

Northern Gas Networks

Young Innovators Council



Session 2: The future of energy – decarbonising our communities

March 2024

Facilitated and written by Solutions for the Planet

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(YIC, S4TP, Northern Gas Networks and other)
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1. Overview of session

Background

2024 marks the fourth consecutive year of Northern Gas Networks' Young Innovators Council (YIC). The YIC continues to be the voice of young people at Northern Gas Networks (NGN). It provides young people's perspectives and Northern Gas Networks ensures these young peoples' thoughts and opinions are put at the heart of the business' decision making. Each session agenda is co-created by S4TP and Northern Gas Networks, influenced by the YIC's input on what topics they want to talk about. The aim is for meaningful and relevant engagement which provides a real opportunity for the YIC members to influence decision-making at Northern Gas Networks. At the beginning of this year, the YIC is made up of 42 young people aged 14–19 who are based across the footprint of Northern Gas Networks. Five other young people were members of the YIC this year, but have had to leave due to other commitments (mostly relating to school).

Background to the session:

In the Young Innovators Council 2024 Session 2, Northern Gas Networks wanted to talk to the Young Innovators Council about their future energy strategy, and what NGN's role will be in a low-cost decarbonised energy transition and subsequent network. With decarbonisation being such a vast and complex topic, it was decided that Session 2 would be the first of two sessions on this topic. We used this session to thoroughly introduce decarbonisation and energy decarbonisation in community settings. It was also an opportunity to explore NGN's current perceived future energy scenarios and gauge the Young Innovators Council's opinion on those.

The questions Solutions for the Planet considered whilst planning this session included:

- Do the YIC have an understanding of terms such as 'decarbonisation', 'just transition', and 'whole systems'?
- What does an ideal decarbonised community look like to the YIC?
- What do the YIC perceive are the main challenges facing communities trying to decarbonise?
- Who do the YIC see as major stakeholders and responsible parties for decarbonisation?

Co-creation continues to be at the core of our facilitation with the Young Innovators Council. Given the breadth of this topic and that so many of the young people have expressed an ongoing interest in the future of energy, it was important that we asked them what they wanted to know. We considered the below responses in planning this session and the upcoming Session 3:

The next session will be about NGN and decarbonisation. What is one thing you would like to cover or learn when we explore this topic?
How is NGN decarbonising their operations?
<ul style="list-style-type: none"> • Global decarbonisation strategies • Ethical issues associated with some countries not wanting to implement decarbonisation policies
How do they plan to decarbonise in a sustainable way?
Financial restrictions (reasons why NGN haven't done this already)
The action plan towards decarbonisation.
What different fuels will you use instead of carbon?
Will they be as effective?
Are they sustainable?
What is the time scale for getting to net 0?
How will you help reverse the damage that you and other fossil fuel companies have done?
Carbon offsetting
Net 0 in general
What, other than vehicles which we discussed last meeting, is NGN planning to do to reduce carbon emissions?
How NGN are decarbonising and what effects that might result in, and whether they are significant or not?
I'd like it if we could cover air source heat pumps and the reluctance of NGN to switch across.
The costs of decarbonisation methods
Greenwashing is an obvious area
How NGN is planning to decarbonise certain sectors of the supply chain.
More about the industrial process of decarbonisation and methods used.
How NGN is approaching decarbonisation and how much is being invested into it.
The gases we can change to and what they will do to affect our future gas prices based off what we pick.
Innovative ways of decarbonisation and how and where it is being implemented.
The chemistry behind it.
How decarbonisation will impact us as a generation.

Table 1: YIC responses from Session 1 feedback form question re: learning about decarbonisation; YIC 2024 Session 2

YIC 2024 Session 2: the future of energy – decarbonising our communities

Total length: 1 hour and 40 minutes.

People involved: 2 S4TP facilitators, 4 NGN facilitators, 1 NGN observer, 1 NGN witness, 1 external witness

Date and time: Wednesday 27th March, 5.15 – 6.55

Panel attendance: 27

Apologies: 14

Did not attend: 1

Objectives:

- To begin to understand the concept of energy decarbonisation in communities.
- To understand what the YIC imagine a decarbonised energy community might look like and include.
- To identify what a just transition might include: who should pay what, and when?

Prior to the session the YIC were asked to:

- Research communities that are attempting to reduce their carbon footprint or are becoming decarbonised.
 - What are the main challenges facing communities trying to decarbonise energy?
 - Who is taking responsibility for pushing energy decarbonisation, i.e., the government, local authorities, individuals, community groups, etc.?

Pre-reading

As many of the YIC have often asked for more context in your feedback, for this detailed topic there were 3 items for everybody to read, and then some additional material for those who wished to delve deeper:

- [Decarbonisation: how it works!](#)
- A guide to the decarbonisation of heat in the UK: [Heat decarbonisation guide - Energy Systems Catapult](#)
- Insights on the future of energy: [The Future of Energy \[simplified\] Video Series | Cummins Inc.](#)
- The Climate Dictionary: [The Climate Dictionary: An everyday guide to climate change | Climate Promise \(undp.org\)](#)
- Decarbonising energy and the energy transition: [Decarbonising energy and the energy transition | The Bartlett - UCL – University College London](#)
- Ofgem’s Decarbonisation Action Plan (remember: Ofgem is the governing body that regulates NGN and the rest of the energy industry): [Ofgem’s Decarbonisation Action Plan | Ofgem](#)

Witness 1: Maggie Bosanquet, Net Zero Team Leader at Durham County Council

- A community approach to energy decarbonisation
- Witness to briefly explain how and why a local authority is approaching community decarbonisation – the opportunities and pitfalls.

Witness 2: Sajalu Greenall, Energy Strategy Manager, NGN

- An overview of NGN’s decarbonisation roadmap

Proposed Agenda:

Time	Activity	Lead	Room (M/B)	Timings (mins)
5:15	Welcome & feedback from previous session	S4TP/NGN	M	10
5:25	Introduction to session & objectives	S4TP	M	5
5:30	Witness 1: Maggie Bosanquet, Durham County Council – a community approach to decarbonisation. YIC Q+A	Witness 1	M	15
5:45	Activity 1: What would a decarbonised community look like?	S4TP/NGN	B/O	15
6:00	Witness 2: NGN’s roadmap to decarbonisation YIC Q+A	NGN	M	10
6:15	Activity 2: IS NGN moving in the right direction?	S4TP/NGN	B/O	15
6:30	Activity 3: YIC feedback and vote to prioritise insights	S4TP	M	10
6:50	End			

Table 2: Proposed agenda; YIC 2024 Session 2

2. Attendees

Young Innovators Council

Alfie	Lincoln
Amiee	Lizzie
Anish	Lucy
Basmala	Matthew
Benjamin	Neve
Bradley	Ralph
Emilia	Rosie
Francesca	Sahaj
Georgii	Skylar
Heather	Thomas J
Jack	Thomas M
Jackson	Toby
Kaitlin	Wilhelmina

Solutions for the Planet

S4TP facilitators

Fran Isherwood	Youth Insights Coordinator
Claire Fitton	Youth Insights Manager

Northern Gas Networks

NGN facilitators

Eleanor Glyn-Smith	Graduate Asset Risk and Strategy Analyst
Hollie Scott	Stakeholder Engagement and Project Coordinator
Kati Sexton	Customer Care Officer
Jenny Wilkinson	Stakeholder Manager

NGN observer

Lili Vastel	Business Admin Apprentice
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NGN witness

Sajul Greenall	Energy Strategy Manager
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Other

External witness

Maggie Bosanquet	Net Zero Team Leader, Durham County Council
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External observer

Brian Matthews	Independent Stakeholder Group (ISG), NGN
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3. Key discussion points

Community approach to decarbonisation

Maggie’s role as the Net Zero Team Leader at Durham County Council (DCC) meant she was perfectly placed to present to the Young Innovators Council 2024 about some of the ways a community, with all its many and varied stakeholders, can respond to the climate emergency and net zero targets. She explained DCC’s targets, both as a council and a wider geographical area; the role of partnership in decarbonising, including some of their work with schools, organisations (both commercial and community), transportation and homes; making plans through their Climate Emergency Response Plan¹; and the array of challenges she faces in this role.

The YIC were invited to ask Maggie questions in the Zoom chat function, and these can be found in Appendix 1. Two of the YIC members asked their questions in the session:

Georgii’s question: “What are the biggest carbon emitters in DCC?”
Maggie’s response: <ol style="list-style-type: none">1. The biggest single emission of carbon is heat, from heating our buildings and homes, and manufacturing.2. It’s also the most difficult thing to solve. We use gas for a huge amount of our heat, so if we’re going to completely remove gas, what are we going to replace it with?3. The other very interesting factor which we must start considering now is to do with the internet; social media, AI, sharing and communicating.4. DCC’s biggest single emitter is their data centre. It takes a huge amount of energy to host clouds.
Matthew’s question: “Do you face any polarity or opposition by certain stakeholders when you’re looking at decarbonisation and green initiatives?”
Maggie’s response: <ul style="list-style-type: none">• On the whole most people are fantastic, and the council is brilliant.• Used to get lots of opposition from climate change deniers claiming the science isn’t true, but don’t really get that anymore because it can’t be argued with.• Now what we get, which is worrying and scary, is populist rhetoric that net zero as a goal is a terrible thing and a waste of public money.• Fantastic support from the public when explanation is done well and effectively.

Table 3: Questions for Maggie Bosanquet asked during the session; YIC 2024 Session 2

In their first breakout room of this session, the YIC were asked to consider what an ideal community with a decarbonised energy system might look like to them. They had been asked to research examples as part of their pre-work. NGN wanted to know what the young people perceive to be the opportunities and challenges of such aims. Any further pre-work sent by absent YIC members following the session is included in Appendix 2.

¹ More information on this can be found here: [Climate emergency - Durham County Council](#)

What does an ideal decarbonised community look like to you?

EXAMPLES

Todmorden: exemplary community with district heating, local farming, using heat pumps to heat the local swimming pool and provide energy. They also run a series of community food gardens to reduce food waste.

Community “twinning”: sharing best practice & resources, i.e., example given of a community/council purchasing thermal imaging cameras to help people in the village identify heat inefficiencies in building and help retro fit homes; this is now being lent to the neighbouring council to use.

Scientists can now reduce the methane from cows, and more importantly, reuse that methane to power buses and lorries, so firms like Mercedes, Scania, Caterpillar, Cummins and Volvo who make new engines and re-manufacture old engines can cope with new fuel choices.

Alternative resources in transport:

e.g., buses and lorries which are heavy and need to run for long working hours, can now be powered by compressed natural gas, liquid petroleum gas and electricity, reducing carbon emissions in both built up areas like London, but also in rural areas which tend to be forgotten about.

e.g., scientists have proved that EV's can now be powered by sodium ion instead of using earth rare lithium and cobalt minerals; it's cheaper, better and longer lasting and importantly can be recycled at the end of the car's life.

e.g., vehicles made from aluminium, which takes only 5% of the energy to recycle as to make from new or virgin materials. Aluminium is lighter than steel, making heavier EV cars even better for the world.

Homes built with heat pumps, solar panels and more insulation to stop carbon emissions from the start. In Hartlepool, I watched some homes being built with big shipping containers that are lifted into place on top of each other as you would see in the docks. No bricks or concrete used, just nuts and bolts to hold them together. I call them the Lego houses. I haven't been inside them, but it only took a day to put them in place and make everything work with gas and electricity, just like a normal house would.

Exmouth Council have used the heat from their computers to keep their swimming baths warm, heating the oil rather than using a boiler, which has meant not only bills are reduced but that the pool has been kept open despite cost-of-living cuts.

Transition Town Totnes, UK: Totnes is a leading example of a transition town, with a strong focus on reducing carbon emissions and promoting sustainable living. The community has implemented initiatives such as local food production, renewable energy projects, and community gardening programs.

Catapult Blyth: feeling this is affecting the area moving towards more sustainable practise, with wind energy being highly promoted by the organisation’s presence in the area.

OPPORTUNITIES & IDEAS

CHALLENGES & PITFALLS

Start small in small communities, as Maggie was saying every positive action is more effective than inaction.

Age could be a challenge. Target older generation as they are the least supportive. They may feel they won't see the benefits in their lifetime.

- Circular economies (food, clothes, electronics)
- Pooled resources
- Shared/split funding
- District heating.

- Cost – more expensive than any previous energy transitions globally
- Support for low-income families?
- The wealth gaps: privileged being able to pay their way out or around things

Nature-based approaches, including biomass and tree planting.	Greenwashing and virtue signalling.
More grants to customers to help support their transfer to renewable energy.	<p>Knowledge and lack of information</p> <ul style="list-style-type: none"> • Language barriers • Advanced and technical language makes topics like this almost impossible to comprehend. • There is a mass of contradicting and confusing information. • Difficult to navigate, especially for people with no experience /prior technical knowledge of these topics.
Transport systems such as trams were felt to be better than bus networks as it has dedicated, clear routes.	<p>E.g. electric vehicles</p> <ul style="list-style-type: none"> • Entirely unaffordable and unfeasible for most. • Difficult to charge. • One YIC member doesn't believe they're better because of waste lithium batters and polluted wasteland.
Often only share examples/success on e.g., company website, small town Facebooks due to small changes. If all decarbonising successes were broadcast publicly on national news or local radio, it would spread awareness and be more effective.	Difficult thing to achieve and therefore a difficult thing to promote, especially when businesses only want to be seen to share their successes.
Build eco homes: all new builds should incorporate eco solutions	Changing over all homes and buildings will be time consuming.
Organisations, businesses and governments leading by example.	Lots of people still don't believe it's the solution, and it's hard to change peoples' minds, perceptions or willingness to make an effort!
Carbon neutrality should be business as usual across the board and be as important as profits. What if such performance could impact on e.g., share prices, bonuses, etc.	Governments and businesses back-peddalling on goals; huge global incomes from carbonising industries; local vs national government, and streamlining those policies.
The power of global mood changes, e.g., Greta Thunberg is now internationally recognised as a force for global change which governments and businesses can't ignore anymore.	The impacts we can't yet predict; Do we fully understand the life cycles and long-term impacts of renewable energy sources and materials? E.g., as the planet gets warmer, we need more polluting air conditioning unites.
Reassign investment of all kinds into continuous scientific improvements across all industries, e.g., lab grown palm oil, solar panel source materials.	Changes to infrastructure, e.g., upgrading grids, pipes, retrofitting buildings, space. This has negative impacts on costs and timescales.
Understanding the spread of trusted, accurate and easy to understand information.	Global wars have an enormous environmental impact, both financially – how are we able to

	afford to participate in wars but not invest in saving the planet – and in rebuilding.
Will lead to employment uptake in areas where new industry brings in new work; leading to a lot more education around the ramifications of using renewable energies.	Should be mindful of where these things are in operation, e.g. Blyth has low education and income rates, which will affect how people react and act on changes.

Table 4: YIC key discussion points; Activity 1; YIC 2024 Session 2

Northern Gas Networks’ roadmap to decarbonisation

The YIC were then talked through NGN’s plans for an energy transition away from the use of fossil fuels to renewable sources of energy. This was laid out as 5 different scenarios, on a scale from a high hydrogen future to a high electrification future, with an overview of some of the consumer and community impacts of each scenario.

The second breakout room was then a chance to ask the YIC whether they think NGN are moving in the right direction with those projected scenarios. The council were asked to consider if this was what they expected to see, what challenges and opportunities they perceive for each of them, and any examples or ideas they can share about schemes and projects they’d like to see implemented on the road to decarbonising.

YIC’s thoughts on NGN’s future energy scenarios
Priority for any scenario should be the impact on daily life for the public: <ul style="list-style-type: none"> • Vital to always consider the practical consequences on households. • Availability, efficacy, visibility and affordability of hydrogen appliances.
The strong feeling was about giving consumers choice, particularly around appliances and what type of energy source they use. Perception gap between what people will have choice over.
A view that we’re at the point with Hydrogen that we were with electric cars when they were first introduced: the technology is available, but the infrastructure and supporting industry isn’t just yet – but that perhaps once a handful of big organisations start investment and rollout, the prices will go down and adjust accordingly.
Risk of loss of jobs across the sector if changes are made without upskilling workforce.
Is there also a potential risk of some form of housing crisis, given that people might move away from areas where possibly unwanted changes are being made, to areas where it’s happening at a difference pace or in different ways? Any gap like this will always be felt by those in vulnerable positions first and more acutely.
Conscious of any waste from the network if there is end of life for any of it, e.g. derelict buildings, pipes, power lines, etc.
If we go solely one way or the other, e.g. hydrogen vs electrification, customer choice will be heavily effected, and there isn’t public understanding about this. It could prompt distrust, outrage, protest, etc.
Some surprise that NGN are taking into consideration the possibility of not existing as the organisation in its current form anymore, depending on the future of energy.
Away from heating of homes, we shouldn’t avoid the reality of large-scale industrial manufacturing relying on hydrogen to keep going business as usual. Does that mean changing business as usual for them, changing their processes fundamentally?
Concern over people still being mis-sold properties and appliances, in the misinformation around hydrogen blends, hydrogen-ready, etc.

Table 5

What should NGN be doing now to ensure a just transition?
Come up with incentives to help drive practical change within the network whilst reducing costs to the consumers/end users.
Reward customers and businesses that help towards net zero.
Understand and invest in the jobs, skills and new training that will be required to ensure engineers are able to install and maintain these new heating technologies <i>ahead of time</i> .
Awareness needs to be raised and maintained amongst consumers and the general public about the industry changes and options.
Getting the information out there is as important, if not more important, than the practicalities.
Spread awareness (hydrogen and electrification) by doing more small-scale community outreach: <ul style="list-style-type: none"> • Will help NGN to gain a reputation for this kind of outreach and education. • Prove that e.g. hydrogen, makes no difference practically and functionally.
Host workshops in major workplaces.
Develop communications relationships with national and local news and media outlets that people actually see and interact with regularly.
Information provided in all accessible and varied formats.
Difficult for the public to envision all the ramifications in the long-term, especially with current financial pressures; stakeholder organisations should invest in projecting and portraying what it could look like practically and financially, to increase public understanding.
Regardless of decision at this stage, it needs to be done well and at equal pace across the country. People in rural areas must not be left waiting years longer than those in urban areas, as with other major infrastructure changes. Plan for that now.
Dispose of any waste from transition effectively. Where there is reuse instead of waste, be clear about this and educate around it.
Work with housing and building organisations to implement these changes now, not in the future once a decision is made.
Are there plans in place for if transition is slowed due to war/conflict? Could new energy sources be affected by this in the same way our gas supply can be?
Maintain focus on energy efficiency of current system whilst also investigating the future of energy, e.g. retention of heat across industry/housing.
Explanation needed of the natural circulation of hydrogen-ready appliances that can be converted.
Ensure the consumer still has choice between the future energy options AND share clearer education and information about those choices immediately.
Engage directly across all stakeholders, from small group campaigning that is putting pressure on government for decisions right through to the whole systems businesses.

Table 6 [and Table 5 above]; YIC key discussion points; Activity 2; YIC 2024 Session 2

4. Key Reflections

Each breakout room was invited to feed back the most prescient points from their individual discussions. This wasn't yet an opportunity to prioritise, because we will be continuing with this topic in the next session; more a chance to understand what is proving most important to the young people of the YIC at this stage.

- Conversations surrounded the pros and cons of the two classifications of hydrogen vs electrification, and the related options.
 - Many of the YIC still perceive that hydrogen is a better option because they think less retrofitting is required with these solutions, therefore there'll be less disruption for the individual.
 - This is largely due to the positive comms and extent of their understanding surrounding transitioning to hydrogen, as opposed to a much more questioning attitude towards electrification because they have far less of an understanding here.
- The YIC are very conscious that so much of this topic ultimately boils down to the national government strategy; dictates the way this country will choose to go, and how it is all incentivised. Is it even above Northern Gas Networks and the gas industry at this point? And if so, isn't it also way above the individual consumer?
- Costs, costs, costs; the YIC are hugely preoccupied with the cost of any transition to the public.
 - Even if 'most people agree hydrogen is the way to go' [*one YIC member feeding back*], the fact is that costs need to come down. It is not viable to implement anything straight away.
 - Who funds the research, development, installations, etc.?
 - E.g., new electric heaters/cookers are still very expensive to obtain, let alone run. Do we know about their running costs yet?
- Much of the public still perceive gas to be effective, reliable and affordable.
 - Following the complex discussions in this session, the YIC understand why people don't want to shift.
 - The industry should therefore maintain a strong focus on what we are still using right now to keep that energy consumption as green as possible whilst we're waiting/deciding/transitioning.
- Will the economy survive and thrive during and after energy transition?
 - The YIC talked about a loss of jobs in certain sectors, whilst also considering the possibility that lots of the industrial sector is shifting towards the tertiary and quaternary in the UK.
- NGN should disseminate the hydrogen → electrification table [*Figure 1*] in a more condensed version, accessible to everyone, with options to investigate each term/option further.
- Education about progression of energy and what this industry is doing is lacking, e.g. school leavers don't know.
 - Whilst the government should be acting and putting this in the national curriculum, more could be done from within industry. This could be in collaboration with whole systems so as not to contain bias.

Further pertinent questions relating to the session objectives were asked in the session feedback form also:

Where do you think you <i>currently</i> get most of your information and understanding from about the future of energy?
EIA or similar administrations or institutions
Internet, weekly e-mails, journals
Reading articles online and attending webinars
New Scientist Magazine
I get most of my information currently on online sources; however, I don't know if they are reliable.
My own research
News outputs, social media, my own research.
Mainly social media/smaller bloggers with a lot of redirects to articles and educational materials.
News articles
News (TV, online) and YouTube
News and school
News, school
News and a little from school
I get most of my information from social media and my school - usually science classes.
School, or news on the Internet.
School
From school, specifically in sciences and geography
YIC and school
YIC sessions and from government website
YIC and my parents
The YIC at this moment in time
NGN
The YIC and the NGN/S4TP social media
NGN
The YIC and the info it provides
Young Innovators Council

Table 7

Where do you think you <i>should</i> be getting this information and understanding from?
Government should do more work to make it clearer.
I think that we should get this information from the councils and government websites as I don't know what is happening different areas.
Government statements (which are to some extent covered in the news)
Organisations and the government
Government and different businesses
I think I should be getting it from NGN and other organisations.
Companies who deal with energy in order to support their customers.
Advertising from global corporations
The energy suppliers/providers
Social media accounts that aren't the NGN page.
Internet, weekly e-mails, journals
Letters to our households, news
Mainstream media
School + Broadcast News Media
School
Schools
Schools
School as the information you get will be real
I think I should be getting more information from my community and school as there is not masses of awareness on the topic in my area and I feel it is very overlooked therefore many young people and even adults are uneducated in the topic and make rash uninformed decisions when making decisions about their energy usage.
A lot more from school and not just in science lessons.
School, but on a larger scale as we are taught the bare minimum for the specs, and not given real world, up to date examples
Should be pushed in school more, or like in events (sponsorship etc.)
School
School
School/college lessons
Everywhere, from posters on bus stops to the school curriculum
News, government, energy companies through websites and social media

Table 8

Who do you trust to share information about the future of energy?
Governments, worlds leaders and activists
The decision makers
Government but decision makers as well
Government
Governmental websites and other websites that people can trust.
Government, energy companies
Local council
Organisations and the government
Organisations
Organisations who are driving the development of new technologies related to energy.
I trust organisations such as NGN and others that are very clearly educated on the topic and know what they are talking about instead of just random people trying to sound smart or using it for views on social media.
Leaders of organisations and big businesses across the world.
Organisations, decision makers
Organisations
Organisations, the people directly involved in making the change
I trust the companies themselves, however for young people I believe schools are the best way for information to reach us
Schools, NGN workers - educators, verified social media channels.
Independent news sources
Charity organisations and individuals
Scientists
Scientists, people who are research climate change and the energy crisis, organisations
Researchers in academic institutions only because any corporate information may be twisted with profits in mind.
Anyone that comes from a scientific viewpoint, rather than political.
Experts, peer-reviewed articles.
It depends on which side they are on/ how they make money.

Table 9

If you had to choose one of the 5 scenarios [from Witness 2 presentation] for NGN to focus on in the next few years, which would it be?

- Fuel of the future 64%
- Targeted deployment 4%
- Hybrid deployment 28%
- Death of domestic gas 4%
- Death of networked gas 0%



Figure 1

Thoughts/questions/ideas you've had that you didn't get a chance to say during the session.
Which scenario does NGN believe is most likely?
Why not just convert people on gas to hydrogen and the people already on electric remain on electric?
Education about this topic to the general public should be handled with care otherwise it could lead to a crisis.
I think that having an opinion is a beneficial thing for the future of fuel as the consumers will be able to choose from either hydrogen or electrification.
What would happen if people were against these goals and ideas for the future of energy,
The key point about this issue is that right now I think it mainly just boils down to the government making some sort of a decision about it (and it better be the right one). It's an issue that needs to be tackled on a macro level.
The future of energy is arguably one of the most important choices we are making as a civilization at this point in our history. We have the potential to fix most of the environmental damage done so far by our predecessors and to secure a better future for the next generations if we start taking large-scale action right now, we also have the potential to ruin all organic life on our planet if we don't. That's why I think that there is an urgent need for a new global agreement/policy on climate change. The Kyoto Protocol and Paris Agreement have proven to be quite useless over time but I don't see an alternative solution because it's a global problem that needs global-scale intervention rather than just on an individual country basis.
If we go back to the UK and link all of the above to NGN I think that the best strategy right now would be to keep operating as usual while also actively researching more sustainable, future-proof energy solutions and sharing them with the public to help everyone with making the most informed decision as well as helping the business understand what to expect.

Table 10 [and Tables 7-9, Figure 2 above] YIC feedback form responses pertinent to session discussions; YIC 2024 Session 2

5. Conclusion

The Young Innovators Council 2024 are preoccupied with the financial cost of the energy transition, and more specifically their focus on low-income families and consumers in vulnerable positions. Many of the comments throughout the discussions referred to affordability, disruption to the individual and a just transition. These complicated factors are often the source of any opposition or hesitation from the YIC. Interestingly, some of the YIC are conscious of employment ramifications within the industry, thinking forward to their career choices.

The YIC perceive the sheer scale of the transition, regardless of the chosen direction, to be a huge challenge that NGN need to confront straight away. They feel strongly that this can't be in isolation, but with the whole network and even more broadly. For example, they questioned why the general public isn't seeing what is currently happening more widely, why the discussion isn't being promoted. It is very revealing that the YIC don't believe these to be in the public domain yet. One young person commented that we have a "louder voice together, making it clear where the pressure needs to be put on."

In terms of that awareness, a priority for the YIC from this session was for clear, accurate, widespread education around this topic. They said this is especially around the technical terminology, which is meaningless in context if not properly understood – and actually increases negative impact from misunderstanding and contradictions. They believe it will be useful to have people who are not in education to be aware of this; not only as that makes up a lot of our population, but also because they often represent the perception gap, and a lot of the opposition comes from older generation. Once again, the YIC called for more training and awareness in schools, with multiple cooperative initiatives taking place now to educate young people. Several of the YIC commented that change may not be as difficult as we think it might be in the future if the younger generation have a fuller grasp of the situation.

It is important to acknowledge here that there remains considerable misunderstanding of this complex topic, even amongst the young people of this YIC. Some examples of this from the session include lack of understanding about the current energy network, where gas is coming from, the end of life or re-use of the network infrastructure, and the achievability of net zero. This needs to be prioritised in future YIC sessions, and they themselves call on the industry to play some part in taking responsibility for disseminating accurate information.

This misunderstanding could be one of the factors leading to a few of the YIC remaining very hesitant to move on from natural gas and questioning the viability and acceptability of decarbonising at all. Having said that, others on the council were adamant that having clear goals in place are important even if they're not realistic, to keep people striving for the same thing. There were repeated calls for hydrogen use and electrification to happen in tandem, whilst it is very important to the YIC that focus is maintained on 'greening' our current energy usage. They also put huge store in prioritising customer choice; if the transition ever reaches a point where the consumer is not consulted and included, it will have a negative impact on everybody, and the most vulnerable will feel this first.

“Being heard as a young person is more difficult than ever... I believe we need to stand up and encourage the vocality of our thoughts and interests. Often problems, such as the cost of living crisis impact, are not considered for younger people. Perhaps with new technology we can provide solutions for this.

[YIC member 2024]

6. Appendices

Appendix 1: Questions asked to Maggie Bosanquet by the YIC

Questions for Maggie Bosanquet from the YIC 2024
How does Durham County Council plan on offsetting carbon emissions?
With the wide array of services I imagine Durham Council provides, how viable is a move towards a green initiative?
Is there any evidence to show the publishing of a climate emergency plan is being accepted/registered by the constituents of Durham Council?
Would you like to see Durham become a lead in climate action and advocacy?
Do you plan to educate school children and go into schools to help educate young people on what needs to happen in hopes to influence their families and their schools to make a change?
Do you plan to set out schemes for families with low incomes to become more net zero, like electric vehicles, better lighting, new appliances?
Would there be any other way to incentivise electric vehicles? E.g., I know that some company car schemes have less tax on hybrid or fully electric cars.
Do negative reactions to decarbonising efforts, e.g., North Tyneside Council’s promotion of cycle lanes, influence how your council acts in the best interests of net zero?
Do you have expectations for lower income families to contribute to the decarbonisation of their country?
How does the council plan to deal with the perception gap that especially older generations have with climate change and decarbonisation initiatives?
Could it be viable to increase the amount of solar panels, both in public and private buildings, in any way?
Would you ever consider fundraising instead of relying of investors?
How much of the council’s budget is being committed/invested into decarbonising?
is there disproportionate funding towards green initiatives in the country?
Are solar panels an effective solution for generating carbon-free energy in UK's climate?
What alternative sustainable sources are available to the public and the council?
Could clean air zones be used more within congested areas in Durham?

Appendix 2: Work shared by absent YIC members [that has not already been incorporated into the body of this report].

Ethan

Challenges

- My biggest issue is governments/local councils/firms/individuals just talking a good game. We already know enough about how bad we are about looking after this planet from the industrial revolution onwards, and yet we still just play with rhetoric or act dumb about the consequences.
- The UK government keeps on backpedalling on its 2030 goals for EV cars despite more scientific warnings about not reaching the Paris agreements for 1.5 degree's change. The Scottish Government has also just been told that they won't meet their own 2030 targets too and it seems whenever the environment is up against the economy, there is only one winner, the economy because politicians are only liked when everyone is better off with more money, regardless of how many floods there are in England or how much of the coast is dying. The "white elephant" HS2 project proves this point.
- This virtual signalling is everywhere. I recently did a Greenpeace initiative to highlight just how much waste we chuck out from every single household. When I joined up, I asked my high school what they were doing and could they get involved, and the reply I got from them was that nobody could staff it. When I asked why, the teacher didn't reply. When I asked the teacher again what they thought about the environment, the school said they were committed to carbon zero environment. I find this answer incredibly frustrating and naive; when organisations are just marketing themselves as environmentally aware but have no plan, and if they did it probably wouldn't hit targets.
- A local building firm has just made a big deal about their new eco home - which ironically is still made with bricks and concrete - two of the biggest carbon emitters.
- Tesla recently wanted to expand their factory in Germany but to do so, had to cut down trees in a forest which had been there for hundreds of years. Trees are well known to capture carbon emissions, but when they are cut down, they release whatever emissions they have caught into the atmosphere.
- Lots of other firms such as Shell, BP, BMW and Amazon have also 'watered down' their total and unequivocal commitment to net zero and yet they get away with it because of control over the press.
- Did VW only start making electric vehicles after they were caught out cheating by the European government for deliberately making up their figures for bad emissions?
- Schemes like ULEZ mean those who are able can pay to pollute. Clean zones still allow airplanes to fly overhead who don't use sustainable fuel.

Positives

- Formula 1 are not using any sustainable fuels, but the FIA World Endurance racing are, and importantly they also use planes that fly the cars to locations around the world with sustainable airplane fuel. I couldn't find out from their website whether they use biofuel trucks to take the cars from the airport to the track and they haven't replied to my e-mail yet.
- DHL has started to use EV trucks powered by solar panels on their distribution factories and biofuel in their airplanes. The solar panels will also be replaced when they cannot generate electricity power any more by newer ones which don't use rare materials,

using a material called Perovskite. This makes them more efficient generating electricity and they can be recycled better.

- I know from my science lessons that palm oil can now be grown in a lab, like most food can, meaning trees don't need to be cut down to make the oil from the Amazon. Palm oil also makes food cheaper, helping to stop social inequality when it comes to reducing pollution between the richest and the poorest.
- In Hartlepool, our council installed LED lampposts to reduce carbon and light emissions from the old fashion posts. They are also using solar panels on car parks and other council buildings to reduce energy bills.
- Lastly, at the recent World Cup, instead of building a new Stadium and all the pollution that this would add to the world, Qatar made a stadium out of shipping containers, proving as with all the other examples above that, this is a way and a will.

Dang:

- Governments play a significant role in pushing energy decarbonisation through policy frameworks, regulations, and incentives. In the UK, for instance, the government has set ambitious targets for reducing carbon emissions, such as the legally binding commitment to reach net-zero emissions by 2050. They implement policies like carbon pricing, renewable energy subsidies, energy efficiency standards, and clean transportation initiatives to drive decarbonisation.
- Many local authorities have their own sustainability goals and initiatives to reduce carbon emissions within their jurisdictions. They might implement measures like investing in renewable energy projects, promoting energy-efficient infrastructure, and encouraging sustainable practices among residents and businesses.
- On an individual scale, we have an important role to play in energy decarbonisation through our consumption choices and lifestyle habits. Actions such as reducing energy consumption, switching to renewable energy sources, using public transportation or electric vehicles, adopting energy-efficient appliances, and supporting sustainable businesses contribute to decarbonisation efforts. A particular example is shopping locally, as non-seasonal produce sourced from abroad contributes to carbon produced from shipping/transport.
- Community organisations and grassroots movements often play a vital role in raising awareness, advocating for policy changes, and implementing local projects related to energy decarbonisation. These groups can mobilise communities, promote renewable energy projects (such as community-owned solar installations), and provide support for sustainable living initiatives.
- Businesses increasingly recognise the importance of energy decarbonisation for environmental and economic reasons. Many companies are setting their sustainability targets, investing in renewable energy solutions, improving energy efficiency in their operations, and adopting low-carbon technologies. Large corporations have a significant influence in driving decarbonisation efforts through their supply chains, investments, and innovation. However, it is difficult to incentivise these changes, even with new legislation.
- Globally, international organisations like the United Nations, the International Energy Agency (IEA), and the World Bank are actively involved in promoting energy decarbonisation through research, policy recommendations, financial support for clean energy projects, and facilitating international cooperation on climate change mitigation.

- One of the primary challenges is the cost associated with transitioning to low-carbon energy sources and infrastructure. Renewable energy technologies such as solar panels and wind turbines can require significant upfront investment, which may be prohibitive for some communities, especially those with limited financial resources.

Basmala:

Some specific examples of communities that are actively working towards decarbonisation include:

1. Vauban, Germany: A suburb of Freiburg, Vauban is a car-free neighbourhood with a focus on sustainable transportation options such as public transportation, cycling, and walking. The community also features energy-efficient buildings, solar panels, and green spaces.
2. Masdar City, UAE: This planned city near Abu Dhabi is designed to be a hub for renewable energy and sustainable technologies. Masdar City aims to be a zero-carbon and zero-waste community, with buildings designed for energy efficiency and solar power generation.
3. Vancouver, Canada: The city of Vancouver has set ambitious goals to reduce its carbon footprint, including becoming 100% reliant on renewable energy sources by 2050. The city has implemented policies to promote electric vehicles, energy-efficient buildings, and sustainable urban planning.
4. Malmo, Sweden: Malmo is known for its sustainable development initiatives, including the Western Harbor district, which features energy-efficient buildings, district heating systems, and green spaces. The city also has a goal to become carbon neutral by 2030.

Communities face various challenges in decarbonising energy, including:

- Infrastructure limitations: Upgrades to existing infrastructure are needed for renewable energy integration.
- Cost barriers: Initial investment in renewable technologies can be prohibitive.
- Resistance from stakeholders: Some may resist changes in energy sources.
- Regulatory hurdles: Existing policies may hinder renewable energy adoption.
- Technical challenges: Integrating renewables into the grid poses technical obstacles.
- Lack of knowledge and resources: Communities may lack expertise and resources for decarbonisation.
- Interconnected energy systems: Energy systems spanning regions require coordination for effective decarbonisation.

Who is taking responsibility for pushing energy decarbonisation?

Various stakeholders, including governments, energy companies, NGOs, businesses, communities, and individuals, are actively working towards energy decarbonisation. Governments are setting targets and policies to promote clean energy, while energy companies are investing in renewables. NGOs raise awareness and advocate for policy changes, and businesses are implementing decarbonisation measures. Communities are engaging in renewable energy projects, and individuals are contributing through sustainable practices. Collaborative efforts from these stakeholders are crucial in achieving energy decarbonisation and transitioning to a sustainable energy system.

Orla:

- Urban areas: 2000 miles a year travelled by car.
- Rural areas: 4700 miles a year travelled by car.
- Hard to decarbonise off-grid rural areas.
 - How can you adapt decarbonisation to such remote and isolated communities?
 - In 2010? 36% of all households in rural areas were off mains gas grid, compared to only 8% in urban areas.
- Hydrogen technology
 - Fast tracking but still in development stages
 - Unlikely to be a realistic solution in more rural areas.
 - Not yet an affordable operable solution
- Main challenges
 - Perception gap, limited understanding of specific terms, e.g. carbon emissions, net zero, carbon neutrality.
 - Gap between people' current 'green' behaviour and what's needed for carbon neutrality, e.g., recycling, turning off the light not enough.
 - Change is difficult – overwhelming bombardment of messages to live greener can be confusing, e.g. investment of solar panels.
 - Financial incentives – financial rewards and penalties, benefit to wider society, self interest.
- Who is taking responsibility for pushing carbon decarbonisation?
 - Internationally – Paris Agreement, reduce carbon emissions by 2050 NOT ON TARGET
 - Governments – UK net zero by 2050
 - COP26: UK government committed to reducing UK carbon emissions by 2030.
 - Little government guidance on how to meet these targets.
 - More responsibility placed on separate corporations (though little government guidance on this either)
 - Minimal impact of local authorities and community groups without the above.

Appendix 3: Questions asked to Sajalu Greenall/NGN by the YIC

Questions for NGN on decarbonisation from the YIC 2024	
For gas lines that go to industrial estates, residential estates and overall buildings. Do you think you would consider bringing in a turn off and turn on time, e.g., gas lines open at 5:00am and close at 12:00pm. And as we cut down the times will get longer or shorter?	Answer from NGN: Unfortunately it's not that easy as we would need to 'purge' the system each time. Great idea though.
What is electrification?	Answer from NGN: Electrification is going 'full electric', using technologies like heat pumps to run home heating.
Isn't hydrogen a big risk?	Answer from YIC member: No more than natural gas. Answer from NGN: Hydrogen does have a risk, just the same as using methane or petrol/ diesel, etc. We have carried out in-depth projects to look at risks of using hydrogen and produced mitigations around using it.
Do you think the lack of education about using hydrogen as a heat producer is stopping the progression of hydrogen being introduced to homes?	Answer from NGN: Yes. It is something we face daily. People don't like change and that is a huge barrier to any 'new technology'.
Speaking about hydrogen being brought in, would you consider bringing in hydrogen vehicles when they are released as they are currently in progress to be released to the public?	Answer from YIC member: I think they are currently too expensive to consider on a large scale. Answer from another YIC member: Yes, Hollie mentioned at the start that in Bradford and Teesside where there are plans for hydrogen for transport refuelling, introducing hydrogen vans could be an option.
Would a hydrogen-based network be reliant on changes within homes and businesses?	Answer from NGN: Yes! We would need to upgrade appliances in homes. This is something that has been produced now but is not yet readily available to buy. The transition should be made easier with hydrogen ready appliances when they are available.
When gas gets removed in home, will people have an option to keep gas or will it have to be a full change? Would the gas company in operation pay for the conversion?	Answer from NGN: The whole network would be changed, not allowing people to choose between keeping natural gas and changing to hydrogen. In regard to paying for the conversion, this is yet to be determined. There may be incentives, etc.

	for people to change their appliances but this hasn't yet been decided.
How will methane be disposed of after the change to electricity or hydrogen? *Methane is just natural gas, just in case anyone didn't realise.	Answer from NGN: Methane is taken from underground. It is a natural resource and I suppose it would just remain where it is rather than us taking it.
How do you plan to educate people on future changes, not just being aimed at those within education?	Answer from NGN: The work we currently do mainly in schools at present, but working with colleagues included in this call, we will hopefully be able to spread the message. We are also looking into hosting learning lunches with members of the community.
Could you start with places like schools onto hydrogen first as it is an important place in a community and may lead as an example to others to move as well as educating young people in the process about using hydrogen?	Answer from NGN: Great idea. Unfortunately, we would have to provide a whole new gas main just to that building to do it that way. Instead we will be able to manage the conversion in a sense of length of pipe by length of pipe.
Do you agree that government policy (e.g., subsidising new heat pumps for households) is the key factor in decarbonisation?	Answer from NGN: Yes! Cost is one of the main factors preventing people wanting to change.
What will you do with your pipe and where gas comes from? Will they be destroyed, abandoned to rot away or will you remake them into something for communities, etc.	Answer from NGN: We can use the existing network for hydrogen, nothing will go to waste.
How accessible is this information to the public? Greater awareness about this transition may increase interest and approval of NGN's intention.	Answer from NGN: It is available online and is something we share on social media etc. It is part of my role to 'shout' about it more!
How do you plan to successfully implement electrification in rural areas, where most houses are remote and isolated?	Answer from NGN: We wouldn't directly look to electrify; we would work to help the whole systems approach.
What is NGN doing to communicate this investment and process to stakeholders?	Answer from NGN: We regularly hold engagement sessions with various stakeholders (such as YIC, citizens, local authorities, independent panel, other utility organisations like Northern Powergrid, etc).
Will moving homes onto hydrogen and electricity as their primary sources have a financial impact on communities?	Answer from NGN: Large scale changes tend to have some sort of financial implication. It is unclear how big or small this impact will be, at this current stage. Government energy policy decisions will provide better information.

<p>Why would hydrogen gas be phased out with the rest of the gas network if it is a clean source of renewable energy?</p>	<p>Answer from NGN: There are currently no plans for ‘hydrogen being phased out’. All options including hydrogen are on the table, especially the use of hydrogen for heavy industry and power sector.</p>
<p>Which scenario do NGN think is most likely?</p>	<p>Answer from NGN: Currently we are agnostic of the scenario, and do not have a view on which scenario is most likely. These will be guided by government energy policy decisions.</p>
<p>Why not just convert people on gas to hydrogen and the people already on electric remain on electric?</p>	<p>Answer from NGN: Such decisions will be up to the government.</p>
<p>What would happen if people are against these goals and ideas for the future of energy?</p>	<p>Answer from NGN: Public perception is a key element for enabling net zero, and might be a factor in the way government makes its decision.</p>

Appendix 4: YIC 2024 Session 2 feedback form responses.

1. The YIC were asked to say how far they agreed with the following statements about Session 2, on a scale from 0 = completely disagree to 10 = completely agree:

Statement	Average score	Average score previous session
In Session 1, NGN gave me enough clear information for me to understand the topic and give my informed responses.	7.68	8.85
In this session, NGN was honest about its future choices and what my engagement will influence.	7.68	8.00
I felt that I had the opportunity to contribute to the discussions in this session.	8.24	9.30
I felt that my ideas were listened to.	8.52	9.05
It is clear to me how my ideas and insights are used to change NGN's business plans.	7	7.25

2. Please write here any ideas you've had that you didn't get a chance to say during the session.
Education about this topic to the general public should be handled with care otherwise it could lead to a crisis.
I think having that having an opinion is a beneficial thing for the future of fuel as the consumers will be able to choose from either hydrogen or electrification.
The key point about this issue is that right now I think it mainly just boils down to the government making some sort of a decision about it (and it better be the right one). It's an issue that needs to be tackled on a macro level.

3. Everyone who filled out this feedback form agreed to the group agreement.

[Extracted April 2024, 27 respondents]