

# STFC Impact Framework & Evaluation Strategy

## Contents

1. Introduction .....	2
2. A strategic approach to evaluation .....	3
2.1 STFC's strategy .....	3
2.2 STFC's delivery functions.....	4
3. Evaluation .....	5
3.1 Why evaluate? .....	5
3.2 What is evaluation? .....	6
4. Impact.....	8
4.1 Outcomes and impacts .....	8
4.2 Delivery timescales .....	10
5. Evaluation of STFC's Impact .....	11
5.1 Impact Framework.....	11
5.2 Impact evaluation programme.....	12

## 1. Introduction

STFC continues to bring economic benefits to the UK, building competitiveness and improving the quality of our lives. We deliver this crucial role by ensuring that the UK continues to be amongst the leading scientific nations, by playing a major role in the growth of innovation-tech jobs and by training some of our brightest minds so they can improve and influence society.

STFC's vision is to maximise the impact of our knowledge, skills, facilities and resources for the benefit of the United Kingdom and its people. Our social and economic impact is considerable and affects our lives in a number of different ways. As well as delivering impact, capturing and reporting this impact to stakeholders is a key part of our remit. We are committed to evaluating how our research, facilities and technology improve everyday lives across the UK. Producing credible evidence of our impact to Government is also a key factor in achieving good funding settlements in Spending Reviews.

In recognition of the growing importance of evaluation within the research environment, STFC has developed an evaluation strategy and impact framework. The strategy sets out our approach to impact evaluation and clearly demonstrates STFC's commitment to developing impact evaluation as a core competence of the organisation. A key part of our evaluation work is understanding and communicating the complex nature of how we deliver impact. To do this, we have developed our impact framework which helps us communicate and evaluate the wide range of impacts that the organisation has.

BIS have challenged STFC to demonstrate both the value of our research, innovation and skills to the UK and how we intend to increase our impact. This document details how we are responding to this challenge and how STFC's strategy and our impact framework has helped us to prioritise our impact evaluation programme.

Claire Dougan-McCallie  
Head of Impact Evaluation

June 2014

## 2. A strategic approach to evaluation

### 2.1 STFC's strategy

STFC's strategy is based on our vision of maximising the economic and societal impact of our programmes. We promote and deliver world class research, innovation and skills to generate knowledge, solutions and skilled people, thus underpinning the UK's future competitiveness and the rebalancing of the economy. Our strategic goals, themes and enablers are outlined in Figure 1 below.



Figure 1 - STFC's strategic framework to deliver economic impact for the UK

Having three clear strategic goals has helped us to articulate the different ways in which we produce impact as an organisation. For example in research we produce impact by creating new scientific knowledge, some of which has significant global and long term impact such as the development of the world wide web. In innovation we deliver impact through many routes, including commercialising the technology that arises from our own laboratories or supporting UK industry. In the skills arena we create impact by growing the skills of our own staff and those staff we fund through our university grants.

## 2.2 STFC's delivery functions

STFC delivers its strategy through several different delivery routes or functions. These include:

### **Universities**

STFC is the UK sponsor of astronomy, space science, particle physics and nuclear physics research which it funds in UK universities. We provide the funding that allows the UK's outstanding universities to excel in research, innovation and the training of PhD students. These highly-skilled post-graduates enhance our UK research base, as well as contributing to the wider knowledge economy.

### **National Laboratories and Campuses**

STFC also makes a vital contribution to world class research, innovation and skills through the operation of our national laboratories. These national laboratories include research and technical capabilities in space science, particle physics, accelerator science and computational science. We also deliver impact to the UK through our Science and Innovation Campuses. A key remit of the Campuses is to build a critical mass of skills, businesses and capabilities to attract inward investment. Built around our world class science and technology communities, the Campuses comprise large national facilities, public-sector science organisations, academic centres, large and small commercial companies and other associated activities.

### **Facilities and subscriptions**

STFC provides the UK research base with access to a range of world-leading, large-scale tools and facilities to enable university and industrial researchers to perform cutting-edge science. Including the UK facilities of Diamond Light Source, ISIS and the Central Laser Facility, a key part of our role is to provide these facilities with the support and funding to keep them world leading.

STFC also provides access to world-class, large-scale scientific facilities for UK researchers in strategic areas of research with key international scientific organisations. UK membership of these international scientific partnerships ensures the highest return from national investment in those science areas. Hence, STFC provides access to CERN, ESO, ILL and ESRF at levels agreed with international partners and our fellow Research Councils.

### 3. Evaluation

#### 3.1 Why evaluate?

Evaluation serves multiple purposes, including accountability, reporting and the ability to influence funding decisions and policy. STFC receives approximately £500 million per annum of public funds to deliver its key programmes in research, innovation and skills. As well as providing public accountability, we must demonstrate that this funding is providing sufficient impact to the UK and its people to justify future investment in our programmes. It is particularly important to demonstrate our impact to Government in advance of Spending Reviews, and our evaluation is a key aspect in our ability to attract funding.

Our evaluation also provides BIS with the evidence it needs to make decisions based on the evaluation of its policies. Figure 2 shows the HMT Green Book Policy and Programme Cycle which illustrates Government policy which ensures that evaluation is integrated into policy making.

Finally, effective evaluation also helps us to evaluate the success of our own policies and programmes within our corporate strategy and delivery plan. As well as allowing us to build a rich picture of the impact of past investments, it also helps us assess the success of our corporate approach to evaluation.

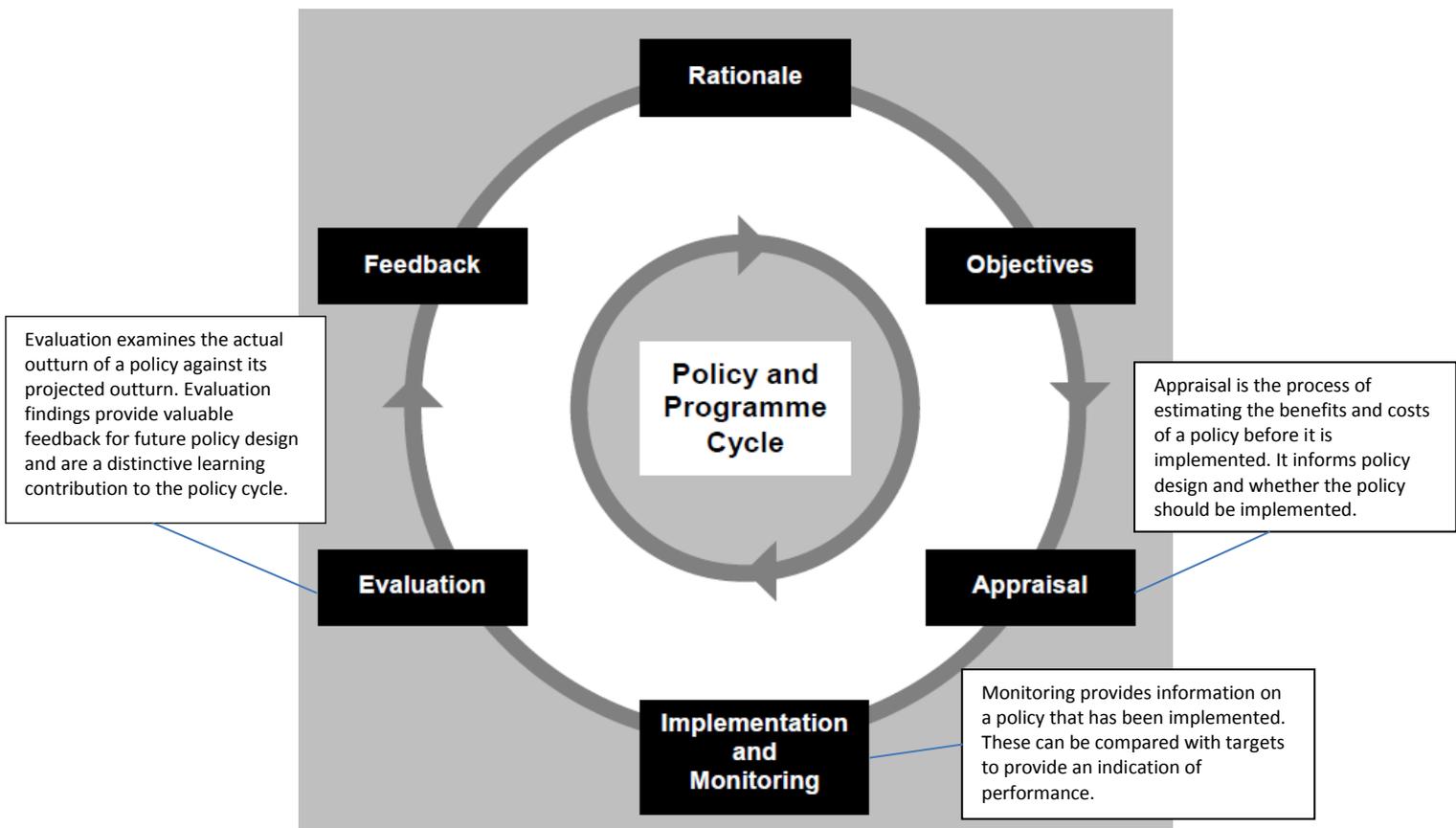


Figure 2 - The ROAMEF Policy & Programme Cycle<sup>1</sup> in which evaluation plays a critical role

### 3.2 What is evaluation?

Evaluation is defined<sup>ii</sup> as:

*“...an [independent] process which aims to assess the success or effectiveness of a project, programme or policy, and what lessons can be learnt for the future...”*

Evaluation differs from monitoring and audit in that it looks at a programme as a whole, assessing its objectives, achievements, and lessons learned. As indicated above, to be effective, lessons must be learned and fed back into policy making, funding allocations and strategic objectives. Successful evaluation involves collaboration between those carrying out the evaluation, those whose work is being evaluated and the decision-making bodies within STFC (e.g. Executive Board, Science Board, Operations Board).

Figure 3 below shows the different levels at which performance is evaluated in STFC’s programme.

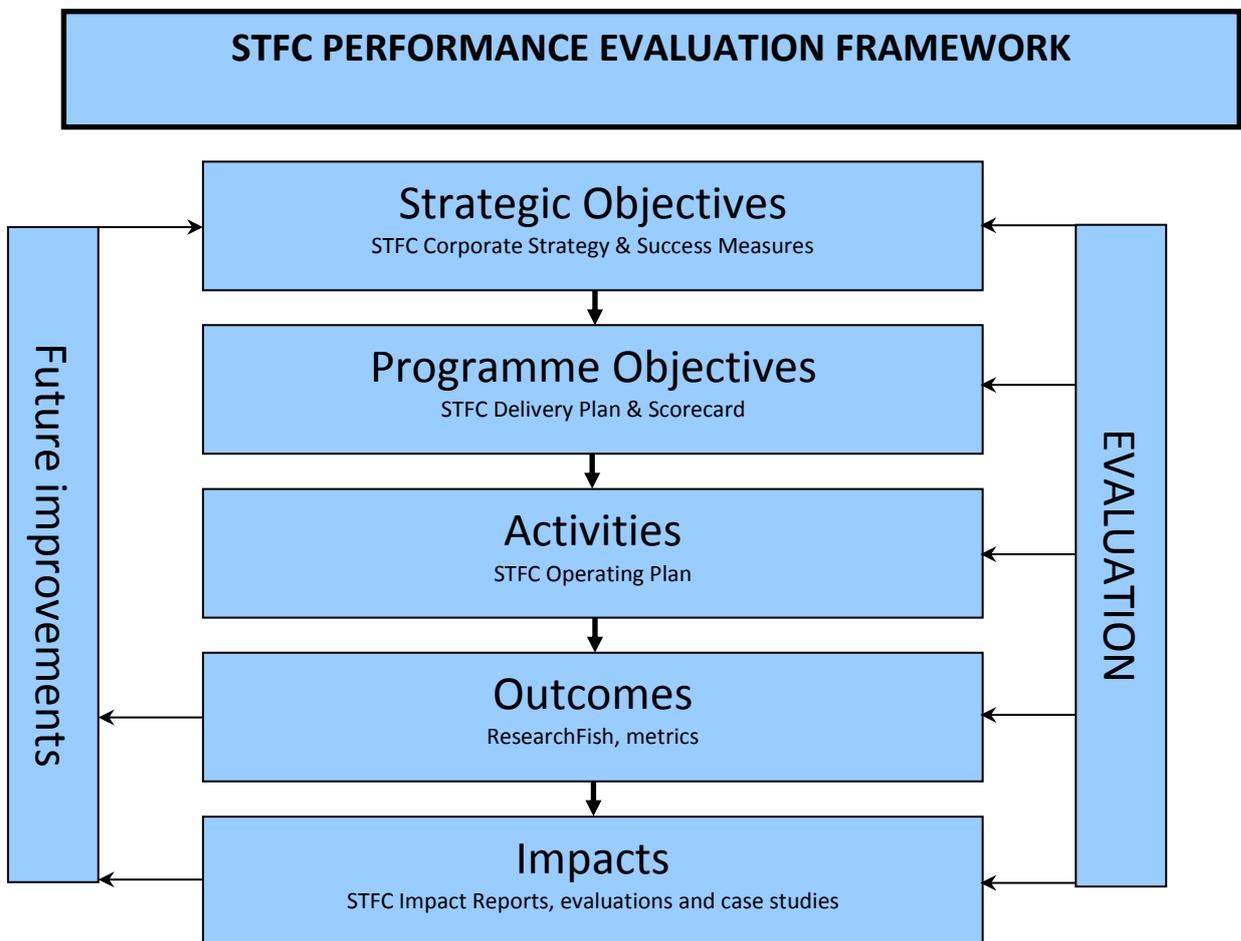


Figure 3 - STFC Performance Evaluation Framework

Details of these evaluations are –

1. **Strategic Objectives: set at a corporate level** – Monitored through the measures of success from the corporate strategy.
2. **Programme Objectives: linked to strategic objectives, for operational and funding programmes** – STFC’s delivery plan and scorecard actions.
3. **Activities: the actions used to achieve the programme objectives** – STFC’s operating plan actions.
4. **Outcomes: immediate outputs and effects, expected during the operation of the project.** These are currently captured by STFC’s ResearchFish system which measures outcomes from our university programmes and captured in a series of metrics and measures from our other programme areas.
5. **Impacts: outputs and effects that are likely to be achieved at the end of a project, and/or sometime after the project ends.** Impacts are reported annually in STFC’s Impact Report, impact case studies and other impact studies.

We discuss STFC’s ResearchFish outputs and other methodological developments in section 5, Evaluation of STFC’s impact.

## 4. Impact

STFC creates impact for the UK through delivery of research, innovation and skills. We use the Treasury Green Book definition of impact –

*“An action or activity has an economic impact when it affects the welfare of consumers, the profits of firms and/or the revenue of government. Economic impacts range from those that are readily quantifiable, in terms of greater wealth, cheaper prices and more revenue, to those less easily quantifiable, such as effects on the environment, public health and quality of life”<sup>iii</sup>.*

### 4.1 Outcomes and impacts

It is important to understand the difference between outcomes and impacts. Outcomes are relatively easy to measure and relate directly to the outputs of particular programmes as indicated above. Impact occurs over the longer term and can be the ultimate application of research or technology. Impact evaluation is about tracking outputs and demonstrating outcomes over a long timescale, sometimes decades after the initial research has taken place. Increasingly, STFC is taking steps to encourage researchers to think more deeply about the potential impacts of their work to create a culture in which impacts are realised at the earliest opportunity.

Although outcomes by themselves do not necessarily demonstrate impact, they are extremely valuable as proxy indicators of impact, or the potential for future impact. Trends in these short-term metrics are monitored by STFC on an annual basis through various data collection mechanisms, and are reported in the annual Impact Report and through other avenues. Some examples of the types of metrics against which STFC collects data include publications, patent applications, numbers of spinouts and facility usage statistics. Through a combination of metrics, case studies and impact studies, we demonstrate the value of our research, innovation and skills, and show trends in how we are increasing our impact for the benefit of the UK economy and society.

The diagram at Figure 4 shows a map of inputs, outputs and resulting impacts from STFC’s research, innovation and skills. It also indicates the relevant delivery vehicles and associated beneficiaries :

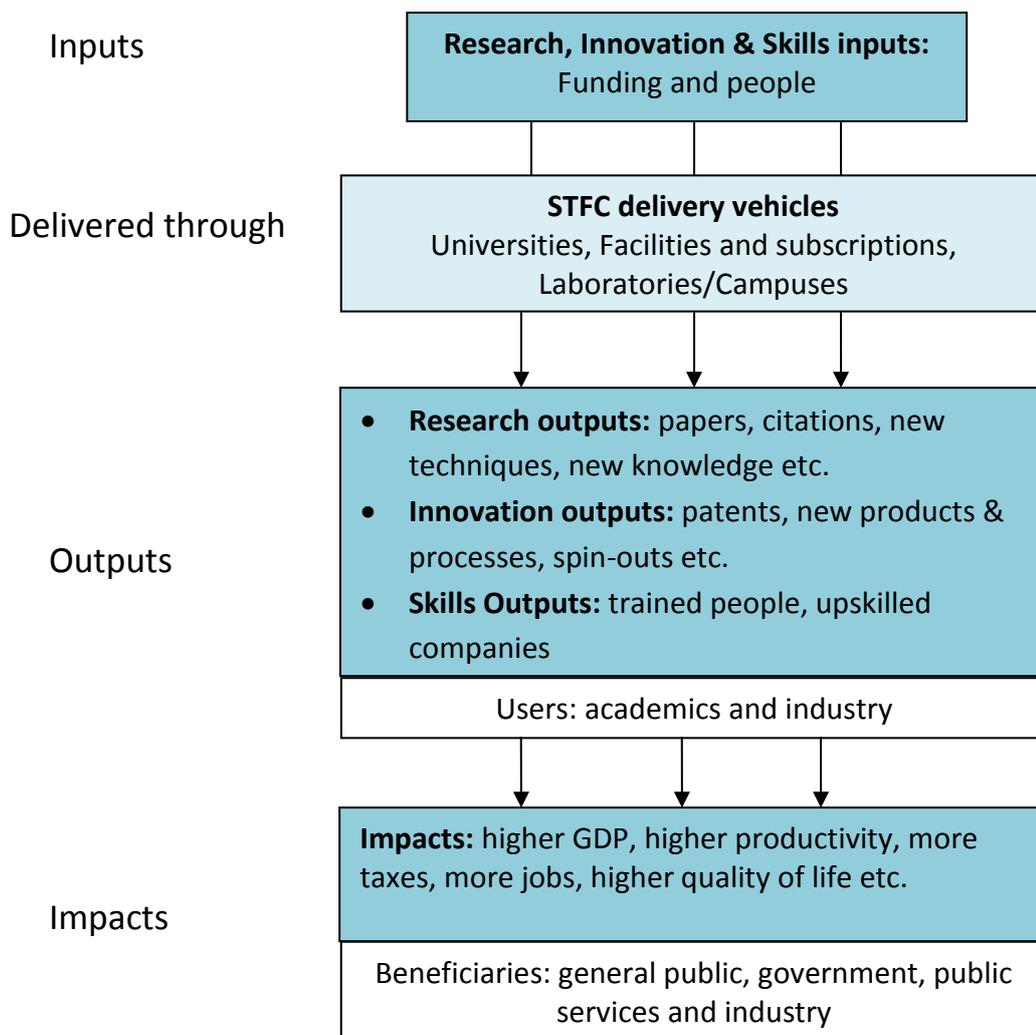


Figure 4 - STFC's impact map

## 4.2 Delivery timescales

As mentioned above, the timescales over which impact occurs can vary. Hence, the outputs and impacts of STFC's programme can occur over different timescales and at different levels:

- **Direct/predicted** – these are the known and predicted outputs of our research, innovation and skills programmes. These are likely to be publications, new technology or skilled people. Such outcomes are predictable, relatively easy to quantify and are short to medium term in nature.
- **Indirect/unpredicted** – this can be defined as the unpredictable outcomes or impacts from a research, innovation or skills programme. These occur when original research or technology is exploited through commercialisation, is used in a novel manner or is applied outwith the original research area. For a skills programme it can be the impact of an STFC trained person to a particular industry or public engagement programme. These impacts normally occur in the medium term.
- **Global** – this is the diffuse, international impact that arises from a small number of research programmes. This kind of impact happens over the long term and normally involves many stakeholders and countries in the development of the research. This kind of impact can be serendipitous and generally has an effect on people's daily lives. These are ground breaking discoveries that happen rarely and can take sometimes up to 50 -100 years to create impact. Examples include the development and impact of lasers, superconductivity and the World Wide Web.

## 5. Evaluation of STFC's Impact

STFC delivers impact in our strategic goals of research, innovation and skills, through each of our delivery vehicles and on differing timescales and levels.

### 5.1 Impact Framework

The development of the STFC's corporate strategy has enabled us to form an impact framework within which we can articulate and describe the impact of our work in a logical and consistent manner.

Using our strategic themes of world class research, innovation and skills, and applying the differing timescales and levels over which our impact occurs, we have developed an impact framework which outlines our impact in each of our delivery vehicles. The following framework maps out this relationship and gives examples where available for each area.

	Laboratories & Campuses	Facilities & subscriptions	Universities
<b>Research Impacts</b>			
<b>Direct:</b> Improved knowledge and improved technologies	New info on nuclear fission reactions	New info on electrical failures in aircraft	New info on formation of the early universe
<b>Indirect:</b> Applied technology/techniques	SORS applied to drug characterisation	HIV characterisation	Astronomy CCDs applied to industry
<b>Global:</b> Ground breaking discovery	Superconductivity research enabled high-field magnets for applications such as MRI	Protein crystallography from SRS	World Wide Web
<b>Innovation Impacts</b>			
<b>Direct:</b> Procurement activities, license or commercial revenue	License for DL POLY molecular simulation software	Oxford Instruments contracts from ISIS and ILL	Grid PP contract with Viglen UK for data processing cluster
<b>Indirect:</b> Techniques/ technology applied to industrial or other problems	Cryo ribbons developed at ATC, transferred into industry	E2V & SRS collaboration	Blackford Analysis spin-out from Edinburgh University
<b>Global:</b> Research/ technology applied to a big problem	STFC's space weather research – worldwide climate change impact	Detectors for cancer treatment from CERN	
<b>Skills Impacts</b>			
<b>Direct:</b> Contribution of students, uplift in salaries & taxation	KE between ISIS & Schlumberger	Upskilling of STFC facility users	~ £1bn tax uplift from PhDs and trained graduates
<b>Indirect:</b> Industry and societal leaders	Vector Fields modelling software spin-out		Professor Brian Cox impact on PUS
<b>Global:</b> Nobel prize winner, someone who transforms society		Sir John Walker for chemistry on SRS	Sir Tim Berner's Lee – world wide web Peter Higgs - existence of the Higgs boson

Figure 5 – STFC's impact evaluation framework

The framework also outlines the varied ways in which STFC can create impact and suggests that there are several options for the impact assessment of our programmes. For example, this could be on a project level, across a strategic theme or a delivery vehicle. The gaps in the framework represent areas in our impact framework where we have gaps in knowledge.

## 5.2 Impact evaluation programme

A proportionate approach is used in evaluating our programmes. More resources are committed to evaluation where the programme represents a significant investment, is complex or large scale. The purpose of the evaluation is to assess the overall impact of a programme in order to generate lessons that are transferable to other projects. STFC prioritises evaluations for major programmes and continues to identify and address gaps in evaluations. We work to ensure that evaluations are designed early on in the development of new programmes and are undertaken when appropriate.

To take this forward, STFC's Impact Evaluation Team manages an impact evaluation programme, incorporating the principles of the evaluation strategy. The programme outlines specific activities to be reviewed with associated timescales. Where appropriate these reviews contain short term metrics that show year on year progress and a series of impact studies to demonstrate value over the medium to long term. The impact evaluation team coordinates impact evaluation activities across the whole of STFC's programmes and works closely with specialist staff from across our programmes.

Our evaluation programme includes [impact studies](#)<sup>iv</sup>, [case studies](#), our annual [Impact Report](#) for BIS, [bibliometric assessments](#), [ResearchFish](#) and the development of shorter term metrics.

### Contact us

The Impact Evaluation Team  
Science and Technology Facilities Council  
Polaris House, North Star Avenue, Swindon SN2 1SZ  
T: +44 (0)1793 442000 F: +44 (0)1792 442002  
E: [impact@stfc.ac.uk](mailto:impact@stfc.ac.uk)  
[www.stfc.ac.uk](http://www.stfc.ac.uk)

---

<sup>i</sup> “Evaluation Strategy: The role of evaluation in evidence based decision making”, BIS, 2010

<sup>ii</sup> “The Green Book: Appraisal and Evaluation in Central Government”, HM Treasury, 2006

<sup>iii</sup> As set out in HM Treasury, .The Green book: Appraisal and Evaluation in Central Government,2003,  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220541/green\\_book\\_complete.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf)