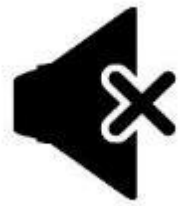


# Welcome to the Bridging the Gap to Net Zero workshop



Due to a large audience, **please put yourself on mute and turn your video off**

**Please use Slido for all questions and comments:**

**[www.slido.com](http://www.slido.com)**

**Slido code:**

**82375**

As we're expecting a large number of attendees, we probably won't get to answer all questions or address all comments today. If you want a response, please leave your name on slido, or email [FESbtg@nationalgrideso.com](mailto:FESbtg@nationalgrideso.com), we'd be delighted to follow up with you separately.

# Bridging the Gap to Net Zero: Technology workstream

*26<sup>th</sup> November 2020*

Slido code: **#82375**

**nationalgrid**ESO

# Welcome

1100 – 1115	Welcome and introduction	Louise Schmitz, ESO
1115 – 1135	Workstream findings and recommendations	Becky Hart, ESO
1135 – 1150	Key stakeholders' reflections in conversation with Laura Sandys	
1150 – 1155	Review of Slido questions and comments	Becky Hart, ESO
1155 – 1200	Wrap up and next steps	Becky Hart, ESO

Slido code: **#82375**

# Bridging the Gap recommends what *needs to happen* to achieve net zero emissions

## FES Bridging the Gap to Net Zero:

- Considers what *needs* to happen in the next 10 years if we are to meet net zero
- Explores key areas of uncertainty, gathers evidence and works collaboratively with stakeholders to build consensus.
- Recommends actions for policymakers and industry to move towards net zero.
- Informs FES modelling and analysis

## What we've done so far:

- Consulted with wide range of external and internal stakeholders about the topic and structure of the project
- Held an online webinar to gather more views and input
- Led three workstreams of industry volunteers



# FES 2020 scenarios all have a greatly increased proportion of renewable electricity generation

- Over 10 million Battery Electric Vehicles on the road (in Leading the Way, with an ICE ban date of 2032)
- Over 5.8 million heat pumps in Consumer Transformation
- Over 135,000 different battery storage sites (LW)
- Carbon emissions reduced by up to 37% (LW)
- Increase in peak demand of up to 13% (LW)
- 17% reduction in amount of dispatchable capacity available

Whilst not all of these changes will happen, there is some certainty about the potential impacts:

- More intermittent electricity supplies due to increase in renewable electricity generation capacity
- More need for flexible demand and supply
- **Increased complexity because of millions interactions on the energy system**

# Bridging the Gap 2020: Peaks and troughs: how markets, technology and data & digitalisation can help meet the new challenges of a decarbonised energy system.

Part 1 –  
Webinar in  
October

## What are the new peaks and troughs?

PART 2: How markets, technology and data and digitalisation can help meet these new peaks and troughs?

### PART 2a: Data & Digitalisation

What can we learn from other sectors' and countries' use of D&D to manage rapidly changing peaks and troughs of supply and demand?

### PART 2b: Technology

Which technologies have the potential to make the biggest positive impact between now and 2030? Where's the biggest bang for buck??

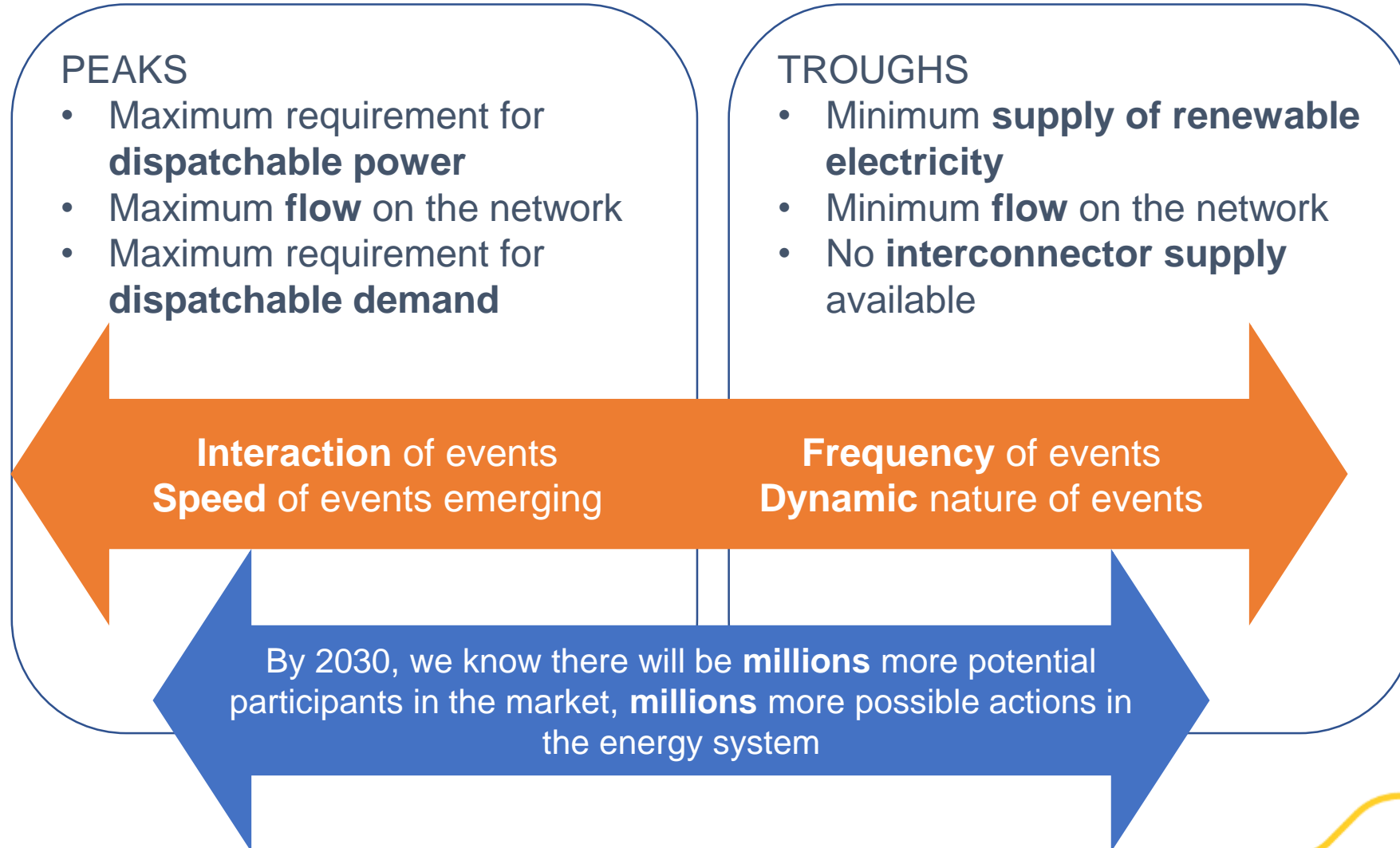
### PART 2c: Markets

How can markets unlock the value of flexibility and enable wider consumer participation?

PART 3 - Report  
in February

## Final report, due early 2021.

# At the October event, we agreed the new peaks and troughs that we are already seeing in our energy system as it decarbonises



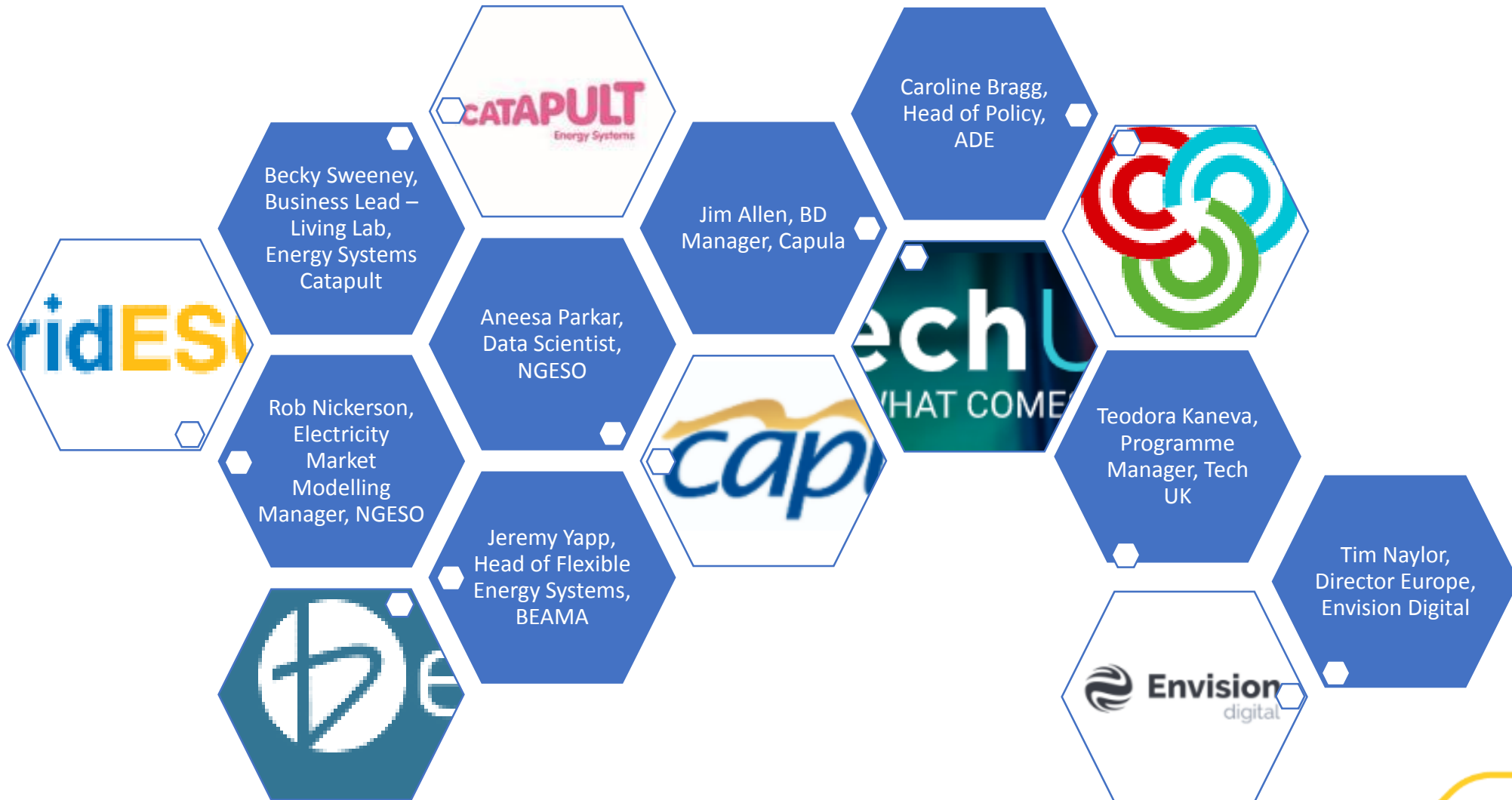
A man in a green shirt is shown in profile, looking down at a smartphone he is holding. Several glowing green lines emanate from the phone and curve towards the interior of a car, suggesting a digital connection or data flow. The background is a blurred outdoor setting with trees and a white car.

# Technology workstream: Interim findings, recommendations & actions

Slido code: #82375



# Introduction – Technology Working Group



# Context and aim

- A high level run-through of the topic with experienced stakeholders
- Peaks and troughs of energy supply and demand
- Technology = hard assets/appliances (not information technology)
- Planning from the future

We need a decarbonised energy system, which is:

- Stable
- Low carbon
- Sufficient
- Cost effective



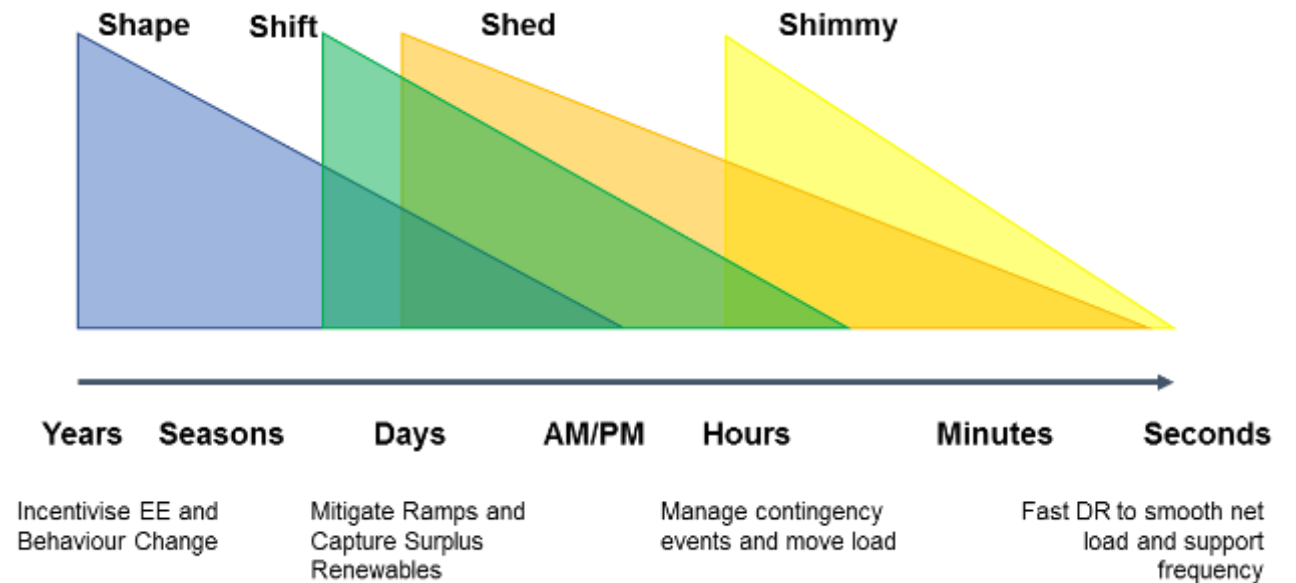
# Here are our questions

- How can technology help us meet the new challenges of a decarbonised energy system?
- Which technologies have the potential to make the biggest positive impact between now and 2030? Where's the biggest bang for our buck?!



# And our answers

- Technology can help in many ways, providing all sorts of different flexibility.
- There is no silver bullet technology, which can reduce the impact of dynamic peaks and troughs
- But with some enabling actions, the technology we already have can make a big, positive impact.



Adapted from: <https://eta-publications.lbl.gov/sites/default/files/lbnl-2001113.pdf>

# Combinations of existing technologies at scale can have a big, positive impact but there are barriers to this happening.

## Community scale energy and storage for new developments

- Lack of whole system thinking from the outset.
- Needs smart energy infrastructure by design, taking into account whole system by developers, planning and local network operators.
- Lack of incentive to design for future, despite potentially lower costs for installations.

Shift/  
Shed

## Integrated end-consumer technologies (e.g. PV and household tech)

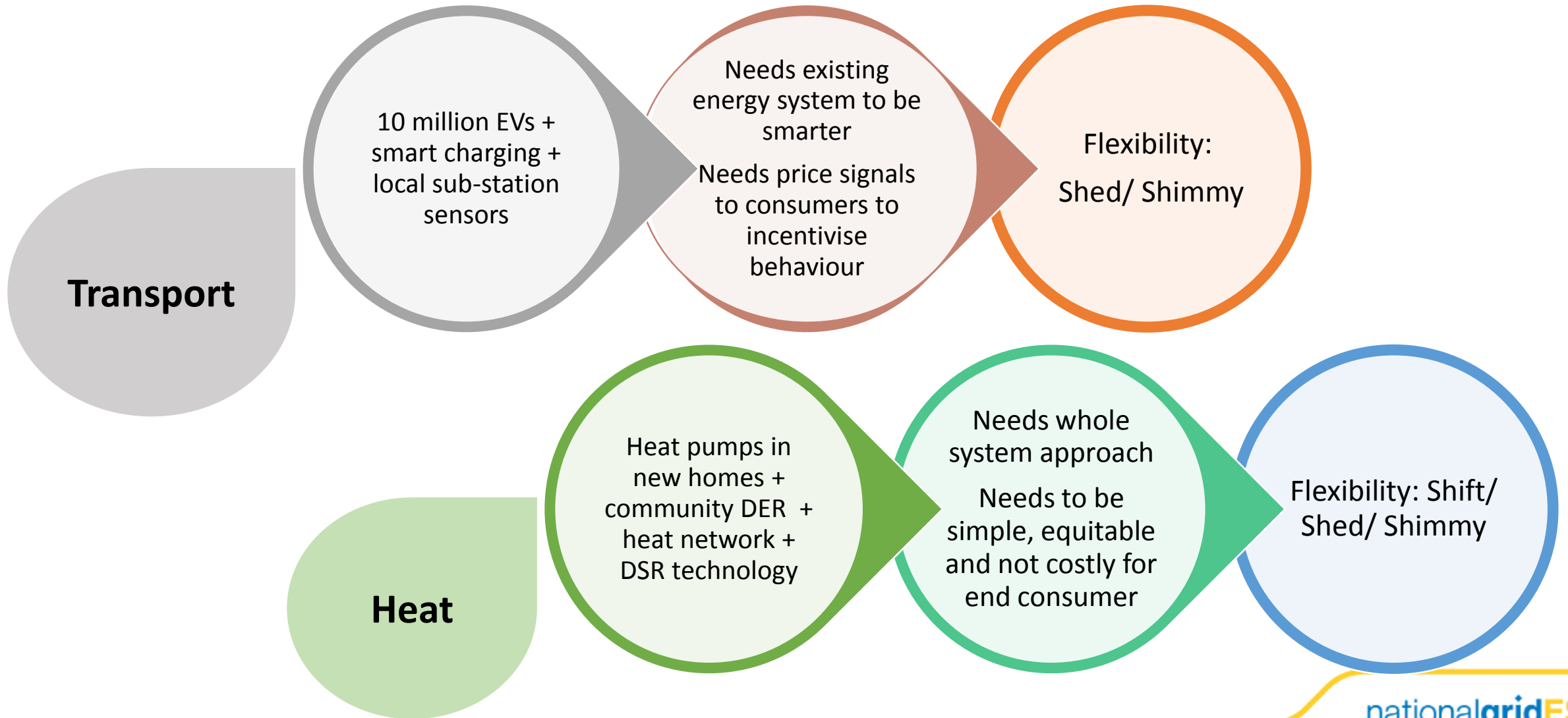
- Currently requires high level of engagement from end-consumer to get involved.
- Few systems in homes or businesses allow technology to communicate to each other
- Supporting systems need to be smarter, before they can be better, e.g. distribution sub-stations at 11kV lack edge technologies, not future ready

Shed/  
Shimmy

## Renewables and storage in one location at a larger scale

- Flexibility markets, at distribution and national level, currently not operating at scale to drive uptake
- Pricing/tariffs not sophisticated enough
- Lack of data (in almost real time) about network peaks and troughs hinders decision making.
- Lack of whole system thinking

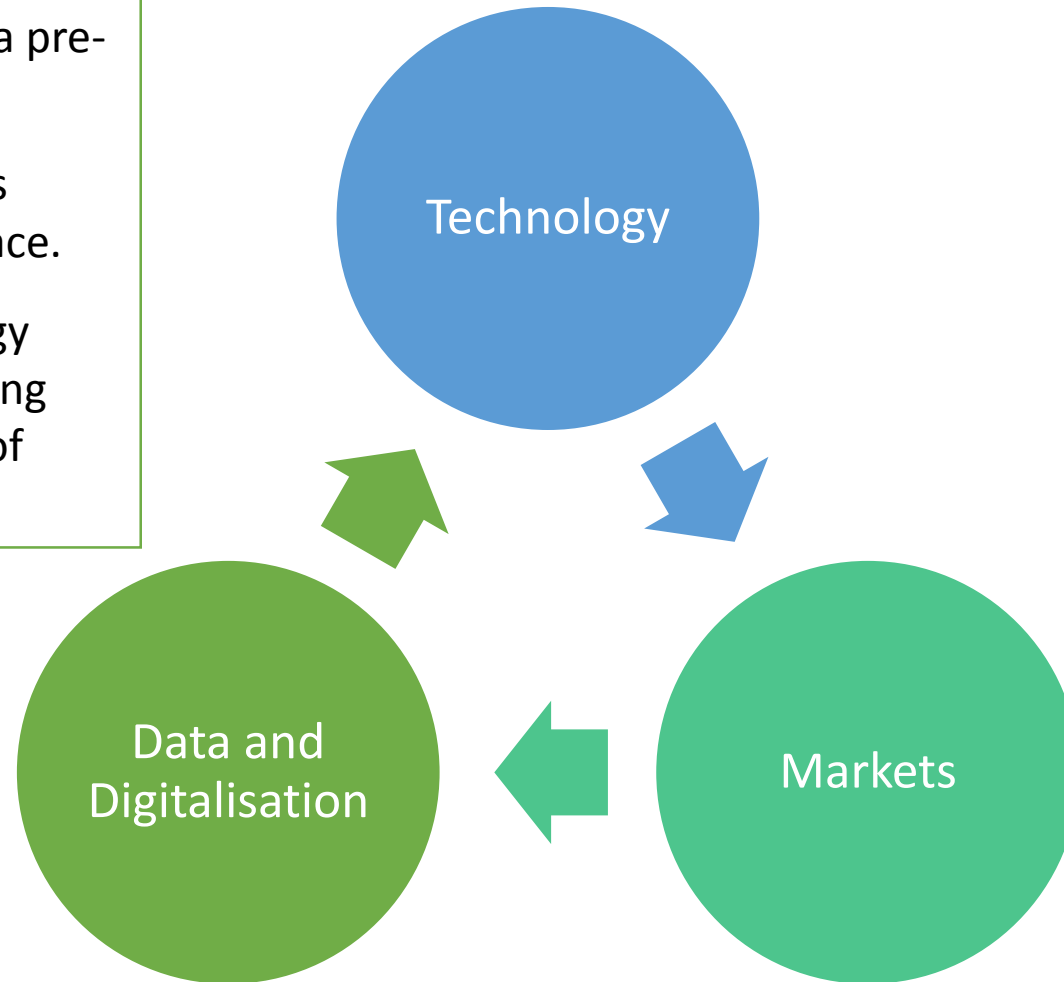
# Combinations of technologies at scale, cross-sector, in areas of **low regrets** = bang for buck



# Assumptions for other workstreams

## Data and digitalisation:

- Availability of data is a prerequisite.
- The necessary comms infrastructure is in place.
- Digitalisation of energy infrastructure, including across the full range of voltage levels.



## Markets:

- There are consumer propositions to incentivise behaviour.
- Improved markets for system stability services, including incentives for long duration flexibility.
- Network charges designed to encourage investment decisions in flexibility for low carbon heating and transport solutions.

# Initial recommendations & actions to enable maximum potential of technology

## **Recommendations**

1. Develop interoperability standards for existing technology types to be able to interact.
2. In order to find a cost-effective way to get to good, near real-time network monitoring down to low voltage networks, look at more use of IOT sensors and control systems at sub-stations.
3. Use demand side response technologies to enable DER flexibility to be aggregated.
4. A whole system approach is needed when planning new DER, with sufficient visibility of potential interactions and impacts, so that assets are designed to help manage local flexibility.

## **Actions / Innovation project ideas**

5. Look into suitability of technologies delivering metering solutions (BEAMA)
6. Review potential for an innovation project, where historic weather data is used to model how different flexibility technologies can respond. (ESO & ?)





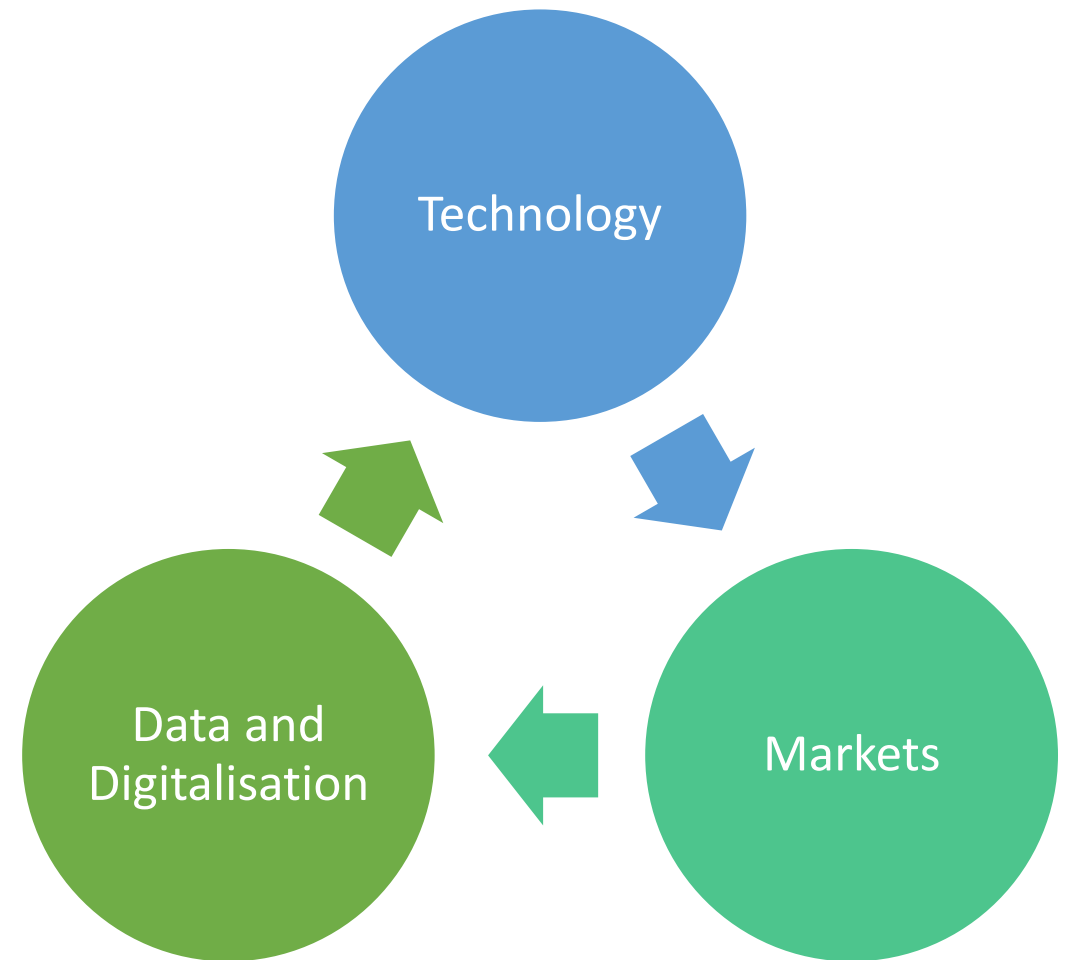
Discussion with Laura  
Sandys, Co-chair

# The Chair's view

There is clear **interaction and integration** between all three workstreams.

And there are some clear, **common themes** arising as well:

- Data and digitalization are fundamental to progress.
- New skills are required to enable the transition.
- Transparency of and availability of data is necessary.
- Clarity of roles and standards for data, governance, performance and delivery vital.
- Government's plan to "build back greener" sets an imperative to take action.

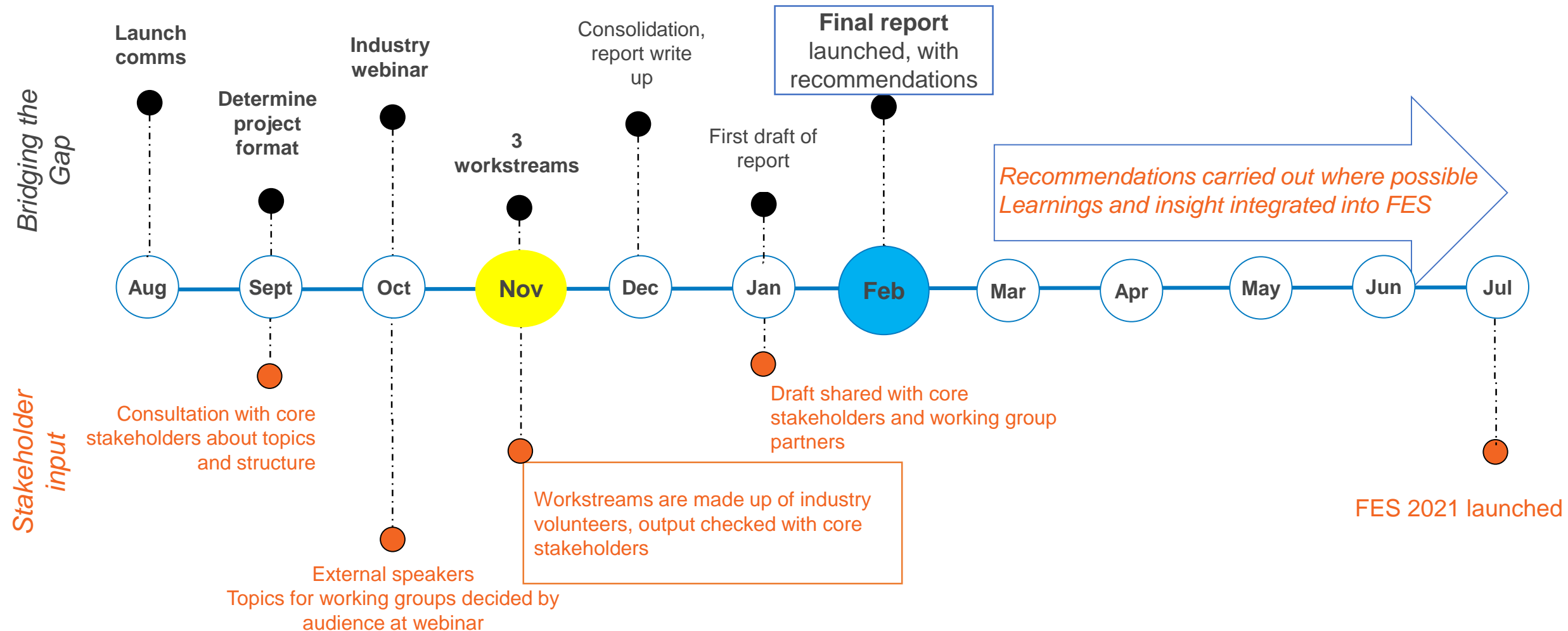


# Review of Slido questions and comments

The background features several decorative yellow lines. In the top-left corner, there are several thin, curved lines that sweep upwards and to the right. In the bottom-left corner, there are several thin, curved lines that sweep downwards and to the right. On the right side of the slide, there are several thick, parallel diagonal lines that run from the bottom-left towards the top-right.

Wrap up and next steps

# Bridging the Gap final report will be due in February 2021



# Thank You

Please complete a really short [survey](#) about today's event.

Contact: [FESbtg@nationalgrideso.com](mailto:FESbtg@nationalgrideso.com) for any further questions/comments