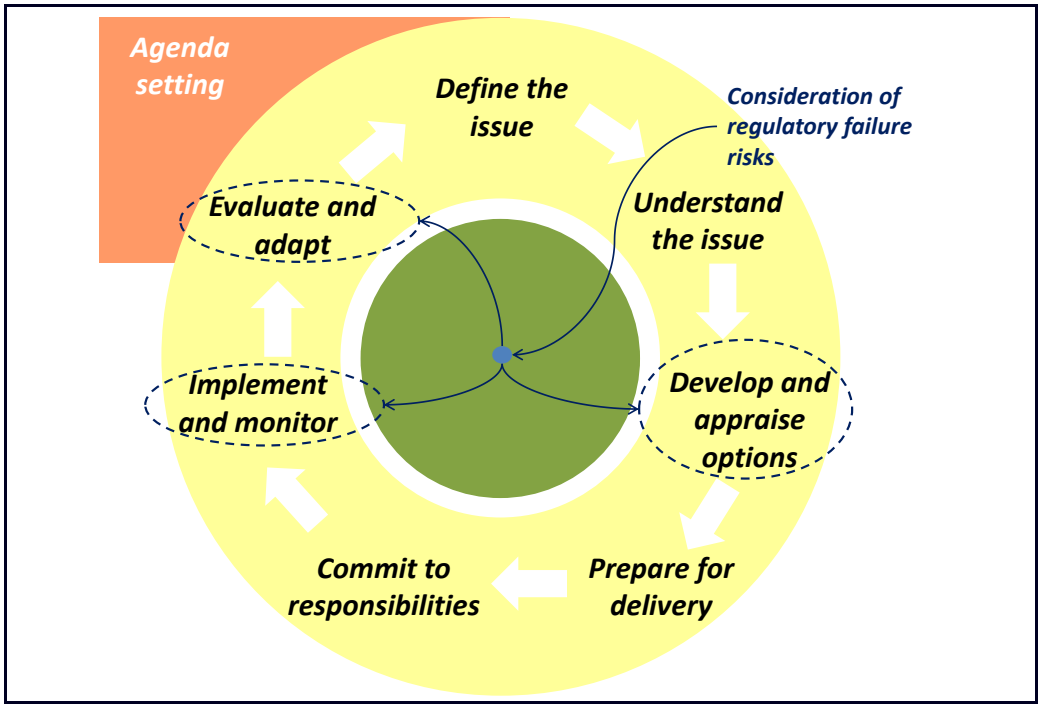
Source: Economic Insight

In our view, it should be for Defra to determine in what circumstances it would be appropriate to undertake analysis at any of the above levels. This is because Defra is best placed to evaluate and trade-off both the expected impacts of regulation and policy changes against available internal resource.

5.3 When to use the methodology – the Defra Policy Cycle

Defra has developed its own internal process for developing and implementing policy in a consistent manner; this is known as the *Defra Policy Cycle*. The following figure provides an illustration of this, along with an indication as to where a consideration of regulatory failure risk is likely to be most appropriate.

Figure 16 Defra Policy Cycle



Source: Defra and Economic Insight

Given that the focus of our methodology is on assessing the risk of regulatory failure, which by definition addresses the *possibility* of regulatory failures occurring on a forward-looking basis, the most appropriate point in the Policy Cycle for Defra to consider its application would be at the *'develop and appraise options'* stage. Here the goal would be to ensure that, at the very inception of policy design, an assessment of regulatory failure risk is used to: (i) help determine whether a regulatory response is appropriate; (ii) help support strong policy design, by ensuring that options are developed in a way that explicitly takes failure risks into account; and (iii) inform an evaluation as to what the most appropriate form of response might be (i.e. to choose between the different options).

In addition to the above, a consideration of aspects of the methodology could be applied at the *'implement and monitor'* stage of the Cycle. With regard to this, if risks concerning implementation were identified, it would be important to ensure that, as implementation commences, the policy is working as intended. In addition, one would expect the design of ex-post monitoring to reflect any specific regulatory failure risks identified in the development stage. For example, if compliance related risks were identified, one would expect the compliance level to be monitored on a forward-looking basis. Finally, the methodology could also be used to assist in the *'evaluate and adapt'* stage. In particular, had any significant regulatory failure risks been identified in the design phase, it would be logical to ensure any evaluation addressed whether these had arisen ex-post. In addition, the consideration of how policy should be adapted should naturally be informed by an understanding of regulatory failure risks, particularly in markets with fast changing characteristics.

The core themes of the Policy Cycle are:

- **Outcome focused.** To understand the outcome that one is trying to achieve and how it contributes to department's Coalition Priorities.

- **Engagement.** To identify those who have a stake in the policy under consideration and to build relationships with them.

- **Evidence.** To gather, interpret and use the best available research and analysis to underpin an understanding of the issues.

- **Risk.** A consistent approach to understanding, assessing and mitigating policy and delivery risk.

An assessment of regulatory failure risk is clearly most relevant to the 'risk' theme. That is to say, one could think of it as an additional tool to help ensure that risk is assessed in a consistent manner across various policy and regulatory topics.

Stepping back from the Defra Policy Cycle context, regulatory failure risk analysis could also be viewed as a useful tool with which to influence the design and reform of EU legislation (i.e. it could be used to help influence the regulatory framework at a stage prior to the implementation or amendment of UK legislation). This is likely to be an important consideration for Defra, given that a significant amount of the legislation for which it has an oversight role emanates from the EU. For example, if Defra is seeking to influence a particular piece of EU legislation, we would suggest considering whether an explicit analysis of regulatory failure risks might assist Defra in making a strong, evidence-based case to EU policymakers.

Defra example – European IPPC Bureau and BREF analysis

The European IPPC Bureau is an action of the Sustainable Production and Consumption Unit of the Institute for Prospective Technological Studies. The IPTS is one of the seven scientific institutes of the European Commission's Joint Research Centre.

The European IPPC Bureau produces reference documents on Best Available Techniques, called BREFs, which are the main reference documents used by Member States when issuing operating permits for the installations that represent a significant pollution potential in Europe. In this context, Defra could consider how regulatory failure risk analysis might inform an assessment of best available techniques as part of the EU information exchanges that inform BREFs. For example, the 2006 BREF on waste incineration addressed issues regarding the regulation of emissions limit values, where a consideration of regulatory failure risks would seem relevant.

5.4 Examples of applying the methodology in a Defra policy context – case studies

In the final part of this section, we set out some short case studies that illustrate how the methodology could be applied to the assessment of regulatory failure risks in a Defra policy context. It is important to emphasise that the objective of these case studies is to help demonstrate the ways in which the methodology could be applied, rather than to assess whether, ex-post, there have been historic regulatory failures. Consequently, the particular case studies presented here do not in any way imply any prioritisation of certain policy areas, nor any assessment that those policy areas are more or less likely to be subject to regulatory failure risks than others.

The case studies are structured around the main stages of our methodology: *identify, anticipate and measure;* and on illustrating the application of a proportionate approach to assessing regulatory failure risk. Across these stages we examine the issues relating to four regulations/regulatory topics within Defra's remit:

- the implementation of the EC Nitrates Directive (where we consider the implications of nitrate storage requirements on compliance incentives);
- the Producer Responsibility Obligations Packaging Waste Regulations (where we discuss the impact of uncertainty on forward-looking assessments of regulatory risk);
- the introduction of sheep and goat electronic identification (where we explore the issues around measuring regulatory failure risk in the context of having multiple regulatory tools designed to achieve the desired end objective); and
- the Seed Marketing Regulations (where we address the proportionality of undertaking regulatory failure risk analysis in the context of a policy change with a small expected incremental impact).

5.4.1 Case study on identifying the causes of regulatory failure risks

The first stage of the methodology is to identify potential causes of regulatory risks and assess their relevance to the issue under consideration. The 'in principle' causes identified in Section 4 of this report are: *regulatory capture, non-compliance, problems of regulatory design/implementation and a lack of regulatory solution.* To illustrate the relevance of this stage of the methodology to Defra's policy areas, we reviewed Defra's proposed 2008 changes relating to the implementation of the EC Nitrates Directive; and in particular, the evidence set out in Defra's Impact Assessment published in August 2008.[39]

Brief overview of the policy

The purpose of the EC Nitrates Directive is to reduce water pollution caused by nitrogen from agricultural sources and to prevent such pollution in the future. In the UK, Defra implements the Directive by using three policy tools:

- Code of Good Agricultural Practice.
- Action Programmes – controls on the use and management of manures and fertilisers, including limits on the total loading of nitrogen in manure.
- Nitrate Vulnerable Zones – areas of agricultural land where farmers must adhere to the controls.

The key changes to these policy tools under consideration in 2008 were as follows:

[39] We are aware that there is an on-going Defra consultation regarding nitrate vulnerable zones ('Implementation of the Nitrates Directive in England 2013-2016') and an impact assessment associated with this was published by Defra in 2011 (IA Defra1407).

- Amendments to storage capacity requirements to reduce the risk of manures being spread when conditions are unsuitable.

- A reduction in the annual farm loading limit to 170 kg per hectare for nitrogen from livestock manures - applied to all land (reduced from 250kgN/ha). Defra found that this change would have the greatest impact on dairy farmers, and so derogation was considered in relation to them. Defra estimated that such derogation would reduce the costs imposed on dairy farmers by the regulation by between £16.9m and £21.7m pa. Defra ultimately gathered a significant amount of external evidence, which supported its view that there should be derogation for dairy farmers from the 170kgN/ha limit.

- The 'closed periods' when the spreading of organic manures is banned were to be made longer and extended to all soil types (only high risk sandy and shallow soils were subject to the control prior to this).

- The introduction of forward planning rules to ensure nitrogen applications to land from manures and fertilisers are more accurately balanced to crop needs.

In considering the relevance of the four potential causes of regulatory failure risk, we would suggest that the "storage capacity" and "reduction in annual farm loading limits" aspects of the proposed 2008 changes are of most interest. In the following we address these in turn.

Identifying regulatory failure risks: storage capacity

A key element of the proposed changes was to increase the manure storage capacity requirements to between 5 or 6 months. In the 2008 Impact Assessment, Defra identified that this would require many farmers to develop additional storage capacity, which in turn would require capital investment on their part. Indeed, the additional storage costs driven by the increase in manure capacity requirements were the second largest quantified cost item for the agriculture industry. Defra concluded that: *"The anticipated costs of constructing additional storage facilities to comply with the storage capacity requirement are £12.8m to £16.5m per year."*[40] This was out of a total annual industry cost of £44.3m-£65.2m; so farm storage costs were expected to account for between 25% and 28% of the total industry costs.

It is interesting to consider these additional capital costs to farmers in the context of assessing whether there could be non-compliance risks of regulatory failure. In particular, for farmers the cost of complying with the storage requirements via investing in increased capacity has two dimensions:

- the direct cost of the capital itself (i.e. the interest charged by financial institutions for lending money to construct the storage); and

- if there were constraints regarding access to capital, the potential opportunity cost of not being able raise additional capital for other projects, which may be preferable commercially to investing in manure storage.

[40] 'Explanation memorandum to the nitrates pollution prevention regulations 2008 – No 2349.' Attached Impact Assessment – Defra (2008). Page 28.

As outlined in our methodology, we would suggest that Defra considers non-compliance incentives using a 'profit maximisation' framework, whereby it should be assumed that agents will choose to not comply if it is profitable for them to do so. In this case therefore, depending on the relativities of the storage capital compliance costs (compared with the potential non-compliance costs associated with any policy enforcement penalties), it would seem that farmers would naturally have a financial incentive to:

- explore alternative (non-capital intensive) options for meeting the storage requirements; or
- if no alternatives were viable, to consider not complying.

Of relevance to this issue, in 2010 the Northern Ireland Environment Agency (NIEA) undertook a review of compliance with the Nitrates Action Programme Regulations (NAP). The NIEA found a number of breaches, of which insufficient manure storage was one of the most significant.[41]

Given the above, we would suggest that a high level analysis of non-compliance incentives and risks would have been a useful addition to the 2008 Impact Assessment. In particular, whilst the Impact Assessment identified the capital costs set out above, it did not directly consider their implications for compliance, nor were they compared against the costs of non-compliance for farmers (i.e. the expected costs of sanctions). In other words, it was the potential *unintended consequence* dimension of the storage requirements that was not considered. A further issue of relevance is that the expected benefit of the policy is likely to vary relatively directly with compliance (because in the absence of compliance, the expected reduction in nitrates would not occur) and consequently this further suggests that consideration of non-compliance risks, within a profit maximising framework, would be valuable in this area.

Identifying regulatory failure risks: reduction in annual farm loading limits

The proposed 2008 reduction in the annual farm loading limit from 250kgN/ha to 170kgN/ha is a good example of a policy that is likely to affect one group (dairy farmers in this case) much more than other groups. In some cases this will often be an intended consequence the policy. For example, it may be that the group is simply larger than other groups and might therefore contribute a higher proportion of the external costs associated with pollution and, as a consequence, incur a higher proportion of the abatement costs too. In other cases, it may be that the design of the policy is imperfect and unintentionally falls harder on one group compared to another.

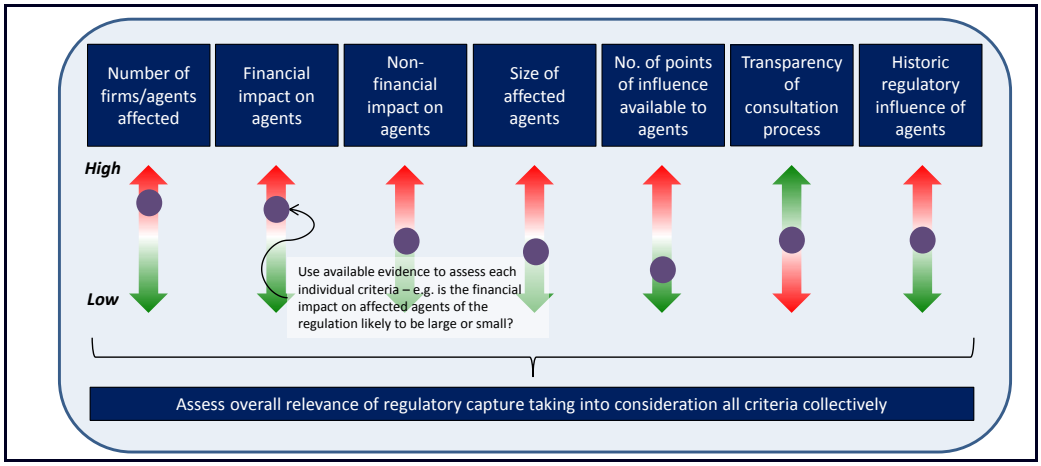
In either case, Defra will rightly need to consider whether it makes sense to amend/refine the policy so that it does not affect the group in question, or reduces or postpones its effects (where it can be clearly demonstrated that inequity or economic inefficiency would result). One regulatory risk that could arise during this process is the risk of regulatory capture – that is, where the group that is

[41] See: http://www.dardni.gov.uk/ruralni/index/ruralni_news-current/ruralni_news-current-2/naprogramme_breaches.htm

affected more than others seeks to influence the policymaking process to serve its own purpose in a way that reduces the potential social benefits of the policy.[42]

At this stage in the process of policy design, Defra will have arrived at some views on the number and size of those affected and the financial and non-financial impact of the policy on them. The regulatory capture dashboard would therefore suggest that the next step would be to consider the points of influence available to the group and their historic influence on the policy making process.

Figure 17 Regulatory capture risk dashboard



Source: Economic Insight

If Defra found that the group had a number of credible points of influence and had successfully influenced policy before, it may consider putting in additional safeguards and cross-checks to limit the risk of regulatory capture. These safeguards and cross-checks might include (but would not be limited to):

- consideration of whether the costs facing the group would be higher than the costs facing other groups on a 'per firm/agent' basis (or whether they would be higher simply because there are more of them);
- consideration of whether the rationale for amending the policy are specific to the group or whether the same rationale would also apply equally to the other groups (albeit with potentially less influence); and
- consideration of whether the potential amendments to the policy should be subject to independent review to check whether they would be net beneficial to society.

5.4.2 Case study on anticipating regulatory failure risks

The second stage of the methodology is to anticipate regulatory risks that could emerge in the future. For example, unanticipated risks can arise when the characteristics of the markets that would be affected by regulation are subject to change (what is 'good' today is not 'good' tomorrow)

[42] There will be times where the interests of these groups coincide with the interests of society and so there should not be any presumption that "serving its own purpose" is necessarily a bad thing: indeed, the process can help improve policy design – for example, by supplying information.

or when the scientific knowledge is in a state of development, which means that there are significant uncertainties about the likely effects of regulation.

To illustrate the relevance of this step of the methodology, we reviewed Defra's proposals relating to the implementation of the EU Packaging Directive; and especially the evidence set out in its Impact Assessment published in October 2011.[43]

Brief overview of the regulation

The EU Packaging Directive is implemented in the UK though: (i) the Packaging (Essential Requirements) Regulations 2003; and (ii) the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended). The producer responsibility regulations seek to internalise the externalities associated with processing packaging at the end of its life, in a way that is more beneficial than landfill to the environment. The scheme does this by setting minimum recycling recovery targets on UK businesses in the packaging supply chain.

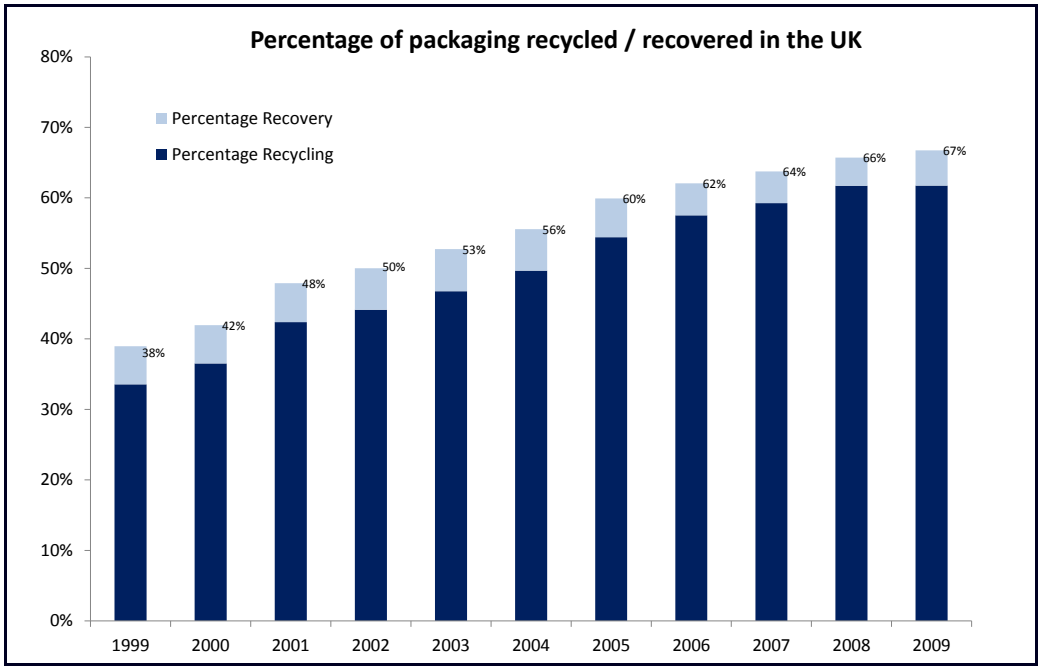
In order to demonstrate that they have reached the minimum recycling/recovery targets, firms must obtain evidence in the form of Packaging Waste Recovery Notes (PRNs) or Packaging Waste Export Recovery Notes (PERNs). These notes are issued by accredited packaging waste re-processors and exporters respectively and are purchased by businesses.

Businesses have a choice as to how they comply with the regulations. Specifically, they can choose to undertake the recycling themselves to obtain PRNs; they can contract directly with re-processors (and obtain PRNs as evidence); or they can pay to join a compliance scheme – which takes on reporting and contractual duties. Most packaging producers have chosen to join a compliance scheme. The use of PRNs in the UK is an important driver of increases in packaging recycling and recovery rates over time, as shown below.[44]

[43] 'Proposal to introduce packaging recovery and recycling targets for 2013 to 2017: Impact Assessment.' IA1368. Defra (2011).

[44] As by definition firms within the scope of the regulations are obligated to reach the required level of recycling and recovery and obtain PRNs as evidence of having complied.

Figure 18 Trends in packaging recycling and recovery



Source: Defra

As current recycling recovery targets run until the end of 2012, Defra has recently consulted on future targets, running from 2013 to 2017. As part of this process, Defra considered a number of options for the level at which the recycling/recovery targets should be set. In particular, it considered whether the targets should be set at the EU minimum until 2017, or whether they should be set higher for some or all the relevant materials.

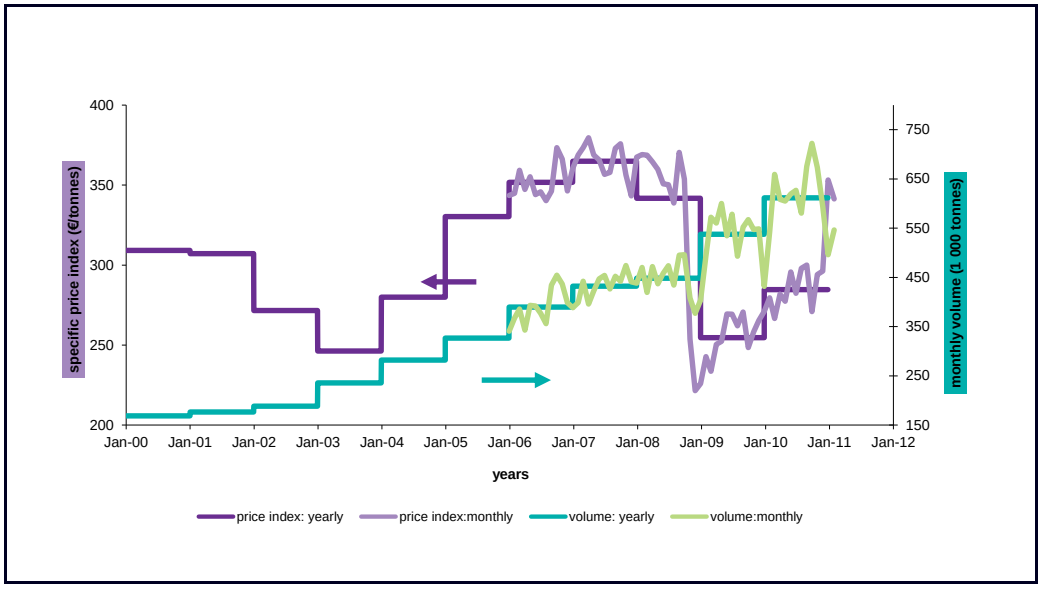
Defra concluded that its preferred option would be to set higher recycling rates for aluminium, plastic, steel and glass. It found that this option would yield the largest net benefit of £256.8m over 5 years in present value terms.[45] The main monetised costs of the policy option would be collection/sorting costs (£271.9m over 5 years in present value terms) and the main monetised benefits of the policy option would be the revenue from the sale of materials (£445.8m over 5 years in present value terms).

Anticipating regulatory risks

As outlined in our methodology, the need to consider and anticipate how regulatory risks might change tends to be greatest in markets in which there may be significant variances in demand and supply side characteristics over the medium term. This is for a number of reasons, not least because designing and implementing effective regulatory frameworks is more challenging in such circumstances. Evidence suggests that the markets for recycled packaging materials may be characterised by a degree of volatility. In particular, Eurostat data shows considerable variation in both the price and volume of waste packaging materials over time, as illustrated in the following figure, which shows prices and volumes for plastic waste materials across the EU27.

[45] Over and above the net benefit of adopting the minimum targets set by the EU.

Figure 19 Plastic waste price index and volumes in EU27



Source: Eurostat

In the current case, we are interested in the potential variance in supply and demand side factors for packaging waste more generally. However, Eurostat does not publish a packaging price or volume index, and so plastic waste has been shown here by way of an example. The data shows that plastic waste volumes within the EU27 have risen sharply over time, with the annual average tonnage rising from 168k to 611k from 2000 and 2012 (an increase of 263% over the time period). Plastic waste prices have been relatively volatile, with marked increases in annual average prices from 2004 to 2008 followed by large falls until 2009/10, since when prices have increased materially. The difference between the minimum and maximum plastics waste price over the period shown was 48%.[46] The volatility in recycling markets was noted by the Department for the Environment (Northern Ireland) as being a key challenge in implementing the Packaging Directive.[47] Price volatility was also acknowledged by Defra in the 2011 Impact Assessment, where a sensitivity analysis was included to reflect the uncertainty in the future price of recyclable materials.

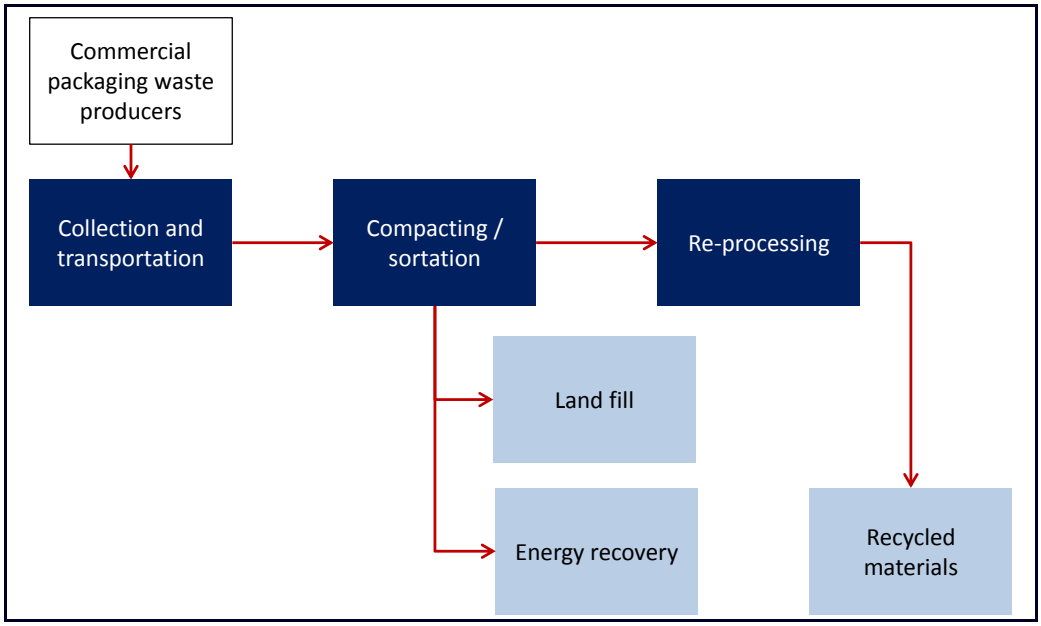
The price of recycling packaging materials is driven by supply and demand side factors. On the supply side, the critical issue is the amount of packaging waste being produced. On the demand side the key issues are: (i) the requirement for recycled packaging materials as an input into future production; (ii) regulatory requirements for firms to undertake packaging recycling (i.e. targeting); and (ii) capacity limits throughout a relatively complex recycling supply chain. The precise nature of the packaging recycling/recovery supply chain will vary to a degree both by material type and locality. However, a stylised illustration is shown below. The diagram shows the main stages of the recycling supply chain, which are as follows. *(i) Collection and transportation:* whereby packaging waste is collected and is transported to facilities for compacting and sortation. In the UK this stage is often undertaken, or facilitated, by local authorities (for example, private firms operating contracts on their behalf). *(ii) Compacting and sortation:* whereby packaging waste is sorted (through a

[46] Eurostat describes its methodology as follows: *"The new price indicator sums up all value (in €) and volume (in tonnes) of all relevant FTS [EU Trade] codes. Value over volume then gives the specific price indicator (in €/tonnes)."* See: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Recycling_%E2%80%93_secondary_material_price_indicator#Price_indicator_and_trade_flows

[47] See 'Waste Strategy Management.' Department for Environment - Northern Ireland (2000).

combination of mechanised and manual processes) into various categories and, depending on the type of waste, is compacted down (for example, certain plastic materials can be compacted into bales). This stage is typically undertaken at Material Recovery Facilities, from where materials are either then sent: (a) to landfill; (b) to incineration – where energy recovery can occur through the generation of heat and/or electricity; or (c) to re-processors for recycling. *(iii) Reprocessing:* facilities that deal with the actual process of turning packaging into recycled materials, which often involves a combination of: further sortation, shredding, melting and then blending into finished recycled products.

Figure 20 Stylised illustration of packaging recycling supply chain



Source: Economic Insight adapted from Wong (2010).[48]

In addition to direct supply and demand side factors, the input price of primary materials is also important. In commenting on the variance in waste plastic prices, Eurostat stated that: *"the price of plastic waste depends, on one hand of the supply and demand of plastic waste material, and on the other hand on crude oil price which strongly influences the price of the virgin (primary) material."*[49]

Why uncertainty matters in relation to Packaging Waste Regulations

The uncertainty regarding demand and supply side factors relating to packaging recycling is particularly important given the deployment of packaging recycling/recovery targets and the use of PRNs in the UK model. In particular, this is because the demand for PRNs is ultimately a derived demand (determined in part by the recycling targets themselves). The purpose of setting recycling/recovery targets, in a general sense, is try and incentivise a level of recycling that is closer to its economically efficient level than would occur absent targeting (accepting that it is not practical, nor cost effective, to attempt to precisely target a hypothetically efficient level of recycling). Consequently, with regard to *anticipating* potential regulatory risks, the issue is whether targets set today result in either over or under incentivising recycling in the future, relative to its

[48] Adapted from Figure 9 of 'A Study of Plastic Recycling Supply Chain.' Wong, University of Hull Business School and Logistics Institute (2010).

[49] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Recycling_%E2%80%93_secondary_material_price_indicator#Price_indicator_and_trade_flows

efficient level. In practice however, because the EU Packaging Directive specifies EU minimum targets, the question of most relevance to Defra (and addressed in the 2011 Impact Assessment) is whether setting more demanding recycling/recovery targets than the EU minimum results in *more efficient* outcomes, relative to setting targets consistent with the EU minimum.

Here the challenge is that, due to changing market factors (described above) the efficient level of recycling will also change over time, meaning both that (i) static targets are unlikely to remain appropriate over the medium-to-long term; and (ii) the expected additional net benefit of more stringent targets (than the EU minimum) might also vary over time. However, weighing against this issue is the downside of introducing new uncertainty into the regulatory framework, which could deter investment in the recycling industry. In particular, one way of addressing the supply and demand volatility issue would be to set targets over a shorter period of time, or to introduce adjustment mechanisms to increase flexibility within the framework. However, these solutions (in particular, the use of short time periods for targeting) might themselves be problematic if they make it hard for recycling processors to plan and finance investment in new capacity. Indeed, at the time of the 2011 Impact Assessment, the industry view was that five year targets were necessary in order to provide the required certainty to support investment.

As certain supply side investments are long lived, there is a relationship between expected future demand and the scope for investment to increase capacity. Consistent with this, one of the key risks highlighted in the Impact Assessment was a 'market risk', described as: *"due to the lack of demand-pull created by increasing targets PRNs [might] remain at the floor price. This would discourage entry into the market and long-term investment. Since 2009, the average PRN price for most materials has been close to the historic low. The current levels would not provide a significant revenue stream and probably only cover admin costs. This has resulted in a 22% reduction in the number of re-processor/exporter accreditations for compliance year 2011."*[50]

In simple terms, setting higher targets in the present provides greater certainty as to future recycling volumes, which in turn helps drive PRN prices upwards, creating incentives for investment on the supply side. There are both direct and indirect mechanisms regarding this. The direct mechanism is that PRN revenues must be re-invested in recycling – so, for example, in 2009 and 2010 £13.4m and £9.8m of PRN revenues we re-invested in infrastructure and capacity.[51] The indirect mechanism is that, over time, the increase in demand would naturally encourage wider investment into the supply chain.

An important issue is whether that additional investment and capacity enables the recycling supply base to reach a point of 'critical mass', at which production costs are (i) at a lower, more efficient level than would have been the case without the expansion; and (ii) whether those lower costs translate into market prices that make the increased production viable (i.e. whether the demand effect is sufficient to make production profitable). These factors are most likely to be relevant if there are economies of scale and/or scope in the recycling supply chain. The rationale for a 'demand pull' effect with regard to setting higher recycling/recovery targets is likely to be stronger if the above factors hold.

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[50] 'Proposal to introduce packaging recovery and recycling targets for 2013 to 2017: Impact Assessment.' IA1368. Defra (2011). Page 32.

[51] 'Consultation on recovery and recycling targets for packaging waste for 2013-2017.' Defra (2011), page 13.

In summary, the packaging recycling targets are a good example of a situation where an explicit consideration of future uncertainties would inform an assessment of regulatory failure risk. On one hand, there is the risk that any recycling 'target' level quickly diverges from an efficient outcome, given supply and demand side volatility (or, with respect to the specific legislative framework in question, whether the net benefit of setting more stringent targets than the EU minimum varies over time). On the other hand, mechanisms to accommodate increased flexibility in targeting may themselves create uncertainty, which undermines long term investments. As a result, when considering both the level of, and mechanism for delivering, packaging recycling targets, a forward-looking analysis of both the supply and demand side are essential. For example, with regard to the question of whether a 'demand pull' stimulus is required to incentivise supply side investment, one would need to consider:

- how capacity was likely to evolve over the medium term absent any such stimulus;
- how demand was likely to evolve absent the stimulus; and
- whether, on the supply side, industry cost structure was likely to change over time and – in particular – whether fixed costs were likely to be an important feature.

5.4.3 Case study on measuring regulatory failure risks

The third stage of the methodology is to gauge the likelihood of the identified/anticipated regulatory risks occurring and the severity of the potential consequences if they were to occur. As noted previously, we envisage that Defra would only undertake this step if regulatory risks had been identified in the first two steps. Rather than arrive at precise quantitative measures of likelihood and consequence, the purpose of this step is to reach an indicative view as to the overall impact of regulatory risks.

To illustrate both the relevance of this step, and its practical application to Defra policy areas, we examined the UK's implementation of EC Regulation 21/2004, which relates to the introduction of sheep and goat electronic identification (EID). In particular, we reviewed Defra's Impact Assessment of the policy from 2009[52]; and the supporting evidence and reports that were used and drawn on in that assessment.

Brief overview of the policy

In 2003 the Commission passed regulation (EC) 21/2004, which governs the rules for the identification of sheep and goats. This was adopted in response to the 2001 foot and mouth disease outbreak, where the Commission concluded that there was a need to improve the traceability of sheep and goats in order to mitigate the impact of future outbreaks.

In the UK the regulation was introduced in two phases. The first phase introduced 'double tagging' (the physical tagging of each animal's ears). This was replaced by EID on 31 December 2009 (EID is a system of electronic devices - typically ear tags or boluses - and readers, that is used to identify and monitor animals).

[52] 'Impact Assessment for the introduction of sheep and goat EID under EC regulation 21/2004.' Defra (2009).

A key issue when considering the likely impact of EID is that a range of existing measures already sought to address the problem under consideration. In particular:

- **The standstill rules.** In the aftermath of the 2001 outbreak of foot and mouth disease Defra introduced standing restrictions on the movements of livestock (cattle, sheep, goats and pigs). Whenever cattle, sheep, goats or pigs are moved onto a farm, they cannot move off for a period of six days in England and Wales (13 days in Scotland).

- **Double tagging.** As described above, prior to EID, a manual tagging system for the identification of sheep and goats was already in operation.

- **Animal Movement Licensing System.** A central database used to record the batch movement of animals.

Given the above, by reference back to the potential causes of regulatory failure risk, an area we might be concerned about is the potential for failure due to *regulatory design and implementation.* That is to say, given that regulations and policies were already in place to address the identified issues: (i) the incremental benefits of EID 'as designed' could be small – and potentially insufficient to offset the costs; and (ii) it may be methodologically difficult to isolate the incremental impact/benefit of EID, such that there is likely to be uncertainty around any estimate of the incremental benefits. Of course, other regulatory failure risks (such as non-compliance) might also be relevant and, consistent with our methodology, this would need to be assessed. For the purpose of this example however, our assumed start point is the risk of design and implementation. Given this, the next step is to review existing data and evidence and come to a pragmatic assessment as to both the likelihood and consequence of this risk occurring.

Using existing evidence to pragmatically assess regulatory failure risks

Both Defra's 2009 Impact Assessment and associated supporting evidence provide a range of material that can be used to inform the above assessment. In particular, Defra commissioned Risk Solutions (a risk management and strategy consultancy firm) to undertake economic modelling of the impact of EID under a range of scenarios. In undertaking this work, Risk Solutions noted that: *"while a full implementation of… EID may have significant disease control benefits, many of these benefits could have been achieved already in some measure by the specific policies already in place in the UK."*[53]

Consistent with the above, Risk Solutions modelled the reduction in outbreak cost management (i.e. the benefit) arising from EID in a way that allowed its incremental impact (over and above existing policy tools) to be assessed. Risk Solutions adopted a scenario analysis approach in which the mean cost reduction was estimated under a range of outbreak and control scenarios, as follows:

- Two outbreak scenarios: one in Cumbria, one in Powys.

- Two control strategy options: infected premises/disease control culling (referred to as IP/DC); and IP/DC plus vaccination.

[53] 'Impact of Sheep EID on disease control: additional analysis – a report for Defra.' Risk Solutions (2008). Page 8.

In addition, Risk Solutions modelled a range of alternative EID *implementation* scenarios, which were:

- Derogated Hybrid EID Regime (EID for breeding sheep and batch identification for animals 'intended' for slaughter under 12 months of age).
- Enhanced Derogated Hybrid EID Regime (EID for breeding sheep and batch identification for animals going 'direct' to slaughter under 12 months of age).
- Full EID (also termed as maximum EID).

The table below summarises the results of Risk Solutions' scenario modelling. For each scenario we have shown both the total (mean) cost reduction and the incremental cost reduction due specifically to EID being implemented.

Table 3 Incremental impact of EID as modelled by Risk Solutions

	Cumbria (IP DC)		***Cumbria (+ Vacc)***		***Powys (IP DC)***		***Powys (+ Vacc)***	
Scenario	Mean cost saving (£m)	Incremental saving over and above tagging regime (£m)	Mean cost saving (£m)	Incremental saving over and above tagging regime (£m)	Mean cost saving (£m)	Incremental saving over and above tagging regime (£m)	Mean cost saving (£m)	Incremental saving over and above tagging regime (£m)
Double Tagging Regime	£80.2		£83.7		**£64.6**		£65.1	
Derogated Hybrid EID Regime	£79.8	-£0.4	£83.3	-£0.4	£66.6	**£2.0**	£65.5	£0.4
Enhanced Derogated Hybrid EID Regime	£90.8	£10.6	£91.2	£7.5	£78.8	£14.2	£73.7	£8.6
Full EID Regime	**£91.8**	**£11.6**	£90.4	£6.7	£79.4	£14.8	£73.5	£8.4

Source: Adapted from Table 5 of Risk Solutions report (2008).

The Risk Solutions analysis showed that, in the event of an outbreak, the mean reduction in costs (i.e. the benefit) due *collectively* to the disease control measures ranged from £64.6m to £91.8m (as highlighted in bold in the above table). Consistent with our methodology, an important issue is to consider the incremental impact of the specific policy tool in question with reference to both consumers and producers (and in many cases this would be the next analytical step that Defra would need to take). In this case however, the Risk Solutions analysis already provides some insights. In particular, as shown above, the total cost saving, the expected contribution of EID was estimated to be very small. For the IP DC scenarios, the incremental impact of EID ranged from just -£0.4m to £11.6m (13%); again as highlighted. Indeed, Risk Solutions concluded that: *"the additional cost saving offered by some form of sheet EID system was found to be between 3% and 13%... This*

indicates that the majority of the benefit (as noted in the 2006 report) can still be attributed to the operation of the standstill."[54]

A further important point to note is that the implied incremental cost savings arising from EID are not annual numbers but, rather, are the savings that would arise in the event of an outbreak occurring. In its 2009 Impact Assessment Defra assumed that a 'major infectious disease' outbreak might happen once every 30 years. In assessing the annual incremental benefit of EID therefore, we must divide the incremental benefit by 30 to calculate an annualised number. Focusing only on the IP DC scenarios (and ignoring negative values) this would suggest an annual incremental benefit of between just £70k and £0.5m.[55]

Implications for the likelihood of regulatory failure risk crystallising

As indicated above, the Risk Solutions analysis indicated that the pure incremental benefits of implementing EID were likely to be small. However, of particular relevance to considering the *likelihood* of regulatory failure risk is the uncertainty around these estimates. This uncertainty stems from the inherent difficulties in isolating the impact of EID from that of existing regulatory tools. In this regard, Risk Solutions identified two types of uncertainty within their modelling framework.

- **Assumed input parameter values.** For each modelled scenario (described previously) it was necessary to input assumptions regarding parameters relating to the overall effectiveness of the option – specifically animal traceability (for each parameter, a 'pessimistic', 'standard' and 'optimistic' parameter value was modelled).

- **Probability distributions.** A number of parameters used in Risk Solutions' modelling were selected from a range of possible values, based on a random selection from a probability distribution.

By taking the above uncertainties into account, Risk Solutions were able to report confidence intervals around their results. These indicated that the incremental benefit (relative to double tagging) of the *'Derogated Hybrid EID Regime'* was not statistically significant, but that the *'Enhanced Derogated Hybrid EID Regime'* and *'full EID'* options would result in statistically significant incremental benefits (also relative to double tagging).[56] It is important to understand that *in addition* to the uncertainty captured within Risk Solutions modelling approach, there is a risk that the 'true' impact of the scenarios being modelled fell outside of the ranges assumed for the input parameters themselves.

The above uncertainty matters because the estimated incremental benefits of EID are small in absolute terms (see earlier). Consequently, there *may* not need to be many divergences between assumed input parameter ranges and the 'true' impact values for the incremental benefit of EID to cease to become statistically significant.[57] Therefore, even where cost benefit analysis does explicitly address uncertainty through sensitivity (or similar) analysis, it will not necessarily explicitly

[54] 'Impact of Sheep EID on disease control: additional analysis – a report for Defra.' Risk Solutions (2008). Page 29.

[55] Calculated as £2.0m / 30 and £14.8 / 30 respectively. Note Defra's Impact Assessment included the total, rather than incremental, benefit. The annual benefit was therefore calculated as £65m / 30 = £2.2m.

[56] Based on a 95% confidence interval. See: 'Impact of Sheep EID on disease control: additional analysis – a report for Defra.' Risk Solutions (2008). Paragraphs 6.24-6.26, age 26.

[57] We cannot comment on the probability of this being the case and have not reviewed Risk Solutions' model for the purpose of developing this case study.

consider the likelihood of specific outcomes under which costs could outweigh benefits, nor the implications of those outcomes. This illustrates why an explicit consideration of the likelihood of regulatory failure risk can provide insights over and above those contained in a standard cost benefit framework. By overlaying a 'risk of regulatory failure' assessment, a number of further questions are raised, such as:

- Are there some outcomes under which incremental costs are likely to exceed incremental benefits?
- What is the likelihood of those outcomes arising? What would one have to assume for those outcomes to occur?
- Given the preceding, what kind of 'weighting' should be attached to such outcomes when adjusting for uncertainty in policy evaluations?

A consideration of the above issues may result in an alternative ranking of policy options relative to a standard cost benefit approach. Consequently, this illustrates how, by addressing these issues and by making use of existing analyses and evidence, Defra can make pragmatic assessments as to the *likelihood* of regulatory failure risk occurring. It should be noted that, in this case study, the Risk Solutions analysis provided a good source of relevant evidence for considering regulatory failure risks. In other instances, it may be that similarly detailed evidence does not exist. In these cases we suggest that it remains appropriate to consider the above questions, based on first principles economics.

With regard to considering the consequence of regulatory failure risk crystallising, a similar approach could be adopted. In the event that EID did not deliver material incremental benefits, the consequence would be that the agents affected by the regulation would continue to bear the incremental costs, which in this case could be evidenced using the existing Impact Assessment.

The context of European legislation

It is important, particularly in the example of EID set out above, to understand the context of the European legislative framework that Defra has to operate within. Much of the regulation that Defra has oversight of in the UK emanates from the EU and, in such circumstances, whilst Defra may be able to shape and influence the way in which the regulation is applied, the application itself is mandatory. (Though, as noted elsewhere, in such cases the relevant consideration is whether regulatory failure risk analysis can be deployed as part of Defra's overall influencing strategy at the EU level).

EID is one such example – it is an obligation imposed by EU legislation and must be applied by all member states where the animal population in question exceeds 160,000. It should also be noted that, since the EID implementation was finalised, both Defra and the industry have lobbied the Commission to secure concessions. In particular:

- The Regulation provides a phased approach to individual recording which, according to Defra's Impact Assessment, will significantly reduce costs to English keepers during the

transition period by £1.7m for the historic flock and by between £10k and £20k for breeding animals born after 31 December 2009.[58]

- The Regulation allows for the use of certain derogations from the need to electronically identify and individually record animals. Defra applied the slaughter and Central Point Recording (CPR) derogations to take advantage of the 160,000 threshold set for goats, under which they do not need to be electronically identified.

5.4.4 Case study regarding assessing the proportionality of regulatory failure risk assessments

As described previously in this section, a key recommendation is that Defra and its Agencies should only seek to undertake regulatory failure risk assessments in circumstances in which it is proportionate (and further, in cases where an assessment is undertaken, the resource expended should be proportionate to the expected incremental impact of the regulation/policy in question). In the following we set out a short case study regarding the proposed modification to the marketing of fodder seed regulations.

Brief overview of the regulation

In 2011, the Food and Environment Research Agency (Fera - an executive agency of Defra) evaluated the impact of making modifications to the Seed Marketing Regulations so that they were fully compliant with Commission Directive 2010/60/EU.[59] Fera found that most of the requirements of the Directive were already captured in the Seed Marketing Regulations. However, small changes to the regulations were needed in order to ensure that England's authorisations, labelling and testing processes were fully compliant with the Directive.

Fera estimated that the changes would affect (on average) 8 companies per year, and that implementation would cost industry £8,320 per year and deliver a monetised benefit of £0 per year (excluding the benefits associated with higher consumer confidence and better consumer information).

Considering the issue of proportionality

As described previously, we consider that there are two circumstances under which it would not be proportionate to undertake any regulatory failure risk assessment:

- Instances where Defra (and its Agencies) has no discretion as to how a particular regulation or policy is implemented.
- Instances where the changes in regulation/policy under consideration are so minor that their expected incremental impact is trivial.

With regard to the proposed modification to the Seed Marketing Regulations, both of the above conditions are met. With regard to the former, the modifications were only necessary because of

[58] Figures as quoted by Defra in: 'Impact Assessment for the introduction of sheep and goat EID under EC regulation 21/2004.' Defra (2009). Page 9.

[59] 'Preservation Fodder Seed Mixtures – implementation of Commission Directive 2010/60/EU.' Impact Assessment Defra1278 (2011).

the need to comply with the Commission Directive 2010/60/EU. Indeed, given this, Fera only considered two options (making minor modifications in order to comply; and not complying); before concluding that the modifications were preferred *"because Option 2 [i.e. not making the policy modifications] does not comply with EU legislation."*[60] Of course, the need to comply with the Directive does not necessarily mean that Government/Defra had no discretion as to how the Seed Marketing Regulations should be modified in order to comply. However, given the nature of the requirements (which included, amongst other things, minor prescriptive changes to reporting, quantity of preservation fodder and labelling) the degree of discretion regarding implementation was limited. Consequently, even if Fera/Defra believed that there were material regulatory failure risks associated with the regulation, it would have limited means to mitigate those risks; and thus the benefit of analysing those risks is restricted.

In addition to there being limited discretion, the expected incremental impact of the policy was small, due to it affecting a *"small scale specialised market."*[61] Indeed, there were no monetised benefits identified in the Impact Assessment and the total expected cost was just £70k in present value terms (£83k annual sectoral costs).

Taking both of the above factors into consideration, our view would be that the proposed modifications to the Seed Marketing Regulations considered in the Impact Assessment provide an example of where any consideration of regulatory failure risk would be disproportionate and consequently, should not be undertaken.

[60] 'Preservation Fodder Seed Mixtures – implementation of Commission Directive 2010/60/EU.' Impact Assessment Defra1278 (2011), page 1.

[61] 'Preservation Fodder Seed Mixtures – implementation of Commission Directive 2010/60/EU.' Impact Assessment Defra1278 (2011), page 1.

6 Key messages and recommendations

In this final section of the report we set out our key messages and recommendations for Defra regarding the use of regulatory failure risk analysis.

6.1 Key messages

- We suggest the following definition of regulatory failure risk: *"The risk that the economic costs of regulation outweigh the benefits, arising from regulation having unanticipated and/or unintended effects."*

- The analysis of regulatory failure risk should be regarded as complementary to the existing tools of cost benefit analysis and impact assessments; and as such, it should be regarded as an 'additional tool' that can help inform policy and regulatory decision making.

- The importance of considering regulatory failure risks is accentuated by the Government's regulatory reform agenda; and in particular, the Red Tape Challenge and Better Regulation Strategy. This is because it provides additional insights that can be used to help identify the most proportionate solution to identified issues that might require a regulatory response.

- In other (non-Defra) sectors, an assessment of regulatory failure risks is often a key part of policy/regulatory design and evaluation, and has played a central role in major regulatory decisions in recent years. In our view, best regulatory practice requires – as a minimum – a consideration of regulatory failure risks.

- The existence of regulatory failure risks does not, in and of itself, mean that regulation in some form is not net beneficial from a social welfare perspective. Indeed, an assessment of such risks can help rank alternative regulatory options, rather than necessarily implying that regulation is not needed.

- We suggest a 'three stage' conceptual methodology for assessing regulatory failure risks, based on (i) identifying potential risks and assessing their relevance; (ii) anticipating the potential for future risks to emerge; and (iii) measuring regulatory failure risk, with regard to its likelihood and consequence.

- With regard to the measurement stage of the methodology, it is rarely possible or proportionate to undertake a precise quantification of the risk. The appropriate approach is therefore to make best use of existing evidence in order to judge the likely 'order of magnitude'. This is consistent with current regulatory practice across a range of sectors.

6.2 Recommendations

1. Defra should seek to explicitly consider regulatory failure risks as part of its policy design and evaluation processes (where appropriate), and in doing so, follow the three stages of the methodology set out in this report (identify, anticipate and measure).

2. The most appropriate point in the Policy Cycle for Defra to consider its application would be at the *'develop and appraise options'* stage. Here the goal would be to ensure that, at the inception of policy design, an assessment of regulatory failure risk is used to: (i) help determine whether a regulatory response is appropriate; (ii) help support strong policy design, by ensuring that options are developed in a way that explicitly takes failure risks into account; and (iii) inform an evaluation as to what the most appropriate form of response might be (i.e. to choose between the different options). The methodology could also be used to inform the *'implement and monitor'*; and *'evaluate and adapt'* stages of the Cycle. However, we would not recommend that Defra adds further process to formalise or mandate the assessment of regulatory failure risks; but rather, uses judgement to determine when it is, and is not, appropriate (see recommendation 4).

3. Stepping back from the Defra Policy Cycle context, regulatory failure risk analysis could also be viewed as a useful tool with which to influence the design and reform of EU legislation, where Defra has scope to do so (i.e. it could be used to help influence the regulatory framework at a stage prior to the implementation or amendment of UK legislation).

4. We further recommend that Defra should seek to apply this methodology in a proportionate way, rather than mandating detailed analysis in a uniform manner across all policy areas and regulatory issues. This is particularly important given that (i) much of the regulation of which Defra has oversight emanates from the EU, which can reduce Defra's ability to determine whether and how it is implemented; and (ii) in instances of reforms to existing regulations, the likely incremental impact may be so small that it would be disproportionate to require detailed analysis. We specifically recommend that:

    a. No assessment of regulatory failure risk is appropriate in circumstances where:

        i. Defra has no discretion as to how a particular regulation or policy is implemented.[62]

        ii. The changes in regulation/policy under consideration are so minor that their expected incremental impact is trivial.

    b. In other circumstances, Defra should undertake some assessment of regulatory failure risks, but should do so in a proportionate way, balancing the effort

[62] For example, this may be the case in relation to certain existing regulations emanating from the EU. Here it is important to note that Defra's discretion will be more limited where: (i) the implementation of the EU regulation in the UK is mandatory; and (ii) the nature of the regulation means there is also little discretion in how it is implemented. This is distinct from the question as to how Defra can influence EU policy itself (as per recommendation 3), where regulatory failure risk analysis may also be relevant.

expended against the overall impact of the regulation/policy in question. We suggest that Defra is best placed to make this assessment of proportionality, as it will need to take into consideration its own internal resources and prioritisations in making any decision.

5. Without adding additional prescriptive process, Defra should consider developing high level internal guidance as to when a consideration of regulatory failure risks would be appropriate and communicate this to relevant internal teams and stakeholders.

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Economic Insight Limited

90 Long Acre - Covent Garden - London - WC2E 9RZ | +44 (0) 207 849 3004
www.economic-insight.com