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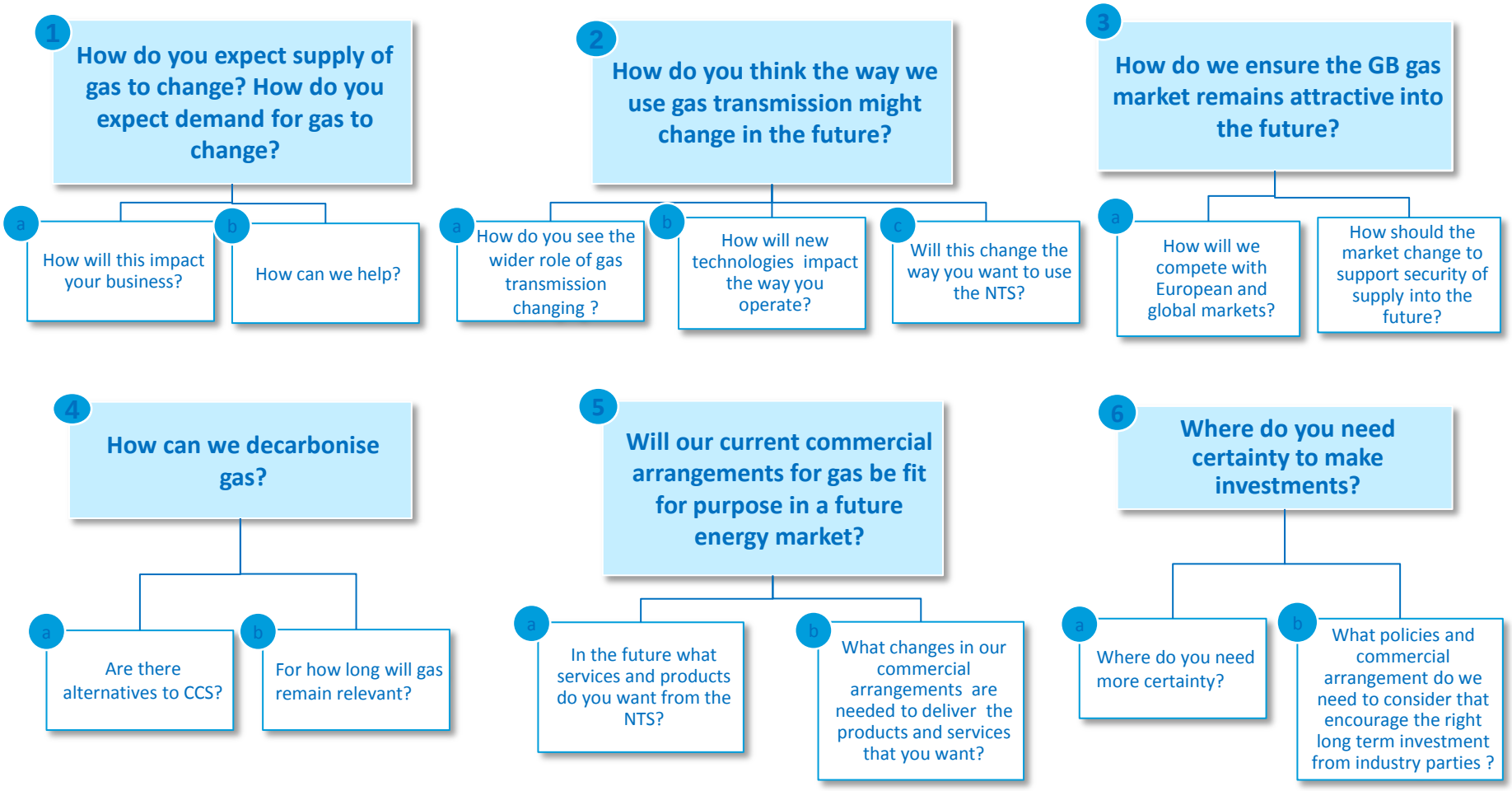
Future of Gas customer seminar – round table break out session

29 November 2016

Future of Gas Seminar – round table break out sessions

- The following slides provide details of discussions that took place during the round table break out sessions of the FOG stakeholder seminar on the 29th November.
- The purpose of the sessions was to gain a initial understanding of key focus areas of the UK energy future that are important to our customers and stakeholders.
- Going forward we will use this information to build our FOG stakeholder engagement plan. We want to facilitate an open discussion about the future of gas in order to inform our plans for the gas transmission system.
- In the new year we are seeking to schedule further workgroups, 1:2:1 sessions and discussion groups to test our developing analysis and recommendations.
- We would like to take this opportunity to thank all that were involved in the round table discussions for their time and input in helping us to develop our understanding of what role gas transmission should play in the future of energy in GB.
- It is important to us that we fully consider our customer and stakeholders' future energy needs and concerns. To this end we hope that you will continue to be involved through ongoing engagement in our FOG program in the new year.

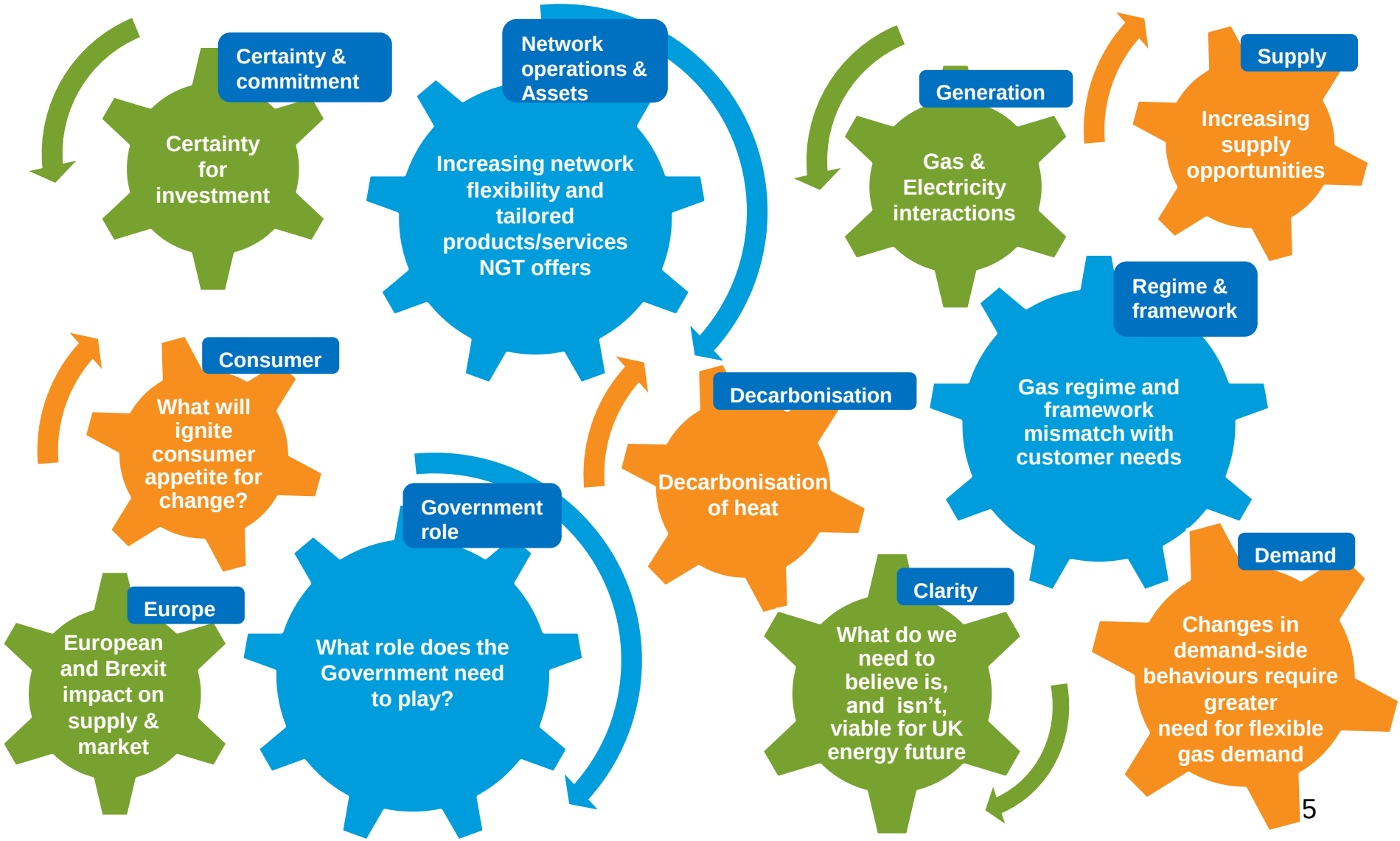
Break out session round table questions



Round table key messages on current state of play:

- Plenty of supply (as a result of Shale, Biogas etc, envisage that likely to flow flat.
- Plenty of Demand which is unlikely to flow flat increased profiling of demand within day likely, much greater flexibility required.
- What are the drivers for change? Will they be consistent with meeting the 2050 targets.
- Certainty to invest and understanding of government role required.
- Incremental decarbonisation of heat rather than wholesale centralised solution – UK could be in transition for a long time.
- Gas/Electricity interaction, NG SO has a greater role to play, more transparency required between both energy SO's
- Advocacy of gas – How might public opinion change – political agenda

Common themes across the discussion tables



Round table sessions – break down of discussions

November 2016

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1. How do you expect supply of gas to change? How do you expect demand for gas to change?

How will this impact your business? How can we help?

Supply **Plenty of Supply (as a result of Shale, Biogas etc) envisage that likely to flow flat**	
Brexit	- Impact of Brexit and the need to increase self sufficiency. - Incremental change, transitional approach. Policy is required to facilitate change!
Increasing supply opportunities	- Shale - resistance. Future affected by public opinion, political pressure and media weighting, commercially competitive in isolated regions. EU have no appetite for fracking due to accessibility of Russian gas. - LNG - No guarantees of delivery. - Non storage supply - plentiful - Bio - SNG, transportation logistics to different areas from production sites.
Green Gas	- Should there be incentives or levies to encourage greener gases - Bio-SNG, transportation logistics to different areas from production sites - Green electricity generation incentives could stimulate a green gas market
Demand Plenty of Demand which is unlikely to flow flat increase profiling of demand with in day is likely Industry view gas as a commodity, consumers view gas as a resource.	
Government driver	- Political pressure and the image of gas. Should gas be championed by government as electricity is?
Gas/electricity interaction	- Gas is still required to facilitate intermittency from renewables. - Solar could be a major driver for change in system use and flexibility. - Solar is not a steady feed so gas is still important to flexibility (in the absence of storage).
Decarbonisation of heat	- Decarbonisation of heat is expensive and we lack infrastructure to accommodate. - To achieve decarbonisation through heat pumps requires government subsidy or mandate - We don't have a clear understanding of the impact of electrification of the domestic heat market and the impact of the efficiency of older houses.
Consumer appetite	- Educating consumers - DNs not incentivised to reduce energy usage.
Transport	- Conversion to CNG and EV vehicles - HGVs give you the best return as infrastructure is easier. EV best for small vehicles, CNG for HGVs; questionable over mid sized vehicles.

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2. How do you think the way we use gas transmission might change in the future?

How do you see the wider role of gas transmission changing ?	How will new technologies impact the way you operate?	Will this change the way you want to use the NTS?
Gas/electricity interaction	- Less power generation	
Increasing supply opportunities	- Changes to gas quality parameters - opening for more diverse sources of gas.	
NTS change of purpose	- Purpose of the NTS might change - Storage facility - Is gas taken for granted - H2 route, may help to decrease diurnal profile of the DNs which means less impact on linepack swing. Less of an issue with pressure, could help with linepack usage.	
Viability of electrification of heat	- Electrification of the domestic market for heat problematic and costly.	
Meeting carbon targets	- In situ, CCS would be great but we're not there yet	

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3. How do we ensure the GB gas market remains attractive into the future?

How will we compete with European and global markets?

How should the market change to support security of supply into the future?

Gas is often neglected/overlooked.	
Increasing supply opportunities	Changes to GS(M)R - attractive market, increase security of supply.
Consumer appetite	- Consumer reluctance to change. - Throughput vs unit rate, costs to consumers tipping point. - Public perception of gas, will it remain positive? What would drive customers to change/stay? - Perception how public perceive clean fuel
Market Model	- Need a market model to facilitate future energy supplies. - Could envisage different market such as in the US where they don't balance daily (although they can trade daily).

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4. How can we decarbonise gas?

Are there alternatives to CCS?	For how long will gas remain relevant?
Multi solution, incremental change	- Advocate Incremental steps to achieve, no big bang - trying to make big decisions, need incremental change otherwise we'll still be here in 10 years. - Multi solution required - Local/ communal solutions could take time to achieve - Apart from Hinckley Point, feel government is moving away from large generation and towards small, local demand. To what extent is this because of the lack of CCS?
Government drivers	- Government driven policy/framework and strategy required to incentivise change and investment in innovation. - Industry have the technical expertise to achieve decarbonisation Government are reliant on these technical experts to guide policy
Consumer appetite	- Customers at the heart, incentivise to reduce demand, green tech, smart appliances, socialise cost similar to Contract for Difference. - Consumer wont buy unless subsidised or mandated - Regional and communal solutions one size wont necessarily fit all
Gas decarbonisation, Transition or the future ?	- Is decarbonisation of gas long term the future or transition - pre combustion decarbonisation using steam methane reformation process may be the future.
Heat	- With decarb targets how viable is the electrification of heat? should time be spent of more realistic pragmatic solutions? - Hybrid system, look to increase H2 in the NTS

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5. Will our current commercial arrangements for gas be fit for purpose in a future energy market?

Where do you need more certainty?	What policies and commercial arrangement do we need to consider that encourage the right long term investment from industry parties ?
Need for Greater NTS Flexibility	- Speedier connections/access to the network - Charging regime – does not reflect the customer needs, and is restrictive - A need to facilitate unconventional gas connections - making the best of the daily customer and NG data to improve operationally.
Changing customer needs	- Commercial and market arrangements no longer reflect how the customer uses and wants to utilise the system - Commercial arrangement need to be revised to be more receptive to customer needs - Work the assets to accommodate change in customer requirements - More bespoked arrangements required (custom fit) - Flexible capacity within day, sweat the asset (NTS) to make it work for the current customer scenarios
Charging mechanism	- Need to rethink how NGT collect it's revenue - Long term capacity based mechanism no longer meets the needs of the customer, need for more focus on flexible service and products
Gas/Electricity interaction	- NG in a favourable position to understand both gas and electricity networks and therefore can provide better information to the market.

6. Where do you need certainty to make investments?

	Will our current commercial arrangements for gas be fit for purpose in a future energy market? / What changes in our commercial arrangements are needed to deliver the products and services that you want?
Brexit and Europe	- Brexit - What flavour? Creates more uncertainty - Charging stability - understanding of European charging to understand our competition
Increasing supply opportunities	- Commercial arrangements need to change to connect more diverse sources of gas.
Investment drivers	- Clarity on investment drivers. - Consistency between local and government policy - Long term costs, charges - need stability. - Appropriate incentivise need to be in place, now, to create investment in innovation and tech which best meets the 2050 targets.