



Department  
for Environment  
Food & Rural Affairs

# Resources and Waste Strategy

## Evaluation Plan

August 2020



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## Contents

Acknowledgements.....	3
1 Introduction.....	7
1.1 Purpose and structure of the plan.....	7
1.2 Timing.....	9
1.3 Evaluation principles.....	9
1.4 Evaluation within a framework of complexity.....	13
1.5 Theory-based approach.....	14
1.6 The place for Post-Implementation Review.....	15
1.7 Limitations, risks and constraints.....	16
2 Monitoring.....	19
2.1 The role of monitoring.....	19
2.2 Indicators and targets to be monitored.....	19
2.3 Reporting.....	21
3 Evaluation of the work to tackle waste crime and poor performance.....	23
3.1 Background.....	23
3.2 Scope.....	23
3.3 Developing a theory of change.....	24
3.4 Evaluation questions.....	26
3.5 Evaluation design.....	27
3.6 Stakeholders.....	30
3.7 Limitations, risks and constraints.....	31
3.8 Proposed stages of Evaluation.....	32
4 Evaluation of the Implementation of Consistent Recycling Collections.....	34
4.1 Background.....	34
4.2 Scope.....	34

4.3	Initial theory of change.....	35
4.4	Evaluation questions.....	36
4.5	Evaluation design .....	37
4.6	Stakeholders.....	41
4.7	Limitations, risks and constraints .....	42
4.8	Proposed Stages of Evaluation .....	42
5	Evaluation of Extended Producer Responsibility for Packaging .....	44
5.1	Scope.....	44
5.2	Background.....	44
5.3	Initial theory of change.....	45
5.4	Evaluation questions.....	46
5.5	Evaluation design.....	47
5.6	Stakeholders.....	49
5.7	Limitations, risks and constraints .....	53
5.8	Proposed Stages of evaluation .....	54
6	Evaluation of the Deposit Return Scheme for England.....	55
6.1	Background.....	55
6.2	Theory of change .....	55
6.3	Evaluation questions.....	56
6.4	Evaluation design.....	57
6.5	Stakeholders.....	60
6.6	Limitations, risks and constraints .....	62
6.7	Proposed stages of evaluation.....	63
7	Evaluation of the effectiveness of Government policies in reducing the damage caused by plastics to the natural environment.....	64
7.1	Background.....	64

7.2	Evaluation scope and systems mapping .....	65
7.3	Evaluation questions .....	65
7.4	Evaluation design.....	67
7.5	Stakeholders .....	68
7.6	Limitations, risks and constraints .....	68
7.7	Timing of the Evaluation .....	69
8	Evaluating the impact of the strategy.....	70
8.1	Background.....	70
8.2	Theory of change .....	70
8.3	Evaluation questions .....	71
8.4	Evaluation design.....	71
8.5	Evidence collection .....	72
8.6	Stakeholders .....	73
8.7	Quality assurance .....	73
8.8	Limitations, risks and constraints .....	74
8.9	Proposed stages of evaluation.....	74

# 1 Introduction

Following on from the publication of the Resource and Waste Strategy (RWS), the *'Evaluation Plan'* has been released alongside *'Monitoring Progress'*. The *Evaluation Plan* establishes how policies implemented under the RWS will be evaluated to provide a full picture of impact. Evaluation builds on the data generated during monitoring, but goes further, by more comprehensively assessing policies against several dimensions in addition to intended outcomes. These dimensions include the costs and benefits of the policies, whether other consequences arose and the effectiveness of implementation. *Monitoring Progress* begins the process of tracking the indicator framework outlined in the strategy which will enable us to monitor whether our interventions are working to guide policy-making.

In December 2018, the government published *Our Waste, Our Resources: A Strategy for England* ('the Strategy' 'the Resources and Waste Strategy').<sup>1</sup> In that document the government committed to publish a Monitoring and Evaluation Plan ('the Plan'; 'the Evaluation Plan') once consultation on some of the key measures contained within the Strategy was complete. This Plan together with *'Monitoring Progress'* meets that commitment.

The evaluations described in the plan will either be carried out by government and its agencies or contracted out to external organisations.

## 1.1 Purpose and structure of the plan

The purpose of the Plan is to clearly and transparently set out the provisions for evaluating the impact of the policies described in the Resources and Waste Strategy. It explains how we will monitor and report the progress of the Strategy in achieving change through identifying to what extent policy initiatives are working and how much of the observed impacts are due to the strategy, rather than external factors.

This evaluation plan is structured as follows. Firstly we set out high level principles and approaches which we will adhere to in conducting evaluations across the Strategy. Secondly, we set out a framework of key performance indicators. Thirdly, building on this, we include our plans for five initial evaluation projects. These were selected on the basis that (i) the Strategy contains close to 100 commitments and we cannot evaluate all of them in detail, (ii) these are priority initiatives where work has commenced and changes will be

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<sup>1</sup> HM Government (2018) [Our Waste, Our Resources: A Strategy for England](#)

implemented in the short to medium term (iii) the policies are sufficiently well developed that we can start to explore how we might evaluate them.

These evaluation projects are:

- Reform of the UK's **producer responsibility (PR) scheme for packaging**<sup>2</sup>. The intention of this policy is to ensure that those who place packaging on the market take full financial responsibility for its proper disposal and to incentivise greater recyclability.
- The introduction in England of a **Deposit Return Scheme (DRS) for drinks containers**. The purpose of this policy is to reduce littering of drinks containers and to incentivise recycling. It would place a deposit on eligible drinks containers which can be reclaimed when the container is returned for recycling.
- The implementation of **consistency in recycling collections**, which will require a consistent set of materials to be collected from households and businesses throughout England. The purpose is to make it easier for people and businesses to recycle, thereby increasing the quantity and quality of recycling.
- Measures to tackle **waste crime and poor performance**<sup>3</sup> within the waste sector. Waste crime is a priority area for Defra as it removes resources from legitimate waste processes, thereby reducing resource efficiency and potentially undermining other measures within the Strategy.
- As assessment of **the impact of actions on the use and waste of plastics**. This will primarily consider commitments within the Resources and Waste Strategy, expanding to encompass areas where there is clear overlap with other interventions across Government.

In addition to this, The Evaluation Plan includes one further evaluation project which we consider to be important in understanding the wider impact of the Resources and Waste Strategy as a whole. The project will enable us to answer questions about **what difference resources and waste policy has made** over and above what would have happened anyway. This more technical project will feed into future economic impact assessments, and will answer evaluation questions around contribution, attribution, causality and additionality of the policy.

We expect to evaluate other commitments within the Strategy in time. But they are not developed enough yet to be able to provide a well-informed insight into what an evaluation

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<sup>2</sup> We have consulted on EPR here: <https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/>

<sup>3</sup>Poor performance is defined in the Resources and Waste Strategy as careless or thoughtless practice by the waste sector. While it isn't intentionally breaking the law, people and the environment are put at risk by the failure to comply with rules for transporting, storing or disposing of waste.



should look like. 1.2 describes how this Plan will be updated to incorporate new evaluation projects and other developments pertinent to the evaluation of the Resources and Waste Strategy.

## 1.2 Timing

The Evaluation Plan is a living document. We plan to take an adaptive and agile approach so this Plan will evolve and develop over time. Nonetheless, by publishing this Plan now we are making a firm commitment to undertake evaluations and what the shape of those evaluations will look like. We will publish updates to the Evaluation Plan to coincide with planned revisions of the Resources and Waste Strategy. We may publish additional updates to the Evaluation Plan as policies are developed and priorities shift, new methodologies to capture data are developed and we gain a better understanding as we gather evaluation evidence. During the scoping for each evaluation project we set out the timeframe for change that is expected. For example, is it anticipated that the policies will lead to improvements in months, years or decades? This will ensure that data collection and analyses are done at the appropriate time, and to place some boundaries on the timescale during which we should conclude the extent to which our policies have been successful.

## 1.3 Evaluation principles

This evaluation plan draws on the Magenta Book<sup>4</sup> on government evaluation, the Green Book<sup>5</sup> on the economic principles that must be applied in policy appraisal, and the Aqua Book<sup>6</sup> guidance on producing quality analysis for government. Using this guidance, we are following a number of principles for our monitoring evaluation approach to ensure it is:

- high quality, rigorous and robust (1.3.1)
- independent of influence (1.3.2)
- inclusive of stakeholders, not only as participants in the delivery phase but also in the development of the scoping and design phases (1.3.3)
- transparent and open to scrutiny (1.3.4)
- proportionate, both in terms of time and money (1.3.5)
- flexible and appropriate for complex situations (1.3.6)
- inclusive of an economic evaluation, if appropriate (1.3.7)

We explain how we will apply each of these principles below.

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<sup>4</sup> <https://www.gov.uk/government/publications/the-magenta-book> (The Magenta Book was updated in March 2020 and we will act on any revisions to the guidance that impact on our Evaluation Plan).

<sup>5</sup> <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

<sup>6</sup> <https://www.gov.uk/government/publications/the-aqua-book-guidance-on-producing-quality-analysis-for-government>

### 1.3.1 Quality, rigour and robustness

We place great importance on evaluation being high quality. The design must be well thought through and capable of answering the questions. The methods must be rigorous and set out transparently, and the conclusions must be robust and defensible. Quality assurance will take different forms at different stages of a project, and will differ according to the particular requirements of the project. Table 1 sets out some of the approaches that we will adopt.

**Table 1: Approaches to meeting quality assurance requirements**

Stage	Quality requirement	Possible approaches	Outputs
Scoping (pre-procurement)	Clarity about the evaluation questions and what we need to report against – who wants to know what, when, for what purpose, and what level of certainty is required.	Appointment of a Senior Responsible Officer with methodological accountability Steering group Workshop with policy and analyst colleagues Engage stakeholders from the outset Rapid review of evidence from similar evaluations to learn from past designs	Project scoping document considering what, why and for whom Engagement plan Rapid Evidence Review report
Design (pre-procurement)	Assurance that one or more designs are available, they are affordable and are capable of answering the questions with the required level of certainty	Workshop with evaluation specialists Call for expressions of interest Internal review and consultation with policy advisors, economists, social researchers and evaluators	Research and analysis plan considering options for ‘how’ without being too prescriptive Technical specification for the invitation to tender
Procurement	Assurance that the project is designed well, feasible, affordable and that there is capacity with a suitable level of expertise to carry it out and within the required timescales	The procurement process (provided that there is a well thought-through specification, a realistic budget and reasonable timescale) Tender assessors who have research and evaluation experience	Contract, incorporating any requirements in terms of approach and quality assurance Provider’s quality assurance policy and plan
Project delivery – research and analysis	Assurance that the evaluators are complying with the agreed programme of works (adjusted as necessary in response to changing circumstances), using appropriately qualified and experienced individuals and applying best practice	Steering group, incorporating methodological expertise as well as subject expertise Project management processes External peer reviewer	Notes of meetings with agreed remedial actions Peer reviewer’s reports

Stage	Quality requirement	Possible approaches	Outputs
		Provider's quality assurance policies and practices	Statements of compliance with QA requirements
Project delivery – reporting	Assurance that conclusions drawn are robust and defensible	<p>Checking that outputs meet required standards e.g. spreadsheets are designed with AQUA Book in mind; metadata files are provided</p> <p>Internal review, sense checking of data and replication of results, if appropriate</p> <p>External peer review</p> <p>Place the findings in the context of other, similar evaluations to allow the findings of this study to be compared, contrasted and, if appropriate, combined with those from other similar studies.</p>	<p>QA statement</p> <p>Formal sign-off process</p> <p>Peer review report, appended to main report where appropriate</p> <p>Updated Rapid Evidence Review</p>

### 1.3.2 Independence

While evaluation leads will work closely with policy colleagues and stakeholders, evaluator objectivity is essential for any evaluation. With this in mind, we plan to externally contract the individual evaluation projects, while retaining oversight of the monitoring and evaluation programme as a whole and the individual projects.

For significant projects, including the six set out here, we will separately commission external peer reviewers to work alongside the evaluation team, assuring independence and objectivity as well as rigour.

We also intend to involve subject and method specialists to help us scope and design the project before preparing the formal tender specification.

We will establish an evaluation programme board, which will include representatives from other government departments and academia. To ensure independence, the programme board will be consulted on decisions to publish the findings and the timeliness and content of any such publications.

### 1.3.3 Stakeholder involvement

There are many groups with an interest in, or affected by, the commitments in the Strategy. We will involve those stakeholder groups in the evaluation process, not just as

subjects of research but also in the co-development of the scope and approach. They have a more detailed and nuanced understanding of their respective sectors, and their perspectives and expertise will be crucial in, for example, co-creating systems maps and theories of change, identifying data sources and issues with data quality, alerting to us changes in context, and challenging our thinking and assumptions.

### **1.3.4 Transparency**

We are committed to evaluating the Strategy transparently as well as robustly. This means we will ensure that evaluation reports contain sufficient detail for others to judge for themselves the robustness of the findings. We will highlight any issues with data quality and/or uncertainty in the findings, applying the principles and good practice set out in Government guidance (e.g. the Aqua Book). We will learn as we go; where we notice data gaps or issues with data quality we'll identify how we could better collect this data. Where practical we will publish monitoring and evaluation datasets.

### **1.3.5 Proportionality**

We will reflect on what evidence we need to answer our evaluation questions and evaluate accordingly. However, the plans set out in this document, and any further developments to these, are budget and resource dependent. Notwithstanding any external contractor costs, any evaluation will require significant input from analytical and policy professionals within Government to ensure it is designed and carried out successfully. We will endeavour in all cases to take a proportionate approach to each evaluation, assessing how we can design a sufficiently robust evaluation that meets our evidence needs using the available resources. If the evaluation is constrained by lack of resources to the extent that results would no longer be reliable, we will not be able to proceed.

### **1.3.6 Heterogeneity of approaches**

We will remain flexible in our approach and use the methods best suited to answer our questions, which are likely to vary from project to project. These may include approaches designed for complex situations such as process tracing or contribution analysis (see section 1.4) as well as more traditional types of evaluation, such as cost-benefit analysis and experimental designs.

### **1.3.7 Economic evaluation**

An economic evaluation aims to identify the costs and benefits of having introduced a specific policy, and whether or not the benefits outweigh the costs. Given the resource requirements to conduct such an evaluation, we will apply the principle of proportionality outlined in 1.3.5 to determine whether an economic evaluation is necessary. As part of the Post Implementation Reviews (see section 1.6) we will review whether the cost and benefit analysis conducted in the relevant Impact Assessment was accurate by comparing its assumptions to the outcomes driven by the relevant policy. This will help inform

whether an economic evaluation is needed to determine if the policy is still fit for purpose and having the intended effects.

## 1.4 Evaluation within a framework of complexity

Rapid change in the resources and waste policy environment, a wide network of stakeholders, and diversity of views about 'what works', all contribute to uncertainty about how and where policy impacts will be felt. In order to learn, genuinely and openly, about the effects we have had, the evaluation must function within this complex environment.

Complexity scientists refer to 'complex adaptive systems' and it is within these types of system that the Resources and Waste Strategy interventions are operating. These systems are **open**; they are affected by things happening in other systems. They consist of **multiple relationships, levers and hubs** with some components having more influence than others due to high connectivity or power within the system. They display **self-organising** properties where outcomes **emerge** from the coming together of actors and interventions within specific contexts. Importantly, the system is made up of human actors who **learn and adapt**. Chains of events are long and convoluted and interventions are never completely 'done'; the measures within the Strategy are building on existing policies and interventions.

All of this makes outcomes highly **unpredictable** and evaluation **challenging**: the relationship between inputs and outputs is not linear, uncertainty about feedback loops and the ways in which interactions work, along with the fact that outcomes are different depending on who is affected and the context in which the intervention occurs.

Complexity is different from complicated, on the one hand, and chaotic, on the other. Machines are complicated but are knowable and predictable. By contrast, in **chaotic** contexts events occur in non-linear ways (i.e. an outcome cannot easily be attributed to causes). In reality there are simple hidden rules playing out that have resulted in the outcome; an example would be an earthquake or weather event.

Concepts of **complexity** are more applicable to social, economic and natural *systems*. Complex systems have numerous interacting parts which operate in non-linear<sup>7</sup> ways. Policy interventions have to operate in complex systems with the result that the consequence of the intervention may be disproportionate to the effort or resources put in; the benefits may grow exponentially but can reverse direction midway through an

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<sup>7</sup> Defined in the 'Complexity Evaluation Framework' developed by CECAN as: "When the effect of inputs on outputs are not proportional. Outputs may change exponentially, or even change direction (e.g. after increasing for some time, they may begin decreasing), despite small or consistent changes in inputs".  
<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=220&ProjectID=20401>

intervention, despite there being virtually no change to the intervention itself. Moreover, the consequences of a policy intervention are often 'emergent' (i.e. they occur in unpredictable ways as parts of the system interact as the intervention progresses) and context is always key to understanding what is happening.

The existence of complexity poses challenges to traditional evaluation approaches such as randomised trials and quasi-experimental methods. This is because social systems are changing quickly, counterfactuals and control groups can be difficult to find or define, and the effect of a policy is different in different contexts for different people. However, evaluations are still needed if we are to gather information on the impact of policy that might help predict its ongoing or future impact, and where there is sufficient similarity for answers from different contexts and different people in the past to be likely to apply to the future. We will therefore design bespoke evaluations for each priority area, weighing up the merits of each approach accordingly, only using experimental approaches where we are confident we can work with these challenges and ensuring that observational approaches are robust enough to provide reliable evidence for the future.

Hybrid and novel approaches are increasingly thought to be most useful in these contexts. To help develop and test new approaches in the food, energy and environmental policy fields, CECAN<sup>8</sup> recommends techniques such as process tracing, qualitative comparative analysis (QCA), agent-based modelling, realist evaluation and contribution analysis to assess their potential role in understanding the impact of policy interventions. Defra has recently published the Complexity Evaluation Framework<sup>9</sup>, developed by CECAN, which we have drawn on in particular for chapter 7.

## 1.5 Theory-based approach

We will take a theory-based approach to evaluating the impact of resources and waste policy, looking at what works for whom, in what ways and in what context. The mapping of the theory may look slightly different depending on the methodology selected for the evaluation, but in essence involves describing the anticipated chains of cause and effect (outputs, outcomes and impacts). The extent to which the theory holds when examined in a real-world context is then at the heart of the evaluation process. It is particularly relevant given the complexity of the context we are operating within, as it enables a robust approach to be taken even in the absence of counterfactual and control groups, a better understanding of the role played by context in the success of the intervention, and a focus on the interactions between different parts of the system. Where available, evidence will

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<sup>8</sup> CECAN (the Centre for Evaluating Complexity Across the Nexus) is funded and supported by the ESRC, NERC, Defra, BEIS, the Food Standards Agency and the Environment Agency.

<sup>9</sup>

<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=220&ProjectID=20401>

inform the theories of change; we will not rely purely on abstract theory. For each of the evaluation projects in the Plan, we have set out a very high level initial conception of how we expect the measures to work. At the outset of each of the evaluation projects, these will be further developed and preceded by systems mapping where appropriate.

## 1.6 The place for Post-Implementation Review

Ministers have a duty to include a statutory review provision in new secondary legislation that has a regulatory effect on business, unless it is not appropriate to do so. This means that a good deal of the policy commitments in the Strategy will be subject to Post Implementation Review (PIR)<sup>10</sup>. PIRs are a form of evaluation which seeks to establish whether:

- a measure has achieved its original objectives
- those objectives remain appropriate
- the measure is still required
- it remains the best option for achieving those objectives
- objectives could be achieved in another way which involves less onerous regulatory provision in order to reduce the burden on business and/or increase overall societal welfare

The first PIR must be completed within five years of the regulatory measure coming into force and then on a five-year cycle, or in accordance with statutory deadlines.

This evaluation plan has been developed in line with official guidance<sup>11</sup> which states that, “monitoring and evaluation plans should be built in at the start of the policy process to monitor specific elements of the policy to help Departments manage their resources to produce higher quality PIRs, by ensuring they can collect the data they require for the evaluation throughout the life of the policy and enable the measuring of the success of the policy when a PIR is written.”

Guidance suggests that evaluation for a PIR should focus on assessing the extent to which the goals set out in the Regulatory Impact Assessment (RIA) have been achieved in actuality and whether any unintended consequences have occurred. This is a crucial element of the evaluation approach set out in this plan.

The proposed timelines for the evaluation work set out in this plan have been influenced by the timing (and expected timing where secondary legislation is expected to be made) of PIRs.

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<sup>10</sup> <https://www.gov.uk/government/publications/small-business-enterprise-and-employment-act-statutory-review-requirements>

<sup>11</sup> BEIS (2018) [Producing Post-Implementation Reviews: Principles of Best Practice](#)

Establishing a quantitative counterfactual is difficult but is a necessary input into the economic evaluation which is required for the PIR. There may not be opportunities for trial-based approaches since legislation will come into force across England at the same time. However, we will look to utilise natural experiments should these occur. For instance, in the case of consistent collections for households it is likely that contractual circumstances and other factors will lead to some phasing of implementation which would allow us to measure the difference before and after for the local authorities that have implemented the changes and compare this to the difference before and after for those who have not. There may be early adopters of the core materials in advance of the legislation being implemented that could be used as a kind of control group. However, experience has shown that geographic, socio-demographic and operational differences can prevent the creation of adequately matched comparison groups in these types of quasi-experimental designs in waste and recycling contexts.

An alternative would be a scenario-based modelled counterfactual based on available evidence gathered via the evaluation projects, and this is what will be used if no trial-based or natural experiment-based data can be obtained. If this is necessary, the same type of modelling should be used to predict what should happen when the policy is implemented, to test whether the answer from that model is close to what actually happens. If it is, that would be reassuring. If it isn't, this would raise questions about whether the model for the counterfactual is a good prediction of what would have happened in a control group.

It has been agreed that New Burdens resulting from the Resources & Waste strategy policies may be subject to post implementation scrutiny, in line with the New Burdens Doctrine<sup>12</sup>.

## 1.7 Limitations, risks and constraints

### 1.7.1 Appropriate methods

All evaluation methods carry intrinsic risks of failing to produce the necessary insight. The most important things for this project will be to ensure the method is appropriate to a) the research question, b) the way the policies are implemented and c) the available data.

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<sup>12</sup> Further guidance and a framework outlining the remit of the scrutiny can be found in the New Burdens doctrine published online:  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/5960/1926282.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/5960/1926282.pdf))<sup>12</sup>



## **1.7.2 Data availability and quality**

The success of the evaluation projects is reliant on reliable input data. For some projects we will be able to access operational and monitoring data, for others we will need to collect primary data as part of the evaluation. We may be reliant on the co-operation of others so data collection may not be directly within our control. In a minority of cases, a methodology is yet to be developed for how data can reliably be collected and analysed. Data may be subject to fraud, bias or error, and robust measures will need to be in place to prevent this. We are not expecting to have perfect data; there will be some compromises but we will be transparent in our reporting about any limitations.

## **1.7.3 Costs / budget availability**

As mentioned in 1.3.5 above, the evaluation of the Resources and Waste Strategy will be conditional on having adequate resource to ensure it is designed and carried out successfully. As well as staff time, budgets will need to be sufficient to pay for external contractors to conduct the evaluations, and the component elements within the evaluations, including waste compositional analyses, social research and peer reviews.

## **1.7.4 Respondent burden and lack of participation**

An important element of most of the evaluation projects will be surveys or qualitative interviews to gain the perspectives of stakeholders. These may be constrained by other research being carried out by the Department if the burden on respondents is thought to be too great. Responses will not be mandated and so there is also a risk of low response rates and/or a non-representative sample. We will combine research where we can, across the Resources and Waste evaluation projects and across the wider Department where the same population is being targeted. We will work with industry bodies to promote the value of participating in the research.

## **1.7.5 Stakeholder engagement**

There is a risk that stakeholders will have insufficient time to input effectively. Their perspectives will be crucial in developing the systems maps and theories of change, in reviewing them at the relevant stages, and in helping us to develop appropriate methodologies for the sectors in which they operate. We will encourage evaluators to utilise existing opportunities where they can, for instance stakeholder forum meetings, to engage with stakeholders in a manner that minimises the burden placed on them.

## **1.7.6 The impact of EU exit**

Delivery of the Strategy comes alongside the UK's exit from the European Union. A key challenge will be to differentiate the impacts of the Strategy from those that transpire from EU Exit. It is essential that the evaluation adequately address this. Our systems maps and theories of change will be reviewed regularly and updated to reflect changes in the system

and how our policies interact with that system. The ex-post evaluation project described in section 1.1 above, examining the contribution, attribution, causality and additionality of the Strategy, will take account of EU Exit and other external factors to assess in what ways, and to what extent, the Strategy contributed to the observed outcomes.

## 2 Monitoring

### 2.1 The role of monitoring

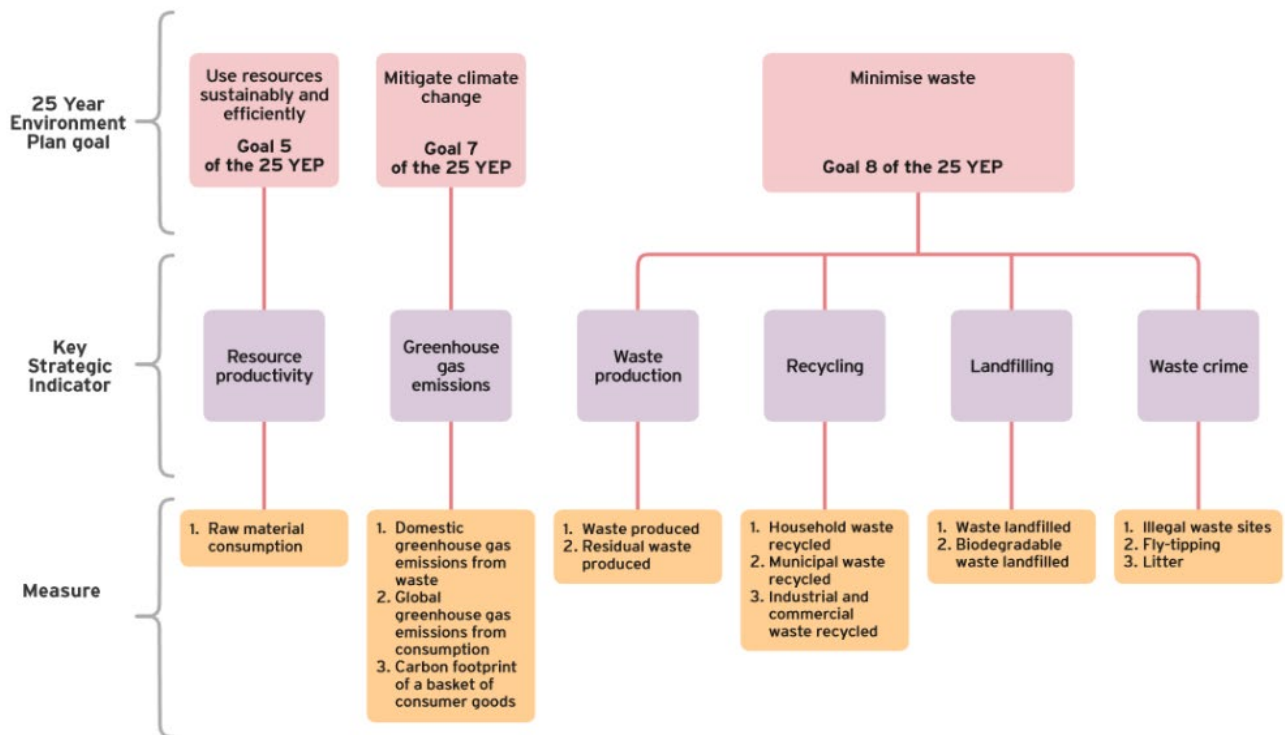
In this context, monitoring refers to the regular collection of quantitative data that provides an indication of progress towards achieving the Strategy's goals. Monitoring supports timely decision making, ensures accountability, and provides the building blocks for evaluation, learning and progress.

As set out in 1.1, the Strategy contains close to 100 commitments and we cannot evaluate all of them in detail. The current plan therefore sets out our commitment to evaluating a number of major policies in detail. Consequently, monitoring will play an essential role in evaluating the wider Strategy. Together with the project (chapter 8), examining what difference resources and waste policy has made over and above what would have happened anyway, monitoring against key indicators and targets will help us assess to what extent the Strategy has achieved its goals.

### 2.2 Indicators and targets to be monitored

In section 8.2 of the Resources and Waste Strategy, we outlined a suite of indicators which were developed to measure progress towards six policy priorities. These are: increasing resource productivity, reducing greenhouse gas emissions, reducing waste production, increasing recycling, reducing landfilling and eliminating waste crime. These align with three of the overarching goals of the 25 Year Environment Plan (25YEP): Goal 5. Use resources sustainably and efficiently; Goal 7. Mitigate Climate change; and Goal 8 Minimise waste. – see Figure 1.

**Figure 1. Indicator Framework for Monitoring the Resources and Waste Strategy**



Further indicators which will need to be monitored arise from the Government's strategic commitments, including those published in the 25 Year Environment Plan<sup>13</sup>, the Industrial Strategy<sup>14</sup>, the Clean Growth Strategy<sup>15</sup> and the Litter Strategy for England<sup>16</sup>. Key commitments include:

- Work towards zero food waste to landfill by 2030, while exploring policies to achieve zero biodegradable waste to landfill by the same date
- Double resource productivity<sup>17</sup> by 2050

<sup>13</sup> HM Government (2018) [A Green Future: Our 25 Plan to Improve the Environment](#)

<sup>14</sup> HM Government (2017) [Industrial Strategy: Building a Britain Fit for the Future](#)

<sup>15</sup> HM Government (2017) [The Clean Growth Strategy: Leading the Way to a Low Carbon Future](#)

<sup>16</sup> HM Government (2017) [Litter Strategy for England](#)

<sup>17</sup> A measure of the value obtained from resources. Typically measured as value added per tonne of resources used. At a national level, measured by GDP or GVA/Raw Material Consumption (RMC). RMC

- Zero avoidable<sup>18</sup> plastic waste over the lifetime of the 25 Year Environment Plan
- Zero avoidable waste by 2050
- Work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025

In addition to the above, we are fully committed to meeting the UN Sustainable Development Goal 12.3 target, which seeks to halve global food waste at consumer and retail levels by 2030.

Also, there are the recycling targets from the EU Circular Economy Package (CEP), including those listed below. As stated in the RWS, we are committed to meeting a recycling target of 65% by 2035, but we will also explore whether more stretching targets, over and above these, can be developed that will deliver the most effective approach to recycling. Should they be preferable, we will present proposals to the UK Parliament following the UK's departure from the EU.

- Recycle 55% of municipal waste by 2025, 60% by 2030 and 65% by 2035
- Reduce landfill to a maximum of 10% of municipal waste by 2035
- Recycle 65% of packaging waste by 2025 and 70% by 2030.

In addition to these, a ban on the landfilling of separately collected waste will also be implemented.

Where not yet completed, work is ongoing to develop the indicators outlined in the *Resources and Waste Strategy*, and to track performance against the Government's commitments and targets as listed above. A more thorough review of progress towards this aim is provided in the *Monitoring Progress* document, published alongside this evaluation plan.

## 2.3 Reporting

In recent years we have produced an annual *Digest of Waste and Resource Statistics*<sup>19</sup>, which is a collection of published data covering a range of waste and resource-related areas. In future, we will no longer produce the *Digest*.

Since the *Digest* is a collection of data from published sources, all of the content previously included in the *Digest* will continue to be publically accessible. However, we

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includes an estimate of the materials extracted within England's borders to meet final demand for goods and services in addition to the full upstream material requirements needed to produce imports.

<sup>18</sup> Waste that is technically, economically and environmentally feasible to reuse or recycle, or, where this does not apply, it is (technically, economically and environmentally) feasible to replace with alternatives that are reusable or recyclable.

<sup>19</sup> <https://www.gov.uk/government/statistics/digest-of-waste-and-resource-statistics-2018-edition>

recognise that users who are more familiar with accessing the data through the *Digest* may experience difficulty.

In each section of the most recent waste *Digest*, we provide references to the underlying data. We recommend using these references to locate the published source for each topic area.

Discontinuing the *Digest* will allow us to prioritise publishing the latest indicators for measuring performance against the Resources and Waste Strategy and 25 Year Environment Plan, in the *Monitoring Progress* document, published together with this plan.

The first edition of the *Monitoring Progress* document will focus on the indicators outlined in the section above. In summary, it is intended that this document will:

- Summarise the suite of indicators that we intend to formally track in the *Monitoring Progress* document. We refer to these as the headline indicators.
- Provide more detail on, and an easily assessable reference for, the calculation methodologies used to produce each of the headline indicators, including sources and other metadata.
- Provide a progress update for the headline indicators which are currently still under development.
- Explain how we intend the monitoring of indicators for the *Resources and Waste Strategy* and *25 Year Environment Plan* to develop into the future. This includes moving further away from solely weight-based measures to impact-based measures, such as carbon-based and natural capital focused measures, and indicators of social value.
- Present the historic trends for the indicators which have been developed, with an accompanying discussion of progress in this goal area, including with consideration to the impact of planned policies. If applicable, progress will be assessed against corresponding targets and commitments.

Long-term, we also aim to develop models to forecast the impacts of the planned policies against at least some of the headline indicators, but this may not be achievable in the first iteration of the *Monitoring Progress* document.

It is intended that updates to the *Monitoring Progress* document will be published at least annually to provide an up to date summary of recent trends. In addition to the annual updates, we intend to provide less frequent, but more comprehensive progress reviews every 3-5 years. These reviews will provide a more in depth assessment of performance towards achieving our goals.

# 3 Evaluation of the work to tackle waste crime and poor performance

## 3.1 Background

Waste crime is defined in the Resources and Waste Strategy as anything that intentionally breaks the law relating to the handling and disposal of waste. The motivators of waste crime are varied, but are often financial. Waste crime typically falls into the following categories:

- Illegal waste sites (which may operate for a short or a long period)
- Illegal burning of waste
- Fly-tipping
- Misclassification and fraud
- Serious breaches of permit conditions including the abandonment of waste
- Illegal exports of waste.
- Failure to comply with producer responsibility obligations

Poor performance is defined as careless or thoughtless practice by the waste sector. While it isn't intentionally breaking the law, people and the environment are put at risk by the failure to comply with rules for transporting, storing or disposing of waste.

Waste crime and poor performance damage the natural environment, cause harm to local people and lead to unnecessary cost for the taxpayer.

The Resources and Waste Strategy sets out how the Government will meet its aim to eliminate crime and poor performance in the waste sector by preventing it from happening in the first place, detecting it when it does occur, and deterring would-be criminals and poor performers from engaging again.

## 3.2 Scope

The scope of the evaluation is centred on the effectiveness of the policies outlined in the Resources and Waste Strategy. Many of the policies will be implemented by the Environment Agency (EA) using a variety of measures. The EA's own evaluation will focus on the effectiveness of its regulation and enforcement measures. We will work closely with the Agency to ensure our respective evaluations are aligned and complementary, agreeing a shared direction for the overall evaluation and addressing any gaps and overlaps.

The Office for Product Safety and Standards (OPSS) undertakes monitoring and enforcement on certain obligations for Defra. This covers waste electrical and electronic equipment (WEEE), End-of-life vehicles (ELV), Batteries and the Restriction of the use of

Certain Hazardous Substances in Electrical and Electronic Equipment (RoHs) regulations. The OPSS will be involved in reviews of these areas. Similarly, Defra’s resources and waste team enforces directly recycling requirements under the ELV regulations.

### 3.3 Developing a theory of change

The theory of change will be developed fully when the project starts so we can take full account of the context at the time. Table 2 sets out a very high level initial conception of how we expect the measures to work.

**Table 2: High level theory of change for reducing waste crime and poor performance**

Activity	Directed at	Expected behaviour changes	Outcome	Environmental, economic or social benefit
Reforming existing regulations relating to waste carriers, brokers, dealers and duty of care	Businesses and households	Only use properly regulated companies to deal with their waste.	Less transportation and management and description of waste being carried out by unregulated individuals and businesses.	Reduced damage to the environment Reduced amenity loss to communities caused by illegal dumping and illegal waste sites
Strengthen intelligence sharing and engagement to tackle illegal activity	EA, police, local authorities, OPSS, HMRC and the waste industry	Better intelligence sharing and engagement	Improved prevention and disruption of waste crime	Reduced costs for taxpayer of managing impact of poor performance and illegality
Reform the existing regime	Operators who illegally mis-describe waste as exempt; those applying for new permits and existing permit holders	Waste described and handled legally and by competent operators who have the right provisions in place if things go wrong	Prevention of illegal activity being hidden through waste exemptions; properly competent operators holding permits	Increased income to legitimate operators Increased tax income to the Treasury
Mandate the digital recording of waste movements	Businesses that produce or handle waste	Waste described, handled and disposed of legally	Reduction in illegal dumping, tax and regulation avoidance and fraud	Increased resource efficiency
Create a Joint Unit for Waste Crime	EA	Agencies share intelligence and respond collectively	Serious and organised waste crime is detected and disrupted more quickly	
Toughen penalties for waste criminals	Magistrates, Judicial Office,	LAs improve the quality of their cases	More crimes are successfully prosecuted and	



	Sentencing Council, LAs	<p>Sentencing Council keep Environmental Offences Definitive Guideline up-to-date</p> <p>Magistrates are effectively trained on sentencing for environmental offences</p>	<p>attract appropriate sentences.</p> <p>Deterrence effect leading to a reduction in illegal dumping, tax and regulation avoidance and fraud</p>	
Communications to increase awareness of waste regulations and publicise positive work of enforcement bodies	Businesses, households and potential and actual criminals	<p>Householders and businesses ensure their waste is only dealt with (in its broadest sense) by bona fide, properly regulated companies</p> <p>Criminals and would-be criminals deterred from offending by naming and shaming</p> <p>Operators understand what is expected of them by understanding good practice</p>	Reduction in illegal dumping, tax and regulation avoidance and fraud	
Enhanced powers and resources for the regulator to enforce the regulations on obligated producers	Producers	<p>Producers: Register as an obligated producer</p> <p>Meet all of their recycling targets including for each nation</p> <p>Submit information by the relevant deadline(s)</p> <p>Provide true and accurate information</p>	A level playing field which minimises any potential for individual stakeholders to gain unfair advantages.	<p>Increased resource efficiency</p> <p>Increased recycling</p> <p>Reduced litter</p>

		Resubmit information when requested  Pay the all required fees  Meet the requirements of any Notice served upon them.		
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### 3.4 Evaluation questions

The evaluation should answer the following questions.

#### **Outcomes: What difference (if any) did the measures make?**

- Using our theory of change as a guide, what outcomes do we see? For example:
  - Has there been the change in the detection rate of waste crime and poor performance?
  - Has there been a positive or negative change in the incidence rate of waste crime and poor performance?
  - To what extent have would-be criminals and poor performers been deterred from engaging in illegal and poor practices?
  - Has there been a change in the number of illegal sites and compliance breaches?
  - Has there been a change in the number of pollution incidents and fires?

#### **Mechanisms, contexts and attribution: Why did observed changes occur?**

- How did the measures work? What aspects were successful? For whom? Why? And in which contexts and combinations?
- Did they work as we thought they would? If not why not?
- Which measures have been less effective? Why? And in which contexts and combinations?
- What were the major factors influencing the achievement or non-achievement of the objectives?
- To what extent can we attribute the observed outcomes to the measures? What other factors might have contributed? For example, were there changes in access and availability of civic amenity sites where rubbish could be disposed of legally?

- What are the unintended consequences?

### **How were the activities delivered, and what can we learn?**

- What actions were undertaken within each of the measures to reduce waste crime and poor performance? What were these actions expected to achieve? (Answering this question will help build up the theory of change.)
- Have the measures been actioned as anticipated? To what extent does regulatory discretion affect how measures are implemented on the ground?
- What improvements could be made to the way in which measures have been actioned to maximise impact, efficiency and effectiveness?
- In what ways have the measures and how they are implemented, changed over time as new knowledge has been gained about their efficiency and effectiveness?

### **Economic efficiency: Did the benefits justify the costs?**

- What were the intended and unintended costs of the policy measures?
- What were the expected and unexpected benefits of the policy measures? This is likely to include but may not be limited to:
  - Increases to tax revenue
  - Avoided costs and harm to society and the environment
  - Increased profits in the compliant regulated waste sector
- Have the costs of the measures been outweighed by the benefits? What is the cost benefit ratio? What is the return on investment?

## **3.5 Evaluation design**

The objective is to quantify the impact and cost effectiveness of the measures-as-delivered to reduce waste crime and poor performance, and understand the reasons behind those observed impacts. The design will need to be multi-faceted including:

1. An impact evaluation, including an assessment of attribution/contribution – what happened and how effective was it?
2. A process evaluation – how and why did it happen, and what can we learn?
3. An economic evaluation – was it value for money, and how can we improve efficiency?

The results will be used by Defra policy colleagues and the EA to ensure that measures are effective, efficient and beneficial to society. This evaluation will feed into any formal Post Implementation Reviews and enable, in due course, any changes to be made to the policy measures to increase their effectiveness.

### 3.5.1 Theory

The first step will be to establish a systems map which places waste crime within the relevant wider economic, legal, environmental and judicial systems. We will develop this in collaboration with stakeholders and other government departments and agencies, building on the work already carried out by the EA.

We will then use the systems map to further develop a theory of change which will set out the expected relationships between inputs, outputs and outcomes (immediate and longer term) for each measure set in its context.

The theories of change will have two main purposes. Firstly they will be used to develop specific, measurable and relevant indicators of change. Secondly they will be used to identify the evidence required to answer the evaluation questions and where we might find that evidence, including instances where we might need to invest in new primary data collection.

### 3.5.2 Evidence collection

Evidence will fall into three categories:

1. Quantitative evidence of **outcomes**, for example the number of illegal sites detected and closed down (the impact evaluation)
2. Qualitative (and very occasionally quantitative) evidence of the **causes of the outcomes** (for whom and in what contexts), in particular the ways in which the measures played a part; for example, interviews with EA officers may reveal the importance of new detection tools in enabling them to act more swiftly before sites become established (the process evaluation)
3. Quantitative evidence of the **costs** of delivering the measures (the economic evaluation)

#### ***Impact evaluation***

The EA keeps a wide range of data about the environment, regulated activities and its own operations. This includes Category 1 and 2 incidents recorded<sup>20</sup>, new illegal waste sites identified, illegal export of unsuitable waste seized or stopped, and the amount paid in court fines for waste-related environmental offences. Once we are clear about the evidence we need to collect to answer the questions, we will review the range of available data.

A Joint Unit for Waste Crime is due to be established, which will sit within the EA with input from the National Crime Agency, HMRC, the police, Devolved Administrations and the waste industry. The Unit will gather and share information relating to waste crime and

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<sup>20</sup> Defined as environmental management incidents where the environment impact level is either major (category 1) or significant (category 2)

coordinate a multi-agency response to the most serious cases. We will ensure that as far as possible we have access to aggregated and/or anonymised data for evaluation purposes. We will also work more widely with HMRC, OPSS and the Ministry of Justice to access data relevant to our evaluation questions. Additionally, the EA is currently reviewing its data and metrics for enforcement and we will feed into this review so that our data requirements are addressed as far as possible. Using operational information of this kind reduces the burden and cost of primary data collection while ensuring the availability of baseline data. It will be important that systems are in place to check these data for potential fraud and error.

### ***Process evaluation and assessing attribution***

Primary research will be an essential component of the process evaluation. The perspectives of staff, the waste management sector, local authorities, and strategic partners such as HMRC, the police and the court system will all be important in telling the full story. They will contribute to our understanding of why any observed changes occurred, how measures were delivered and any improvements that would make them more effective or efficient. In some cases primary research may be required for quantifying outcomes if operational data is not available. Primary data may also be required to develop models for less tangible outcomes, such as the extent to which would-be criminals and poor performers have been deterred from engaging in illegal and poor practices.

It will be difficult to directly attribute changes in waste crime to the measures in the Strategy. Firstly, waste crime is primarily financially motivated so changes in economic conditions may have a significant impact on the amount of waste crime. For instance, an increase in landfill tax may prompt rogue operators to try to avoid the tax by illegally dumping, exporting or falsifying records. Similarly, shifts in the market value for recyclable materials will affect the extent to which it is economically beneficial for businesses to operate within the law. Secondly, the measures are not designed to operate in isolation so separating their effects from the effects of other initiatives and interventions, whether delivered by the EA or by another body, is challenging.

In its evaluation of the work, funded by the Landfill Communities Fund 2014-2016<sup>21</sup>, to reduce the risk from illegal waste sites, reduce the illegal export of waste and reduce the misdescription of waste, the EA used regression analysis to develop a modelled counterfactual, analysing outcome metrics, expenditure and contextual data such as waste arisings and recycle prices, to estimate the outcomes that would have been achieved without the additional funding. We will review this methodology and repeat it if it is suitable. We acknowledge the benefits of a consistent approach, while keeping an open mind about other potential methods for evidencing causality including qualitative comparative analysis (QCA), contribution analysis and process tracing.

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<sup>21</sup> Environment Agency (2017) [Waste crime interventions and evaluation project](#)

## Economic evaluation

In line with government’s Green Book guidance on appraisal and evaluation, we will conduct an economic assessment of the outcome of the measures, insofar as data availability will allow. Although it will be difficult to directly attribute outcomes to specific measures, nonetheless an impact evaluation using cost-benefit analysis will attempt to understand the size of the achieved impact; what the costs were to deliver the benefits; and whether the intervention achieved a benefit cost ratio as estimated at the original examination or appraisal. Hence, the economic evaluation will seek to draw conclusions on overall value for money.

## 3.6 Stakeholders

The main stakeholders in the results of the evaluation are Defra, HMRC, the Treasury, the EA and the waste industry. They will be consulted and an engagement plan prepared.

The table below shows the likely participants in the evaluation.

**Table 3: Stakeholders’ involvement in the evaluation of waste crime and poor performance**

	Overarching policy interests	Involvement in evaluation	Constraints to participation in evaluation
Public	Clean, pleasant environment Clarity and confidence in understanding responsibilities Clarity and confidence in identifying legitimate waste operators who uphold duty of care	Citizen survey on Household Duty of Care Rural crime survey includes small section on dumping and fly tipping Crime survey for England and Wales has a small section on litter and rubbish LEQSE (last run in 2018) provided data on litter and its impact. Date for next run not yet announced.	Costs of running surveys
Large waste producers obligated under EPR	Easy to understand regulations Regulations that are proportionate to the risk  Effective and efficient systems for recording and reporting data Effective regulation and enforcement by the regulator	Pre-launch user testing of digital waste tracking system Feedback on waste digital waste tracking system Qualitative interviews or survey	Burden Participation in primary research not mandated – potential low response rates Commercial sensitivity Fear of lack of confidentiality / being investigated

	Overarching policy interests	Involvement in evaluation	Constraints to participation in evaluation
Waste transporters (domestic), exporters and waste site operators	<p>Easy to understand regulations</p> <p>Regulations that are proportionate to the risk</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Level playing field where they are not undercut by illegal activity</p> <p>Profit</p>	<p>Pre-launch user testing of digital waste tracking system</p> <p>Feedback on waste digital waste tracking system</p> <p>Qualitative interviews or survey</p>	<p>Burden</p> <p>Participation in primary research not mandated – potential low response rates</p> <p>Commercial sensitivity</p> <p>Fear of lack of confidentiality / being investigated</p>
Local authorities	<p>Effective guidance where it is needed</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Cost minimisation</p> <p>Reduced waste crime and its negative impacts on a clean, pleasant environment in their areas</p>	<p>Qualitative interviews or survey</p>	<p>Burden</p> <p>Participation in primary research not mandated – potential low response rates</p>
Court system	<p>Guidance</p> <p>Referrals of good quality and appropriate cases</p>	<p>Qualitative interviews</p> <p>Data sharing</p>	
Trade bodies	<p>Represent interests of producers, waste transporters and site operators</p>	<p>Qualitative interviews</p> <p>Data sharing</p>	
HMRC	<p>Maximising tax receipts</p> <p>Intelligence sharing</p>	<p>Qualitative interviews</p> <p>Data sharing</p>	

## 3.7 Limitations, risks and constraints

In addition to the overarching limitations, risks and constraints set out in 1.7, there are others that are more specific to the evaluation of measures to tackle waste crime and poor performance.

### 3.7.1 Measuring undetected crime

One of the key limitations in evaluating the impact of waste crime measures is that the amount of undetected crime is, by its very nature, unknown. Therefore there is no true baseline figure. The principal objective of the programme is to reduce waste crime, yet it is likely that, at least initially, as investment increases in investigating waste crime and poor performance, so too will the number of incidents recorded. It is important that such an increase is not seen as a failure of the programme. The EA is looking at ways to address this. One approach is via remote sensing to detect illegal waste sites; another is a 'national

waste crime survey' to gather a range of independent industry perspectives on levels of waste crime. Both are at early stages of development. Therefore other outcomes will be used to make an overall assessment, such as the number of Category 1 and 2 incidents from illegal waste management (quantitative) and level of satisfaction within the waste industry that waste crime is being adequately tackled (qualitative).

### 3.7.2 Measuring in the context of an adaptive system

There may be displacement effects; waste criminals may adapt their behaviours and evolve new responses to adjust to enforcement measures and other changes within the system. There may also be a change in the mix of those undertaking criminal activity, where there is no overall reduction in waste crime but different people or groups to those targeted by the interventions are non-compliant. This means we will need to keep our evaluation approaches, and even the evaluation questions, flexible as we identify and respond to these adaptations. Recording the facilitating factors of crime must be done diligently. Identifying the known factors and their interactions and combinations, will enable us to hypothesise about waste criminals' future behaviour in novel circumstances so that evaluations can be focused in the right areas.

### 3.7.3 Time lag

It will take time for regulatory changes to become embedded within the system and therefore impacts may be slower to observe than in some areas of the Strategy where policy instruments can lever more immediate change.

## 3.8 Proposed stages of Evaluation

An initial high level proposal of the steps in the evaluation is set out below.

**Table 4: High level proposed plan for evaluating waste crime and poor performance**

Step 1. Initial systems mapping and theory of change development with stakeholders
Step 2. Scoping of the evaluation project within Government, including establishing data availability and data gaps
Step 3. Preparation of a tender specification
Step 4. Tendering process
Step 5. Initiation
Step 6. Rapid evidence review of relevant evaluations Methodology development, including implications for policy implementation
Step 7. Update systems and logic maps



Step 8. Collect year 1 outcome data

Step 9. Analysis of year 1

Step 10. Reporting of year 1 and feedback into policy

Step 11. Further evaluation

# 4 Evaluation of the Implementation of Consistent Recycling Collections

## 4.1 Background

Recycling rates in England have improved since the turn of the century; rising from around 11% to nearly 45% for waste from households. Government supports frequent and comprehensive rubbish and recycling collections. However, progress in England has recently stalled for both domestic and business waste recycling. While many local authorities continue to make improvements and have introduced new services, some have seen a drop in recycling rates or have stopped services such as food waste collection or do not collect the full range of recyclable materials.

The Resources and Waste Strategy sets out proposed measures to achieve consistency in the materials collected for recycling amongst waste collection authorities. This includes the separate collection of food waste. Consistency will make it easier for householders to recycle. The measures will also increase the amount of material collected for recycling from businesses and improve the quality of recycling collected so it achieves better value on materials markets.

## 4.2 Scope

The scope of the evaluation is on the effectiveness of the consistency policies outlined in the Resources and Waste Strategy. The consultation exercises on the measures set out in the Strategy have recently concluded<sup>22</sup>, and discussions on the breadth of the evaluation are ongoing: as to whether the evaluation should focus solely on the consistency measures, or whether it should explore more broadly the impact of all the Strategy's policies likely to impact on the quality and quantity of recycling. Once we have clarity on how Consistency and EPR for packaging are to be implemented and a final decision on introducing a deposit return scheme for drinks containers, a decision on the evaluation

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<sup>22</sup> Government response on consistency in recycling collections is available here: <https://www.gov.uk/government/consultations/waste-and-recycling-making-recycling-collections-consistent-in-england/outcome/consistency-in-recycling-collections-in-england-executive-summary-and-government-response>

Government response on extended producer responsibility is available here: <https://www.gov.uk/government/consultations/packaging-waste-changing-the-uk-producer-responsibility-system-for-packaging-waste>

Government response on introducing a DRS is here: <https://www.gov.uk/government/consultations/introducing-a-deposit-return-scheme-drs-for-drinks-containers-bottles-and-cans>

scope will be made. In the meantime, we are assuming that they will be evaluated separately.

### 4.3 Initial theory of change

The first step will be to establish a systems map which depicts how Consistency measures interrelate with other packaging measures including EPR and a DRS and the relevant wider economic, legal, environmental and judicial systems.

A theory of change will then be developed fully taking into account the wider context drawn out by the systems mapping.

In the meantime, here we set out a very high level initial conception of how we expect the measures to work.

**Table 5: High level theory of change for consistent recycling collections**

Activity	Directed at	Expected behaviour changes	Outcome	Environmental, economic or social benefit
Government to specify a core set of materials to be collected from households by all local authorities and waste operators  Introducing non-binding performance indicators for the quantity of materials collected for recycling and minimum service standards for recycling	Local authorities and waste operators	Householders find it easier so start to recycle	Improved participation in recycling so increased amounts of waste are recycled	Reduced landfill and incineration and their associated carbon emissions  Increased revenue for the recycling industry
		Householders are less confused so put more recyclables into the recycling collection rather than the residual	Improved capture rates so increased amounts of waste are recycled	
		Householders are less confused so put fewer contaminating items into the recycling	Less contamination of recycling streams so recycle is more valuable (higher quality) and less time and money is spent removing contaminants	
Mandate the separate collection of food waste for households	Local authorities and waste operators	Householders and businesses currently without separate collections can recycle food waste	Improved capture rates so increased amounts of food waste are recycled	
Action to ensure that businesses present recycling and food waste separately from	Businesses	Businesses owners and managers recycle materials that would otherwise been	Improved capture rates so increased amounts of material from non-household	

residual waste for collection		landfilled or incinerated	municipal sources are recycled	
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## 4.4 Evaluation questions

### Outcomes: What difference (if any) did the measures make?

- Using our theory of change as a guide, what outcomes do we see? For example, have we seen any positive or negative changes in:
  - participation rates
  - dry or food waste recycling, for household and for non-household waste
  - capture rates for specific materials
  - contamination

### Mechanisms, contexts and attribution: Why did observed changes occur?

- How did the measures work? For whom? Why? And in which contexts and combinations? Did they work as we thought they would? If not why not?
- Which measures have been less effective? Why? And in which contexts and combinations?
- What were the major factors influencing the achievement or non-achievement of the objectives?
- To what extent did the consistency measures cause these changes? What other explanations are there?
- Were there any unintended consequences? For example, were there any changes to local amenity affecting residents' satisfaction with the local environment?

### How were the activities delivered, and what can we learn?

- What actions were undertaken?
- How effectively were they undertaken? Have the measures been implemented as anticipated?
- What improvements could be made to maximise efficiency and effectiveness?
- How satisfied were residents with their household waste and recycling collections?

### Economic efficiency: Did the benefits justify the costs?

- What were the intended and unintended costs of the policy measures?

- What were the expected and unexpected benefits of the policy measures? This is likely to include:
  - Avoided harm to the environment and climate from landfill and incineration
  - Higher quantity and quality of recycle
  - Reduced costs to local authorities, such as avoided landfill tax, reduced gate fees etc.
  
- Have the costs of the measures been outweighed by the benefits?

## 4.5 Evaluation design

The objectives of the evaluation are to determine the impact of introducing consistent recycling collections into households and business across England, understand how those impacts have been generated, and assess cost-effectiveness. This information will be useful to policy makers within Defra and to those rolling out new 'consistent' services, including WRAP and local authorities. It will be of broader interest in assessing which interventions work most effectively in increasing recycling in developed countries with relatively high recycling rates.

The design will need to be multi-faceted including:

1. An **impact** evaluation, including an assessment of attribution/contribution – what happened and how effective was it?
2. A **process** evaluation – how and why did it happen, and what can we learn?
3. An **economic evaluation** – was it value for money, and how can we improve efficiency?

### 4.5.1 Theory

The first step will be to expand on the headline theory of change set out above. We will use the theory of change to determine key metrics that will be used in the assessment.

### 4.5.2 Evidence collection

The theory of change development process, along with the consideration of key metrics against which change will be assessed, will enable us to assess what data is required. This will also highlight gaps where baseline or primary data will need to be gathered or proxies agreed. We may adapt our evidence collection approach following this exercise.

#### ***Impact evaluation***

##### **1. Quantity of household waste and recycling**

The primary metric for tracking progress will be the amount of waste recycled. The data source will be WasteDataFlow, a platform by which every local authority in England

provides quarterly weight data to government. It is broken down by waste stream and material, allowing us to calculate increases in recycling tonnage for the core set of dry recyclables and organic waste, as well as recycling overall.

We calculate the recycling rate for specific materials by comparing the amount that is recycled against the total waste arisings for each material type. Tonnages of recyclable materials in residual waste and also the material composition of co-mingled recycling are not routinely measured and, even where they are, they are not systematically reported; therefore we will use waste compositional analysis to gather this data. Waste composition analysis involves taking samples of waste, sorting them into component materials and weighing each to make an estimate of the contribution of each to the total mixed (residual) waste stream. It is very costly to undertake compositional analysis with sufficient sampling points to allow reliable estimates to be generated. It is therefore anticipated that this will be commissioned only every three to five years, or as budgets allow.

Baseline figures have been established by combining data from a range of local authorities' own compositional analysis studies and this methodology may be repeated as an alternative to commissioning primary data collection.

In between compositional analyses we will use other available data sources as proxies to assess whether things are moving in the right direction. Householders' self-reported recycling behaviour is captured by WRAP's annual household recycling tracking survey<sup>23</sup>. Although respondents are likely to overstate positive recycling habits due to social desirability bias<sup>24</sup>, this will still serve as a good relative measure, assuming that the extent of over-claiming remains consistent year on year. The tracker will also measure changes in levels of uncertainty and confusion about what can and cannot be recycled, which we would expect to reduce with the introduction of greater consistency in the materials collected for recycling. We will finalise the selection of proxies after we have finalised the theory of change.

## **2. Quality of household recycling**

We will measure levels of contamination using Materials Facility reporting data. This data is reported by permitted facilities receiving at least 1,000t of mixed waste annually. Data is available quarterly via WRAP's Materials Facility Reporting Portal<sup>25</sup> We will use the amount of non-target material<sup>26</sup> and non-recyclable material<sup>27</sup> as a proportion of the total recycling input streams to those facilities, to calculate levels of contamination.

In addition, we will work with WRAP on a project to gather local authority data on rejected recycling containers. Most authorities receive daily or weekly reports of households that

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<sup>23</sup> WRAP (2014-2018) [Recycling Tracker Report](#)

<sup>24</sup> Social desirability bias occurs when respondents consciously or unconsciously edit their responses in a way they deem to be more socially acceptable than would be their "true" answer.

<sup>25</sup> <http://www.wrap.org.uk/content/materials-facility-reporting-portal>

<sup>26</sup> Material that is capable of being recycled but is not a target material for that facility.

<sup>27</sup> Material that is capable of being recycled but is not a target material for that facility.

have contaminated recycling to such an extent that the container has been rejected at kerbside; this data, which would amount to many thousands of cases over a long period of time, could be collated to assess trends. Although this covers the extreme end of contaminating behaviour, it will provide a useful indication of trends.

We will use a survey or qualitative interviews with reprocessors to explore the extent to which changes in the quality of recycling collected has contributed to its value on materials markets, taking into account other external factors.

### **3. Quantity of non-household municipal waste and recycling**

In 2018, WRAP commissioned a study on Defra's behalf to quantify, through primary research, the composition of non-household municipal waste. The latest estimates for the recycling rates for non-household municipal waste are presented in National municipal commercial waste composition, England 2017<sup>28</sup> These estimates were derived by Eunomia by triangulating multiple data sources including:

- Municipal commercial residual waste composition analysis collected in 2017 (Resource Futures)<sup>29</sup>
- *UK Statistics on Waste*<sup>30</sup> which included an estimate of total waste generation from the commercial and industrial (C&I) sectors for England
- Previous recycling rate for commercial waste (2011)<sup>31</sup>
- WasteDataFlow

These are the best available estimates for use as a baseline. Subject to budget availability we will update the estimates for the recycling rates for non-household municipal waste. This methodology may be repeated, or evidence may become available by another means. For instance, via its Smart Waste Tracking challenge<sup>32</sup>, the Government is supporting organisations to develop systems to track individual movements of waste through the economy so that we know more about the types and amounts of waste generated, what is done to it, where it ends up, and in what form.

#### ***Process evaluation and assessing attribution***

For each of the outcome measures, we will look for evidence that actions related to the consistency policy have played a role. We acknowledge from the outset the challenging nature of this task, and the unlikelihood that the role played by consistency actions can be robustly distinguished from other actions, even in a qualitative assessment. Nevertheless, we need an estimate for the economic evaluation, even if that is an approximation based

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<sup>28</sup> Forthcoming WRAP publication 2020

<sup>29</sup> Forthcoming WRAP publication 2020

<sup>30</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/784263/UK\\_Statistics\\_on\\_Waste\\_statistical\\_notice\\_March\\_2019\\_rev\\_FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784263/UK_Statistics_on_Waste_statistical_notice_March_2019_rev_FINAL.pdf)

<sup>31</sup> Page 3, UK Statistics on waste statistical notice. As for footnote 29

<sup>32</sup> UK Government services and information (2018) <https://www.gov.uk/government/publications/smart-waste-tracking-digital-challenge>

on the evidence we are able to find. We will ensure that the uncertainty associated with any reporting on this is made very clear so that results can be used appropriately.

Measures to mandate consistent collections of dry materials from households and business intentionally sit within a package of complimentary measures, especially DRS, designed to work systematically to transform how packaging is produced and recycled. These measures in turn sit within wider complex social, political and technological systems. Empirically isolating the effects of the Consistency measures for the purposes of insight and learning is neither possible nor desirable, as they are not intended to work in isolation. We don't expect to be able to answer the question "Have these measures caused these impacts?" but we will be able to answer the question "Have these measures contributed to the observed impacts in the ways that we expected?", and this will be useful for policy makers and implementers to understand.

The logic model developed for Consistency will describe how the measures are intended to work. It will clearly articulate the hypothesized associations between the activities and the outcomes expected, including the assumptions inherent in the associations we have described. We propose using a realist approach with methods which might include QCA, process tracing or a contribution analysis approach as a framework for seeking evidence, and will seek input from methodological experts about which will be the most helpful in this evaluation. We will prioritise investigation of links in the theory of change that either seem to be the most important or are currently less well evidenced.

Assuming (by way of example) that we use a realist methodology, the theory of change will firstly be set out as a context-mechanism-outcome (CMO) configuration, for example:

In situations where there are good recycling communications <sup>[C]</sup>, where the service provided by the crews is at least satisfactory <sup>[C]</sup> and where enforcement of gross contamination is strong enough <sup>[C]</sup>, introducing collections consistent with the national model <sup>[M]</sup> increases the confidence of householders <sup>[M]</sup>, resulting in greater participation <sup>[O]</sup>, lower levels of contamination <sup>[O]</sup> and higher levels of capture of the core materials <sup>[O]</sup>, bringing environmental and climate benefits <sup>[O]</sup>.

These theorised links are the assumptions that underpin the theory and this is the focus of testing. An 'evidence sourcing plan' should be created outlining for each of the stages and the links (context, mechanism, outcome, context to mechanism, and mechanism to outcome) stating, for each, where evidence could be found to support, refute or refine the theory. Evidence might be found in documents (e.g. published survey results that show high levels of satisfaction with services that have rolled out consistency), interviews (e.g. surveys of householders stating they are more confident since roll-out) or through analysis of existing data (e.g. recycling rate from WasteDataFlow).

The research plan is then formulated around the specific evidence needs. The data is collected, brought together and analysed and middle range theories produced based on the observed outcome patterns.



It is too soon to be specific about the precise types of evidence we will seek; that will depend on decisions about the scope of the evaluation and subsequent to that the formulation of the theory of change. However, we can be fairly certain that it will involve:

- Analysis of local authority waste collection and treatment data
- Collection and analysis of other local authority data on recycling participation, capture and contamination
- Qualitative interviews or focus groups with residents, businesses, local authority officers, waste collection contractors, recycling crews and reprocessors

### ***Economic evaluation***

If a detailed economic evaluation is necessary, it will build on previous evaluation of waste collection changes carried out by WRAP and would be focused on the financial and environmental costs and benefits from the policy. It would seek to verify whether the appraised costs and benefits of the policy were accurate and produce new estimates if appropriate. It will be conducted in line with government’s Green Book guidance on appraisal and evaluation. An impact evaluation will use a standard cost-benefit analysis to understand the size of the achieved impact; what the costs were to deliver the benefits; and whether the intervention achieved a benefit cost ratio as estimated at appraisal. Hence, the economic evaluation will draw conclusions on overall value for money.

This evaluation may be preceded by a more qualitative process evaluation. Given the large scale of change proposed by this policy it will be helpful to understand how it was delivered and what lessons can be learned.

## **4.6 Stakeholders**

The main groups of stakeholder for this evaluation are policy makers, WRAP, local authorities, waste management companies and reprocessors. We will ensure we involve them at the scoping and design phase so they can feed in their requirements and requests.

The table below shows the groups likely to be participants in the evaluation.

**Table 6: Stakeholders’ involvement in the evaluation of consistent recycling collections**

	Overarching policy interests	Involvement in evaluation	Constraints to participation in evaluation
Waste producers (householders)	Clarity in what and how to recycle Ease of recycling Belief that their efforts are worthwhile	Over 1,000 to be selected for inclusion in WRAP’s annual consumer recycling tracking survey	Budget for the study

Waste producers (businesses)	Easy to understand regulations Easy to comply with regulations Lowest possible cost while assuring compliance with the law and their own policies	Survey	Commercial sensitivity Burden Participation in primary research not mandated – potential low response rates
Recycling sector	Increase in quality of recycle Increase in quantity of recycle Improved material price Profit	Gate fees survey Possible survey to explore increased confidence in the sector	Commercial sensitivity Burden
Local authorities	Costs and efficiency initiatives Effective guidance on implementation Speed and magnitude of change Satisfied residents	Survey	Burden Participation in primary research not mandated – potential low response rates

## 4.7 Limitations, risks and constraints

In addition to the overarching limitations, risks and constraints set out in 1.7, there are others that are more specific to the evaluation of the measures to introduce consistent recycling collections into households and business across England.

### 4.7.1 Requirement for Waste Compositional Analysis

One of the key risks is the reliance on, and expense of, waste compositional analysis for both the household and non-household fractions. Overall recycling rates for household waste will be available via WDF, but getting reliable data on the recycling rates for core dry materials, food, and garden waste will be budget-dependent, as will collecting reliable data on the volume and composition of business recycling and residual waste streams.

## 4.8 Proposed Stages of Evaluation

Although scoping and design can start sooner, the evaluation itself will need to wait until schemes have at least begun to be rolled out.

An initial high level proposal of the steps in the evaluation is set out below This will be developed further as during the scoping phase.

**Table 7: High level proposed plan for evaluating consistent recycling collections**

Step 1. Initial systems mapping and theory of change development with stakeholders
Step 2. Scoping of the evaluation project within Government, including establishing data availability and data gaps
Step 3. Preparation of a tender specification
Step 4. Tendering process
Step 5. Initiation
Step 6. Rapid evidence review of relevant evaluations Methodology development, including implications for policy implementation
<i>Policy implementation, (subject to consultation)</i>
Step 7. Update systems and logic maps
Step 8. Collect year 1 outcome data
Step 9. Analysis of year 1
Step 10. Reporting of year 1 and feedback into policy
Step 11. Further evaluation

# 5 Evaluation of Extended Producer Responsibility for Packaging

## 5.1 Scope

'Extended Producer Responsibility' (EPR) is an environmental policy approach through which a producer's responsibility for a product is extended to the post-use stage. This incentivises producers to design their products to make it easier for them to be reused, dismantled and/or recycled at end of the product's life. In the Resources and Waste Strategy we set out our ambition to improve producer responsibility for a range of product types and to introduce EPR for other products in the future. Our first priority is reform of the packaging producer responsibility scheme. Our evaluation efforts will reflect this priority, and will initially focus on packaging. We will develop evaluation plans for other products as those policies progress.

## 5.2 Background

The current packaging producer responsibility system is over 20 years old<sup>33</sup>. Whilst it has enabled the UK to meet UK and EU packaging waste recycling targets and kept the cost of compliance to business lower, there are concerns with the current system. It provides little incentive for producers to design for greater re-use or recyclability. Local authorities have received limited support from producers for managing packaging waste including direct financial benefit. The demand for recycled materials has not been stimulated sufficiently and recycling that can be done at a lower cost overseas has been encouraged leading to an over-reliance on export markets. Many people continue to be confused over what packaging can and can't be recycled.

The current packaging producer responsibility system is being reformed to reduce unnecessary and difficult to recycle packaging and incentivise the use of packaging that can be and is recycled, by rewarding good design and penalising poor design. Government consulted on its initial proposals in early 2019.

A key principle is that the full net costs of managing packaging waste would be placed on business, in particular those businesses who are best placed to influence its design. It is proposed that the fees raised from such businesses would be used to fund the collection, transporting, sorting and treatment of household/ household-like packaging waste for recycling. The fees could further be structured to incentivise the design of packaging as suggested above. Under the proposals, the treatment and disposal of any packaging entering the residual waste stream would also be funded. As a result of better designed packaging for recycling, consumers should find it easier to recycle.

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<sup>33</sup> <https://www.gov.uk/guidance/packaging-producer-responsibilities>

To deliver the maximum outcomes from the proposed reforms and demonstrate that national (overall UK and by nation) packaging waste recycling targets have been achieved, the regulations will place data and reporting requirements on stakeholders, against which compliance can be monitored robustly; and effective and proportionate enforcement action can be taken to drive high levels of compliance.

## 5.3 Initial theory of change

The theory of change will be developed fully when the project starts so we can take full account of the context at the time. Here we set out a very high level initial conception of how we expect the measures to work.

**Table 8: High level theory of change for EPR for packaging**

Activity	Directed at	Expected behaviour changes	Outcome	Environmental, economic or social benefit
Businesses bear the full net cost for management of packaging at the end of life	Packaging manufacturers	Reduced use of unnecessary and difficult to recycle packaging	Less packaging is produced.	Reduced landfill and incineration and their associated carbon emissions  Value of and demand for recycled materials increases
Modulated or differential fees or other measures used to encourage business to design and use more sustainable packaging	Packaging fillers (product manufacturers)  <b>Sellers of packaged products</b>	<b>Adopt more re-useable and recyclable packaging</b>	More of the packaging that is produced is recycled	
Mandatory labelling on packaging and improved communications	Consumers	Householders find it easier so start to recycle	Improved participation in recycling so increased amounts of waste are recycled	Full net costs of managing packaging at the end of its life will be borne by manufacturers
		Householders are less confused so put more recyclables into the recycling collection rather than the residual	Improved capture rates so increased amounts of waste are recycled	
		Householders are less confused so put fewer contaminating items into the recycling	Less contamination of recycling streams so recycle is more valuable (higher quality) and less time and money is spent removing contaminants	

## 5.4 Evaluation questions

### **Outcomes: What difference (if any) did the measures make?**

- To what extent has the overhaul of the producer responsibility scheme for packaging increased the amount of packaging recycled?
- To what extent has the overhaul changed the types and design of packaging placed on the market?
- What were the benefits of the policy measures? This is likely to include:
  - a. Avoided harm to the environment
  - b. Higher quantity and quality of recyclate for reprocessing and export
  - c. A reduction in unnecessary and unrecyclable packaging
  - d. Sufficient high quality reprocessing capacity in the UK to handle the increasing quantities of packaging waste for recycling .

### **Mechanisms, Contexts and Attribution: Why did observed changes occur?**

- How did the measures work? For whom? Why? And in which contexts and combinations? Did they work as we thought they would? If not why not?
- Which measures have been less effective? Why? And in which contexts and combinations?
- To what extent did the measures cause these changes? What other explanations are there? For example, could other measures such as bans on certain packaging materials have caused these changes?
- Were there any unintended consequences?

### **How were the activities delivered, and what can we learn?**

- What actions were undertaken?
- How effectively were they undertaken? Have the measures been implemented as anticipated?
- What improvements could be made to maximise efficiency and effectiveness?

### **Economic evaluation: Did the benefits justify the costs?**

- What were the intended and unintended costs of the policy measures? For example, were there any effects on retail prices for consumers?
- What were the expected and unexpected benefits of the policy measures?
- Have the costs of the measures been outweighed by the benefits?

## 5.5 Evaluation design

The objective of the evaluation is to quantify the impact of changing the scheme and to understand the reasons behind those observed impacts – what aspects of the scheme have worked, for whom, in what ways, and in what contexts. This will feed into the formal PIR and enable, in due course, changes to be made to the way the scheme operates.

The framework will be a combination of impact, process and economic evaluation. The impact evaluation will focus on what has been achieved, the process evaluation will focus on how the observed outcomes came about, and will enable conclusions to be drawn about the extent to which the changes to the scheme contributed to the outcomes, and the economic assessment will feed into the PIR, providing benefit/cost ratios.

As there will be no suitable control groups (the scheme will affect everyone in the packaging supply chain across the UK), and as we also want to understand the reasons behind any observed impact, a theory-based approach is expected to be most suitable. We anticipate taking a quantitative approach to establishing impact and carrying out a cost benefit analysis. This would be combined with a more qualitative approach, for example a realist evaluation or a contribution analysis, to understand what happened on the ground, the reasons for those impacts, and the lessons that can be taken from the process.

### 5.5.1 Theory

The first step will be to revisit the theory of change set out in section 5.3, including how EPR measures interact with Consistency measures and a Deposit Return Scheme (for drinks containers). We propose this is done through systems mapping, and from these develop more linear logic models to identify the inputs, outputs and outcomes for each area. This will be used to identify key metrics that will be used in the assessment. The logic models will also highlight gaps in evidence where baseline or primary data will need to be gathered or proxies agreed.

### 5.5.2 Evidence collection

#### ***Impact evaluation***

Data held in the National Packaging Waste Database<sup>34</sup> and data from Material Flow reports<sup>35</sup> have been used in the consultation stage Impact Assessment<sup>36</sup> as the most robust data available to determine proposals for future packaging recycling targets. An alternative methodology is to use dry recyclable tonnage data (relevant local authority data

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<sup>34</sup> <https://npwd.environment-agency.gov.uk/>

<sup>35</sup> <http://www.wrap.org.uk/collections-and-reprocessing/dry-materials>

<sup>36</sup> [https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting\\_documents/packagingepiconsultimpactassessment.pdf](https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingepiconsultimpactassessment.pdf)

being available from WasteDataFlow<sup>37</sup>, and government and/or the regulator waste arisings estimates for commercial and industrial sectors) together with waste compositional analysis to establish collected packaging waste tonnages. These methods produce different estimates and each has some drawbacks<sup>38</sup>. Given this uncertainty around the data, we are reviewing the methodologies and reporting requirements for businesses obligated under the current regulations with a view to improving understanding of packaging waste arisings and reducing uncertainty prior to regulating for new targets. The methodology used for setting targets will be used in the evaluation to measure changes in the amount of packaging recycled.

### ***Process evaluation and assessing attribution***

Policies to reform EPR intentionally sit within a package of complementary measures, designed to work systematically to transform how packaging is produced, used and recycled. These measures in turn sit within wider complex social, political and technological systems. Isolating the effects of the EPR measures from other packaging and waste management measures is neither possible nor desirable, as they are not intended to work in isolation. We won't be able to answer the question "Have these measures caused these impacts?" but we will be able to answer the question "Have these measures contributed to the observed impacts in the ways that we expected?"

The logic model developed for EPR will describe how the measures are intended to work. It will clearly articulate the hypothesised associations between the activities and the outcomes expected, including the assumptions inherent in the associations we have described. We will test these assumptions through the evaluation, prioritising those that are less well understood and most important to the success of the policies, exploring the extent to which they hold true when the measures are implemented. The perspectives of a range of stakeholders will contribute to our understanding of why any observed changes occurred, how the policies were delivered on the ground, and any improvements that would make them more effective or efficient. We will conduct qualitative depth interviews and/or a primarily quantitative survey with key stakeholders. This is likely to include the regulator, any new organisation(s) established to administer a future scheme and compliance schemes (depending on which governance model is adopted), obligated businesses, local authorities, waste management companies, reprocessors and trade associations.

We are not specifying at this stage the methodological approach the process evaluation will take. This will be considered once the final proposals have been agreed and the logic model has been refined.

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<sup>37</sup> <https://www.wastedataflow.org/>

<sup>38</sup> The National Packaging Waste Database / Material Flow model has been criticised due to perceived in-built incentives for under-reporting and variations in the weight data for individual packaging items. The WDF / C&I estimates / compositional analysis methodology has issues with contamination, sample size and sample frequency.



## Economic evaluation

In line with government’s Green Book guidance on appraisal and evaluation, we will conduct an economic assessment of the outcome of the intervention. An impact evaluation will use a standard cost-benefit analysis to understand the size of the achieved impact; what the costs were to deliver the benefits; and whether the intervention achieved a benefit cost ratio as estimated at appraisal. Hence, the economic evaluation will to draw conclusions on overall value for money.

In terms of the packaging reform, this may include economic assessment of the effectiveness and efficiency of achieving higher reuse and recycling packaging rates; ability to meet key packaging reform criteria such as full net cost recovery; packaging data; small and micro business impacts; environmental impacts and so on.

## 5.6 Stakeholders

The main groups of stakeholders for this evaluation are policy makers, WRAP, manufacturers, retailers, local authorities, waste management companies, reprocessors and exporters. We will ensure we involve them at the scoping and design phase so they can feed in their requirements and requests.

The Table 9 shows the groups likely to be participants in the evaluation.

**Table 9: Stakeholders’ involvement in the evaluation of EPR**

	Overarching policy interests	Involvement	Constraints to participation
UK Reprocessors	Raw material supply security Raw material supply quality Healthy market for reprocessed material Financially sustainable UK reprocessing sector is Profit	Qualitative interviews or survey	Commercial sensitivity Burden Participation in primary research not mandated – potential low response rates
Exporters of waste for recycling/reprocessing	Raw material supply security Raw material supply quality	Qualitative interviews or survey	Commercial sensitivity Burden

	<p>Healthy international markets for reprocessed material</p> <p>Profit</p>		<p>Participation in primary research not mandated – potential low response rates</p>
Manufacturers - packaging	<p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Sufficient time to prepare for/ adjust to new requirements</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Material supply security</p> <p>Material supply quality</p> <p>Healthy market for packaging of all materials</p> <p>Profit</p>	<p>Provision of compliance data</p> <p>Qualitative interviews or survey</p>	<p>Commercial sensitivity</p> <p>Burden</p> <p>Potential for error in data returns/provision</p> <p>Participation in primary research not mandated – potential low response rates</p>
Manufacturers – products (pack fillers)	<p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Sufficient time to prepare for/ adjust to new requirements</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Packaging integrity and effectiveness</p> <p>Material supply security</p> <p>Material supply quality</p> <p>Brand reputation / competitive advantage /</p>	<p>Provision of compliance data</p> <p>Qualitative interviews or survey</p>	<p>Commercial sensitivity</p> <p>Burden</p> <p>Potential for error in data returns</p> <p>Participation in primary research not mandated – potential low response rates</p>

	customer loyalty and satisfaction  Profit		
Retailers	Easy to understand regulations  Easy to comply with regulations  Sufficient time to prepare for/ adjust to any new requirements  Effective and efficient systems for recording and reporting data  Packaging integrity and effectiveness  Brand reputation / competitive advantage / customer loyalty and satisfaction  Profit	Provision of compliance data  Qualitative interviews or survey	Commercial sensitivity  Burden  Potential for error in data returns  Participation in primary research not mandated – potential low response rates
Local authorities	Increase in quality of recycle  Increase in quantity of recycle  Income received from the EPR scheme	Qualitative interviews or survey  Captured through WasteDataFlow	Burden  Participation in primary research not mandated – potential low response rates
Waste management companies	Increase in quality of recycle  Increase in quantity of recycle  Improved material price  Profit	MF portal  Qualitative interviews or survey	Commercial sensitivity  Burden  Participation in primary research not mandated – potential low response rates
Trade associations	Represent member interests	Qualitative engagement	

Householders	<p>Feeling that their efforts are worthwhile</p> <p>Governments and industry taking sufficiently impactful action</p> <p>Easy for them to do the right thing</p>	WRAP's annual consumer recycling tracking survey	No additional commitment – existing online quota sampled survey
Producer Management Organisation/Administrator	<p>Compliance – targets and outcomes achieved, reporting requirements met</p> <p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Sufficient time to prepare for/ adjust to new requirements</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Member requirements and expectations met</p>	<p>Provision of compliance data</p> <p>Qualitative interview</p>	None anticipated – would be required to be open and transparent in its operations and would have to fulfil agreed reporting requirements
Compliance schemes	<p>Compliance – targets and outcomes achieved; reporting requirements met</p> <p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Sufficient time to prepare for/ adjust to new requirements</p> <p>Effective and efficient systems for recording and reporting data</p>	<p>Provision of compliance data</p> <p>Qualitative interviews</p>	Commercial sensitivity – but will be required to fulfil certain reporting requirements

	Member requirements and expectations met		
The regulator	Compliance Effective and efficient systems	Qualitative interviews	

## 5.7 Limitations, risks and constraints

In addition to the overarching limitations, risks and constraints set out in 1.7, there are others that are more specific to the evaluation of the measures for EPR for packaging.

### 5.7.1 Unreliable data

As noted, there is some uncertainty about the amount of packaging currently placed on the market and hence recycled. There are limitations with the existing datasets. We will follow developments and adopt the approach that provides the most robust measure.

One of the important inputs to the evaluation will be the data provided by obligated businesses either directly to the regulator or via a compliance scheme or scheme administrator. The National Audit Office 2018 report<sup>39</sup> on the packaging recycling obligations highlighted the risks of fraud and error by both packaging producers and the reprocessors and exporters handling the waste packaging. The proposals for reforming the packaging producer responsibility scheme acknowledge this risk and propose that robust measures are put in place by the regulator to reduce this risk under a future scheme.

### 5.7.2 Requirement for nation-specific data

Whilst each nation within the UK has its own statutory waste management plan and nation-specific targets for recycling and landfill diversion, the packaging producer responsibility scheme operates on a UK-wide basis and the intention is that it will continue to do so. The packaging waste recycling targets are established at a UK level, however, in future these targets will be reported at both a UK and individual nation level. Irrespective of the governance model chosen, the measurement of progress against these targets will require data on the amount of packaging placed on the market in each country to be captured. It would also require greater tracking of waste from the point of collection, as it would be necessary to know the source of the packaging waste (i.e. which country it was collected in) so that it can be reported once collected for recycling /recycled (or recovered).

<sup>39</sup> <https://www.nao.org.uk/wp-content/uploads/2018/07/The-packaging-recycling-obligations.pdf>

## 5.8 Proposed Stages of evaluation

An initial high level proposal of the steps in the evaluation is set out in Table 10. . This will be developed further during the scoping phase.

**Table 10: High level proposed plan for evaluating EPR**

Step 1. Initial systems mapping and theory of change development with stakeholders
Step 2. Scoping of the evaluation project within Government, including establishing data availability and data gaps
Step 3. Preparation of a tender specification
Step 4. Tendering process
Step 5. Initiation
Step 6. Rapid evidence review of relevant evaluations Methodology development, including implications for policy implementation
<i>Policies are implemented, subject to consultation</i>
Step 7. Update systems and logic maps
Step 8. Collect year 1 outcome data
Step 9. Analysis of year 1
Step 10. Reporting of year 1 and feedback into policy
Step 11. Further evaluation

# 6 Evaluation of the Deposit Return Scheme for England

## 6.1 Background

Drinks containers are often made of easily recyclable materials (polyethylene terephthalate (PET) plastic, glass, aluminium, steel), yet recent packaging recycling rates demonstrate that there are significant improvements to be made in drinks container recycling, especially in relation to recycling of containers whilst ‘on-the-go’. Moreover, drinks container litter is a serious issue which needs targeted policy action to overcome. Disposable drinks containers, or parts of them, regularly feature among the most commonly found items on UK beaches<sup>40</sup>.

A Deposit Return Scheme (DRS) is a system that encourages the return of the packaging to collection points through the incentive of a refundable deposit paid by consumers at the point of purchase. The deposit level added to the price of a drink acts as an incentive against improper disposal of the empty drinks container, increasing the recycling rate and reducing the incidence of litter for these materials. The key objectives of introducing a DRS are: a reduction in litter and associated litter disamenity; increased recycling of drinks containers in scope of a DRS, especially those disposed of ‘on-the-go’; higher quality recycling and; greater domestic reprocessing capacity through providing a stable and high-quality supply of recyclable waste materials.

## 6.2 Theory of change

**The theory of change will be developed fully when the project starts so we can take full account of the context at the time. Table 11 sets out a very high level initial conception of how we expect the measures to work.**

**Table 11: High level theory of change for a DRS**

Activity	Directed at	Expected behaviour changes	Outcome	Environmental, economic or social benefit
Consumers charged a deposit up-front when they buy a	Manufacturers and retailers	Comply with the scheme as mandated		Reduced landfill and incineration and their associated carbon emissions
		Consumers do not want to lose their		

 Marine Conservation Society, Great British Beach Clean 2017 Report: [https://www.mcsuk.org/media/GBBC\\_2017\\_Report.pdf](https://www.mcsuk.org/media/GBBC_2017_Report.pdf) ; Great British Beach Clean 2016 Report: [https://www.mcsuk.org/media/cleanseas/GBBC\\_2016\\_Report.pdf](https://www.mcsuk.org/media/cleanseas/GBBC_2016_Report.pdf)

drink in a single-use container, which is redeemable at an official return point	Consumers	money and so return their drinks containers to redeem their deposit	More drinks containers are recycled	Increased revenue for the recycling industry
	People other than the original purchaser	For example, people might collect litter and return it, in order to get the deposits	Reduced litter	Lower costs for local authorities and local tax payers  Reduced litter disamenity costs for residents Reduced litter clean-up costs for local taxpayers

## 6.3 Evaluation questions

### Outcomes: What difference (if any) did the measures make?

- To what extent has the implementation of a DRS scheme for packaging been effective at:
  - a. Reducing litter
  - b. Increasing overall recycling of drinks containers in scope of a DRS
  - c. Increasing recycling of drinks containers in scope of a DRS disposed of 'on-the-go'
  - d. Producing higher quality recycling
  - e. Supported greater domestic reprocessing capacity through providing a stable and high-quality supply of recyclable waste materials.
- What were the benefits of the policy measures? This is likely to include:
  - a. Avoided harm to the environment
  - b. Higher quantity and quality of recyclate for domestic reprocessing
  - c. Avoided litter clean-up costs
  - d. Avoided litter disamenity costs

### Activities, Mechanisms, Contexts and Attribution: Why did observed changes occur?

- How did the measures work? For whom? Why? And in which contexts and combinations? Did they work as we thought they would? If not why not? For example, were some consumers unable to return drinks containers and therefore unable to collect their deposit?



- Which measures have been less effective? Why? And in which contexts and combinations?
- What were the major factors influencing the achievement or non-achievement of the objectives?

### How were the activities delivered, and what can we learn?

- What actions were undertaken?
- How effectively were they undertaken? Have the measures been implemented as anticipated?
- What improvements could be made to maximise efficiency and effectiveness?

### Economic evaluation: Did the benefits justify the costs?

- What were the intended and unintended costs of the policy measures? For example, were there additional costs to consumers who were unable to collect their deposits?
- What were the expected and unexpected benefits of the policy measures?
- Have the costs of the measures been outweighed by the benefits?

## 6.4 Evaluation design

The objective is to quantify the impact and cost effectiveness of introducing a Deposit Return Scheme, and understand the reasons behind those observed impacts. The design will need to be multi-faceted including:

1. An **impact evaluation**, including an assessment of attribution/contribution – what happened and how effective was it?
2. A **process evaluation** – how and why did it happen, and what can we learn?
3. An **economic evaluation** – was it value for money, and how can we improve efficiency?

The results will be used by Defra policy colleagues to ensure that measures are effective, efficient and beneficial to society. This evaluation will feed into the formal PIR and enable, in due course, any changes to be made to the scheme to increase its effectiveness.

### 6.4.1 Theory

The first step will be to refine and expand the high level theory of change set out above, including how DRS measures interact with Consistency measures and EPR via systems mapping, and from these develop more linear logic models to identify the inputs, outputs and outcomes for each area. This will be used to understand key metrics that will be used in the assessment. The logic models will also highlight gaps in evidence where baseline or primary data will need to be gathered or proxies agreed.

## 6.4.2 Evidence collection

### *Impact evaluation*

#### **Litter**

We will use the Local Environmental Quality Survey of England (LEQSE) to assess changes in the amount of litter in England. This is a survey conducted annually by Keep Britain Tidy (KBT) which examines environmental quality at approximately 7,000 sites across England. We will use this to monitor the proportion of sites monitored at or above an acceptable standard for litter, which will give an indication of the change in levels of general litter.

#### **Recycling rates**

The latest estimates for the recycling rates for drinks containers are derived from triangulating multiple data sources including:

- Placed on the market and consumption estimates provided by industry bodies<sup>41</sup>
- Estimated household recycling rates provided by industry bodies<sup>42</sup>
- Estimated on-the-go recycling rates from *Drinks Recycling On-the-Go*, WRAP, 2019, Prepared by Valpak and Recoup<sup>43</sup>

They are the best available data for use as a baseline. To measure the success of the DRS, we expect to have reliable data on drinks containers placed on the market and collected for recycling via the Deposit Management Organisation (DMO)<sup>44</sup>, but we will rely on household waste analysis to measure the amounts still being recycled via kerbside schemes and the litter surveys to estimate the effects on litter.

#### **Recyclate quality**

The metric we will use to assess changes in quality of recycling is contamination. Changes to levels of contamination in household recyclate will be measured using Materials Facility reporting data which is reported by permitted facilities receiving at least 1,000t of mixed waste annually. Data is available quarterly via WRAP's Materials Facility Reporting Portal<sup>45</sup> and shows the average percentage composition of non-target material<sup>46</sup> and

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<sup>41</sup> Including British Soft Drinks Association, British Beer and Pub Association, Valpak, Recoup and Alupro

<sup>42</sup> Valpak, Recoup, Alupro, European Container Glass Federation

<sup>43</sup> <http://www.wrap.org.uk/sites/files/wrap/OTG%20Drinks%20Containers%20Final%20Report%20ENG017-012.pdf> These figures are based on consumer survey of drinks consumption and disposal undertaken in July 2018. Figures include drinks containers disposed of by respondents and includes both consumer (retail) and non-consumer (hospitality) consumption. Comparison of claimed and actual recycling rates for coffee cups suggests a high degree of over-reporting of recycling behaviour by respondents

<sup>44</sup> The DMO is the central body whose role it would be to manage the operation of the DRS, including financial flows (deposit values, unredeemed deposits, producer fees, handling fees and material revenue from recycling), logistics (ensuring collected material reaches the recycler), some DRS infrastructure (e.g. maintenance of RVMs) and reporting to government on collection rates.

<sup>45</sup> <http://www.wrap.org.uk/content/materials-facility-reporting-portal>

<sup>46</sup> Material that is capable of being recycled but is not a target material for that facility.

average percentage composition of non-recyclable material. The level of contamination in DRS collected materials is expected to be low. It is not yet known where the quality of these materials will be assessed. The materials are likely to go to bespoke DRS sorting/counting centres and then on to reprocessors (that would not be bespoke DRS facilities) but this will be determined by the DMO.

### ***Process evaluation and assessing attribution***

For each of the outcome measures, we will look for evidence that actions related to the DRS have played a role. We acknowledge from the outset the challenging nature of this task, and the unlikelihood that the role played by the DRS can be robustly distinguished from other measures, even in a qualitative assessment. Nevertheless, we need an estimate for the economic evaluation, even if that is an approximation based on the evidence we are able to find. We will ensure that the uncertainty associated with any reporting on this is made very clear so that results can be used appropriately. Policies to implement a DRS intentionally sit within a package of complementary measures, designed to work systematically to transform how packaging is produced and recycled. These measures in turn sit within wider complex social, political and technological systems. Isolating the effects of the DRS measures is neither possible nor desirable, as they are not intended to work in isolation. We won't be able to answer the question "Have these measures caused these impacts?" but we will be able to answer the question "Have these measures contributed to the observed impacts in the ways that we expected?" contributed to the observed impacts in the ways that we expected?", and this will be useful for policy makers and implementers to understand.

The logic model developed for the DRS will describe how the measures are intended to work. It will clearly articulate the hypothesised associations between the activities and the outcomes expected, including the assumptions inherent in the associations we have described. We will test these assumptions through the evaluation, prioritising those that are less well understood and most important to the success of the policies, exploring the extent to which they hold true when the measures are implemented.

The perspectives of the DMO, manufacturers, retailers, Local Authorities, waste management companies and reprocessors will be all be important inputs into the process evaluation, as they will contribute to our understanding of why any observed changes occurred. For instance we will use a survey or qualitative interviews with reprocessors to explore the extent to which changes in the quality of recycling collected has contributed to its value on materials markets. They will also feed into the process evaluation of how the policies were delivered and any improvements that would make them more effective or efficient.

In establishing a counterfactual, it may be possible to implement a trial in advance of a full roll-out of a DRS, or utilise the potential of a natural experiment should Scotland implement a DRS before England. If feasible, data from these would provide some data to feed into a modelled counterfactual.

## Economic evaluation

In line with government’s Green Book guidance on appraisal and evaluation, we will conduct an economic assessment of the outcome of the intervention. An impact evaluation will use a standard cost-benefit analysis to understand the size of the achieved impact; what the costs were to deliver the benefits; and whether the intervention achieved a benefit cost ratio as estimated at appraisal. Hence, the economic evaluation will draw conclusions on overall value for money.

## 6.5 Stakeholders

The main stakeholders in the results of the evaluation are policy makers, manufacturers, importers, retailers, local authorities, waste management companies and reprocessors. They will be consulted and an engagement prepared. Table 12 shows the likely participants in the evaluation.

**Table 12: Stakeholders’ involvement in the evaluation of a DRS**

	Overarching policy interests	Involvement	Constraints to participation
Reprocessors	<ul style="list-style-type: none"> <li>Raw material supply security</li> <li>Raw material supply quality</li> <li>Healthy market for reprocessed material</li> <li>Profit</li> </ul>	<ul style="list-style-type: none"> <li>Qualitative interviews</li> </ul>	<ul style="list-style-type: none"> <li>Commercial sensitivity</li> <li>Burden</li> </ul>
Manufacturers – packaging	<ul style="list-style-type: none"> <li>Easy to understand regulations</li> <li>Easy to comply with regulations</li> <li>Effective and efficient systems for recording and reporting data</li> <li>Material supply security</li> <li>Material supply quality</li> <li>Healthy market for packaging</li> </ul>	<ul style="list-style-type: none"> <li>Provision of compliance data</li> <li>Qualitative interviews</li> </ul>	<ul style="list-style-type: none"> <li>Commercial sensitivity</li> <li>Burden</li> <li>Potential for error in data returns</li> </ul>

	Profit		
Manufacturers – products (fillers)	<p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Packaging integrity and effectiveness</p> <p>Material supply security</p> <p>Material supply quality</p> <p>Brand reputation / competitive advantage / customer loyalty and satisfaction</p> <p>Profit</p>	<p>Provision of compliance data</p> <p>Qualitative interviews</p>	<p>Commercial sensitivity</p> <p>Burden</p> <p>Potential for error in data returns</p>
Retailers	<p>Easy to understand regulations</p> <p>Easy to comply with regulations</p> <p>Effective and efficient systems for recording and reporting data</p> <p>Packaging integrity and effectiveness</p> <p>Brand reputation / competitive advantage / customer loyalty and satisfaction</p> <p>Increased footfall</p>	<p>Provision of compliance data</p> <p>Qualitative interviews</p>	<p>Commercial sensitivity</p> <p>Burden</p> <p>Potential for error in data returns</p>
Local authorities	<p>Increase in quality of recyclate</p> <p>Cost of waste management</p>	<p>Captured through WasteDataFlow and existing Gate Fees Reports</p>	<p>No additional burden</p>

	Reduction in litter clean-up costs	Captured through MHCLG street cleansing costs <sup>47</sup>  Possible survey or interviews to ask views of LA's	Potential burden on LAs' time if carried out
Waste management companies	Increase in quality of recyclate  Increase in quantity of recyclate  Improved material price  Profit	MF portal  Qualitative interviews	Commercial sensitivity  Burden  Participation in primary research not mandated – potential low response rates
Trade associations	Represent member interests	Qualitative engagement	
The public	Able to redeem their deposit conveniently	WRAP's annual consumer recycling tracking survey	Additional questions would need to be added
The Deposit Management Company		Qualitative interviews	

## 6.6 Limitations, risks and constraints

In addition to the overarching limitations, risks and constraints set out in 1.7, the evaluation of the measures to implement a DRS has a further issue relating to data availability.

### 6.6.1 Data availability

This evaluation of the DRS will rely on data from multiple sources. Some of these will be necessary for the operation of the DRS and are expected to be available via the DMO. However others, such as kerbside waste composition data and litter surveys, will be reliant on ongoing funding. In particular The Local Environmental Quality Survey of England

<sup>47</sup> Modelling would need to be applied to estimate drinks containers portion

(LEQSE) is not directly funded by Defra and was not undertaken by KBT in 15/16 and 16/17.

## 6.6.2 Calculating litter disamenity effects

It is difficult to obtain measurements of litter disamenity effects as there are no empirical data directly valuing the costs associated with the distress to people affected by the unhygienic and unsightly conditions arising from litter. Attempts are being made to estimate valuations of disamenity by conducting sample studies applying various stated preference methodologies, such as contingent valuation techniques, including willingness to pay surveys, and possibly choice experiment procedures.

## 6.7 Proposed stages of evaluation

An initial high level proposal of the steps in the evaluation is set out in Table 13. This will be developed further during the scoping phase.

**Table 13: High level proposed plan for evaluating a DRS**

Step 1. Initial systems mapping and theory of change development with stakeholders
Step 2. Scoping of the evaluation project within Government, including establishing data availability and data gaps
Step 3. Preparation of a tender specification
Step 4. Tendering process
Step 5. Initiation
Step 6. Rapid evidence review of relevant evaluations Methodology development, including implications for policy implementation
<i>Policies are implemented, subject to consultation</i>
Step 7. Update systems and logic maps
Step 8. Collect year 1 outcome data
Step 9. Analysis of year 1
Step 10. Reporting of year 1 and feedback into policy
Step 11. Further evaluation

# 7 Evaluation of the effectiveness of Government policies in reducing the damage caused by plastics to the natural environment

## 7.1 Background

We use five million tonnes of plastic in the UK every year, nearly half of which is packaging, and demand is rising<sup>48</sup>. The Resources and Waste Strategy sets out the government's ambition for reducing the damage caused by plastics to the natural environment by:

- Preventing plastic from entering the environment in the first place
- Eliminating avoidable plastic waste over the lifetime of the 25 Year Environment Plan (by the end of 2042)
- Where plastics are used, reducing the amount sent to landfill and incineration and re-using or recycling them whenever it is technically, environmentally, and economically practicable to do so
- Supporting industry and academia to develop novel solutions and improve the efficiency, cost and/or effectiveness of existing technologies
- Supporting industry and developing policy proposals to reduce the impacts of microplastics in the water system and marine environment
- Leading international efforts and helping developing nations reduce their plastic waste.

The specific measures outlined in the Strategy are:

- Invoke the 'polluter pays' principle and extend producer responsibility for packaging, ensuring that producers pay the full net costs of disposal for packaging they place on the market
- Harness the potential of extended producer responsibility for other product types [see chapter 5 for further details on evaluating producer responsibility]
- Increase the existing 5p carrier bag charge and extending it to all retailers (including SMEs) on a mandatory basis (subject to government response to the public consultation)
- Introduce a Deposit Return Scheme (DRS) for drinks containers, subject to further evidence and analysis [see chapter 6 for further details on evaluating a DRS]

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<sup>48</sup> British Plastics Federation (2016) [http://www.bpf.co.uk/sustainability/plastics\\_recycling.aspx](http://www.bpf.co.uk/sustainability/plastics_recycling.aspx)



- Stimulate demand for recycled plastic by introducing a tax on plastic packaging with less than 30% recycled plastic
- Ban plastic products where there is a clear case for it and alternatives exist. We have already restricted the sale of plastic microbeads; a ban on plastic drinking straws, stirrers and cotton buds is also planned.
- Improve recycling rates by ensuring a consistent set of dry recyclable materials is collected from all households and businesses [see chapter 4 for further details on evaluating policies to increase the quantity and quality of dry recyclable materials collected from households and business]
- Work internationally to increase the extent and improve the quality of waste management, particularly in developing countries, including through UK aid
- Launch a call for evidence on the development of standards for bio-based, biodegradable and compostable plastics.
- Support further investment in resource efficient technologies, including through the Industrial Strategy Challenge Fund and with UK Research and Innovation (UKRI) on our Areas of Research Interest
- Support WRAP's UK Plastics Pact, an initiative with the Ellen McArthur Foundation to create a circular system that keeps plastic in the economy and out of the natural environment.

## 7.2 Evaluation scope and systems mapping

Defra and the wider government are undertaking many initiatives to reduce the damage caused by plastics to the natural environment. Across government, BEIS, DFID, HMT and others have committed to, or implemented, measures to reduce plastic pollution. Within Defra, working closely with the Resources and Waste Division, the Marine and Fisheries, Floods and Water, and Chemicals Divisions are all engaged in work to reduce the damage caused by plastics.

It is expected that there will be individual evaluations of the particular interventions and a meta-evaluation to review and aggregate the findings. The intention of the project is not to evaluate every activity or intervention undertaken across government. The focus will be on those commitments within the Resources and Waste Strategy, expanding to encompass areas where there is clear overlap. In order to understand the interdependencies and define the boundaries and focus of the evaluation, we will first undertake a systems mapping exercise. Theories of change will be developed for each of the individual evaluations.

## 7.3 Evaluation questions

The overall purpose of the evaluation is to measure what changes have occurred in the production, use and disposal of plastics and to examine the contribution the commitments in the Resources and Waste Strategy have made to these changes.

## **Outcomes: What difference (if any) did the measures make?**

In England:

- What positive or negative changes have been made to the quantity and composition of plastic packaging, including the feedstock from which it is derived (for example whether it's derived from a fossil or bio-based source), placed on the market?
- What positive or negative changes have been made to the quantity of single use plastic bags placed on the market?
- What did consumers do differently in their purchase and in-use behaviours?
- What proportion of plastic packaging is recycled?

Globally:

- What has been the impact in areas receiving overseas aid?

## **Activities, Mechanisms, Contexts and Attribution: Why did observed changes occur?**

- How did the measures work? For whom? Why? And in which contexts and combinations? Did they work as we thought they would? If not, why not?
- Which measures have been less effective? Why? And in which contexts and combinations?
- What were the major factors influencing the achievement or non-achievement of the objectives?
- To what extent did the measures cause these changes? What other explanations are there? Were there any unintended consequences?

## **How were the activities delivered, and what can we learn?**

- What actions were undertaken?
- How effectively were they undertaken? Have the measures been implemented as anticipated?
- What improvements could be made to maximise efficiency and effectiveness?

## **How did the policies in the Resources and Waste Strategy contribute to the observed changes?**

- To what extent (quantitative) and in what ways (qualitative) have the policies changed, influenced or otherwise contributed to the observed outcomes?

- To what extent (quantitative) has the effect been *additional*?
  - How much of the effect would have happened anyway (i.e. deadweight)?
  - How much has been the result of displacement, substitution and leakage (i.e. other non-additional effects)?
- In what ways (qualitative) has the interplay between interventions caused, influenced or contributed to a better or worse outcome?

## 7.4 Evaluation design

### 7.4.1 Evaluation in a complex environment

This evaluation will be designed to take account of complexity. An initial framework is set out below but we will take an iterative approach, adapting plans at each stage based on emerging understanding. The evaluation will not be designed as a single backward-looking assessment, but rather an ongoing process of learning.

- Undertake systems mapping of the RWS policies relating to plastics, placing these alongside other government and sectoral commitments and within the wider social, technical and political context
- Explore with stakeholders what characteristics of complex adaptive systems are at play and how these might influence expected outcomes
- Identify outcomes that could potentially be related to RWS interventions
- Theorise mechanisms and contexts that could have caused these outcomes using a logic model(s)
- Identify evidence requirements:
  - Quantitative data on outcomes (e.g. amounts of plastic packaging placed on the market; amount of polyethylene terephthalate (PET plastic) recycled) – to be tracked over time
  - Data which helps us understand how change has happened, considering the theorised causal chains and networks, and testing whether evidence leads us to confirm, refute or refine our theories
  - Data required to fill gaps in our knowledge of the system
  - Data that help us to identify and measure the effect of theorised unintended consequences
  - Data that provide feedback on changes in context or might alert us to emergent or unexpected outcomes
- Agree initial evaluation approach that best meets data requirements
- Plan stage gates to identify and review changes in context, policies or evaluation, all of which will impact on each other and allow adaptations to evaluation and/or policies as appropriate.

## 7.5 Stakeholders

The main stakeholders in the results of the evaluation are;

- Defra;
- other government departments;
- environmental groups;
- the waste industry;
- retailers, plastic manufacturers; and
- manufacturers who use plastic in their packaging and products.

Stakeholders will be consulted and an engagement plan prepared.

This plan will be updated to include stakeholders' involvement in the evaluation and any constraints to that involvement when the specifics of the evaluation approach have been developed. As a minimum, most stakeholders or their representative trade bodies are expected to contribute to the systems mapping and provide the necessary compliance data as required.

## 7.6 Limitations, risks and constraints

### 7.6.1 Lack of stakeholder engagement

There is a risk that stakeholders will have insufficient time to input effectively. There will need to be a contribution to the initial systems mapping and to the agreed review stages, which will involve light-touch, but ongoing, commitment from stakeholders.

### 7.6.2 Achieving a consensus between partners

There are likely to be different perspectives amongst Defra, stakeholders and delivery partners about how the system works, about the evaluation design and the approach to understanding how effects are delivered. We will work hard to gain a consensus, and where we are collaborating across Government, we will ensure adequate cross-departmental governance is in place for the evaluation.

### 7.6.3 Lack of understanding

The approach outlined here assumes that the stakeholders will, between them, have a sufficient understanding of the system to map the relevant constituent parts and the relationships between them, and to be attuned on an ongoing basis to changes on the ground. Within the scope of our work, there are a huge number of actors and dependencies, some of which are operating at a global level; the breadth of the landscape may be too great to fully capture each of the relevant components adequately, which will impact on our ability to fully understand the outcomes of our policies. For example, incidence of marine plastic pollution will necessarily be affected by changes across the

globe – not just in England – so establishing the extent to which any observed changes, even around our coast, are due to Government policy will be challenging.

#### **7.6.4 Uncertainty**

As parts of this evaluation will not start for several years, we do not know at this stage what data will be available, or the quality of that data. Furthermore, the evaluation design or data collection may be constrained by budget. We will need to cost the initial evaluation plan and may need to review and amend it according to the available budget.

#### **7.6.5 Missed impacts**

There is huge public and media interest in eliminating the use of plastics, and this interest gained momentum very quickly. The Government has responded quickly and robustly to the public's concerns in the RWS, but given the pace of change in the public's perception over a short period of time, measuring the change in how plastics are produced, used and disposed of may be challenging, posing the risk that some impacts may be missed as part of this evaluation.

### **7.7 Timing of the Evaluation**

We will undertake systems mapping with stakeholders and the outcomes of this process will determine the timing for the rest of the project, and will be dependent on data requirements and availability, the evaluation approach and the agreed review period. It is anticipated that the schedule will remain flexible to take account of any emergent or unexpected outcomes.

# 8 Evaluating the impact of the strategy

## 8.1 Background

The Resources & Waste Strategy, and the specific policy initiatives that flow from it, are expected to be important drivers of change in England. However, some improvements would have happened anyway, and some improvements may be due to other factors entirely. Some things may get worse. There may also be escalation or de-escalation effects; the speed of any changes may be influenced by the Strategy, or other external factors.

This project aims to make an assessment of the extent to which the initiatives set out in the Strategy are contributing to any observed changes in the indicators as described in Chapter 2. The purpose of the evaluation is to feed insight and learning back into policy development.

## 8.2 Theory of change

For the purposes of this project we believe that the Resources and Waste Strategy will make a difference in four main ways:

1. The process of developing the 2018 strategy document, and in particular the consultation that occurred in collaboration with stakeholders, created change in and of itself due to the raised profile of action on resources and waste
2. The fact that government policy was explicitly stated in the strategy document, effectively a strategic steer for England, created certainty of direction, enabling investments to be made
3. The key policy interventions that flowed from the strategy directly created change, in particular:
  - a. an improved extended producer responsibility scheme, for packaging in the first instance, expanding to encompass other products.
  - b. a Deposit Return Scheme (DRS) for single-use drinks containers;
  - c. a core set of dry recycling materials to be collected from all households and businesses
  - d. separate collections of food waste from households
  - e. a tax on plastic packaging with less than 30% recycled plastic
4. As well as the effects directly caused by the policy interventions, the prominence and influence of the interventions will lead to spill-over effects, creating further positive changes.

These theories should be expanded upon as part of the development of theory of change, and consideration of alternative explanations and unintended consequences built in.

## 8.3 Evaluation questions

The objective of the evaluation will be to assess the extent to which the Strategy has been a driving force behind change, to document the ways in which this has occurred, seek explanations where there is no evidence that the measures are responsible for the change, all with a view to providing learning to feed into policy review and new policy development.

The evaluation will seek to answer the following specific questions:

1. To what extent (quantitative) and in what ways (qualitative) has Government's Resources and Waste Strategy caused, influenced or otherwise contributed to the observed outcomes?
2. To what extent (quantitative and qualitative) has the effect been *additional*?
  - a. How much of the effect would have happened anyway (i.e. deadweight)?
  - b. How much has been the result of displacement, substitution and leakage (i.e. other non-additional effects)?
3. In what ways (qualitative) has the interplay between interventions caused, influenced or contributed to better or worse outcomes?
4. What can we learn about causality in resources and waste policy to help us make better policy in future?

## 8.4 Evaluation design

The evaluation is a process evaluation consisting of primarily qualitative research.

The evaluation will be theory-driven so will start with refinement of the high level theory of change in section 8.2 above. This will set out the ways we would expect the interventions to work, for whom, and in what context. These theories will then form a framework within which evidence will be collected. The way in which this will be done will depend on the methods chosen. We have chosen to not specify methods at this point in time but envisage methods such as realist evaluation or process tracing. We will consult internally and externally with experts in evaluation before finalising the method, and may even leave it unspecified as we enter the procurement process to allow freedom for tenderers to set out their recommendations.

It is unlikely that any of the theories may be amenable to testing using experimental and quasi-experimental methods but we will not rule out these approaches as they provide a strong counterfactual and, provided they are well-designed, enable robust evidence to be collected about whether the intervention caused the outcome. The specific requirements of the experiment would need to be designed into the way the policy is rolled out so engagement between evaluators and policy leads within Defra will be important for success. The Cross-Government Trial Advice Panel, which consists of experts in

experimental methods, should be consulted at the appropriate time if experimental methods are selected.<sup>49</sup>

One alternative approach to testing causality is qualitative comparative analysis (QCA). This relies on formal logic to analyse the causal contribution of different aspects of an intervention and the context in which it is implemented to an outcome of interest. Data is collected on the configuration of conditions associated with an outcome, and these are then reduced down to the minimum set of conditions (both presence and absence) that can explain an outcome.

Experimental methods, quasi-experimental methods and QCA are useful for assessing whether a particular intervention worked at a particular time in a particular context. They may not on their own, however, be able to provide insight about *why* interventions worked and whether they would work in the same way if replicated. Experimental, quasi-experimental and QCA-type methods will therefore be accompanied by qualitative research to answer the 'in what ways' aspects of the evaluation questions. A theory-driven method such as realist evaluation, contribution analysis or the use of operational research techniques such as simulation modelling may be effective ways to collect the qualitative data in a robust way.

## 8.5 Evidence collection

### 8.5.1 Outcomes

This is the starting point for the evaluation and is not subject to testing. The outcome data will come from work carried out by Defra to report against performance indicators (see chapter 2) or from small amounts of primary research to be carried out as part of the evaluation project if the KPI data needs to be supplemented.

### 8.5.2 Theories of change

A theory of change will be generated as part of the evaluation. This will be compiled through a process of theory development and sense-testing with policy leads and external stakeholders.

### 8.5.3 Causal factors

This depends on the approach used. If **experimental** or **quasi-experimental**, the process will consist of designing a trial where all factors are held constant apart from the anticipated causal factor(s).

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<sup>49</sup> [www.gov.uk/government/publications/cross-government-trial-advice-panel-role-and-membership](http://www.gov.uk/government/publications/cross-government-trial-advice-panel-role-and-membership)



If **QCA** is used, data collection will focus on gathering information about aspects of the intervention and the context in such a way that they can form arrays of data, typically in a binary form (e.g. present/absent). An example might be the roll out of consistency; if different outcomes are observed in different local authorities despite at face value the same scheme being present, a dataset can be created containing a range of variables that might be related to the outcomes, such as population density, affluence, quality of communication materials. QCA would enable patterns to be identified from the data array.

If a **realist** approach is adopted, data collection will consist of seeking evidence to support, refute or refine specific context-mechanism-outcome configurations. This would normally be a combination of quantitative and qualitative data (although the focus would be on qualitative) from as many sources as possible to enable triangulation. In realist evaluation, the emphasis is on the way specific contextual factors, specific interventions and specific people interact with one another to trigger mechanisms that lead to outcomes.

If a **contribution analysis** methodology is used, data collection will consist of seeking evidence that explains how each link in the causal chain works in practice, considering not only the most likely causal chains but also explicitly considering alternative explanations. The evidence can come from any source and may be quantitative or qualitative in nature. The evidence is then analysed and a succinct 'story' created of how the intervention contributed to the observed outcomes. The approach is iterative, with weaknesses in the evidence being identified and gaps filled as an integral part of the method, until all avenues have been exhausted and the story is as strong as it can be. Stories are by nature qualitative but there is no reason why quantitative data cannot be included.

## 8.6 Stakeholders

In this evaluation it will be particularly important to involve stakeholders in assessing the role of Strategy development in influencing outcomes. The development and sense-testing of theories of change also seems to call for stakeholder participation. Precisely how this is done will depend on the design of the evaluation, but it is envisaged they would be invited to take part in theory-building workshops and would be interviewed as part of the primary research.

## 8.7 Quality assurance

An external peer reviewer will be contracted for this project. The peer reviewer will be an expert practitioner in the evaluation method that is adopted for this project.

All data will be managed in line with the requirements of the Aqua Book. The method will comply with best practice as set out in the Magenta Book and, where relevant, the Green Book.

## 8.8 Limitations, risks and constraints

### 8.8.1 Outcome data not available on time

Outcomes are the starting point for this project, and without solid outcome data it will not be possible to assess whether the Strategy has caused, influenced or otherwise contributed to them. The first stage of the project should therefore be to assess its viability; if no outcomes have been recorded then the project should be delayed or abandoned.

### 8.8.2 Recall error

Part of the project involves assessing the role of the Strategy development process. This occurred in 2018 but the project is not due to start until 2024 or 2025 by which time participants in the process may have moved on, and at the very least the process will be hazy in the minds of those who are still in the same role.

We will interview the stakeholders in 2020/21 and again in 2023/24. The intention is to mitigate some of the risk of recall error by interviewing participants in advance of any outcome data being available. The objective of the first wave of interviews will be to capture any early thinking or strategic changes as a result of the Strategy. The second wave will happen after some of the key measures covered by this Evaluation Plan have come into operation, so that participants will be in a position to talk about any changes that they have implemented and the reasons for those changes.

## 8.9 Proposed stages of evaluation

The evaluation cannot be started until there are measurable outcomes, and ideally at least three data points. Because it takes outcomes as the *starting point* of the substantive evaluation it would be sensible to schedule it to occur after the evaluations of the specific interventions which will be collecting data and insight on outcomes. This suggests a 2027 start date at the earliest. An outline proposal of the steps in the evaluation is shown in Table 14.

**Table 14: High level proposed plan for project to assess the role of the Resources and Waste Strategy in driving national improvements**

Step 1. Initial systems mapping and theory of change development with stakeholders
Step 2. Primary research with stakeholders
Step 3. Assess whether outcome data is available
Step 4. Scoping of the project within Government

Step 5. Preparation of a tender specification
Step 6. Tendering process
Step 7. Initiation
Step 8. Rapid evidence review of relevant evaluations
Step 9. Make necessary updates to theories of change
Step 10. Research and evidence gathering
Step 11. Analysis
Step 12. Reporting