



Distribution Future Energy Scenarios

East Midlands licence area

Future Energy Scenarios

East Midlands licence area Stakeholder consultation webinar summary report

Scope of this report

This report collates the results of four stakeholder consultation webinars, run by Regen and WPD as part of the 2020 Distribution Future Energy Scenarios (DFES) project. This report includes the audience comments and questions, as well as the stakeholder feedback on the questions which were asked of the audience live. These results have been grouped by theme from across the four webinars, preceded by a summary of the webinar attendees and links to further reading.

DFES Project summary

To support WPD's strategic network investment planning, Regen has been commissioned to undertake a distribution future energy scenario analysis for the four WPD licence areas – South West, South Wales, East Midlands, and West Midlands. The scenarios analysis will look at the uptake and deployment of renewable and fossil fuel power generation, energy storage, low carbon heat, and electric vehicles, as well as analysing planned new housing and commercial developments. The analysis of different net zero scenarios, informed by detailed contextual factors and stakeholder feedback, will help WPD to plan for strategic investment and flexibility on the electricity distribution network.

Towards net zero

Each region in Great Britain has unique characteristics and resources, therefore each will see unique deployment of renewable and low carbon technologies as part of the net zero transition. This project assesses specific local factors, for example local plans, wind speed and solar irradiance, agricultural land, housing density and public transport provision, and projects connections to the distribution network using the framework of the National Grid ESO 'Future Energy Scenarios', including three net zero scenarios and one 'non-compliant' scenario that does not achieve net zero carbon emissions by 2050 or earlier.

Stakeholder engagement

A key part of this project is engagement and consultation with local stakeholders. Regen consults with local authorities to translate local development plan data into detailed scenarios of connections to the WPD distribution network. Developers of generation sites that may be built out in the near term are also contacted, to assess when and under what circumstances they may connect. Lastly, the insights of other local stakeholders are invaluable in recognising the potential deployment of various other technologies such as electric vehicles and electrified heat in the near and medium term.

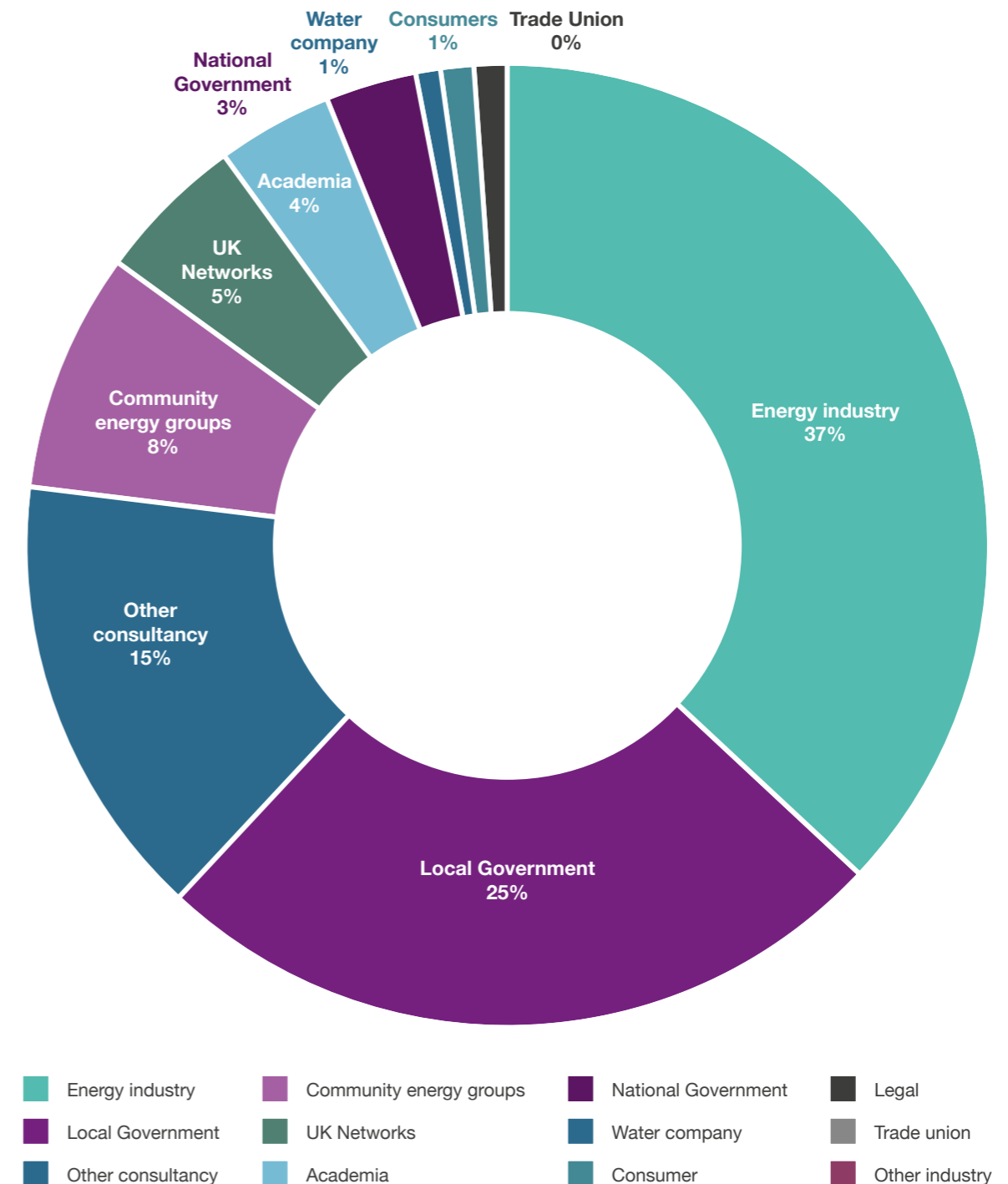
If you wish to find out more information or you have any questions about the webinars or the DFES project, please contact:

wpdnetworkstrategy@westernpower.co.uk

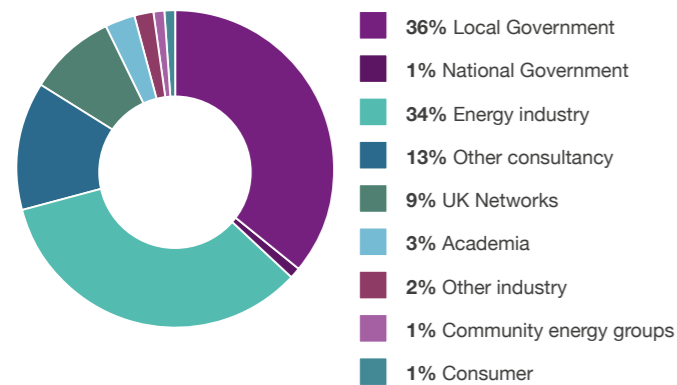
Registrations from all four webinars

The sectors represented by the registrants for all four webinars are shown in Figure 1 and are also shown by individual region. Participants from the energy industry and local government made up at least 50% of each webinar, with varying levels of representation from community energy groups, academia, and UK Networks.

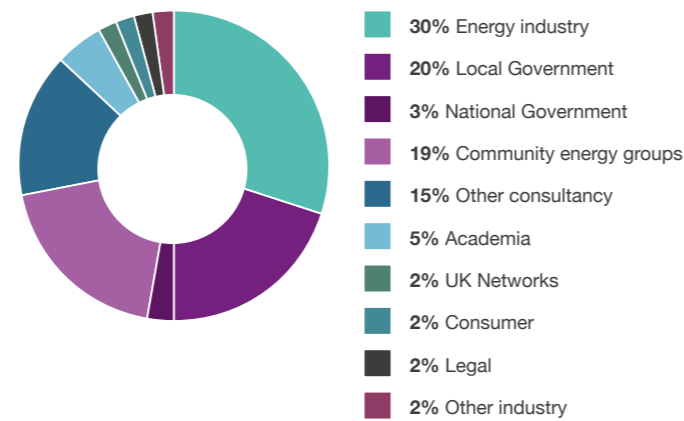
Figure 1
Registrants for all four WPD DFES consultation webinars



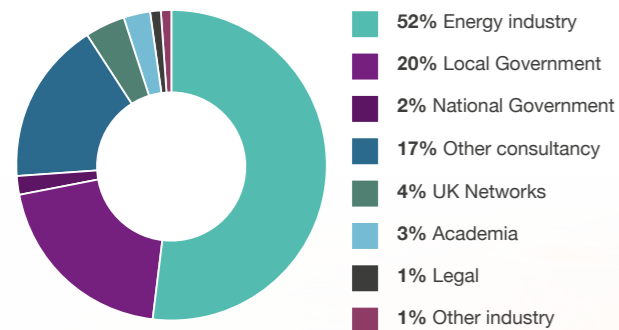
East Midlands webinar



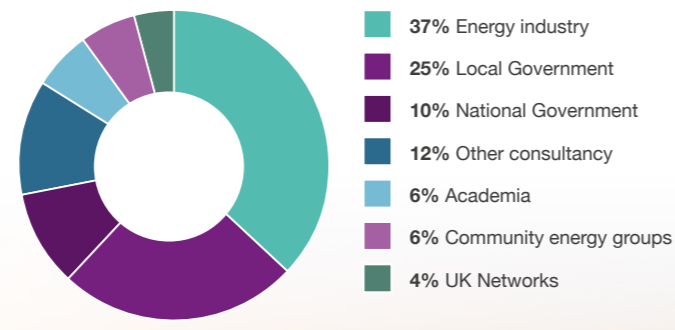
South West webinar



West Midlands webinar



South Wales webinar



East Midlands

DFES stakeholder consultation webinar summary report

Audience survey result
4.3 ★
average rating
★★★★☆

Date: **20 May 2020**
Attendees: **86 (including panellists)**
WPD contact: wpdnetworkstrategy@westernpower.co.uk
Regen contact: fmayo@regen.co.uk
A link to the agenda and recordings is available at the Regen website.

The purpose of the webinar was to communicate to stakeholders in the East Midlands region an overview of the DFES process, what the project outcomes would look like and how they may feed into and access the data. Audience participation was also facilitated, with responses sought on the near-term factors impacting the uptake rate and spatial distribution of low carbon technologies, and how the unique characteristics of the licence area region would impact these.

Oli Spink, network strategy engineer at Western Power Distribution, presented a DFES process overview and the use of DFES data to inform where and when strategic network reinforcement may be needed under a specific scenario. The DFES data and subsequent electrical analysis is also used to inform signposting and in procuring flexibility services.

The WPD DFES interactive map was also introduced, which is available to explore here: www.westernpower.co.uk/distribution-future-energy-scenarios-map

Ben Robertson, analyst at Regen, presented the energy generation context for the East Midlands, showing where and when generators had connected to the WPD network – analysis which is used in the DFES process to inform and calibrate the spatial distribution of different generation technologies. The regional deployment history of ground mounted solar and large-scale fossil fuel power generation was presented, as well as the expected near-term pipeline, before the audience inputted feedback on the near-term deployment prospects. Then, the current uptake of electric vehicles in the East Midlands was presented, as well as the DFES approach to electric vehicle charger deployment. The answers to the live questions suggested that the audience thought that high upfront cost and lack of charging infrastructure was limited electric vehicle deployment, and that COVID-19 would lead to more working from home and cycling to work.

Joe Noble, graduate analyst at Regen, presented the details of the process translating the local authorities' local development plans into DFES data. The audience raised such documents as the East Midlands Manufacturing Zone project, the Oxford to Cambridge Arc, and local climate change strategies.

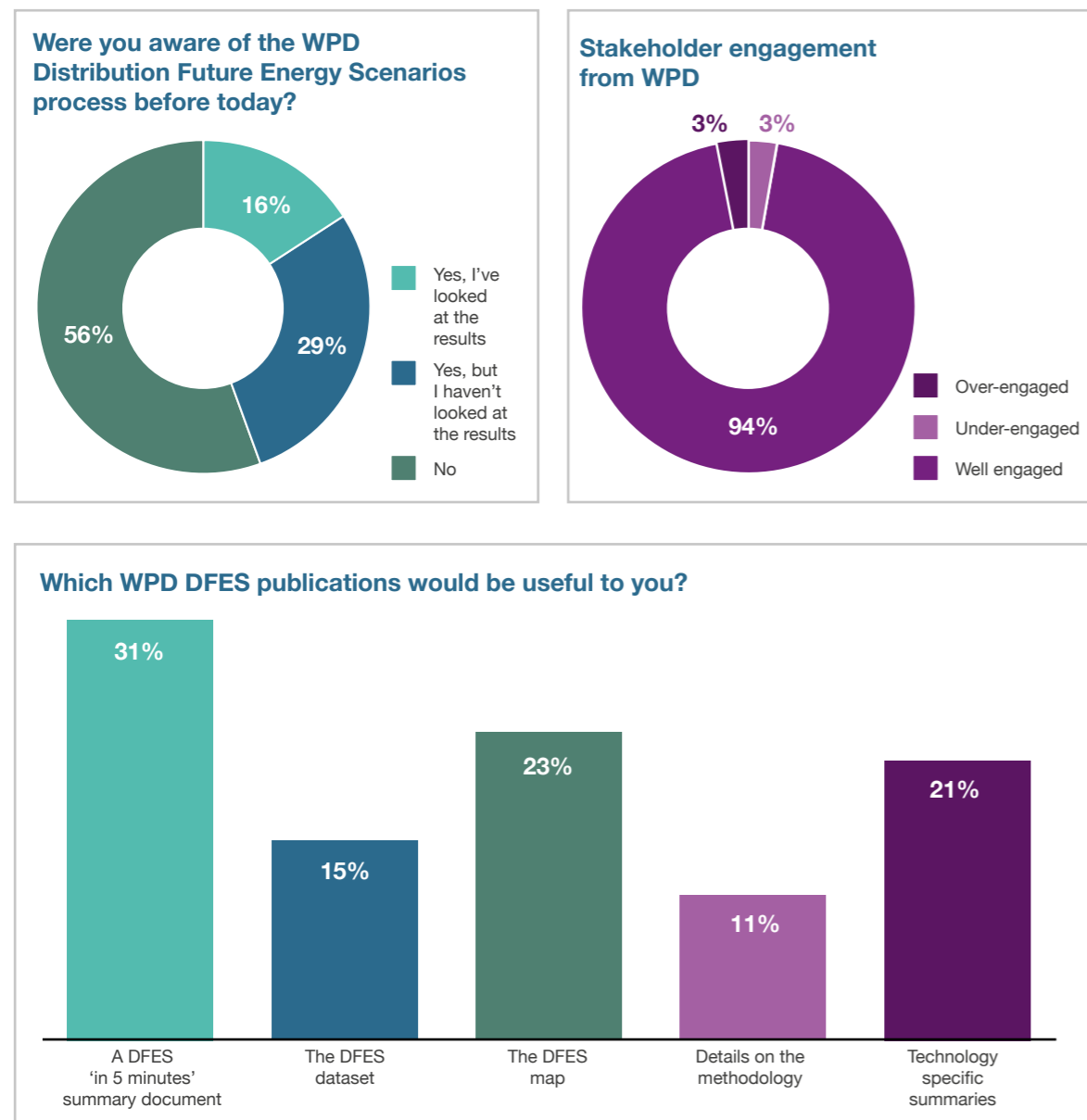
The webinar had a question and answer session between each speaker and these questions, comments, and discussion points are summarised in the next section, categorised by theme, with a summary of how this input will be used in the modelling going forward.

Initial feedback

At the beginning of the webinar, participants were asked if they were previously aware of the WPD DFES process, and whether they were suffering from consultation fatigue, or felt well- or under-engaged.

In response, 45% of those who answered were previously aware of the WPD DFES process, and 16% had looked at the results. Also, 94% answered that they were well-engaged, though there is scope to increase this number by improving communication of upcoming events and making the results easier to engage with so that stakeholders can feed into subsequent DFES rounds, while also refining the targeting of stakeholder engagement to limit the number who feel over-engaged.

As part of this process of continually improving stakeholder engagement the audience were asked which of the current WPD DFES publications were most useful to them. The audience represented a mix of professions and stakeholder views, and as such each current DFES publication was useful to some. However, the most popular was the DFES 'in 5 minutes' publication, followed by the WPD DFES interactive map. The DFES 'in 5 minutes' are a new production for this full round, along with the technology summaries, and these deliverables will be continually reviewed to ensure they are most useful to local stakeholders.



Stakeholder feedback

inputs into the DFES process

The following tables present feedback from the South Wales, South West, East Midlands and West Midlands licence areas, categorised by theme. This feedback was gathered through comments or questions during the Q&A sessions, and summarises the responses to the live polls and questions across the four webinars. Every comment we received during the webinars has been reviewed for the next stage of the analysis.

Your comments to us	Our response
Theme: onshore wind	
<p>You told us that developers will seek to develop projects on a subsidy-free basis, rather than be limited by a lack of a CfD. However, national policy has also been a critical factor in the deployment of wind so far.</p> <p>Your responses also indicated that onshore wind deployment may begin to pick up in the early 2020s.</p>	<p>The impact and scale of government subsidy varies by scenario. We will ensure that even in scenarios without government subsidy, subsidy-free deployment is still included.</p> <p>This modelling will include onshore wind deployment picking up in the early 2020s.</p>
<p>The majority of respondents thought that subsidy-free business models would lead to some very large sites being developed, otherwise only smaller-scale community energy sites would be developed.</p>	<p>Our modelling includes analysis of wind farms at different scales, we will focus projected deployment on large-scale sites and then only smaller-scale sites.</p>
<p>In terms of Welsh policy context, you told us that deployment would not be limited to just the Green NDF zones but would include Amber too.</p> <p>Comments suggest that large parts of the Green NDF zones were unlikely to be developed, due to the wind resource in the area.</p>	<p>We will expand our current spatial distribution factors for wind to include those developable areas in Amber NDF zones too.</p>
<p>The majority of respondents suggested that the existing SSAs would still see deployment, however some are becoming saturated and that emphasis is beginning to move away from these areas.</p>	<p>We will assess each SSA to see how development compares with indicative capacity as set out in the planning guidelines, and move emphasis towards the Green and Amber NDF zones.</p>
<p>You said that the current spatial distribution of onshore wind does not reflect the distribution of developable sites, as Mid-Wales has been avoided by developers due to the network in the region.</p>	<p>Our models do not simply rely on the baseline, instead we complete our own independent resource assessment and will ensure that areas with undeveloped potential are included.</p>

Live results from the webinars

The figures in this section are results from questions which were asked across the four webinars. Here, participants were asked their thoughts on the current DFES assumptions around the spatial distribution of wind, and what types of wind farms might be most common in the future.

Figure 1
Webinar question results regarding onshore wind spatial distribution

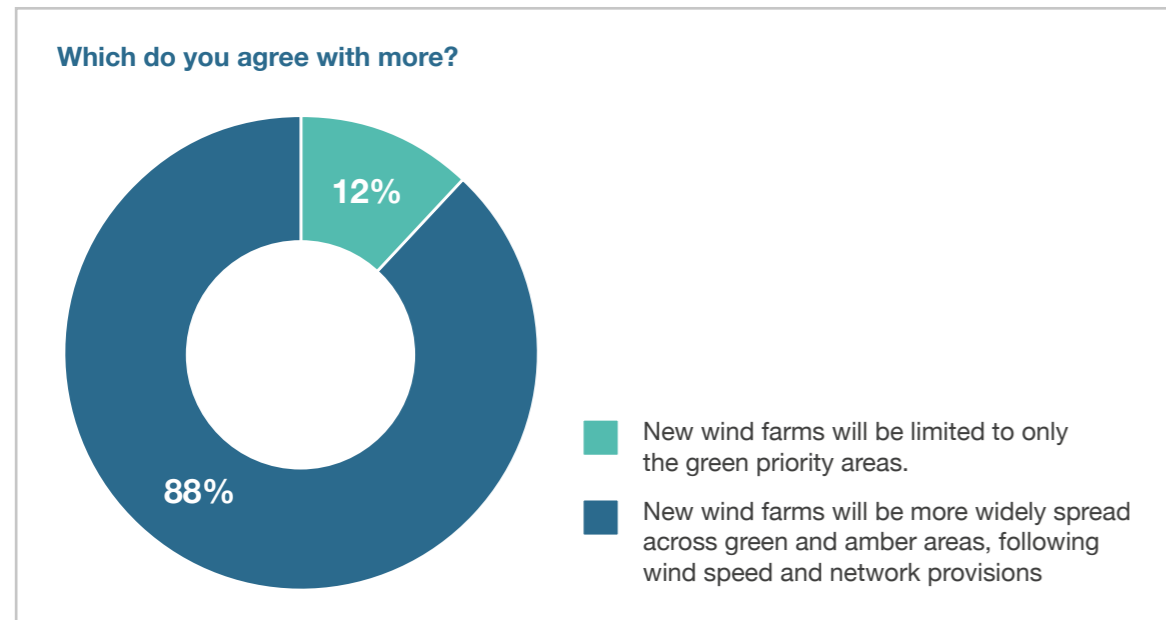
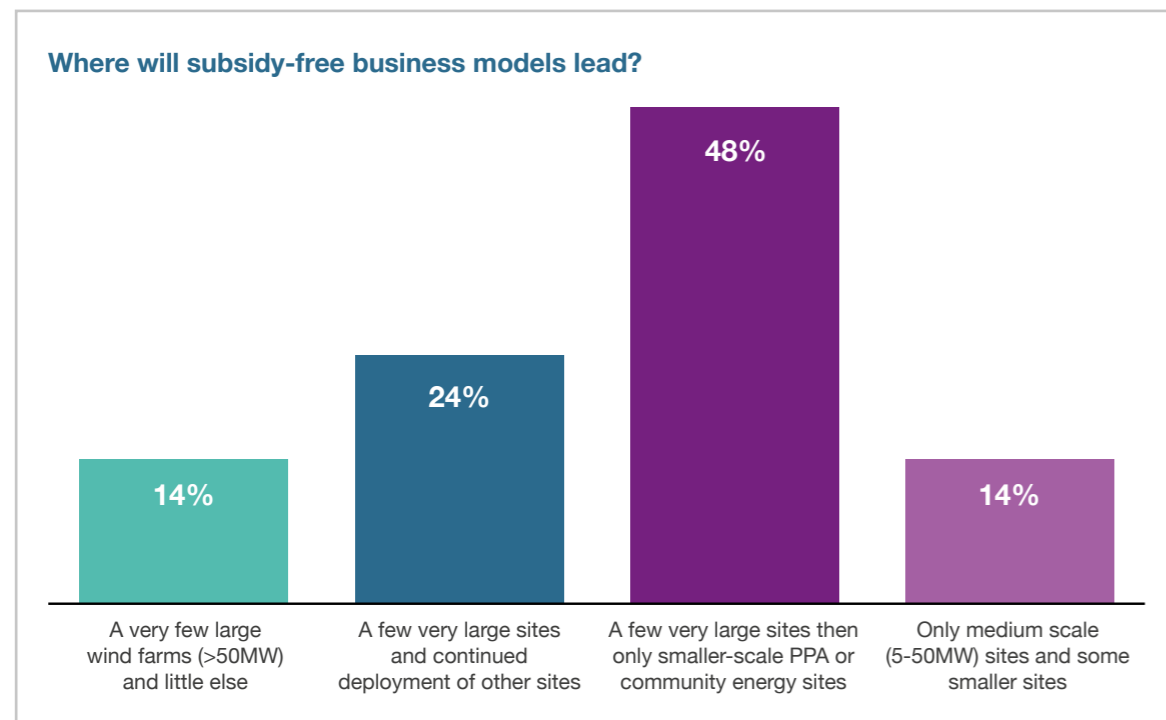
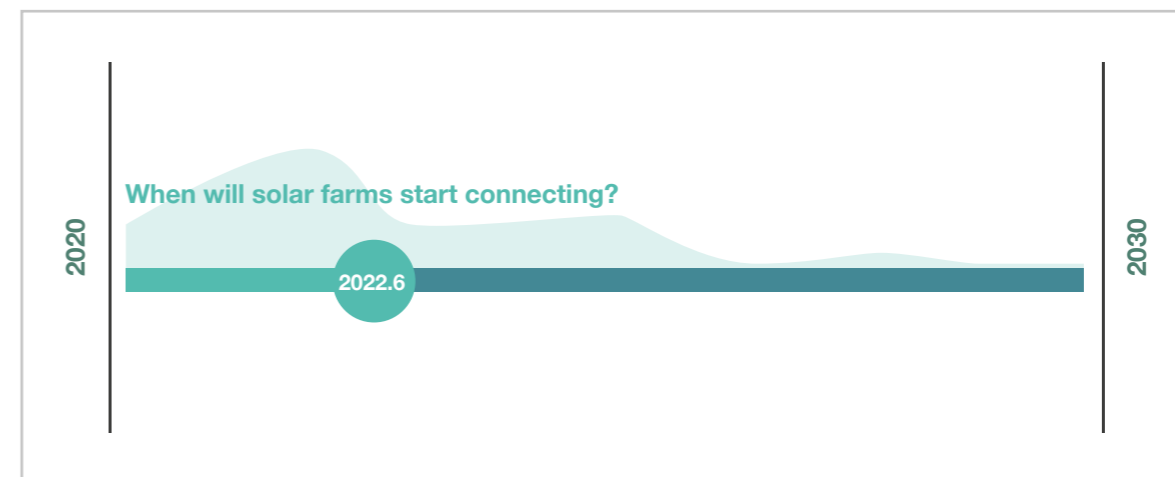


Figure 2
Webinar question results regarding onshore wind subsidy free business models



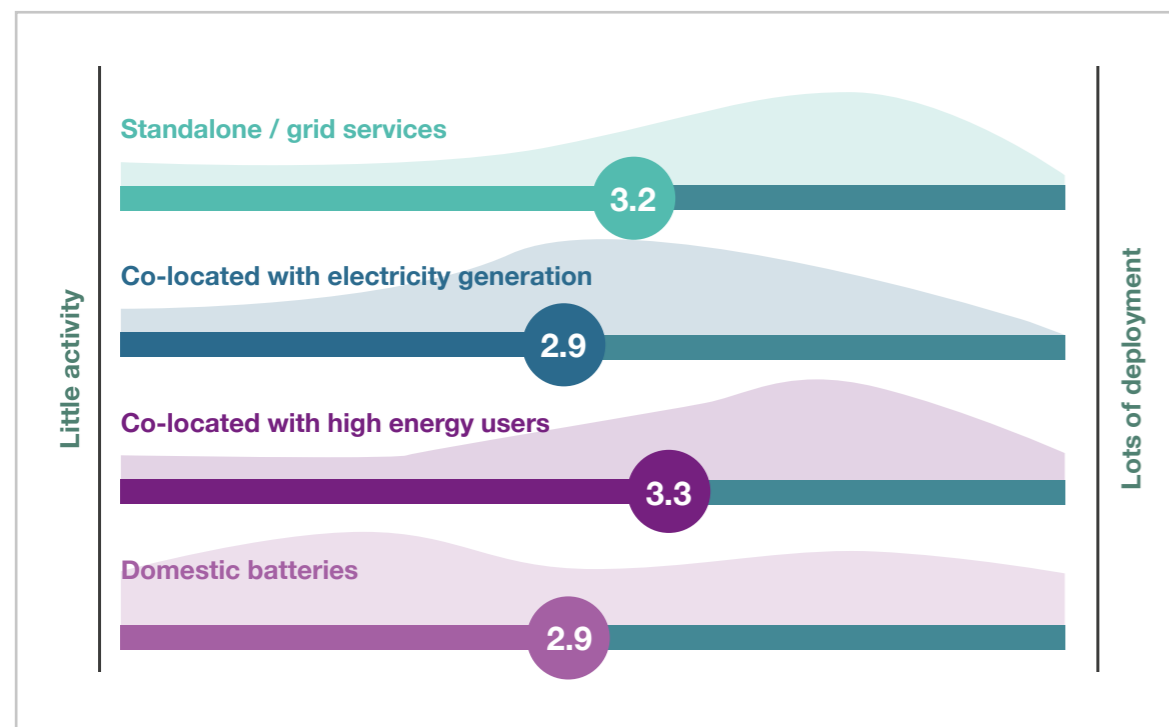
Your comments to us	Our response
Theme: solar PV	
You suggested that solar farm deployment would begin to increase again in the early 2020s, from 2022 onwards.	We will incorporate this trajectory into our models. There are many projects with accepted connection offers which could potentially be sites of development in the early 2020s.
You said that there is high potential for solar farm deployment, which could deploy at a high rate in the medium to long term.	
Cross licence area comparison:	
The results from both the West and East Midlands suggested that most attendees considered that ground-mounted solar deployment would pick up around 2022. There are many projects with an accepted connection offer, which are analysed as part of the DFES project, and this feedback will aid analysis of these projects. There was divergence in opinion regarding the longer-term deployment, however. During the East Midlands webinar, 20% of attendees thought that the rate of solar deployment would lessen after 2030, and almost 40% in the West Midlands webinar voted for this option. However, in both webinars, the majority voted that deployment would continue or increase after 2030.	

Figure 3
Webinar question results from the East Midlands webinar regarding the near-term deployment prospects of ground mounted solar PV



Your comments to us	Our response
Theme: energy storage	
There was support from stakeholders for all energy storage business models presented. However, domestic batteries were rated the least likely to have high deployment in the near term.	We will continue to analyse energy storage deployment through the four business models, and we will update our projections for domestic batteries to reflect this feedback.
You told us that co-located energy storage facilities would be likely be at least 50% of the power capacity of the solar farm, with around a quarter of respondents suggesting the storage sites would be 100% of the renewable energy asset capacity or larger.	This is higher than the current national baseline average, according to data from the Department for Business, Energy, and Industrial Strategy. We will increase our projected proportional power size for co-located energy storage sites.
You told us that energy storage technologies other than lithium-ion and solid state batteries could be deployed in the future. This included liquid or compressed air storage, power-to-gas sites, and small-scale pumped hydro.	We will review this for the next round of DFES and incorporate stakeholder feedback for which technologies we could include.

Figure 4
Webinar question results regarding the near term growth prospects for our energy storage categories

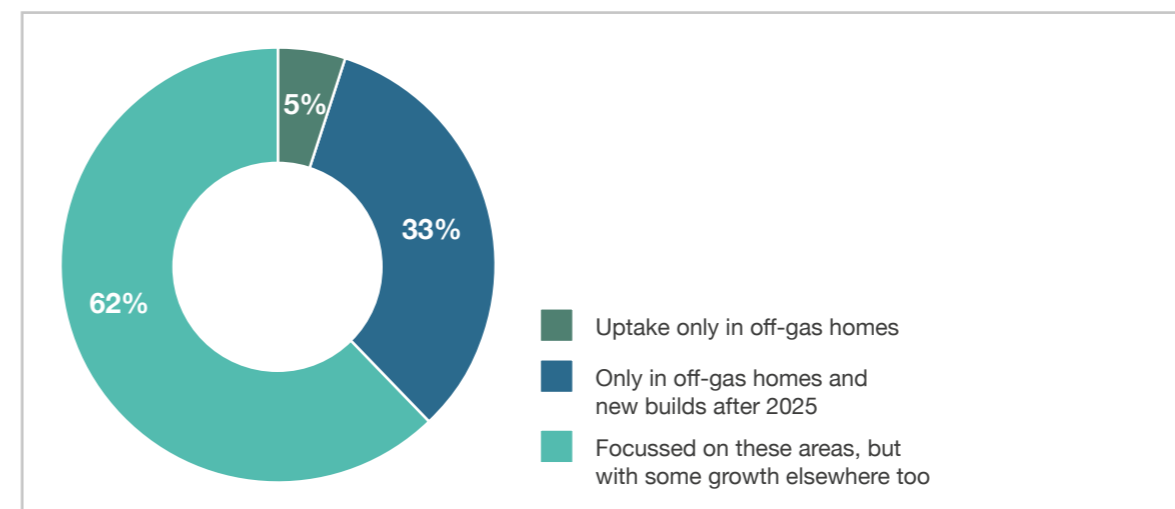


Your comments to us	Our response
Theme: domestic heat	
You asked what analysis of the potential uses of hydrogen do we include in our modelling?	The uptake of domestic hydrogen heating or electric heat pumps differs across the net zero scenarios, and the analysis includes both. However, we focus on electric heat pumps as we are reporting connections to the WPD network.
You told us that hydrogen produced in industrial clusters could be used to generate electricity.	We will review this for the next round of DFES and incorporate stakeholder feedback for including hydrogen peaking plants as an emerging technology by 2050.
The majority of the respondents suggested that gas boilers would continue to be installed in new homes up until 2025, however a significant minority thought that the rate would fall towards 2025.	We will incorporate these into the assumptions which feed our heat modelling work, keeping gas boiler deployment high in new builds out to 2025.
The majority of respondents suggested that though new homes and off-gas areas would receive higher heat pump installation rates, on-gas areas would also see uptake.	We will incorporate this into our spatial modelling, focussing most deployment in the early years in off-gas areas, but widening it out into other areas too.

Cross licence area comparison:

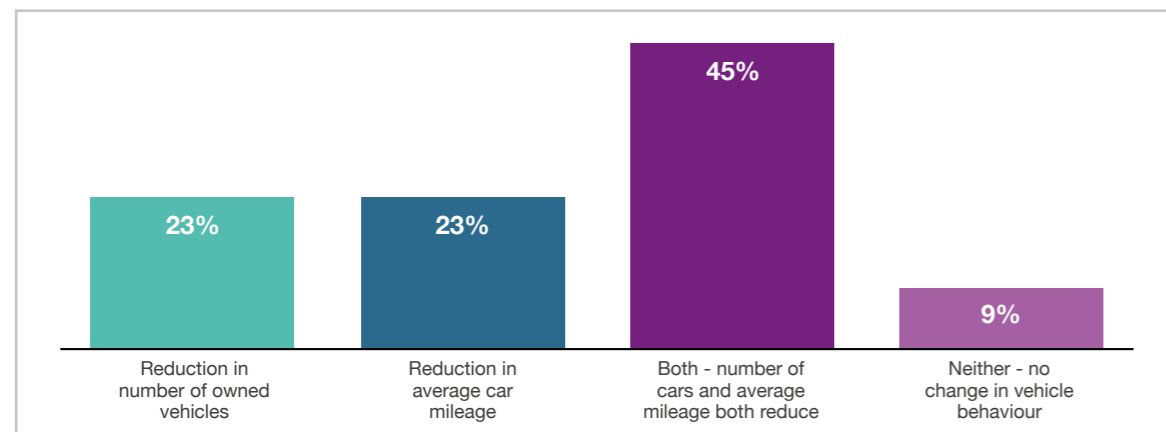
The spatial distribution of new heat pumps, who installs a heat pump and why, is a key assumption that was presented to the audience. Both audiences in the South Wales and South West disagreed with the assumption that deployment would be limited to just off-gas homes and new builds, and the modelling will be updated to reflect some uptake in on-gas homes in the near term.

Figure 5
Webinar question results from the South West webinar, regarding the spatial distribution of heat pump deployment in the near-term



Your comments to us	Our response
Theme: electric vehicles (EVs)	
You told us that in the long term under a net zero scenario, that both the number of vehicles, and the miles those vehicles drive, would be reduced.	Only 9% of respondents thought there would be no change, a clear message, though vehicle number reduction is not an assumption that is currently included in the FES. We will seek to include it in this round of the DFES under the most ambitious net zero scenario.
You asked what assumptions our model makes about the planned phase-out of petrol and diesel vehicles.	The previous FES incorporated the 2040 target, which has now been brought forward. Our modelling incorporates the new 2035 target, however there are other barriers and drivers which will strongly impact near-term uptake too.
You asked if the projections take into account the new houses and commercial buildings planned in the area, and how does we model deployment in existing homes?	Home-based electric vehicles such as electric cars, motorcycles, and some LGVs are modelled used demographic data such as off-road parking and vehicle ownership. Projected new builds are used to inform the spatial distribution of domestic electric vehicle chargers.
Cross licence area comparison:	
The audience from both the West and East Midlands webinars were asked how COVID-19 may impact transport use. In both webinars the outcomes considered most likely was 'less commuting due to working from home', and 'a near-term reduction in public transport use'. This impacts our transport model, potentially decreasing the number of miles driven by personal vehicles meaning a reduced energy demand from electric vehicle chargers. While in both webinars there was only limited expectation that COVID-19 would result in a reduced level of car ownership overall, there was high support for this option as part of a long-term ambitious net zero scenario, which will be included in the modelling of vehicle use long-term.	

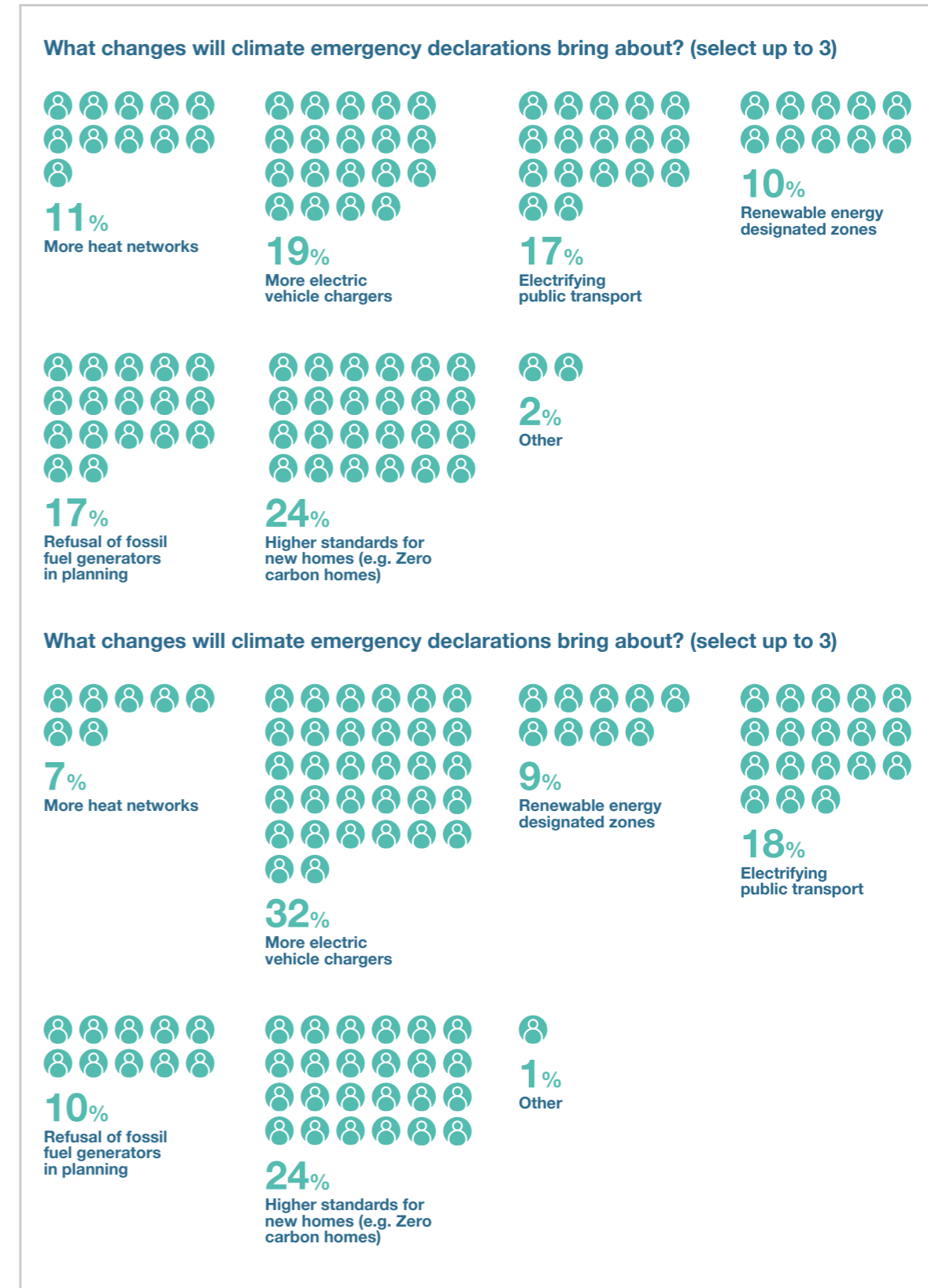
Figure 6
Webinar question results from the West Midlands webinar regarding how vehicle use may change in the long-term.



Your comments to us	Our response
Theme: DFES	
You asked us, to which areas do the ESAs relate?	The ESAs relate to the spatial area served by a single electricity 'primary' supply point. They are also cut by local authority boundaries (2019) so that an ESA which spans across multiple local authorities may be analysed at an ESA or at a local authority level.
If a local authority falls across two areas is the information for the full local authority of just for part of it?	Only the parts of the local authority which are within the WPD network boundary are included within the analysis. However, where an authority falls across multiple ESAs wholly within the WPD boundary, the full local authority is included.
Are the DFES scenarios different from the National Grid ESO Future Energy Scenarios?	The WPD DFES uses the same scenario framework as the National Grid ESO FES as this allows stakeholder to compare DFES/FES studies from different networks. However due to regional variations and a better visibility of near-term pipeline projects, there will be variation between the two publications.
How will the results be released, and are the slides available from these webinars?	The results of the DFES project and the consultation webinars will be made publicly available. We are interested in which publications you find most useful; a full dataset will be published, as well as an 'in 5 minutes' document, and an interactive map interface through which specific locational data can be downloaded.
You told us that it is not always easy to know who councils are required to contact at WPD as part of local plan preparation.	As part of the DFES 2020 process, WPD have started to liaise with Local Authorities through our Distribution Managers to review the current DFES projections and act as a point of contact for future Local Plan preparation. WPD will review this process for future DFES studies and investigate how to accommodate other utilities to provide a whole system approach to Local Energy Planning.
You asked if the WPD distribution managers can engage with Welsh Government Energy Service more formally.	Thank you for the feedback, this is an exercise which WPD will look to initiate with Welsh government.

Your comments to us	Our response
Theme: the climate emergency	
<p>The results of our webinar questions indicate that a climate emergency declaration could impact new developments, increase the provision of electric vehicle chargers, and lead to the refusal of more fossil fuel generators via the planning system.</p>	<p>We will incorporate these responses into our local authority weightings for various technologies, raising the deployment of local vehicle charging stations, public transport electrification, and low carbon technologies in new builds where climate emergencies have been declared.</p>
<p>Cross licence area comparison:</p> <p>The impact of local declarations of a climate emergency will differ by local authority, and with many declarations happening so recently the precise result is hard to evidence. However, attendees to both the East and West Midlands webinars suggested that increased provision of electric vehicle charging and electrified public transport would be a likely change. In the West Midlands, there was stronger expectation that fossil fuel generators would be refused planning permission, receiving 17% of votes, compared to 10% from the East Midlands webinar. In the modelling, those who have made a climate emergency declaration will in the medium-term receive a weighting towards electrified public transport, refusal of fossil fuel generation, and higher uptake for low carbon technologies in new build homes.</p>	

Figure 7
Webinar question results regarding the possible impacts of local climate emergency declarations (results shown from two webinars)

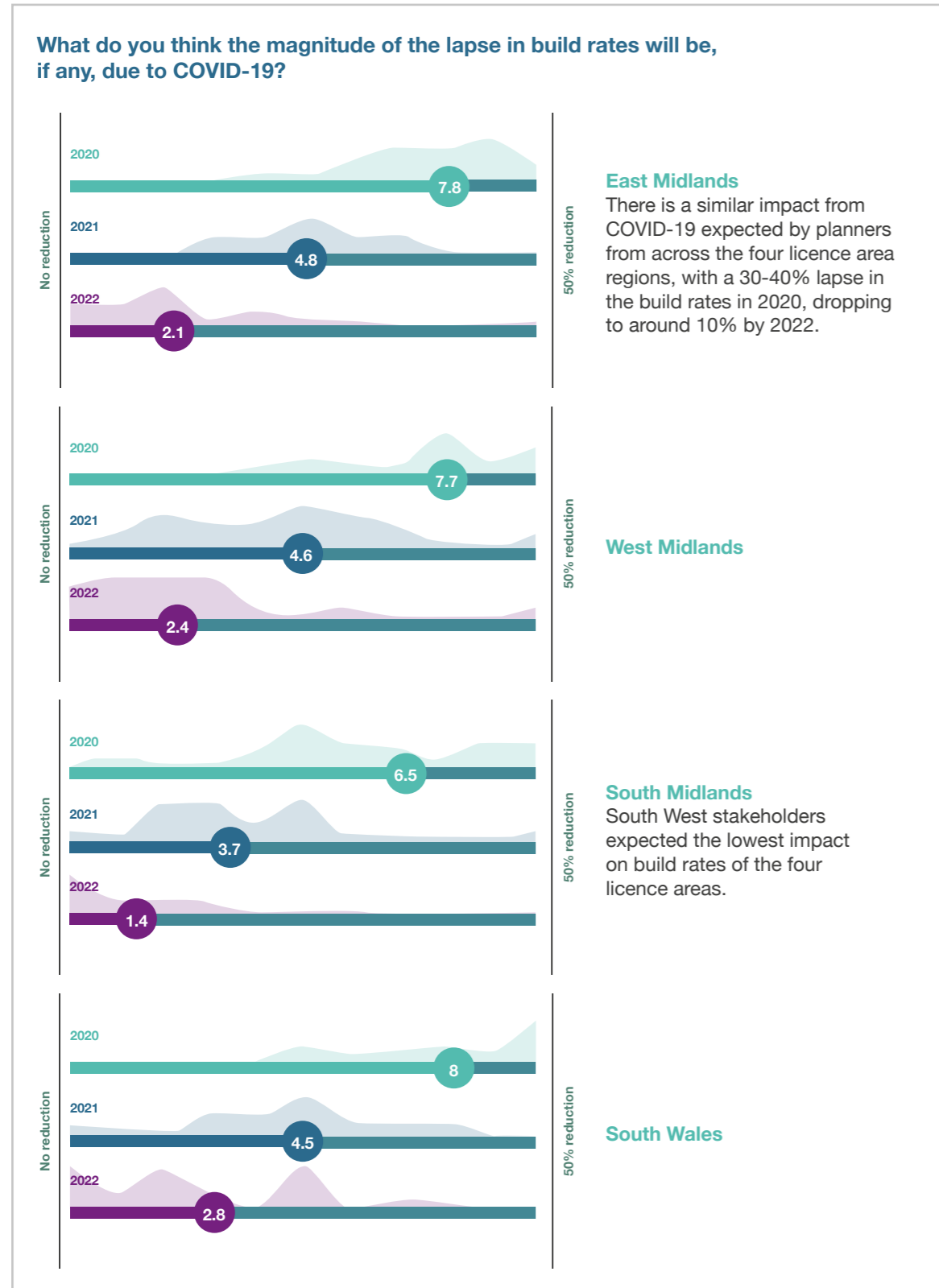


Your comments to us	Our response
Theme: new developments	
You asked how the DFES can effectively feed into Local Plan Infrastructure Delivery Plans.	<p>The DFES is designed to account for the most up to date Local Plan information available, and these projections are used in network analysis to determine potential reinforcements required.</p> <p>Our DFES projections are also disseminated to Local Authorities to review our assumptions and understand how WPD can feed into future Infrastructure Delivery Plans.</p>
You asked at what point in the Local Plan process do WPD want to know about development sites – when the plan has been adopted or when it is in draft.	Draft local plans offer an updated position over previously adopted local plans. Plans in the draft stage are therefore preferred.
You asked if half-hourly metered data is used or peak figures with a diversity factor applied, and whether WPD has their own benchmarks to forecast demand based on floor area.	<p>WPD use a combination of half hourly metered customer data and profiles derived from innovation projects applied to the DFES projections for electrical analysis. More information on the electrical profiles used can be found in our Shaping Subtransmission reports:</p> <p>www.westernpower.co.uk/smarter-networks/network-strategy/strategic-investment-options-shaping-subtransmission</p>

Your comments to us	Our response
Theme: WPD net work	
You said that lots of areas which would otherwise have renewable deployment face network constraints or high connection cost, which is limiting deployment.	We do our own resource assessment so that areas with low existing deployment but high potential are still included. We don't limit deployment in the modelling by network capacity as this wouldn't give an accurate picture of where investment may be needed.
You asked if there is a mechanism for like-minded developers to enter a consortium to reinforce existing infrastructure, and whether local authorities can push for investment in their area.	<p>Yes, this is possible and there is a page on the WPD website about this, link here:</p> <p>www.westernpower.co.uk/connections-landing/facilitating-sharing-of-information-for-potential</p>
You asked whether significant infrastructure is necessary for new domestic or commercial developments which may have vehicle charging or electric heating.	New connections to the distribution network will be designed to provide the lowest cost connection as required by the customer, which may include requirements to reinforce the network. As an industry we support a review of standards to accommodate electric vehicle charging and other low carbon technologies as a requirement for future developments, as this can be incorporated into future modelling.

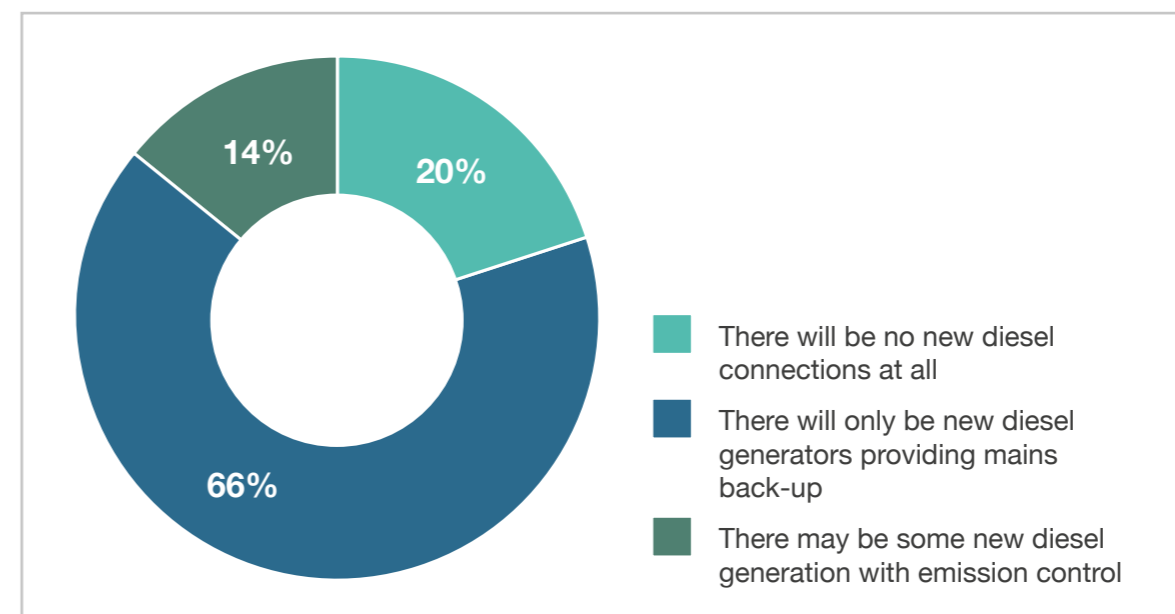


Figure 8
Webinar question results regarding any potential delay to new development build rates resulting from COVID-1



Your comments to us	Our response
Theme: COVID-19 and miscellaneous	
You told us that COVID-19 may lead to a delay to new developments, however that the impact would lessen by 2021 and 2022.	We will increase the delay for projects expected to be built in the near term.
You told us that a delay in new buildings development may not mean a reduction in overall development. It may mean that more 'non-allocated' sites are permitted.	Although we have not collected data for non-allocated developments, we will consider the effect of their possible early permission on the overall annual build out rates. As this is an annual process, we capture any changes each year to minimise discrepancies.
You asked if the role of local energy markets were included as part of the solution to balancing capacity issues.	Local energy markets aren't explicitly modelled anywhere in the DFES process, however assessing and signposting for the need for electricity system flexibility is a key use of the DFES dataset.
Results suggested that most stakeholders believed that the only new form of diesel generation will be to provide mains back-up, if they are deployed at all.	This is a key message and will be used in our modelling of diesel generator uptake and spatial distribution.

Figure 9
Webinar question results regarding the expected deployment of diesel power generation in the 2020s



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