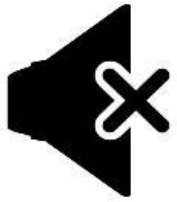
Welcome to the Bridging the Gap to Net Zero workshop



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
Slido code:
#ESOMarkets

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, we'd be delighted to follow up with you separately.

Bridging the Gap to Net Zero: Markets workstream

27 November 2020

nationalgridESO

Welcome

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

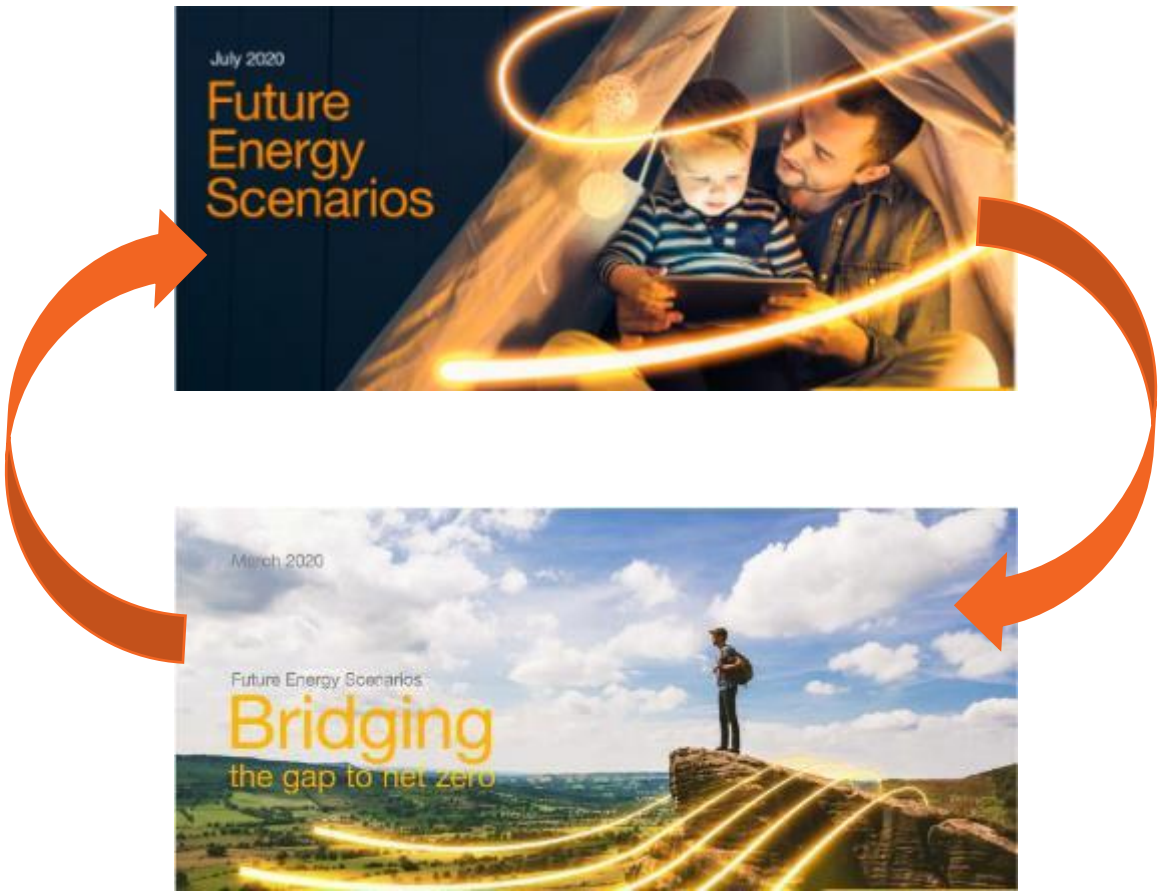
Bridging the Gap recommends what *needs to happen* to achieve net zero emissions

FES Bridging the Gap to Net Zero:

- Considers what *needs* to happen in the **next 10 years** 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
- **This level of renewable generation will require a fundamental change in our markets**

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

PEAKS
- Maximum requirement for **dispatchable power**
- Maximum **flow** on the network
- Maximum requirement for **dispatchable demand**

TROUGHS
- Minimum **supply of renewable electricity**
- Minimum **flow** on the network
- No **interconnector supply** available

Interaction of events
Speed of events emerging

Frequency of events
Dynamic nature of events

By 2030, we know there will be **millions** more potential participants in the market, **millions** more possible actions in the energy system

Markets workstream: Findings, recommendations and actions

Introduction – Markets Working Group

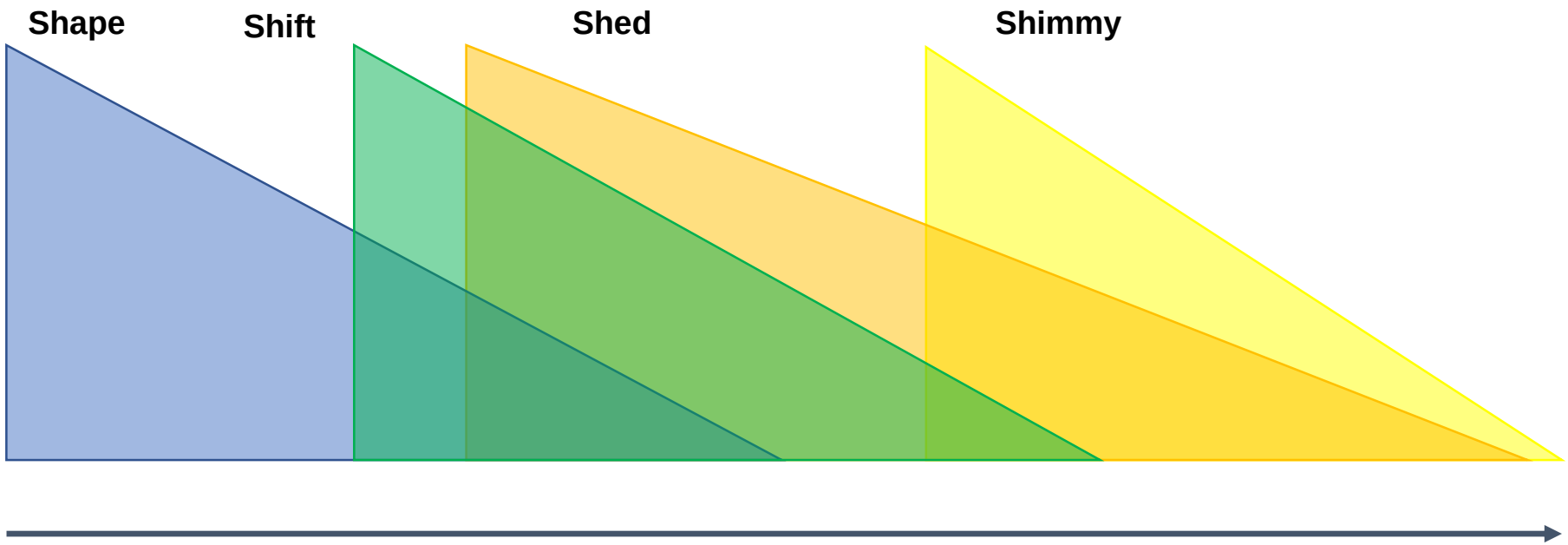
Context and aim of Markets Workstream

- This has been a high level run-through of the topic – intended to find areas of consensus and to share knowledge and experience
- It's about peaks and troughs of energy supply and demand
- By 2030 we need to be securely on a path to net zero
- FES gives an idea what that might look like:
  - Much higher renewable penetration
  - A greater need for flexibility
  - Sources of flexibility becoming more distributed
- *How should markets evolve to manage this?*

Our question

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

What do we mean when we talk about flexibility?



Incentivise EE and Behaviour Change

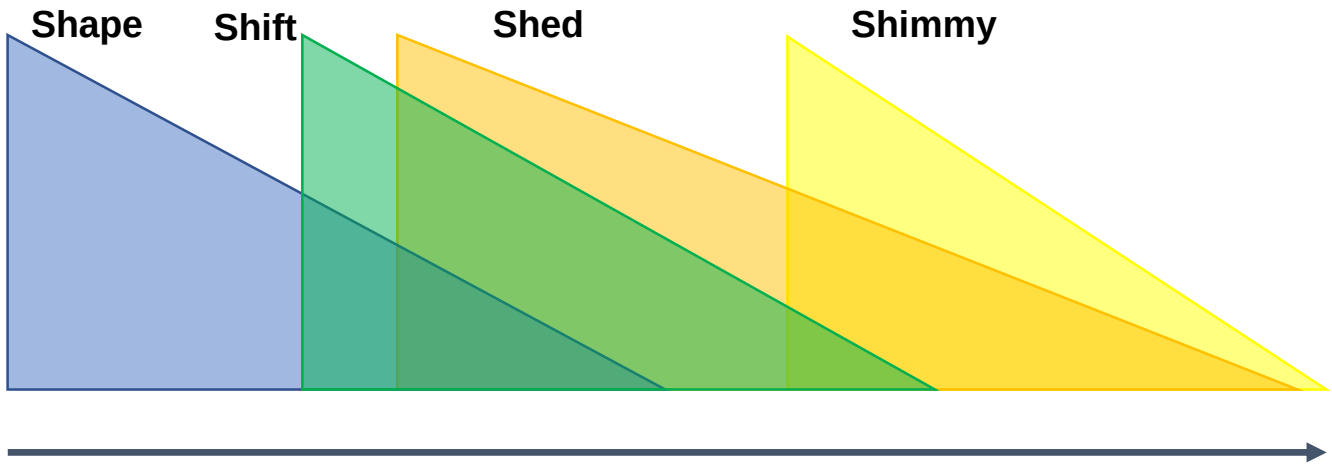
Mitigate Ramps and Capture Surplus Renewables

Manage contingency events and move load

Fast DR to smooth net load and support frequency

https://eta-publications.lbl.gov/sites/default/files/lbnl-2001113.pdf

How can changes to markets address these challenges?



Shape: Market signals and network pricing to help shape demand profiles and drive investment in long term assets

Shift: Day ahead flexibility markets to send signals for appropriate forms of flexibility to respond to surpluses or deficits in supply or demand

Shed: Intra-day flexibility and wider participation in the balancing mechanism

Shimmy: ESO balancing and frequency response services with wider participation and competition between technologies

What should a market look like in 2030?

- Simplified compared to today
- Carbon is priced in for flexibility
- High levels of digitisation allowing automation in dispatch
- More cost reflective – costs borne by those who cause them
- Many more participants - many whose interaction with markets is managed through aggregators
- Balancing Mechanism still playing a key role, but with wider participation

What are the barriers to existing routes to market?

Flexibility is important today, but there are barriers to the development of more flexible assets today, despite the fact we know we will need more flexibility in future

Market structure issues

- Difficulty stacking revenue
- Low cost reflectivity
- Existing interventions reduce the value of flexibility
- Market access rules for small players

Technology and data issues

- Data availability and accessibility
- Smart metering challenges
- Current level of takeup of flexible distributed technologies
- Slow moving incumbents

How could flexibility be better supported in future?

Market design

- Designing energy markets to better meet the needs of the transition
- Appropriate signals for long-term asset investments
- Contract lengths

Removing distortions

- Wholesale markets provide better investment signals
- Create a more liquid forward market
- Remove barriers to stacking some services

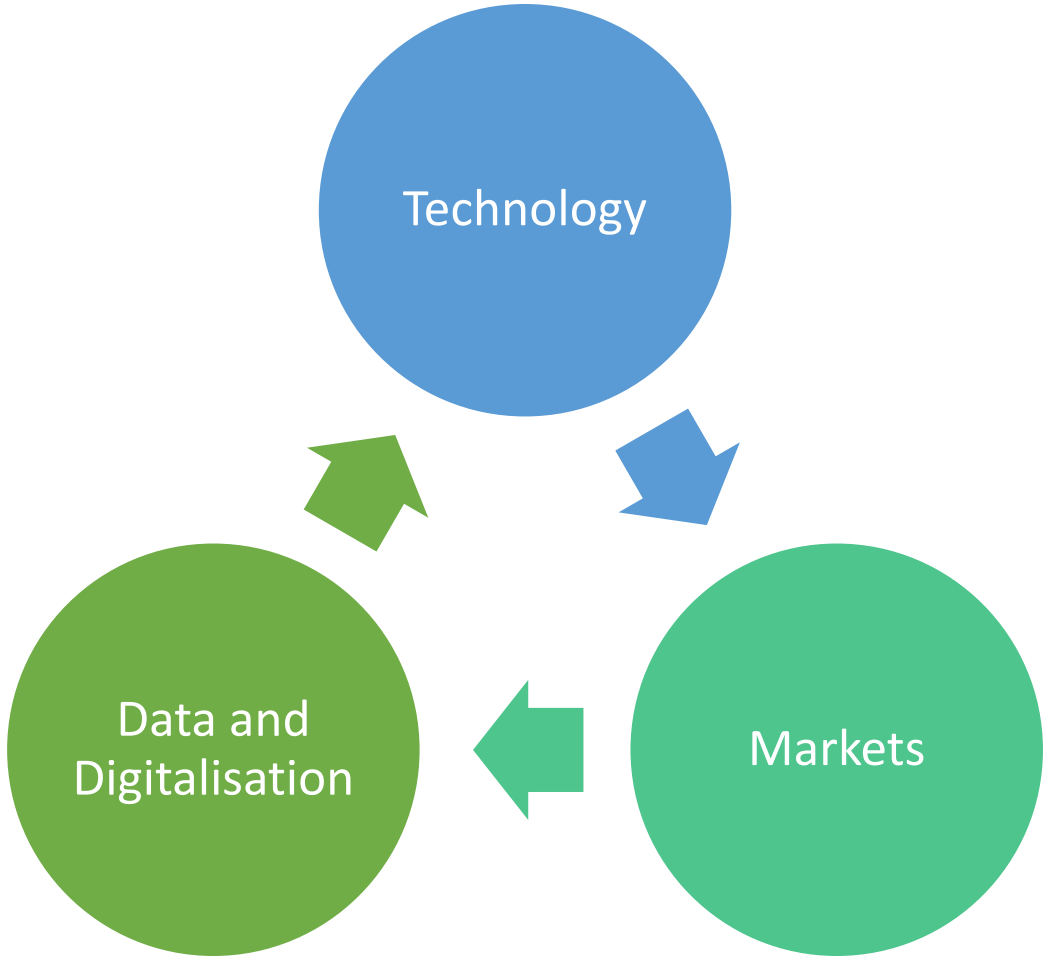
Direct support

- Direct flexibility support/subsidy
- Quotas for flexibility procurement from small providers
- Attaching a greater premium to demand flexibility over supply
- Factoring in carbon emissions from flexibility

Assumptions for other workstreams

Data and digitalisation:

- Availability of data is a pre-requisite
- Data monitoring and openness is needed to enable technologies at different levels to participate
- Digitalisation of energy infrastructure, including across the full range of voltage levels



Technology:

- Facilitates a consumer proposition that is simple and automated
- Technology is adopted by consumers and managed by third parties

Recommendations

Recommendations	Actions
Market simplification, considering new interventions for interaction with existing measures	ESO will be developing a **Single Market Platform** as part of RIIO-2
Carbon pricing to incentivise low carbon flexibility	Potential for an **innovation project** to explore better monitoring and tracking of this metric
Build on DSO/ESO engagement through forums like Open Networks on procurement of flexibility	ESO to raise this with the Energy Network Association through Open Networks
Improve diffusion and dissemination of innovation outcomes	Share learnings with industry in this area

Discussion with Laura Sandys, Co-chair

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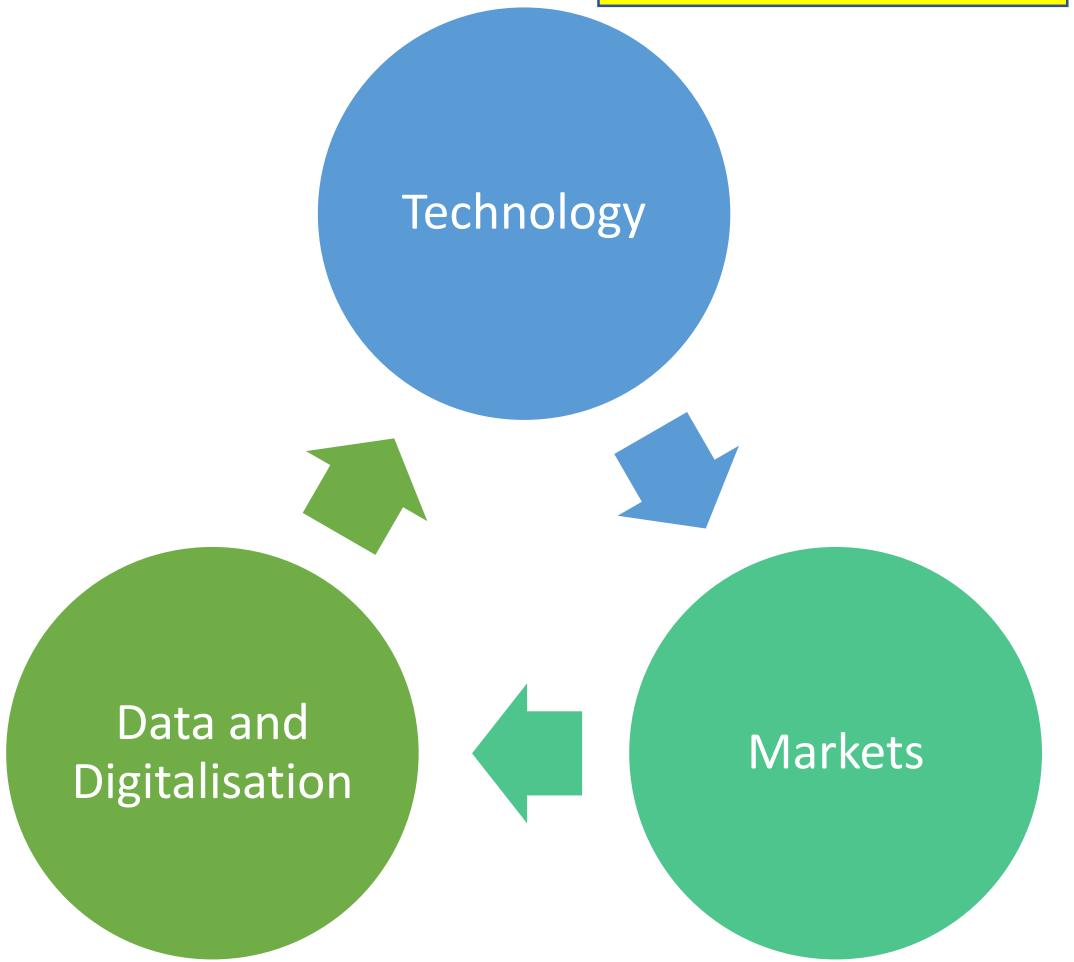
The Chair's view

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 #greenrevolution
- Transparency of and availability of data is necessary
- Clarity of roles and standards for data, governance, performance and delivery is vital
- Government's plan to Build back greener sets an imperative to take action



Review of Slido questions and comments

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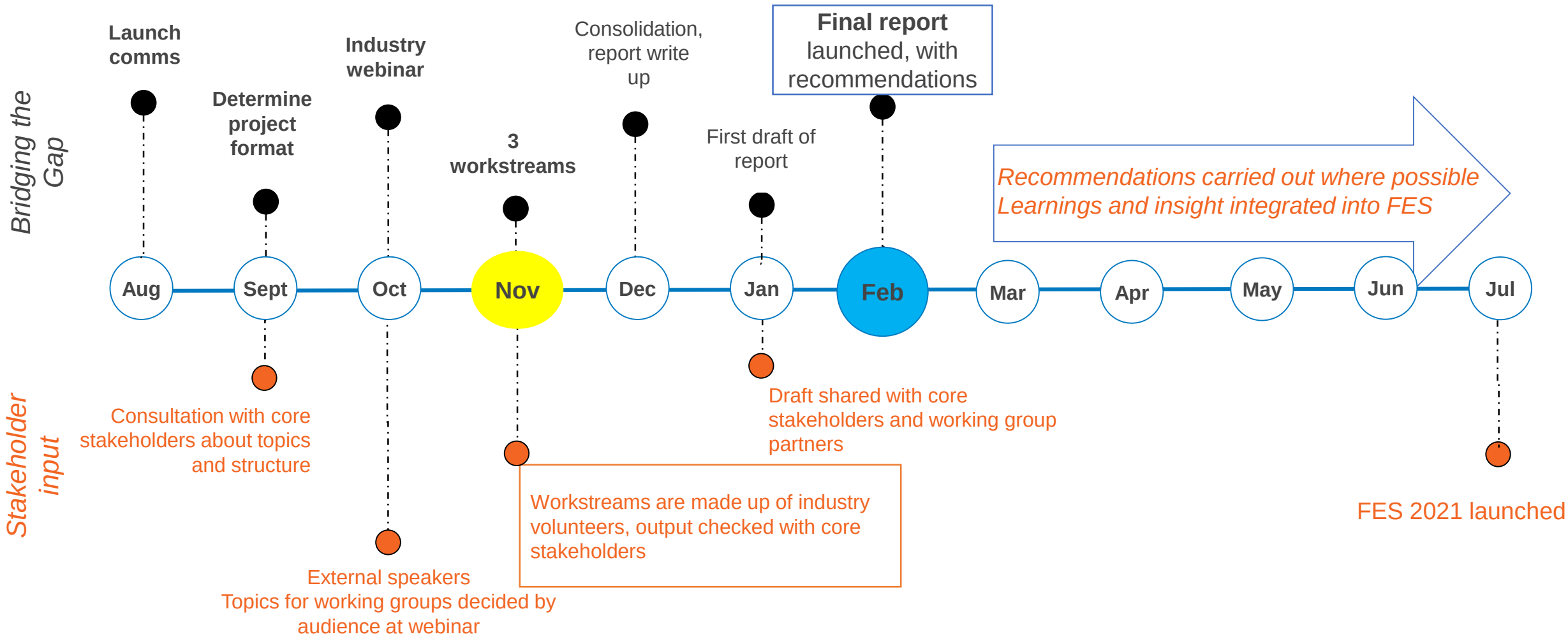
Wrap up and next steps

Bridging the Gap final report will be due in February 2021



Thank You

Please fill in our feedback survey here

Contact: FESbtg@nationalgrideso.com for any further questions/queries