

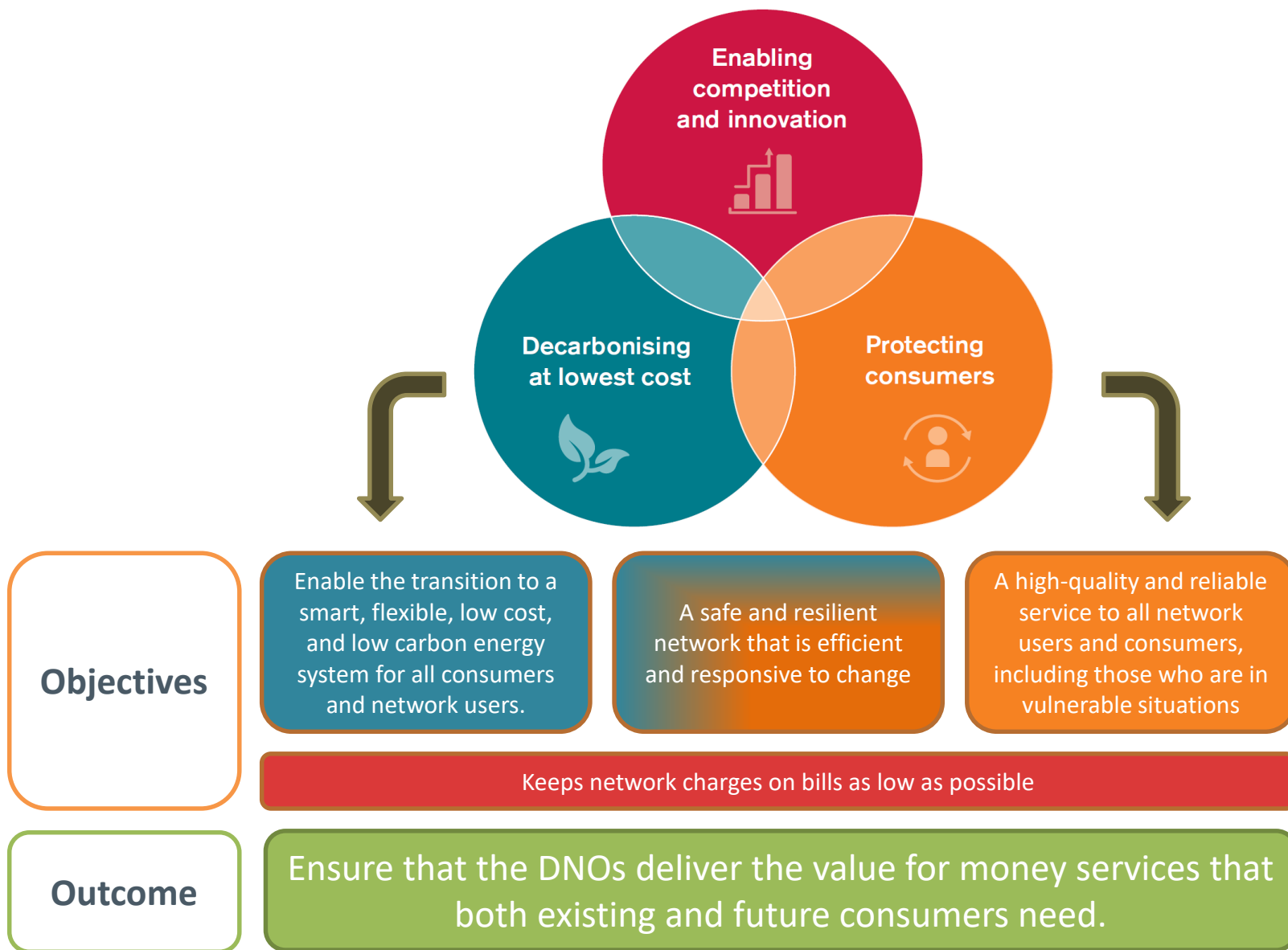
RIIO-ED2 Overarching Working Group Meeting 1

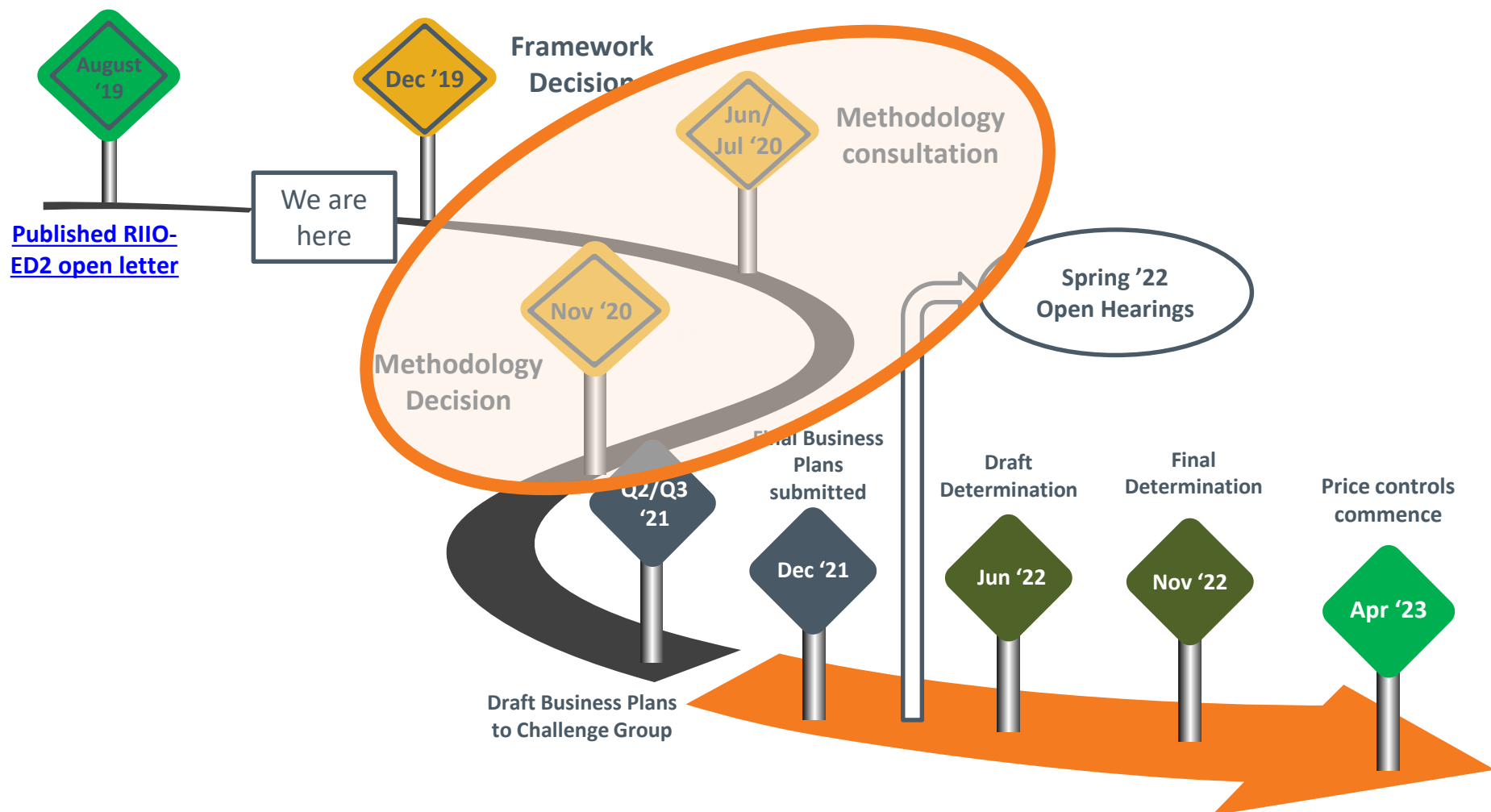


3 December 2019

Item	Timing
Arrival, welcome and introductions	10:00 – 10:30
RIIO-ED2 timeline and context	10:30 – 10:45
Purpose and scope of the Working Group and discussion of draft Terms of Reference	10:45 – 11:30
Topic: Setting price controls consistent with the achievement of the net zero target	11:30 – 12:30 (Lunch 12:30-13:15) 13:15 – 14:00
Topic: Reflecting regional priorities within the price control	14:00 – 15:00
Any other business	15:00 – 15:15

What are we seeking to achieve in RIIO-ED2?





Overarching Approach

Establishing role of...

- NOA, FES & DFES
- Common scenarios
- Local Area Energy Plans
- CEGs/CCGs
- Inter-institutional group
- Willingness to pay
- CBA approach to decarbonisation/ social benefits/ whole system

Exploring interplay between..

- Market-led solutions and price controls
- Baseline funding & uncertainty mechanisms vs. anticipatory investment
- Infrastructure investment vs flexibility solutions

Significant interplay between all groups and the overarching approach may drive need for new outputs and incentives

Output and incentive working groups

A high-quality and reliable service to all network users and consumers, including those who are in vulnerable situations

Customer service, vulnerability & connections process

A safe and resilient network that is efficient and responsive to change

Safety, resilience and reliability

Enable the transition to a smart, flexible, low cost, and low carbon energy system for all consumers and network users.

Impact on environment and decarbonisation

Enabling flexibility, DSO functions & data

Keeps network charges on bills as low as possible

Cost assessment

Financial package

Totex, business plan incentives

Innovation and competition

The Group will focus on informing the approach to some of the key areas for consideration in the process of setting the RIIO-ED2 price control – and

The Group will do this by identifying:

- The key challenges and barriers to the achievement of Ofgem’s overarching objective for RIIO-ED2: “to ensure that the DNOs deliver the value for money services that both existing and future consumers need, and by proposing how these can be addressed.”
- How those challenges could potentially be addressed in the RIIO-ED2 Sector Methodology Consultation and potential options for development.
- The implications for the regulatory framework if we were to take a different approach to the current one. This is expected to be the main focus of the Group.
- The analysis that might be required in order develop credible options.
- How and by whom that analysis should be taken forward (which could be by the Group itself, other RIIO-ED2 working groups or via other arrangements)

The role of the group is not to...

- Make decisions
- Agree or reach consensus on particular issues (necessarily)

This is intended to be a forum for discussion of ideas and options. Any material presented by Ofgem will be solely for the purpose of stimulating discussion.

- Net zero
- The roles of devolved administrations and metro mayors
- Local area energy plans
- Data and digitalisation
- Transition of DNOs into DSOs
- Decarbonisation of heat and transport
- Development of flexibility markets

- Ofgem will take minutes of each meeting and publish these on its website once agreed.
- Our current view is that we should hold meetings on an approximately monthly basis (but keep under review)
- Next meeting: 17 January 2020, Ofgem, Canary Wharf. It is likely we will need to restrict numbers due to room capacity.
- A draft Terms of Reference was circulated – any comments?
- Suggestions for agenda items should be submitted to Ofgem (RIIOED2@ofgem.gov.uk)

17 January 2020:

- How to set price controls for a smart, flexible energy system
- How to set price controls for DSO functions
- Forecasting and scenarios
- Revisit actions from today's session

Future sessions:

- How to set price controls in a big data environment

**Setting price controls consistent
with the achievement of the net zero target**

Measuring and incentivising the achievement of decarbonisation goals

We asked in the Open Letter to what extent should we take into account outcomes linked to decarbonisation targets, and what outcomes might this involve.

We also asked whether stakeholders thought there were reasons to link DNOs' revenues to the achievement of outcomes that go beyond the delivery of traditional network services in support of decarbonisation goals

We said that this might include:

- the decarbonisation of the transport or heating sectors
- tying revenues to outcomes that complement government goals such as reducing peak prices
- increasing renewables
- reducing demand on the network.

We asked how the DNOs' performance against decarbonisation goals could best be measured and assessed

Suggested measures of DNO performance towards decarbonisation targets:

In relation to actual connection requests and time to connect:

- Time taken for renewable generation to connect
- A measure of the % of applications for EV charging points/distribution-connected renewable generation/storage connected

In relation to providing capacity for potential future connections:

- Progress towards accommodating a predetermined % switch to EVs by a target date
- An index to measure the readiness of the network to connect LCTs

In relation to a potential wider role for DNOs

- The amount of renewable generation connected
- Actual LCT growth within DNO regions

BUT some DNOs cautioned against using incentive mechanisms to them to account for things significantly outside of their control, as this could result in windfall gains or losses.

Suggested measures of DNO performance towards decarbonisation targets:

- In relation to constraint management:
 - Avoiding the constraining of renewable generation connected to the distribution system
 - For constraint management the DNOs could be measured around their ability to beat the full reinforcement cost
- An Incentive to minimise losses on the distribution system
- A measure of 'kWh lost' from renewable generation as a result of planned network outages

Which of these potential measures, or other measures, do the Group members think should be considered further? Which areas should be prioritised?

A RII0-ED2 Incentive on renewable DG curtailment

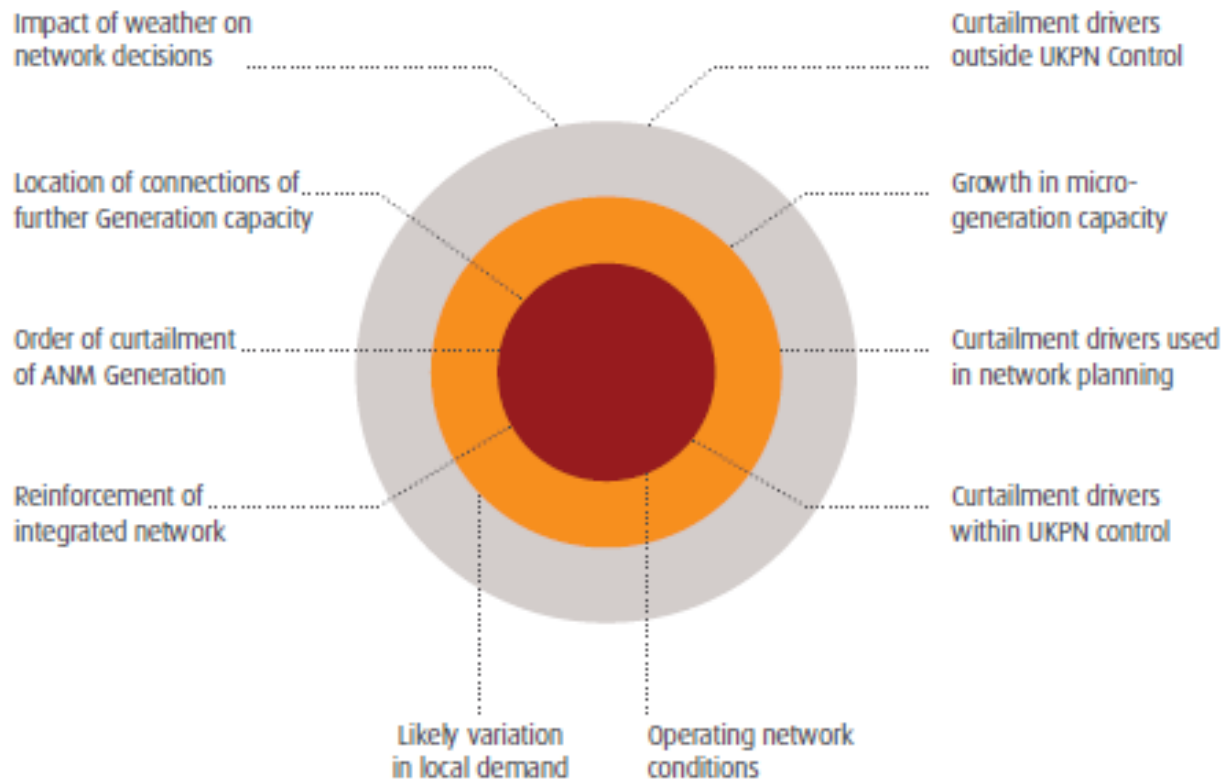
3 December 2019



Purpose

- Background
- Rationale for a renewable DG curtailment incentive
- Precedents
- Possible approach

Background: Drivers of generation curtailment



Background:

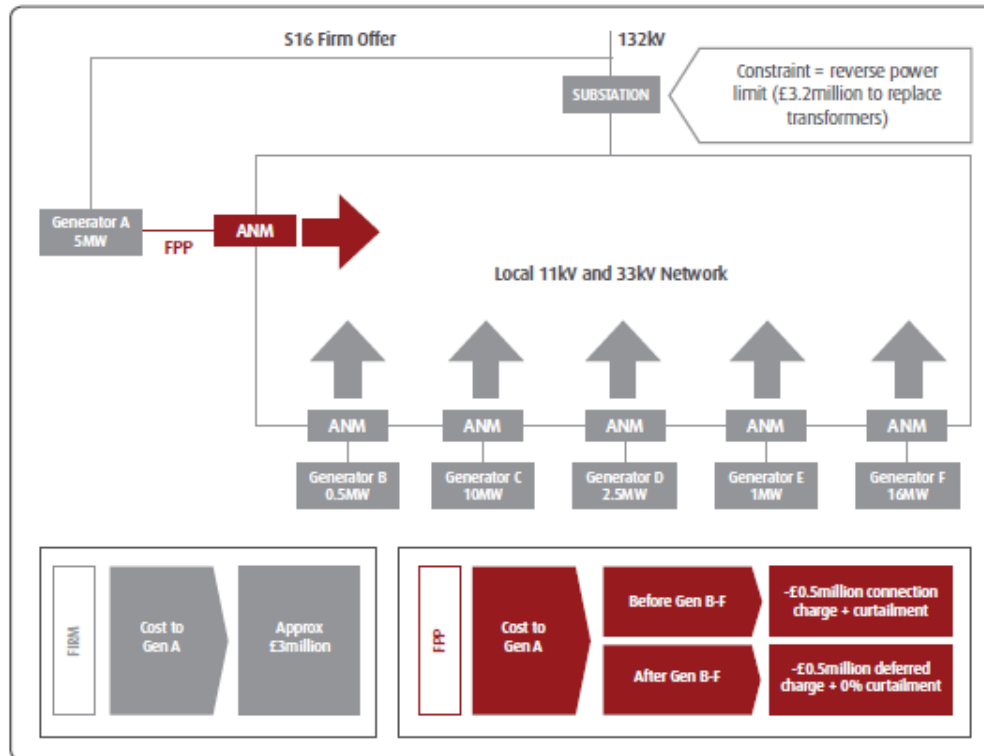
Clean Energy Package: Electricity Directive

New European regulations expected to be transposed into GB in 2020 (1)

- Electricity from renewable sources from small power-generating facilities should be granted priority dispatch
- Network tariffs should be applied in a way which does not positively or negatively discriminate between production connected at the distribution level and production connected at transmission level
- DSOs shall guarantee the capability of distribution networks to transmit electricity produced from renewable energy sources or high-efficiency cogeneration with minimum possible redispatching
 - I. When redispatching DSOs must demonstrate in a transparent way that doing so is more economically efficient and does not exceed 5 % of the annual generated electricity in installations which use renewable energy sources
- DSOs shall report at least annually to the competent regulatory authority, on:
 - I. the level of development and effectiveness of market-based redispatching mechanisms for power generating, energy storage and demand response facilities;
 - II. the reasons, volumes in MWh and type of generation source subject to redispatching;
 - III. the measures taken to reduce the need for the downward redispatching of generating installations using renewable energy sources or high-efficiency cogeneration in the future including investments in digitalisation of the grid infrastructure and in services that increase flexibility.

(1) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.158.01.0054.01.ENG&toc=OJ:L:2019:158:TOC

Current arrangements in constrained networks



- Under current arrangements new generators are responsible for paying reinforcement they trigger (subject to the voltage rule, high cost cap etc)
- DNOs help generators get quicker and cheaper connections by offering non-firm connections using ANM
- These are opted into by the connectee on the basis that they will be curtailed without compensation

<https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2019/06/SDRC-9.2-Principles-of-Access.pdf>

Rationale for curtailment index

- Encourages new renewable generation capacity by de-risking curtailment – particularly as investors focus locational decisions on where renewable resource is (wind & solar)
- Increase renewable energy utilisation and therefore reduce costs of meeting net zero target
- Provide renewable generators assurance regarding their network access, thereby improving flexible connection arrangements
- Fosters a level playing field between new and existing renewable resources
- Creates a price signal and commercial structure for demand turn up and electricity storage
- Places curtailment risk with best party able to manage it

Precedent: GB Transmission

- Connect & Manage has been happening at transmission level
- TSO compensates generation curtailed due to network congestion
- TSO has an incentive to reduce constraint costs and this feeds into NOA
- Wind power related constraint costs were c.£125m in 2018
- Also possible for some DG to get constraint payments through BEGA³
- However, it is also possible for transmission connected generators to forego any compensation through an intertrip solution until wider reinforcement undertaken
- Compensation is priced at the wholesale market price plus any subsidy foregone (this is reflected in the BM bid/offer price)

(3) http://www.energynetworks.org/assets/files/electricity/futures/Open_Networks/Entitlements%20and%20rights_Oct%2016.pdf

Precedent: Germany

- In Germany, which has over 105GW of installed solar and wind capacity, constraint costs were 635m euros in 2018
- Unlike in the UK constraint compensation arrangements apply to both transmission and distribution connected assets in a similar way – however the focus is on renewables
 - Germany operates under a shallow connection boundary for both T&D
- 2016 Energy Act set clear rules that meant all renewable curtailment will be compensated – this is treated as a pass through from TSO/DSO to customers⁴
- To avoid overinvestment in network upgrades the German energy regulator allows DSOs to curtail 3% of annual renewable generation before having to intervene i.e. reinforce
- There is ongoing debate about whether arrangements are providing a strong enough signal for the DSO and the market to find cost efficient solutions to reduce curtailment

(4) <https://www.sciencedirect.com/science/article/pii/S0960148118313090>

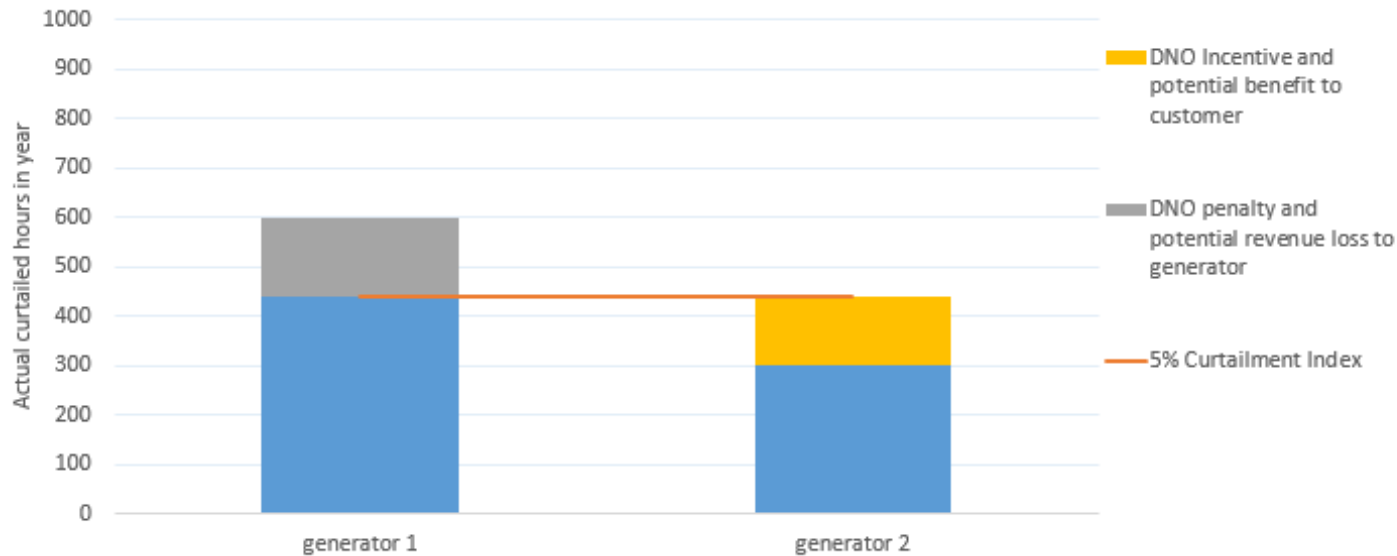
Curtailment risk and how this is managed

- For DNOs to take action on curtailment beyond what is done today there needs to be a transfer of risk
- Whilst there are incentives in ED1 on ATTQ/C, GSoP, and BMoCS there is no direct incentive on DG curtailment
- In DPCR5 there was a 'DG incentive' that encouraged DNOs to facilitate connections
- Any underwriting of curtailment will involve improved forecasting and a robust understanding of what has triggered curtailment
- Any approach used there has a challenge of equating reinforcement costs to curtailment costs and developing a way to reflect controllable cost factors and performance

A possible option for RII0-ED2

- Recognising there is a value between forecasted/agreed curtailment and actual curtailment this could be monetised through a new incentive
- This could involve setting a capped curtailment index, which ties a symmetrical reward and penalty for going above and below the accepted threshold
- The new generator accepts the non-firm connection on the basis of the index – by doing this they accept a level of curtailment cost already i.e. vs the firm option. For example, the generator could accept that 5% of operational curtailment is ‘free’
- If the actual curtailment is lower than the index this should translate into a reward commensurate to the benefit provided to customers (carbon + wholesale + system)
- In terms of customer costs & benefits a calculation will also be required of the additional capacity that will be connected due to the new index (versus BaU)

Construct for a congestion based curtailment index



- Once a curtailment index is established it will enable performance to be measured
- In the theoretical example above Generator 1 and 2 are curtailed 6.8% and 3.4% of the year respectively
- Based on the wholesale market price the differences between the actual and forecast curtailment would result in a financial gain for generator 1, whereas generator 2 would have a loss
- To measure the impact of curtailment, data is required on what output the generator would have had

Key questions for incentive design

- How do we devise a consistent and practical way of forecasting and measuring curtailment?
- Should this apply to renewables (in line with the CEP) on non-firm agreements only?
- How would existing non-firm connections be affected?
- How will any new incentive design be affected by the SCR into Network Access and Forward Looking Charges?
- Should there be a fixed curtailment index or should this be unique to each generator?
- What level of data granularity is required?
- Is this only relevant to constraint based curtailment? If not what else would be included and how?
- How exactly will generators be compensated e.g. what will set the price?

- Load related expenditure (LRE) is the investment required to accommodate new and changing patterns of customers' electricity use.
- In RIIO-ED1 load related expenditure is forecast to account for 9% of DNOs total expenditure.
- LRE was an uncertain area of expenditure in RIIO-ED1 so we applied an uncertainty mechanism in ED1
- Earlier in 2019 the Reliability, Safety and Environment Working Group the treatment of load was discussed to review the current reporting mechanisms. It is currently reported across the following areas of regulatory reporting:
 - Cost and Volume reporting pack
 - Connections reporting pack
 - Environmental and Innovation reporting pack
 - Reinforcement Load Index
- Within the working group it was agreed that the reporting of load built on and improved to inform policy development for RIIO-ED2

Load reopener development in RIIO-ED1

- Is the current model fit for purpose in RIIO-ED2
- It is a blunt tool focused on expenditure (“in the round principles”)
- How can it be developed to capture uncertainty (5yr price control)
- LIs, Generation Index, EVs and other LCTs
- Flexible solutions

How do we assess true demand needs?

- Tool box approach
 - Load index development
 - Developments to understand capacity utilisation
 - EV and LCT volumes (improvements are required to the reporting of LCT uptake)
 - The potential use of volume drivers to manage uncertainty

Other key developments:

- Business plan formats and tables
- CBAs

Load mechanisms were discussed in a number of working groups in RIIIO-ED1:

Cost assessment working group

- Evaluation of load forecasts to set allowances

RSWG

- Technical detail of the capacity and demand modelling
- Discussions of extension of LIs to HV and LV

Flexibility and Capacity working group

- Incentive and uncertainty work
 - Development of scenarios and LCT uptake modelling
-
- It will be necessary to continue with the work split across working groups in order to inform policy development appropriately.
 - How is it best pulled together and where does this work sit (through the OAWG)?
 - What are the key priorities for RIIIO-ED2?

Strategic investment

In the Open Letter, we said that strategic investment can be an effective tool to ensure the network meets the needs of existing and future consumers

But the associated uncertainty brings with it an inherent question of whether it is right that this investment is made by the energy networks, with their consumers (or investors) bearing the full risk of anticipated requirements that do not materialise.

We highlighted the challenge of assessing efficiency of investment in one period when it may take many years to demonstrate it has achieved its intended outcome.

We asked:

- how we can ensure that network companies are best placed to undertake strategic investment and how the risks associated with these investments be managed.
- What changes to the framework may be required to support strategic investment.
- How should we hold the companies to account for the delivery of strategic investment and associated outcomes?

Suggested areas for development relating to strategic investment

- Clear definition of what constitutes strategic investment
- Clear, transparent guidelines and methodologies for assessing anticipatory investment decisions
- Forecasting over a range of credible future scenarios to enable a least regrets investment approach
- Clearer multi-stakeholder understanding of the circumstances when investment is merited
- Consistent cost benefit approach (including the potential addition of societal and wider benefits) within the existing framework
- Establishing a principle-based governance framework for these activities.
- Requirement for DNOs to work directly with Local Authorities in order to help predict future need

Strategic Investment Considerations

Enabling the Investment required for Net Zero

The low carbon future is uncertain but Net Zero will not be met if we do not invest now

- Strategic investment is required to enable the pace & uptake of Low Carbon Technologies and eventual achievement of Net Zero
 - Network upgrades can take up to 10 years to deliver and substantial levels of investment are required
 - The ED2 framework should firmly establish anticipatory investment as an effective tool
 - The route to Net Zero will have a high number of dependencies outside the DNOs' control
 - The high degree of uncertainty must be addressed as it will not be possible to set accurate ex-ante allowances in this context
 - Timeframes for this scale of investment, and for measuring success, will be outwith the clean edges of a single price control
-

A clear and transparent methodology that enables strategic investment to meet Net Zero is required

Uncertainty is at the core of the Strategic Investment issue

- Three fundamental uncertainties exist due to the dependency on customer demand, government intervention, and evolving network constraints:

Timing – timelines of uptake are uncertain, with trigger points dependent on a number of factors; risk of DNOs being seen as the blocker if response is slow

Scale – the scope of the engineering solution will vary by Voltage and by stakeholder driver / region

Location – location of customer uptake, and of the network constraint, could be challenging to predict; stakeholder involvement and network intelligence is key

We believe that LCTs will impact on the LV network first, particularly on cable systems, where information is least available

How Might a Strategic Investment Incentive Mechanism work?

In DPCR4 and DPCR5, Ofgem operated a Distributed Generation (DG) hybrid incentive to encourage proactive, efficient investment for DG.

There are parallels between the objectives of the DG Incentive and the objectives of a Incentive for LCTs, EVs and decarbonisation investment within ED2...

- Handles uncertainty well
- Incentivises efficient investment and enables decarbonisation



- Difficulties confirming actual LCT uptake for incentive driver
- Is not costed and set in allowances upfront



D4/5 DG Incentive:



1. Cap (2 x WACC) and Collar (cost of debt).
2. 80% of Investment as Pass Through.
3. Remainder as £/kW revenue driver, once DG had connected.

DG Incentive Mechanism principles could be developed to enable LCT growth in in ED2 to meet Net Zero

Strategic Investment CBAs

CBAs should fully take account of the benefits of Strategic Investment and be applied consistently for a fair comparison

- Strategic investment can bring a range of benefits: faster facilitation of consumer demand and generation connections; reduced losses; faster reduction of carbon dioxide and other pollutants; ensuring safety and resiliency of network assets
- Optimal investment timing can boost the economy. Research at University of Strathclyde¹ has shown that investment in network upgrades should be spread over a longer time frame to limit costs and disruption to the wider economy
- Strategic Investment must be considered over the right time-period, and should be future-proofed to avoid repeat work

¹<https://doi.org/10.17868/67737>

The CBA process should be reviewed to include consistently quantified societal benefits and appropriate time periods

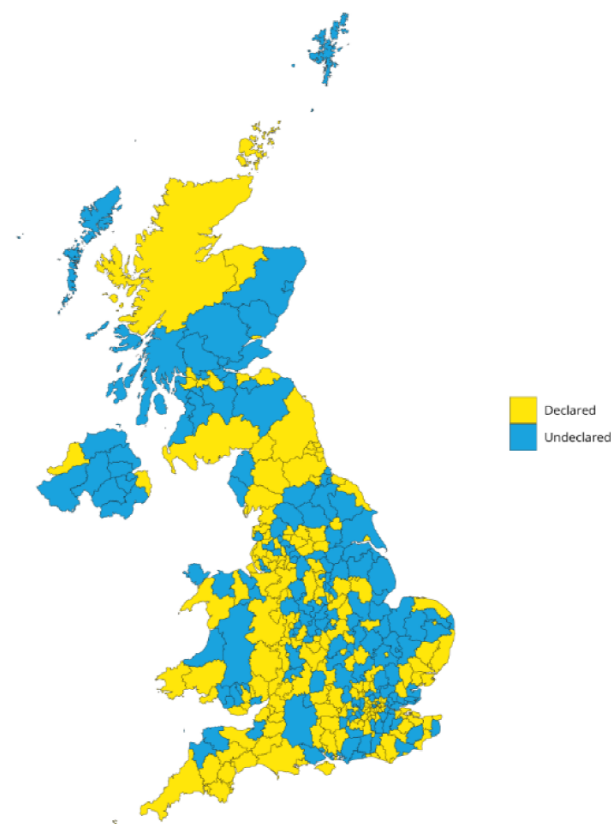
Regional Considerations

The race to Net Zero will vary across the UK

- Different regional government legislation and ambitions in place
 - e.g. Scotland has target for 100% enablement of EV/ULEV by 2032, vs. 2040 ban for petrol/diesel vehicles at UK level
 - UK + regional incentives could be significant
- Cities & local communities have leading ambitions for Net Zero and should be enabled; local decisions best made by those involved
 - Liverpool, Edinburgh, Glasgow – Net Zero by 2030
- DNOs will have different 'starting points' for capacity

DNOs must navigate national, regional and local plans to deliver stakeholder ambitions

UK councils declaring a climate emergency
as of 15 July 2019

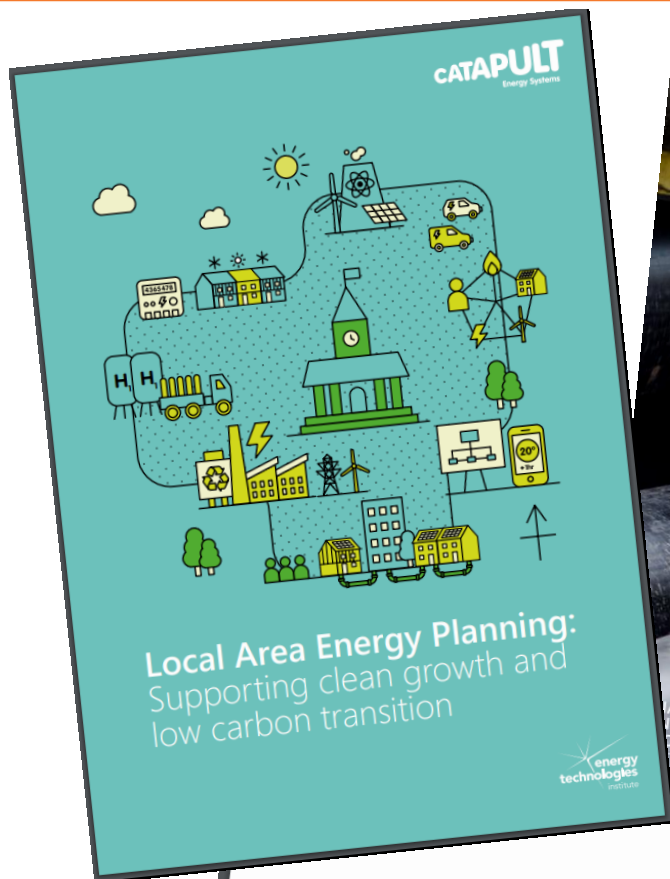


Contains Ordnance Survey data © Crown copyright and database right 2019
Data: climateemergency.uk

Strategic Investment – broader considerations

- Consistency and transparency in process & proposals, involving stakeholders in the development of regional and local plans; what is an equitable balance between socialisation of costs & customer funding?
- Consistent investment triggers across DNOs; use of leading indicators where available, augmented by modelling & analytics; draw out the distinction between '*strategic investment*' versus '*primary/secondary reinforcement*'
- Strategic “investment”, but variety of tools must be available in the short term, i.e. flexibility,
- DNOs should not be rewarded or penalised for predicting consumer demand for LCTs in ED2
- Partnership models (such as SPEN/SSE partnership with Scottish Government for EV charging) can be an effective model

Reflecting regional differences within the price control



"Greater Manchester is leading the way in tackling climate change – we want to become the greenest city-region in the UK. We have committed to becoming carbon neutral by 2038, 12 years ahead of the government's own target. We want to establish a clean energy blueprint which every other city-region in the world can follow."

Andy Burnham, Mayor for Greater Manchester



Local Area Energy Planning – *informing network investment priorities*

George Day
Head of Markets, Policy and Regulation

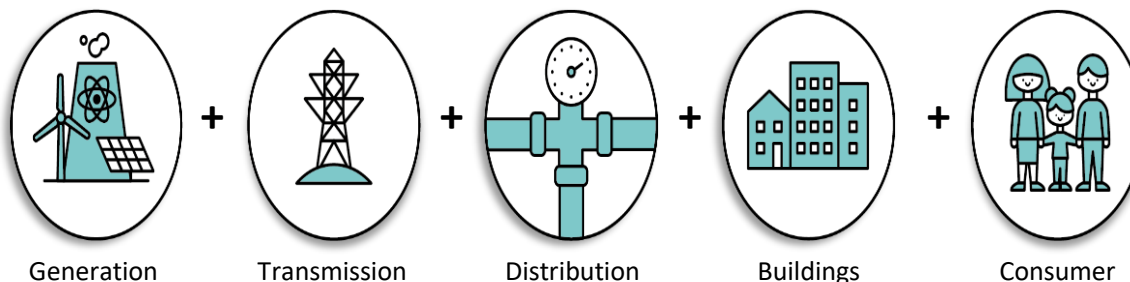
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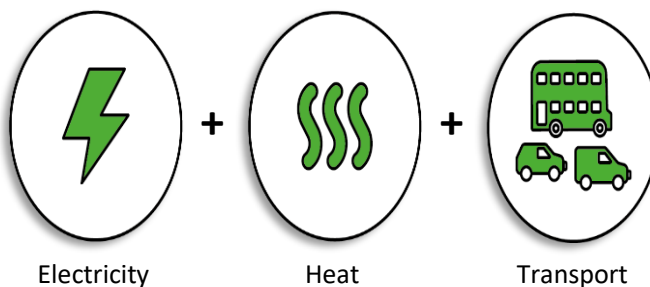
About ESC

What is whole systems thinking?

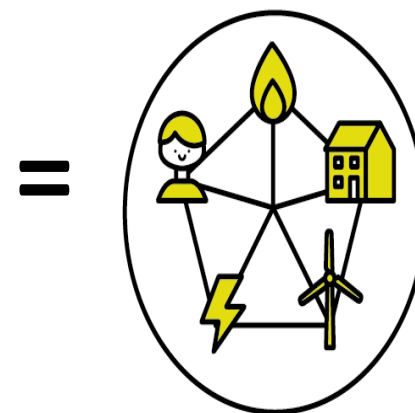
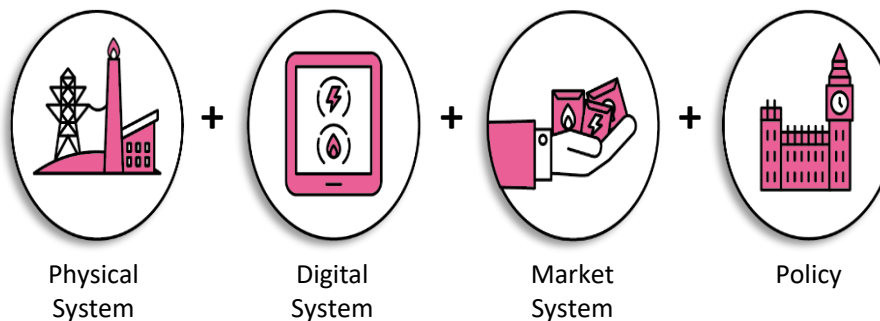
Joining up the system
from sources of energy to
the consumer



Breaking down silos
between energy
vectors



Joining up physical
requirements of the
system, with policy, market
and digital arrangements



Our capabilities and assets



Modelling

National Energy System
Modelling (ESME)

Local Energy System
Modelling

Building Energy System
Modelling



Digital

Home Energy Services
Gateway

Living Lab

Data Science

Data Systems

Energy Knowledge
eXchange™

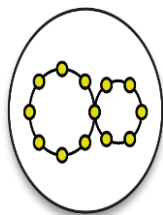


Markets, Policy and Regulation

Policy and Regulatory Knowledge

Stakeholder Engagement

Economic Appraisal



Systems Integration

Systems Engineering and Integration

Business Model Innovation

Dynamic Energy System Architecting
and Simulation

Energy System Integration Guides

Future Power System Architecture

Utility 2050



Consumer Insight

Research

Design

Trials



Infrastructure and Engineering

Bioenergy

Carbon Capture and Storage,
Industry and Hydrogen

Networks and
Energy Storage

Nuclear

Renewables

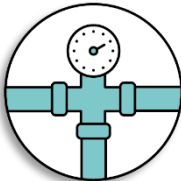
Transport

Local Area Energy Planning Overview

Some of the toughest challenges for decarbonisation will likely require local and regional coordination and action



How to decarbonise buildings and what combinations of fabric upgrades, heating systems and infrastructure in different local areas



The future of the gas network (including the potential of hydrogen)



How to minimise the costs of the transition for consumers, including integration of electric vehicles and low carbon heating

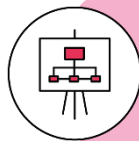
What is Local Area Energy Planning?



Each local area is different - its people, geography, building stock, energy networks and ambitions and priorities



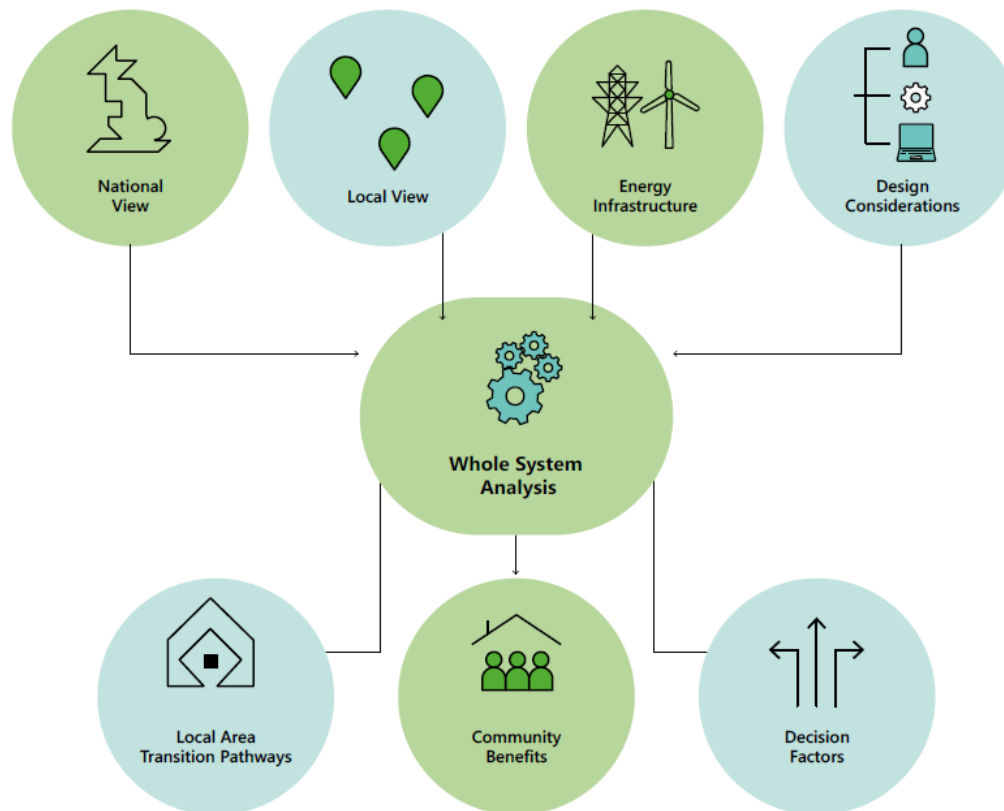
Local Area Energy Planning provides a data driven, spatial and collaborative means, involving local government & network operators, of exploring a range of possible future local energy scenarios to cost-effectively decarbonise



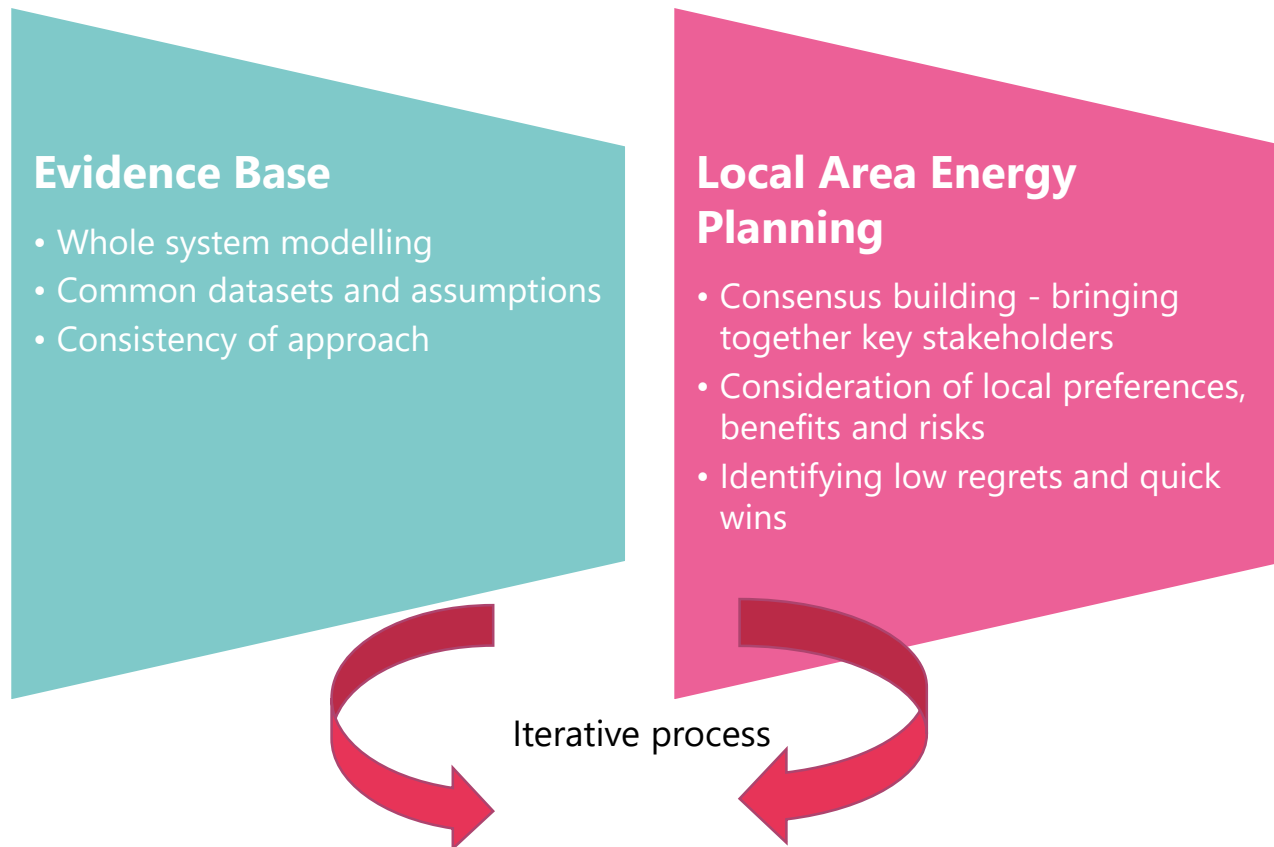
Resulting in the identification of energy network and system choices to support carbon neutral aspirations - informing what local action is needed and where



Based on whole energy system modelling and analysis

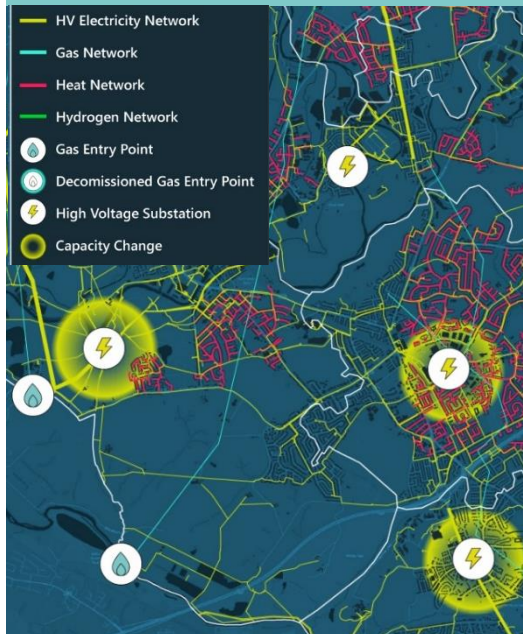


Using a collaborative two-tier approach

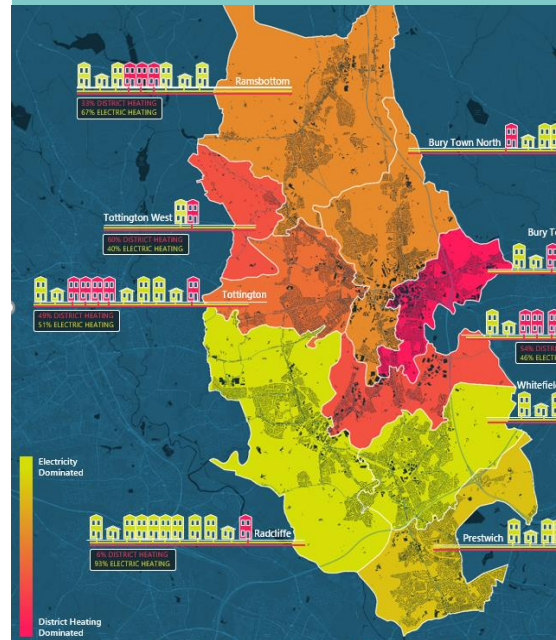


Developed a structured & repeatable framework

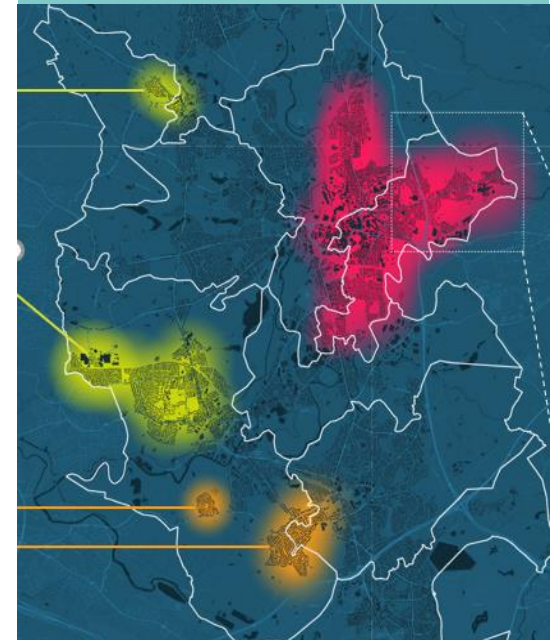
Understand **local options and choices for heat** in whole system context



Collaboratively develop a **long term evidence based plan** to decarbonise



Resulting in data and insight to **target innovation and deployment** projects



Piloted with three different local areas

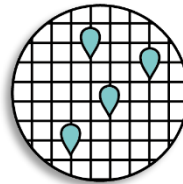
Smart Systems and Heat programme



Local Area Energy Planning provides the tools for a cost-effective transition



Supports the major decisions on
decarbonising heat
and the **future of the gas grid**



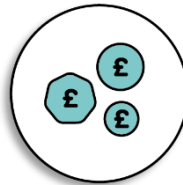
Recognises the importance of
place and **regional variation**



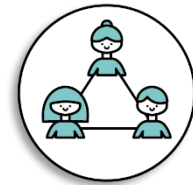
Takes a **whole energy system**
approach - to minimise cost



Enables **local leadership**
in supporting the clean
transition



Helps to drive **action,**
investment and
clean growth



Stimulates
engagement with
consumers and
communities

Developing the policy & funding framework for local area energy planning



Legislative framework

consider energy infrastructures as part of existing local planning

Opportunities to embed LAEP into existing processes:

*Integrate Local Area Energy Planning as part of the planning system, encouraging a **Whole Systems approach** to meeting the challenge of climate change, fuel poverty and cost-effectively transitioning local energy systems.*



Strengthen **local planning** regulation and clarify guidance (e.g. NPPF, PPG)



"**Section 106** agreement" type of planning/ development arrangements



Integrate LAEP into **RIIO-2 investment framework**

Supporting network operators and price control



Provide a robust, well justified and consistent whole system evidence-based process that can be used and reviewed throughout price control periods



Utilise more open and accessible data, support network innovation activity and identify areas to target low regret measures (such as building retrofit/energy efficiency)



Facilitate stakeholder engagement through connecting network companies with local authorities, consumers and other key local stakeholders in an open, collaborative and structured dialogue



Provide evidence to inform well justified anticipatory investment and help to ensure that plans consider long-term decarbonisation; so that capacity is provided in a coordinated way



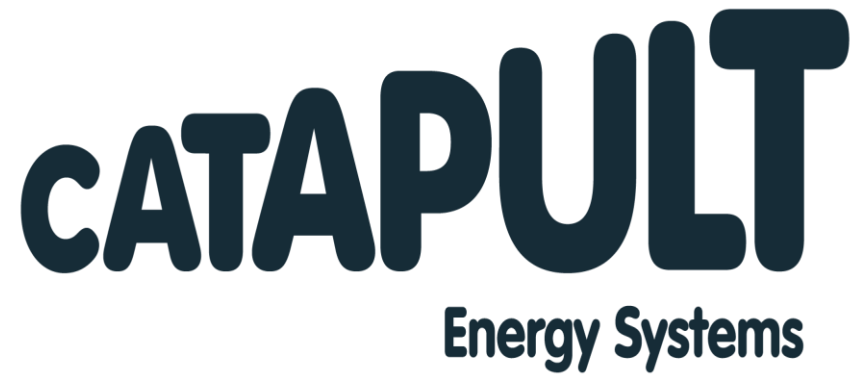
Understand the role of hydrogen and decentralised energy generation and storage across local areas

Next steps: exploring how to integrate LAEP into RIIO-2 framework for DNOs

Assess how LAEP processes and methods can be incorporated into the RIIO2 framework:

- Initial comparison of LAEP framework and the **Business/ Investment Planning** approach
- **Requirements** or guidance for DNOs to incorporate LAEP approaches into business plans?
- Potential linkages to the **Customer Engagement Process**
- Potential incentives or requirements to adopt a fully **multi-vector perspective** on decarbonisation
- **Practicalities**: costs, funding, data requirements and access, responsibilities, timelines, stakeholders, etc.
- Potential to set incentives for DNOs for the **delivery of outputs** identified through LAEP

Thank you



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What role should LAEPs play within the price control framework?

How do we ensure appropriate engagement with devolved administrations and local authorities? Directly or via the DNO?

What type of commitment do we need to see in order to reflect local priorities in allowances?

Do regional priorities raise issues of cross-subsidisation? If so, should this be addressed?

Do Working Group members have suggestions for how the we can ensure the approach in ED2 appropriately reflects regional priorities?

Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.