Network innovation strategies
Stakeholder engagement feedback – round 2

January 2020

Contents

The network innovation strategies

The energy network operators produced the first joint innovation strategies for gas and electricity in 2018. They are required to be updated every two years. The purpose of the strategies is to encourage wider participation in innovation, collaboration, coordinated action on priority areas that offer significant potential benefit, shared learning and the minimising of duplication.

Why engage?

The network companies recognise that they don't have all the answers to the complex questions the energy industry faces. An extensive process of stakeholder engagement is, therefore, at the heart of updating these joint innovation strategies.

It is also recognised that partners are crucial to developing projects and suggesting new ideas. Therefore, the strategies need to be accessible, relevant and provide the right information to enable third parties to engage with network innovation activities.

Round 1:

| Expert Interviews | → | Online consultation | → | Webinars and roundtable |

Round 2:

| Stakeholder workshops (London and Glasgow) | → | Webinar | → | Strategy drafting |

What did we do?

- Round two of the engagement process built on feedback gained from an online survey and two webinars that were held over November and December 2019
- Workshop events were held in London and Glasgow in January 2020 to engage stakeholders, as well as a summary webinar for those unable to attend the events
- The Glasgow event on the 16th January had a 63% attendance rate along with input from Ofgem
- The London event on the 22nd January had a similar 64% attendance rate
- Between these two events we had around 100 participants
- Due to high participation in the workshops there were lower numbers for the webinar on the 24th January, however a number of polls were still conducted with the six participants.
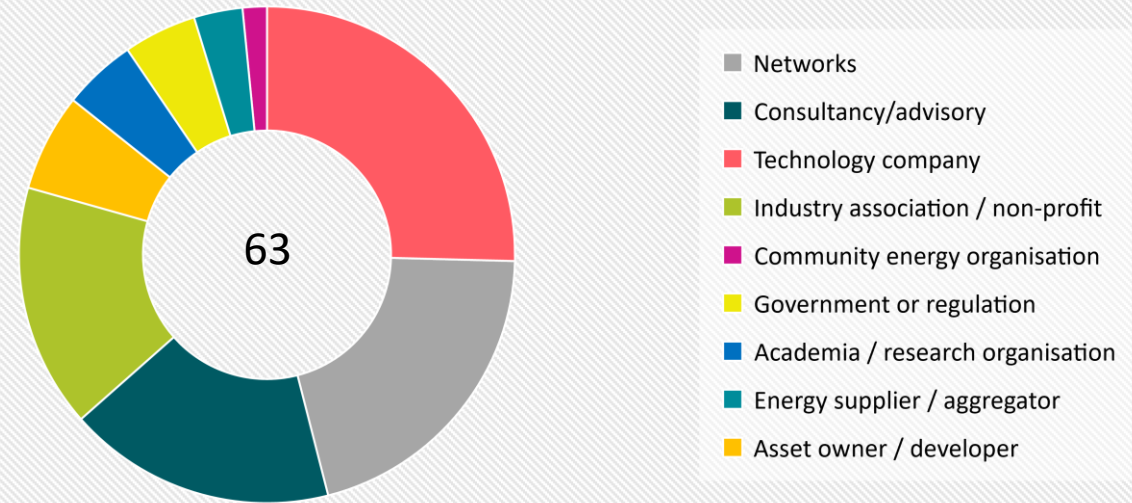
The findings

This report summarises the findings of this second stage of stakeholder engagement and Regen makes recommendations based on the feedback received. These recommendations will be used in the strategy drafting process.
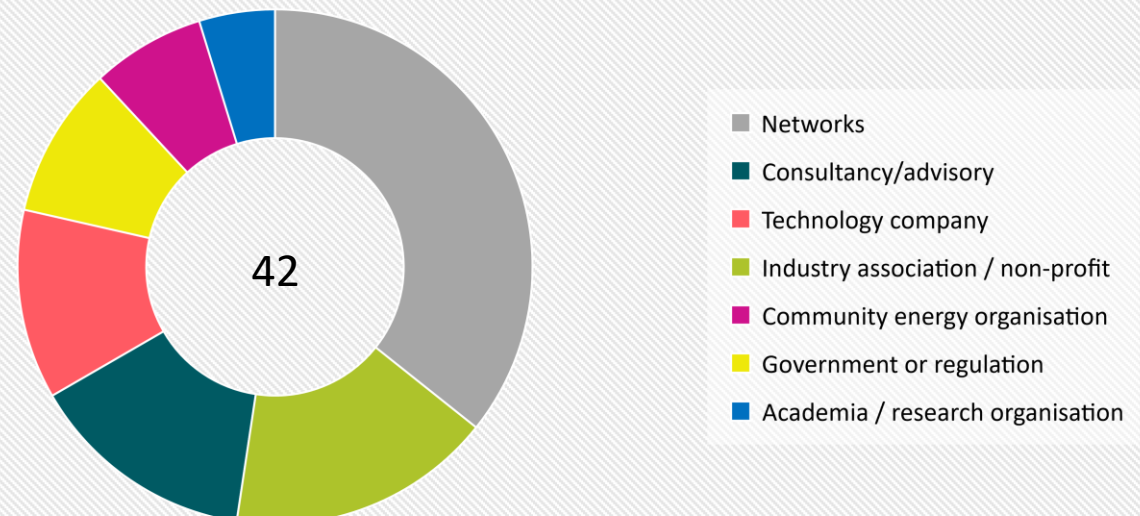
Participants

- Overall we had around 100 participants in the workshops and 6 webinar participants.
- The London event included a wider range of sectors with 25% from technology companies and 17% representing consultancy or advisory companies.
- Glasgow had a larger participation from the networks, but still included 17% industry associations / non – profits and 14% consultancy or advisory companies.
- Within the workshops there were breakout discussions talking through the focus areas of each of the five innovation themes. The outcomes of these were fed back into a series of polls. Each event had 11 polls as well as a Q&A session.
- The webinar conducted the same polls as the London event and welcomed additional feedback around the themes.
- The full list of organisations that participated can be found in Appendix 1.

London participants by sector

63

- Networks
- Consultancy/advisory
- Technology company
- Industry association / non-profit
- Community energy organisation
- Government or regulation
- Academia / research organisation
- Energy supplier / aggregator
- Asset owner / developer

Glasgow participants by sector

42

- Networks
- Consultancy/advisory
- Technology company
- Industry association / non-profit
- Community energy organisation
- Government or regulation
- Academia / research organisation
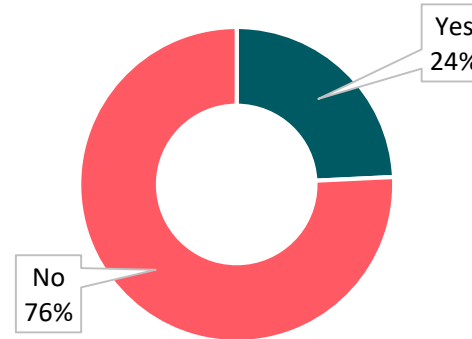
Underlying principles of network innovation

Findings

- As part of the morning presentations at the beginning of the workshops there was discussion around our decision to not have decarbonisation as an underlying principle at this stage.

- Across the two workshops 72% of participants said that they didn't believe that there were any principles missing. This is an improvement from the first round of engagement which saw only 44% believing that there were no principles missing.

- Of those that did think there were principles missing, we received 19 responses which have been summarised in the chart on the right.

- The most common responses were around decarbonisation and sustainability despite our justification of the reasons why it had not been included.
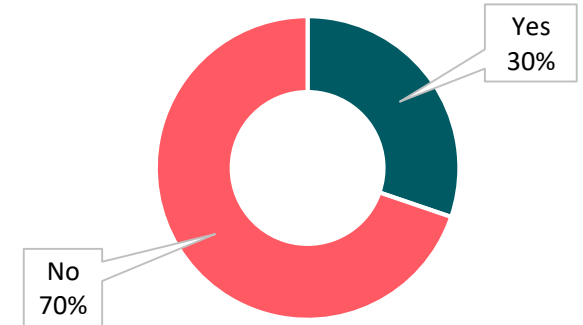
Regen recommendations

- Stakeholders were not fully satisfied by our justification for not including decarbonisation as an underlying principle, as all projects will have a carbon impact. Therefore we recommend that 'carbon impact' is included as an additional underlying principle, which would encourage the consideration of carbon (potentially both embedded and operational), as well as contributing the wider transition to net zero.

Glasgow – are there any missing underlying principles?
Yes 24%
No 76%

London - are there any missing underlying principles?
Yes 30%
No 70%

Principles considered missing
Decarbonisation / sustainability
Whole system
Health and safety
Fairness/openness
Decentralisation/community
Measurement
Future system
Learning

Defining the key themes for network innovation

Regen recommends the following changes to the definitions of the five themes, off the back of feedback received in round 2 of engagement:

- **Consumer vulnerability:** Exploring how best to support the needs of consumers in vulnerable circumstances today and in the future, ensuring that everyone can experience the benefits of the energy transition and those adversely affected by change is minimised.

- **Net zero and the energy system transition:** Facilitating and accelerating the UK's transition to net zero greenhouse gas emissions before 2050.

- **Optimised assets and practices:** Developing and implementing industry leading techniques for optimising assets and practices for energy networks.

- **Flexibility and commercial evolution:** Developing and testing innovative solutions to increasing the flexibility, transparency and efficiency of the energy system, enabling information to be more open and networks to be more responsive to change.

- **Whole energy system:** Enabling joined up and efficient approaches across multiple aspects of the energy system around planning, forecasting, design, construction, operation, maintenance and data. [bullet points removed]

- **We will also look to clarify that the strategy is focused on what role(s) networks and network innovation can play under these themes.**
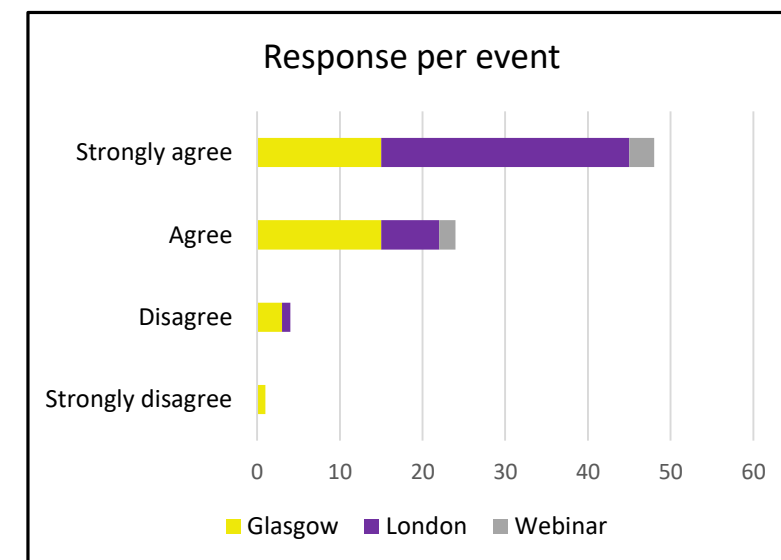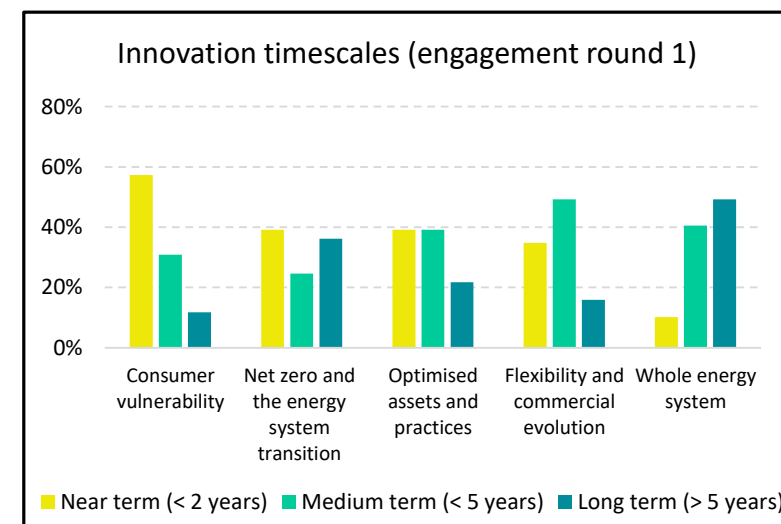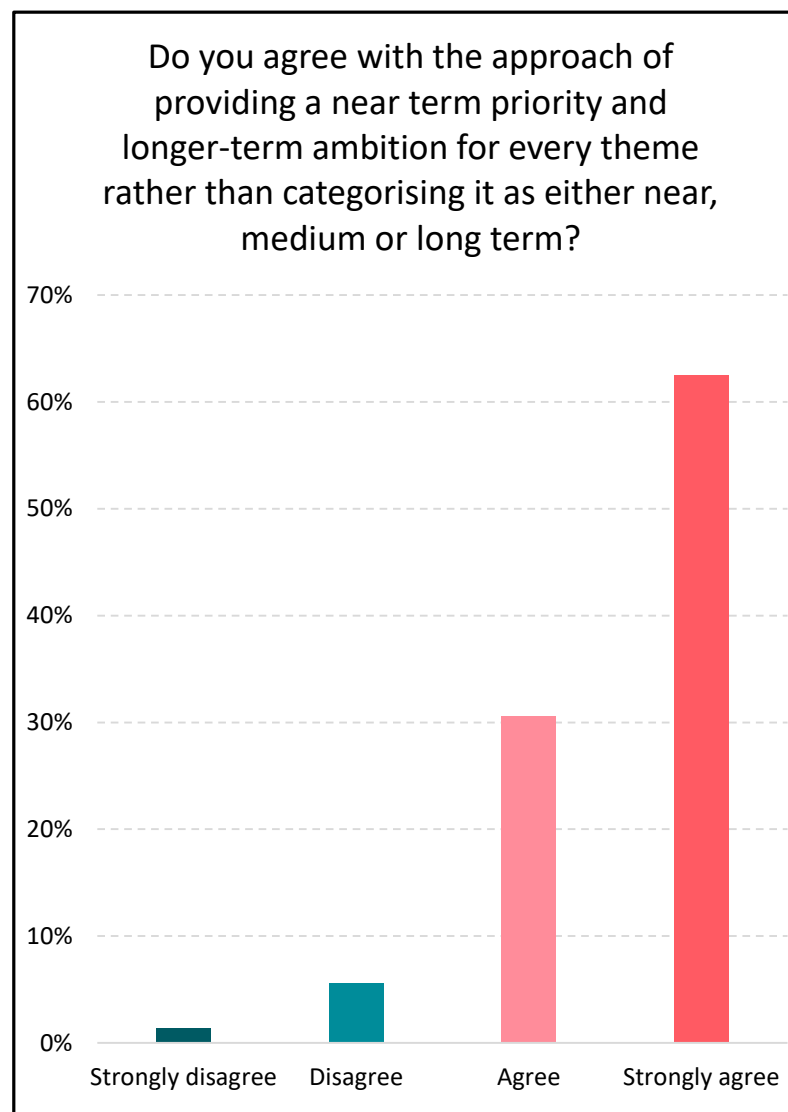
Innovation theme	Stakeholder feedback	Recommendation
Consumer vulnerability	'Nobody' to be adversely affected is unrealistic Vulnerability needs to be defined	Change to minimise those adversely affected Definitions of vulnerability to be provided in description
Net zero and the energy system transition	Regional targets could be different to 2050 2050 is potentially too late	Change 'by' to 'before' 2050
Optimised assets and practices	Definition is too long	Make definition snappier with more detailed explanation to be included in the description
Flexibility and commercial evolution	Should focus on 'innovative' rather than 'technical and commercial' solutions Include references to regulatory context	Change 'technical and commercial' to 'innovative'
Whole energy system	Definition is too long, bullet points shouldn't be included	Make definition snappier with detail/examples provided in explanation

Timeframes for themes

Findings

- There was strong agreement across both workshops for the proposed approach to summarise both the near and long term priorities/ambitions for all themes, instead of categorising each of them as either near, medium or long term.

- This follows on from the previous round of engagement which showed a wide range of responses to the timescale categorisation of the themes.

- Despite the positive general consensus, there was a much stronger agreement at the London event than at the Glasgow. 79% of participants strongly agreed and 97% agreed in total whilst in Glasgow 44% strongly agreed and 88% agreed in total. London also saw no one strongly disagreeing.

- The webinar saw 60% strongly agree and 100% agree in total.

Regen's recommendations

- For each theme, take the shortlisted focus areas forward to develop near term priorities and work with the networks to define a long term ambition.

Do you agree with the approach of providing a near term priority and longer-term ambition for every theme rather than categorising it as either near, medium or long term?

Innovation timescales (engagement round 1)

Legend: Near term (< 2 years) ■ Medium term (< 5 years) ■ Long term (> 5 years)

Response per event

Legend: Glasgow ■ London ■ Webinar

Q&A sessions

Findings

- The Q&A sessions raised a broad range of questions regarding how the Network Innovation Competition and Allocations are run, the new strategy writing process, the themes and the principles proposed. Most of the questions were answered in the Q&A session however there were a few that require some further consideration.

- During the London workshop the participants were asked why or why not people had engaged in network innovation before. A summary of the answers from two people covering both sides is included in the boxes on the right.

- The webinar raised questions around the next stages of the strategy writing and why it is difficult to engage with the networks around these topics. Both were answered directly through a follow up response email and a summary of the next steps was outlined in the webinar slides.

- The full list of questions and comments can be found in Appendix 2.

Questions categories

Category	Value
NIC/NIA	25%
Drafting process	20%
Theme	45%
Focus areas	10%
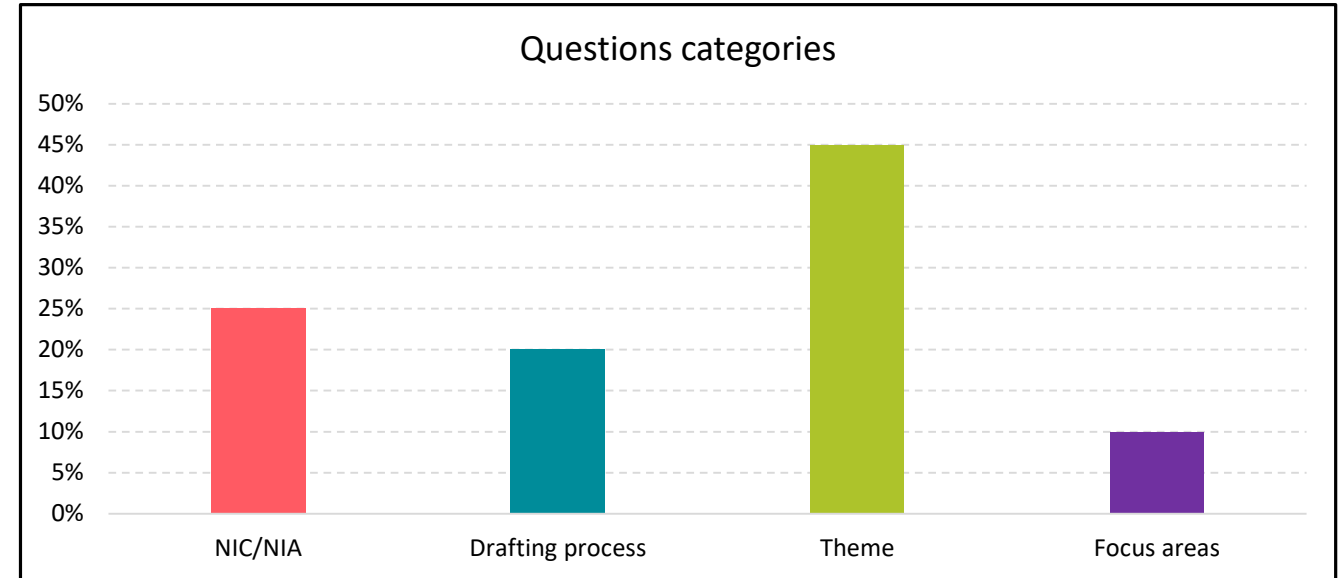
Had engaged in network innovation:

- Innovation activity is good route into the industry for researchers e.g. the next generation of engineers

- NIC so lots of partners and big budget - scale enables whole energy system. Question going forward how you can involve other utilities, sectors

Hadn't engaged in network innovation:

- Too network focussed and run by the networks

- Network benefit focussed and NIA has no great scale of ambition. Not large scale enough. Need independent organisation running the funding pots.

Network innovation themes – Key focus areas

Summary of process and results:

- Up to five focus areas were summarised for each theme as the key discussion points for the Glasgow workshop roundtable groups.

- During the workshop these focus areas were reviewed and edited and additional ones were proposed by the groups.

- Suggested changes and the additional focus areas were then fed back and added to polls, which were then voted on by the stakeholders.

- The top five focus areas that came from the polls for each theme were then used as the key discussion points for the London workshop and the webinar.

- The London workshop attendants went through a similar process as the Glasgow participants, visiting key innovation theme 'market stalls' facilitated by representatives from Regen, ENA and network companies. The attendees them completed a series of polls around the focus areas.

- Those on the webinar similarly voted on the priority focus areas, without making any edits or additions. The voting from the webinar was combined with the London votes.

- The results of the polling at the events and webinar provided a set of the highest priority focus areas for each theme as voted by the stakeholders.

Proposed focus areas for each theme
Some areas shared, some were specific to electricity and gas networks

↓

Discussion, revisions and additions

↓

Polls enabling stakeholders to vote on the most important focus areas

↓

Revised shortlists of five key innovation focus areas under each theme

Findings

- The discussions brought around many interesting points with this theme in particular stimulating significant debate around the definition of vulnerability, the scope of the theme and the its relevance within network innovation.

- For the 'support for customers that are vulnerable supply interruptions' there were questions whether this should be combined with consumer visibility or broadened to include other utilities as well as comments regarding the clarity of the wording.

- 'Supporting fuel poor and improving customer affordability' was mentioned as a more important topic but there was a question whether this was within the remit of the networks or network innovation.

- Increasing visibility brought about questions around the definition of visibility and the privacy of consumers and consumer data.

- Other questions were raised as to whether the theme should be limited to just vulnerable customers or all customers, since vulnerability can change over time.

- There was also a large focus on the role of smart technology and partnerships.

| Consumer vulnerability – Proposed focus areas (electricity and gas) |
|---|
| Improve the support for customers that are vulnerable to supply interruptions |
| Support the fuel poor and improve customer affordability |
| Increase the visibility of vulnerable consumers |
| Understand and remove barriers to adopting smart technologies and services for vulnerable customers |
| Improve the customer experience for vulnerable consumers |

Consumer vulnerability – Revised focus areas (electricity and gas), ranked by stakeholder importance
1. Understand and remove barriers to adopting smart technologies and services for vulnerable customers
2. Support the fuel poor and improve customer affordability
3. Define and increase the visibility of vulnerable consumers and their data, as well as customer visibility of networks
4. Co operation with other parts of industry and other sectors e.g. water
5. Improve the support for customers that are vulnerable to supply interruptions
6. Looking at the future of vulnerability and its definition such as understanding the vulnerability that comes with EVs
7. Improve customer engagement with clearer messaging

Percentage of participant votes for each focus area:

10
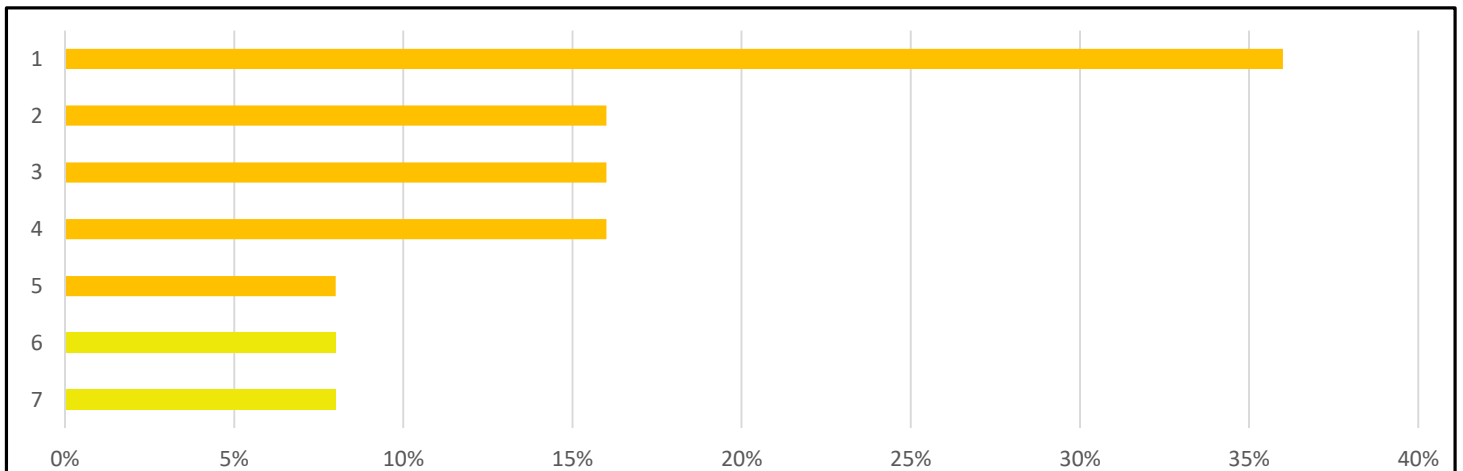
Findings

- 'Support the fuel poor and improve customer affordability' was reworded slightly but it was also mentioned that the those who are the most affected by fuel poverty should be helped first with energy efficiency measures

- Discussion around 'increasing the visibility' raised the potential to expand this into increasing the transparency for customers, working with other businesses and the importance of education and information

- 'Understanding the barriers to adopting smart technologies' was not considered to be holistic enough and was replaced with 'new technologies'. It was mentioned that vulnerable customers should be prioritised around this.

- 'Co-operating with other parts of the industry' was broadened in the discussion to include partnerships with community organisations and local government. However there was also feedback that this was more of a principle and not an outcome.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

| Consumer vulnerability – Proposed focus areas (electricity and gas) |
|---|
| Improve the support for customers that are vulnerable to supply interruptions |
| Support the fuel poor and improve customer affordability |
| Define and increase the visibility of vulnerable consumers and their data, as well as customer visibility of networks |
| Understand and remove barriers to adopting smart technologies and services for vulnerable customers |
| Co operation with other parts of industry and other sectors e.g. water |

Consumer vulnerability – Revised focus areas (electricity and gas), ranked by stakeholder importance
1. Understand and remove barriers to adopting new technologies and services for vulnerable customers
2. Building resilient local communities
3. Support the fuel poor and improve affordability for customers
4. Fairness in funding/charging system and available grants and subsidies
5. Increase the visibility of, and engage with, vulnerable consumers to the networks and the networks to the vulnerable
6. Co-operate and partner with other parts of industry and other utilities
7. Understanding changing customer base and energy system and what vulnerability means over time
8. Improve the support for customers that are vulnerable to supply interruption

Percentage of participant votes for each focus area:
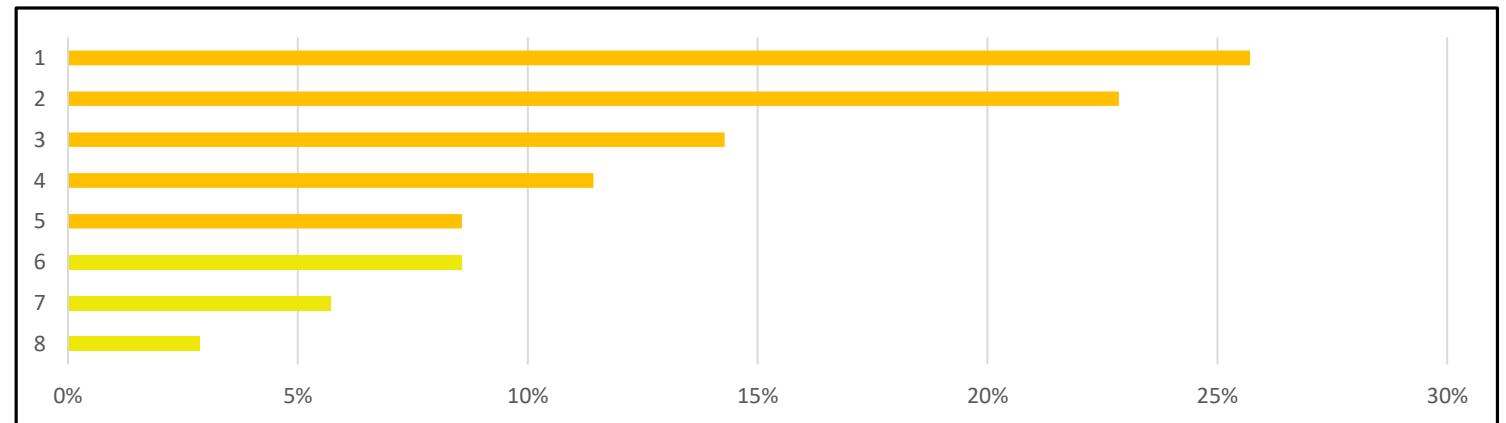
Findings

- Net zero was seen to have a significant crossover with whole energy systems.

- The majority of focus areas stayed the same at this point in the engagement process

- 'Electricity storage' was replaced with 'flexibility and smart systems', as participants thought it should be more technology neutral.

- 'Facilitating behavioural change' was identified as a difficult area from the perspective of network companies, but participants thought that they should support energy efficiency measures and improve customer communications.

- There were a few additional focus areas considered at this point, including: the reduction in the use of Sulfur Hexafluoride (SF_6), smarter networks, more dynamic control systems, collaboration with petrochemical industry and maximising the value of renewables on the network.

- Focus areas around supporting islanded or off-grid communities, supporting job transition or aging workforces through social justice and engaging with carbon intensive industries didn't get any votes through the poll.

| Net zero and the energy system transition – Proposed focus areas (electricity) |
|---|
| Enable more renewable electricity generation |
| Facilitate and enable the electrification of heating and transport |
| Facilitate the adoption of electricity storage |
| Facilitate behavioural change through smart meters and energy efficiency |

Net zero and the energy system transition – Revised focus areas (electricity), ranked by stakeholder importance
1. Facilitate and enable the electrification of heat and transport
2. Facilitate the adoption of flexibility and smart system
3. Enable more renewable electricity generation
4. Social justice in the transition
5. Engage with carbon intensive industries
6. Support off-grid and islands

Percentage of participant votes for each focus area:

regen
transforming energy
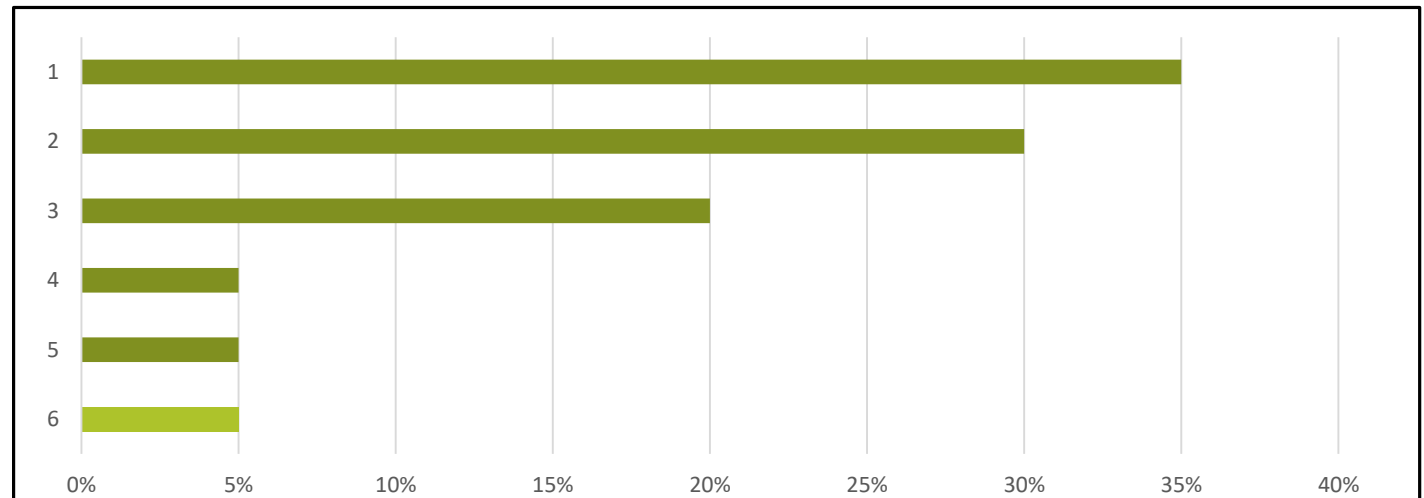
Findings

- London stakeholders enabled some further clarity on some the focus areas, with the 'adoption of flexibility' being expanded to include 'more existing and new sources'.

- 'Renewable electricity generation' became 'zero carbon electricity generation', due to the inclusion of low carbon sources with CCS.

- 'Engaging with carbon intensive industries' caused debate around whether it would be via befriending or tackling.

- There were two additions of 'large scale, long duration storage', however the definition required more clarity over daily or seasonal cycling/duration.

- 'Understanding the cost of carbon with a focus on the price or market' was also introduced as an additional focus area.

- The additions from this session were chosen instead of those from the previous workshop.

- The top three focus areas were consistent across both workshops and the webinar.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

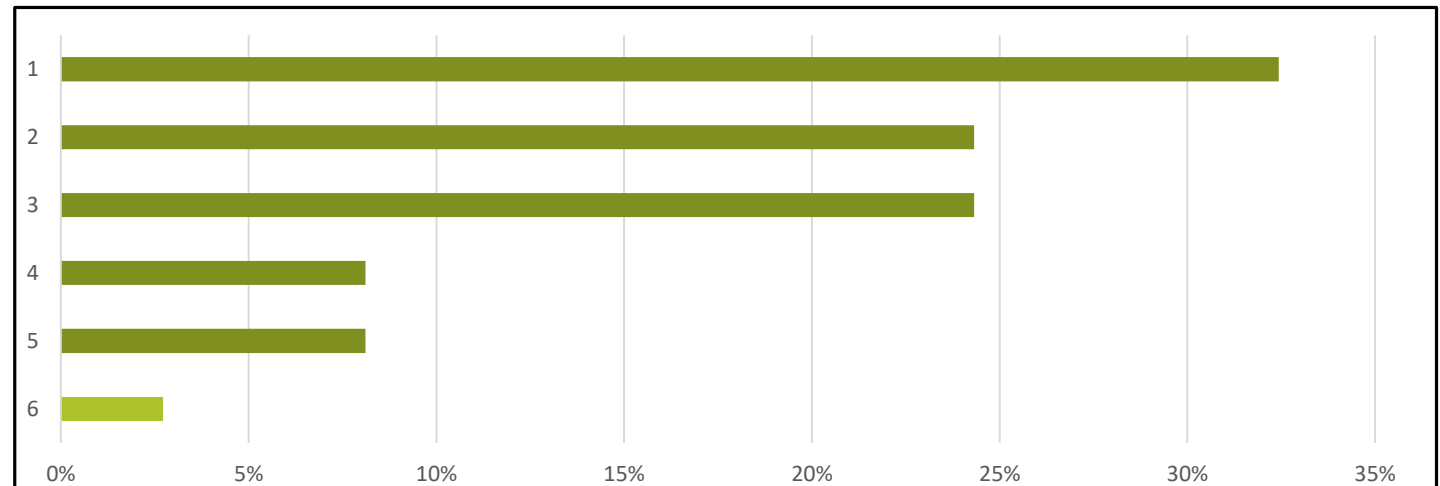| Net zero and the energy system transition – Proposed focus areas (electricity) |
|---|
| Facilitate and enable the electrification of heat and transport |
| Facilitate the adoption of flexibility and smart systems |
| Enable more renewable electricity generation |
| Engage with carbon intensive industries |
| Ensure social justice in the energy transition |

Net zero and the energy system transition – Revised focus areas (electricity), ranked by stakeholder importance
1. Facilitate the adoption of more existing and new sources of flexibility and smart systems
2. Facilitate and enable the electrification of heat and transport
3. Enable zero carbon electricity generation
4. Opportunities for large scale long duration storage
5. Understanding the cost of carbon
6. Ensure social justice in the energy transition

Percentage of participant votes for each focus area:

Findings

- Many focus areas were seen as shared between gas and electricity around the topic of net zero with potential for combining the two.

- 'Low carbon heating' was expanded to include transport, echoing an equivalent electricity network focus area, with some consideration around the potential increase in hydrogen fuelled vehicles.

- The focus area of 'hydrogen ready networks' prompted discussions around how the consumers use and interact with hydrogen and potentially other green gases. The wording of the focus area was ultimately kept the same.

- 'Supporting the adoption of energy efficiency in homes' was considered difficult from a network company viewpoint, since it is on the other side of the meter for them. This focus area was not prioritised due to receiving no votes.

- 'Social justice' and 'supporting islanded communities' electricity focus areas were brought across to gas, considering some alignment of these topics across both networks.

- 'Reliability and resilience' was also added and became the only addition to receive more than 4% of votes.

- 'Enabling the transition to low carbon heating and transport' received 56% of votes in the gas section compared to only 35% in electricity.

| Net zero and the energy system transition – Proposed focus areas (Gas) |
| --- |
| Enable the transition to low carbon heating |
| Facilitate the supply of a wider range of gases |
| Actively develop hydrogen ready networks |
| Support the adoption of further energy efficiency in homes and businesses |

Net zero and the energy system transition – Revised focus areas (Gas), ranked by stakeholder importance
1. Enable the transition to low carbon heating and transport
2. How markets will enable transition
3. Actively develop hydrogen ready networks
4. Resilience and reliability
5. Facilitate the supply of wider range of gases
6. Social justice within transition
7. Support off-grid and island networks

Percentage of participant votes for each focus area:

14
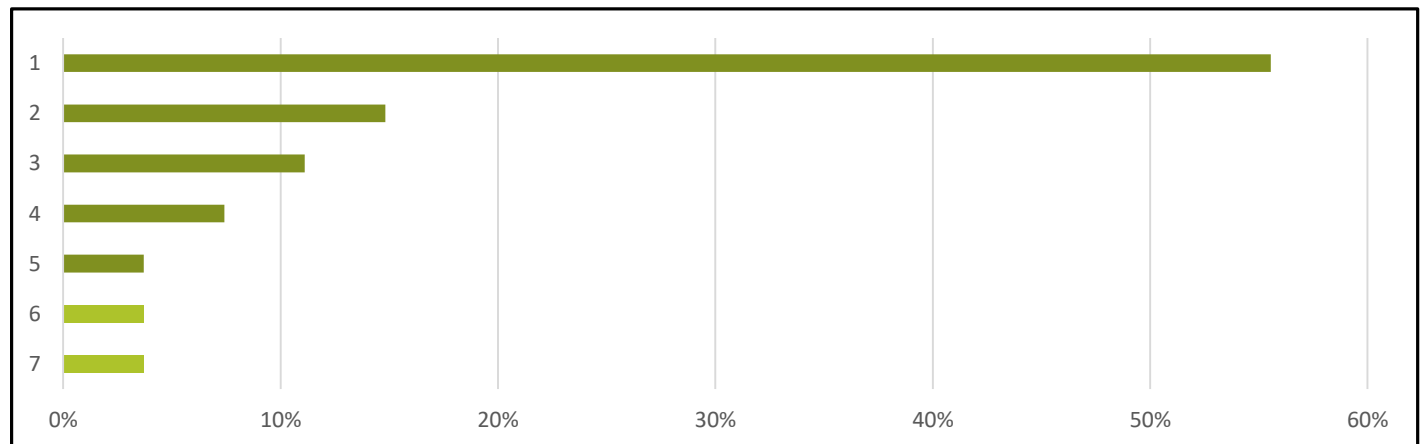
Findings

- The London participants made some revisions to the existing focus areas, but created no additions, meaning that all of the existing focus areas were in the top 5.

- Before the session, 'green gas' had been added to the 'hydrogen ready networks', following comments received from the Glasgow event.

- 'Facilitating the supply of wider range of gases' was reworded to focus on 'prioritising the best solution for the supply of wider range of gases'.

- The most significant change was to the 'develop markets to support and enable the energy transition' focus area. This now includes 'commercial, legal and market solutions to enable the transition' and focuses on understanding them instead of developing them.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

| Net zero and the energy system transition – Proposed focus areas (Gas) |
|---|
| Enable the transition to low carbon heating and transport |
| Develop markets to support and enable the energy transition |
| Actively develop hydrogen and green gas ready networks |
| Ensure resilience and reliability through the transition |
| Facilitate the supply of wider range of gases |

Net zero and the energy system transition – Revised focus areas (Gas), ranked by stakeholder importance
1. Actively develop hydrogen and green gas ready networks
2. Enable the transition to low carbon heating and transport
3. Understand commercial, legal and market solutions to enable the energy transition
4. Ensure resilience and reliability through the transition
5. Prioritising the best solution for supplying a wider range of gases

**Percentage of participant votes for each focus area:**

15
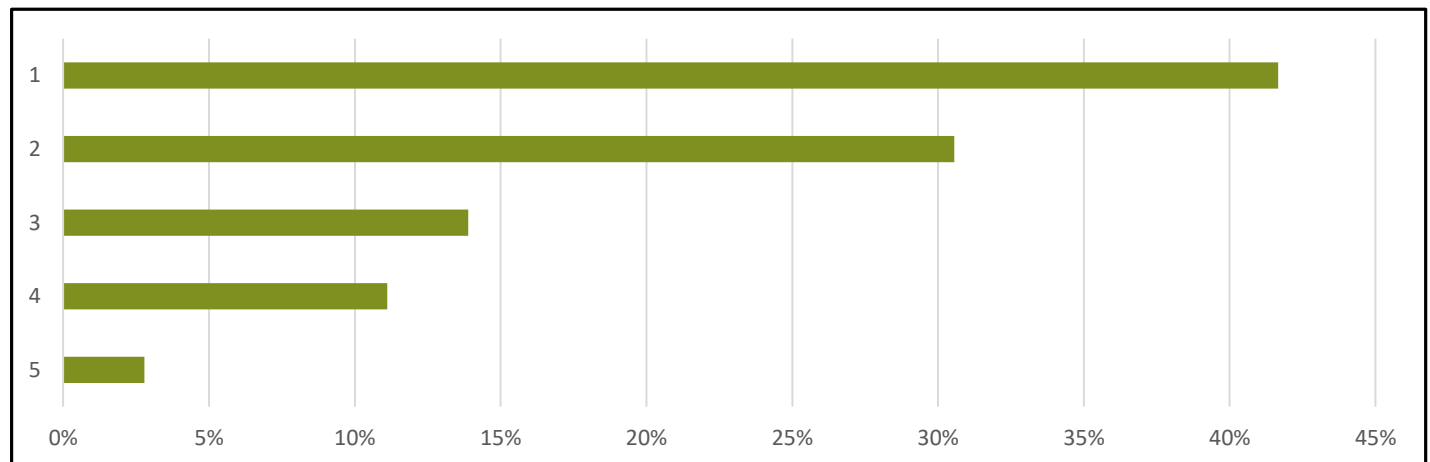
Findings

- This theme also saw a lot of cross over between the gas and electricity sections

- 'Reduce and mitigate unplanned outages' was seen by some as business as usual and some thought that optimising assets was in conflict with the idea of unplanned outages. 'Supply interruption' was resultantly added and it received the most votes.

- The three shared focus areas did not make through into the top five for this theme.

- The additions of 'reducing wider disruption', 'maximising the use of assets across networks' and 'digitalisation' received 9%, 27% and 9% of the votes respectively.

- 'Improving the visibility of connected customers' was seen as key to enabling flexibility, however the inclusion of data was also highlighted.

- There were many other additional focus areas created for this theme that didn't receive any votes. These include 'reducing the impact on the environment', 'more disruptive supply chain', 'telecoms infrastructure', 'reducing losses' and 'improving the visibility of buried assets'.

Optimised assets and practices – Proposed focus areas (electricity)
Reduce and mitigate unplanned outages
Improved visibility of connected consumers and generators and their behaviour
Industry leading standards for cyber security and data protection
Industry leading standards for safety and health of workforce and the public
Improved forecasting and network planning processes

Optimised assets and practices – Revised focus areas (electricity), ranked by stakeholder importance
1. Maximising the use of assets across networks
2. Reduce and mitigate unplanned outages and supply interruption
3. Improve the visibility of connected customers and generators and their behaviour
4. Reducing wider disruption
5. Digitalisation
6. Industry leading standards for the health and safety of workforce and the public

Percentage of participant votes for each focus area:

16
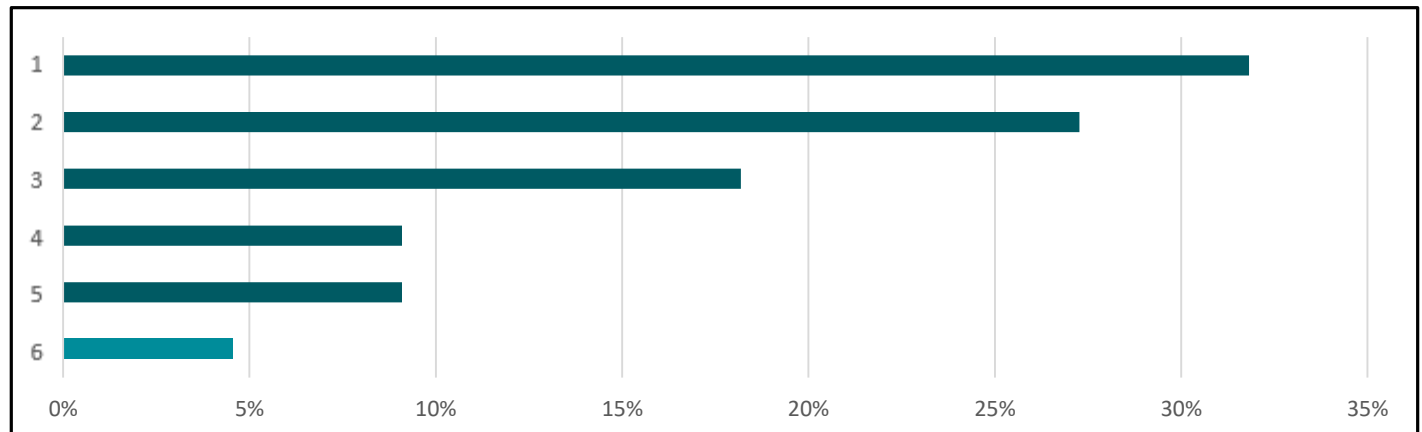
Findings

- 'Improve the visibility of connected customers' was adapted to be 'and/or' their behaviour due to a lack of clarity over the wording

- 'Maximise the use of assets' was adjusted to be 'optimise...', due to an understanding that maximising the use of assets isn't often the most efficient approach or outcome

- Only the top four received any votes in London. But 'reduce wider disruption' was included in the final list as it received votes in Glasgow.

Regen's recommendation is that the top five focus areas are taken forward for further revision and consider the option to rationalise and combine with the gas network focus areas for the strategy.

Optimised assets and practices – Proposed focus areas (electricity)
Reduce and mitigate unplanned outages and supply interruptions
Maximise the use of assets
Improve the visibility of connected customers and generators and their behaviour
Enable digitalisation for optimisation
Reduce wider disruptions

Optimised assets and practices – Revised focus areas (electricity), ranked by stakeholder importance
1. Improve the visibility of connected customers and generators and/or their behavior
2. Enable digitalisation for optimisation
3. Optimise the use of assets
4. Reduce and mitigate unplanned outages and supply interruptions
5. Reduce wider disruption

Percentage of participant votes for each focus area:

Optimised assets and practices (gas) – Glasgow
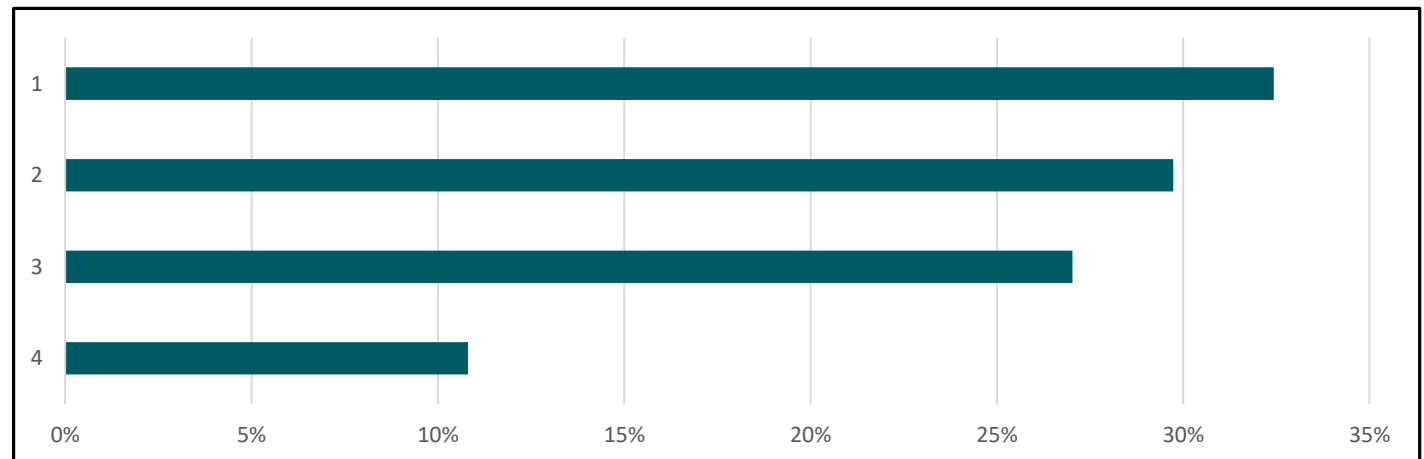
Findings

- Due to the similarities between the two sections of this theme, once some new focus areas were added to the electricity poll, it was copied across and 'visibility of connected customers' was replaced with 'acceleration of gas pipe replacement', as a key focus area.

- Despite the similarities, gas brought about different poll results. 'Reducing unplanned outages' remained on as the area with the most votes. However 'maximising assets' received no votes, with 'reducing impacts on the environment' being seen as more important.

- 'Improved forecasting and network planning process' also secured more votes that 'digitalisation' as a key focus area.

- Optimised assets saw a lot of potential additions with 'asset management', 'asset health/lifecycle', 'improving operational practices' and 'system inertia and fault tolerance' were all proposed.

| Optimised assets and practices – Proposed focus areas (gas) |
|---|
| Reduce and avoid unplanned supply interruptions and pressure issues |
| Develop solutions to tackle aging gas network assets and infrastructure |
| Industry leading standards for cyber security and data protection |
| Industry leading standards for safety and health of workforce and the public |
| Improved forecasting and network planning processes |

Optimised assets and practices – Revised focus areas (gas), ranked by stakeholder importance
1. Reduce and mitigate unplanned outages and supply interruptions
2. Acceleration of gas pipe replacement
3. Reducing wider disruption
4. Improved forecasting and network planning process
5. Reducing the impact on the environment
6. Digitalisation

Percentage of participant votes for each focus area:
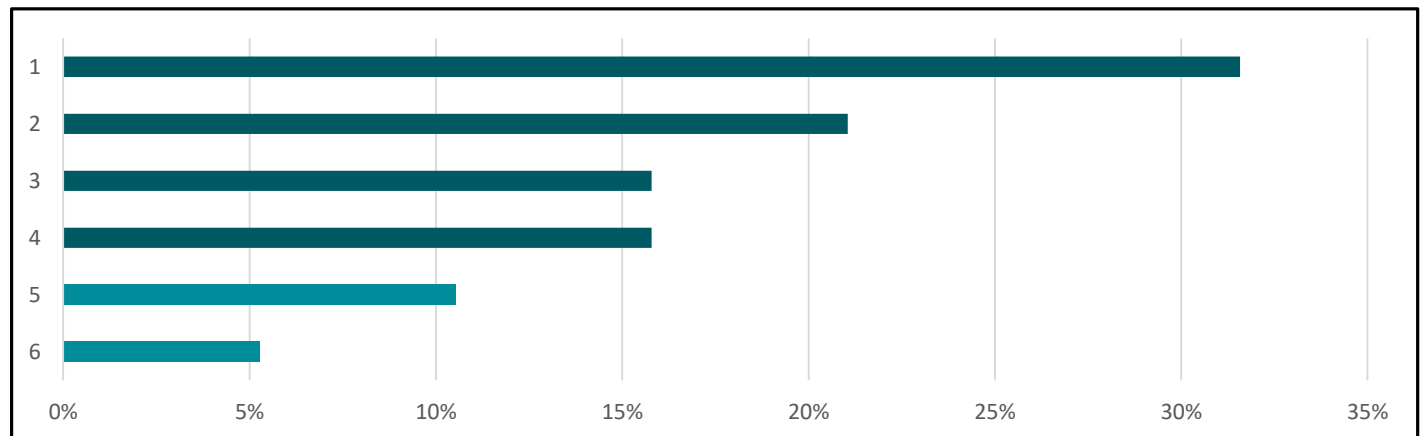
Findings

- The discussions tended to be heavily focused on electricity rather than gas, therefore few changes were made.

- One significant change was the replacement of 'accelerate gas pipe replacement' with a broader focus area of 'facilitate new gases'.

- The event also saw the addition of a few new focus areas, such as on 'people and practices' and 'safety, security and health'.

- 'Reducing environmental impact' was again picked up as an important focus area for the gas network around optimised assets.

Regen's recommendation is that the top five focus areas are taken forward for further revision and consider the option to rationalise and combine with the electricity network focus areas for the strategy.

| Optimised assets and practices – Proposed focus areas (gas) |
|---|
| Reduce and mitigate unplanned outages and supply interruptions |
| Accelerate gas pipe replacement |
| Improve forecasting and network planning processes |
| Reduce wider disruption from street works |
| Reduce the impact on the environment |

Optimised assets and practices – Revised focus areas (gas), ranked by stakeholder importance
1. Reduce the impact on the environment
2. Improve forecasting and network planning processes
3. Facilitate newer gases
4. Reduce and mitigate unplanned outages and supply interruptions
5. Focus area on people and practices
6. Reduce wider disruption from street works
7. Safety, security and health

Percentage of participant votes for each focus area:
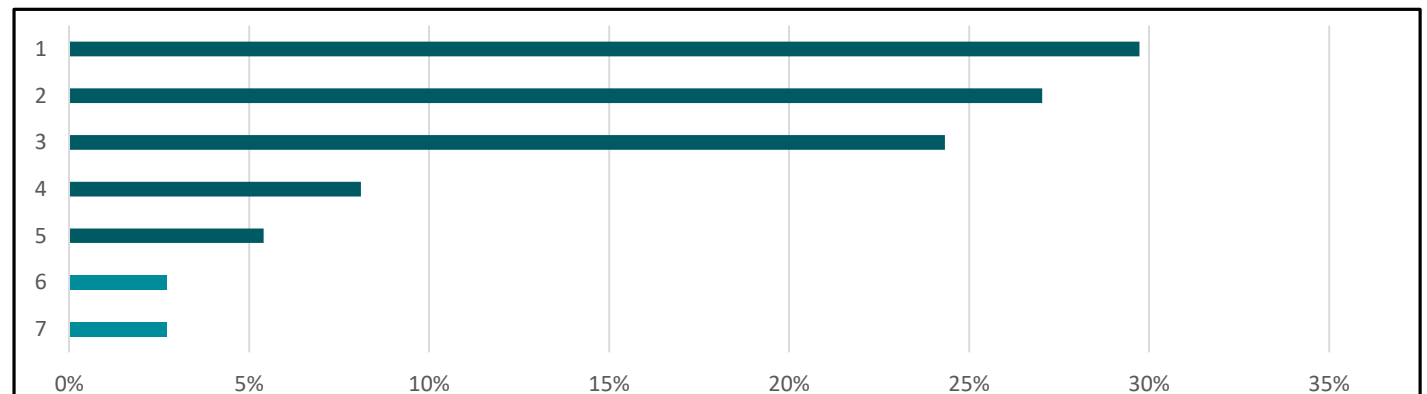
Findings

- With only three focus areas initially presented, there were a significant number of additions to the flexibility and commercial evolution theme.

- Those not seen here include 'visibility of DNO data' and 'non-network markets and interactions'

- Unlike other themes, this one saw only one clear priority area in the top five, with 'trial and implement innovative commercial arrangements to support network management' receiving 21% of votes and all others receiving 13%.

- There were comments around the potential to reword some of the focus areas.

- An additional focus area around newer or more specific flexibility services were discussed, such as reactive power, harmonics and black start.

- Other additional focus areas was raised around 'enabling new non-network markets' (such as peer-to-peer), 'modelling and forecasting of flexibility markets and associated impact', were also suggested.

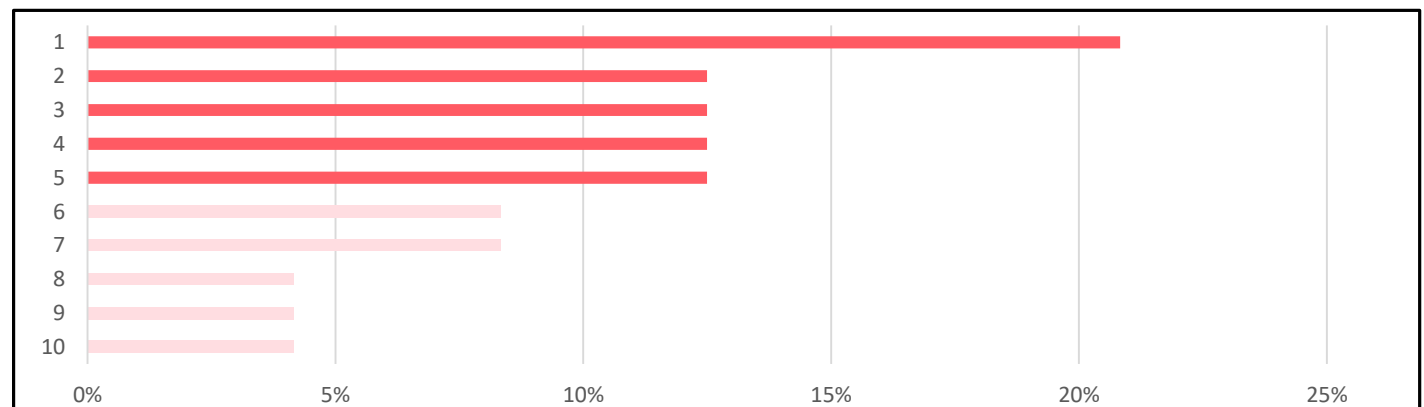| Flexibility and commercial evolution – Proposed focus areas (electricity) |
|---|
| Develop flexibility services, markets, commercial arrangements and platforms |
| Trial and implement innovative commercial arrangements to support network management |
| Maximise the opportunities of smart meters, data and network charging reforms |

Flexibility and commercial evolution – Revised focus areas (electricity), ranked by stakeholder importance
1. Trial and implement innovative commercial arrangements to support network management
2. Maximise the opportunities of smart meters, data and network charging reforms
3. Flexible connection arrangements and changing customer behaviours
4. Regulatory reform
5. Enabling domestic flexibility
6. Modelling market interaction e.g. local energy
7. Develop flexibility services, markets, commercial arrangements and platforms
8. Long term seasonal flexibility markets
9. Procuring new services
10. Standardisation

Percentage of participant votes for each focus area:

20

regen transforming energy

Findings

- The proposed focus areas under flexibility and commercial evolution saw little changes at the London event.

- 'Enabling domestic flexibility' was expanded to include 'local energy markets, electric vehicles and smart charging'.

- The discussions often alluded to similarities between the gas and electricity focus areas.

- 'Domestic flexibility' raised questions around the impacts of interoperability. Also if it could be linked with network capability and data. A point was also raised around if it should be wider than domestic to 'community flexibility'.

- 'Opportunities for smart meters, data and network charging reforms' raised the idea of recognising companies that are reducing demand.

- 'Reducing regulatory barriers' was a reoccurring issue and therefore it was questioned whether it could potentially sit under the whole energy system theme.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

| Flexibility and commercial evolution – Proposed focus areas (electricity) |
|---|
| Trial and implement innovative arrangements to support network management |
| Maximise the opportunities of smart meters, data and network charging reforms |
| Identify regulatory barriers and make recommendations for reform |
| Develop flexible connection arrangements and mechanisms for changing customer behaviour |
| Enable domestic flexibility |

Flexibility and commercial evolution – Revised focus areas (electricity), ranked by stakeholder importance
1. Enable domestic flexibility, local energy markets, EVs and smart charging
2. Trial and implement innovative arrangements to support network management
3. Maximise the opportunities of smart meters, data and network charging reforms
4. Identify regulatory barriers and make recommendations for reform
5. Develop flexible connection arrangements and mechanisms for changing customer behaviour

**Percentage of participant votes for each focus area:**

21
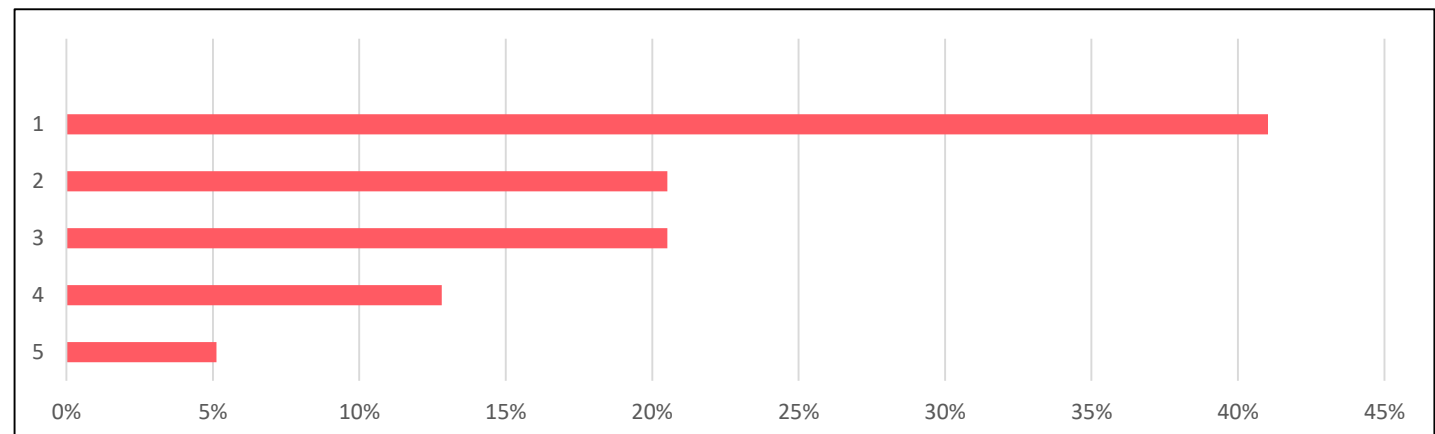
Findings

- Flexible connections and flexibility for gas was questioned in general, due to these types of markets being in their early days.

- 'Maximise the commercial opportunities for connecting green gas' raised comments around investigating the impacts of this on consumers.

- There were many additional focus areas proposed under this theme, such as 'standardisation of connection process for gas entry', 'billing methodologies' (with a specific point around moving from m^3 to kWh), 'understanding the impacts of flexibility on gas networks', 'facilitating net zero' and 'changes in timescales and improved visualisation of networks and constraints'.

- There was also a more even split among focus areas under gas, with the top choice receiving 21% of votes and the 5th receiving 13%.

Flexibility and commercial evolution – Proposed focus areas (gas)
Enable and adopt more flexible connections
Maximise the commercial opportunities for connecting green gas
Develop commercial market arrangements for delivering hydrogen

Flexibility and commercial evolution – Revised focus areas (gas), ranked by stakeholder importance
1. Develop commercial market arrangements for delivering hydrogen
2. Understanding potential impacts of flexibility on gas networks
3. Enable and adopt more flexible connections?
4. Billing methodology
5. Maximise the commercial opportunities for connecting green gas
6. Long term seasonal flexibility markets
7. Regulatory standardisation
8. Standardisation of connection process and customer experience

Percentage of participant votes for each focus area:
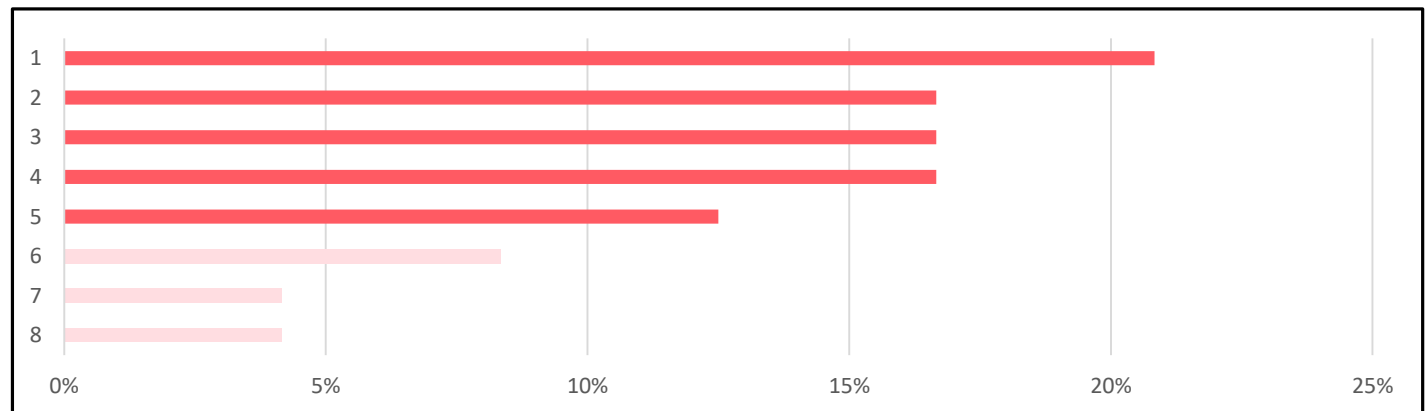
Findings

- Few changes were raised against the focus areas for this theme in London or the webinar.

- The need to include CCS was added to the focus area of 'commercial opportunities for green gas'.

- There was a request for a clarification of the definition of the commercial markets arrangements for delivering hydrogen, regarding the production of blue or green gas.

- 'Modernising billing methodology' was mentioned as not being a strategic enough focus area. This area was dropped in favour of 'enable and adopt more flexible connections'.

- An additional focus area of 'trial and implement innovative arrangements to support network management' was included for gas.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

Flexibility and commercial evolution – Proposed focus areas (gas)
Develop commercial market arrangements for delivering hydrogen
Enable and adopt more flexible connections
Modernise billing methodologies
Develop understanding of potential impacts of flexibility on gas networks
Maximise the commercial opportunities for connecting green gas

Flexibility and commercial evolution – Revised focus areas (gas), ranked by stakeholder importance
1. Develop commercial market arrangements for delivering hydrogen
2. Maximise the commercial opportunities for connecting green gas and CCS
3. Develop understanding of potential impacts of flexibility on gas networks
4. Trial and implement innovative arrangements to support network management
5. Modernise billing methodologies
6. Enable and adopt more flexible connections

Percentage of participant votes for each focus area:

# Whole energy systems - Glasgow
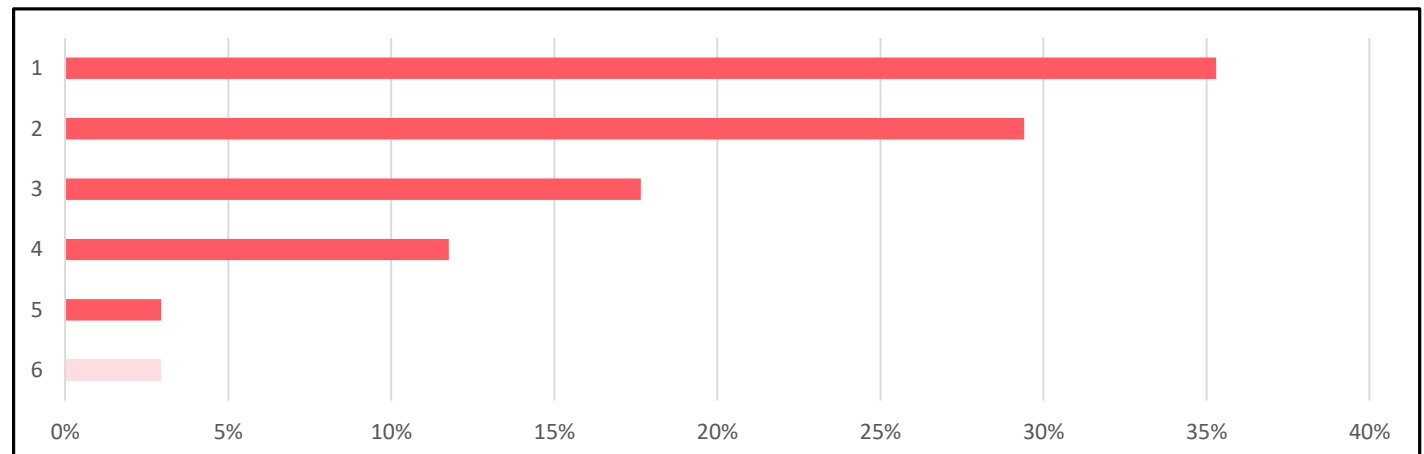
Findings

- There were a few comments around whether the scope of joined up approaches should include other utilities (e.g. water, telecoms etc.) and be across local authorities and network providers.

- The focus area of 'coordinated approach to energy system management and balancing' was also expanded to include other utilities with potential for locational coordination.

- The 'coordinated network maintenance and work scheduling' focus area was questioned as to whether it was in the control of networks, but there was a suggestion for the potential for an information sharing platform.

- 'Collaboration around the growth of disruptive technologies' was missing the supplier element.

- There were many suggestions for additional focus areas, however only 'coordinated cost benefit analysis' appeared in the final shortlist after voting, ranking joint first.

Whole energy systems – Proposed focus areas (electricity and gas)
Joined up approaches to regional network planning and forecasting
Coordinated approach to energy system management and balancing
Coordinated network maintenance and work scheduling
Collaborate around the growth, operation and role of disruptive technologies (e.g. heat pumps, hybrid heating, bioenergy, ultra-low emission vehicles etc.)
Coordinated planning between networks, local authorities and city regions
Assess and implement cross vector / cross network commercial opportunities (gas←→electricity)

Whole energy systems – Revised focus areas (electricity and gas), ranked by stakeholder importance
1. Joined up approach to regional network planning and forecasting
2. Whole system coordinated cost benefit analysis
3. Coordinated approach to energy system management and balancing, including utilities
4. Assess and implement cross vector / cross network commercial opportunities (between gas and electricity)
5. Collaborate around the growth, operation and role of disruptive technologies (e.g. heat pumps, hybrid heating, bioenergy and low emission vehicles)
6. Coordinated understanding of whole energy system disruptions
7. Co ordinated planning between utilities, local authorities, cities and developers

Percentage of participant votes for each focus area:

Whole energy systems – London/webinar feedback
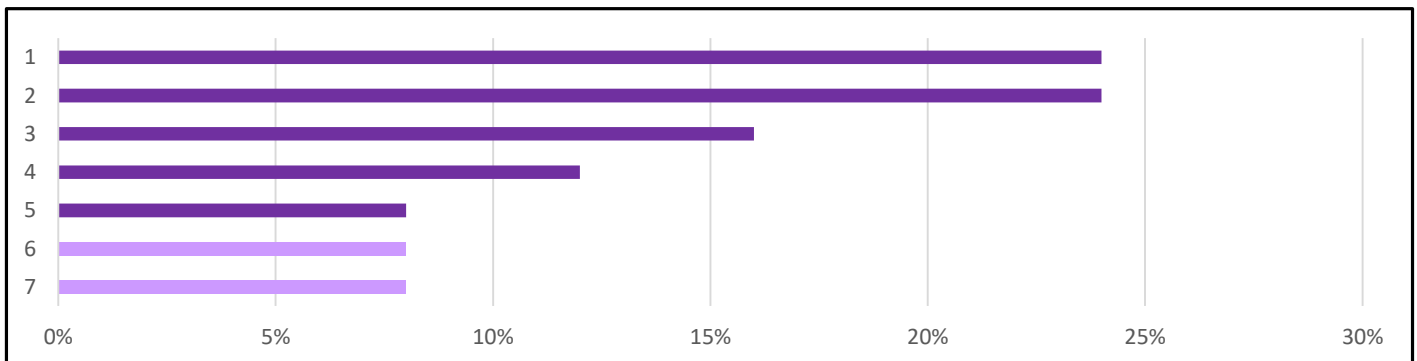
Findings

- 'Joined up approaches to regional network planning and forecasting' was proposed to be potentially expanded to include local level considerations. The wording of this area remained the same for clarity of wording.

- It was also raised that the 'whole system coordinated cost benefit analysis' should include societal benefits such as carbon, air quality and fuel poverty.

- The only revisions to the focus areas for the final poll was the addition of 'access to network data' and the replacement of disruptive technologies in 'collaborate around the growth, operation and role of disruptive technologies' with 'new solutions' being more holistic.

Regen's recommendation is that the top five focus areas are taken forward for further revision and inclusion in the strategy.

| Whole energy systems – Proposed focus areas (electricity and gas) |
|---|
| Join up approaches to regional network planning and forecasting |
| Develop whole system co-ordinated cost benefit analysis |
| Co-ordinate approaches to energy system management and balancing, including other utilities |
| Assess and implement cross vector / cross network commercial opportunities (between gas and electricity) |
| Collaborate around the growth, operation and role of disruptive technologies (e.g. heat pumps, hybrid, bioenergy and low emission vehicles) |

Whole energy systems – Revised focus areas (electricity and gas), ranked by stakeholder importance
1. Collaborate around the growth, operation and role of new solutions (e.g. heat pumps, hybrid, bioenergy and low emission vehicles)
2. Develop whole system coordinated cost benefit analysis
3. Join up approaches to regional network planning and forecasting
4. Access to network data
5. Co-ordinate approaches to energy system management and balancing, including other utilities

Percentage of participant votes for each focus area:
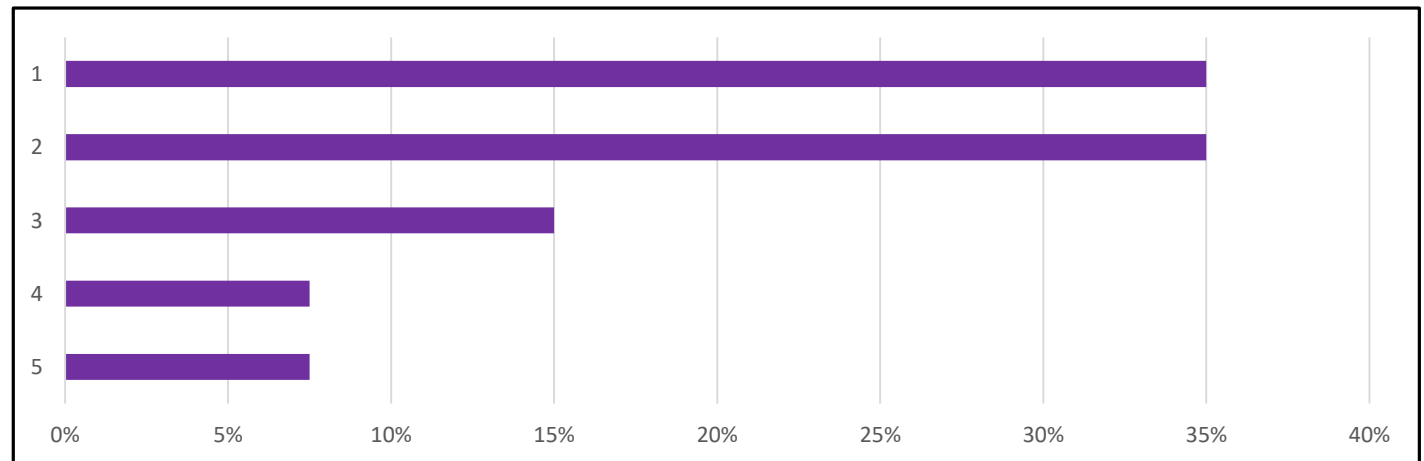
Engagement events - feedback

- For the workshops overall, almost all feedback was positive, especially regarding the how dynamic the events were and that participants liked the use of polling.

- There was a suggestion that the event could have been paperless and in particular for Glasgow the spacious nature of the venue reverberated the sound too much during the breakout discussions.

- The themes had more general feedback, with the potential for merging some areas as we have discussed in the breakout sessions, but there was positive feedback around net zero and the energy system transition being a theme.

- There were suggestions that more focus is placed on regulation, as a barrier to deployment, and to allow greater access to network data.

- The strategies themselves brought about significant interest in the post-publication feedback. There were requests for feedback post publication and the potential for additional 'strategy road map sessions' for each of the five themes.

- It was also suggested that the strategies provide more detail for potential innovators, such as priority areas, some sort of timescales and case studies.

Feedback response rate

Rate today's event

Most useful part of the workshop

26
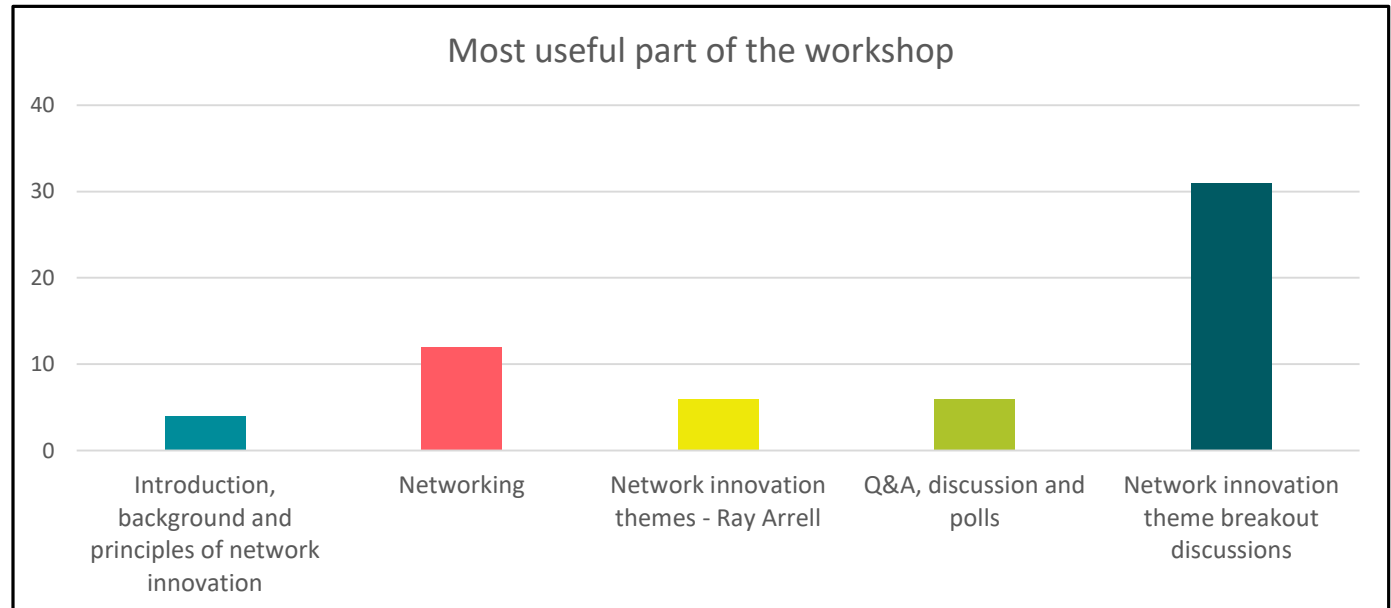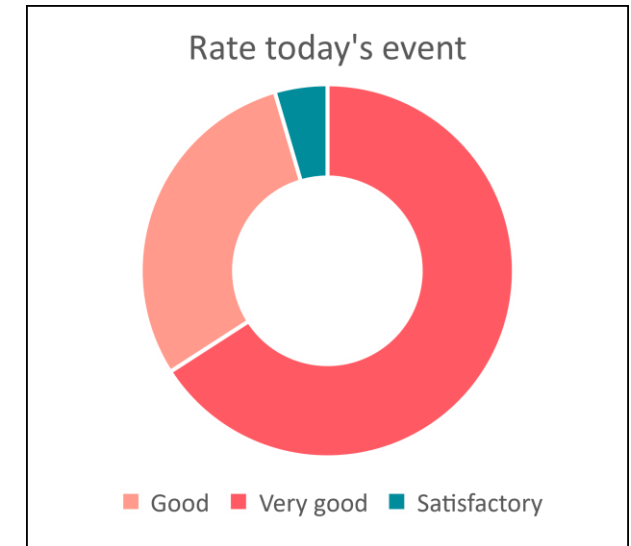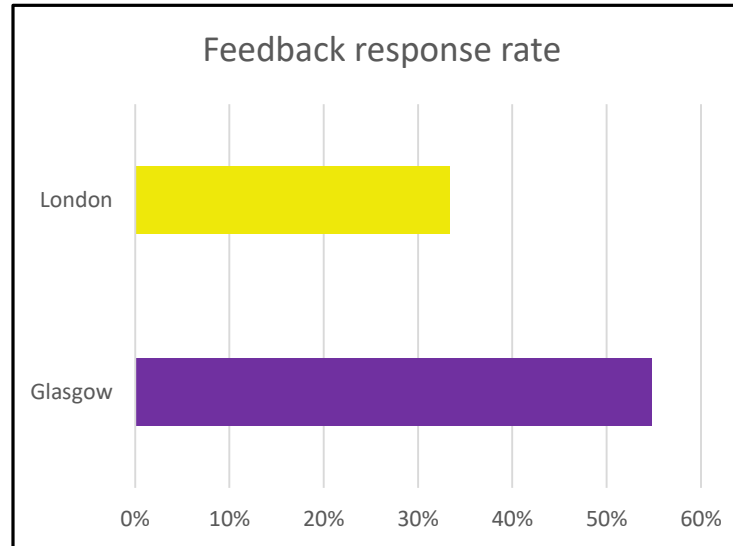
Appendix 1: Full list of participants

regen
transforming energy

ABB
ADBA
Amberlink Energy
Bharco Ecotechnologies
BMT
Bristol Energy
Cadent Gas
CGI IT UK
Changeworks
Cheesecake Energy
CSA Catapult
Community Energy England
Delta-EE
Depsys SA
Digital Engineering
DNV GL
Earthwave
EIC
Electralink
Electricity North West
ENA
Energy System Catapult
Energy Technology Partnership
Energy4All Ltd
Engie
Facilitating the Future

General Electric
GE Grid Solutions
Gemserv Ltd
Gillespie Macandrew LLP
Google
Google Cloud
Hanergy
Kelvatek
Lagoni
Leeftech
Local Energy Scotland
Macleman Associates Ltd
Manufacturing Technology Centre
Mentone Energy Consultancy Ltd
National Energy Action
National Grid ESO
National Grid ETO
National Grid Gas
New Resource Partners
Norfolk County Council
Northern Gas Networks
Northern Powergrid
Ofgem
Opus one solutions
OrxaGrid
PME

Regen
RS Renewables Ltd
Scene Connect
Scottish Enterprise
Scottish Government
Scottish Renewables
SGN
SHE Transmission
Smarter Grid Solutions
SP Energy Networks
SSEN
Storelectric Ltd
Tatla Technologies Ltd
TRESOC
UK Power Networks
University of Manchester
University of Sheffield
University of Strathclyde
Voltalia
Wales and West Utilities
Warmworks
West Solent Solar Cooperative
Western Power Distribution
ZIV Automation

- *"Can we use the strategy as guidance for submitting project on the collaboration portal? Is their further guidance we could see?"*

- *"How many of the innovation projects have involved 3rd parties?"*

- *"Does the current structure of NIC competitions enable an accelerated approach to decarbonising heat and transport?"*

- *"Gas or electricity, how is the current base energy generators engaged in this process?"*

- *"Vulnerable customers don't just sit in their homes. All connections could be supporting vulnerables, shouldn't all connections be treated as vulnerable customers?"*

- *"Not a question, but... the electricity network possibly needs a theme to "enable the large-scale production of hydrogen"."*

- *"Another one on network decarbonisation... the infrastructure that manages and maintains the networks needs decarbonised."*

- *"Need provision to NIA/NIC fund projects that fall outside the regulatory remit of network operators, or cross hardware /trading etc. boundaries."*

- *"NIA&NIC need a rule change so the innovating company retains the IP."*

- *"Decarbonisation being a customer benefit implies that this will be the only group that does benefit. It will also benefit all organisms globally. Do you agree?"*

- *"Integration to whole system perspective."*

- *"To help with the strategies and funding, is there a briefing pack for UK energy demand split between gas and electricity use commercial, Industrial , domestic?"*

- *"In the definition of 'whole system' - the focus was on T&D elements. The production/supply and use/demand were not covered as part of those systems? Why not?"*

- *"For gas, if electrification of heat occurs it will have to shrink and change shape. Should that go alongside focus on new gases and the like? (Optimise assets)."*

- *"Would stakeholders like to attend a similar events after the strategy is published and to help define theme specific roadmaps for industry to follow? @Rob, depends on scope. Yes if it inputs to what's funded, no if it's merely developing recommendations."*

- *"Can the innovation strategy highlight opportunities to reduce demand in aggregate - key to cost effective net zero etc."*

- *"Collaboration most important things, but missing trust and training. Trust of consumers is essential. Training is essential for role-out. Do we need a hybrid innovation strategy?"*

- *"Many limitations due to regulatory context. How can networks influence? Has the innovation process really changed enough in the last decade?"*

- *"Don't agree with decarbonisation not being a principle. Whole life carbon needs to be considered."*

- *"Question timescale for net zero being 2050 - regional differences"*