



STRATEGIC INNOVATION FUND

A report to Ofgem

April 2020

STRATEGIC INNOVATION FUND





Contact details

Name	Email	Telephone
David Cox	david.cox@afry.com	+44 (0) 1865 812 223
Gareth Davies	gareth.davies@afry.com	+44 (0) 1865 812 204

AFRY is an international engineering, design and advisory company. We support our clients to progress in sustainability and digitalisation. We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations.

AFRY Management Consulting provides leading-edge consulting and advisory services covering the whole value chain in energy, forest and bio-based industries. Our energy practice is the leading provider of strategic, commercial, regulatory and policy advice to European energy markets. Our energy team of over 250 specialists offers unparalleled expertise in the rapidly changing energy markets across Europe, the Middle East, Asia, Africa and the Americas.

**Copyright © 2020 Pöyry Management Consulting (UK) Ltd
trading as AFRY Management Consulting**

All rights reserved

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the prior written permission of Pöyry Management Consulting (UK) Ltd trading as AFRY Management Consulting ("AFRY").

This report is provided to the legal entity identified on the front cover for its internal use only. This report may not be provided, in whole or in part, to any other party without the prior written permission of an authorised representative of AFRY. In such circumstances additional fees may be applicable and the other party may be required to enter into either a Release and Non-Reliance Agreement or a Reliance Agreement with AFRY.

Important

This document contains confidential and commercially sensitive information. Should any requests for disclosure of information contained in this document be received (whether pursuant to; the Freedom of Information Act 2000, the Freedom of Information Act 2003 (Ireland), the Freedom of Information Act 2000 (Northern Ireland), or otherwise), we request that we be notified in writing of the details of such request and that we be consulted and our comments taken into account before any action is taken.

Disclaimer

While AFRY considers that the information and opinions given in this work are sound, all parties must rely upon their own skill and judgement when making use of it. AFRY does not make any representation or warranty, expressed or implied, as to the accuracy or completeness of the information contained in this report and assumes no responsibility for the accuracy or completeness of such information. AFRY will not assume any liability to anyone for any loss or damage arising out of the provision of this report.



TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
1. INTRODUCTION	8
2. FUND FRAMEWORK	12
3. CASE STUDIES	16
4. OPTIONS FOR A NEW FRAMEWORK	20
5. PROPOSED FRAMEWORKS	26
ANNEX A - EVALUATION OF BUILDING BLOCKS	44
ANNEX B – CASE STUDIES	68
ANNEX C – CASE STUDY FACTSHEETS	84
QUALITY AND DOCUMENT CONTROL	96



[This page is intentionally blank]

EXECUTIVE SUMMARY

This work has been designed to explore alternative structures for a new Strategic Innovation Fund. The new fund will be introduced under the RII0-2 framework. The objective of the new strategic innovation funding mechanism will be to:

- focus innovation funding on the energy system transition and what is strategically important (i.e. innovation challenges facing networks considering the strategic challenges associated with the decarbonisation of power, heat and transport),
- develop measures to increase third party involvement in the innovation funding; and
- and ensuring alignment with wider public sector funding from bodies such as BEIS, UKRI and the Devolved Administrations.

Our approach to this work has developed in three Stages. In the first Stage we undertook case study reviews of a wide range of innovation funding processes within the energy sector and more widely to understand the various options available to Ofgem in developing a new framework. This involved both desk-based research and discussions with the energy innovation funding teams in BEIS and Innovate UK. The second Stage involved constructing a set of potential framework options built up from choices around some core elements (or building blocks). Finally, we assessed the performance of each of these frameworks against a set of defined Primary Objectives for the new Fund agreed with Ofgem.

Framework building blocks

From our discussion with Ofgem and a review of existing funds (see Annex B), we identified a set of building blocks that can be used to define any fund framework. Under the scope of this study, the focus was on the administrative aspects of the fund and therefore some of the building blocks were not considered as part of the development of framework options.

Each building block describes a separate element of the structure of the fund framework, and consequently will determine how the fund is administered and how participants interact with the fund. Under each of these building blocks we agreed a set of options for assessment. These options would be evaluated to determine framework of the fund. Under the scope of this study, the focus was on the building blocks relating to the administrative aspects of the fund. These are:

- **Eligibility and Participation:** This building block will determine the rules under which participants will engage with the new fund.
- **Format of competition:** This building block will determine both the frequency of competitions and type of competitions
- **Promoting Collaboration:** This building block will consider how funding bodies interact with the fund participants to help develop proposals.

- **Project selection and assessment:** This building block will consider how project assessment and selection can be used to deliver the strategic aims of the innovation fund.
- **Project Administration and Governance:** This building block will consider the practicalities of administering and governing the fund. It will also consider whether the administrator, and the decision maker of the fund, needs to be the same entity

Proposed Frameworks

The Frameworks bring together options under each building block which can work together within a single innovation fund. These are summarised below

- **Framework 1: Single Economy-wide Energy Innovation Fund:** This framework will deliver a single economy wide strategic innovation fund for energy innovation. Ofgem will remain involved in the design of the fund and evaluation of projects; however the governance of the fund would be shared and therefore the objectives may be broader than under an Ofgem-only innovation fund.

The strategic aims of the fund would be agreed in parallel with other UK innovation funds – this approach will ensure that conflicts that currently exist between innovation funds will be addressed through a single strategy and fund.
- **Framework 2: Ofgem Strategic Initiatives.** This framework will deliver a Strategic Innovation Fund, funded solely by Ofgem. This framework would see Ofgem retain full governance of the fund – e.g. the design of the fund, evaluation of projects – but with external administration of the process. Allowing Ofgem to maintain direct control of fund is designed to address the challenges of delivering a single external fund in the RII0-2 timelines.
- **Framework 3: Targeted Innovation.** The aim of this proposed framework is to specifically allow Ofgem to target strategic innovation challenges as and when they arise. In this case funding would not be on an annual or regular funding round but would respond to identified needs (highlighted through some innovation challenge process). This framework would streamline the current innovation fund to focus only on strategic innovation initiatives as and when they are identified.
- **Framework 4: External administration.** This framework will retain the majority of the elements of the current NIC arrangements, in that it will still be restricted to network-company applications around Ofgem defined strategic innovation challenges, but would move the administration of the fund to an external administrator.

Each of these four frameworks has been created based on discussion with Ofgem. However the final design of the proposed frameworks is our own independent view. It should be noted that Ofgem's duties and independence may impact on the real-world application of the frameworks should they be taken forward.

These Proposed Frameworks are summarised in Table 1.

Table 1 – Overview of Proposed Frameworks

	Proposed Framework			
	1	2	3	4
Eligibility and Participation	Allow third party led projects Impose structures on the consortium		Allow third party led projects	Network Company led
Format of competition	Open competition and Strategic Funding		Strategic Funding	Regular competition and Strategic Funding
Promoting Collaboration	Collaboration Facilitated by Ofgem			
Project selection and assessment	Independent assessment			
Project Administration and Governance	Single external Fund and shared governance	Third party administration		

The next step was to undertake a qualitative assessment of the Frameworks against the Primary Objectives of the new Strategic Innovation Fund.

Evaluation of the Proposed Framework

In discussion with the Ofgem team we agreed four Primary Objectives. These objectives are used to assess the suitability of the Proposed Frameworks for the Strategic Innovation Fund.

- 1 Support ambitious whole system (cross-sector) solutions to facilitate the Energy Sector transition and achieve net zero.** The focus of this objective is to ensure that innovation is coordinated across all sectors of the energy market. To achieve the more ambitious net zero target there will be a focus on wider system innovations.
- 2 Promote inclusive participation to encourage innovation from a wide range of innovators.** The focus of this objective is to ensure that the innovation funding applications reflect as broad a cross-section of innovation actors as possible. The innovation community is diverse and new solutions/concepts/technologies may emerge from various sources.



- 3 Deliver long-term cost and environmental savings for existing and / or future energy consumers.** The focus of this objective is to ensure that innovation is being delivered economically and efficiently. It is important that consumers remain protected from having to finance activity that provides no significant cost reductions or environmental benefit.
- 4 Deliverability of the fund:** The focus of this objective is to ensure the new framework is suitable under Ofgem's current remit. The aim is to ensure that the option put forward under the framework do not reduce the efficiency of the operation of the fund or increase the risk of the fund not delivering innovative projects.

For each of our Proposed Frameworks we assessed the building block options against the fund objectives to determine a qualitative score. This assessment uses a simple qualitative scoring system to understand the extent to which the overall Primary Objectives have been met. The scores from this evaluation are summarised in Table 2. This assessment has been based on the knowledge developed within this study, including discussion with other innovation fund providers (e.g. BEIS and Innovate UK) and the case study review of other innovation funds.

The nature of innovation projects that may be considered under any framework is outside of the scope of what we are looking at. However, to the extent that the innovation focus is set appropriately, all funds could deliver projects that have a greater emphasis on whole system solutions. The differentiator identified in this study is that a Single Economy-wide Energy Innovation Fund may be expected to capture a wider set of projects than one that is led by Ofgem where there is likely to be a network-bias.

Table 2 – Summary of the Framework Assessment

Framework	Objective scores			
	1	2	3	4
Single Economy-wide Energy Innovation Fund	✓✓	✓✓	✓	✗
Ofgem Strategic Initiatives	✓	✓✓	✓	✓
Targeted Innovation	✓	✓✓	✓	✗
External administration	✓	-	✓	✓

Based on an evaluation of these frameworks against the fund objectives we were able to develop our preferred approach for developing the new Strategic innovation Fund



Preferred Approach

Our preferred approach is the implementation of the Ofgem Strategic Initiatives. The evidence behind our preferred approach has been drawn from the research undertaken within this study. In particular, we have considered how the building block option presented in this preferred framework has worked in existing schemes, as evidenced through our case study review.

This Framework recognises the benefits of expanding the accessibility of the fund to a wider set of applicants and the potential cost efficiencies of external administration but avoids the delivery risk within the RIIIO-2 timeframe of trying to coordinate multiple bodies under Framework 1.

We acknowledge some aspects of this framework will be more straightforward to implement. Therefore we are proposing a staggered approach to implementing the fund. Under this staggered approach certain options selected in the in Ofgem Strategic Initiatives will be turned off until an appropriate agreement is triggered.

This is summarised in Table 3.

Table 3 – Approach for implementing the Ofgem Strategic Initiatives

	Eligibility and Participation	Frequency of competition	Promoting collaboration	Project selection and assessment	Project Administration and Governance
'Ofgem Strategic Initiatives'	Allow third party led projects Impose structures on the consortium	Open competition Discretionary special funding rounds to target strategic needs	Facilitated	Independent assessment	External administration
Initial position	Off	On	On	On	Off
Trigger	Agreement with Network Companies on licence changes				Successful contract with 'External Administrator' via tender process
Pre trigger option	Network Company led				Self-administration and governance



The starting point identified in Table 3 is the most straightforward approach to meeting Ofgem's immediate needs for incentivising greater strategic innovation, and reducing the administration on Ofgem resources. The implementation of options under the Frequency of Competition, Promoting Collaboration and Project selection and assessment building blocks, while significant, should be able to be made ahead of the RII0-2 implementation date. Then the speed at which decisions can be made to activate the remaining two building block options will be based on Ofgem's ongoing discussions with industry and timelines for contracting with an external administrator.

Another advantage of Framework 2 (Ofgem Strategic Initiatives) is future compatibility with a move towards a single strategic fund along the lines of Framework 1 as and when discussions and agreement across funding bodies is reached. This would set the foundation for the wider changes required within Framework 1.

1. INTRODUCTION

The Office of Gas and Electricity Markets (Ofgem) commissioned a partnership of CEPA, AFRY Management Consulting (AFRY) and Economic Consulting Associates (ECA) to provide economic advice for RIIO-2. This report has been prepared by AFRY under this Economic Strategic Partner contract for RIIO-2.

As part of the RIIO-2 process, Ofgem has stated its intention to introduce a new Strategic Innovation Fund to replace the existing Network Innovation Competition (NIC). The aim of this study is to explore alternative structures for the operating framework for such a Fund and assess these against Ofgem's agreed objectives for the Fund. The study draws on a review of existing innovation funding across a range of sectors and jurisdictions and provides initial qualitative assessments of four possible future frameworks.

1.1 Background

Ofgem initially introduced its innovation stimulus programmes to address concerns that the price control mechanism was encouraging companies to seek short term cost savings to the exclusion of innovation projects which either require longer term pay-offs, or deliver benefits which do not directly accrue to the network company.

Although price controls can incentivise innovation, they can also discourage certain types of innovation. This is because increased expenditure on research and development can make companies look inefficient in the context of a five year price control period, if the cost of these activities does not deliver benefits within that period. The resetting of allowances in subsequent price controls can limit the payback period for successful innovation projects. Additionally, activities which deliver carbon or wider environmental benefits are not naturally incentivised within price controls. The RIIO price control is designed to provide a ring fenced innovation stimulus to network companies.

Under RIIO-1 the innovation stimulus was designed to encourage a culture of innovation within the network companies, and support trials that may otherwise not take place within the price control framework. Through the RIIO-1 period the NIC has provided £270 million of support to network companies (awarded to the end of 2018). This has allowed the development of approximately 13 projects (to the end of 2018) across a range of activities from the 'Future Role of Gas' to understanding whether Distributed Energy resources can deliver 'Black Start' Capability¹.

In its May 2019 Sector Specific Methodology Decision, Ofgem made the decision to introduce a new strategic innovation funding pot/mechanism, replacing (or reforming) the current RIIO-1 Network Innovation Competition (NIC).

The objective of the new strategic innovation funding mechanism will be to focus innovation funding on the energy system transition and what is strategically important (i.e. innovation challenges facing networks considering

¹ Introduction of SMEs to Ofgem Innovation Stimulus

the strategic challenges associated with the decarbonisation of heat and transport), and ensuring alignment with the wider public sector funding from bodies such as BEIS, UKRI and the Devolved Administrations.

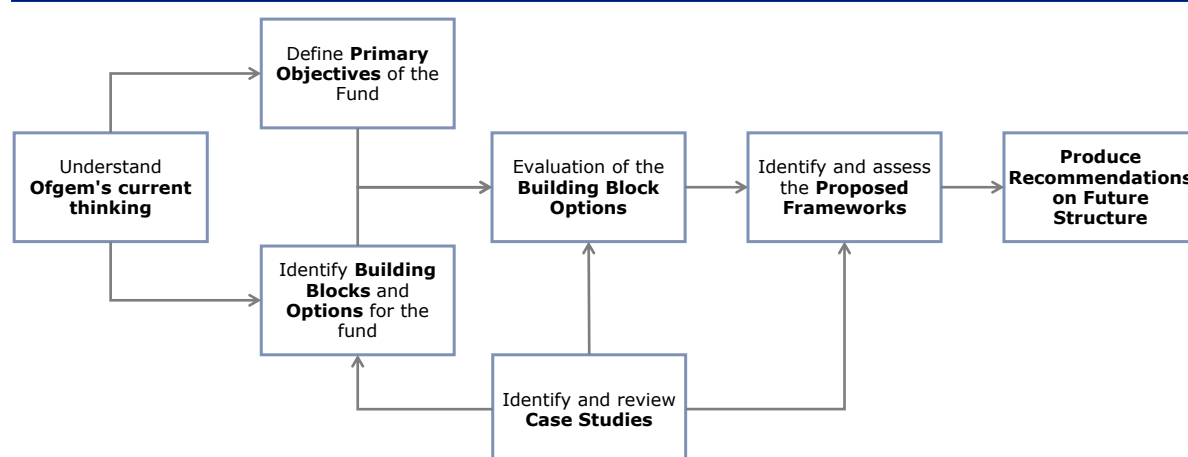
1.2 Methodology

Our approach to the study is summarised in Figure 1. It has three main stages of work:

- Develop an understanding of current innovation processes;
- Construct a set of alternative frameworks for the new SIF; and
- Evaluate the frameworks against Ofgem’s objectives.

Further detail on each stage is provided in the following sections.

Figure 1 –Overview of the approach



1.2.1 Stage 1: Understanding

The starting point for this work was to review the previous Low Carbon Network Fund (LCNF) and NIC funding competitions. This is to ensure that any recommendations we make are consistent with Ofgem thinking in regard to RII0-2 and that they address concerns over the operation of the current funds.

We built on our existing knowledge through meetings with Ofgem and other UK innovation partners (BEIS and Innovate UK) to ensure our work was in line with current Ofgem and Government thinking. This was supplemented by assessment of a range of case studies² providing further understanding of innovation funding and helping to identify the key characteristics, or building blocks, of any funding regime and the various options or choices under each building block. We identified a long-list of potential case studies based around three groups (see Annex B).

² The Case Study assessment is based on our desk-top study, and the information provided is based on our interpretation of the case studies. We have not spoken to the fund directly to review this information.

- **Energy sector innovation in other countries.** These case studies focus on experiences in comparator countries.
- **Innovation in non-energy sectors:** These case studies focus on experience in other (non-energy) sectors.
- **UK and European Commission funding:** These case studies focus on alternative energy funding mechanisms in the UK (e.g. non-Ofgem) and European Commission based funding

Four case studies were assessed in more detail to provide further insight and lessons (see Annex C).

1.2.2 Stage 2: Constructing Alternative Frameworks

The second stage constructed several alternative funding frameworks for the new Fund. Each framework was defined in terms of its choice of option under a series of building blocks describing the key characteristics of the fund. The focus of this study is on the operational and administrative framework for the fund. The key building blocks considered around this were:

- **Eligibility and Participation:** The rules underlining who is able to participate in the funding competition and under what terms.
- **Format of competition:** The frequency of competitions and the type of competitions (fixed or open tenders).
- **Promoting Collaboration:** If, and how, funding bodies pro-actively support or encourage participants to develop funding proposals.
- **Project selection and assessment:** Through what process, and by whom, project assessment and selection is undertaken.
- **Project administration and governance:** The practicalities of administering the fund, in particular the relative role of the funding body or external parties in managing the delivery of the funding competition.

While other aspects of the regime were identified as important – for example, the definition of innovation projects within the mechanism, the source of funding for the projects and the extent of knowledge sharing and reporting by successful projects – these were considered out of scope for the current project and Ofgem intend to undertake further work on the remaining aspects of the fund framework later in the year.



1.2.3 Stage 3: Evaluation of Alternative Frameworks

The final stage of the work is to evaluate the alternative frameworks against the fund objectives. These objectives were agreed with Ofgem and reflect the aspects of the current funding mechanisms that were identified as areas for improvement. They will also be used to assess whether the new Strategic Innovation Fund is a success.

The high level evaluation is qualitative in nature and is informed by the performance of the mechanisms reviewed in the case studies and our discussions with Ofgem and other funding bodies. Based on this initial assessment, we set out a Preferred Approach for the new Fund and highlight areas for further analysis and consideration by Ofgem.

2. FUND FRAMEWORK

In this section we outline those aspects of the funding framework that will be considered as part of this study.

2.1 Introduction

As we outlined in Section 1, Ofgem is seeking to develop a new framework for a Strategic Innovation Fund. To understand how the new fund will be structured, we have identified a set of building blocks that will provide the outline of the fund framework. For this study we have focussed on those building blocks which focus on the logistics of operating the fund. The building blocks are presented in Figure 2 below.

The remaining building blocks focus on the scope of the fund (i.e. innovation focus) the source of funding and the ongoing monitoring and reporting requirements and are considered to be out of scope at this stage. These building blocks will be assessed in detail once Ofgem have a clearer understanding on the administrative structure for the Fund, and have agreed the relationships and interactions with other GB funding bodies (e.g. BEIS and UKRI).

Figure 2 – Overview of the building blocks

Assessed		Not assessed
Eligibility / participation: Considers how participants engage with the fund	Frequency of competitions Considers the frequency of competitions and type of competitions	Innovation Focus Consider the types of innovation that should be funded
Fund Administration + governance Considers the practicalities of administering the fund	Promoting Collaboration Considers how funding bodies interact with the fund participants	Funding Considers the origin of the funding
Project Selection and Assessment Considers how the strategic aims of the fund can be incentivised		Reporting and Knowledge sharing Considers management and development of the funded projects

In the section below we present each of the building blocks considered within scope of this report, and outline the types of issues that we will consider in our assessment.

2.2 Fund building blocks

Each building block describes a separate element of the fund framework, and it is choices around how each building block is represented that determines how the fund is administered and the extent of engagement that innovation promoters can have in the process. The building blocks form a framework for describing the case studies (see Section 3) which then provide examples of the range of options open to Ofgem under the new Fund arrangements. These building block options are described in Section 4 and used to construct the alternative frameworks for evaluation.

The building blocks assessed in this study are as follows:

- **Eligibility and Participation:** This building block will determine the rules under which participants will engage with the new fund. Through this building block Ofgem will be able to influence the types of organisation that can directly apply for funding and any limitations on the structure or role of applicant organisations.

The key issues assessed include:

- How does the fund incentivise participation? (e.g. how does the fund make sure it reaches as many potential stakeholders, and what are the best channels to reach out and engage with different players?)
- How are third parties treated under the fund? (e.g. are non-network companies able to access funds directly or must their involvement be indirect through a network business?)

- **Format of competition:** This building block will determine both the frequency and type of competitions. For example Ofgem will be able to determine whether competition should be open (i.e. applications able to be submitted throughout the period) or restricted (i.e. applications only eligible in pre-defined, short, windows). This building block will also consider the benefits of offering targeted calls to meet specific innovation requirements.

The key issues assessed include:

- How frequent are the funding rounds, and is there flexibility over when to announce a call?
- Is there scope for different funding rounds for different innovation challenges?



- **Promoting Collaboration:** This building block will consider how funding bodies interact with the fund participants to support the development of more innovative and value-added proposals. This will try to balance the benefits of direct competition with a desire to ensure cooperation and coordination between potential participants.

The key issues assessed include:

- How are companies encouraged to coordinate (if at all)? (e.g. are there 'match-making'³ services to introduce companies to one another).

- **Project selection and assessment:** This building block considers how project assessment and selection can be used to deliver the strategic aims of the innovation fund. This focusses on who is undertaking the assessment rather than to assessment criteria itself. For example, this takes account of who is best placed to make the decisions on which projects to take forward. And separately, how the decision making process can be used to incentivise the types of innovation put forward.

The key issues assessed include:

- Who is making the evaluation decisions? (e.g. who are the relevant experts and how to ensure consistency between the assessment decision criteria and the wider Strategic Vision?)

- **Project Administration and Governance:** This building block considers the practicalities of administering and governing the fund. It will also consider whether the administrator, and the decision maker of the fund, needs to be the same entity. This will investigate whether there are any unintended consequences from the different approaches.

The key issues assessed include:

- Is the coordinator and funder the same entity? (e.g. is there differentiation between the decision maker and the administrator)
- If not, how do they interact? (e.g. what is the split of responsibilities and how are decisions made)

2.3 Current Framework of the NIC

To summarise the structure of the current NIC, and to enable comparison with the building block options we will present in Section 4, we have outlined how the current NIC arrangements map to the building blocks. This is presented in Table 4.

³ Although this can take many forms, we have assumed this option will require the fund administrator to host an online portal for collaboration between participation and forum for the development of ideas. This portal will allow interested parties to submit their own skills and experience as well as searching for other participants with skills they require

Table 4 – Mapping the Building Blocks to the current NIC

Building blocks	Current arrangements
Eligibility and Participation	<p>Projects must be led by the network company and other parties can only participate if they are in partnership with a network company.</p> <p>Network companies are required to consult with industry (e.g. call for ideas), before developing proposals that will be submitted to Ofgem.</p>
Frequency of competition	<p>Competitions are currently annual, and are open to all topic areas linked to improving the operation of the gas and electricity networks.</p> <p>This gives certainty on when companies should expect to develop proposals, allowing them to plan resources appropriately</p>
Promoting Collaboration	<p>Ofgem encourages coordination between innovators by requiring the network companies to consult with the wider industry. However, Ofgem does not directly support the development of the innovation proposals or oversee the call for ideas.</p>
Project selection and assessment	<p>The selection process starts with network companies submitting project proposals for an Initial Screening Process by Ofgem to ensure the minimum criteria are met.</p> <p>Following the initial screening the projects are evaluated based on pre-defined criteria, by a group of independent experts. The evaluation criteria take account of Ofgem's statutory duties.</p>
Project Administration and Governance	<p>The NIC is currently administered and governed by Ofgem. Ofgem publish an associated governance document on an annual basis setting out the rules of participation.</p>



3. CASE STUDIES

In this section we present an overview of the reviewed case studies.

3.1 Introduction

We have selected seventeen case studies based on their relevance to Ofgem. These case studies have been derived from three separate groups:

- **Energy sector innovation in other countries.** These case studies focus on experiences in comparator countries.
- **Innovation in non-energy sectors:** These case studies will focus on experience in other (non-energy) sectors.
- **UK and European Commission funding:** These case studies will focus on alternative energy funding mechanisms in the UK (e.g. non-Ofgem) and European Commission based funding

These three groups have been chosen to ensure a wide range of funding options are reviewed. In Table 5 we set the case studies assessed under each group (Annex B provides a detailed summary of the case studies).

Table 5 – Case Studies assessed

Energy market innovation in other countries	Innovation in non-energy sectors	UK and European Commission funding
Innovation Norway	Ofwat, Innovation Fund	EC Horizon 2020
Fondo Nazionale Innovazione (Italy)	TfL, London FreightLab (2020)	EU Innovation Fund
Baltic Innovation Fund	Transport Scotland, Low Carbon Travel, Transport Challenge Fund	Energy Catalyst – UK
Canada Energy Innovation Program		Innovate UK – General Guidance
Germany Central Innovation Programme for SMEs		The Energy Entrepreneurs Fund – UK Government
ARENA, Advancing Renewables Programme		EuroStars – European Commission
France’s Fund for Innovation and Industry		



In Section 3.2, we will provide a high level summary of the case studies, and then in Annex B we provide a detailed summary of the approaches used by the case studies in respect of the building blocks. Finally in Annex C we present more detailed factsheets on the following case studies:

- Horizon 2020 – European Commission
- ARENA, Advancing Renewables Programme (Australia)
- Germany Central Innovation Programme (ZIM) for SMEs
- Canada Energy Innovation Program

3.2 Case Study summary⁴

The case studies identified a range of different approaches under each of the building blocks. In this section we present a summary of the options observed. These approaches will help to develop and evaluate the options we set out in Section 4.

- **Eligibility and participation.** The common approaches we identified focussed on the structure of the project consortium, ability to access finance and building the innovation capacity of participants.

A number of case studies (for example Horizon 2020 fund and the EuroStars funding) proposed restrictions on the make-up of consortia. This is used to ensure the consortium covers different countries / regions, or to reduce the dominance of a single organisation in a project. In this latter case the EuroStars fund enforces a 75% limit on the amount of budget that can go to a single consortium member.

Matching finance is also widely used as eligibility criteria. In both the Norwegian Explorer fund and the Baltic Innovation Fund individual projects must be able to match the funding it receives through the innovation fund. The aim here is to ensure that prospective bidders are considering the commercialisation of the solution during the development stage. Without a detailed commercial business plan, they are unlikely to receive match funding from the private sector.

Finally, many funds have also attempted to improve the innovation capability of potential bidders by providing training (German SME innovation fund) on developing a company's capacity for innovation, or exposing them to an increased range of feedback from other innovation bodies (TfL FreightLab).

⁴ The 'Case Study' assessment is based on our desk-top study, and the information provided is based on our interpretation of the case studies. We have not spoken to the fund directly to review this information.

- **Frequency of Competitions:** The approaches included regular or open competitions, one off targeted calls, or a combination of both.

Both the regular and open competitions are frequently used in the case studies we assessed. The regular competitions operate much in the same way as the NIC, although the Horizon 2020 provides call topics to focus the direction of innovation in line with strategic objectives. For the open competitions (e.g. European Commission EuroStars fund) most funds have set assessment points, whereby all proposals received within a certain period will be assessed together.

There are also examples of funds only operating one-off funds to target specific innovation needs if and when required. This is the approach used in the TFL FreightLab funding, which has targeted retail technological innovation (2019), safer roadworks RoadLab (2019), bus safety (2017).

Finally a number of funds offer both annual competitions (either regular or open) combined with one off call for certain push topics. This includes both the Australian ARENA fund and the funds administered by Innovate UK.

- **Promoting Collaboration:** There are a number of funds that offer support / incentives for consortium bids.

There are several examples of the administrators actively promoting consortium bids within this competitive structure beyond the existing approaches. For example the German SME innovation fund will offer increased funding to proposals submitted by consortium. The Horizon 2020 fund also actively encourages consortium proposals through a 'match-making' facility. In this case they use an online portal to enable companies to share ideas and capabilities. However, other approaches are in use, for example, BEIS offers workshops with innovators to bring together those participants with similar and complimentary ideas.

- **Project Selection and Assessment:** There are a number of different approaches used within the assessed case studies. The majority of funds use independent experts, while a minority use a combination of independent and internal evaluation.

The majority of the main funds (Horizon 2020, Innovate UK, EuroStars, TfL etc.) are evaluated by independent experts. The aim in these cases is to ensure transparency and fairness for those bidding into the fund. In these cases the evaluation criteria is published in advance by the fund administrator.

Another approach used by BEIS includes a two stage evaluation process. Under this approach an internal BEIS panel undertakes an initial assessment, and then the second stage is undertaken by an external commercialisation panel. This second panel is used to help understand the attractiveness of the solution to the target market.

Finally the proposed French fund is considering the inclusion of Government Officials on the assessment process.

- **Project Administration and Governance:** There is a broad set of approaches across the case studies. This includes funds where the governance (decision on the fund structure, funding levels, evaluation of projects as well as setting the rules by which the applications are assessed) and administration is undertaken by the same organisation and other funds where the governance and administration is split.

For example, in the funds run by TFL and the fund proposed by Ofwat, they are both the funder and administrator. This is also the current approach in the NIC fund. There are a number of funds which use external administrators. The main examples of this are in the European Commission funded funds. The funds financed by the EC are provided by the Commission, but the funds are administered and decisions are made by bodies reporting to the Commission (for example, the European Investment Bank). A similar, if not identical, relationship exists between Innovate UK and the UK Government.

4. OPTIONS FOR A NEW FRAMEWORK

In this section we present the options under each of the fund building blocks, alongside an overview of our Proposed Frameworks develop from the option.

4.1 Building block options

For each of the building blocks identified in Section 2, we have identified a number of options which will be used to create our Proposed Frameworks. These options are presented below (and a more detailed discussion of the option against the Ofgem objectives is presented in Annex A).

4.1.1 Eligibility and Participation

We have considered four options for the Eligibility and Participation building block. These are:

- **Option 1: Network Company led:** Under this option the competition will be open to all market participants, but the projects will have to be led, and proposals submitted, by the network companies.

Under this approach network companies are required to consult with industry (e.g. through a call for ideas), before developing proposals that will be submitted to Ofgem. This is the current approach used in the NIC

- **Option 2: Allow 'third party'⁵ led projects:** Under this option third parties will be able to take the lead in projects. The aim is to ensure that the network companies are not able to block certain solutions coming to market.

Under this approach there would need to be clear and defined rules for the third party to test solutions on the network without impacting on the safe and efficient operation of the network.

- **Option 3: Impose structures on bid consortia:** Under this option Ofgem would define how consortia are structured (e.g. types of companies involved, role/responsibilities of the companies within the consortium). The aim would be to achieve greater inclusion, ensuring input from different types of businesses.

For example this could take the form of Ofgem stating all consortia must include a SME (or similar). Or Ofgem could state that one company, and its subsidiaries, should not be responsible for more than a maximum share of the project funding. We have seen examples of this in the Horizon 2020 fund and the EuroStars funding

- **Option 4: Match funding:** This option requires innovators to provide evidence that they are able to match the funding they receive from the innovation fund with funding from private sector investment – without this evidence the proposals would be rejected. Under this option the innovation fund would only cover a set percentage of costs (to be determined by Ofgem). The rest of the funding would come from private finance.

⁵ Non network companies

Match funding is used to encourage project developers to consider the commercialisation of the solution in greater detail. This approach has been seen in many funds e.g. Norwegian Explorer fund, the Baltic Innovation Fund, Transport Scotland.

This option will also be considered alongside the levels of funding in future work Ofgem will take forward after this study, and we recognise the challenges of implementing this within a regulated business environment.

4.1.2 *Frequency Competitions*

We have considered three options for the Frequency of Competition building block. These are:

- **Option 1: Regular Competitions:** Annual competitions are used in a number of innovation funds including the existing NIC. This approach gives certainty on when companies should expect to develop proposals, allowing them to plan resources appropriately.

However these competitions can be seen as restrictive, for example regular competitions fail to address the fact that innovation itself is not regular and so may end up funding less innovative projects just because they are ready at the time of the call for tenders.

- **Option 2: Open Competitions:** Under Open competitions the participants will be able to submit proposals at any time within the overall funding period (e.g. the five year price-control period for RII0-2). The proposals will then be assessed by the fund operator at predefined intervals.

The open competition should reduce the administration for smaller companies developing proposals for set deadlines. However there will be an increase in the administrative requirements on the fund administrator as a result of the increased number of assessments periods.

Open competitions are used by Innovate UK and the European Commission EuroStars fund.

- **Option 3: Discretionary special rounds to target strategic needs (Strategic Funding):** This approach will allow the fund administrator the flexibility to strategically plan the areas where innovation is required.

Discretionary competitions are used in the TfL, London FreightLab.

4.1.3 *Promoting Collaboration*

We have considered three options for the Promoting Collaboration building block. Enhanced collaboration is likely to be required to address the fact that new types of innovation project may dictate more direct facilitation from Ofgem with bidders, rather than neutral standoff assessment of bids. These are:

- **Option 1: Neutral:** Under this option the funding body will not directly support the development of the innovation proposals (e.g. by facilitating the sharing of ideas).

The fund will be driven by the competition between potential participants.

- **Option 2: Incentivised:** Additional incentives may be provided to particular types of project or participant to encourage their participation (e.g. allowing access to greater funding for consortia). This approach is used in the German fund, whereby an additional 10% of the total project cost is provided (the remaining is funded privately).

Other variants of this could include providing a bonus where consortia are used, or reduce amount of funding provided by the company itself.

- **Option 3: Facilitated:** The fund administrator (this can either be undertaken by Ofgem or by an external administrator) will facilitate third party participation through various means of encouraging collaboration across activities. Although this can take many forms, we have assumed this option will require the fund administrator to host an online portal for collaboration between participation and forum for the development of ideas. This portal will allow interested parties to submit their own skills and experience as well as searching for other participants with the skills they require. The forum could also be used to discuss potential innovation solutions and provide non-binding votes on which proposals should be taken forward in to assessment.

This approach is used to different extents in existing funds e.g. Horizon 2020 has an automated web-portal, while BEIS hold workshops for interested parties. This approach would give Ofgem greater visibility on the types of participants and the potential innovative solutions being developed.

4.1.4 *Project Selection and Assessment*

We have considered three options for the Project Selection and Assessment building block – under all three options we would also expect there to be a minimum set of qualification criteria which each proposal must meet prior to moving through to the assessment phase.

We assume under all options that proposals are assessed on individual merit and the best are selected. Differences in the selection process may occur in terms of the maximum number of projects selected. For example, this could be based on the total available budget, or on a pre-defined number of projects being taken forward. The extent to which the final evaluation is qualitative and based on subjective expert opinion or may include quantitative ranking metrics around project effectiveness is not considered at this stage – it is largely focused on who is responsible for making the selection.

Our proposed options are:

- **Option 1: Independent assessment:** The majority of the funds reviewed in our case studies (Horizon 2020, Innovate UK, EuroStars, TfL etc.) are evaluated by independent experts. This ensures transparency and fairness for those bidding into the fund.

Typically the criteria will include – clarity of objectives; demonstration of innovation beyond BAU; coordination and support of findings; alignment with national policies. The criteria could also include specific minimum criteria – for example length of project and time for commercialisation of the main project (this is used in the EuroStars funding mechanism).

- **Option 2: Dual assessment (independent and fund administrator):** In this case the assessment takes place in two stages. The first stage will allow the fund administrator to filter / select those proposals that are meeting specific strategic targets. The chosen projects are then passed on to the second stage where each project will be assessed by an external independent panel. An approach similar to this is used by BEIS⁶
- **Option 3: Government oversight within expert panel.** Under this approach government officials would be directly involved in the assessment process – the aim would be to ensure the strategic aims of the fund are met, and secondly to increase the accountability of funding decisions (e.g. answerable to the people). For example this could include assessment by the Civil Service with final sign-off from a Minister. This type of approach is proposed for the planned French fund.

4.1.5 *Project Administration and Governance*

We have considered three options for the Project Administration and Governance building block. These are:

- **Option 1: Self-administration and governance:** The majority of funds we reviewed as part of the case study assessment administer their own funds. For example this includes both funds run by TFL and the fund proposed by Ofwat, as well as Ofgem's current NIC fund. This approach gives the funding body full control over the framework and operation of fund. But it will also increase administration for the funding body, which may not have the skills and expertise to efficiently manage an innovation fund.
- **Option 2: External administration:** In this case the fund will be administered by an appropriate external administrator – this would focus on the ongoing running of the fund and management of projects funded. However the decisions on the structure of the fund, alongside the principles for selection / evaluation of project will remain in the hands of funding body (e.g. Ofgem). This approach would be used to reduce administration for Ofgem. This type of approach is employed by the European Commission and Transport Scotland
- **Option 3: Single external fund:** Under this option Ofgem would provide funding for the innovation projects into a single, wider, external fund. The administrator would also cover the ongoing operation of the fund, including the management of projects funded under the fund. However Ofgem would still remain active in decisions on the structure of the fund, alongside the selection / evaluation of project. This may reduce Ofgem's control over the selection and assessment criteria if it were part of a wider collaboration with other funding bodies. This option may allow a single innovation portal for all GB energy innovation, which is jointly funded through Ofgem and Government. The split of funding could be decided on a project by project basis depending on the solution proposed by the project itself.

⁶ In the BEIS fund the first stage is an independent evaluation of the fund and then the second stage of the assessment considers the commercialisation of the proposals

4.2 Overview of the Frameworks

Based on an assessment of the building block options⁷ discussed in Section 4.1 we have proposed four Frameworks. The Frameworks are summarised below, and then in Section 5.2.1 to 5.2.4 we provide a detailed assessment of each Framework against the Primary Objectives (described in Section 5.1).

- **Framework 1: Single Economy-wide Energy Innovation Fund:** This framework will deliver a single economy wide strategic innovation fund for energy innovation. Ofgem remain involved in the design of the fund and evaluation of projects; however the governance of the fund would be shared and therefore the objectives may be broader than under an Ofgem-only innovation fund.

The strategic aims of the fund would be agreed in parallel with other UK innovation funds – this approach will ensure that conflicts that currently exist between innovation funds will be addressed through a single strategy and fund.

- **Framework 2: Ofgem Strategic Initiatives.** This framework will deliver a Strategic Innovation Fund, funded solely by Ofgem. This framework would see Ofgem retain full governance of the fund – e.g. the design of the fund, evaluation of projects – but with external administration of the process. Allowing Ofgem to maintain direct control of fund is designed to address the challenges of delivering a single external fund in the RII0-2 timelines.
- **Framework 3: Targeted Innovation.** The aim of this proposed framework is to specifically target strategic innovation challenges as and when they arise. In this case funding would not be on an annual or regular funding round but would respond to identified needs (highlighted through some innovation challenge process). This framework would stream-line the current innovation fund to focus only on strategic innovation initiatives as and when they are identified. This approach to targeting innovation is currently used by the TfL, London FreightLab fund. For example, this fund has used focussed rounds to address strategic needs (e.g. retail technological innovation (2019), safer roadworks RoadLab (2019), bus safety (2017)).
- **Framework 4: External administration.** This framework will retain the majority of the elements of the current NIC arrangements, in that it will still be restricted to network-company applications around Ofgem defined strategic innovation challenges, but would move the administration of the fund to an external administrator.

Each of these four frameworks has been created based on discussion with Ofgem. However the final designs of the proposed frameworks are our own independent view. It should be noted that Ofgem's duties and independence may impact on the real-world application of the frameworks should they be taken forward. These options under each of the Proposed Frameworks are summarised in Table 1.

⁷ The assessment of the building block option is presented in Annex A



Table 6 – Overview of Proposed Frameworks

	Proposed Framework			
	1	2	3	4
Eligibility and Participation	Allow third party led projects Impose structures on the consortium		Allow third party led projects	Network Company led
Format of competition	Open competition and Strategic Funding		Strategic Funding	Regular competition and Strategic Funding
Promoting Collaboration	Collaboration Facilitated by Ofgem			
Project selection and assessment	Independent assessment			
Project Administration and Governance	Single external Fund and shared governance	Third party administration		

4.2.1 Minimum requirements for each framework

Based upon Ofgem's preferred direction for RIIO-2 innovation, and as detailed in the SSMD, our proposed frameworks have been designed to meet the strategic challenges which arise in a flexible manner, increase collaboration between industry and increase coordination with other funders. As a result, each of the proposed frameworks includes the following three minimum requirements:

- **Frequency of Competition:** Each framework allows for discretionary funding rounds to targets any strategic requirements
- **Promoting Collaboration:** Each framework allows Ofgem to help facilitate new innovate solutions through interaction with innovators in the form of enhanced match-making activities.
- **Project Administration and Governance:** Each framework assumes some of the administrative responsibilities will be outsourced to a suitable provider.

5. PROPOSED FRAMEWORKS

In this section we present our assessment of each of the Proposed Frameworks presented in Section 4. The Frameworks bring together options which can work together within a single innovation fund to meet the needs of the wider energy system. We assess these Frameworks against the Primary Objectives of the fund which are set out in Section 5.1.

5.1 Primary Objectives

Initially we present the Primary Objectives of the Fund that define at a high level the aims of any Framework and have been developed in discussion with the Ofgem team. These are supplemented with a set of secondary supporting metrics⁸.

5.1.1 Primary Objective 1

Support ambitious whole system (cross-sector) solutions to facilitate the Energy Sector transition and achieve net zero

The focus of this objective is to ensure that innovation is coordinated across all sectors of the energy market. To achieve the more ambitious net zero target there will be a focus on wider system innovations. For example, this may include the transformation of our passenger vehicle stock from ICEs to Battery EVs.

We would expect this objective to deliver the use of new technology, wider sector coupling, while ensuring all knowledge is shared to facilitate a wider economy benefit. We will monitor progress against this objective by considering the following metrics:

- a) Facilitate wider delivery of new technologies/energy sources
- b) Facilitate and coordinate with transport and heat sector innovation
- c) Ensure knowledge sharing amongst all interested parties

5.1.2 Primary Objective 2

Promote inclusive participation to encourage innovation from a wide range of innovators.

The focus of this objective is to ensure that the innovation funding applications reflect as broad a cross-section of innovation actors as possible. The innovation community is diverse and new solutions/concepts/technologies may emerge from various sources. One of the concerns with the existing fund was that it may have put unreasonable barriers to some third party innovation ideas. The

⁸ As part of the ongoing work Ofgem will need to define options for the quantification of the Secondary metrics. This quantification will enable effective monitoring of whether the Fund is delivering against its objectives and providing value for money.



new fund should not unreasonably exclude any projects from the wider community. While recognising that access to networks is critical for testing these solutions and therefore the network itself will have a central role, the fund should aim to facilitate consideration of ideas/projects originating from a wider group. Progress against this objective will be monitored by considering the following metrics:

- a) Promote access for third parties to offer network solutions – ensuring transparency and collaboration
- b) Improve coordination with alternative funding sources, to facilitate joined up energy strategy for innovation
- c) Promotes best practise for innovation projects – for example, this will include how experts are being brought together, and how innovation projects are delivered.

5.1.3 Primary Objective 3

Deliver long-term cost and environmental savings for existing and / or future energy consumers.

The focus of this objective is to ensure that innovation is being delivered economically and efficiently. It is important that consumers remain protected from having to finance activity that provides no significant cost reductions or environmental benefit. Progress against this objective will be monitored by considering the following metrics:

- a) Provides value for money (e.g. net financial benefits) to future and/or existing customers by reducing the administration costs of the fund.
- b) Delivers environmental benefits (e.g. emission reductions) to future and/or existing customers.
- c) Reduces the timescales for the future roll-out and adoption of the funded innovation solutions, to the benefit of current and future consumers.

5.1.4 Primary Objective 4

Deliverability of the fund

The focus of this objective is to ensure the new framework is suitable under Ofgem's current remit. The aim is to ensure that the option put forward under the framework do not reduce the efficiency of the operation of the fund or increase the risk of the fund not delivering innovative projects. Progress against this objective will be monitored by considering the following metric:

- a) Does not require changes to Ofgem current roles and responsibilities, e.g. remains within Ofgem's capability and does not increase Ofgem's regulatory burden.



5.2 Assessment Approach

Our qualitative assessment of the Frameworks against the primary objectives uses a simple scoring metric as set out in Table 7. Based on this approach we have been able to identify a Preferred Approach for the design of the Strategic Innovation Fund.

Table 7 – Qualitative assessment scoring description

Scoring	Description
✓✓	Meets objectives
✓	Partially meets the objective
-	Neutral (not applicable)
✗	Does not meet the fund objectives



5.2.1 Framework 1: Single Economy-wide Energy Innovation Fund

This framework will deliver a single economy wide strategic innovation fund for energy innovation. Ofgem will remain involved in the design of the fund, evaluation of projects; however the governance of the fund would be shared. The main building blocks are presented in Table 8

Table 8 – Framework 1: Single Economy-wide Energy Innovation Fund

Building blocks	Option
Eligibility and Participation	Option 2: Allow third party led projects Plus Option 3: Impose structures on the consortium
Frequency of competition	Option 2: Open competition Plus Option 3: Discretionary special funding rounds to target strategic needs
Promoting collaboration	Option 3: Facilitated
Project selection and assessment	Option 1: Independent assessment
Project Administration and Governance	Option 3: Single Fund

In the following sections we assess this framework against the Primary Objectives.

5.2.1.1 Primary Objective 1: Support ambitious whole system (cross-sector) solutions.

Since this framework is based on an economy-wide fund that has a broader remit than network-specific innovations it is expected to incentivise participation from a wider range of innovators to target strategic requirements to help deliver the energy transition. This opportunity for wider participation (alongside third Party led projects) should lead to greater cross-sector coordination, supporting the whole system solutions. At the same time this option will also ensure that innovation proposals linked to the operation of the network can continue to be assessed.



The use of an Open competition alongside targeted rounds, in line with the majority of European Commission funds (e.g. the EuroStars Fund), and in the Australian ARENA fund will reduce any barriers related to time constraints for developing proposals in line with short annual tender rounds. This approach is also used by Innovate UK, who offers these options with a number of its funds.

5.2.1.2 Primary Objective 2 Encourage inclusive participation to encourage

This framework will benefit from the opportunity to fund third party led projects (proposed under Eligibility and competition), by increasing the number of innovators able to bring solution directly to the fund. This would be implemented alongside a combination of open and specific calls for innovation within the Framework of the new Strategic Innovation Fund.

The implementation of a match-making platform (funding collaboration) will also ensure participants (with similar and complementary ideas) are able to identify each other more efficiently. This match-making portal approach has been used in the Horizon 2020 fund to help innovators come together across Europe. However, other approaches are in use, for example, BEIS offers workshops with innovators to bring together those participants with similar and complementary ideas. The preferred approach would be to develop a web based portal where people can share ideas and set out their skills and experience. This approach can be enhanced through face-to-face workshops and discussions between Ofgem and participants using the portal.

This option would facilitate cross-sector sharing between innovators increasing the chances of solutions meeting the wider strategic needs of the energy sector. This approach would also encourage innovators from beyond the usual sphere of energy sector participants. This should inject new ideas and approaches into the types of innovations being proposed.

However, we would also recommend that Ofgem should retain the flexibility to turn-off the functionality under Eligibility and Participation for individual funding rounds (assuming the implementation of our recommendation to incorporate targeted rounds for innovation) if it is deemed necessary. In addition, consideration will need to be given to the mechanisms through which third party led proposals are facilitated by the network businesses and how costs and benefits for the networks are reflected in their regulatory allowances.

5.2.1.3 Primary Objective 3: Deliver long-term cost and environmental savings.

By promoting a wider range of innovative solutions and services, it is anticipated that this will, in the longer-term, lead to greater benefits in terms of long term cost and environmental savings. At the same time funding will be more targeted to the wider needs of the energy transition and reduce the overall cost of delivery of decarbonisation initiatives. An increased efficiency of idea development through facilitation should help to reduce costs.

The maintenance of a 'match-making' portal would lead to increased administrative costs; however there are existing examples to draw on and the expectation is that this responsibility would be undertaken by an external administrator who would be expected to deliver any platform on a cost-effective basis.



5.2.1.4 Primary Objective 4: Deliverability of the Fund.

This approach will result in significant changes for both the funding bodies and potential participants. While retaining an influential role over the governance of the fund, this approach may result in Ofgem (GEMA) having to compromise on the objectives and criteria for project selection and assessment to ensure consistency across multiple fund partners. In addition, this Framework will require changes to the governance arrangements to enable third parties to take a lead in the innovation projects. This would, we understand, include changes to the network company licences.

However, there are synergies between Ofgem's requirements and the funds managed by UKRI and BEIS. As a result there would be some benefits resulting from sharing the fund administration and governance and reducing the risk of double-funding of some projects.

Finally, the continued use of independent assessment would allow some continuity in the governance arrangements. This approach is least likely to lead to unintended consequences, and many of the benefits discussed in Option 2 (Dual assessment⁹) and Option 3 (Government Official oversight¹⁰) can be achieved through different mechanisms.

5.2.1.5 Framework assessment Score

In Table 9 we present the scores for this framework.

Table 9 – 'Single Economy-wide Energy Innovation Fund' framework assessment

Framework	Objective scores			
	1	2	3	4
Single Economy-wide Energy Innovation Fund	✓✓	✓✓	✓	✗

⁹ The benefits of the dual assessment approach focussed on the ability of the administrator to prioritise those proposals delivering on the strategic requirements of the energy sector. However this can be achieved through specific innovation calls (under 'frequency of competitions') that target the strategic requirements.

¹⁰ The benefit of oversight from a government department is to ensure innovation projects meet the strategic aims and to help increase the visibility of the fund outside of the usual participants. However both of these can be achieved separately through specific calls (under 'frequency of competitions') and through a combination of 'match-making (Funding Support) and through changes to the Project administration and governance.



5.2.2 Framework 2: Ofgem Strategic Initiatives

The aim of this proposed framework is to deliver a Strategic Innovation Fund that is designed and governed solely by Ofgem. This Framework avoids the potential delays and challenges of agreeing and delivering a single fund across multiple funding bodies in the RII0-2 timelines, by allowing Ofgem to maintain direct control of fund. The building blocks of the framework are set out in Table 10.

Table 10 – Framework 2: Ofgem Strategic Initiatives

Building blocks	Option
Eligibility and Participation	Option 2: Allow third party led projects Plus Option 3: Impose structures on the consortium
Frequency of competition	Option 2: Open competition Plus Option 3: Discretionary special funding rounds to target strategic needs
Promoting collaboration	Option 3: Facilitated
Project selection and assessment	Option 1: Independent assessment
Project Administration and Governance	Option 2: External administration

In the following sections we assess this framework against the Primary Objectives.

5.2.2.1 Primary Objective 1: Support ambitious whole system (cross-sector) solutions.

This Framework has similar impacts in terms of supporting whole system solutions to those in Framework 1. By opening up the competition to third-party led applications, there is a likelihood of an increase in the number and range of projects applying. However, this may be less successful than an economy-wide fund if potential innovators are less familiar with Ofgem and its role in innovation funding than they are with the more general innovation funding bodies.



5.2.2.2 Primary Objective 2 Encourage inclusive participation to encourage

Again, as in Framework 1, widening the eligibility of third-parties to directly apply for funding and offering a more flexible funding application window should positively affect the number of innovators able to bring solution directly to the fund. Alongside the implementation of a match-making fund this option would facilitate cross-sector sharing between innovators increasing the chances of solutions meeting the wider strategic needs of the energy sector.

Challenges around the mechanisms through which third party led proposals are facilitated by the network businesses, and how costs and benefits for the networks are reflected in their regulatory allowances, still need to be addressed.

5.2.2.3 Primary Objective 3: Deliver long-term cost and environmental savings.

Through widening the accessibility of the fund to more diverse innovation solutions this framework should lead to benefits in long term cost and environmental savings. Again, the maintenance of a 'match-making' portal would lead to increased costs of delivery for the external administrator.

5.2.2.4 Primary Objective 4: Deliverability of the Fund.

Under this Framework Ofgem will be supported in the delivery of the fund by an external administrator. We have seen many examples of external administration being used within our case studies. For example this is a regular feature of European Commission funds, and this approach has also been used in the Transport Scotland Low Carbon Travel and Transport Challenge Fund. If selected properly the external administrator should be able to draw on economies of scale to administer the fund at a lower cost. However in contrast to Framework 1 Ofgem would maintain full governance of this fund.

Whereas Framework 1 would likely take a significant amount of time and is unlikely to be in place in time for the start of the RIIO-2 period, under this option Ofgem is able to target strategic needs straight away and supporting ongoing increases in the number and type of innovation solutions funded (facilitating cross sector proposals). Ofgem will also be able to facilitate the coordination of different companies looking to develop innovative solutions.

5.2.2.5 Framework assessment Score

In Table 11 we present the scores for this framework.

Table 11 – 'Ofgem Strategic Initiatives' framework assessment

Framework	Objective scores			
	1	2	3	4
Ofgem Strategic Initiatives	✓	✓✓	✓	✓

5.2.3 Framework 3: Targeted Innovation

The aim of this proposed framework is to specifically target strategic innovation requirements on an ad hoc basis. In this case funding would not be decided through an annual or regular funding round but would be initiated by Ofgem as and when required in response to identified needs (requiring some innovation challenge process). It is likely this may involve a much narrower range of projects linked to a clear demonstrated need, similar to the most recent TfL innovation process (e.g. retail technological innovation (2019), safer roadworks RoadLab (2019)). The building blocks of this approach are set out in Table 12.

Table 12 – Framework 3: Targeted Innovation

Building blocks	Option
Eligibility and Participation	Option 2: Allow third party led projects
Frequency of competition	Option 3: Discretionary special funding rounds to target strategic needs
Promoting collaboration	Option 3: Facilitated'
Project selection and assessment	Option 1: Independent assessment
Project Administration and Governance	Option 2: External administration

In the following sections we assess this framework against the Primary Objectives.

5.2.3.1 Primary Objective 1: Support ambitious whole system (cross-sector) solutions.

The framework would focus solely on discretionary special funding rounds to target strategic innovation. This option would therefore enable Ofgem to directly promote the wider strategic needs of the energy sector. This approach to targeting innovation is currently used by the TfL, London FreightLab fund. This fund has used focussed rounds to address strategic needs (e.g. retail technological innovation (2019), safer roadworks RoadLab (2019), bus safety (2017)).

Under this approach Ofgem will be able to consider what strategic requirements for networks would help deliver the energy transition and when they would be required. This will give Ofgem greater control over the types of proposals

brought forward by industry. Such a system would need to be supported by a more robust innovation challenge round to help Ofgem identify areas of interest for each round.

However this option could restrict the development of smaller projects (due to removal of regular competitions) which improve the efficient operation of the networks, but do not meet the requirements of the wider strategy. This may require Ofgem to review the current arrangements of the Network Innovation Allowance to ensure these types of project can still find funding if the RIIO price-control incentives are not considered sufficient.

5.2.3.2 Primary Objective 2: Encourage inclusive participation

This framework will provide the flexibility for Ofgem to incentivise participation from a wider range of innovators through third party led projects and facilitated match-making. This wider participation should lead to greater cross-sector coordination. The implementation of a match-making fund (via the Funding Collaboration building block) should also help to ensure that those participants with similar and complementary ideas are coming together in an efficient way.

The match-making portal would be used to support the development of innovative ideas. This match-making portal has been used in the Horizon 2020 fund to help innovators come together across Europe. However, other approaches are in use, for example, BEIS offers workshops with innovators to bring together those participants with similar and complimentary ideas. As described previously, the preferred approach would to develop a web based portal where people can share ideas and set out their skills and experience. This approach can be enhanced through face-to-face workshops and discussion with Ofgem.

Ofgem would also have the flexibility to encourage innovators from beyond the usual energy sector participants towards the fund. This should inject new ideas and approaches into the innovation solutions being proposed. This will be enhanced by the option for a third party to lead a project (proposed under Eligibility and Competition building block above) - increasing the number of innovators willing to bring solutions directly to the fund.

In line with Frameworks 1 and 2 Ofgem should retain the flexibility to turn-off the functionality under Eligibility and Participation for individual funding rounds (assuming the implementation of our recommendation to incorporate targeted rounds for innovation) if it is deemed necessary.

5.2.3.3 Primary Objective 3: Deliver long-term cost and environmental savings.

It is our view that this option will be positive to the long term reduction of costs and environmental savings if a wider range of solutions are brought forward, and as these will be targeted on priority areas they will address the biggest challenges of the long term energy transition needs. However, there is a risk that smaller innovation activities will be lost through the discretionary nature of this funding and therefore some benefits may be missed. In addition, there will be a need to more pro-actively undertake foresight and innovation needs assessments to identify when it is appropriate to start a call for proposals.



5.2.3.4 Primary Objective 4: Deliverability of the Fund.

The framework will result in a number of changes compared to the current arrangements. While it maintains the central role for Ofgem in governing the fund and benefits from the outsourcing of administrative responsibilities to a suitable (competent) external provider, it will require additional work from Ofgem staff to determine when, and on what innovation area, each discretionary round should occur.

5.2.3.5 Framework assessment Score

In Table 13 we present the scores for this framework.

Table 13 – ‘Targeted Innovation’ framework assessment

Framework	Objective scores			
	1	2	3	4
Targeted Innovation	✓	✓✓	✓	✗



5.2.4 Framework 4: External administration

This framework will see the current NIC arrangement adapted to allow Ofgem to target strategic innovation challenges, and move the administration of the fund to an external administrator. The main building blocks are set out in Table 14.

Table 14 – Framework 4: External administration

Building blocks	Option
Eligibility and Participation	Option 1: Network Company led
Frequency of competition	Option 1: Regular Competitions plus Option 3: Discretionary special funding rounds to target strategic needs
Promoting collaboration	Option 3: Facilitated
Project selection and assessment	Option 1: Independent assessment
Project Administration and Governance	Option 2: External administration

In the following sections we assess this framework against the Primary Objectives.

5.2.4.1 Primary Objective 1: Support ambitious whole system (cross-sector) solutions.

Under this option third parties will still not be able to bring forward innovative solutions to fund independently. The continued requirement for Network Companies to lead the innovation projects may result in innovative solutions that deliver incremental change in the current operation of the networks – as opposed to delivering whole system solutions.

However, within this constraint, this framework does provide Ofgem with the flexibility to target strategic requirements to help deliver the energy transition while at the same time ensuring that innovation proposals linked to the operation of the network can continue to be assessed.



5.2.4.2 Primary Objective 2: Encourage inclusive participation to encourage

This framework includes the implementation of regular and focussed calls for innovation. This approach, of combining regular competition alongside targeted rounds, has been used in funds such as the Horizon 2020 fund. This will be matched with the implementation of a match-making fund (funding collaboration) will also ensure participants (with similar and complimentary ideas) are able to identify each other more efficiently.

While this approach should lead to some increase in participation (e.g. resulting from the targeted funding rounds and the match-making portal which is expected to improve upon the current industry led call for ideas), the continued use of regular competitions may not address the fact that innovation needs are not regular and there is a risk of funding less innovative projects. In addition, innovative solutions may also be reduced by the continued requirement for network company led projects (proposed under eligibility and Participation). It will also fail to address the issues raised by some third party participants¹¹, that regular funds increases administration faced by smaller innovators.

As described previously, the preferred approach for the match-making portal would be the development of a web based portal where people can share ideas and set out their skills and experience. This approach can be enhanced through face-to-face workshops and discussion with Ofgem. This approach would allow Ofgem to engage with innovators earlier and provide guidance on the potential innovations. The aim is to switch the dynamics of the innovation section away from direct competition, towards a more collaborative approach.

5.2.4.3 Primary Objective 3: Deliver long-term cost and environmental savings.

It is our view that this option will be positive to the long term costs and environment savings if a wider range of solutions are brought forward, with benefits of targeting specific innovation to meet the long term energy transition needs. This will result from the benefits of targeting specific innovation to meet the long term energy transition needs. However, by restricting the routes through which third-party innovators can access funding these benefits may be less than could be realised in a broader access fund.

Ofgem's role in designing and evaluating projects would remain. However it would be enhanced by being able to appoint an external provider to administer the fund. The external administrator should be able to draw on economies of scale and a more focused administration to operate the fund at a lower cost.

5.2.4.4 Primary Objective 4: Deliverability of the Fund.

This option would result in a positive change to Ofgem's roles and responsibilities – reducing the current administration for Ofgem. Outsourcing the administrative responsibilities to a suitable (competent) external provider should free Ofgem resources to focus on more relevant and appropriate challenges. This should enable the continued efficient operation of the fund.

¹¹ This was first raised as a concern during the evaluation of the Low carbon Network fund.



This approach also provides continuity on the evaluation process. Under this option Ofgem's role will remain the same as under the current NIC fund. This should result in minimal change in how the fund is administered and operated. We have seen examples of external administration being used within our case studies. For example this is a regular feature of European Commission funds, and this approach has also been used in the Transport Scotland Low Carbon Travel and Transport Challenge Fund.

The maintenance of a 'match-making' portal could lead to additional administration for Ofgem (if it is required to monitor the portal); however we would expect this to be maintained by the external provider described in the Project Administration and Governance building block.

5.2.4.5 Framework assessment Score

In Table 15 we present the scores for this framework.

Table 15 – 'External Administration' framework assessment

Framework	Objective scores			
	1	2	3	4
External Administration	✓	-	✓	✓

5.2.5 Summary of Framework Assessment

In Table 16 we summarise the overall scores under each of the frameworks we have presented above.

Table 16 – Summary of the Framework Assessment

Framework	Objective scores			
	1	2	3	4
Single Economy-wide Energy Innovation Fund	✓✓	✓✓	✓	✗
Ofgem Strategic Initiatives	✓	✓✓	✓	✓
Targeted Innovation	✓	✓✓	✓	✗
External administration	✓	-	✓	✓



5.3 Preferred Approach

Our preferred approach will be the implementation of the Ofgem Strategic Initiatives. The evidence behind our preferred approach has been drawn from the research undertaken within this study. In particular, we have considered how the building block option presented in this preferred framework has worked in existing schemes, as evidenced through our case study reviews.

This Framework this recognises the benefits of expanding the accessibility of the fund to a wider set of applicants and the potential cost efficiencies of external administration but avoids the delivery risk within the RIIO-2 timeframe of trying to coordinate multiple bodies under Framework 1.

The approach is summarised in Table 17.

Table 17 – Approach for implementing the 'Ofgem Strategic Initiatives'

	Eligibility and Participation	Frequency of competition	Promoting collaboration	Project selection and assessment	Project Administration and Governance
'Ofgem Strategic Initiatives'	Option 2: Allow third party led projects Option 3: Impose structures on the consortium	Option 2: Open competition Option 3: Discretionary special funding rounds to target strategic needs	Option 3: Facilitated	Option 1: Independent assessment	Option 2: External administration
Initial position	Off	On	On	On	Off
Trigger	Agreement with Network Companies on licence changes				Successful contract with 'External Administrator' via tender process
Pre trigger option	Option 1: Network Company led				Option 1: Self-administration and governance



We acknowledge some aspect of this framework will be more straightforward to implement. Therefore we are proposing a staggered approach to implementing the fund. Under this staggered approach certain options selected in the in Ofgem Strategic Initiatives will be turned off until an appropriate agreement is triggered.

A staggered approach may be more appropriate given the impact on the fund (e.g. changes both for the roles and responsibility of Ofgem and the fund participants) and the timescales available to make the change, ahead of the start of the RIIO-2 process.

The starting point identified in Table 17 is the most straightforward approach to meeting Ofgem's immediate needs for incentivising greater strategic innovation, as well being possible to deliver for RIIO-2. The implementation of options under the Frequency of Competition, Promoting Collaboration and Project selection and assessment building blocks, while significant, should be able to be made ahead of the RIIO-2 implementation date. Then the speed at which decisions can be made to turn on the remaining building block options will be based on Ofgem ongoing discussions with industry and timelines for contracting with an external administrator.

It is our expectation that Ofgem will be in a position to activate the options under the Eligibility and Participation building block first. By implementing 'Option 2: Allow third party led projects' and 'Option 3: Impose structures on the consortium' the framework of the fund will be in-line with the 'Ofgem Strategic Initiatives' proposed framework. This will provide significant benefits both to Ofgem and to participant by increase the opportunities for third parties to directly access the fund. At the same time Ofgem can also start the tender process to select external administrator under the Project Administration and Governance'. Once agreed, this framework will deliver benefits linked to increased accessibility for wider set of applicants while allowing efficiencies associated with external administration.

However, we see that Framework 2' Ofgem Strategic Initiatives' is compatible with the possible move towards a single strategic fund along the lines of 'Framework 1 Single Economy-wide Energy Innovation Fund' as and when discussions and agreement across funding bodies is reached.

This would set the foundation for the wider changes required within Framework 1. For example define strategic objectives, move to change licences to allow third party participation and the latter funding merger would then be at a later stage. This Framework will deliver benefits both for funding bodies and potential participants from the increased coordination. Once agreed this would ensure that conflicts which currently exist between the innovation funds will be addressed.

5.4 Future consideration for implementing the Strategic Innovation Fund

This report has focused on the broad framework for administering the fund. There are several additional issues that have been raised during our research and discussions with Ofgem that will require further consideration as proposals are developed.

5.4.1 Evaluation Process

In making awards, the strategic fund will need to be able to compare and rank a wide range of innovation projects. Under recent funds (LCNF and NIC), this assessment has been qualitative, with expert opinion shaping the successful projects (along with some pre-filtering done within industry). As future projects may vary greatly in size and focus, some way of ensuring the relative as well as the absolute benefits of projects may become necessary. Therefore, it may be worth considering the value of a quantitative metric in addition to the qualitative assessment of technical feasibility. This may be focused on some simple effectiveness measures linked to data already provided in the funding application and compatible with the broad objectives of the fund itself – for example, the estimated funding cost per unit of carbon saved, or the consumer ‘benefit:cost’ ratio associated with the project.

5.4.2 Ensuring appropriate scope for projects

There is a sense that the Strategic Innovation Fund will end up providing funding to larger, more holistic, projects. This may mean that (a) even with a larger fund, fewer projects may get funded; and (b) network specific projects may get lost in the wider innovation space. It will therefore continue to be important to ensure that smaller, or more narrowly focused, projects can still compete effectively for money or that Ofgem is confident the wider RIIO framework contains the appropriate incentives to drive these smaller innovation solutions. Where these projects still require additional support, there may be some consideration to the award criteria (e.g. ensuring at least a minimum number of projects are supported in each identified category of innovation).

5.4.3 Developing effective coordination across funding bodies

While we recognise that there are ongoing discussions with the likes of BEIS and Innovate UK over a single strategic fund, there are specific elements of any future single innovation fund that would need further consideration. These include how to trade off multiple objectives across funding bodies and understanding of the rights of veto/challenge that Ofgem/GEMA may have over award decisions (and similar for the other bodies).

5.4.4 Definition of secondary metrics

The secondary metrics supporting each primary objective will need to have some stronger quantification to enable effective monitoring of whether the Fund is delivering against its objectives and providing value for money.

5.4.5 Collaboration/match-making platform

There would need to be further work on the form of any future match-making platform. The form this would take will need to be agreed and the platform implemented in time for the start of the first funding round if the wider participation that is being sought is to be realised. It will also need to be decided how this platform is maintained, e.g. by Ofgem or an external body

5.4.6 Procurement of the external administrator

The process through which an external administrator for the fund will be appointed needs to be done ahead of the start of the funding period otherwise there remains a risk of excessive administrative costs as Ofgem would have to temporarily operate the fund while an external operator is being sought. The timeframe for procurement, the specification for the administration role and the format for the process will all need to be established in the next few months.

5.4.7 Timing of necessary licence changes

Ofgem will need to get a clear view on the extent of licence amendments that may be required to ensure third-party involvement and the timescales for implementing these. To the extent that such changes cannot be made in a reasonable timeframe then stricter restrictions on consortia may need to be applied as a fall-back.

ANNEX A - EVALUATION OF BUILDING BLOCKS

This section presents our assessment of the building block options.

A.1 Eligibility and Participation

We have considered four options for the 'Eligibility and Participation' building block. These are:

- **Option 1: Network Company led:** Under this option the competition will be open to all market participants, but the projects will have to be led, and proposals submitted, by the network companies. Under this approach network companies are required to consult with industry (e.g. through a call for ideas), before developing proposals that will be submitted to Ofgem. This is the current approach used in the NIC
- **Option 2: Allow 'third party'¹² led projects:** Under this option third parties will be able to take the lead in projects. The aim is to ensure that the network companies are not able to block certain solutions coming to market.

Under this approach there would need to be clear and defined rules for the third party to test solutions on the network without impacting on the safe and efficient operation of the network.

- **Option 3: Impose structures on bid consortia:** Under this option Ofgem would define how consortia are structured (e.g. types of companies involved, role/responsibilities of the companies within the consortium). The aim would be to achieve greater inclusion, ensuring input from different types of businesses.

For example this could take the form of Ofgem stating all consortia must include a SME (or similar). Or Ofgem could state that one company, and its subsidiaries, should not be responsible for more than a maximum share of the project funding. We have seen examples of this in the Horizon 2020 fund and the EuroStars funding

- **Option 4: Match funding:** This option requires innovators to provide evidence that they are able to match the funding they receive from the innovation fund with funding from private sector investment – without this evidence the proposals would be rejected. Under this option the innovation fund would only cover a set percentage of costs (to be determined by Ofgem). The rest of the funding would come from private finance.

Match funding is used to encourage project developers to consider the commercialisation of the solution in greater detail. This approach has been seen in many funds e.g. Norwegian Explorer fund, the Baltic Innovation Fund, Transport Scotland. This option will also be considered alongside the 'levels of funding' in future work Ofgem will take forward after this study, and we recognise the challenges of implementing this within a regulated business environment. In Table 18 we present our evaluation and recommendation.

¹² Non network companies

Table 18 – Assessment of ‘Eligibility and Participation’ options

Objective	Score	Comment
Option 1: Network Company led (Current NIC arrangements)		
Objective 1: Support ambitious whole system solutions		<p>Under this option it is the responsibility of the network companies to bring forward innovative solutions. Third parties cannot do this independently. This can result in a focus on solution being brought forward that either improve the operation of the electricity network or the gas network – e.g. this is no incentive for the companies to consider cross sector challenges.</p> <p>The network companies¹³ are also more likely to pursue ideas that are familiar to themselves, which will often lead to innovation solutions that deliver incremental change in the current operation of the networks. This behaviour has been seen within the current NIC fund.</p> <p>Under this approach the network companies may also be faced with a ‘conflict of interest’ between the innovation solutions and maintaining their current ways of working. This may lead to the companies to take less risky innovative solutions forward.</p>
Objective 2: Promote inclusive participation		<p>The obligation on the network companies to consult with industry ahead of submitting the proposals should lead to increased participation third parties.</p> <p>However, this approach can act as a barrier to entry for new ideas as the network companies retain the power to say which solutions are taken forward. This lack of control over their own innovate solutions may lead to some third parties deciding not to interact with the fund.</p>
Objective 3: Deliver long-term cost and environmental savings		<p>Under this option innovation should lead to the development of innovation solutions that deliver both financial and environmental savings.</p> <p>The experience and knowledge within the network companies should means that proposals and projects are managed efficiently, allowing an effective transfer to BAU.</p> <p>However, this option will tend to prioritise incremental network changes. This may result in cross sector solutions which deliver benefits to the end customer being missed.</p>

¹³ This has mainly been a concern in the electricity sector. The gas sector has started to consider strategic aims through the development of hydrogen projects.

Objective 4: Under this option Ofgem's roles and responsibilities will remain the same as under the current NIC fund. This should enable the continued efficient of operation of the fund.

Deliverability of the Fund

However, this option will not address the challenges currently faced by Ofgem in the administration and management of the fund.

Option 2: Allow third party led projects

Objective 1: Allowing third party led project should increase the numbers and types of solution put forward under the innovation fund. Opening up the fund should encourage new participants to the fund and this could potentially include participants from other sectors (e.g. heat and transport) encouraging greater coordination. This approach will allow the third party to have greater control over the development of its proposed solution, as opposed to being a junior partner in a network company led project.

Support ambitious whole system solutions

However issues could arise in terms of IPR. The commercial relationship between the third party and the network company will need to be carefully considered. For example, who will receive the financial benefit from the solution? This issue has been raised in response to both the LCNF evaluation and NIC consultations.

It may still be necessary that network companies play a part in each project to ensure that any testing requiring the network is undertaken in a controlled environment. Ultimately it is the network companies who are responsible for the safe operation of the electricity / gas systems.

Objective 2: Allowing third party lead projects should increase participation within the fund. This will promote access for a third party to directly present its solutions to Ofgem and removes some of the control currently held by the network companies.

Promote inclusive participation

This option will allow for greater consistency between the participants operating across UK innovation funds. This decision would give them the same opportunity to access Ofgem funds as it does under other innovation funds.

Objective 3: Deliver long-term cost and environmental savings

This option could lead to cost saving for customers if a wider range of solutions are brought forward. Third Parties may also be more incentivised to make sure their solutions are commercialised through to BAU faster than network companies.

This approach may increase the risks of network operations. And any impact on the efficient operation could lead to cost increases. This will require robust processes to be put in place between the third party and the network company to remove risks on the network operation.

Objective 4: Deliverability of the Fund

This option will require changes to the governance arrangement to enable third parties to take a lead in the innovation projects. This will include changes to the network company licenses to ensure they are 'insured' against any damage (physical and reputational) caused to the network as a result of projects they are not leading.

This approach is also likely to lead to a greater 'hands on role' in the ongoing administration of funded projects. This is because the third parties are likely to have less experience of both managing the projects, and of Ofgem's requirements for reporting etc. (compared to the network companies).

Option 3: Impose structures on the consortium

Objective 1: Support ambitious whole system solutions

Allowing Ofgem to provide guidance on the structure of consortium should increase involvement under the fund. Specifying limits on the role of any single member of the consortium will lead to larger consortium, reducing the dominance of a single company in the development of the project. This should lead to greater knowledge sharing as more companies come together. This may lead to an increased chance of developing solutions that facilitate and coordinate across sector.

However it will be important that Ofgem interventions do not increase the administration involved in preparing proposals (e.g. how much additional work is required for each additional consortium member). Or secondly dampen the competitive spirit of the innovation fund.

Objective 2: Promote inclusive participation This option will give Ofgem the potential to 'encourage inclusive participation'. The option will open up more opportunities for third party involvement – which should lead to greater coordination of companies operating across the different innovation funds.

Ofgem will be able to specify the types of companies (e.g. SMEs) it wishes to be involved, and as a result it can be used to encourage third parties of all shapes and sizes.

Objective 3: Deliver long-term cost and environmental savings This option is unlikely lead to direct cost savings or environmental benefits. However it has the potential to ensure that a greater range of innovative solutions are taken into account. This should reduce the chance that solutions, which benefit the wider economy economically or environmentally, are missed.

Objective 4: Deliverability of the Fund Under this option there will be upfront changes (we would not expect any significant challenges to the delivery of the innovation fund) to the governance arrangements to allow for Ofgem to specify requirement of the fund (increased effort to assess and vet the consortium).

Option 4: Match funding

Objective 1: Support ambitious whole system solutions This option should not have a direct impact on whether the projects brought forward 'support ambitious whole system (cross-sector) solutions to facilitate the 'energy sector transition' and achieve 'net zero'".

However there is the chance that the involvement of private sector funding will lead to proposals that deliver financial benefits ahead of solutions that facilitate the energy sector transition.

Objective 2: Promote inclusive participation This option has the potential to reduce the number of proposals being submitted which are less commercially attractive. A requirement to deliver returns to private sector investors is likely to lead a shift towards projects which are more likely to deliver financial returns in the short term.

However, involvement of 'private funding' could allow Ofgem to co-fund a greater number of projects. This could lead to an increase in participation.

Acquiring match funding is also likely to increase the administration involved in the development of proposals, this may fall disproportionately on the smaller participants.



Objective 3:
Deliver long-
term cost
and
environment
al savings

This option should reduce costs by reducing the amount of funding coming directly from the public sector. Match funding will de-risk Ofgem's involvement by forcing the participants to partially fund the project from alternative private sector funds.

The involvement of the private sector may also lead to innovative solutions that are closer to, or more certain of achieving BAU due to investors seeking faster returns. This may come at a cost of missing out on solutions that will deliver financial and environmental benefits in the long term.

Objective 4:
Deliverability
of the Fund

This option is likely to increase the complication of administering the innovation fund. For example, Ofgem (or an external administrator) will be required to coordinate with private sector funding providers, and may be required to undertake initial financial standing assessments which would be more time consuming.

A.2 Frequency of Competitions

We have considered three options for the 'Frequency of Competition' building block. These are:

- **Option 1: Regular Competitions:** Annual competitions are used in a number of innovation funds including the existing NIC. This approach gives certainty on when companies should expect to develop proposals, allowing them to plan resources appropriately.

However these competitions can be seen as restrictive, for example regular competitions fail to address the fact that innovation itself is not regular and so may end up funding less innovative projects just because they are ready at the time of the call for tenders.

- **Option 2: Open Competitions:** Under Open competitions the participants will be able to submit proposals at any time within the overall funding period (e.g. the five year price-control period for RII0-2). The proposals will then be assessed by the fund operator at predefined intervals.

The open competition should reduce the administration for smaller companies developing proposals for set deadlines. However there will be an increase in the administrative requirements on the 'fund administrator' as a result of the increased number of assessments periods.

Open competitions are used by Innovate UK and the European Commission EuroStars fund.

- **Option 3: Discretionary special rounds to target strategic needs (Strategic Funding):** This approach will allow the fund administrator the flexibility to strategically plan the areas where innovation is required.

Discretionary competitions are used in the TfL, London FreightLab.

In Table 19 we present our evaluation and recommendation.

Table 19 – Assessment of 'Frequency of Competitions' options

Objective	Score	Comment
Option 1: Regular Competition (Current NIC arrangements)		
Objective 1: Support ambitious whole system solutions		<p>This option provides certainty to participants, but lacks flexibility to fully support coordination across different sectors.</p> <p>Regular competitions also fail to address the fact that innovation itself isn't regular and so may end up funding less innovative projects just because they are regular. This has the potential to divert funding from when there are bigger needs challenges arising</p> <p>It can also discourage third parties through an increased administration; this will ultimately impact on the types of solutions being put forward.</p>
Objective 2: Promote inclusive participation		<p>The administration linked to set deadlines falls hardest on the small participants. This is a disincentive to become involve with potential projects.</p> <p>As highlight above, this option also places unnecessary timings on the development of innovative solutions ahead of the submission.</p>
Objective 3: Deliver long-term cost and environmental savings		<p>Indirectly this option could reduce the number and types of solutions brought forward, and this may mean missing beneficial solutions.</p>
Objective 4: Deliverability of the Fund		<p>Under this option Ofgem's roles and responsibilities will remain the same as under the current NIC fund. This should will result in minimal changes to how administers and operates the fund.</p>

Option 2: Open Competitions

Objective 1: Support ambitious whole system solutions		<p>In line with Option 1 the open competition will allow participants to bring forward innovative solutions as and when they emerge. It should also remove some of the 'barriers to entry' for smaller third parties.</p>
--	--	---

Objective 2: Promote inclusive participation	This approach should allow participants to submit proposals when ready rather than in specific windows - allow proposals to be developed more naturally. This will be particularly beneficial for small participants with lower resources.
Objective 3: Deliver long- term cost and environment al savings	<p>It is our view that this option will benefit long term costs and environmental savings. It will allow funding to be accessed more readily and at the right point in their development.</p> <p>The fund will be more likely to capture more innovative solutions, but there will also be increased costs associated with the management of an open competition.</p>
Objective 4: Deliverability of the Fund	<p>This option would require change from the current operation of the fund. We would anticipate a small increase in administration to run an 'open' fund, and some increased coordination challenges associated with more frequent evaluations.</p> <p>However, we would not expect any significant changes to Ofgem's roles and responsibilities.</p>

Option3: Discretionary special funding rounds to target strategic needs

Objective 1: Support ambitious whole system solutions	This option will allow Ofgem to guide the types of solutions brought forward. For example it will be able to ask directly for proposals providing solutions that focus on hydrogen and interactions with the other energy sectors. This should help to deliver new technologies across sectors to achieve the energy system transition.
Objective 2: Promote inclusive participation	By allowing for targeted rounds, this option will enable Ofgem to improve the consistency and coordination across the different strategic aims of the energy sector innovation funds. For example it can work together with other funding providers to ensure gaps in the innovation landscape are filled. This approach will also allow Ofgem to target different levels of innovation, depending on the aim of a specific call.
Objective 3: Deliver long- term cost and environment al savings	It is our view that this option will be positive to the long term costs and environment savings. This will result from the benefits of targeting specific innovation to meet the long term energy transition needs.



Objective 4: Deliverability of the Fund This option would result in material changes to the delivery of the innovation fund, which will impact on Ofgem's roles and responsibilities.

Although this option will place additional administration on Ofgem, there are examples and experience from other innovation funds (e.g. Horizon 2020, ARENA -as shown in the case study assessment) from which Ofgem can learn.

A.3 Promoting Collaboration

We have considered three options for the 'Promoting Collaboration' building block. Enhanced collaboration is likely to be required address the fact that new types of innovation project may dictate more direct facilitation from Ofgem with bidders, rather than neutral standoff assessment of bids. These are:

- **Option 1: Neutral:** Under this option the funding body will not directly support the development of the innovation proposals (e.g. by facilitating the sharing of ideas).

The fund will be driven by the competition between potential participants.

- **Option 2: Incentivised:** Additional incentives may be provided to particular types of project or participant to encourage their participation (e.g. allowing access to greater funding for consortia). This approach is used in the German fund, whereby an additional 10% of the total project cost is provided (the remaining is funded privately).

Other variants of this could include providing a bonus where consortia are used, or reduce amount of funding provided by the company itself.

- **Option 3: Facilitated:** The fund administrator (this can either be undertaken by Ofgem or by an external administrator) will facilitate third party participation through various means of encouraging collaboration across activities. Although this can take many forms, we have assumed this option will require the fund administrator to host an online portal for collaboration between participation and forum for the development of ideas. This portal will allow interested parties to submit their own skills and experience as well as searching for other participants with the skills they require. The forum could also be used to discuss potential innovation solutions and provide non-binding votes on which proposals should be taken forward in to assessment.

This approach is used to different extents in existing funds e.g. Horizon 2020 has an automated web-portal, while BEIS hold workshops for interested parties. This approach also gives Ofgem greater visibility on the types of participants and the potential innovative solutions being developed.

In Table 20 we present our evaluation and recommendation.

Table 20 – Assessment of ‘Promoting Collaboration’ options

Objective	Score	Comment
Option 1: Neutral (Current NIC arrangements)		
Objective 1: Support ambitious whole system solutions		<p>Competitive forces should continue to drive innovation as it has done during the LCNF and NIC funds. It is possible that competition alone will not necessarily lead to innovation in the areas targeted by Ofgem, and again may not deliver innovation solution across different sectors.</p> <p>These issues have been identified under the current NIC fund, which has continued to lead to innovation, but without a strategic focus on the wider needs of the energy sector.</p>
Objective 2: Promote inclusive participation		<p>This option may lead to hesitancy in companies actively trying to engage with third parties. Companies are much more likely to develop solutions alone and bring them to Ofgem without consideration of the benefits from wider collaborative thinking.</p> <p>The extent to which these issues can be mitigated in the development of solutions will depend on other building blocks, such as those assessed under ‘eligibility and participants’.</p>
Objective 3: Deliver long-term cost and environmental savings		<p>We would expect competition to lead to value for money for customers.</p> <p>However as a result of lower coordination between participants it is possible to imagine that proposals submitted to Ofgem could have been more efficient if there was greater collaboration between participants.</p>
Objective 4: Deliverability of the Fund		<p>Under this option Ofgem’s roles and responsibilities will remain the same as under the current NIC fund. This should result in minimal changes to how administers and operates the fund.</p> <p>However this will not address the challenges of encouraging greater participation from a wider range of innovators.</p>

Option 2: Incentivised

Objective 1: Support ambitious whole system solutions	<p>Under this option Ofgem could use financial incentives to encourage wider cross sector coordination to help achieve the energy sector transition. However this would be a clunky instrument to achieve this goal, and there would be better options under the building blocks.</p> <p>Simply incentivising a consortium bid will not necessary deliver on the wider goals of the fund. And to achieve the requirements under this objective would need very specific rules on the structure of the consortium, which has the potential for unintended consequences.</p>
Objective 2: Promote inclusive participation	<p>The benefit of this option is that it would encourage wider participation in the fund.</p> <p>However as we discussed above, this does not necessarily lead to the consortium being developed for the benefits of the innovation solution.</p> <p>There is a still a risk that a consortium will be developed for the sole reason of accessing greater funding. This can be mitigated by specifying the input from each consortium member, but it does not force companies to seek out ideas and views that are challenging to their own.</p>
Objective 3: Deliver long-term cost and environmental savings	<p>Under this option there is a risk of inefficiencies being created in the delivery of projects through 'unnatural consortium'.</p> <p>For example, although the innovative solution being developed may still lead to a wider economic and environment benefit, there may be extra cost associated with maintaining an unnecessary member of the consortium.</p>
Objective 4: Deliverability of the Fund	<p>It is our expectation that this option would require minimal changes from Ofgem's current roles and responsibilities.</p> <p>We would expect some changes to the governance arrangements to allow Ofgem to positively discriminate in favour of consortium, but no legislative changes. Further, we would not anticipate any change in the evaluation of the innovation proposals, or the long term management of the funded projects.</p>



Option 3: Facilitated

Objective 1: Support ambitious whole system solutions

Under this option the fund administrator can help to facilitate the coordination of different companies looking to develop innovative solutions. Companies will be able to use a 'database' to search for companies who may have the skills and expertise that can enhance their existing innovative solutions. This will benefit cross-sector type solutions where potential innovators are not known to each other.

This approach will also develop a forum for companies / individual with a shared interest in innovation. Through these discussions, we would expect to see benefits in the development of ideas prior to the proposal being submitted. This forum could also be used by fund administrator / companies to vote (non-binding) on those ideas that should be put forward for funding.

This approach would also encourage much greater knowledge sharing between the participants. And while we still would expect competition between types of innovative solutions, we would expect that this option will reduce the competition between variants of the same solution.

Objective 2: Promote inclusive participation

The development of this type of 'forum' will allow greater access for all participants (across research, development and deployment) to share ideas.

The approach should encourage greater participation from third party innovators, while improving coordination across sectors by encouraging these innovators to discuss ideas with each other. Ultimately this should increase research excellence by bring the experts closer together.

Objective 3: Deliver long-term cost and environmental savings

This option may lead to increased efficiency savings in the development of projects resulting from prior screening of ideas by the innovators themselves.

By encouraging a mix of technical experts and more commercially minded experts to discuss and develop proposals together should lead to a better balance on the process of taking the innovative solution through to business as usual.

Maintaining a portal will increase the cost of administrating the fund, but we would expect these to be offset by the benefits of sharing ideas more freely and easily.



Objective 4:
Deliverability
of the Fund

The maintenance of a 'match-making' portal could increase administration for Ofgem (if it is required to monitor the portal i.e. this could be undertaken by an external administrator). For example this may include a range of different impacts, from greater engagement with innovators ahead of the proposal stage to a requirement to moderate the content of the portal.

A.4 Project selection and Assessment

We have considered three options for the 'Project Selection and Assessment' building block – under all three options we would also expect there to be a minimum set of qualification criteria which each proposal must meet prior to moving through to the assessment phase.

We assume under all options that proposals are assessed on individual merit and the best are selected. Differences in the selection process may occur in terms of the maximum number of projects selected. For example, this could be based on the total available budget, or on a pre-defined number of projects being taken forward. The extent to which the final evaluation is qualitative and based on subjective expert opinion or may include quantitative ranking metrics around project 'effectiveness' is not considered at this stage – it is largely focused on who is responsible for making the selection.

Our proposed options are:

- **Option 1: Independent assessment:** The majority of the funds reviewed in our case studies (Horizon 2020, Innovate UK, EuroStars, TfL etc.) are evaluated by independent experts. This ensures transparency and fairness for those bidding into the fund.

Typically the criteria will include – clarity of objectives; demonstration of innovation beyond BAU; coordination and support of findings; alignment with national policies. The criteria could also include specific minimum criteria – for example length of project and time for commercialisation of the main project (this is used in the EuroStars funding mechanism).
- **Option 2: Dual assessment (independent and fund administrator):** In this case the assessment takes place in two stages. The first stage will allow the fund administrator to filter / select those proposals that are meeting specific strategic targets. The chosen projects are then passed on to the second stage where each project will be assessed by an external independent panel. An approach similar to this is used by BEIS¹⁴
- **Option 3: Government oversight within expert panel.** Under this approach government officials would be directly involved in the assessment process – the aim would be to ensure the strategic aims of the fund are met, and secondly to increase the accountability of funding decisions (e.g. answerable to the people). For example this could include assessment by the Civil Service with final sign-off from a Minister.

This type of approach is proposed for the planned French fund.

In Table 21 we present our evaluation and recommendation.

¹⁴ In the BEIS fund the first stage is an independent evaluation of the fund and then the second stage of the assessment considers the commercialisation of the proposals

Table 21 – Assessment of 'Project Selection and Assessment' options

Objective	Score	Comment
Option 1: Independent assessment (Current NIC arrangements)		
Objective 1: Support ambitious whole system solutions		<p>This option should help to facilitate the 'Energy Sector Transition' if the guidelines for the evaluators are defined correctly.</p> <p>However if the evaluation criteria is neutral in terms of the wider strategic value of the project, the evaluators may select a project that meets the criteria but not the broader aim of the energy sector transition.</p> <p>Although this risk can be mitigated, there is also a risk that asking independent evaluators to interpret government policy may not be appropriate. It may increase the risks of judicial review.</p>
Objective 2: Promote inclusive participation		<p>The guidelines can help to encourage participants to coordinate between sectors etc. However, we do not see this having a significant impact on the participation across the different levels of research.</p>
Objective 3: Deliver long-term cost and environmental savings		<p>This option should ensure that those projects which receive funding have both environmental and financial benefits. It will do this by ensuring that only the best proposals are taken forward, and reduces the risk that project are funded based on non-transparent reasons.</p> <p>However if combined with an open / regular interval competition the independence of this evaluation could mean that projects taken forward do not meet the wider strategic benefits of the sector.</p>
Objective 4: Deliverability of the Fund		<p>Under this option Ofgem's roles and responsibilities will remain the same as under the current NIC fund. This should will result in minimal changes to how administers and operates the fund.</p> <p>This should also result in minimal changes even in combination with changes to the other building blocks.</p>

Option 2: Dual assessment (independent and fund administrator)

Objective 1: Support ambitious whole system solutions	<p>This option should help to facilitate the 'Energy Sector Transition'. This option should also focus the evaluation on the strategic aims by eliminating those projects that do not match the objectives.</p> <p>Prior knowledge of the evaluation process should encourage potential bidders to coordinate with each other to deliver cross sector solutions.</p> <p>However this option relies on the 'fund administrator' having a clear and detailed understanding of which projects will meet the strategic aims. In some cases this may be obvious, but in others there may not be a direct link – making it harder to assess. Therefore there is an increased risk of 'valuable' projects being missed.</p> <p>This approach may also be unnecessary if the fund operates specific funding rounds for strategic projects. Under such a structure we would expect most of this filtering is completed by the companies themselves submitting the bids.</p> <p>This also has the potential to reduce the independence of the evaluation process, and risks becoming a barrier to entry.</p>
Objective 2: Promote inclusive participation	<p>Again the guidelines can help to encourage cross sector coordination between participants. But again, we do not see this having a significant impact on the participation across the different levels of research.</p> <p>But in line with the assessment under Objective 1, there are risks that this process could negatively impact on the independence of the fund. If this does occur then it likely to reduce the participation in the innovation fund.</p>
Objective 3: Deliver long-term cost and environmental savings	<p>This option will help to ensure that all projects taken forward meet the strategic needs of the funding body. This should lead to economy wide benefits from delivering the projects.</p>
Objective 4: Deliverability of the Fund	<p>This option should have a limited impact on the administrative responsibilities faced by Ofgem.</p> <p>The main change will be the requirement to coordinate between the two separate assessments, and any subsequent changes in the governance arrangements between the two (e.g. which assessment will carry the most weight in deciding which options should be taken forward).</p>

Option 3: Government oversight within expert panel

Objective 1: Support ambitious whole system solutions

The oversight from government officials should reinforce the strategic objectives of the innovation fund. A governmental presence may also assist with the coordination across different funds as they have greater ability to bring people together.

However the strategic benefit will rely on the government official having responsibility for the sectors involved, and being able to drive strategy.

Objective 2: Promote inclusive participation

It should promote the visibility of the fund and its aims wider than the energy sector. This may increase the familiarity of the fund more widely, and encourage participation from new sectors of the market.

However, it could lead to negative consequences linked to changes in how the fund is perceived in terms of the independence and the risk profile of the funded projects.

Objective 3: Deliver long-term cost and environmental savings

Under this option we would expect that the risk profile of funded project would be lower – with a focus on commercialisation. This will ensure value for money for the customers.

However, this option may lead to an increased focus on projects with shorter turnaround for commercialisation. This is a result of the political landscape where short term gains are often taken at the expense of longer term benefits.

If this were to be the case, it is likely to have a detrimental impact on the longer term financial and environmental benefits.

Objective 4: Deliverability of the Fund

As in the case of Option 2, we would not expect this option to have a significant impact on the administration of the innovation fund (either through evaluation of proposals or the delivery of projects).

The main requirements would be to develop clear governance arrangements to set out coordination between the Government and Ofgem.

A.5 Project Administration and Governance

We have considered three options for the 'Project Administration and Governance' building block. These are:

- **Option 1: Self-administration and governance:** The majority of funds we reviewed as part of the case study assessment administer their own funds. For example this includes both funds run by TFL and Ofwat, as well as Ofgem's current NIC fund.

This approach gives the funding body full control over the framework and operation of fund. But it will also increase administration for the funding body, which may not have the skills and expertise to efficiently manage an innovation fund.

- **Option 2: External administration:** In this case the fund will be administered by an appropriate external administrator – this would focus on the ongoing running of the fund and management of projects funded. However the decisions on the structure of the fund, alongside the principles for selection / evaluation of project will remain in the hands of funding body (e.g. Ofgem). This approach would be used to reduce administration for Ofgem.

This type of approach is employed by the European Commission and Transport Scotland

- **Option 3: Single external fund:** Under this option Ofgem would provide funding for the innovation projects into a single, wider, external fund. The administrator would also cover the ongoing operation of the fund, including the management of projects funded under the fund. However Ofgem would still remain active in decisions on the structure of the fund, alongside the selection / evaluation of project. This may reduce Ofgem's control over the selection and assessment criteria if it were part of a wider collaboration with other funding bodies.

This option may allow a single innovation portal for all GB energy innovation, which is jointly funded through Ofgem and Government. The split of funding could be decided on a 'project by project' basis depending on the solution proposed by the project itself.

In Table 22 we present our evaluation and recommendation.

Table 22 – Assessment of 'Project Administration and Governance' options

Objective	Score	Comment
Option 1: Self-administration and governance (Current NIC arrangements)		
Objective 1: Support ambitious whole system solutions		<p>Under this option Ofgem would continue to oversee all aspects of the fund, which should ensure consistency across all aspects of the fund (e.g. from planning, to evaluation and project oversight).</p> <p>This option also allows the fund administrator to provide guidance on the strategic direction of innovation funded if it wishes (e.g. through specific competitions) – this could include requirements to consider cross sector proposals.</p>
Objective 2: Promote inclusive participation		<p>Ofgem would be able design the innovation fund to ensure inclusive participation. This option would also ensure that no potential participant is discriminated against due to the misinterpretation of guidance of process.</p> <p>However Ofgem's 'focus' within the energy sector, may mean that potential innovators outside of the energy sector who are less familiar with Ofgem may not have visibility of the fund.</p>
Objective 3: Deliver long-term cost and environmental savings		<p>Administering an innovation fund is not the primary function of an economic regulator.</p> <p>The responsibilities placed on the Ofgem team could potentially reduce its ability (e.g. in terms of resources) to have positive impacts on addressing other challenges in the energy sector.</p> <p>It is likely that there are other bodies that are better placed to undertake this function at a lower cost.</p>
Objective 4: Deliverability of the Fund		<p>Under this option Ofgem's roles and responsibilities will remain the same as under the current NIC fund.</p> <p>Under these arrangements Ofgem will be required to continue to administer the fund. However, the current administrative tasks may increase as a result of the options being considered under each building block.</p>



Option 2: External administration

- Objective 1:**
Support ambitious whole system solutions
- Under this option we would expect no change in Ofgem's role in designing and evaluating projects.
- Ofgem will continue to decide which projects are taken forward and whether specific 'calls' are necessary to manage the strategic direction of innovation funding (e.g. through specific competitions). This will include its ability to continue to facilitate and coordinate across sectors.
- Objective 2:**
Promote inclusive participation
- As the decision maker Ofgem would still be able design the innovation fund to ensure inclusive participation, and reduce any potential discrimination.
- In addition, an external provider (e.g. if selected appropriately) who has experience in managing funds may be in a better position to promote participation from a wider pool of potential innovators.
- The external provider may be able to draw on its previous experience to, assist Ofgem in identifying certain types of participant
- Objective 3:**
Deliver long-term cost and environmental savings
- If selected properly the external provider should be able to draw on economies of scale to administer the fund at a lower cost.
- This may include the benefits of having existing processes in place to manage the communications / data flows as well as being able to draw on previous fund management experience.
- We see potential benefits in the ongoing running of the funds and the management of funded projects
- Objective 4:**
Deliverability of the Fund
- This option would result in significant positive changes to Ofgem roles and responsibilities – reducing the current administration.
- Outsourcing the administrative responsibilities to a suitable (competent) external provider should free Ofgem resources to focus on more relevant and appropriate challenges.
- It will be necessary to implement changes in the governance arrangements to define the relationship between Ofgem and the 'external' administrator. However there are examples of this 'fund structure' in other funds that can be used as a starting point.
-



Option 3: Single External Fund

Objective 1:
Support
ambitious
whole
system
solutions

Under this option Ofgem would coordinate with other UK based innovation funds (e.g. BEIS and UKRI) to develop a single external fund for all energy innovation.

This approach would enable much greater coordination across the different sector to meet the strategic aim of the government.

The projects would be funded from a combination of sources – depending on the specific aim of the project. This would have the potential to increase the amount of funding available, and may lead to more ambitious cross sector project being brought forward.

This will, of course, require that Ofgem retains a strong role in the governance of the fund and the evaluation process.

Objective 2:
Promote
inclusive
participation

Having a single external fund for all proposals should facilitate a joined up approach for innovation.

For example it will help to reduce the administration for participants on applying under different funds. Bidders will be able to familiarise themselves with a single set of requirement which will also increase the efficiency of putting proposals together.

This approach should also encourage bidders to coordinate in order to deliver projects across all level of research.

Objective 3:
Deliver long-
term cost
and
environment
al savings

If implemented effectively, this approach should lead to significant benefits in the administrative cost incurred across the innovation funds.

Pooling resources will lead to economies of scale and should mean that the appropriate body is responsible for the appropriate task.

This option could also reduce the overlap between different projects submitted under the different innovation funds, and as a result will reduce inefficient spending.

The coordination should also mean that projects are chosen based on a single strategic direction. This should help mean the longer term environmental and financial benefits are achieved.



Objective 4:
Deliverability
of the Fund

We would expect the implementation of this option to lead to a positive impact on the roles responsibilities of Ofgem. As discussed under Option 2, outsourcing the administrative responsibilities to a suitable (competent) external provider should free Ofgem resources to focus on more relevant and appropriate challenges.

However there may be will be an increased risk associated with the strategic planning and evaluation of the projects. Under this option Ofgem would need to agree to a common set of governance arrangements with its UK innovation partners.

ANNEX B – CASE STUDIES

In the following tables we have outlined the main findings from the case studies in relation to the building blocks. For each case study we have provided a high level overview of the fund, followed by comment on the particular approach to the building blocks. The case studies are presented in line with the three groups set out above in Section 3.

B.1 Energy sector innovation

In this section we present examples of energy innovation funds used in other energy markets.

Table 23 – Case Study 1: Innovation Norway

Innovation Norway	Norwegian Government Fund
https://www.innovasjon Norge.no/en/start-page/	
<p>Innovation Norway has roles in funding within Business Development, Innovation and SMEs. EEA and Norway Grants contribute to strengthen the relations between Iceland, Liechtenstein and Norway and 16 EU countries</p> <p>Innovation in Norway is delivery significant benefits in regard to the transformation of the energy system and specifically the electrification of transport. The fund also promotes for strong relationships with the private sector to help increase the speed at which innovations are commercialised.</p>	
Eligibility and Participation	Users encouraged using 'The Explorer', a tool to match Norwegian green solutions to international buyers. Similarly it encourages Norwegian firms to use databases such as Enterprise Europe Network to find partners.
Frequency of competition	Calls for proposals are published regularly for each of the partner's countries as needed.
Promoting collaboration	Respondents to calls for proposal compete with each other, but partnership between companies is encouraged
Project selection and assessment	A component of joint development or testing is needed. Pure infrastructure projects are likely to be forbidden under state aid regulations
Project Administration and Governance	Innovation Norway is the coordinator and the funders are the tax payers of Iceland, Liechtenstein and Norway. Innovation Norway is a Government instrument for funding

Table 24 – Case Study 2: Fondo Nazionale Innovazione (Italy)
Fondo Nazionale Innovazione - Italy
Cassa depositi e prestiti – ministry of economic development

<https://www.mise.gov.it/index.php/it/incentivi/impresa/fondo-nazionale-innovazione>

The fund aims at effectively promoting interventions in equity capital and at ensuring adequate synergies with existing funding tools

The fund includes program 4.3 which is called 'Innovation, energy networks, energy security and natural resources'. Though the fund seems to be early stage.

Eligibility and Participation	Eligible SMEs at stage of seed financing, start-up financing, early-stage financing, expansion, or scale up financing.
Frequency of competition	Still to be defined under the fund.
Promoting collaboration	Still to be defined under the fund
Project selection and assessment	Still to be defined under the fund
Project Administration and Governance	Venture capital funds will have to receive approval by the central bank or direct investments in SMEs by the economic development ministry

Table 25 – Case Study 3: Baltic Innovation Fund
Baltic Innovation Fund
European Investment Fund – help SMEs to access finance

https://www.eif.org/what_we_do/resources/BIF/index.htm

Begun in 2012 by the EIF, Estonia, Latvia and Lithuania – focuses on investment opportunities (debt or equity) rather than grants.

Focused on micro and SME.

The fund intends to address the gaps left by venture capital markets in the Baltic countries being of limited size, and less attractive to international investors.

This fund provides some interesting elements such as the demonstration of attraction private finance that could be useful for Ofgem

Eligibility and Participation	Applicants need to demonstrate the project's ability to attract further private finance – Round 2 of the fund is expected to attract another €350m of private finance to the selected projects
Frequency of competition	Round 1 in 2012, €130m awarded to over 29 companies. Round 2 in 2019, €156m for SMEs.
Promoting collaboration	Competition is used to allocate the set budget.
Project selection and assessment	The EIF assesses the proposals considering a broad range of details including applicant's track record, management team, geographical scope, expected return, buy-in by stakeholders, and commercial viability of the proposed project.
Project Administration and Governance	The EIF administers and provides a large proportion of the funding. Some funding is from the individual countries' national promotional institutions (KredEx, Altum, and Invega).

Table 26 – Case Study 4: Canada Energy Innovation Program

Energy Innovation Program – Canada (open to non-Canadian partners)

Natural Resources Canada – government department responsible for development and use of natural resources

<https://www.nrcan.gc.ca/science-data/funding-partnerships/funding-opportunities/funding-grants-incentives/energy-innovation-program/18876>

This was a highly competitive programme aimed at achieving substantial reductions in emissions (including GHG), with potential for global implementation, in support of 2050 targets.

It is focused on technologies that have achieved proof of concept and are progressing towards developing prototypes or demonstrations of the technology.

This fund targets investments in energy technologies with TRL 4-8 (matching the requirements of the current NIC fund); network related project can be funded if they meet the criteria (e.g. emission reduction).

Eligibility and Participation	<p>Alongside funding, participants will have access to potential funding and insight from private investors, and will be invited to attend networking events for further funding opportunities.</p> <p>Required to have high emissions reduction and be TRL4-8.</p>
Frequency of competition	<p>One round to date, with no future rounds announced yet.</p> <p>A competitive process in 2019-20 appointed 10 recipients with up to CA\$3m per project (had a budget of CA\$40m).</p>
Promoting collaboration	<p>Competitive process that first selected 22 finalists and then reduced this to the 10 successful applicants.</p>
Project selection and assessment	<p>Need to set out project milestones, how technology could scale up to achieve global implementation, and why it is innovative.</p>
Project Administration and Governance	<p>Yes, Government of Canada.</p>

Table 27 – Case Study 5: Germany Central Innovation Programme (ZIM) for SMEs

Zentrales Innovationsprogramm Mittelstand (ZIM) – Central Innovation Programme for SMEs, Germany

German Federal Ministry for Economic Affairs and Energy (BMWi).

<https://www.zim.de/ZIM/Navigation/DE/Meta/Englisch/englisch.html>

The central innovation programme (ZIM) launches several thousand projects each year, funding R&D.

It aims to address the risk faced by SMEs in undertaking R&D, and seeks to help out in the final stages of development – to help bring ideas to market.

25-45% funding – or up to 55% if innovation also involves some multi-company collaboration.

The fund recognises the additional costs and benefits involved in collaborations, and will offer more financial support for such projects.

Eligibility and Participation	To receive funding, projects must be “highly innovative, market oriented, and entail a substantial technological risk” – there is also a focus on improving companies’ capacity/innovation skills, and on enhancing the competitiveness of the companies. Not allowed to be in receipt of other funding, or be by a third party.
-------------------------------	--

Frequency of competition	Annual budgets (€559m in 2019) but appears to be ongoing rather than in rounds. Projects seem to be selected according to whether they are perceived to meet the criteria rather than in competition with other projects.
--------------------------	---

Promoting collaboration	Higher level of funding (55% rather than 45%) allowed for companies applying as part of a collaboration.
-------------------------	--

Project selection and assessment	Need to set out technological development, the form of the project, and potential partners for collaboration at start – advised to contact BMWi if need to make any changes. Final 10% of funding will only be released following presentation of proof of proper use.
----------------------------------	--

Project Administration and Governance	The German Federal Ministry for Economic Affairs and Energy (BMWi) administers the fund, fitting well with several of its overall objectives: designing the energy transition, encouraging investment, and supporting SMEs.
---------------------------------------	---

Table 28 – Case Study 6: ARENA, Advancing Renewables Program (Australia)

Advancing Renewables Program (ARP)	ARENA, an independent agency of the Australian government
---	--

<https://arena.gov.au/funding/advancing-renewables-program/>

Australia's Renewable Energy Agency (ARENA) was established to increase the supply and improve the competitiveness of Australian renewable energy, and set up this fund to encourage projects that are aligned with their overall investment plan, i.e. integrating renewables into the electricity system, accelerating hydrogen, and supporting industry to reduce emissions.

Focuses on taking projects from demonstration to deployment but does have some involvement in development.

The fund allows applications that meet general objectives continuously, while having roughly annually competitions focused on specific technological areas/challenges.

Eligibility and Participation	Does not appear to set out explicit incentives for participation. Applicants are expected to match funding – not sure if this is allowed to be via other funds. Knowledge sharing is mandatory.
Frequency of competition	Described as “continuously open” but does appear to have some degree of rounds e.g. a “hydrogen round” opens in April 2020. The amount of funding is uncertain as it is with reference to other ARENA commitments.
Promoting collaboration	It is a competitive process. Rounds so far from A\$7m-\$100m each: 2015 large-scale solar, 2017 demand response, 2018 short term forecasting, 2019 power system security and strength, 2020 hydrogen deployment
Project selection and assessment	ARENA will assess the proposals, but may bring in experts or consultants to assist. Its portfolio of projects is designed to address the objectives.
Project Administration and Governance	ARENA is both funder and coordinator in its role as the agency to enhance the Australian renewable energy sector, although has received some funding from elsewhere (e.g. A\$7.5m from the Government for the demand response competition)



Table 29 – Case Study 5: France’s Fund for Innovation and Industry

le Fonds pour l’innovation et l’industrie (FII)

French Government

<https://www.gouvernement.fr/le-fonds-pour-l-innovation>

€250m/year innovation fund announced in 2018. However, prior to implementation, in 2019, the government decided to review the fund to understand whether it remains value for money.

This fund is a cooperative effort between the government and private companies, and has a mix of ministers and external parties assessing applications.

Eligibility and Participation Not yet defined

Frequency of competition Annual ongoing – annual budget of €250m.

Promoting collaboration Not yet defined

Project selection and assessment The Innovation Council (6 ministers and 6 experienced innovators) is tasked with allocating resources of the fund.

Project Administration and Governance The Government is the coordinator, although details are not yet settled so it is unclear whether an external administrator may be involved.
Funded by €10bn endowment (Government capitalising on national assets (e.g. stakes in Engie and Renault) and contributions from EDF and Thalés).

B.2 Innovation in non-energy sectors

In this section we present examples of energy innovation funds used in other non-energy sectors.

Table 30 – Case Study 1: Ofwat, Innovation Fund

Innovation Fund, GB	Ofwat, regulator
Fund in development – main document to date is: https://www.ofwat.gov.uk/wp-content/uploads/2019/12/Time-to-act-now-driving-transformational-innovation-in-the-sector-decision-document.pdf	
£200m available 2020-25, provided as additional allowed revenue in companies' regulatory determinations. Complements the approach to innovation already in the PR19 price controls – recognises low risk appetite of water companies. The innovation fund sits alongside the regulatory regime, as a method of encouraging more risky investments than might be included in a regulatory determination.	
Eligibility and Participation	There is considered to be a reputational incentive to the competitions. Companies consider this fund somewhat de-risks innovation in a way the PR19 price control doesn't.
Frequency of competition	Competition on at least an annual basis. The fund is still in the design stage.
Promoting collaboration	Funds are allocated through a competitive process. In advance of opening the competition, Ofwat has challenged the water companies to develop a sector-wide joint innovation strategy focusing on key themes, areas of focus, and strengths/ weaknesses/gaps in innovation in the sector.
Project selection and assessment	Ofwat is the decision-maker. There are no clear decisions up front, with flexibility over the type of project but projects must show consumer benefit (e.g. even if 'fail' must bring 'lessons' to knowledge sharing).
Project Administration and Governance	Administration and governance provided by Ofwat in its role as water regulator, enabling the links to the regulatory determinations (e.g. the collection of funds through the regulated allowances) and access to existing stakeholder engagement processes (e.g. Ofwat's consultations).



Table 31 – Case Study 3: TfL, London FreightLab (2020)

London FreightLab, UK

TfL, local government body

<https://tfl.gov.uk/info-for/business-and-commercial/commercial-innovation>

£120k fund focused on innovations in freight.

Road freight is an issue in London, particularly in the morning peak, affecting both air quality and road safety.

TfL also hopes to make freight more efficient, to support its aims to reduce road freight vehicle numbers in the morning peak by 10% by 2026 (vs 2019).

TfL offers multiple types of support to assist pilots into ideas for innovative approaches.

Although this Fund is small, the use of industry experts to assess projects and provide expertise adds an additional incentive (alongside potential land provision for pilots).

Eligibility and Participation	Not just funding: TfL will provide subject matter expertise, and can offer land sites for the pilot.
-------------------------------	--

It is not clear how this fund aligns with others, although winners may also pitch their solutions to the Mayor's Office in LA to test their idea there.

Frequency of competition	This is a one-off fund of approximately £120,000. Earlier funds include: retail technological innovation (2019), safer roadworks RoadLab (2019), bus safety (2017).
--------------------------	--

Promoting collaboration	Competition – will support up to six projects.
-------------------------	--

Project selection and assessment	TfL lead selection, with a group of ten partners supporting evaluation (incl. Royal Mail, John Lewis, Thames Water, an NHS Trust) – these may choose to stay on to support the pilot. Innovative product, potential for commercial viability and scale.
----------------------------------	--

Project Administration and Governance	TfL manages and administers the fund. TfL has experience of administering a range of funds via their Commercial Innovation department.
---------------------------------------	--

Table 32 – Case Study 4: Transport Scotland, Low Carbon Travel and Transport Challenge Fund

Low Carbon Travel and Transport Challenge Fund	Transport Scotland, national transport agency of Scotland
---	--

<https://energysavingtrust.org.uk/scotland/businesses-organisations/transport/low-carbon-travel-and-transport-challenge-fund>

This fund is focused on travel hubs, including low carbon travel hubs, and more broadly improving public and low-carbon transport.

Projects in the third round of funding should be delivered by September 2022 and be able to run for at least 5 years from the final payment

Applicants need to demonstrate additionality/that could not go ahead without this support.

The fund also aims to introduce a smart ticketing fund.

Use of annual funds, external administrator, and requirements on collaboration and stakeholder engagement.

Eligibility and Participation	Match funding is required, and some types of funding cannot be used as match funding (private/corporate funding, in-kind funding, and other EU funding).
Frequency of competition	The three rounds so far have been annually (2017, 2018, 2019), with all containing all areas of the fund.
Promoting collaboration	It is competitive but applications are required to set out how they might work with partners to deliver the project and on engaging communities.
Project selection and assessment	Some requirements are set by the EU due to the EU funding contributions. Quite a few specifics set out in the intro docs for the 3rd/2019 round, e.g. project size, type, match funding requirements.
Project Administration and Governance	Energy Savings Trust administers the fund on behalf of Transport Scotland. Transport Scotland receives funding from European Regional Development Funds.



B.3 UK and European Commission funding

In this section we present examples of energy innovation funds used in the UK and wider European Commission funding

Table 33 – Case Study 1: Horizon 2020

Horizon 2020	European Commission
https://ec.europa.eu/programmes/horizon2020/en	
Horizon 2020 Energy, with a budget of around €6bn over the period 2014 - 2020, is the EU's Research and Innovation grant funding Programme for energy technology research, development, demonstration and removing market barriers	
This fund has been considered successful at driving innovation across the EU. The drive to encourage innovation between different participants within and across countries, has led to new approaches for bringing innovators together.	
Eligibility and Participation	Based on published guidance. In most cases consortium must include three legal entities from different EU / Horizon 2020 countries. The bidder must ensure all parties are relevant to the study. No restriction on companies applying to multiple funds
Frequency of competition	Most competitions are opened annually, with a set of 'Call topics' are released by Horizon 2020. However some topics are continuously open. With topics assessed at pre-determined cut-off times
Promoting collaboration	Funding is competitive, but companies are encouraged to coordinate in out to meet the needs of the calls. Online portal includes a specific function to help companies identify partners (search function based on skills etc.)
Project selection and assessment	Assessment is by independent experts based on published evaluation criteria. Including – clarity of objectives; demonstration of innovation beyond BAU; Coordination and support of findings; alignment with national policies
Project Administration and Governance	The fund is financed and coordinated by four main groups: European Research Council; Future and Emerging Technologies; Marie Skłodowska-Curie; and Research infrastructures.



Table 34 – Case Study 1: EU Innovation Fund

Innovation Fund, EU

European Commission

https://ec.europa.eu/clima/policies/innovation-fund_en

Investing in low carbon technology, seeking to boost growth and competitiveness – it will cover up to 60% of the capital and operational costs.

This takes over from the earlier NER300 programme.

A 'significant' portion of Innovation Fund financing is required to be as a grant, due to riskiness of innovation. Projects are required to be at an 'advanced' TRL and all energy sectors are eligible.

The focus on financial support and ensuring some balance across the eligible regions/countries.

Eligibility and Participation	No clear incentives beyond financial support. Allowed to access other Union programme's funds (as long as they aren't covering the same costs).
Frequency of competition	'Regular' calls for applications expected between 2020 and 2030, but timings not yet announced. Overall €10bn budget.
Promoting collaboration	A competitive process to allocate funding, with an intention to ensure that there is a balance across EU member states.
Project selection and assessment	Projects are chosen by an EC team based on effectiveness of emission reduction, degree of innovation, viability, scalability, and cost efficiency. Evaluation will be supported by financial and technical experts, the EC put out a call for evaluators in February 2020. 60%+ of the payment is results-based.
Project Administration and Governance	Yes – the European Commission, although some private investors may be involved in funding and evaluating the projects.

Table 35 – Case Study 2: Energy Catalyst
Energy catalyst
Innovate UK: Innovation agency of the UK Government

<https://www.gov.uk/guidance/energy-catalyst-what-it-is-and-how-to-apply-for-funding>

The Energy Catalyst programme supports UK and overseas businesses and organisations to develop highly innovative, market-focused energy technologies that primarily look to enable energy access in Sub-Saharan Africa and South/South East Asia.

Businesses can apply into funding competitions to get a grant to carry out an innovation project, regardless of the stage that project is at.

The fund provides examples of the UK Governments approach to innovation funding. Innovate UK have a strong reputation for administering innovation funding and delivery successful projects.

Eligibility and Participation	<p>The fund is open to any organisation; however the administrative lead must be UK based. They will receive the funding and distribute to the international partners.</p> <p>Criteria can change depending on the sector</p>
Frequency of competition	<p>Funding is based on annual competitions, which are published by the innovation funding service</p>
Promoting collaboration	<p>Funding is competitive, but companies are encouraged to coordinate in out to meet the needs of the calls.</p>
Project selection and assessment	<p>Business can receive funding for a project at any stage of the innovation lifecycle.</p>
Project Administration and Governance	<p>Funding is provided by the UK government and the project is administered by Innovate UK</p>

Table 36 – Case Study 3: Innovate UK – General Guidance
Innovate UK: General Application Innovation agency of the UK Government

<https://www.gov.uk/government/organisations/innovate-uk>

Innovate UK has 2 competition application processes: online through our Innovation Funding Service; and document-based through our secure upload site

The fund provides examples of the UK Governments approach to innovation funding. Innovate UK have a strong reputation for administrating innovation funding and delivery successful projects.

Eligibility and Participation	<p>Applications are either through open competition or invitation.</p> <p>There are specific eligibility rules for the competition which define what types of organisation can apply. Each partner within the consortium is responsible for completing its own project costs and finances</p>
Frequency of competition	Combination of both open and annual funding. Funding can either be via specific competitions or through more general funding
Promoting collaboration	All funding is competitive. Applications are assessed on their individual merit and the best are selected (based on the availability of the funding)
Project selection and assessment	Only applications that meet the eligibility criteria and scope of the competition will be sent for assessment. Applications are assessed by up to 5 independent assessors. The assessors are experts from both business and academia.
Project Administration and Governance	The Innovate UK funder's panel makes the final decision regarding funding



Table 37 – Case Study 4: The Energy Entrepreneurs Fund

Energy Entrepreneurs Fund

BEIS: UK Government department

<https://www.gov.uk/government/collections/energy-entrepreneurs-fund>

The Energy Entrepreneurs Fund is a competitive funding to support the development and demonstration of state of the art technologies, products and processes in the areas of energy efficiency, power generation, heat and electricity storage and carbon capture and storage

The fund particularly aims to assist small and medium-sized enterprises, including start-ups, and those companies that are selected will receive additional funding for incubation support.

The fund provides examples of the UK Governments approach to innovation funding. BEIS have experience of delivery innovation to meet Government strategy.

Eligibility and Participation	<p>All companies can apply, and success / failure in previous fund rounds do not impact on funding (however the same application can only be submitted twice).</p> <p>An individual organisation may not submit more than one application to a specific funding phase</p>
Frequency of competition	<p>Competitions are released in Phases, usually on an annual basis (but not always). Application period generally lasts 2 months</p>
Promoting collaboration	<p>All phases are competitive</p>
Project selection and assessment	<p>Projects have to meet defined eligibility criteria, followed by two stage assessment. Part 1 (BEIS): level & nation of innovation; impact on energy targets; value for money; market viability and commercialisation. Part 2 (external commercial panel): similar criteria with addition of attractiveness to target market</p>
Project Administration and Governance	<p>Funding is provided by the UK government and the project is administered by BEIS</p> <p>Funding must be in line with state aid guidelines and as a result companies will be required to provide match-funding</p>



Table 38 – Case Study 5: EuroStars – European Commission

EuroStars

European Commission

www.eurostars-eureka.eu/

EuroStars supports international innovative projects led by research and development- performing small- and medium-sized enterprises (R&D-performing SMEs).

EuroStars is a joint programme between EUREKA and the European Commission, co-funded from the national budgets of 36 EuroStars Participating States and Partner Countries and by the European Union through Horizon 2020. In the 2014-2020 period it has a total public budget of €1.14 billion.

This fund provides evidence of how the European Commission is engaging with small and medium sized enterprises that have an interest in innovation.

Eligibility and Participation	Project consortium must have partners (independent legal entities) based in at least two different countries participating in the EuroStars programme. No single organisation, or participants from a single country, can be responsible for providing more than 75% of the total project budget
Frequency of competition	Applications can be submitted on a rolling basis. Cut off dates are used to assess proposals received within a predefined period.
Promoting collaboration	National Project Coordinators will help to find project partners
Project selection and assessment	Amongst other (standard) eligibility criteria, the project duration must be less than 36 months and the market introduction of the main product / service etc. (e.g. move to BAU) must occur within 24 months of the project completed.
Project Administration and Governance	Fund is governed by the European Commission (funding is decentralised), but is administered by 'EuroStars' through National Project Coordinators.

ANNEX C – CASE STUDY FACTSHEETS

In this section we present detailed case study factsheets from four selected case studies.

C.1 Advancing Renewables Program – Australia

Table 39 – Advancing Renewables Program: Australia

Advancing Renewables Program (ARP), Australia	Australia's Renewable Energy Agency (ARENA)
Dates of Fund operation: 2015 – 2022	Level of funding Individual grants of A\$0.1m-A\$50m each, with A\$563m awarded so far.

Overview of the fund

ARENA set up this program to encourage projects that are aligned with their overall objective of increasing supply and competitiveness of Australian renewable energy sources.

The program targets innovative projects that address one or more of the following key objectives:

- reduction in the cost of renewable energy;
- increase in the value delivered by renewable energy;
- improvement in technology readiness and commercial readiness of renewable energy;
- reduction in or removal of barriers to renewable energy uptake; and
- increase in skills, capacity and knowledge relevant to renewable energy.

This is in addition to the three overarching objectives in ARENA's overall investment plan: grid integration, accelerating hydrogen, and reduced industry emissions.

ARENA opens competitive funding rounds most years, with a specific focus and budget. ARENA is both funder and coordinator, although has received some funding from elsewhere (e.g. A\$7.5m from the Government for the demand response competition)

Overview of funded projects

372 projects have been awarded funding totalling A\$563m (according to the [project database](#)), including the \$167m from the five competitive rounds awarded to date. Notably:

- Large-scale solar accounts for the most budget (39%, A\$222m) despite accounting for only 6% of projects (23) – including one A\$100m award. Meanwhile standard solar projects account for the highest percentage of



projects (29%, 107) and only 9% of funding (\$50m).

- The average ARENA project award is \$1.5m of an average \$8.8m overall value – ARENA contributes an average 17% of the project value. This is as high as 50% in system security and reliability, and as low as 5% in bioenergy.
- Funding awards range from 11 projects under A\$0.25m to the A\$100m large-scale solar award.

Building Block Assessment

Eligibility and Participation	<p>Eligibility for the continuous aspect of the ARP is fairly broad, focusing on whether the project meets one of the five key objectives as well as general criteria (e.g. a focus on Australian companies, consideration of the organisation's capacity and capability, etc.). Specific rounds have tighter eligibility due to their focus on specific areas of renewable energy – e.g. projects may be selected according to which is expected to provide the lowest levelised cost of renewable energy.</p> <p>All proposals are required to match the funding requested from ARENA; ARENA will fund at most 50% of a project.</p>
Frequency of competition	<p>Applications for the general objectives of the program can be made at any point until 2022. Specific funding rounds have taken place in 2015, 2017, 2018 (two), 2019, and 2020 (but not 2016).</p>
Promoting collaboration	<p>Applications submitted to the fund outside of the competitive rounds will be assessed on their own merit.</p> <p>The competitive rounds so far have included been in the following areas:</p> <ul style="list-style-type: none">▪ Demand response to manage electricity supply during extreme peaks. 2017, A\$37.5m▪ Power system security and strength services from innovative methods or technologies. 2019, A\$7m.▪ Commercial-scale renewable hydrogen deployment projects. 2020, A\$70m.

Project selection and assessment	<p>ARENA leads assessment of all applications itself. It has highlighted that it may use some external consultants in assessing proposals. ARENA also out clear guidelines to help applicants, including:</p> <ul style="list-style-type: none"> ▪ A short online questionnaire to help applicants to any ARENA fund/programme understand whether their project is eligible according to a range of criteria – in some cases, if the answer indicates that the project is ineligible, the questionnaire suggests alternative support that may be available elsewhere. ▪ A full set of general guidelines for the ARP, with a checklist and clarification of the stages of application. ▪ Each competitive round has its own 'merit criteria'. <p>Criteria include the extent to which the project addresses ARENA objectives, applicant's capability and capacity, project design and risk, approach to and value of knowledge sharing.</p>
Project Administration and Governance	<p>ARENA is both funder and coordinator, although has received some funding from elsewhere (e.g. A\$7.5m from the Government for the NSW demand response competition).</p>



[This page is intentionally blank]

C.2 Energy Innovation Program – Canada

Table 40 – Energy Innovation program: Canada

Canada Energy Innovation Program (EIP)	Government of Canada (Natural Resources Canada)
---	--

Dates of Fund operation:

2016-2020

Level of funding:

Roughly 50% of the project costs

Overview of the fund

This is a highly competitive programme aimed at achieving substantial reductions in emissions (including GHG), with potential for global implementation, in support of the 2050 targets.

It focuses on technologies that have achieved proof of concept and are progressing towards developing prototypes or demonstrations of the technology.

The fund is directed to RD&D projects with potential to reduce emissions by at least 0.5 giga tonnes/year globally. A 2019 evaluation claims that while too early to realise longer-term outcomes, several technology areas demonstrate promise.

Overview of funded projects

Projects awarded include the 'breakthrough energy solutions Canada'. This is part of the EIP funding include:

- a passive aerodynamic enhancement technology that bolts to the centre of a wind turbine and increases the energy production while reducing loads and noise,
- a circular economy model to reuse CO2 in concrete,
- a novel type of methane pyrolysis with direct carbon fuel cells to produce hydrogen from natural gas at lower cost than steam methane reforming while reducing greenhouse gas emissions by more than 90%.

10 projects were announced in 2020 and the typical project size ranges from CA\$4M to CA\$7M, with a typical government contribution between CA\$1.5M and CA\$2.7M.

Building Block Assessment

Eligibility and Participation

Alongside funding, participants will have access to potential funding and insight from private investors, and will be invited to attend networking events for further funding opportunities. All projects are required to have high emissions reduction and be TRL4-8.

However, the creation of several new innovation programs dispersed among several departments and agencies has

	<p>contributed to confusion among external stakeholders. To rectify this the Office of Energy Research and Development worked with Natural Resources Canada to develop a new communications plan and suite of products and tools to help clarify the objectives, scope and focus – e.g. an Applicants' Guide to the Terms and Conditions and a structured FAQ section</p>
Frequency of competition	<p>There are no open funding opportunities as of March 2020; there are some closed ones with application in review and several past ones. The program does not seem to indicate fixed frequency for the competition.</p> <p>A competitive process in 2019-20 appointed 10 recipients with up to CA\$3m per project (had a budget of CA\$40m).</p>
Promoting collaboration	<p>Competitive process that for the 2019/20 round first selected 22 finalists and then reduced this to the 10 successful applicants.</p>
Project selection and assessment	<p>Need to set out project milestones, how technology could scale up to achieve global implementation, and why it is innovative.</p> <p>After an evaluation in 2018, performance indicators and metrics were reviewed in an effort to reduce and streamline reporting requirements.</p>
Project Administration and Governance	<p>The Government of Canada is the sole party involved, with two agencies: the Office of Energy Research and Development and Natural Resources Canada that work.</p>

C.3 Central Innovation Programme – Germany

Table 41 – Central Innovation Programme: Germany

Central Innovation Programme (ZIM), Germany	German Federal Ministry for Economic Affairs and Energy (BMWi)
--	---

Dates of Fund operation:

Began in 2008, applications were open until the end of 2019.

Level of funding

Over €5.5bn approved between 2008 and 2018, over 40,500 projects

Overview of the fund

The central innovation programme (ZIM) launches several thousand projects each year. It is open to all sectors and technologies.

It aims to address the risk faced by SMEs in undertaking R&D, and seeks to help out in the final stages of development – to help bring ideas to market. Parts of the fund focus on collaboration or co-operation, and this is intended to speed up the transfer of cutting-edge technology. There are three types of projects under this fund:

- **Individual projects.** R&D projects undertaken by individual companies classed as SMEs: less than 50 employees, and up to €10m turnover or balance sheet total. Some support for SMEs of up to 500 employees was given until the end of 2013.
- **Collaborative projects.** R&D projects undertaken by several companies or between a company and research institutes. The same institutions as for individual projects, plus “public and non-profit-making private research institutes”
- **Co-operation networks.** Co-operation networks covering both network management and R&D projects. The same organisation eligibility as for collaborative projects.

A [2019 evaluation](#) of the ZIM highlighted that it was meeting its objectives well – with projects being implemented as intended including a higher R&D sales intensity, and with a higher degree of cooperation between companies and research institutions (including good knowledge sharing).

The funding rate is high level, at approximately 42% of overall project value. Administration of the project is highlighted as going well and being well co-ordinated, facilitating the ZIM’s overall functioning.

Overview of funded projects

Projects can receive different percentages of costs.

There are some percentage limits on original components, as well as limits on the overall project (e.g. 45% for most R&D projects, with an additional 10% permitted when there is international cooperation).



Network-based projects can receive up to 90% of costs in the first year of their project, falling in subsequent years.

For co-financing of R&D projects can be up to €380,000 – or up to €2m for collaborative R&D projects. There are typically higher rates of funding available due to higher transaction costs and to recognise the higher benefits that come from international collaboration and knowledge sharing. To date around 5% of the 'co-operation networks' projects are international.

Some support is available for services and consulting on innovation (50% up to €75,000), personnel costs (up to 25%), and costs for project-related contracts to third parties (up to 25%).

The majority of companies receiving funding have between 10 and 49 FTE (56%) with only 3% have 250 or more FTE.

Building Block Assessment

Eligibility and Participation	<p>Project criteria are set out as:</p> <ul style="list-style-type: none">▪ A new project/process/technical service with better functions/parameters/features.▪ State of the art in technology, and raises the level of technological performance/innovative skills of the company.▪ Significant but predicable technical risk.▪ Will increase the competitiveness of the companies, open new markets, and create/safeguard jobs.▪ If the project wouldn't be realised – or would be delayed – without the funding. <p>Projects must not be in receipt of other funding, or carried out on behalf of third parties.</p> <p>There are also requirements on the capability of the applicants, and they must also provide their own contribution.</p>
Frequency of competition	<p>There are annual budgets (€559m in 2019), ongoing rather than in rounds.</p> <p>Projects are selected according to whether they are perceived to meet the criteria rather than in competition with other projects.</p>
Promoting collaboration	<p>Collaboration is encouraged, and more funding will typically be approved for companies applying as part of a collaboration (particularly international), although this is at least partly to recognise higher transaction costs incurred in collaborations.</p> <p>A 2019 review of the ZIM highlighted that the ZIM networks component has enabled better cross-sector cooperation, including internationally.</p>



Project selection
and assessment

Each proposed project is required to set out technological development, the form of the project, and potential partners for collaboration at start – advised to contact BMWi if need to make any changes.

The final 10% of funding will only be released following presentation of proof of proper use and a supporting report.

Project
Administration
and Governance

BMWi is the funder and selects recipients, etc.

There are three 'project management agencies' each managing a separate project type:

- Individual projects
 - Collaborative projects
 - Co-operation networks
-



[This page is intentionally blank]

C.4 Horizon 2020 – European Commission

Table 42 – Horizon 2020: European Commission

Horizon 2020 / EU	European Commission
Dates of Fund operation: 2014 - 2020	Level of funding: Funding generally covers 70% of eligible costs, but may increase to 100% for non-profit organisations and for Research & Innovation and frontier research actions

Overview of the fund

Horizon 2020 Energy, with a budget of around €6bn over the period 2014 - 2020, is the EU's Research and Innovation grant funding Programme for energy technology research, development, demonstration and removing market barriers. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation.

The interim review of the first three years of the fund highlighted that it is an attractive and well performing programme, relevant to EU and global priorities, with low administrative overhead, effective in strengthening the science base and the creation of jobs and more coherent than predecessors; it created additionality as 83% of projects would not have gone ahead without EU funding. The most important challenges are: underfunding, need to improve in market-creating innovation, outreach to civil society, and synergies with other EU programmes, international cooperation, simplification and open access to data.

Overview of funded projects

Under the Secure, Clean and Efficient Energy fund there were 1,719 projects, with a size averaging €3.2M and the maximum funding from the EU per project averaging €2.5M.

The top five projects by size include a project to bring hydrogen innovations in the transport sector to achieve market maturity, hydrogen pilot plants, demonstrations of a tidal arrays and the trial of a fuel cell micro CHP

Building Block Assessment

Eligibility and participation	Based on published guidance. In most cases consortium must include three legal entities from different EU / Horizon 2020 countries. The bidder must ensure all parties are relevant to the study. No restriction on companies applying to multiple funds
-------------------------------	---

Frequency of competition	Most competitions are opened annually, alongside a set of 'Call topics'. However some topics are continuously open. You can submit at any time, with topics assessed based on cut-off times
Competition	<p>Funding is competitive, but companies are encouraged to coordinate in order to meet the needs of the calls.</p> <p>Online portal (Single Electronic Data Interchange Area) includes a specific function to help companies identify partners. The portal is composed of a search function to identify relevant calls for proposals and tenders and within each call companies can flag that they are looking for collaborating partners alongside a description of the company, the request date, the organisation type, the country and whether they are requesting or offering an expertise. Similarly, the list of companies looking for collaborating partners is publicly accessible and there is a contact button for interested parties.</p>
Project Selection and Assessment	Assessment is undertaken by independent experts based on published evaluation criteria, including: clarity of objectives; demonstration of innovation beyond BAU; Coordination and support of findings; alignment with national policies
Project Administration and Governance	<p>The Commission is responsible for the Research and Innovation policy, and in particular the content of the Work Programmes, following the opinion of the Programme Committee, consisting of Member State representatives.</p> <p>The implementation is externalised to four agencies, responsible for the operational and programme management tasks across most of the programme. The agencies are: the Executive Agency for Small and Medium-sized Enterprises (EASME), the European Research Council Executive Agency (ERCEA), the Innovation and Networks Executive Agency (INEA) and the Research Executive Agency (REA).</p> <p>For specific parts of the programme, management is carried out through different forms of partnership (Public-Private Partnerships (PPP) and Public To Public Partnerships (P2P)), where the Commission's involvement is at arm's length. There are several types of actions depending on the objective: collaboration-based grants covering different stages of development and innovation, mono-beneficiary grants and non-grant actions such as lump sum prizes.</p>



QUALITY AND DOCUMENT CONTROL

Quality control

Report's unique identifier: MWE/2020/**0267**

Role	Name	Date
Author(s):	David Cox Gareth Davies	April 2020
Approved by:	Gareth Davies	April 2020
QC review by:	David Cox	April 2020

Document control

Version no.	Unique id.	Principal changes	Date
v100	2020/0267	Initial client release	April 2020
V200	2020/0267	Final Client version	April 2020

AFRY IS AN INTERNATIONAL ENGINEERING, DESIGN AND ADVISORY COMPANY.

We support our clients to progress in sustainability and digitalisation. We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations.

AFRY Management Consulting provides leading-edge consulting and advisory services covering the whole value chain in energy, forest and bio-based industries. Our energy practice is the leading provider of strategic, commercial, regulatory and policy advice to European energy markets. Our energy team of over 250 specialists offers unparalleled expertise in the rapidly changing energy markets across Europe, the Middle East, Asia, Africa and the Americas.



AFRY Management Consulting

King Charles House
Park End Street
Oxford, OX1 1JD
UK

Tel: +44 (0)1865 722660

Fax: +44 (0)1865 722988

afry.com

E-mail: consulting.energy.uk@poyry.com



AFRY
Ä F PÖRY

Pöyry Management Consulting (UK) Ltd trading as AFRY Management Consulting
Registered in England No. 2573801
King Charles House, Park End Street, Oxford OX1 1JD, UK