

Net Zero Go



UK Local Authorities Innovator Workshop: Solar Projects Business Case Validation & Investment


Department for
Energy Security
& Net Zero



UK Research
and Innovation

Part of

CATAPULT
Energy Systems



Welcome

Gordon Graham, *Net Zero Go* – Strategic Engagement Manager, Energy Systems Catapult



UK Research
and Innovation



Department for
Energy Security
& Net Zero

ABOUT US.

MISSION: UNLEASHING INNOVATION AND OPEN NEW MARKETS TO CAPTURE THE CLEAN GROWTH OPPORTUNITY.

WHO?



**INNOVATION
EXPERTS**

WHAT?



**SUPPORTING
INNOVATORS TO
COMMERCIALISE**



**HELPING TO DESIGN
THE FUTURE ENERGY
SYSTEM TO UNLOCK
INNOVATION**



- Business Case Development / Validation
- Strategic Case and LAEP Planning
- Commercial Case & Business Model
- Project and Management Case

- Markets, Policy and Regulation Advice
- Digital and Data Guidance
- Whole & Local System Modelling
- Consumer Insights

Platforms

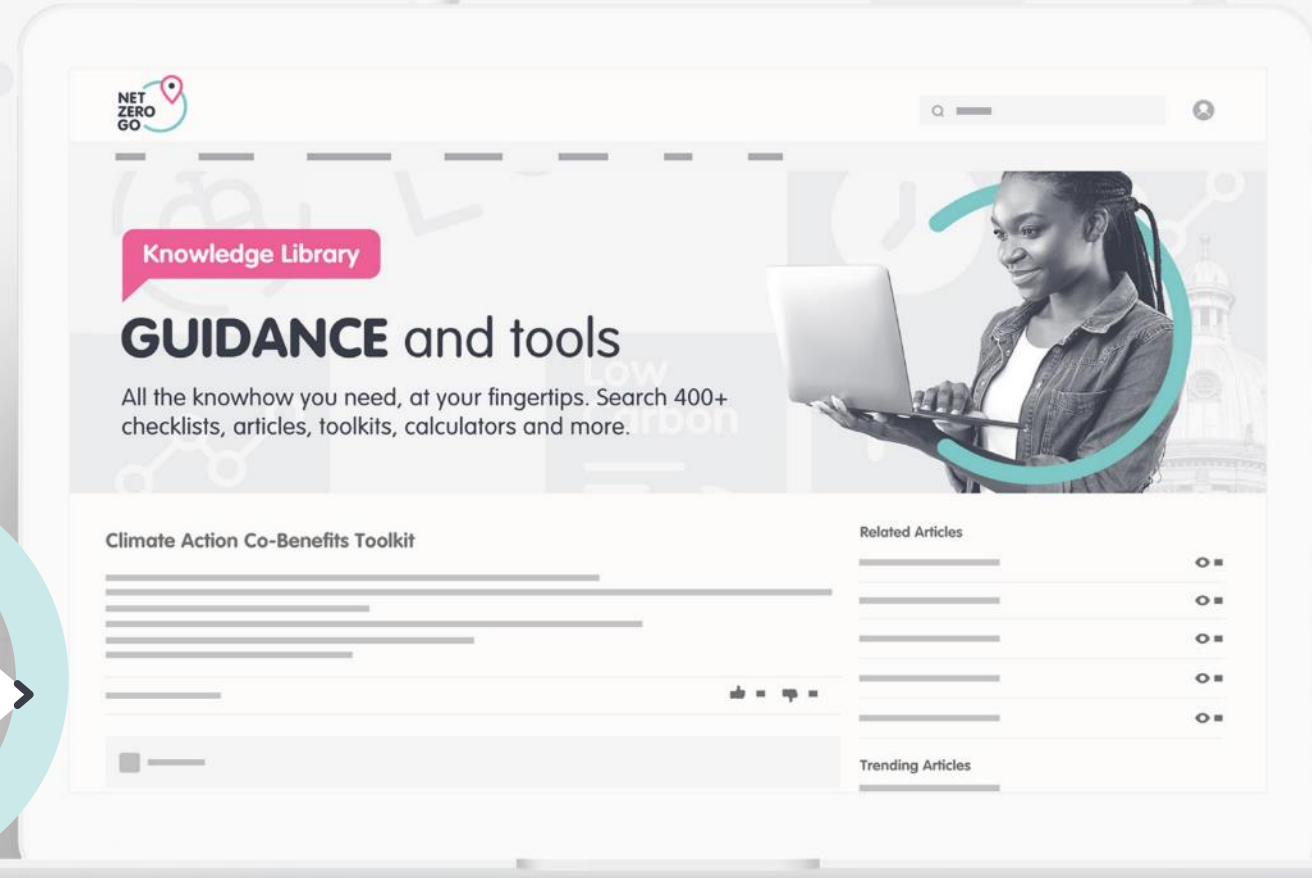
- Decarbonising Local Places, Homes, Public Sector Estate, Campuses, Business Parks and Industrial Estates
- Integrating Transport, Buildings, Sites with Energy System
- Deliver Large Scale Innovation Trials

We work with
Innovate UK

Net Zero Go

A unique digital platform...
that brings together all net
zero transition knowledge,
tools, and expertise in
one place...

for the benefit of UK local
authorities and their
partners.



Purpose of today's session

- To share knowledge, insight and experience from across the industry on Energy Project Business Case development
- Focus on validating the business cases for various Solar project types, and how these can be funded
- Share the work that Energy Systems Catapult has been doing with Greater Manchester Combined Authority in support of the ERDF funded Unlocking Clean Energy in Greater Manchester (UCEGM) programme, sharing knowledge on how this work is developing robust Solar projects for the GMCA region, which could be useful for other UK councils.
- To learn from other UK local authorities about their experiences of business case development, obtain feedback on the work we have been doing for Net Zero Go, and confirm the direction of future work on this topic.

Agenda

Welcome and intro	Gordon Graham – Energy Systems Catapult	13.30	5 mins
Investment into Solar Projects	James Screen – UK Infrastructure Bank	13:35	10 mins
Developing an Outline Business Case – Net Zero Go Best Practice Guide	Laura Penny – Energy System Catapult	13:45	5 mins
Introduction to Unlocking Clean Energy in Greater Manchester (UCEGM)	William Hart – Energy Systems Catapult	13:50	2 mins
Business Model Implementation in UCEGM	Reace Edwards – Energy Systems Catapult	13:52	8 mins
Validating the Business Case for Investment in UCEGM	David Elam – Energy Systems Catapult	14:00	10 mins

Agenda

Introduction to a local authority solar innovation challenge	Keith Grimley – Gravesham Borough Council	14:10	5 mins
Roundtable – responding to solar innovation challenge	Jane Forshaw – Welsh Government Energy Service Steve Gummer – Sharpe Pritchard Solicitors Reace Edwards – Energy Systems Catapult James Screen – UK Infrastructure Bank	14:15	20 mins
Solar Business Case – Five Case Model	Huw Russell – Local Partnerships	14:35	10 mins
Looking at solar projects in a Local Area Energy Plan – Strategic Case	Peter Graham – Energy Systems Catapult	14:45	10 mins
Final remarks	Gordon Graham – Energy Systems Catapult	14:55	5 mins
End		15:00	

Investment into Solar Projects

James Screen, *Head of Local Lending*, UK Infrastructure Bank

UK Infrastructure Bank

Net Zero Go Solar Business Case Event
2023

Core Objectives & Investment Principles

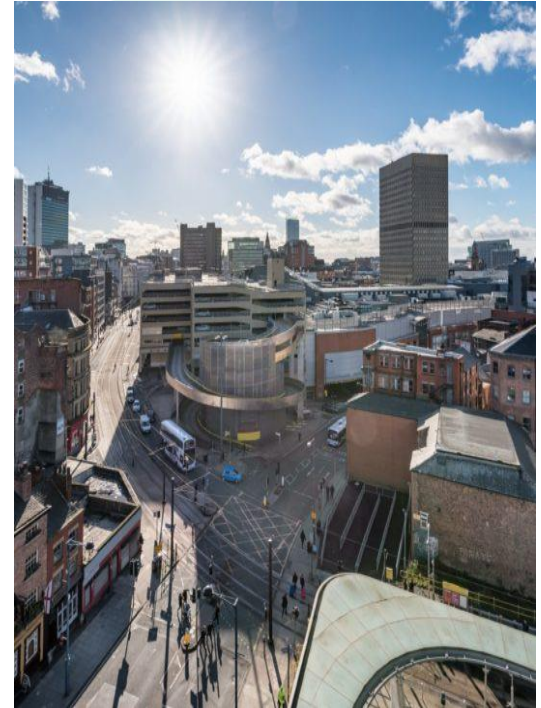
The Bank's core objectives are to:

1. Help **tackle climate change**, particularly meeting our **net zero emissions target by 2050**;
2. Support **regional and local economic growth** through better connectedness, opportunities for new jobs and higher levels of productivity

The Bank has four **Investment Principles** it will deliver against. These are:

1. Supporting the Bank's objectives to drive regional and local economic growth or support tackling climate change.
2. Investing in infrastructure assets or networks, or in new infrastructure technology.
3. Delivering a positive financial return, in line with the Bank's financial framework.
4. (Crowding in significant private capital over time)

Our June 2022 Strategic Plan sets out how we will meet these objectives and principles. You can see it here <https://www.ukib.org.uk/strategic-plan>



What we can offer Local Authorities

Local Authority Lending

- UKIB has **up to £4bn** in capital to lend to Local Authorities
- We are able to offer loans at **gilts +60bps** (which is 20bps lower than the PWLB rate)
- We can offer **flexible interest payments** and the option of **payment holidays** to meet project demands. As an example, we can lend up to 50yrs and rolling up the initial payments during construction phase, we can discuss other flexibilities according to the needs of the project
- We have a minimum ticket size of £5m with no specific upper limit

Local Authority Advisory Service

- UKIB advises local authorities in developing complex infrastructure projects and financial structuring.
- We also look to convene public and private stakeholders to identify solutions to common challenges
- We can offer 'intelligent client' advisory support to local authorities working with private sector partners on projects
- Initial areas of focus – heat networks, mass transit and Zero Emission Buses
- There is no charge to Local Authorities for our advisory service

UKIB support for LA Solar projects

We expect to support solar projects where the council is seeking to borrow and the project:

- Demonstrates impact against UKIB's strategic goals (i.e. supporting council's net zero plans)
- Has an appropriate financial and commercial case, considering key sensitivities
- Has considered/mitigated the risks associated with the project e.g. financial, demand, site, technology, procurement, environmental
- Is affordable within councils wider plans

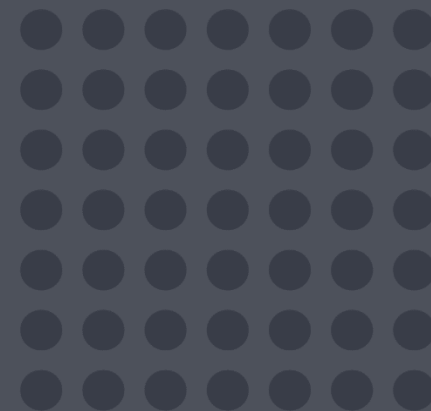
Get in touch at: laending@ukib.org.uk

Some solar success factors

- Connection rights/costs/timings – need to factored in early
- Access to suitable site with rights
- Appropriate offtake arrangements – private wire/commercial PPAs
- Appropriate advice – legal, commercial, technical

Developing an Outline Business Case: Net Zero Go Guide

Laura Penny, Net Zero Go – Local Energy Insights Manager,
Energy Systems Catapult



Presentation outline

- Showcase one of the Best Practice Guides in Net Zero Go – [Developing the initial business case for your local energy project.](#)
- Demonstrate the platform as a one-stop-shop for local authorities, bringing together relevant resources on net zero and energy projects into one place.
- Welcome feedback on any additional tools or resources relevant to business cases that could be added to the Guide.
- Outline our next steps and upcoming events related to this topic.

Manage My Projects



Browse Knowledge Library



Browse Case Studies



Visit the Forum



[Action Plan](#)
[Upcoming events](#)
[Other actions](#)

Based on what you have told us, these are sections of Net Zero Go we recommend you start with.

Guides

- Our insight paper identifies five emerging business models for SLES, and how – by making designs more investable, replicable and scalable – they can help deliver value to local communities as they try to decarbonise.
 [Emerging business models for smart local energy systems \(SLES\)](#)
- This guide summarises key Planning Legislation and Building Regulations relevant to local energy projects and links to external sources for further information and guidance.
 [Local energy planning legislation](#)
- This Net Zero Go guide provides a review of steps that should be carried out to ensure successful procurement of products or services for local energy projects.
 [Best practice procurement](#)

References

- The purpose of this toolkit is to provide advice to local authorities on planning and taking measures to reduce carbon emissions from transport by: highlighting the benefits of different interventions setting out the actions local authorities can
 [Transport decarbonisation: local authority toolkit](#)
- A new guide from the Low Carbon Vehicle Partnership (LCVP) for fleet operators shows how renewable fuels can immediately cut greenhouse gas emissions in road
 [The Renewable Fuels Guide: Helping fleet operators cut](#)



Guide

Developing the initial business case for your local energy project

This guide has been developed to help you navigate and access tools and resources designed to support you to make the case for local energy projects. It has been broken down using the 'Five Case' business model recommended by HM Treasury, the Welsh Government and the UK Office of Government Commerce. These 5 cases have been widely used across central government departments and public sector organisations over the last 10 years.

Business cases can be broken down into 5 different aspects which are interconnected but distinct (namely, the strategic, economic, financial, commercial and management aspects of the case). The purpose of using these 5 cases is to clearly demonstrate that a business case:

- is supported by a robust Case for Change – **the Strategic Case**;
- will optimise Value for Money – **the Economic Case**;
- are commercially viable – **the Commercial Case**;
- are financially affordable – **the Financial Case**; and,
- can be delivered successfully – **the Management Case**.

The sections are as follows:

1. Strategic Case

- 1.1. Benefits framework
- 1.2. CARES toolkit collections by Local Energy Scotland
- 1.3. Decision Making Doughnut
- 1.4. Evidence Base to Support EV Charge Point Strategy and Decision Making in Hull and East Riding of Yorkshire

2. Economic Case

- 2.1. Emerging Business Models for Smart Local Energy Systems
- 2.2. Risks for Integrated Smart Local Energy Systems
- 2.3. Case Study Library

3. Commercial Case

- 3.1. Best Practice Procurement Guide
- 3.2. Procurement Decision Tree
- 3.3. Procurement Framework Finder

4. Financial Case

- 4.1. Investment Appraisal Tool
- 4.2. Funding Guide
- 4.3. Cost Benefit Analysis

5. Management Case

- 5.1. Net Zero Go Project Management Support Toolkit
- 5.2. Project Risks, Opportunities, Constraints and Dependencies

[Business Case](#)[Develop Business Case \(Strategic Outline Case\)](#)[Develop Project Brief \(Outline Business Case\)](#)

Provided by [Net Zero Go](#)

Related

Files



Recommended Articles

Article Title

- 1 [Strategic Outline Case \(SOC\)](#)
- 2 [The Sourcing and Consultancy Playbooks](#)
- 3 [Five Case Model](#)
- 4 [Investment Appraisal Tool](#)
- 5 [Hub Guides](#)

Details

Details

1. Strategic Case

The strategic case sets out the rationale for the proposal, it makes the case for change at a strategic level. It should set out the background to the proposal and explain the objective that is to be achieved. The strategic policy context and the fit with the wider public policy objectives and the department's corporate plan must also be satisfactorily explained, as should any interaction with or dependency on any other public sector programmes.

1.1. Benefits framework

What benefits do you think this project should generate?

Defining your benefits within a standard framework can help identify potential opportunities to create impact and change. A benefits framework can also provide a robust approach to testing whether a proposed benefit is realistic and if it is measurable.

We have provided a list of benefits that a local energy project could provide that have developed alongside the Ashden Co-Benefits Toolkit (Ashden 2021) and the case studies referenced in this project.

[Access online benefits tool here](#)

1.2. CARES toolkit collections by Local Energy Scotland

The CARES toolkit guides you step-by-step through the process of developing a renewable energy project, from determining your goals to helping you achieve them.

It includes guides to help define community benefits of local energy projects and how to measure these, information on different technology options, template project plans, agreements, tender documents and many more!

[Access the resources through this page](#)

1.3. Decision Making Doughnut

This self-assessment framework has been developed following the theory of Doughnut Economics. Doughnut Economics takes into account the social and ecological impact of human activities while developing strategic aims or projects or programmes.

In answering the questions included in each subsection, the user will need to engage with internal stakeholders spread across their organisation, stimulating a discussion on the social and environmental impact of a specific project.

As an outcome, the user will be able to communicate to internal and external stakeholders the social and ecological benefits of the project, as well as its risks.

[Access decision making doughnut here](#)

Net Zero Go Benefits Navigator

The benefits tool supports selecting the benefits that a project can achieve through using the Net Zero Benefits Framework.

Review the [Net Zero Go Benefits Framework](#).

To use the tool

- Select your priority Benefits types
- Select the benefits
- Finish to add to your project



Preview Responses

Next

Choose your target benefits types

Which types of benefits and impacts are you interesting in delivering through your project or business case?

Financial	☐
Net Zero	☐
Health and Wellbeing	☐
Equity and Social	☐
Economic and Job Creation	☐
Resilience	☐

Preview Responses

Next

2. Economic Case

The economic case is the essential core of the business case and should be prepared according to Treasury's Green Book guidance. This section of the business case assesses the economic costs and benefits of the proposal to society as a whole, and spans the entire period covered by the proposal. These are not the same as the financial costs to the department or body undertaking the expenditure.

Elements of the economic case include:

- A cost benefit analysis must be performed in which the economic costs (-) and benefits (+) should be calculated for each year covered by the proposal and then summed to produce a net figure for each year.
- An Options Analysis to consider alternative options for achieving the desired objective. This options analysis starts from a long list of all reasonable alternatives including a do nothing option (the so called counterfactual) or if doing nothing is not possible a do minimum option.
- Demonstrating the potential wider impacts of the project on society
- Demonstrating the potential environmental and sustainability impacts
- An approach for evaluation and monitoring of the project to capture how it is delivering against the defined objectives and benefits.

2.1. Emerging Business Models for Smart Local Energy Systems

This insight paper identifies five emerging business models for smart local energy systems, and how – by making designs more investable, replicable and scalable – they can help deliver value to local communities as they try to decarbonise.

Each model considers:

- Benefits of the business model and the value it can deliver to the local area
- Risks and considerations for those looking to set up new projects
- Different roles the local authority could play in the business model and how they might interact with other key delivery partners

[Access the full insight paper here](#)

2.2. Risks for Integrated Smart Local Energy Systems

To help you consider what risks may be linked to your local energy project, this report, created as part of the Prospering from the Energy Revolution programme was generated. It highlights the typical attributes of smart local energy systems and analyses the potential risks associated with them and their operation with or alongside other systems.

Smart Local Energy Systems (SLES) are a varied and complex set of solutions using local assets to potentially provide resilience, network services, better consumer experiences and local network constraint management. They bring unique requirements and challenges to the specification, design, delivery, integration, and operation of SLES (or systems that will form SLES) in a rapidly changing energy sector.

[Access the report here](#)

2.3. Case Study Library

Evidence & Inspiration

Case Studies

Case Studies & Templates

Browse the examples below, or use the search bar above to view information about real-world projects, in various stages of development.

Use these resources to provide an evidence base for your project's business case. Or, check the templates below as sector-best templates to provide a starting point for your project.

NZG Case Studies

[Case Study Map](#)[Other Case study libraries](#)[Templates](#)[EnergyREV Case study map](#)

Warrington Borough Council

3rd Party Solar on factory rooftop

Warrington Borough Council are targeting the reduction of carbon emissions across Warrington, improving long-term energy security and supporting the local economy. We are setting up a programme of solar photovoltaic (PV) installations on buildings across the borough, ranging from domestic residences to schools and commercial buildings.

APSE Energy

Essex County Council

Braintree Electric Forecourt

The consortium has successfully developed a convenient, scalable, low-cost model for ultra-rapid public EV charging. The Electric Forecourt ® concept is designed to be the ultimate electric vehicle public charging experience, powered by low cost clean energy and supporting the local electricity grid. Co-location of 36 EV charging bays, retail building, multi-MW on-site battery storage and solar PV canopy creates resilient, high power technical solution with multiple revenue streams.

UK100

Leeds Council

Carmarthenshire County Council

Search Results

All

Guides

Groups

Topics

Knowledge

Case Studies

Projects

Discussions



[Collapse List](#)

Refine By

Name

Linked Organization

Case Studies

11 Results • Sorted by [Relevance](#) ▼

NAME	LINKED ORGANIZATION	BRIEF SUMMARY
Solar PV development on former Lamby Way landfill site	Cardiff Council	Cardiff Council have developed a major solar farm on a former landfill site. The 9MW solar farm, which involved installing 33,000 solar photovoltaic panels, is a landmark project for the Welsh public sector and has won a national design award. As well as generating locally owned renewable energy, the project will generate income for the council by selling green electricity to a nearby water treatment plant owned by Welsh Water and help both decarbonise this facility and the local energy grid.
Solihull School PV	Solihull Metropolitan Borough Council	As part of a broad programme of work, Solihull Council partnered with npower to install solar PV on a number of schools including Dickens Heath Community School. A programme of engagement and training through the Ashden Less CO2 schools initiative and the installation of AMR in the school enabled significant energy consumption savings, resulting in reduced costs and empowerment of students and staff in their energy consumption.
3rd Party Solar on factory rooftop	Warrington Borough Council	Warrington Borough Council are targeting the reduction of carbon emissions across Warrington, improving long-term energy security and supporting the local economy. We are setting up a programme of solar photovoltaic (PV) installations on buildings across the borough, ranging from domestic residences to schools and commercial buildings.
Flint Landfill Solar Farm	Flintshire County Council	Around 9000 400W solar photovoltaic (PV) panels will be installed across the two locations - a former chemical works at Crumps Yard in Connah's Quay and a site in Flint previously used for landfill.
MADE Project	Devon County Council	MADE project, a £1.6m Network Innovation Allowance (NIA) project investigates the network, consumer and broader energy system implications of high-volume deployments of the combination of LCTs, including generation and storage. The project explored the feasibility of controlling and aggregating multiple LCTs (EV, hybrid heating system, battery storage and solar PV) through a single consumer device by optimising to ToU tariffs and other market signals, with the aim to reduce network peaks, unlock value from energy markets and reduce consumers bills.
Falkirk Stadium EV charging hub	Falkirk Council	An electric vehicle (EV) charging hub with 26 bays served by 5 rapid and 8 fast chargers with solar generation and storage capacity.

4. Financial Case

The financial case is concerned with issues of affordability, and sources of budget funding. It covers the lifespan of the scheme and all attributable costs. The case needs to demonstrate that funding has been secured and that it falls within appropriate spending and settlement limits. The focus in this section of the case is on capital and resource requirements (near-cash or non-cash) and so here VAT and capital charges are included.

The financial case is concerned with:

- does the financial case identify and fill any funding gaps,
- does it contain provision for dealing with the financing of any time or cost overruns,
- does it fully explain and estimate any contingent liabilities that may result from the proposal?

4.1. Investment Appraisal Tool

The Financial appraisal tool enables the comparison between Costs (or Expenditures) and Earnings Before Income Tax Depreciation Amortisation (EBITDA). The tool calculates the Net Present Value (NPV), Internal Rate of Return (IRR), Simple Payback Time, and Discounted Payback Time. The inputs required have been kept to a minimum to allow easy use and quick implementation.

[Access the investment appraisal tool here](#)

4.2. Funding Guide

Our Net Zero Go funding guide will help you navigate the various resources we have to help you identify sources for funding and consider what finance options may be viable for your project.

[Access the guide here](#)

4.3. Cost Benefit Analysis

The Greater Manchester Combined Authority (GMCA) Research Team (formerly New Economy) has pioneered the development of a cost benefit analysis (CBA) methodology that has become nationally leading in its approach to articulating the fiscal, economic and social value of interventions. The methodology has been subject to an ongoing process of development since it was initially developed in 2011, and was adopted as supplementary guidance to HM Treasury's Green Book in 2014. Representatives from a range of central government departments have supported the development process and remain engaged in further refinement of the model and accompanying resources.

[Access the CBA tool here](#)

5. Management Case

The management case is concerned with the deliverability of the proposal and is sometimes referred to as programme management or project management case. The management case must clearly set out management responsibilities,

Directory > Funding Providers

Organisations which have open or ongoing grants and funds of interest to Local Authorities.

Government

Charity

Investors

Infrastructure providers



Department for
Energy Security
& Net Zero

Department for Energy Security and
Net Zero (DESNZ)

England;Scotland;Wales



Department
for Transport

Department for Transport

England;Scotland;Wales

MAYOR OF LONDON

Mayor of London

England



Innovate
UK

Innovate UK

Greater London Authority

England



Department for Levelling Up,
Housing & Communities

Department for Levelling Up, Housing &
Communities

England;Scotland;Wales



Ofgem

England;Scotland;Wales



HM Treasury

HM Treasury

England;Scotland;Wales;Northern Ireland



Llywodraeth Cymru
Welsh Government

Welsh Government

Wales



Department
for Environment
Food & Rural Affairs

Department for Environment Food &
Rural Affairs

England;Scotland;Wales



Environment
Agency

Environment Agency

England

One Public Estate

England;Scotland;Wales



Office of
Zero Emission
Vehicles

Office for Zero Emission Vehicles

England;Scotland;Wales



Historic England

Historic England

England



Homes
England

Homes England

England



Department for Communities



Department
for Education

Department for Education



MIDLANDS
ENGINE
Investment Fund

Delivered by British Business Bank
Financing growth for Midlands businesses

Midlands Engine Investment Fund

Directories

Net Zero Go has collated a number of useful lists of information that will help you find the support you need for your projects and programmes

Organisation Directories

District Network Operators



Regional Support Hubs



Funding Providers



Funding Links

Funding trackers



Ongoing Funds



Next steps

- Working with Local Partnerships to develop business case project templates that will be pre-populated with text and guidance where appropriate and made available to download through Net Zero Go, alongside the Best Practice Guide.
- **Dissemination event** on 5th April 10:00-11:30 “Local Energy Project Business Case Development”.
- Register here: <https://www.netzerogo.org.uk/s/events>
- Validation of the templates and content will follow in April.

To register for Net Zero Go, visit <https://www.netzerogo.org.uk/s/>

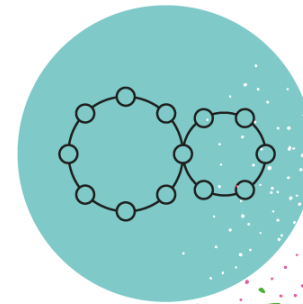
To follow us for events and announcements <https://www.linkedin.com/company/net-zero-go/>

Introduction to Unlocking Clean Energy in Greater Manchester (UCEGM)

**William Hart, *Project Manager*, Energy Systems
Catapult**

Unlocking Clean Energy in Greater Manchester (UCEGM)

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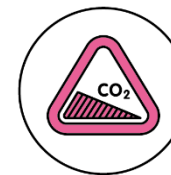
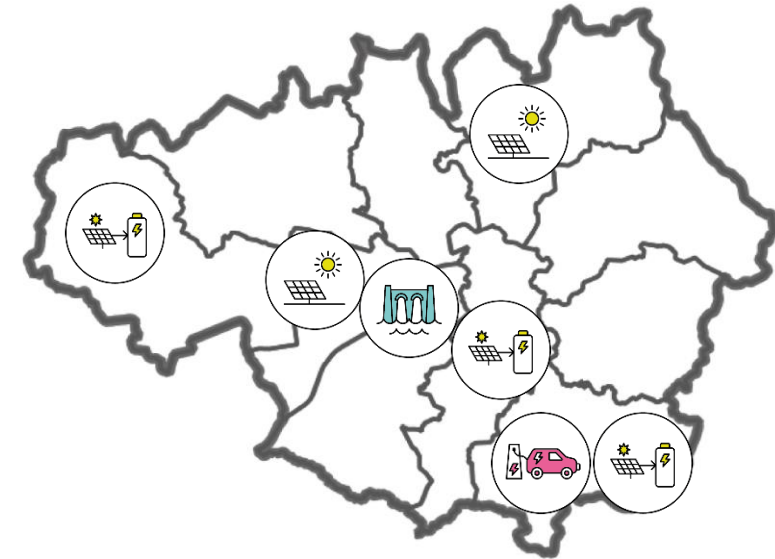
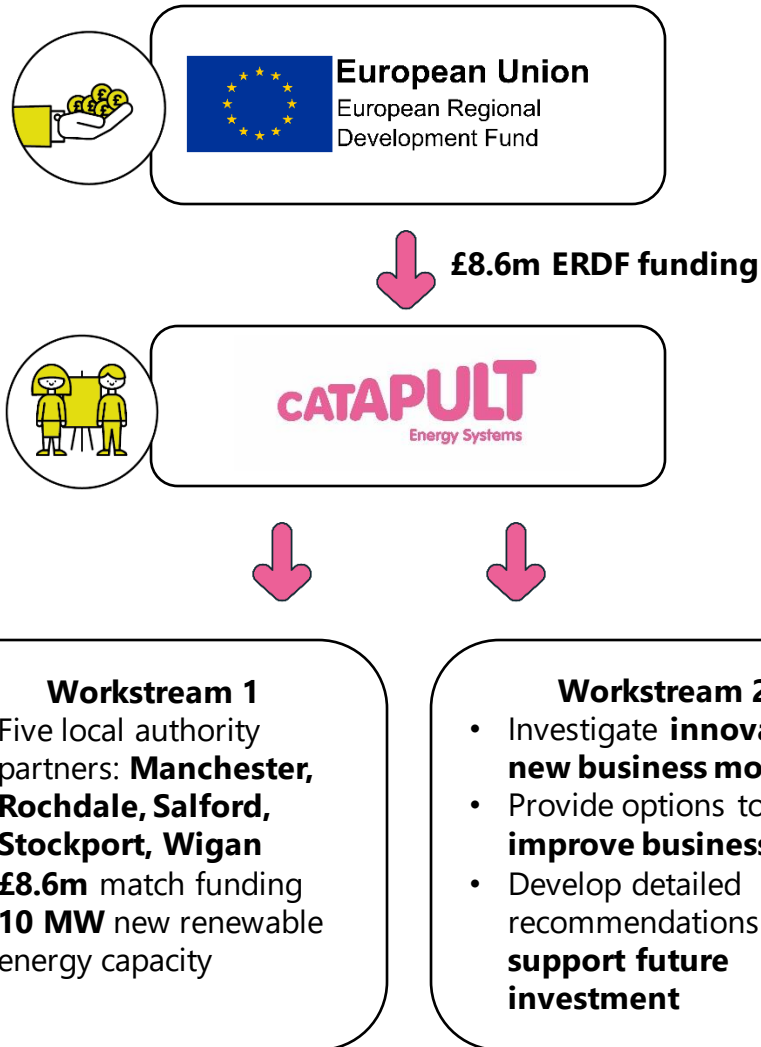


Project summary

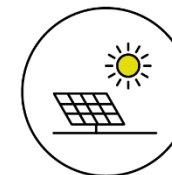
CATAPULT
Energy Systems



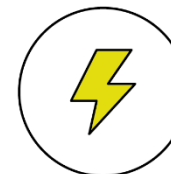
PROGRAMME SUMMARY



3,134 tCO₂ annual reduction in emissions



10 MW new renewable energy generation capacity – **22% of 2024 target** for new capacity in GM



8,881 MWh annual energy generation



Generating electricity to **reduce long-term costs** for local authorities

PROBLEM

Over reliance on grant funding to develop and initiate renewable generation projects cause **difficulties** for local authorities in several areas:

- Funding availability to reach net zero targets
- Complying with grant funding rules

To truly **unlock value** of renewable generation assets there needs to be other ways of developing renewable generation projects.

APPROACH

WS2 will demonstrate how **innovative business models, robust procurement methods and alternative routes to finance** can improve the business case for future renewable generation projects to **negate the need for grant funding**. The outputs, whilst using Greater Manchester local authorities as a pilot, will be **useable by all local authorities** and will include steps that will improve the business case.

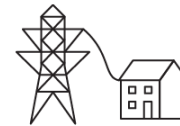
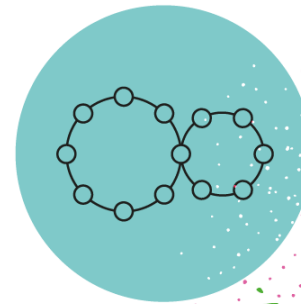
To understand how changes to the energy system will affect local authorities, ESC will simulate the performance of the business models in the **defined future scenarios**.

Business Model Implementation in UCEGM

Reace Edwards, *Business Modelling Analyst*, Energy Systems Catapult

Business Model Implementation

CATAPULT
Energy Systems



PHASE 2: BUSINESS MODELLING

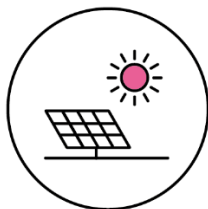
WHAT WE'RE DOING



European Union
European Regional
Development Fund



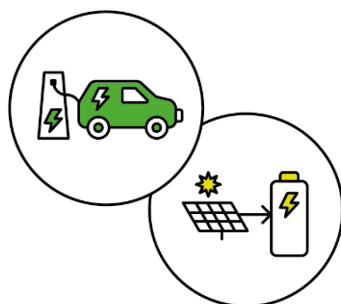
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- Sleeved PPAs
- Private Wire



- Site Optimisation and Storage
- Solar and Storage Licensing Arrangement



- Solar Car Port

1

Desirability

Does the business model satisfy your (and other project partners) needs and objectives?

- Exploring the value proposition for different roles local authorities may assume in business models

2

Feasibility

Do you know, and have access to, what is needed to deliver the business model?

- Mapping key project phases
- External validation with industry experts
- External validation with local authorities

3

Viability

Is the business model commercially viable?

- Identifying revenue generation streams
- Identifying cost saving/avoidance opportunities
- Exploring different pricing structures

PHASE 2: BUSINESS MODELLING

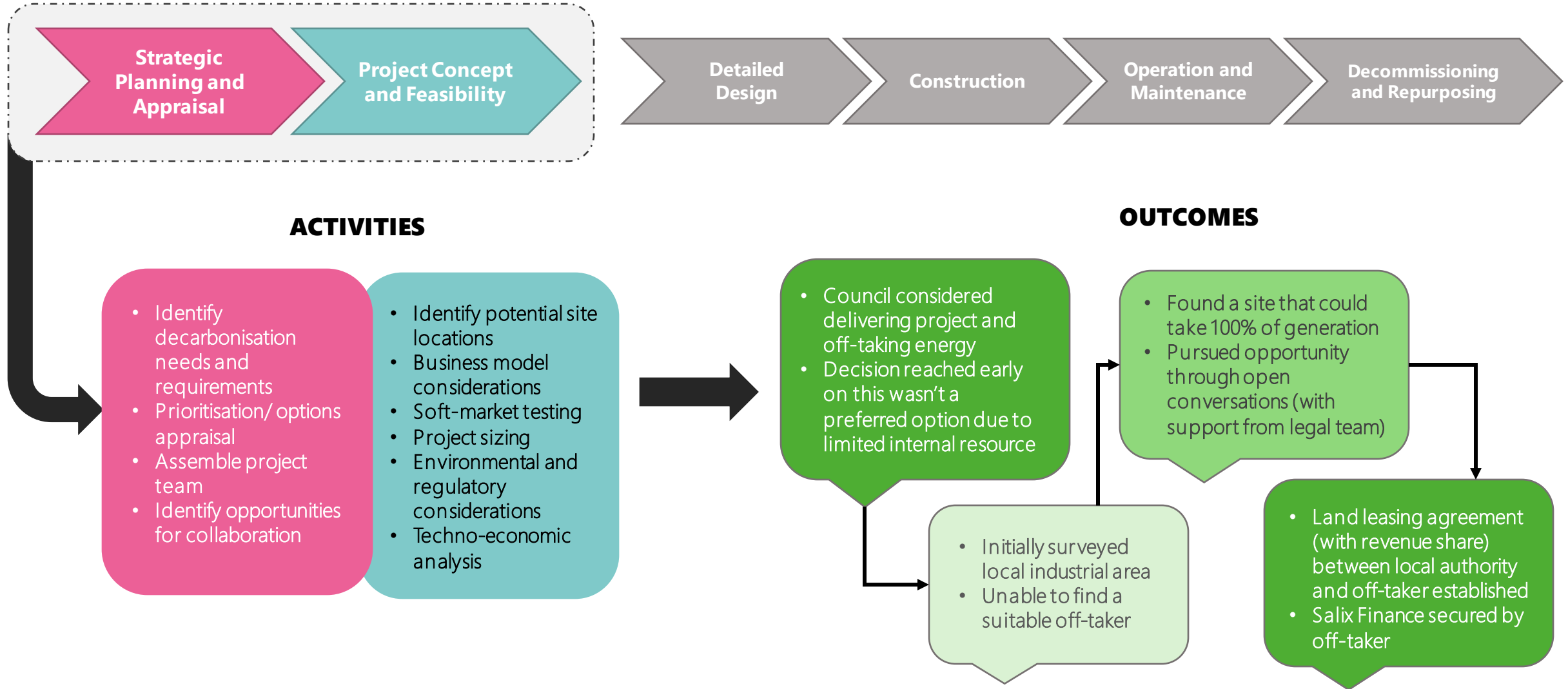
PRIVATE WIRE: AN EXAMPLE CASE



European Union
European Regional
Development Fund



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PHASE 2: BUSINESS MODELLING

WHAT ABOUT VIABILITY?

SETTING A PRIVATE WIRE POWER PRICE

- Private wire projects offer **cost savings** through **avoided network charges and policy costs**
- When **setting a price** for private wire power purchasing agreements (PPAs), the **benefits of these savings** should be **shared between the generator and the off-taker**
- E.g., the generator should **receive more revenue (p/kWh)** than if they were **selling to the wholesale market** and the off-taker should **pay a lower price for the electricity generated** than their existing **retail electricity price**



European Union
European Regional
Development Fund



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FACTORS TO CONSIDER

There are **numerous factors** that can **influence** the **power price** chosen such as:

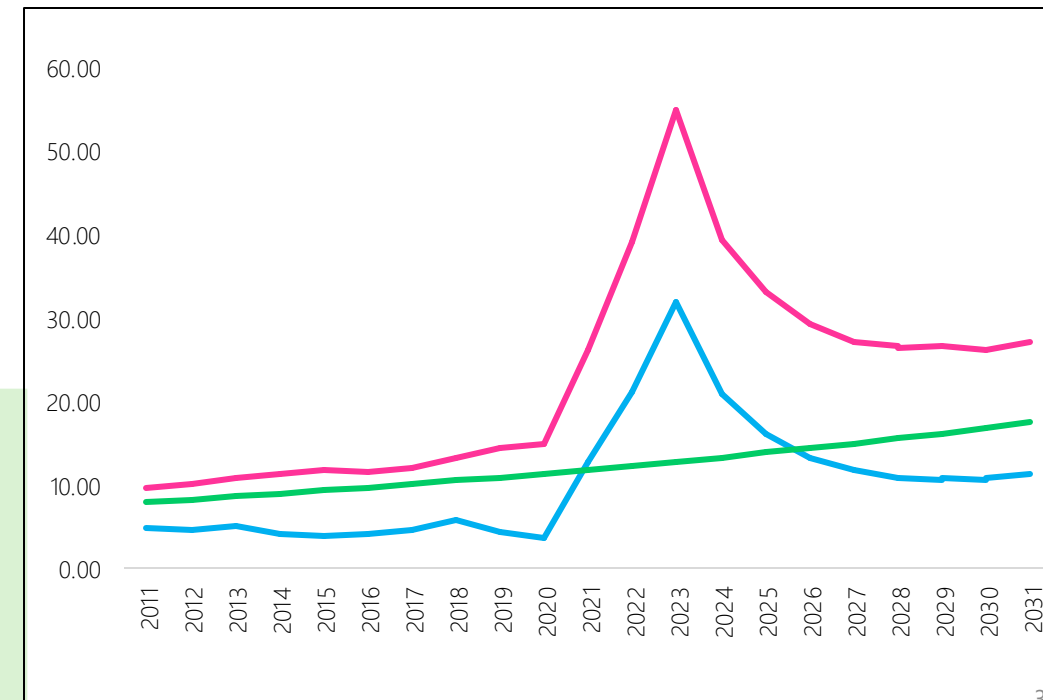
1. The **project IRR** required by the generator
2. **Cost-savings** required by the off-taker
3. Whether or not a **'take or pay'** clause is stipulated in the private wire PPA contract

Key

- Wholesale Price (p/kWh)
- Retail Price (p/kWh)
- PPA Private Wire Power Price (p/kWh)

DETERMINING A PRICING STRUCTURE

- Some **pricing structures** may be **more suitable** than others
- E.g., **fixed price with inflation** can provide **long term cost visibility** for an **off-taker** and **long term revenue visibility** for the **generator**
- However, changes in wholesale and retail prices could make the make fixed prices look less attractive to both Parties

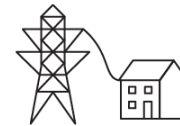
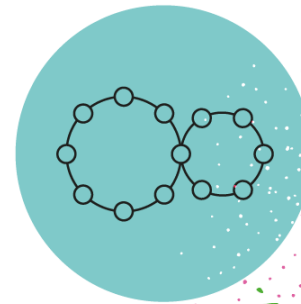


Validating the Business Case for Investment in UCEGM

David Elam, *Consultant Systems Engineering*, Energy
Systems Catapult

Validating the business case (commercial modelling)

CATAPULT
Energy Systems



- **Background**

- GMCA requested a way to quickly identify the viability of the renewable generation assets, considering the uncertainty in the inputs such as energy prices and CAPEX estimates.
- ESC supported each district with this modelling and provided expert guidance. Through this work additional insights and learning have been captured

- **Purpose**

- To understand the financials for a renewable generation asset using the available data at different stages of a project.

- **How to access**

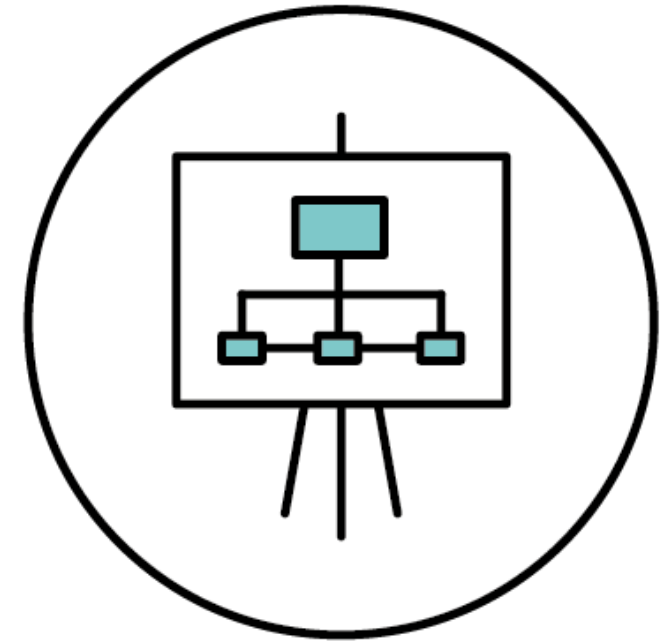
- Currently the model is operated by Catapult staff only – however work is underway to make the model useable by any local authority (plan is for this to be hosted on the Catapult's Net Zero Go Platform)

- **Data typically used**

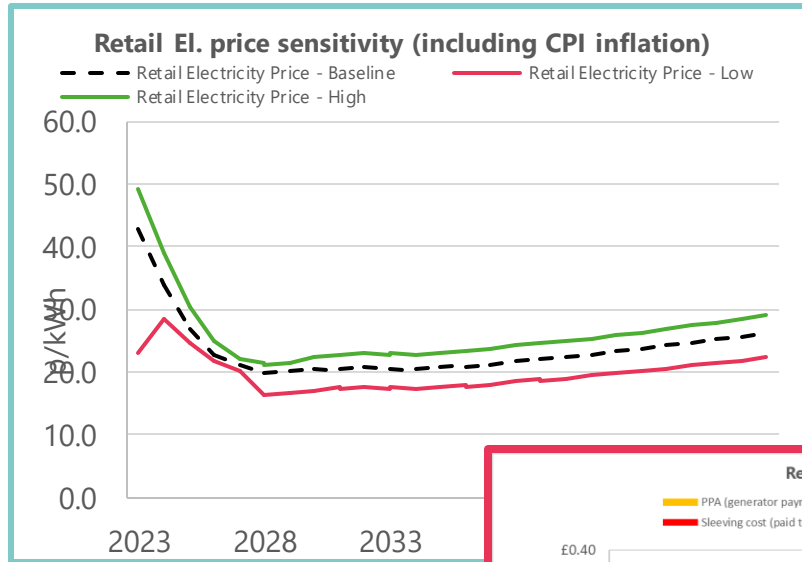
- Feasibility study outputs undertaken for renewable generation assets
- Load profiles (provided by local authorities)
- Financing options (Cornwall Insight produced a report informing this optionality)

- **Outputs**

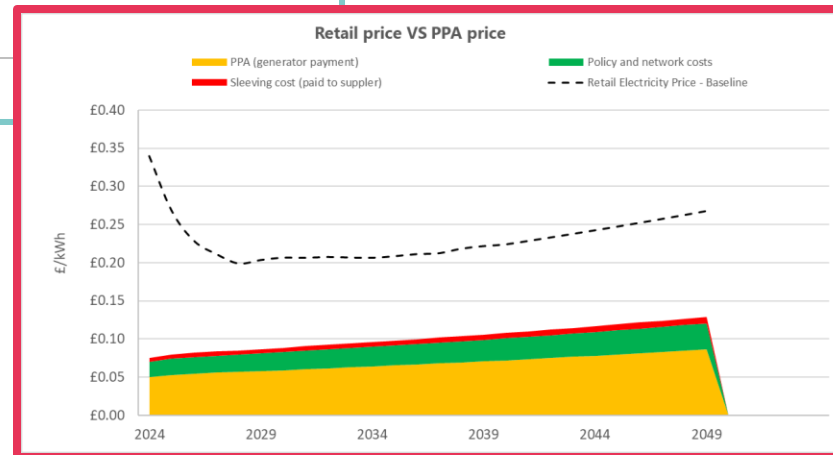
- Report with key business case metrics and sensitivity analysis



- Provide **credible** business case for projects to gain approval to proceed
- Includes several **different business models** for different sites
- **Addresses inaccuracies** in previous third-party analyses



Internal Rate of Return				
CAPEX Variation	Price Scenario £/kWp	Retail Electricity Price - Low	Retail Electricity Price - Baseline	Retail Electricity Price - High
-60%	490	33%	38%	43%
-45%	674	23%	27%	30%
-30%	858	17%	20%	23%
-15%	1041	13%	16%	18%
0%	1225	11%	13%	15%
15%	1409	9%	11%	13%
30%	1593	7%	9%	11%
45%	1776	6%	8%	9%



- Capex
- Generation rating
- Maintenance costs
- Grant %
- Self-consumption %

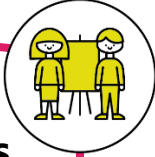
Project data:
CAPEX, Asset
capacity etc.

Energy price
forecasts

Business models
(sleeved PPA vs self
consumption etc)

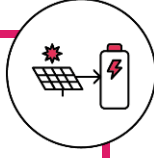
Financial return of
investment over
time

Sensitivities



LA understanding of business models

Business models are novel and may be misunderstood. Risk of losing £M of benefits. >> Simplify explanations and test the understanding of stakeholders.



Self-consumption

Tendency to over-estimate self-consumption (e.g. initial estimate of 100%, but typically 50% to 90%). >> Ensure generation and demand profiles are understood



Energy supplier engagement

Energy suppliers may not support all business models. >> Important to start discussions earlier and include provision in contracts. Also obtain prices or commercial model may be invalid



Energy prices

Original energy price assumptions were poor. A range of energy price scenarios is important for unlocking the value of business models and providing sensitivities to enable project business case approval.



Complexity of billing (e.g. schools)

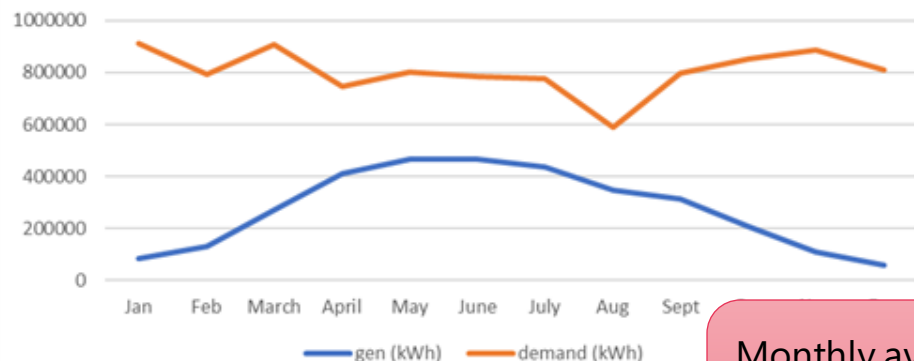
The LAs own a variety buildings. Some schools on the same energy supply contract have separate billing arrangements. Added complexity for sleeving power from a solar farm.

What happens next?

- Commercial model being adapted for use directly by LAs.
- Commercial model needs to be combined with experience from tailored support.

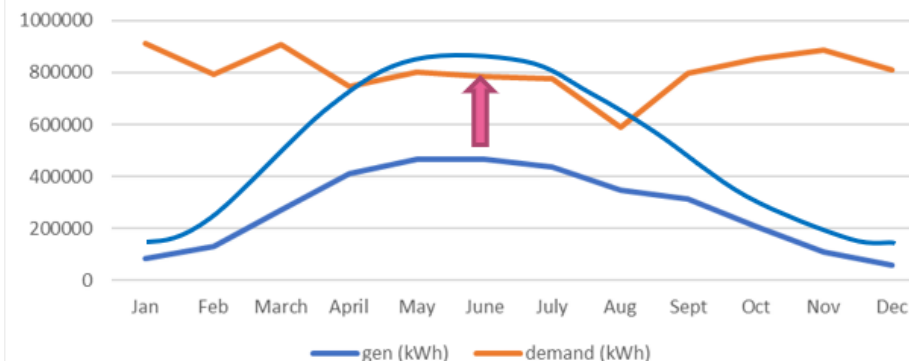
GENERATION AND DEMAND PROFILES

Ref case (4MW) solar farm average monthly generation & demand



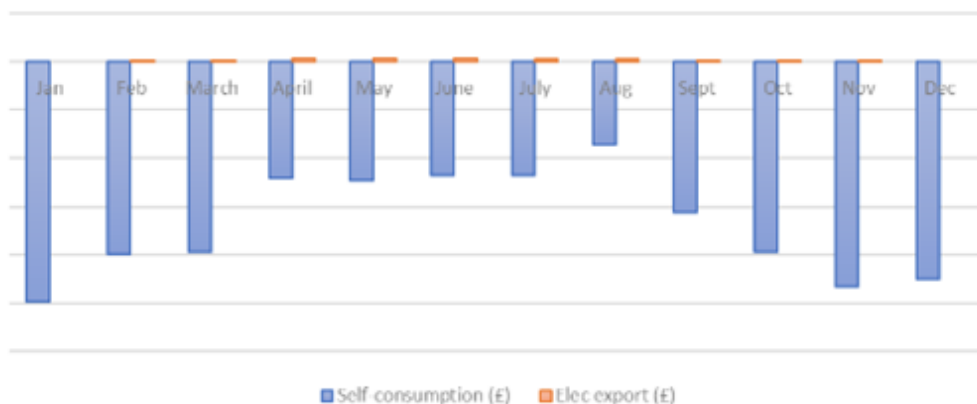
Monthly average figures may suggest that 100% of generated electricity will be consumed.

Ref case (4MW) solar farm average monthly generation & demand



Increasing generation size may over-generate more in summer months but offsets more grid electricity consumption. Explore the trade-off in commercial modelling.

Ref case (4MW) solar farm export vs self-consumption



In practice self-consumption = circa 88% due to hourly mismatch between demand and supply and lower weekend demand. Consider options for surplus and factor these into the commercial modelling.

Local authority solar innovation challenge

Keith Grimley, *Senior Economic Development Officer,*
Gravesham Borough Council

Springhead Enterprise Park, Gravesend (Thames Estuary)

Gravesham Council Freehold – business units,
a mix of short & long leasehold

Net Zero Go - Solar Innovation Challenge



Google

OBJECTIVE

DECARBONISATION OF LA ASSETS TO REDUCE
COSTS OF DOING BUSINESS

A. Cheaper Energy

B. Resilient Local Power

Project - Mini 'urban' Solar PV Park, built on:

1. Landscape strips | Small Land Parcels OR 2. Rooftops

Business case

- Panel installation cost borne (100%?) by Gravesham Council, with payback from supplying power to occupiers (insured maintenance?)
- Patient return on LA capital (15-20 year return, not 4-5yrs)
i.e. share benefit of cheap, local power with tenants
- Driver of uprated Energy Performance Certificate (EPC) compliance

Challenges

- Access to capital (at right price)
- Apportioning solar power, to multiple tenants (high/low energy users)
- 'Passporting' power purchase via leases, to future tenants
- Impact of grid-supplied energy price volatility, on business case
- Suitable legal entity (LATCo) to become energy provider
- Subsidy Control (ex 'State Aid') – benefits to commercial tenants



Roundtable

Jane Forshaw, *Project Director*, Welsh Government Energy Service

Steve Gummer, *Partner*, Sharpe Pritchard Solicitors

Reace Edwards, *Business Modelling Analyst*, Energy Systems Catapult

James Screen, *Head of Local Lending*, UK Infrastructure Bank

Solar Business Case – Five Case Model

Huw Russell, *Project Director*, Local Partnerships

NET ZERO GO INNOVATOR WORKSHOP: HMT GREEN BOOK BUSINESS CASES

Huw Russell

16 March 2023

WHO WE ARE



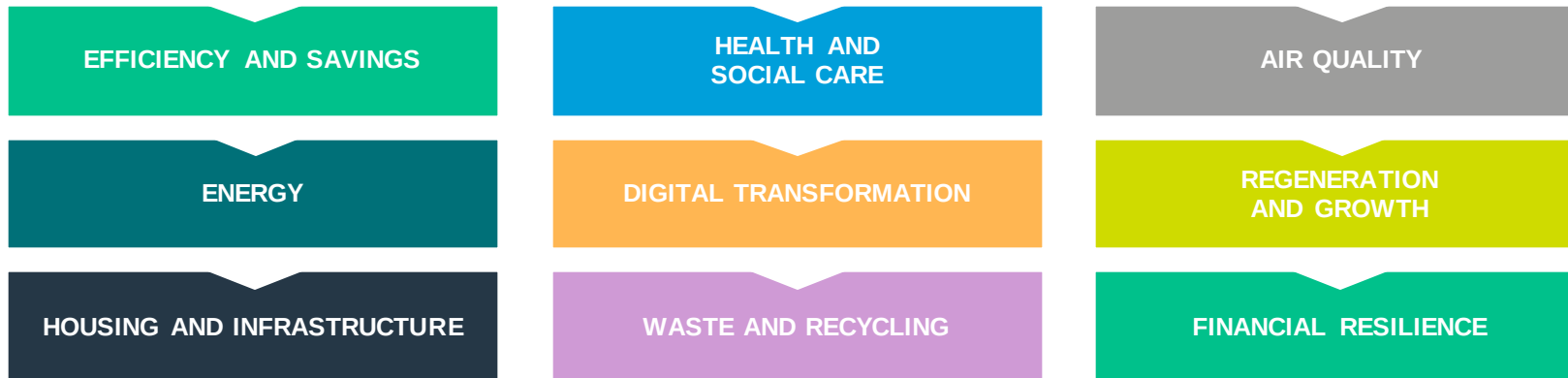
JOINTLY OWNED BY



Local Partnerships is a joint venture between the Local Government Association, HM Treasury and the Welsh Government.

We work solely for the benefit of the public sector. We bring public and private sector experience that provides **confidence**, **capacity** and **capability**, helping councils achieve and maintain financial resilience.

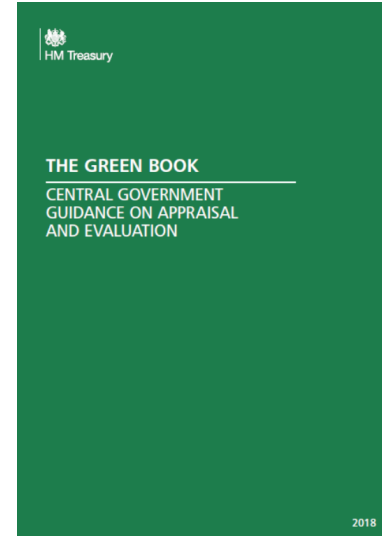
Our experts provide trusted, professional support and advice over multiple disciplines, helping you make best use of limited resources as demand for services continues to rise.





SESSION OBJECTIVES

- Very brief overview of:
 - HMT Green Book 5-case model
 - The Business Case development process
- To highlight the benefits of following a robust process for developing a business case
- Ask some questions about your experience of business cases, to help us produce the business case templates and pitch them at the right level





POLL – QUESTION 1

Q – Have you drafted a business case based on the HMT Green Book previously?

A – Yes/ No/ Not sure

Please add any alternative business case processes that you have followed in the chat function, particularly if any templates are provided with these processes.



INTRODUCTION

What is a business case?

- A framework for scoping and planning spending proposals leading to efficient and effective spend
- Uses:
 - Internal and external approval
 - Accountability for public funds
 - Support programme and project management
 - Repository for information / evidence base
 - Post project implementation evaluation

Why use them?

- History of cost and time over run in public sector projects
- Risk of lack of value for the public purse
- Business case approach provides:
 - Clear links to organisational strategic priorities
 - A requirement to consider a number of options
 - A framework for identifying a range of risks



TYPE OF BUSINESS CASE

Business Case	Characteristics	Examples
Programme Business Case	Strategic programme	Policy Delivery Regulation Grants Programmes
Three stage project business case: • Strategic Outline Case • Outline Business Case • Full Business Case	Large scale project	Major projects which require an OJEU procurement
Business case with stages combined	Small scale, high risk projects where procurement has already been completed	
Business Justification case	Small scale, low risk projects where procurement has already been completed	Minor project spending proposals



POLL – QUESTION 2

Q – Have you drafted a 3-stage business case, i.e. Strategic Outline Case, Outline Business Case, then Full Business Case?

A – Yes/ No/ Not sure



POLL – QUESTION 3

Q – Have you drafted a Business Justification Case suitable for small scale, low risk projects?

A – Yes/ No/ Not sure



POLL – QUESTION 4

Q – Have you drafted a Programme Business Case suitable for setting up a programme?

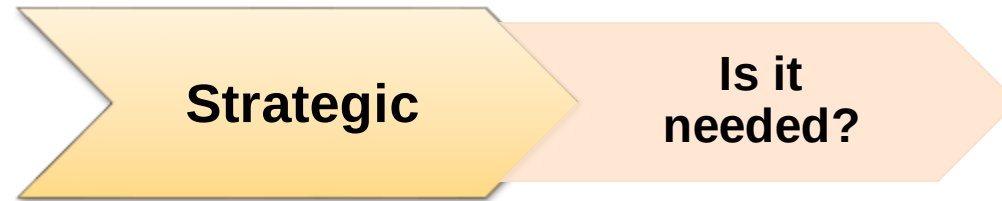
A – Yes/ No/ Not sure

PROJECT BUSINESS CASE – STANDARD STAGES

	SOC Strategic Outline Case	OBC Outline Business Case	FBC Full Business Case
Key Outcome	Commitment & Resource	Ready for Procurement	Ready to sign Contract(s)
Key Activities at this Stage	Ascertain Strategic fit; Make Case for Change; Determine Shortlist of Options; Establish Project Arrangements	Appraisal of Short list options; Determine Preferred Option; Procurement Plan for Preferred Option; Confirm Affordability and funding; Delivery Plan	Procuring the Solution; Confirming Value for Money; Agreeing the 'Deal' Comprehensive plan for Delivery



STRATEGIC CASE



The Business Case should demonstrate:

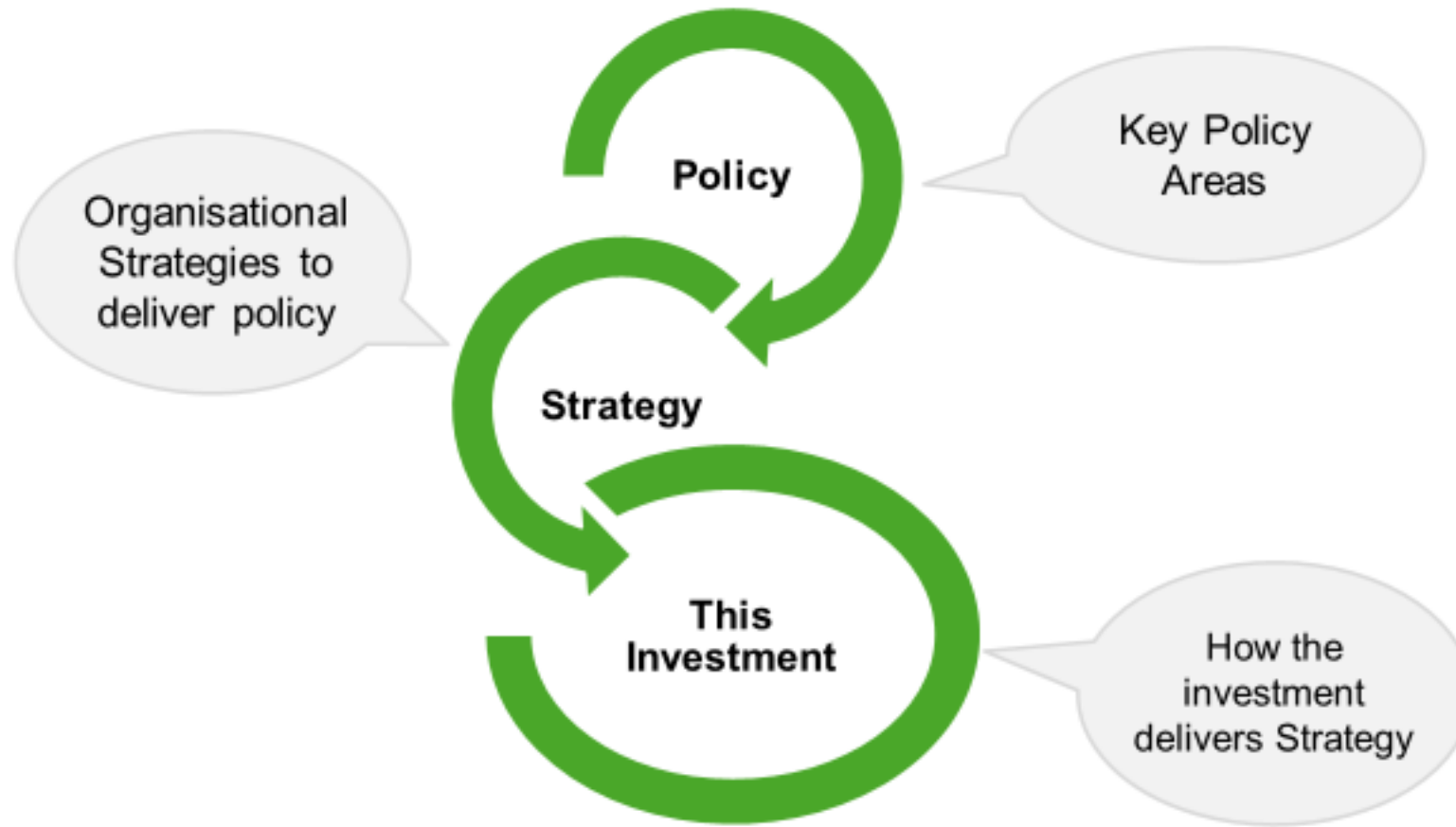
A strategic fit:

How the investment will further the aims and objectives of the organisation

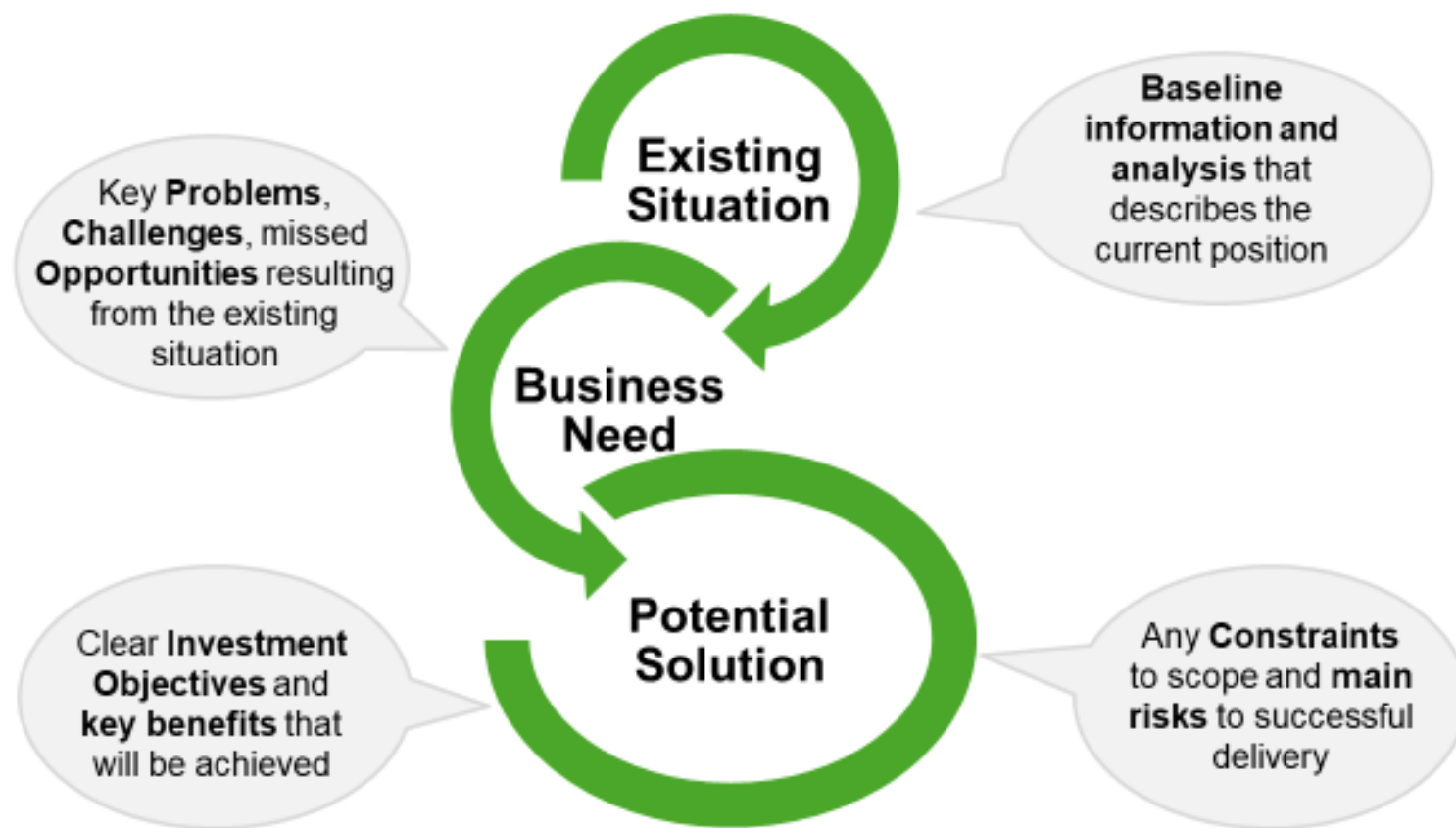
Making the case for change:

A clear rationale for making the investment

Ascertain Strategic fit



Make The Case For Change





ECONOMIC CASE



The Business Case should demonstrate:

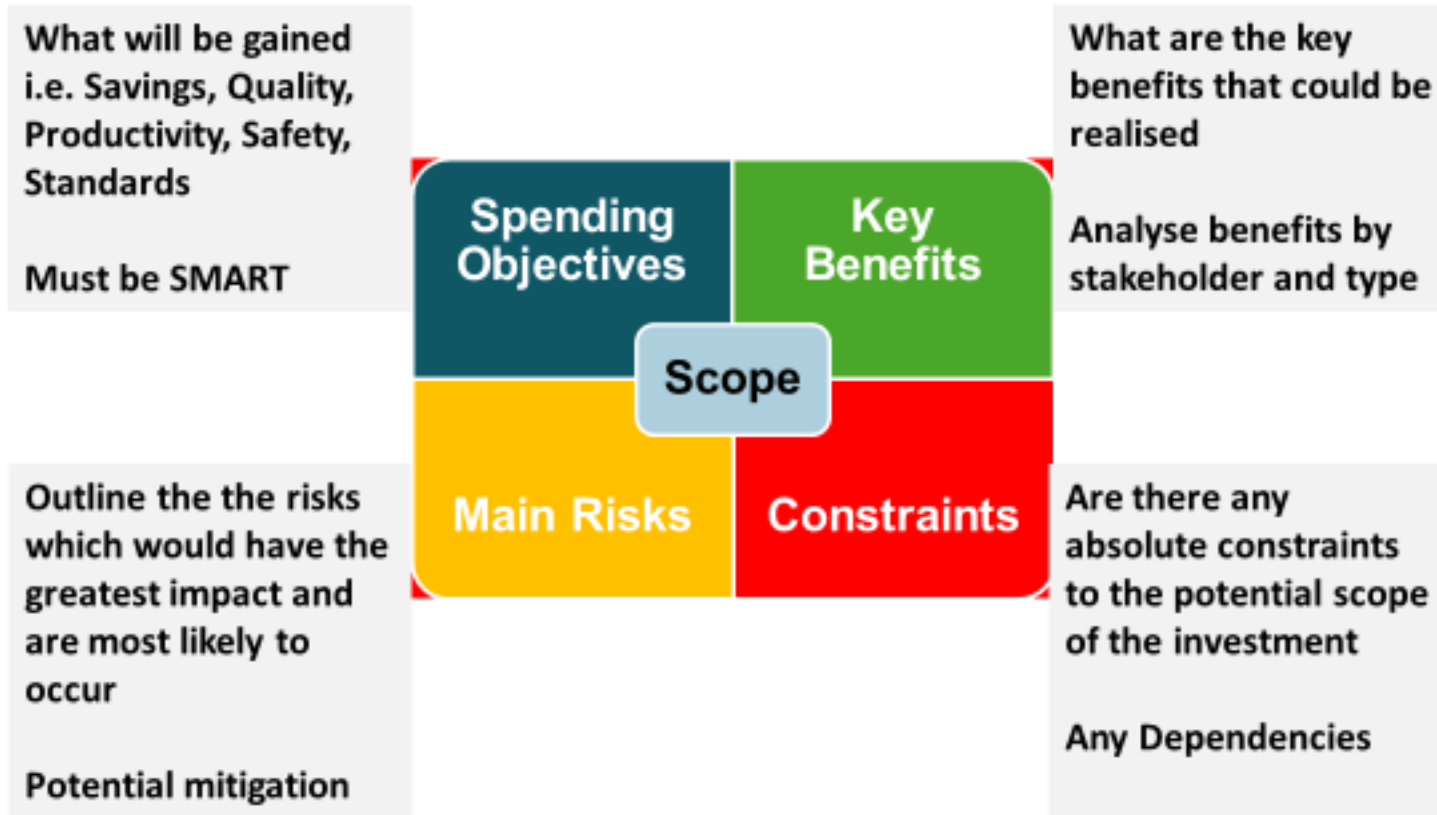
Options:

A wide range of options for solving the problem have been considered

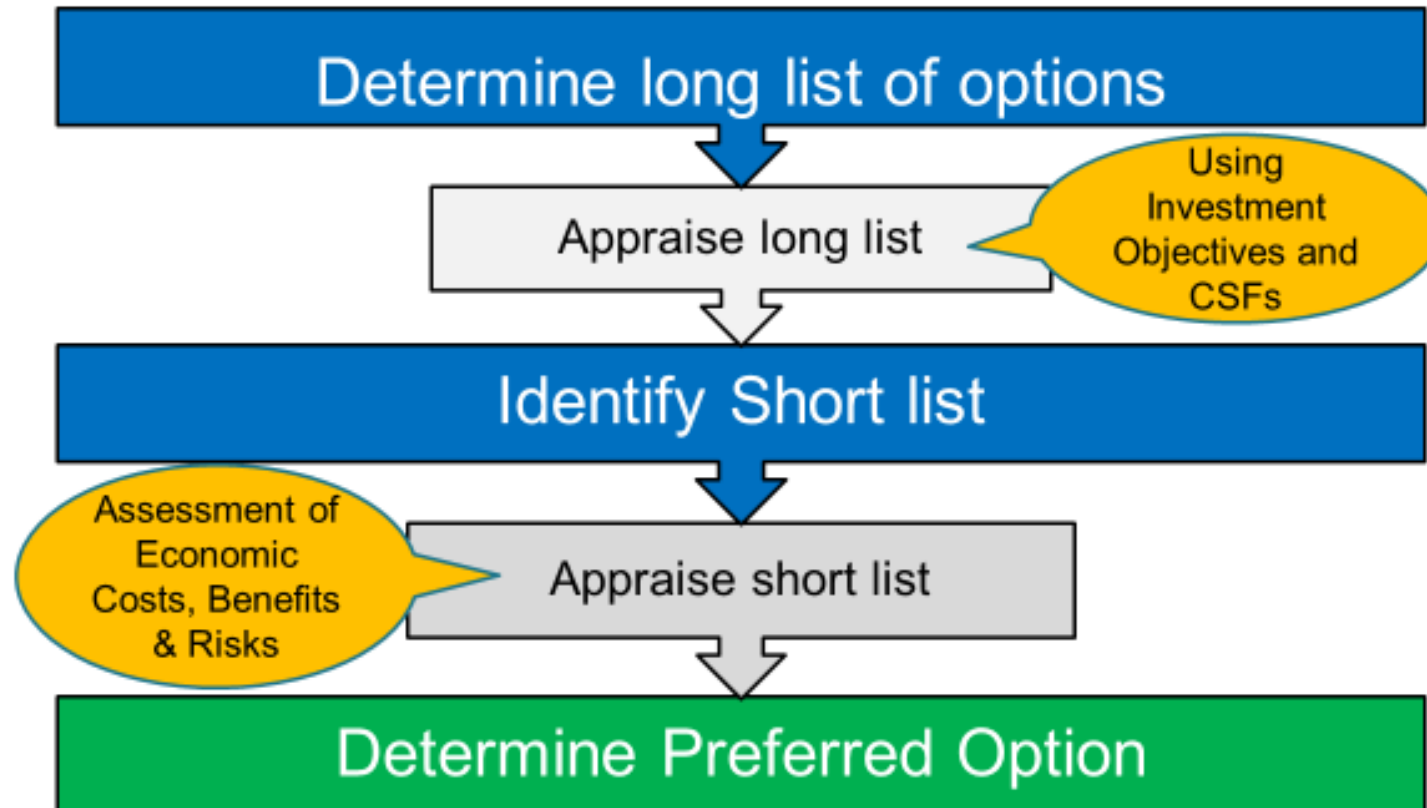
The Best Solution:

The preferred approach is the optimum mix of cost, benefit and risk

The Potential Solution



Appraisal of Options





COMMERCIAL CASE



The Business Case should demonstrate:

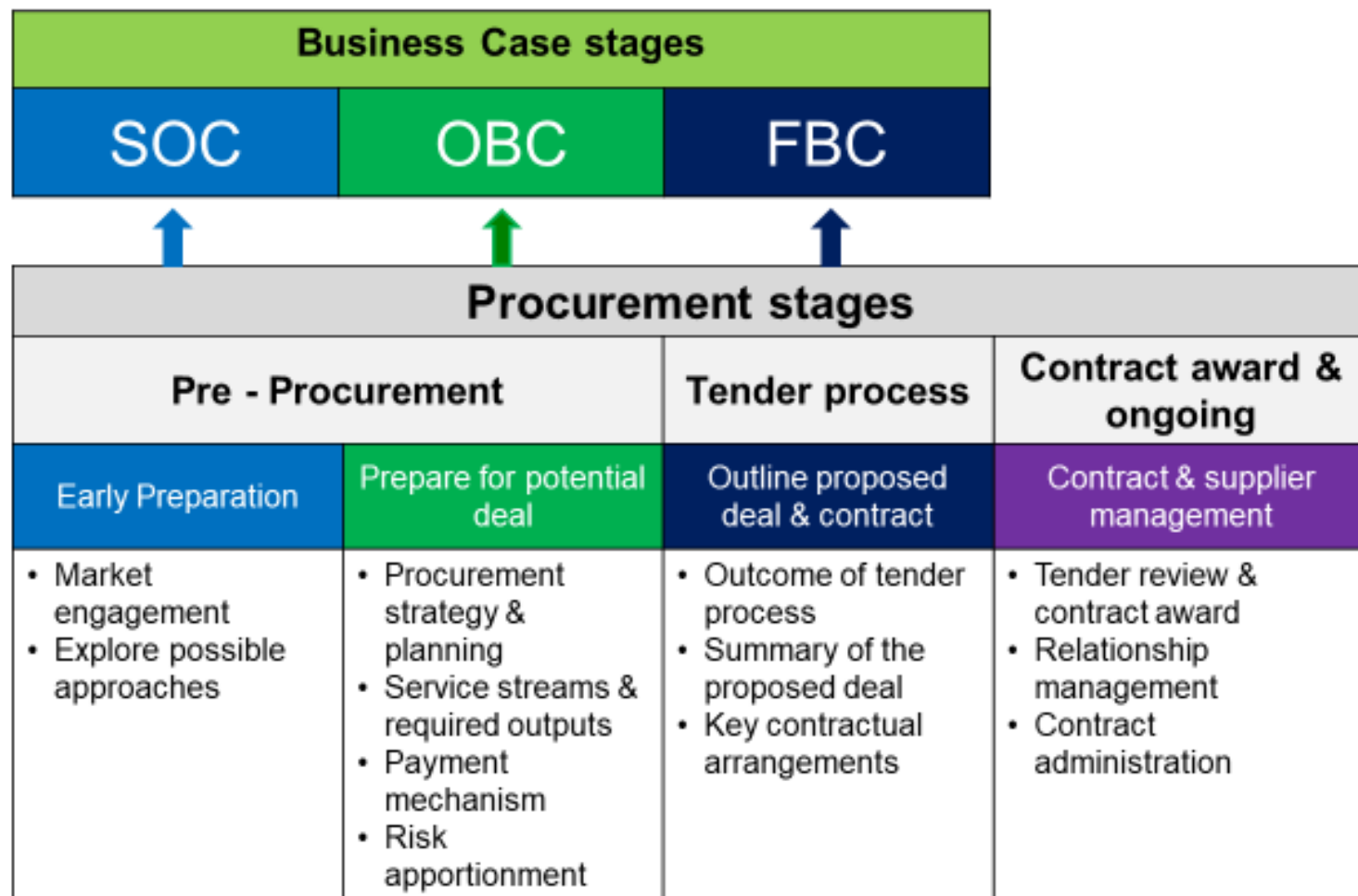
Suppliers:

Suppliers who can provide the requirements

A Potential Deal:

A contract can be agreed that will satisfy the requirements within the Value for Money constraints

Commercial Case





WHAT IS THE ROLE OF THE COMMERCIAL CASE?

The Green Book

- “The Commercial Case demonstrates that the “preferred option” will result in a viable procurement and well structured Deal

Procurement strategy / strategies	
Service requirements	Risk allocation
Payment approach	Contractual arrangements

- Enable the first step after OBC to be procuring the solution (not creating a plan to procure)



GREEN BOOK CHECKLIST FOR ASSESSMENT OF BUSINESS CASES - COMMERCIAL CASE

- Is the proposal commercially feasible / deliverable ?
- What procurement is required: goods, services, land, buildings?
- What is the procurement strategy?
- What are the key contractual issues?
- There must be clear contractual key milestones and delivery dates
- Is risk identified and managed and allocated?
- Is there a risk allocation table?
- What if any are the personnel implications and is TUPE applicable ?
- Is the accounting treatment clear and agreed ?



FINANCIAL CASE



The Business Case should demonstrate:

Financial Viability:

Income and Expenditure assumptions are realistic and relevant targets can be met

Clear Funding:

There is support for additional capital and revenue funding from reliable sources

Financial Case

	SOC Strategic Outline Case	OBC Outline Business Case	FBC Full Business Case
Key Outcome	Outline Costs of Options	Financial Plan for Preferred Option	Confirmed Affordability
Key Activities at this Stage	• Agree financial targets or imperatives • Estimated Capital & Revenue costs and income for realistic options; • Consideration of Optimism Bias • Outline confirmation of funding sources	• Demonstrate the organisation's ability to manage the impact of the investment • Outline capital costs and how they will be funded • Impact on revenue budgets and how they will be managed • Evidence for funding support • Balance sheet impact – if appropriate	• Confirm Capital, Revenue and Funding Assumptions • Update Financial Plan if required • Set out the financial parameters of the proposed deal



FINANCIAL CASE

Outline Business Case

The following are required:

- financial model
- budget statement
- cash flow statement
- funding statement

Contingencies: The statements should include the contingencies (in £s) necessary to ensure that there is sufficient financial cover for risks and uncertainties



FINANCIAL CASE

Capital and revenue requirements

Following on from the modelling exercise, a statement showing the capital and revenue requirements for the recommended deal should be prepared

This should set out:

- **capital and revenue** consequences of the preferred option over the life span of the service and/or contract period
- any shortfall in capital and revenue requirements (the '**funding gap**')
- This statement should also indicate the capital sum being requested

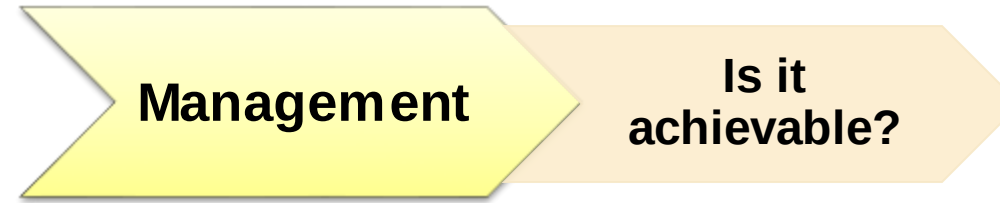


CHECKLIST FOR THE FINANCIAL CASE

1. Are the assumptions for the costs reasonable and can their source be identified?
2. Does the financial model include forecast P&L, cash flow and balance sheet?
3. Have all capital costs been identified together with an appropriate contingency for cost overruns?
4. Are the costs of all measures contributing to compliance included?
5. Is the cost of decommissioning taken into account and provided for?
6. Are ALL sources of funding confirmed? Is there sufficient evidence that the sources of funding have been confirmed? Confirm there is no funding gap.
7. Is the project cash flow positive in the base case and sensitivity cases for i) lower than forecast income, and ii) higher than expected costs?
8. Budget statement, capital and revenue statement, income and expenditure account, impacts on the council.
9. Section 151 officer letter of support.
10. Does the Financial Case demonstrate that the “preferred option” is reasonably likely to result in a fundable and affordable solution?



MANAGEMENT CASE



The Business Case should demonstrate:

Ability to Deliver:

The organisation is capable of successfully delivering the solution

A Robust Approach:

Appropriate systems and processes, which comply with best practice, are in place

Management Case

	SOC Strategic Outline Case	OBC Outline Business Case	FBC Full Business Case
Key Outcome	Established Arrangements	Plan for Delivery	Ready to Implement
Key Activities at this Stage	• Clear governance structure with SRO and Project Manager in place • Stakeholder plan in place with involvement in governance and in key processes • Key risks identified and risk management approach established • Outline plan and timescales	• Delivery Plan through to completion • Appropriate Project team with specialist advisers appointed • Current and future risks being identified and managed • Realistic and deliverable benefits identified and planning for benefits realisation started	• Updated plan for managing development and implementation stages agreed across the supply chain • Robust benefits realisation plan in place • Post-Project Evaluation arrangements



THE MANAGEMENT CASE

What should it include?

1. Evidence of good governance
2. Project plan
3. Communications strategy
4. Benefits realisation
5. Risk management

CHECKLIST FOR MANAGEMENT CASE

- Practically deliverable? Delivery plans?
- Delivery dates? Detailed milestones?
- Contract management plan?
- Change management plan
- Reviews / health checks
- Contingency plan? Risk management?
- Benefit realisation plan?
- Monitoring and evaluation arrangements?



THANK YOU

Looking at solar projects in a Local Area Energy Plan

Peter Graham, *Local Energy Transition Advisor*, Energy Systems Catapult

Looking at Solar Projects within a Local Area Energy Plan

Peter Graham

Local Energy Transition Advisor

March 2023



CCC 6th Carbon Budget: Electricity Generation

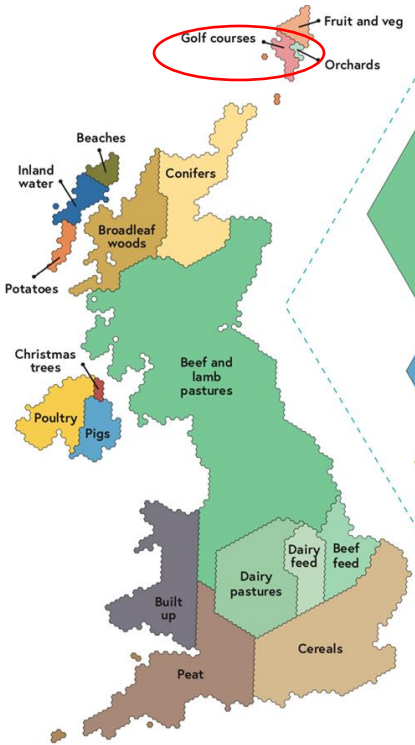
Table M5.1
Role of technologies in the scenarios

	Capacity 2050	Average build rates 2030-50	Levelised cost 2050
Balanced Pathway	GW	GW/year	£/MWh
Offshore wind	95	3	40
Solar	85	3	40
Gas CCS	15	1	80
Nuclear	10	<1	85
BECCS	5	<1	125-185
Headwinds	GW	GW/year	£/MWh
Offshore wind	65	1	40
Solar	85	3	40
Gas CCS	15	1	80
Nuclear	10	<1	85
BECCS	10	<1	125-185
Widespread Engagement	GW	GW/year	£/MWh
Offshore wind	100	3	40
Solar	80	2	40
Gas CCS	5	<1	80
Nuclear	5	<1	105
BECCS	10	<1	125-185
Widespread Innovation	GW	GW/year	£/MWh
Offshore wind	140	5	25
Solar	90	3	25
Gas CCS	15	1	80
Nuclear	5	<1	105
BECCS	5	<1	125-185
Tailwinds	GW	GW/year	£/MWh
Offshore wind	125	4	25
Solar	75	2	25
Gas CCS	5	<1	80
Nuclear	5	<1	105
BECCS	10	<1	125-185

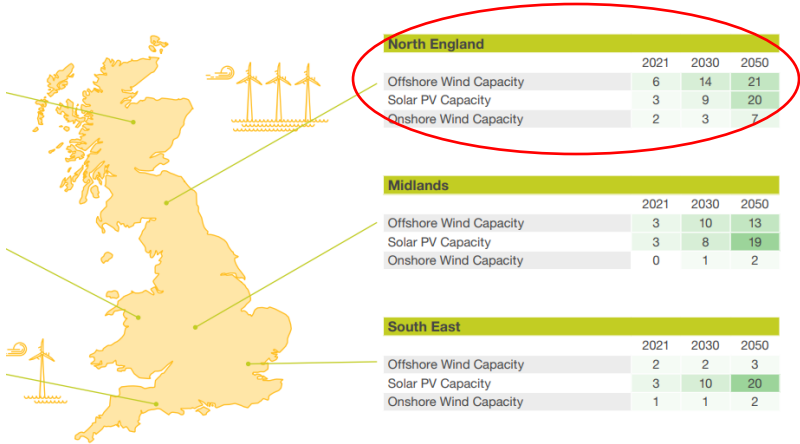
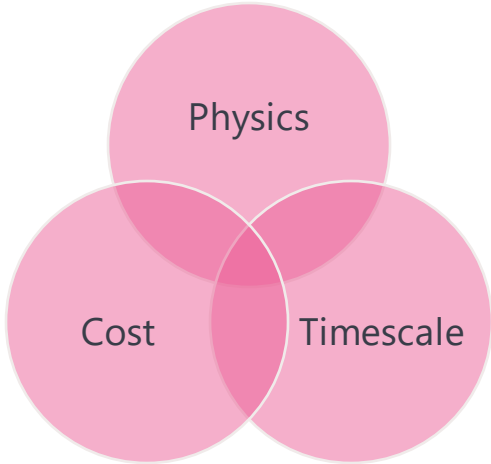
Source: CCC analysis based on BEIS (2020) Electricity Generation Costs and Wood Group (2018) Assessing the Cost Reduction Potential and Competitiveness of Novel (Next Generation) UK Carbon Capture Technology.
Notes: Costs in 2019 prices. Capacities and costs rounded to the nearest 5.

CCC LCOE

National Food Strategy: The Plan, July 2021



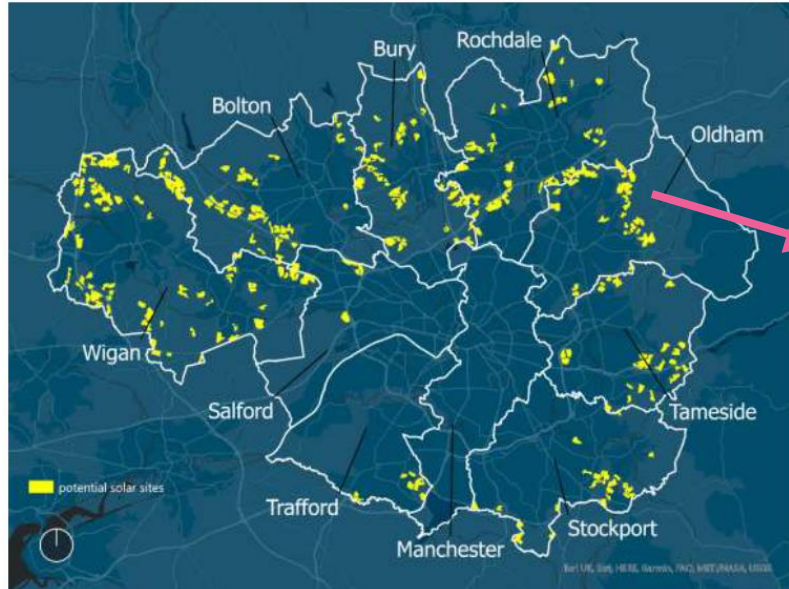
UK Land use



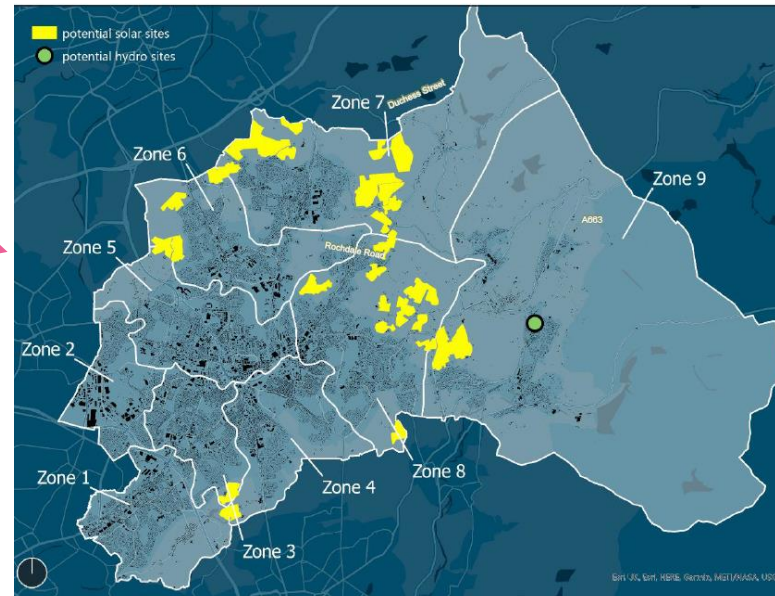
National Grid FES

National Grid Future Energy Scenarios July 2022

Data driven | Techno-economic | Least cost optimisation



GMCA suitable land for
large scale ground solar
PV



Oldham suitable land for
large scale ground solar
PV



Street level analysis for
rooftop solar PV

3.3 GWp

+

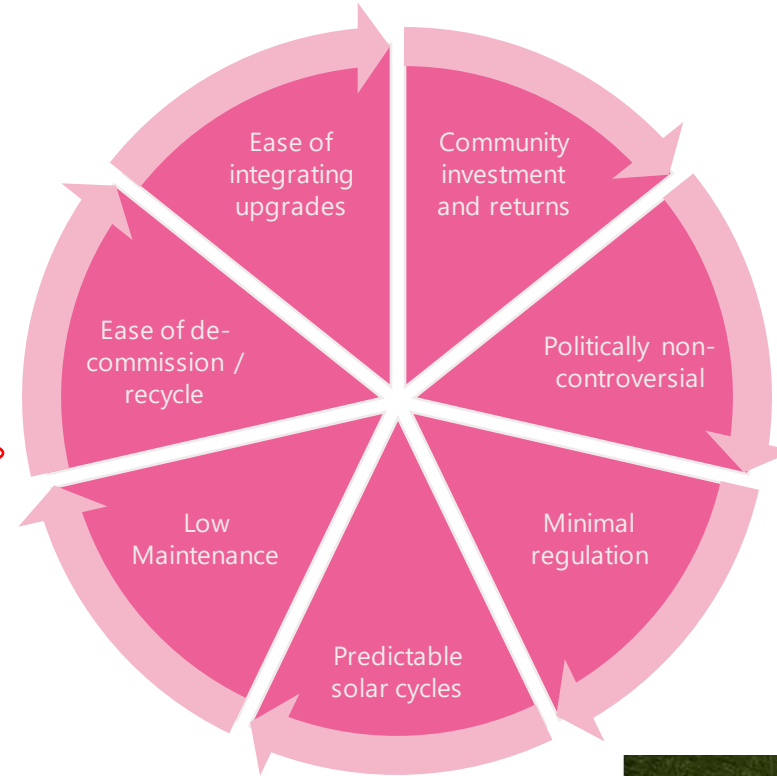
7 GWp

=

10 TWh annual

BENEFITS

Project type	Mean cost overrun (%)
Nuclear storage	238
Olympic Games	157
Nuclear power	120
Hydroelectric dams	75
IT	73
Nonhydroelectric dams	71
Buildings	62
Aerospace	60
Defence	53
Bus rapid transit	40
Rail	39
Airports	39
Tunnels	37
Oil and gas	34
Ports	32
Hospitals, health	29
Mining	27
Bridges	26
Water	20
Fossil thermal power	16
Roads	16
Pipelines	14
Wind power	13
Energy transmission	8
Solar power	1

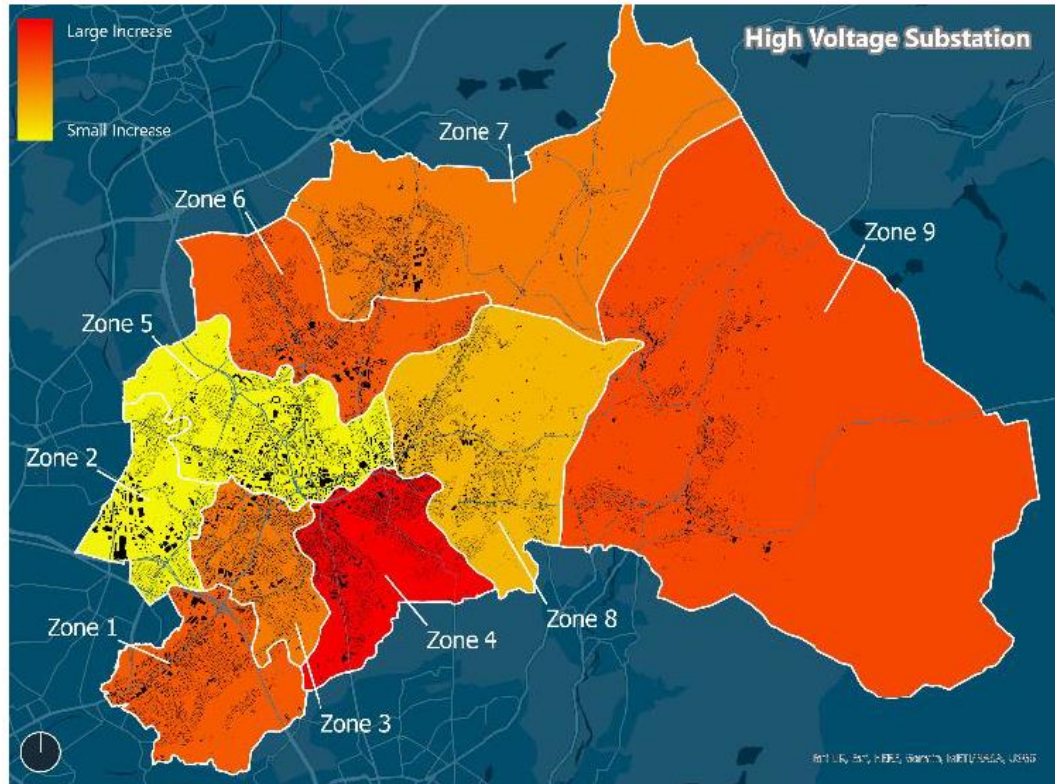


Jobs | Economic Growth



Cost performance on "mega projects"¹

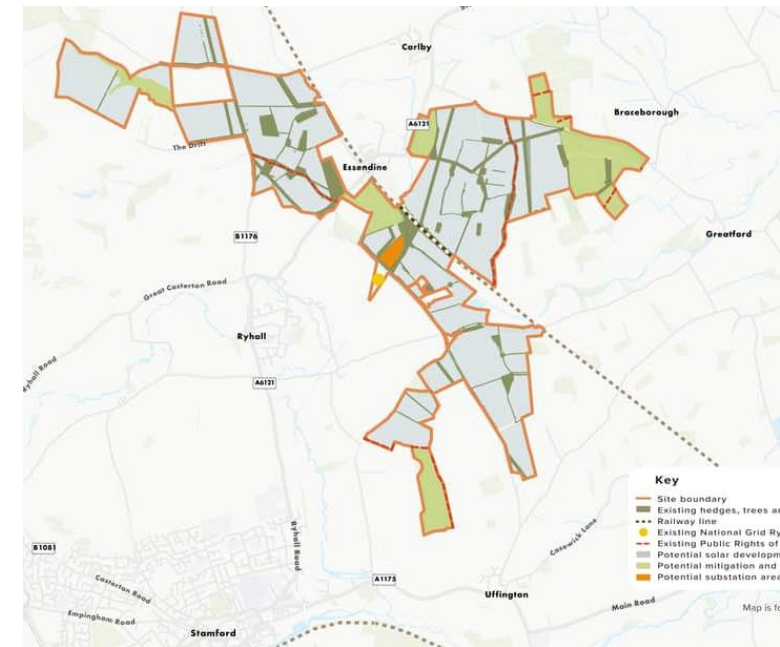
WIDER CONSIDERATIONS



Impact on Network HV
substations - Oldham

Fears voiced as plans are unveiled for huge solar farm near Peterborough

One of the largest solar farms in the UK could be created on swathes of countryside just outside Peterborough.



Local Community
Viewpoints

Thank You



Closing Remarks

**Gordon Graham, *Net Zero Go* – Strategic Engagement Manager,
Energy Systems Catapult**

Find out more

- Get in touch with Net Zero Go team using enquiries@netzerogo.org.uk
- Local authorities register to access Net Zero Go: <https://www.netzerogo.org.uk/s/express-sign-up-page>
- Register for our next event here: <https://www.netzerogo.org.uk/s/events>
UK Local Authority Quarterly Webinar – “Local Energy Project Business Case Development”
- Net Zero Go users – please provide feedback on the platform here (5 mins):
<https://www.netzerogo.org.uk/s/surveys/have-your-say/extended-feedback-survey>

Thank you for joining us and we look forward to seeing you on Net Zero Go and sharing more with you in the future

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