



Rialtas na hÉireann  
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**Environmental Protection Agency**  
**An Ghníomhaireacht um Chaomhnú Comhshaoil**

**EPA Research Programme 2014–2020**

# **Sustainability Research Call 2019 – Technical Description Document**

The EPA Research Programme is a Government of Ireland initiative funded by the Department of Communications, Climate Action and the Environment

# EPA Research Programme 2014–2020

## Sustainability Research Call 2019

This document provides the Technical Description for the Environmental Protection Agency (EPA) Sustainability Research Call 2019. Applicants should read the following carefully and consult the other documentation provided (e.g. Guide for Applicants, Guide for Grantees, Terms and Conditions for Support of Grant Awards).

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## Introduction

The EPA's Research Programme 2014–2020 is designed to identify pressures, inform policy and develop solutions to environmental challenges through the provision of strong evidence-based scientific knowledge:

- **Identifying Pressures:** Providing assessments of the current environmental status and future trends to identify pressures on our environment.
- **Informing Policy:** Generating evidence, reviewing practices and building models to inform policy development and implementation.
- **Developing Solutions:** Using novel technologies and methods that address environmental challenges and provide green economy opportunities.

## Ireland's Environment

Ireland's State of the Environment Report (SoER)<sup>1</sup> 2016 states that, although the overall quality of Ireland's natural environment is "good", this must be qualified. There are many challenges surrounding its protection, both now and into the future, along with more immediate local environmental issues that need to be resolved, such as air quality, water pollution, odours and noise. Many of these problems can be masked by national-level assessments but can have severe impacts on the health and wellbeing of people in individual communities and on the quality of the local environment. From an emerging risks perspective, we need to be vigilant in relation to climate change-induced health risks, antimicrobial resistance and new chemicals and substances.

## EPA Sustainability Research

The EPA Research Programme has a strong focus on policy and is driven by national policy and strategy, European directives and international policy commitments, such as the United Nations Sustainable Development Goals. The EPA recognises the importance of Ireland's role and the role of research in advancing the Sustainable Development Goals to protect the planet from degradation, by sustainably managing its natural resources and taking urgent action on climate change so that it can support the needs of present and future generations.

The EPA Sustainability Research Pillar is structured into four thematic areas of research, as follows:

**Theme 1:** Resource Efficiency;

**Theme 2:** Health and Wellbeing including Radiation Protection;

**Theme 3:** Natural Capital and Ecosystem Services including Soils and Biodiversity;

**Theme 4:** Socio-economic Aspects of a Sustainable Environment.

Research conducted under the umbrella of the Sustainability Research Pillar is cross-cutting with complementarity and links across the four themes listed above. These links also extend to the Water and Climate Research Pillars. Multi- and inter-disciplinary research is required on these themes, with expected social, economic, technological, environmental and policy impacts.

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<sup>1</sup> [http://www.epa.ie/pubs/reports/indicators/SoE\\_Report\\_2016.pdf](http://www.epa.ie/pubs/reports/indicators/SoE_Report_2016.pdf)

## Funding Structure

The EPA invites research proposals under the specific topics listed in Table 1.

Proposals can be Desk Studies, Research Fellowships, Medium Scale Projects or Large Scale Projects:

**Desk Studies** will typically last from 9 to 12 months, with an indicative cost of up to €100,000;

**Research Fellowships** will typically last for 24 months, with an indicative cost of up to €175,000;

**Medium Scale Projects** will typically last from 24 to 36 months, with an indicative cost of up to €350,000;

**Large Scale Projects** will typically last from 36 to 48 months, with an indicative cost of up to €500,000.

## Co-funding and Partnerships

Co-funding will be provided by the following organisations:



An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine

In carrying out its mandate, the **Department of Agriculture, Food and the Marine (DAFM)** undertakes a variety of functions, including:

- policy advice and development in all areas of departmental responsibility;
- representation at national, European and international negotiations;
- development and implementation of national and EU schemes in support of agriculture food, fisheries, forestry and the rural environment;
- monitoring and controlling aspects of food safety;
- control and audit of public expenditure under its control;
- regulation of the agriculture, fisheries and food industries through national and EU legislation;
- monitoring and controlling of animal and plant health and animal welfare;
- monitoring and direction of state bodies engaged in the following areas: research training and advice, market development and promotion, industry regulation and development, commercial activities;
- direct provision of support services to agriculture, fisheries, food and forestry.

The DAFM operates three “public good” competitive research funding programmes for agriculture, food and forestry to support innovation and economic success across the bioeconomy. The DAFM also provides support for Irish involvement in the EU Horizon 2020 research funding programme.



The **National Parks & Wildlife Service (NPWS)** is part of the Heritage Division of the Department of Culture, Heritage and the Gaeltacht. One of its roles is to secure

the conservation of a representative range of ecosystems to maintain and enhance populations of flora and fauna in Ireland. In this it is supported by national and EU legislation and policies for nature conservation and biodiversity, including the [EU Habitats and Birds Directives](#).



The **European Recycling Platform (ERP)** is Ireland's only pan-European compliance scheme for waste electrical and electronic equipment (WEEE) and waste battery recycling and is an approved body under the Waste Management [Waste Electrical and Electronic

Equipment (WEEE)] Regulations (S.I. No. 355 of 2011). ERP's mission is to develop high-quality, cost-effective recycling services for the benefit of producer members, consumers and ultimately the environment and society. ERP Ireland has considerable expertise in managing WEEE and waste battery compliance for its members across various industry sectors, from information technology to pharmaceuticals, and various organisational sizes, from small- to medium-sized businesses to some of the largest multinationals in the world. For more information, please visit [www.erp-recycling.ie](http://www.erp-recycling.ie)



**WEEE Ireland** is the largest compliance scheme for the management of WEEE and waste batteries in Ireland. The not-for-profit scheme, approved by the Minister for the Environment, works with a community of organisations on behalf of its members to help meet

their producer responsibilities under Irish legislation. WEEE Ireland works closely with retailers, local authorities, other collection points and stakeholders at a national level to develop the WEEE and battery take-back system in Ireland. It also works with European colleagues in the WEEE Forum and Eucobat to share experiences, technical information and best practice in compliance scheme management on behalf of its members. For more information, please visit [www.weeireland.ie](http://www.weeireland.ie)



The **Marine Institute (MI)** manages competitive marine research funding programmes. Its competitive research awards have supported more than 260 researchers in the period 2007–2013. It also provides information on marine research funding opportunities from national and EU programmes.

# Application Process

## Making an Application

Applications **must** be made online at <https://epa.smartsimple.ie>

You will also need to refer to the following documentation, which is available to download from the EPA's Online Grant Management and Application Portal or from the [EPA website](#):

1. 2019 Guide for Applicants;
2. 2019 Terms and Conditions for Support of Grant Awards;
3. EPA Online Grant Management and Application Portal – User Guide for Applicants;
4. EPA Online Grant Management and Application Portal – Registration and General User Notes.

### IMPORTANT:

1. Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified**.
2. **For all co-funded topics**, researchers **may not** apply for or participate in projects that are to be co-funded by their organisation, even if their organisation would not be in receipt of funding.

## Value for Money

All research proposals **must** build on findings and recommendations from past and current research<sup>2</sup> projects (where relevant). Applicants **must** clearly demonstrate the value for money of their proposal and that the amount requested as the project budget will allow the proposed research to be addressed appropriately.

## Open Access and Open Data

All projects must comply with the EPA's Open Data and Open Access rules, which are aligned with Horizon 2020 for the 2014–2020 EPA Research Programme.

## Deadlines

It is the responsibility of the Applicant to ensure that proposals are submitted before the call deadline, and the responsibility of the relevant Grant Authoriser (i.e. Research Offices/Managing Directors for companies) to ensure that proposals are authorised before the organisational approval deadline. **FAILURE TO MEET EITHER OF THE ABOVE DEADLINES MEANS THAT YOUR PROPOSAL WILL NOT BE CONSIDERED FOR FUNDING.**

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<sup>2</sup> Including EPA-funded, other Irish and EU and international research projects and initiatives/activities.

## List of Topics

The EPA invites research proposals under the topics listed below for the Sustainability 2019 Call.

Up to one award is expected for each of the topics included in the 2019 Call. Awards will be funded from the 2019 and 2020 EPA budget (depending on budget availability). **Topics listed with an (\*) may be placed on a Reserve List to be progressed in 2020, conditional on budget availability.**

**Table 1. List of topics for the Sustainability 2019 Call**

Call Topic Reference	Thematic Areas and Call Topic Titles	Max Budget (€) Per Project	Co-funded By
<b>Theme 1: Resource Efficiency</b>			
Sustainability 2019 Call – Project 1	Biodegradable, compostable and/or recyclable bio-based plastics: innovative production to end-of-life management	€500,000	DAFM
Sustainability 2019 Call – Project 2 (*)	Solutions to enable conversion of mixed urban bio-waste into sustainable feedstock for the circular bio-based industry	€400,000	
Sustainability 2019 Call – Project 3	Identifying sustainable waste management practices in approaches to treatment options and their potential to reduce carbon emissions	€300,000	
Sustainability 2019 Call – Project 4	Understanding the nature and extent of food losses and food waste from primary production in Ireland	€100,000	
Sustainability 2019 Call – Project 5	What is a realistic model for setting targets for environmental management of long-life products at their end of life?	€100,000	ERP; WEEE Ireland
Sustainability 2019 Call – Project 6	The impact of online sales into the Irish market on waste generation and target achievement	€100,000	ERP; WEEE Ireland
<b>Theme 2: Health and Wellbeing including Radiation Protection</b>			
Sustainability 2019 Call – Project 7	State of the art of the potential human health impacts of odour from industrial and waste facilities licensed by the EPA	€100,000	
Sustainability 2019 Call – Project 8	Mitigating impacts of pesticide use on drinking water quality	€450,000	DAFM

Call Topic Reference	Thematic Areas and Call Topic Titles	Max Budget (€) Per Project	Co-funded By
Sustainability 2019 Call – Project 9	Radioactivity in the coastal environment	€200,000	
<b>Theme 3: Natural Capital and Ecosystem Services including Soils and Biodiversity</b>			
Sustainability 2019 Call – Project 10 (*)	Bat surveillance: ecosystem services of Irish bats	€350,000	NPWS
<b>Theme 4: Socio-economic Aspects of a Sustainable Environment</b>			
Sustainability 2019 Call – Project 11	Holistic sustainability performance assessment of Irish ports/harbours	€250,000	MI
Sustainability 2019 Call – Project 12	Assessing the impact of green public procurement on achieving sustainability	€100,000	
Sustainability 2019 Call – Project 13	Examination of the effectiveness of EPA industrial licensing	€175,000	
Sustainability 2019 Call – Project 14	Options to enhance public engagement with consultation on plans and programmes during SEA processes	€100,000	
Sustainability 2019 Call – Project 15	Tiering of environmental assessments – the influence of SEA on project-level EIA	€100,000	
Sustainability 2019 Call – Project 16	Analysis of the effectiveness of, and maximising, behaviour change initiatives to reduce consumer food waste	€250,000	



# Call Content

## Theme 1: Resource Efficiency

In a world with growing pressures on resources and the environment, Ireland has no choice but to transition to a resource-efficient and ultimately regenerative circular economy. Irish and European Union policy is driving this transition. This challenge presents us with many opportunities. Increasing resource efficiency is key to securing growth and jobs for Ireland, as well as reducing our carbon footprint, limiting the environmental impact of resource use and increasing our sustainability.

The overall goal for this thematic area is to support research that will deliver solutions for more efficient use of resources, water and materials. In line with the Waste Framework Directive<sup>3</sup>, waste treatment hierarchy, waste prevention and waste minimisation should be prioritised. Where waste arises, research will be supported into approaches and technologies that recover the value in waste to yield raw materials for other processes and/or energy.

Resource efficiency research will have four subthemes:

1. supporting policy and enforcement;
2. resource-efficient production;
3. waste as a resource;
4. sustainable waste treatment options.

**IMPORTANT:** Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified.**

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<sup>3</sup> <http://ec.europa.eu/environment/waste/framework/>

<b>Six topics are included in the EPA Sustainability 2019 Call under Theme 1: Resource Efficiency</b>	
<b>Sustainability 2019 Call – Project 1</b>	Biodegradable, compostable and/or recyclable bio-based plastics: innovative production to end-of-life management
<b>Sustainability 2019 Call – Project 2</b>	Solutions to enable conversion of mixed urban bio-waste into sustainable feedstock for the circular bio-based industry
<b>Sustainability 2019 Call – Project 3</b>	Identifying sustainable waste management practices in approaches to treatment options and their potential to reduce carbon emissions
<b>Sustainability 2019 Call – Project 4</b>	Understanding the nature and extent of food losses and food waste from primary production in Ireland
<b>Sustainability 2019 Call – Project 5</b>	What is a realistic model for setting targets for environmental management of long-life products at their end of life?
<b>Sustainability 2019 Call – Project 6</b>	The impact of online sales into the Irish market on waste generation and target achievement

<b>Call Topic Title:</b>	Biodegradable, compostable and/or recyclable bio-based plastics: innovative production to end-of-life management		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 1		
<b>Project Type:</b>	Large Scale Project		
<b>Maximum Budget:</b>	€500,000	<b>Maximum Duration:</b>	48 months
<b>Co-funded by:</b> Department of Agriculture, Food and the Marine			

## Background

Bio-based plastics have the potential to play a vital role in our transition to a sustainable circular economy, assisting with reducing our carbon emissions targets as well as positively contributing to our environment, economy and society. The revised European Union Bioeconomy Strategy<sup>4</sup> seeks to strengthen the bio-based sector and sustainably use bio-based resources to make materials such as plastics, thus replacing fossil fuel chains. Biodegradability, compostability and recyclability of bio-based plastics can offer considerable added value in terms of sustainability; however, a significant challenge facing bio-based plastics is their ability to compete with fossil-based counterparts in terms of price and performance. Hence, there is a need to identify innovative production routes that can offer competitive and sustainable alternatives and which are scalable to an industrial level.

The end-of-life fate and management of bio-based plastics is a separate challenge that must be overcome to promote to the market the implementation of bio-based solutions and prevent these materials from causing pollution in soil and water or going to landfill. Currently, bio-based plastics cannot be appropriately addressed in the waste management process because of a lack of data/knowledge on whether or not they are appropriate for mechanical recycling. Hence, there is an urgent need to assess and provide informed evidence on the options for end-of-life management of these plastics in the current and future waste management infrastructure/system and data are required to assist with implementation of this market to ensure appropriate recovery/disposal.

## Scope

There are two aspects to the current proposed research:

1. For the first aspect, innovative research proposals are invited that could address either of the following two avenues of research:
  - i. identify and validate novel production routes from biomass to biodegradable, compostable and/or recyclable bio-based plastics that can compete with fossil-based counterparts in terms of price, performance and environmental sustainability; **or**
  - ii. identify and validate novel production routes from biomass streams to bio-based plastics that can be recycled at end of life into comparable products and that are competitive compared with fossil-based plastics in terms of price, performance and environmental sustainability.

<sup>4</sup>

[https://ec.europa.eu/research/bioeconomy/pdf/ec\\_bioeconomy\\_strategy\\_2018.pdf#view=fit&pagemode=none](https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none)

Within this aspect of the research, an evaluation of the waste hierarchy should be performed to consider the intervention position for substitutes to fossil resources, in particular bio-based, recyclable and marine biodegradable substitutes for plastic.

Proposals should include an environmental assessment using consequential life-cycle assessment methodologies and cost analysis. Proposals should also include a viability performance check of the developed process(es) based on available standards, certification and accepted and validated approaches, as well as measurement and testing approaches allowing for future regulatory compliance checks, such as biodegradability, compostability and/or recyclability laboratory and field testing.

## AND

2. For the second aspect, innovative research proposals are invited that could provide an assessment of the processing and treatment of bio-based and biodegradable plastics, as well as the end-of-life management fate of those that are currently on the market or close to entering the market.<sup>5</sup> In this regard, research is required to increase understanding of the following aspects:
  - performance in commercial composting facilities, as well as home composting units;
  - determination of how bio-based and biodegradable plastics function in mechanical recycling, alone and when mixed with fossil-based plastics;
  - assessment of how a mixture of bioplastics, biodegradable plastics and conventional fossil-based plastics perform in thermochemical processing;
  - Investigation of how separation technologies can be deployed to separate fossil-based, bio-based and biodegradable plastics from each other in a plastic mix (to aid with recycling);
  - in the anaerobic digestion of commercial bioplastics, determination of the biogas outputs, residence times and performance when mixed with organic waste and the percentage of bioplastics that can be tolerated or benefit the anaerobic digestion system;
  - investigation of how bioplastics may be broken down to produce building blocks of value.

The proposed research may need to focus on a small number of bioplastics to ensure adequate depth to the research. The research should identify the implications of the research for the circular economy and the bioeconomy as they relate to Ireland and should outline the research infrastructure that is required to address the environmental sustainability of existing and emerging bioplastics.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

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<sup>5</sup> Examples include, but are not limited to, polylactic acid (PLA), thermoplastic starch (TPS), polybutylene succinate (PBS), polyhydroxyalkanoate (PHA), cellulose-based plastics, polybutylene adipate terephthalate (PBAT), polycaprolactone (PCL), polyethylene furandicarboxylic acid (PEF) and composites of the aforementioned plastics.

## **Outputs**

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Solutions to enable conversion of mixed urban bio-waste into sustainable feedstock for the circular bio-based industry		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 2		
<b>Project Type:</b>	Large Scale Project		
<b>Maximum Budget:</b>	€400,000	<b>Maximum Duration:</b>	48 months

## Background

In Ireland, an estimated 63% of the population currently resides in urban areas, with this number set to rise to over 75% by 2050.<sup>6</sup> This expanding level of urbanisation concomitantly results in higher levels of municipal waste generation, with organic waste representing a significant fraction of, as well as significant pressures in terms of, wastewater production, treatment and management. Recovery of key usable components from urban bio-waste streams and valorisation to high value-added compounds/products represents an innovative solution that supports development and deployment of a circular local bioeconomy<sup>7</sup>.

There is a need to develop and implement effective and efficient solutions that overcome issues related to dilution, pollution and disparity of content, to enable utilisation of urban bio-waste as a sustainable feedstock for the bio-based industry in Ireland. The revised European Union (EU) Bioeconomy Strategy<sup>8</sup> has set a number of concrete actions as part of its Strategic Deployment Agenda. One of the five pilot actions to be implemented to enhance synergies between existing EU instruments to support local activities will be an Urban Bioeconomies Pilot. It is expected that this particular pilot will enable 10 European cities to “turn organic waste from a societal problem into a valuable resource for the production of bio-based products”. The establishment of a corpus of Irish research activity is now required in order to place Irish researchers and their stakeholders in a strong position to avail of such demonstration opportunities.

## Scope

Innovative research proposals are invited that could address the following:

- tackle all limitations that impede the conversion of urban waste streams (including urban wastewater, separately collected organic waste, mixed solid municipal waste streams or a combination) into sustainable feedstocks such as chemical precursors, polymers, materials and/or fertilisers at yields that are appropriately scalable to pre-commercial levels;
- applying a cascade-type approach, develop solutions to valorise as much as possible of the target feedstock into a range of products and materials, with energy or biogas valorisation considered only at an appropriate point in the cascade;

<sup>6</sup> United Nations, Department of Economic and Social Affairs, Population Division, 2018. World Urbanization Prospects: The 2018 Revision.

<sup>7</sup> <https://www.ellenmacarthurfoundation.org/publications/urban-biocycles>

<sup>8</sup>

[https://ec.europa.eu/research/bioeconomy/pdf/ec\\_bioeconomy\\_strategy\\_2018.pdf#view=fit&pagemode=none](https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none)

- assess the economic, social and environmental impacts of the developed products/materials or processes using life-cycle assessment methodologies based on accepted and validated approaches.

Proposals should seek co-operation and involvement of key waste management stakeholders to ensure the availability of the urban waste streams under investigation.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

### **Outputs**

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

### **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Identifying sustainable waste management practices in approaches to treatment options and their potential to reduce carbon emissions		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 3		
<b>Project Type:</b>	Medium Scale Project		
<b>Maximum Budget:</b>	€300,000	<b>Maximum Duration:</b>	36 months

## Background

Ireland produced 2.7 million tonnes of municipal solid waste (MSW) in 2016. A total of 42% was recycled to end of waste (EoW) in Ireland or abroad and 32% was processed for treatment in Ireland and abroad as solid recovered fuel (SRF) or refuse-derived fuel (RDF). Although government policy is to reduce our reliance on export markets and secure greater value added from the waste industry's outputs, thereby leading to increased job creation in Ireland, we are still heavily reliant on exports. Carbon emissions associated with the additional transport abroad are not known but are an important measure of the sustainability of the sector. Notably, the waste sector was identified as a sector with significant potential for greenhouse gas (GHG) abatement through circular economy actions.<sup>9</sup>

Irish waste operators can use different practices and approaches in the production of EoW materials. This can involve multiple collection, storage and processing steps and different amounts of domestic and international transport, resulting in varying CO<sub>2</sub> emissions. The numerous differing approaches and the varying CO<sub>2</sub> emissions emanating from each have not yet been assessed. The lack of reliable data means that the carbon emission impact of meeting our circular economy targets, as well as the potential to use sustainable waste management practices to assist towards meeting Ireland's GHG reduction targets, have not been fully assessed.

## Scope

Innovative research proposals are invited that could address the following:

- identify the approaches used for collection, processing and transport of MSW for recycling and recovery of EoW by a number of representative waste operators in Ireland and, using available data sources, determine the CO<sub>2</sub> emissions associated with each step of the approaches examined;
- identify the best practice approach and benchmark in Ireland's waste services for achievement of EoW with the least CO<sub>2</sub> emissions for the main outputs of non-hazardous MSW waste processing, including recyclables, SRF and RDF;
- identify appropriate methods to incentivise adherence to a best practice standard that would optimise the environmental performance of the waste sector;
- develop a tool capable of:
  - calculating CO<sub>2</sub> emissions of the selected waste management approaches in terms of CO<sub>2</sub> emissions per tonne of material reused, recycled or recovered to EoW;

<sup>9</sup> Trinomics B.V., 2018. Quantifying the benefits of circular economy actions on the decarbonisation of EU economy.



- using a life-cycle analysis approach, determining the CO<sub>2</sub> emissions and environmental benefits (including avoidance of virgin materials) of the different waste management options [reuse, recycling, recovery (SRF and RDF) and disposal];
- assess the feasibility of outputs from the calculation tool as a basis for multi-sectoral carbon/GHG taxation or tiered levies for GHG waste emissions to incentivise mitigation.

## **Outputs**

Outputs arising from the research will provide key information to allow Ireland to better model the potential contribution of CO<sub>2</sub> emissions by the waste sector and advise on the potential of the sector to meet GHG emission targets. Outputs will provide information around those waste management practices offering the best environmental outcome and will also guide waste operators in limiting their CO<sub>2</sub> emissions and therefore their exposure to increasing carbon taxes.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Understanding the nature and extent of food losses and food waste from primary production in Ireland		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 4		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months

## Background

Food losses and food waste are significant global and national issues. Reducing food waste is a national priority and is therefore identified as one of the main objectives of the National Waste Prevention Programme.<sup>10</sup> Ireland is among 200 countries that signed up to the United Nations (UN) Sustainable Development Goals (SDGs) in 2015. These goals include a specific commitment on food waste (SDG 12.3):<sup>11</sup> “by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses”. Although there is no food waste reduction target in the European Union (EU) Waste Framework Directive,<sup>12</sup> the EU is committed to meeting UN SDG 12.3 and is considering the possibility of introducing a target for 2030.

In Ireland, it is estimated that 1 million tonnes of food waste are generated per annum. However, this figure does not include the food losses or waste arising within the agriculture and fishery sectors as little is known about the nature or extent of the problem in these sectors or, indeed, if it is a problem in Ireland. To address this issue, there is a need for a quantitative understanding of how much and where food waste is generated/food is lost along the farm-to-fork supply chain and the reasons why.

## Scope

Innovative research proposals are invited to address the knowledge gaps in relation to losses and waste of food intended to be consumed from the Irish agriculture and fishery sectors. Proposals could address the following:

- develop an inventory of currently available data on primary production to address EU monitoring requirements under the EU Waste Framework Directive, as well as data requirements of SDG 12.3;
- identify key information/data gaps that exist and provide recommendations around how these gaps may be addressed;
- identify quantities of food waste generated and characterise points where losses occur along the food chain within the agriculture and fishery sectors;
- investigate the reasons why food losses and waste occur and develop/identify a range of appropriate targeted solutions and policy intervention measures to promote greater resource efficiency in food-production systems.

<sup>10</sup> <https://www.epa.ie/pubs/reports/waste/prevention/reports/TowardsAResourceEfficientIreland.pdf>

<sup>11</sup> <https://sustainabledevelopment.un.org/sdg12>

<sup>12</sup> <http://ec.europa.eu/environment/waste/framework/>

## **Outputs**

Outputs arising from the research will assist Ireland to meet its monitoring and reporting requirements under the EU Waste Framework Directive and to ensure that the necessary data on primary production to meet the requirements of SDG 12.3 are also available. Outputs may also assist in developing greater resource efficiency within these sectors by addressing the inefficiencies identified.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	What is a realistic model for setting targets for environmental management of long-life products at their end of life?		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 5		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months
<b>Co-funded by:</b> WEEE Ireland and the European Recycling Platform			

## Background

Under the European Union (EU) Waste Electrical and Electronic Equipment (WEEE) Regulations,<sup>13</sup> Ireland is required to meet a 65% collection target for WEEE from 2019, with the same or higher targets required in the future. Moreover, a recast of the current EU Battery Directive<sup>14</sup> is likely to impose collection targets on industrial batteries, including lithium electric vehicle/hybrid batteries and storage types.

The emergence of new technologies resulting in longer life products aims to support sustainable energy and lower carbon lifestyles. However, the potential longevity of these products, for example photovoltaic cells and accompanying battery storage systems, means that they do not support the current established model for collection targets under existing Extended Producer Responsibility (EPR) approaches and waste legislation. Moreover, long-life products can somewhat skew the results of current collection and recycling systems compared with the volume of products placed on the market. It is therefore essential for effective financing models to be put in place for long-life products to ensure that their environmental liabilities are appropriately contained under EPR regulations.

## Scope

Innovative research proposals are invited that could address the following:

- determine the most appropriate approach for setting environmental targets for long-life products;
- determine the most appropriate approach for environmental management of, and reporting models for, long-life products under the existing EPR system, with reference to the financial guarantee that producers of these products are obliged to fund.

<sup>13</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0019&from=EN>

<sup>14</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02006L0066-20131230&rid=1>

## **Outputs**

Outputs from this research will provide information and recommendations regarding reporting models of waste generated or arising for long-life products, as a measure of effectiveness of their EPR systems. It is expected that outputs from this research will also support and inform policy efforts regarding financial guarantee and environmental liabilities of new technologies and their producers and end users, while also impacting the reporting by Ireland on environmental management achievements under WEEE and Battery Directives.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	The impact of online sales into the Irish market on waste generation and target achievement		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 6		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months
<b>Co-funded by:</b> WEEE Ireland and the European Recycling Platform			

## Background

There has been a considerable shift in consumer buying to the online marketplace in Ireland in recent years. Euromonitor international figures indicate that Irish consumers are one of the fifth biggest internet shoppers internationally, with electrical and electronic equipment (EEE) representing a considerable share of the observed online sales. The sale of EEE online can pose a number of issues for implementation of waste EEE (WEEE) Extended Producer Responsibility (EPR) initiatives, namely underfinancing of WEEE management costs and issues with physical take-back, as well as impacts on WEEE recycling rates because of under-/overestimation of products placed on the market. A recent Organisation for Economic Co-operation and Development report<sup>15</sup> examining the EPR and the impact of online sales acknowledged that online sales platforms can create free-riding opportunities where producers and sellers avoid compliance, obligation and costs associated with the sale of EEE. This poses considerable challenges for environmental policies and producer responsibilities initiatives.

The scale and speed of change in relation to patterns of online buying in Ireland needs to be understood to inform stakeholders, including regulators, and to ensure that producers and sellers online meet their registration, financial, reporting and take-back commitments.

## Scope

Innovative research proposals are invited that could address the following:

- provide a comprehensive understanding of the scale and nature of free-riding issues that arise in relation to the sale of EEE from an Irish context, using available data regarding revenue customs procedures and classification codes;
- identify and advise on appropriate complementary mechanisms and good practices to address and strengthen enforcement around current free-riding issues.

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[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/EPOC/WPRPW\(2017\)2/FINAL&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/EPOC/WPRPW(2017)2/FINAL&docLanguage=En)

## **Outputs**

Outputs from this research will provide a greater understanding of the role of the online marketplace in Ireland in relation to the extent of free-riding and provide evidence and recommendations that could inform future EPR guidance and legislation.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

## Theme 2: Health and Wellbeing including Radiation Protection

Human health is fundamentally linked to our environment as our health depends on, for instance, the air we breathe, the water we drink, the noise levels we experience, the food we eat and our sense of wellbeing. The EPA addresses a broad range of environmental health issues including those that lie beyond its regulatory remit, such as indoor air quality.

The aim of the research funded under the Health and Wellbeing theme is to:

- develop national capacity in key areas;
- generate data and make assessments of priority issues for Ireland; and
- mobilise this knowledge for use in environment and health protection.

The Health and Wellbeing research theme has five subthemes:

1. ecosystem benefits for health;
2. safe water for drinking, food production and recreation;
3. clean air and noise;
4. chemicals and other threats;
5. radiation protection.

**IMPORTANT:** Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified**.

<b>Three topics are included in the EPA Sustainability 2019 Call under Theme 2: Health and Wellbeing including Radiation Protection</b>	
<b>Sustainability 2019 Call – Project 7</b>	State of the art of the potential human health impacts of odour from industrial and waste facilities licensed by the EPA
<b>Sustainability 2019 Call – Project 8</b>	Mitigating impacts of pesticide use on drinking water quality
<b>Sustainability 2019 Call – Project 9</b>	Radioactivity in the coastal environment



<b>Call Topic Title:</b>	State of the art of the potential human health impacts of odour from industrial and waste facilities licensed by the EPA		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 7		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	9 months

## Background

A large number of complaints received by the EPA regarding licensed sites relate to odour nuisance. In 2017, the EPA received a total of 412 complaints regarding odours arising from EPA-licensed facilities, with sectors responsible for generating the most complaints being the food and drink, waste transfer, landfill and agricultural sectors.

Odour complaints are often accompanied by concerns from members of the public about the potential health impact of the odours. Complainants commonly report symptoms of asthma, nausea, headaches, vomiting, eye, nose and throat irritation, stress and sleep disturbance. EPA licences tackle odour from an air quality and nuisance stance; however, they do not address or monitor the impact of odours from a health and wellbeing perspective.

The aim of this study will be to identify and interrogate current scientific literature in this area and provide an evidence base to inform the public on the health and wellbeing impact, if any, of odours arising from the types of facilities licensed by the EPA.

## Scope

Innovative research proposals are invited to establish the current state of knowledge in this field, identify key knowledge gaps for potential future research and advise on the appropriate channels and formats for communicating the information to the broader public. The research should encompass current knowledge/studies on risk assessment models to assess the likelihood and types of adverse health and wellbeing effects from exposure to odour.

The literature review could address the following:

- any related studies that have taken place before, both nationally and internationally;
- the expected range of odour emission rates based on national and international data, from typical non-hazardous waste transfer stations and food and drink, agricultural and industrial facilities, similar to those licensed by the EPA and which have significant potential for the generation of odorous emissions;
- the individual components of emissions to the atmosphere that cause odour from the different sectors;
- any documented health effects of odours from these facilities on nearby populations;
- the association between self-reported symptoms, clinical measurements and odour exposure;
- any documented health impacts resulting from odours from these facilities;

- any odour-related research work specific to Ireland.

## **Outputs**

Outputs arising from the research will provide a detailed review of current scientific literature in this area and an evidence base to appropriately inform the public on the health impacts of odours emanating from the types of facilities licensed by the EPA, in particular the food and drink, waste transfer, landfill and agricultural sectors. It is anticipated that further research may be carried out in the future to investigate any associations found in this review.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Mitigating impacts of pesticide use on drinking water quality		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 8		
<b>Project Type:</b>	Large Scale Project		
<b>Maximum Budget:</b>	€450,000	<b>Maximum Duration:</b>	48 months
<b>Co-funded by:</b> Department of Agriculture, Food and the Marine			

## Background

Pesticides are used across a variety of sectors and in a wide range of settings in Ireland, with the agriculture sector being one of the largest users. Pesticides can enter surface and groundwater bodies that are used as sources for drinking water (public supplies, large group water scheme supplies and private supplies) through many diffuse and point source pathways.

The current Drinking Water Regulations<sup>16,17</sup> set standards for pesticides at levels considerably below those that would impact human health; however, persistent pesticide failures are being encountered in drinking water supplies in Ireland.<sup>18</sup>

There is a pressing need to reduce the number of pesticide failures in order to minimise potential impacts on the aquatic environment, drinking water quality and, ultimately, human health. To begin to address this issue, we need to better understand the behaviour of certain pesticides under representative Irish environmental conditions. Moreover, we need to identify suitable, effective and targeted mitigation measures and technological solutions to protect Ireland’s drinking water quality both at “source” and “end of pipe”, respectively, and help encourage greater stewardship among pesticide users.

## Scope

Innovative research proposals are invited that could address the following:

- thoroughly investigate the persistence, fate, interactions and cumulative effects of certain pesticides within the Irish environment;
- understand the drivers and pressures, from an Irish context, surrounding use of those pesticides under examination;
- develop a range of scalable prevention and mitigation measures to promote more responsible, sustainable and targeted use of pesticides and perform field trials to test the effectiveness and acceptance of those measures;
- perform a pilot scale assessment of technological methods for efficient and cost-effective removal of pesticides from drinking water supplies.

<sup>16</sup> <http://www.irishstatutebook.ie/eli/2014/si/122/made/en/pdf>

<sup>17</sup> <http://www.irishstatutebook.ie/eli/2017/si/464/made/en/pdf>

<sup>18</sup> [http://www.epa.ie/pubs/reports/water/drinking/2017%20DW%20Report\\_web\\_Final.pdf](http://www.epa.ie/pubs/reports/water/drinking/2017%20DW%20Report_web_Final.pdf)

The proposed research should focus on a number of pesticides of concern from an Irish perspective, with clear justification provided for those pesticides selected.

The proposed research should also focus on **both agricultural and urban pesticide use**.

**Proposals for this topic will be accepted only from multi-disciplinary teams of researchers.** Where possible, a **multi-institutional** approach should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

## Outputs

Outputs arising from the research will provide a key understanding of the behaviour of pesticides of concern from an Irish perspective. Evidence gathered will provide a clearer understanding of the underlying reasons for use of those pesticides examined and recommendations around potential changes to relevant guidance and policies in this area. Detailed guidance and recommendations will be provided around appropriate trialled prevention and mitigation measures (“source” measures) for potential implementation in an Irish context. Outputs will also deliver robust testing and analysis of “end-of-pipe” technology measures to support the achievement of compliance with the Drinking Water Directive<sup>19</sup> pesticide standards. It is envisaged that this research will assist and inform the work of the National Pesticides in Drinking Water Action Group.<sup>20</sup>

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA’s policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

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<sup>19</sup> [http://ec.europa.eu/environment/water/water-drink/legislation\\_en.html](http://ec.europa.eu/environment/water/water-drink/legislation_en.html)

<sup>20</sup> <http://www.epa.ie/water/dw/protectingdrinkingwatersupplies/>

<b>Call Topic Title:</b>	Radioactivity in the coastal environment		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 9		
<b>Project Type:</b>	Medium Scale Project		
<b>Maximum Budget:</b>	€200,000	<b>Maximum Duration:</b>	36 months

## Background

The proposed research should aim to provide a status update on radioactivity in Irish coastal/inshore sediments and organisms, with a focus on evaluation of the effects of material that accumulates or is disposed of in this environment. In relation to naturally occurring radionuclides, European Council Directive 2013/59/Euratom Annex VII (Limits for Exempted Practices)<sup>21</sup> refers to 1 mSv/a above natural background radioactivity. The International Atomic Energy Agency publication IAEA-TECDOC-1759<sup>22</sup> describes approaches to determining the suitability of materials for disposal at sea. This uses the *de minimis* concept and works from a base of 0.01 mSv/a above pre-existing levels for evaluation of naturally occurring radioactive material (NORM), as well as artificial radionuclides. It also describes adoption of reference levels for flora and fauna, incorporating recent recommendations of the International Commission on Radiological Protection, which originated through the European Radioecology Alliance. The radiometric laboratory of the EPA regularly receives samples of material related to dredging activities, for which NORM levels need to be accurately reported. Future resource requirements (in personnel and expertise) to meet the additional needs of European Council Directive 2013/59/Euratom in the areas of NORM have been identified as a key risk for the EPA in the area of radon, radiation monitoring and air quality. The project proposal should address these issues from the perspective of applied environmental radiometrics and radioecology. It should highlight linkages to policy through, for example, the Euratom Directive, Marine Strategy Framework Directive<sup>23</sup> and Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)<sup>24</sup>, as well as implications for stakeholders such as consumers, the inshore fisheries industry, the Department of Communications, Climate Action and Environment, the Department of Agriculture, Food and the Marine and the EPA.

## Scope

Innovative research proposals are invited that could address the following:

- collate and review existing relevant Irish data;
- select and sample locations subject to, or potentially subject to, accumulation of material with the potential to be classified as NORM (“natural” processes resulting in the accumulation of material with elevated levels of radioactivity may also be considered);
- experimentally evaluate radionuclide concentrations in sediments and selected organisms;
- perform modelling of radionuclide transfer and/or radiation exposure.

<sup>21</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0059&from=EN>

<sup>22</sup> <https://www.iaea.org/publications/10841/determining-the-suitability-of-materials-for-disposal-at-sea-under-the-london-convention-1972-and-london-protocol-1996-a-radiological-assessment-procedure>

<sup>23</sup> [http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm)

<sup>24</sup> <https://www.ospar.org/convention>

It is anticipated that the researcher(s) will be trained in and conduct radiometric and radiological analyses at the EPA Radon and Radiation Monitoring laboratory at the EPA Office, Dublin, under the supervision of an EPA member of staff. The project will use and build on recent developments at the laboratory, focusing on low background detection systems and the modelling of summing and attenuation effects in gamma spectrometry, but also including methods such as alpha spectrometry and liquid scintillation counting to facilitate inter-comparison of results. Procedures for measurement of natural radionuclides in different matrices will be tested and refined. This will include evaluations of (dis)equilibrium and detailed uncertainty evaluation.

**All queries must be submitted to [research@epa.ie](mailto:research@epa.ie).**

The proposal should describe particulars of the collaborative arrangement, the multidisciplinary activities that will be established through it, how these will help to develop and apply the expertise of the EPA Radon and Radiation Monitoring Sections and how they will help build the corpus of Irish radiological expertise.

### **Outputs**

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

### **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

## Theme 3: Natural Capital and Ecosystem Services including Soils and Biodiversity

Natural capital refers to the elements of nature that produce value directly and indirectly to people, such as the stock of forests, rivers, land, minerals and oceans. It includes the living aspects of nature, such as fish stocks, as well as the non-living aspects, such as minerals and energy resources.

Natural capital provides a huge range of benefits to us. These benefits, frequently referred to as ecosystem services, include the provision of food, materials, clean water, clean air, climate regulation, flood prevention, pollination, recreation and wellbeing. As the flow of services from ecosystems requires that they function as whole systems, the structure and diversity of ecosystems are important components of natural capital. In this regard, biodiversity, soil composition, land cover and land use are important elements to consider.

We continue to seriously degrade our natural capital, undermining our resilience to environmental shocks and jeopardising our sustainability. Sustainable management of natural capital is therefore required to protect and enhance the services we derive from it. This will require an integrated and cross-sectoral approach, embedding ecosystem approaches such as natural capital, ecosystem services and green infrastructure into policy and practice.

Over the period 2014–2020, the core areas of research will be within the following three areas:

1. evaluation/assessment of our natural capital;
2. managing, protecting and restoring our natural capital;
3. governance and behavioural changes.

**IMPORTANT:** Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA’s Grant Management and Application Portal as **mistakes will not be rectified.**

**One topic is included in the EPA Sustainability 2019 Call under Theme 3: Natural Capital and Ecosystem Services including Soils and Biodiversity**

**Sustainability 2019 Call –  
Project 10**

Bat surveillance: ecosystem services of Irish bats

<b>Call Topic Title:</b>	Bat surveillance: ecosystem services of Irish bats		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 10		
<b>Project Type:</b>	Large Scale Project		
<b>Maximum Budget:</b>	€350,000	<b>Maximum Duration:</b>	48 months
<b>Co-funded by:</b> National Parks & Wildlife Service			

## Background

Bats play an important role in many environments around the world. Some plants depend partly or wholly on bats to pollinate their flowers or spread their seeds, whereas other bats help control pests by eating insects.<sup>25</sup> Pollination benefits production in 75% of the world’s food crops, which represents approximately 10% of the entire economic value of the global food supply, estimated at €153 billion/year.<sup>26</sup> Loss of pollinators could potentially cost consumers €190–310 billion/year. Insects, particularly bees, are considered the most important pollinators globally, but in some parts of the world bats are crucial pollinators. Bats also deliver other key services including pest control, ecosystem regulation and seed dispersal;<sup>27</sup> however, little is known about the ecosystem services provided by Irish bats. There are nine resident species of Irish bats, all insectivorous and protected under national and European Union (EU) legislation (protected under EU Habitats Directive Annex IV 92/43/EEC<sup>28</sup> and Irish Wildlife Act 1976<sup>29</sup>). Bats are found throughout all landscapes and habitats on the island. Ireland is obliged to protect its bat populations, monitor their trends, populations and ecology and report to the EU on a 6-yearly basis.

As major arthropod predators, bats are classified as “keystone species”, ensuring optimal ecosystem functioning across multiple trophic levels. Bats feed on crop pests and the cost of maintaining and controlling these arthropod pest species in the absence of bats, within the USA alone, is estimated as an economic loss of US\$3.7–53 billion/year.<sup>30</sup> In addition, bats feed on biting insects that are disease vectors such as mosquitoes carrying the Zika virus, aphids that carry plant pathogens and botflies that parasitise cattle and sheep. Therefore, the role of bats in maintaining the quality of recreational outdoor areas, limiting crop damage, limiting disease transmission to humans, domestic animals and agricultural crops and ultimately enhancing human wellbeing is immense.

Next-generation sequencing technologies, environmental biodiversity assessment and monitoring projects have been revolutionised and now multiple species can be identified quickly and precisely from non-invasively collected material such as faeces, hair and saliva.<sup>31</sup> These new technologies have resulted in novel genetic methods to monitor “hidden biodiversity”, enabling faster, more precise

<sup>25</sup> <https://www.bats.org.uk/about-bats/why-bats-matter>

<sup>26</sup> Gallai, N., Salles, J.-M., Settele, J. and Vaissière, B.E., 2009. Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. *Ecological Economics* 68: 810–821.

<sup>27</sup> Kunz, T.H., Braun de Torrez, E., Bauer, D., Lobo, T. and Fleming, T.H., 2011. Ecosystem services provided by bats. *Annals of the New York Academy of Sciences* 1223: 1–38.

<sup>28</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN>

<sup>29</sup> <http://www.irishstatutebook.ie/eli/1976/act/39/enacted/en/index.html>

<sup>30</sup> <https://science.sciencemag.org/content/332/6025/41>

<sup>31</sup> Alberdi, A., Aizpurua, O., Gilbert, M.T.P. and Bohmann, K., 2017. Scrutinizing key steps for reliable metabarcoding of environmental samples. *Methods Ecology and Evolution* 9: 134–147.



and efficient assessments of species interactions and species richness. These methods have allowed a better estimation of the economic value placed on the services provided by Irish wildlife and therefore provide an economic rationale for bats to be surveyed and protected. This is critical as, globally, invertebrates have been shown to be declining at unprecedented rates,<sup>32</sup> but little is still known about the potential environmental impacts within Ireland.

## Scope

Innovative research proposals are invited that could address the following:

- develop new molecular and computational methods to estimate the ecosystem services provided by Irish bats;
- develop a novel DNA metabarcoding assay that could be used to survey arthropod diversity from Irish bat droppings;
- generate a novel baseline of Irish arthropod diversity to enhance future biodiversity monitoring;
- examine the potential for citizen science to assist with bat dropping collection to identify the diverse range of prey species of bats across the Irish landscape;
- generate a publicly available database of Irish arthropods that could provide a baseline for future monitoring in relation to changes in agricultural practices or climate;
- raise public awareness of the essential role of bats in our environment.

## Outputs

Outputs arising from the research would help to raise awareness about the role and importance of Irish bats. The research would provide strong scientifically based evidence and assessment of the quality of Ireland's fauna and this could be used to inform management and future policies. This would place Ireland at the forefront of monitoring European natural capital by developing novel methods of estimating arthropod biodiversity and bat ecosystem services in the context of changing climate and species loss.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

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<sup>32</sup> Dirzo, R., Young, H.S., Galetti, M., Ceballos, G., Isaac, N.J.B. and Collen, B., 2014. Defaunation in the Anthropocene. *Science* 345: 401–406.

## Theme 4: Socio-economic Aspects of a Sustainable Environment

Environmental socio-economic research looks at the relationship between economy, society and environment. It is the study of the sociological and economic factors, policies, behaviours, instruments, interactions, interventions, etc., that exert an influence – for good or bad – on our environment. It seeks to identify opportunities for, and roadblocks to, leveraging and sustaining environmental gains through socio-economic approaches or mechanisms.

This theme will examine the role of social and economic “forcers” that trigger, motivate and create barriers or solutions to sustainable production/provision of goods and services and sustainable consumption choices and behaviour change. This theme is also interested in the effectiveness of existing or possible future government policies and measures in promoting sustainability in consumption and/or production.

The core areas of research will be within the following three areas:

1. production and service provision;
2. consumption;
3. governance.

**IMPORTANT:** Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA’s Grant Management and Application Portal as **mistakes will not be rectified.**

Six topics are included in the EPA Sustainability 2019 Call under Theme 4: Socio-Economic Aspects of a Sustainable Environment	
Sustainability 2019 Call – Project 11	Holistic sustainability performance assessment of Irish ports/harbours
Sustainability 2019 Call – Project 12	Assessing the impact of green public procurement on achieving sustainability
Sustainability 2019 Call – Project 13	Examination of the effectiveness of EPA industrial licensing
Sustainability 2019 Call – Project 14	Options to enhance public engagement with consultation on plans and programmes during SEA processes
Sustainability 2019 Call – Project 15	Tiering of environmental assessments – the influence of SEA on project-level EIA
Sustainability 2019 Call – Project 16	Analysis of the effectiveness of, and maximising, behaviour change initiatives to reduce consumer food waste

<b>Call Topic Title:</b>	Holistic sustainability performance assessment of Irish ports/harbours		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 11		
<b>Project Type:</b>	Medium Scale Project		
<b>Maximum Budget:</b>	€250,000	<b>Maximum Duration:</b>	36 months
<b>Co-funded by:</b> Marine Institute			

## Background

Ports have a fundamental role in facilitating economic growth and prosperity. Ireland, as a small open-island economy, depends on the quality and efficiency of port services. Ports are more than trading gateways to the world; they are frequently centres of great historical, cultural, social and recreational importance. Many of Ireland’s oldest cities and towns were founded as trading ports. Over time, some have relinquished their commercial focus and now primarily serve social and recreational functions for their communities. Ports provide diverse economic, social and environmental services, with goods arriving and departing and visitors from across the world coming to explore the port cities and the seas, both above and beneath, where a rich and diverse ecosystem teems with life.

Port sustainability is a significant challenge in modern society that is being addressed globally. At a national level, the Sustainable Energy Authority of Ireland (SEAI) recently reported a case study on energy upgrades at Dublin Port, where installation of high-efficiency boilers, supported in part by SEAI funding, resulted in a 54% annual cost saving.<sup>33</sup>

Research is required to evaluate the holistic sustainability performance of Irish ports based on various sustainability criteria under three main areas: pollution, habitat and biodiversity changes, and energy consumption. This will assist Irish ports to determine their sustainability and facilitate the development of a policy-making framework to help minimise and prevent potential environmental damage caused by unsustainable port operation practices. Improved port sustainability will deliver economic, social and environmental benefits at a national level in Ireland and help Ireland to meet international policy obligations in this area.

The sustainable development of Irish ports is central to the government’s National Ports Policy<sup>34</sup> and is profiled largely in Port Masterplans and associated developments. Other policy areas that the research would address include the Sustainable Development Goals<sup>35</sup> (SDGs) and global and European Union port policy,<sup>36</sup> green ports and associated regulation. The issue of port sustainability was also identified in the 2018 National Marine Planning Framework Baseline Report.<sup>37</sup> As Irish ports

<sup>33</sup> <https://www.seai.ie/resources/case-studies/dublin-ports-energy-upgrade/>

<sup>34</sup> <http://www.dttas.ie/sites/default/files/node/add/content-publication/National%20Ports%20Policy%202013.PDF>

<sup>35</sup> <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

<sup>36</sup> [https://ec.europa.eu/transport/modes/maritime/ports/ports\\_en](https://ec.europa.eu/transport/modes/maritime/ports/ports_en)

<sup>37</sup>

[https://www.housing.gov.ie/sites/default/files/publications/files/national\\_marine\\_planning\\_framework\\_baseline\\_report.pdf](https://www.housing.gov.ie/sites/default/files/publications/files/national_marine_planning_framework_baseline_report.pdf)

continue to develop and implement their Masterplans, it is critical to ensure that this development is carried out in a manner that is economically, environmentally and socially responsible for current and future generations.

## Scope

Innovative research proposals are invited that could address the following:

- critically review current port practices, analysing the socio-economic influences of environmental issues arising in port regions in depth.
- identify “best practice” examples of an integrated and holistic approach to port sustainability.
- engage with key stakeholders to encourage port authorities and port operators in the co-design of innovative sustainability strategies for Irish ports that are developed in an integrated and holistic manner.
- develop a framework of sustainable port practices to facilitate meaningful implementation of port policy and strategy. This framework should consider the following areas:
  - the environmental considerations of facilitating larger sized vessels to visit Irish shores, including dredging activities;
  - the adoption of port services that are more environmentally sustainable, e.g. a move to ship-to-shore power and allowing ships to connect to the national grid when in port to reduce the need to produce their own power and the resulting emissions;
  - the promotion and use of alternative fuels in ports to reduce emissions from diesel engines;
  - sustainable practices for ports during port construction and operational activities that may have a potential impact on air quality, noise and marine biodiversity;
  - practices to ensure that future development activities will balance the need for a reduced carbon footprint and the need for a level of operational efficiency that will ensure our competitiveness;
  - best practices to ensure the ability of ports to act as safe havens for particular marine species post port construction activities.

## Outputs

Outputs arising from the research will provide a detailed review of current scientific literature in this area and an evidence base to develop a framework of sustainable port practices as future masterplans are implemented.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA’s policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Assessing the impact of green public procurement on achieving sustainability		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 12		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months

## Background

Green public procurement<sup>38</sup> (GPP) is a process in which public authorities seek to source goods, services or works with a reduced environmental impact. Ireland's National Mitigation Plan<sup>39</sup> identifies the GPP potential to drive a low-carbon transition. The purchasing power of Ireland's government sector (12% of gross domestic product) has enormous potential to reduce emissions and protect our environment while saving money over the full life cycle of goods and services. GPP research can be used to inform ways to reduce Ireland's carbon footprint, limit the environmental impact of resource use and increase innovation and sustainability. Commitment to GPP sends a powerful signal to the market that government, in leading by example, requires projects, products and services that make the most positive contribution to our environment and that can save money over their full life cycle.

GPP has also been identified as a key government lever in effecting change across the agendas of climate change, the United Nations Sustainable Development Goals,<sup>40</sup> transition to a circular economy<sup>41</sup> practices and the quality of air, water and soil, as well as combatting the proliferation of hazardous substances and protecting public health. Sustainable Development Goal 12.7 advocates promoting public procurement practices that are sustainable across Member States. The European Union (EU) actively promotes the use of GPP as a means of delivering its environmental and economic objectives and provides comprehensive technical supports to Member States in assessing products and services that meet green criteria. In January 2019, the government decided to introduce a number of measures that demonstrate public sector leadership in embedding sustainability practices. These include a ban on certain single-use plastic items, the reporting of resource efficiency measures by government and public sector bodies and a direction to the Office of Government Procurement and the Department of Communications, Climate Action and Environment to develop proposals for the embedding of GPP in national public procurement policy. GPP proposals also feature in the government's Future Jobs Ireland 2019<sup>42</sup> as a vehicle for stimulating future green growth and job development.

Providing a credible evidence base for the impact of GPP on emissions targets and wider sustainability goals is an essential aspect of ensuring the successful embedding of GPP policy across the public sector but one that has, to date, been under-researched and under-developed.

<sup>38</sup> <https://www.dcaae.gov.ie/en-ie/environment/topics/sustainable-development/green-public-procurement/Pages/default.aspx>

<sup>39</sup> <https://www.dcaae.gov.ie/en-ie/climate-action/publications/Pages/National-Mitigation-Plan.aspx>

<sup>40</sup> <https://sustainabledevelopment.un.org/?menu=1300>

<sup>41</sup> [https://ec.europa.eu/growth/industry/sustainability/circular-economy\\_en](https://ec.europa.eu/growth/industry/sustainability/circular-economy_en)

<sup>42</sup> <https://dbej.gov.ie/en/Publications/Publication-files/Future-Jobs-Ireland-2019.pdf>

## Scope

Innovative research proposals are invited that could:

- conduct a review that outlines the current level of green tendering in practice in Ireland;
- critically evaluate the impact of GPP on emissions reductions and its potential to contribute to further reductions;
- identify the potential impacts of GPP on wider sustainability goals to demonstrate specific and quantifiable impacts of GPP practices;
- develop the required evidence base to support the further implementation of GPP across the public sector, including the semi-state sector;
- identify methods to accurately quantify the impact of GPP policy on wider policy agendas;
- provide a methodology to enable statistical data collection for EU reporting requirements;
- conduct an international review to understand where GPP has been effectively integrated into public procurement, identify key barriers encountered and provide practical recommendations to overcome these barriers in Ireland.

## Outputs

Outputs arising from GPP research could reinforce the evidential basis, potentially leading to stronger commitment across relevant stakeholder groups. Advances in this area would provide Ireland with an opportunity to become a leader in the development of measurement standards for GPP policy across Europe.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Examination of the effectiveness of EPA industrial licensing		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 13		
<b>Project Type:</b>	Research Fellowship		
<b>Maximum Budget:</b>	€175,000	<b>Maximum Duration:</b>	24 months

## Background

Ireland has a relatively long history of integrated licensing dating back to 1994. Emissions data are submitted to the EPA and are presented in Annual Environmental Reports (AERs). A study conducted in 2010<sup>43</sup> devised an Environmental Emissions Index (EEI) model, based on life-cycle impact assessment characterisation, normalisation and weighting methodologies, to compare and aggregate 20 key mass annual emissions reported in AERs. Six major environmental impact categories were considered. A sectoral pollution trend was derived for the pharmaceutical manufacturing sector from 1995 to 2007 and used to estimate the change in pollution intensity of pharma production over this time. The influence of Integrated Pollution Prevention and Control (IPPC) licensing on pollution intensity was estimated based on a survey of the industry. Sectoral pollution trends were also derived for the chemical, food and drink and power generation sectors from 2001 to 2007. This study examined the environmental footprint of various sectors and demonstrated the value of IPPC licensing.

It is timely 25 years after the issue of the first EPA licence to repeat and build on the 2010 research study to examine the further impacts of the subsequent regime: Industrial Emissions Directive (IED) licensing.<sup>44</sup> The outputs from this work would assist the EPA to examine the effectiveness of IED licensing and to compare this with baseline and IPPC licensing and other European Union (EU) regulatory regimes.

## Scope

Innovative research proposals are invited that could address the following:

- critically compare Irish chemical footprints (sector, substances) with those of other European countries;
- review the effectiveness of IED licensing compared with baseline and IPPC licensing and other EU regulatory regimes;
- develop an indicator-based approach to the assessment of environmental emissions (air, water) related to economic performance for identified industrial sectors (e.g. power, cement, food, agriculture);

<sup>43</sup> [https://www.epa.ie/pubs/reports/research/waste/ERC\\_16\\_Styles\\_IPPCEmissions\\_web.pdf](https://www.epa.ie/pubs/reports/research/waste/ERC_16_Styles_IPPCEmissions_web.pdf)

<sup>44</sup> <http://www.epa.ie/licensing/industrialemissionslicensing/>



## **Outputs**

Outputs arising from the research will provide greater insight into and an improved understanding of the effectiveness of the industrial licensing process in Ireland. The research will build expertise and knowledge within the EPA and beyond of the impact of various industrial sectors on the environment. The research would assist Ireland to meet its commitments in this area for key stakeholders.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Options to enhance public engagement with consultation on plans and programmes during SEA processes		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 14		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months

## Background

Strategic Environmental Assessment<sup>45</sup> (SEA) is the process by which environmental considerations are required to be fully integrated into the preparation of plans and programmes prior to their final adoption. The objectives of SEA are to provide for a high level of protection of the environment and to promote sustainable development.

There is an awareness among planning authorities, SEA authorities, the Irish Planning Institute, planning consultants and other stakeholders of the difficulties relating to limited public engagement with the planning consultation process at a plan/SEA level. Low levels of public participation at the plan/SEA level can be followed by high numbers of objections, legal challenges and delays at the project/Environmental Impact Assessment level (e.g. road projects, flood relief schemes).

The need to better engage communities in environmental protection was identified as one of the seven key challenges for Ireland in the 2016 EPA State of the Environment Report<sup>46</sup> This is despite the existence of wide-ranging provisions for public participation in both planning and environmental legislation, including the Aarhus Convention<sup>47</sup> (which provides everyone with a right to access environmental information and to participate in environmental decision making). The SEA process provides an ideal opportunity to promote public engagement at the plan level, in a formal and structured way.

## Scope

Innovative research proposals are invited that could address the following:

- critically examine the key barriers to public participation in the plan-making/SEA process;
- evaluate methodologies and techniques that have been used successfully by planning authorities in Ireland and elsewhere to successfully promote public engagement in plans/SEAs;
- develop a Good Practice Guidance Note, with a series of practical recommendations and techniques to raise awareness and promote greater levels of engagement by communities, citizens and organisations in plans/SEAs.

<sup>45</sup> <https://www.housing.gov.ie/sites/default/files/migrated-files/en/Legislation/DevelopmentandHousing/Planning/FileDownload%2C14421%2Cen.pdf>

<sup>46</sup> [http://www.epa.ie/pubs/reports/indicators/SoE\\_Report\\_2016.pdf](http://www.epa.ie/pubs/reports/indicators/SoE_Report_2016.pdf)

<sup>47</sup> <http://ec.europa.eu/environment/aarhus/index.htm>

## **Outputs**

Outputs arising from the research would facilitate enhanced engagement with communities and citizens leading to more informed planning decisions. Promoting better, more wide-ranging and more meaningful public engagement in the SEA process will help in addressing challenges, obstacles and barriers that have historically slowed down the planning process. This research will need to be solutions focused and provide recommendations on practical approaches and techniques for achieving greater levels of public and community engagement in the plan/SEA process.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## **Project Structure and Funding**

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Tiering of environmental assessments – the influence of SEA on project-level EIA		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 15		
<b>Project Type:</b>	Desk Study		
<b>Maximum Budget:</b>	€100,000	<b>Maximum Duration:</b>	12 months

## Background

Impact assessment obligations derive from multiple pieces of legislation [e.g. Environmental Impact Assessment (EIA),<sup>48</sup> Strategic Environmental Assessment (SEA),<sup>49</sup> the Habitats Directive<sup>50</sup> and the Water Framework Directive<sup>51</sup>]. Responsibility for carrying out the assessments (and implementing their outputs) lies with different actors at the different levels in the planning hierarchy (public authorities, project proponents). This typically leads to large monetary and administrative burdens. There are opportunities to achieve synergies, reduce duplication of effort and prevent delays or potentially undesirable planning outcomes.

At both European and national level, there is a focus on better regulation and improving the efficiency and effectiveness of environmental assessment. Ireland is under considerable European Union pressure to improve its impact assessment procedures. EIA and SEA have been operating together for 15 years but, to date, there has been no comprehensive examination of the degree to which SEA and EIA are linked/co-ordinated in Ireland. If properly carried out, a tiered approach to environmental assessment should give rise to efficiency gains for assessments at lower levels and allow for more focused environmental assessments with regard to scope, level of detail, alternatives, etc. The 2012 *Review of SEA Effectiveness in Ireland*<sup>52</sup> identified the linking/tiering of SEA and EIA as an area where further improvements and practical guidance were needed, and for this reason this topic is included as an action in the SEA Action Plan for 2018–2020. Accordingly, the proposed research would provide a valuable opportunity to address a significant knowledge gap in Ireland.

<sup>48</sup> <http://www.epa.ie/monitoringassessment/assessment/eia/>

<sup>49</sup> <http://ec.europa.eu/environment/eia/sea-legalcontext.htm>

<sup>50</sup> [http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

<sup>51</sup> [http://ec.europa.eu/environment/water/water-framework/index\\_en.html](http://ec.europa.eu/environment/water/water-framework/index_en.html)

<sup>52</sup>

<https://www.agriculture.gov.ie/media/migration/ruralenvironment/environment/seainformation/SeaEffectivenessReviewMain%20Report.pdf>

## Scope

Innovative research proposals are invited that could address the following:

- review a selection of case studies in order to critically evaluate the current practice of “tiering” of environmental assessments (SEA and EIA) in Ireland. The study will draw conclusions on the degree to which effective tiering happens in practice in Ireland (e.g. whether mitigation measures and monitoring recommended in the SEA were applied at the project EIA level) and what the barriers to effective tiering are and make recommendations on ways to better align/co-ordinate the SEA and EIA processes. Sectors for the case studies could include land-use planning, renewable energy, transport, flood management and electricity transmission.
- produce a Guidance Note, setting out recommendations and practical examples on how the SEA and EIA processes can be more effectively co-ordinated. The Guidance Note should include specific recommendations on how SEA practice in Ireland can be improved to ensure better, more effective tiering.

## Outputs

The research outputs will contribute to promoting good practice in the tiering of environmental assessments in the operational planning arena and facilitate more efficient, effective and co-ordinated assessments (less duplication/overlap and greater focus on the key environmental issues).

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA’s policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

<b>Call Topic Title:</b>	Analysis of the effectiveness of, and maximising, behaviour change initiatives to reduce consumer food waste		
<b>Call Topic Reference:</b>	Sustainability 2019 Call – Project 16		
<b>Project Type:</b>	Medium Scale Project		
<b>Maximum Budget:</b>	€250,000	<b>Maximum Duration:</b>	36 months

## Background

The Circular Economy Package aims to achieve a European Union-wide food waste reduction of 30% by 2025 and 50% by 2030 and this represents a significant challenge for Ireland and all Member States. The revised Waste Framework Directive (2018/851/EC)<sup>53</sup> states that “Member States shall adopt specific food waste prevention programmes within their waste prevention programmes”. The accompanying Action Plan for the Circular Economy Package<sup>54</sup> identifies food waste as one of five priority sectors. In parallel with this, Ireland has committed to achieving the United Nations (UN) Sustainable Development Goals (SDGs), which include SDG 12.3<sup>55</sup>: “By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains”.

Food waste prevention is an area of policy and public concern. Increased research and behaviour science expertise are required to maximise consumer food waste prevention initiatives to support the targeting of measures to change complex consumer behaviours and to support future targets under the Circular Economy Package and UN SDGs. Since its inception in 2009, the Stop Food Waste programme, as part of the EPA’s National Waste Prevention Programme, has raised awareness of and facilitated engagement in food waste prevention. In 2019 the Stop Food Waste Challenge training initiative took place.<sup>56</sup> As every household produces different types of food waste, for different reasons, there is no one solution that can work for all. The Stop Food Waste Challenge was developed, first, to allow participating households to understand their own food waste and, then, to provide the tools to allow them to develop solutions that work as part of their daily lives. The programme, which involves four 1-hour meetings held over 4–6 weeks, employs a range of activities, tools and media to train and support participants. In 2017, 23 Stop Food Waste Challenges were run nationally, with over 300 households participating.<sup>57</sup>

<sup>53</sup> [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2018.150.01.0109.01.ENG&toc=OJ:L:2018:150:TOC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.150.01.0109.01.ENG&toc=OJ:L:2018:150:TOC)

<sup>54</sup> [http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm)

<sup>55</sup> <https://sustainabledevelopment.un.org/sdg12>

<sup>56</sup> <https://stopfoodwaste.ie/wp-content/uploads/2017/09/SFW-Challenge-V003.pdf>

<sup>57</sup>

[http://www.epa.ie/pubs/reports/waste/prevention/reports/EPA\\_NWPP\\_Ministers%20Report%202017\\_web.pdf](http://www.epa.ie/pubs/reports/waste/prevention/reports/EPA_NWPP_Ministers%20Report%202017_web.pdf)

## Scope

Innovative research proposals are invited that could address the following:

- critically evaluate and prepare a review of the current state of art in food waste prevention interventions internationally, to include barriers and opportunities;
- conduct a longitudinal study of the effectiveness of the Stop Food Waste Challenge training as a behaviour change initiative;
- conduct analysis and reporting of consumer behaviour change variables (metrics and indicators) over time following participation in the Stop Food Waste Challenge in the community and workplaces;
- determine quantitative indicators of the impact of food waste prevention through the Stop Food Waste Challenges to date;
- involve citizen science methods to collect qualitative information on participants' perceptions of the impact of undertaking the behaviour change training to reduce food waste;
- identify evidence-based recommendations, supports and measures to maximise and sustain consumer behaviour change during and following participation in the Stop Food Waste Challenges;
- provide recommendations of the most appropriate interventions for Ireland in terms of food waste prevention that could be developed through the EPA's Stop Food Waste Programme.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

## Outputs

Outputs arising from the research will provide greater insight and an improved understanding of the effectiveness of the Stop Food Waste Challenge initiative. The research would inform the development of interventions to further reduce food waste and assist Ireland's key stakeholders in meeting its commitments in this area, including regional waste offices, local authorities and other relevant stakeholders. This research would raise awareness using targeted media channels to advocate behaviour change and build partnerships with the shared aim of addressing the challenge of food waste.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

## Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

## Expected Outputs

Please consult the **2019 Guide for Applicants**, **2019 Guide for Grantees** and the **Terms and Conditions for Support of Grant Awards** for the full list of expected outputs and interim/final reporting requirements. Please also refer to the [EPA Guidelines for research project communication plans](#) when preparing your project communication Work Package.

It is essential that, in their proposal, applicants clearly demonstrate the policy relevance of the outputs of their proposed research; the applicability of their findings; and how these outputs address a knowledge gap and can be efficiently transferred/applied to the implementation of policies and the protection of our environment. Applicants **must** clearly demonstrate how their proposed research will provide the evidence to support environmental policy in Ireland, in terms of identifying pressures, informing policy and developing solutions.

**It is strongly recommended that applicants familiarise themselves with and utilise the tools provided in the EPA Bridging the Gap Resource Kit:**

- [EPA Research Report 131](#): BRIDGE: Tools for Science–Policy Communication;
- [EPA Research Report 132](#): Good Practice Guide for Science–Policy Communication; and
- [EPA Research Report 133](#): A Knowledge Transfer Guide for Researchers.

## Indicative Time Frame

<b>30 April 2019</b>	Call opening
<b>19 June 2019 at 17:00 (Irish Standard Time)</b>	Deadline for queries relating to the technical contents of this call
<b>28 June 2019 at 17:00 (Irish Standard Time)</b>	Deadline for submission of applications by applicants
<b>10 July 2019 at 17:00 (Irish Standard Time)</b>	Organisation approval deadline for authorisation by Research Offices
<b>July/September 2019</b>	Evaluation process
<b>October/November 2019</b>	Negotiation <sup>58</sup>
<b>November/December 2019</b>	Grant award of successful projects
<b>By 31 March 2020</b>	Start of successful projects

<sup>58</sup> The EPA may consider calling the shortlisted applicants for interview at this stage.



## Further Information

Information on current research projects being supported by the programme is available in the Research section of the EPA website: [www.epa.ie/researchandeducation/research](http://www.epa.ie/researchandeducation/research)

The following additional documents are available from the EPA website:

<http://www.epa.ie/pubs/reports/research/opencalls/currentcalldocuments/>

- 2019 EPA Research Guide for Applicants;
- 2019 EPA Research Guide for Grantees;
- 2019 EPA Research Terms and Conditions for Support of Grant Awards;
- Guidelines to Open Access Research Publications and Data in Horizon 2020;
- Open Access to Publications and Data in Horizon 2020: Frequently Asked Questions (FAQs) – Fact Sheet;
- EPA Guidelines for Research Project Communication Plans;
- Communications Plan Template;
- Work Package Template.

### For updates on the 2019 EPA Research Calls:

1. Subscribe to [EPA Research Newsletters](#)
2. Follow us on Twitter [@EPAResearchNews](#)
3. Visit the [EPA Funding web pages](#)
4. Check the [Research Call Frequently Asked Questions web page](#)

**Any queries that are not covered in the call documentation or on the FAQs web page must be submitted to [research@epa.ie](mailto:research@epa.ie).**