

NET ZERO ROUNDTABLE

DELIVERING NET ZERO - RESIDENTIAL

April 2020 – Summary report



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Residential	Online Discussion	30.04.20	Patrick Matheson	Rob Harris

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1 Introduction

1.1 Net Zero

The Net Zero Carbon agenda affects different sectors in different ways. Elementa Consulting have gathered a cross section of industry leaders and clients from all different disciplines to discuss the benefits, challenges, and solutions in the building of Net Zero Carbon residential developments.

We assume in these discussions that the metrics for achieving Net Zero in the LETI Climate Emergency Design Guide are a fair representation of the targets required.

This summary report provides a highlight of the discussions that took place during the Roundtable discussion on Thursday the 30th April, focusing on residential led mixed-use developments.

1.2 Elementa Consulting

Elementa Consulting provide a full range of MEP, sustainable design and diverse consultancy services for projects in the UK and across the world.

We operate in all sectors of the built environment providing sustainable, energy efficient, performance focused practical solutions for all stages of a buildings lifecycle to provide great environments while reducing costs and carbon footprint.

1.3 LETI

In 2017, Elementa started the London Energy Transformation Initiative (LETI) which has now grown into a network of over 1,000 built environment professionals that are working together to put London on the path to a zero carbon future.

In January 2020, LETI released their Climate Emergency Design Guide, which sets out the approach, targets and benchmarks that developments in the UK need to achieve to reach Net Zero Carbon in operation. One of our Associate sustainability engineers, Clara Bagenal George led the delivery of this document, acting as the lead editor and coordinator.

LETI has done the collaborative research and goal setting, the next step is for designers to work towards the delivery of buildings that meet these targets. As it stands today there is a small handful of developments that have managed to achieve or have come close to achieving this challenging benchmark.

Why is that? And what can we do about changing that metric, to mitigate or even reverse, the current climate emergency and keep up with the rate of Net Zero building design and construction that is needed as of now to meet our climate change commitments.



2 Roundtable Participants

Nathan Millar	Elementa Consulting
Rob Harris	Elementa Consulting
David Glossop	Elementa Consulting
Clara Bagenal George	Elementa Consulting + LETI Taskforce
Richard Fairhead	3DReid
Charlie Whitaker	3DReid
Debby Ray	Woods Bagot + LETI Taskforce
Alan Penfold	Apache Capital
David Williams	Apache Capital
Gareth Atkins	Civic Engineers
Gary Akers	L&Q Group
Adam Mactavish	Currie and Brown + LETI Taskforce
Rita Dimitri	JLL
Asif Din	Perkins and Will
Michael Severn	Morgan Sindall



3 Summary of the Roundtable

To introduce the roundtable, Clara Bagenal George provided a brief introduction into the development of the LETI Climate Emergency Design Guide, together with a precise of the design requirements that we as practitioners, clients and constructors we will need to put in place in order to meet our Net Zero Carbon commitments.

This provided those gathered a clear understanding of the challenges and opportunities that lay-ahead for our industry.

3.1 What are the benefits to you of building Net Zero buildings?

The group initially looked at the benefits and opportunities that building to Net Zero Carbon can bring to developers and the wider market.

Financials:

- By targeting Net Zero developments, it opens up the opportunity for cheaper capital through government backed products. A number of lenders are offering green funds, with lower yields on green assets - Soon to be a focus of all lenders and possibly mortgage assessments in the future
- Use of local/ grant funds should be explored to push Net Zero Carbon

Occupants:

- Taking people out of fuel poverty – this is a key consideration in the selection of the correct systems approach, ensuring this it affordable
- Healthier environment with optimised daylighting and natural ventilation are one of the natural benefits of good passive design approach – these are the supplementary benefits that we find through good passive design solutions. This also draws you away from more expensive to install system approaches, making maintenance and operation simpler

Future profitability:

- Acceptance that there is a future real value add – this is likely to be seen with the younger generations, where environmental performance and Carbon management is more of a key consideration
- Potential rental premiums for Net Zero Carbon homes are unclear currently, but have the potential to materialize in the future
- There is a positive reflection on the company/ practice to be ahead on this issue – can be related to the corporate responsibility
- It was noted that building in this way was a route to future business survival and currently competitive advantage. Getting left behind in this area would become a key business risk
- By building Net Zero now you are preventing the need for an eventual expensive retro fit 15-20 years down the line. Key to social housing providers and long term asset operators/owners

People:

- A focused design team from the start achieving strong coordinated results. There was an acknowledgement that this was fundamental to successful and cost effective outcomes based on challenging the norm and shifting the cost drivers
It is important to use the development of Net Zero Carbon to think about the tangible benefits of good design - community benefits that also centre around place making to drive interaction



Environmental impact:

- Better air quality, through the promotion of natural ventilation when climatically available, together with the benefits of developing to PassivHaus standards. Ability to better manage the environment in your home with simple operational interfaces
- Optimized daylight, saved energy and benefits to occupant health and wellbeing
- Realisation of reduced Carbon emissions
- Positive steps towards our climate change targets

Future survival within the industry:

- Gives your company a competitive advantage
- Preparing for future legislation
- Responds to generational shift in perception towards green infrastructure
- If you are holding the assets long term you are preventing the need for an eventual inevitable retrofit to Net Zero
- Net Zero buildings are becoming a desirable PR product for clients

Operational:

- Reduced energy delivery required

3.2 What barriers can you see to building Net Zero buildings?

Having discussed the benefits and opportunities that delivering Net Zero Carbon buildings can bring, the group moved to discuss some of the barriers that is being seen in the market.

Achievability:

- Achieving Net Zero relies on high quality products and construction experience
- PassivHaus standards of airtightness are more difficult to meet – this has proved challenging when the project gets on site
- There is very little margin of error in order to achieve Net Zero buildings, the design has to be robust and aligned with this aspiration – coordinated input needed early
- Pivoting a project to Net Zero part way through is almost impossible to achieve, particular for envelopes. Net Zero plans have to be in place before RIBA Stage-2 and a key briefing criteria to focus the team
- Not all builders or contractors are technically capable of delivering what is required – with little communication of ‘what works’ around the industry, this can cause delays and unnecessary complications. For developers the process of finding their way can be complex and expensive

Clients:

- Clients come with many different personalities and have different expectations. They often have to be convinced to take on financial risk in order to reach Net Zero.
- Not everyone cares about building Net Zero. This can be ideologically based or just perspective based, for example someone holding onto a long term asset can benefit from energy savings in the long term or lower maintenance costs, but those dealing with short term profitability projects are less likely to be concerned with the long term energy savings of a Net Zero home. The focus is on short term sales value benefits or construction budget/lending benefits.

Financials:

- 2-3% uplift in capital expenditure for Net Zero – however, with limited experience on the construction side, these costs tend to amplified – With building regulations/policy catching up the base minimum build requirements are tending close to being the standard which will close the gap i.e. it by definition becomes the norm.



- Not all institutions are offering 'Green funds' or discounts on green assets and its still an emerging money market
- Difficult to maintain competitive advantage when focusing on land purchases/land value – the premium that exists to deliver Net Zero can make financials more challenging in the short term

Planning:

- Net Zero or PassivHaus needs to be a clear focus from the Concept design stage
- Client needs to be on board right from the beginning and assisted to make informed decisions
- Takes real design and budget effort from the beginning collaboratively to achieve successful and important economic outcomes

Handover:

- Educating home owners/ building managers in how to use their building effectively is not always possible
- Operational data does not always reflect original design intent – this gap needs to be closed

Certification:

- True successful Passivhaus homes can be challenging to complete, need to take experience on to the next project – take whats best and review critically what can be sensibly achieved (go for 2 rather than 1 for air tightness for example)
- High standards causing delays to certification, affecting sales and or profitability.

Knowledge gap:

- There is limited sharing of experiences - particularly bad ones, which is incredibly important
- There is a big gap in learning within the industry, which is possibly a bigger issue than cost to achieving Net Zero.
- Historically limited interest in innovation - Construction lagging behind the car industry for example. Need to think differently about how we build things. 'This is how we do things round here' attitude
- General uncertainty around the subject - Knowledge gap generally in the industry
- Limited data and outcome assessments available
- Not enough focus on embodied carbon and materiality – this needs to be a focus of design teams as well
- Passive design isn't that complex, so why aren't we doing it

Regulation:

- Unintended consequences of tick box compliance and policy achievement leading to operational and user legacy issues
- Conflicting regulation – Timber is cheaper and more sustainable, but due to fire regulations cannot be used widely
- Daylight vs façade efficiency vs overheating
- Challenges with builders delivering against regulation minimums there to prevent the worst rather than the aspiration

Support:

- People and supply chain are part of the problem, even simple details. Concerns with the application of modern methods of construction

Time:

- Time is the biggest cost, materials are 10% of the overall build cost, prelims are 20% and time bound whatever anyone tells you, so just go as fast as possible with the least operatives on site



3.3 How do we as a group achieve Net Zero buildings as a standard means of building delivery?

Walk the talk:

- Be responsible clients ourselves with the buildings that we occupy which will quickly align with a general buyer/public expectation
- Keep your colleagues and teams educated and up to date on the most current data and research of Net Zero, to mold thinking patterns to be more sustainability focused.
- Developers should have some 'skin in the game' by keeping hold of their developments for a few years to be able to prove that it is Net Zero, before they can sell it as a Net Zero building – this provides more incentive and impetus of design teams to deliver these aspirations

Financials:

- Take advantage of preferential lending and grants to ensure off-setting of increased capital expenditure
- Expand analysis of this area to be able to provide investors with current, measurable, detailed data
- Know the cost vs added value data. For example, triple glazing adds significant cost, but identifying the added value in energy saving or rental premiums will help influence a client towards a Net Zero agenda.
- Understand that cutting costs to save money up front, very often ends up costing much more in the long term. Value vs value engineering should be a key assessment criteria in any design and construction judgement
- Shift costs to the new value areas - reduce net to gross to spend on design quality
- Modular offsets regional cost variances, cheaper labour partly offsets site specific development costs
- Create new design cost and procurement models

Added Value:

- Know the added value of building to Net Zero
- Added cost must be offset by added value – this needs to be communicated
- Be innovative with the number of ways that we can add value to a property, gyms, shared workspaces, balconies, green spaces, energy savings, panoramic views, work-from-home ready, superfast fibre broadband, creating a sense of community and environment which keeps people in the development. Particularly important with renting becoming more necessary and occupants having the ability to rate their 'stay' on tripadvisor type applications
- Need to focus on the outside of the building and making developments community focused and better places to be.

Collaboration and Information sharing:

- Endure the initial friction and learning curve by aligning the team and contractor early
- Share our mistakes so that we don't all make the same mistakes
- Encourage information sharing both within organisations and externally
- Seek out colleagues and like minded thinkers within the industry to work with, that have the same drive and determination to build sustainably. This will encourage further research and development to find the necessary solutions to our problems.
- Involve all stakeholders from client, architect, engineers, contractors and more in the whole process, from design stages to completion to build consensus and keep each part accountable to the rest that standards are met.
- Disseminate current knowledge – Reduce or remove contractor perception of 'green risk'

Design better earlier:

- Must challenge the business model early as an entire team



- Set real sustainability goals early which clients have understood, have bought into and feel knowledgeable about
- Be engaged in the creation of the business model from early stages

Thinking differently:

- There has been the development of an AI to form part of boards to make non- emotional/non- embedded perception based decisions. Good sensible data in leads to good solutions out. Be open and do not put forward previous design and construction bias. Freely challenge them on every new project as they may now be possible and beneficial
- Adopt practices like 'Virtuous Learning' trying to work out what are the most impactful decisions and methodologies you can apply that will make the world a better place
- Part volumetric and part component based approach
 - Interesting Imperial paper on the subject - <https://spiral.imperial.ac.uk/bit-stream/10044/1/78217/6/3232%20Discussion%20Paper%205%20Fiscal%20frame-work%20WEB%20FINAL.pdf>
- More accountability on actual delivery of results which then links to sales value
- Must focus around the user as well as the high-level development aim to add real long term development/asset value
- Micro to Macro – relatively small decisions have a massive impact on design and operational outcomes and the associated effect on occupants. Design map needs to be carefully thought through with all 'stakeholders' in mind – Developer, Operator, Contractor, Resident etc.

Changing construction delivery processes:

- Make it easy to build and robust
- Make construction sites much more of a controlled environment
- More offsite construction of components that can then be brought to site and fitted in a much more efficient manner
- Become more efficient with using cheaper materials
- A focus on the removal of human error within what needs to be a high performance product

Policy:

- Policy and regulatory changes are still required to level the playing field and are coming. These also need to be consistently applied nationally

Soft Landings:

- Develop better and more in-depth soft landings strategies
- Engage all parties in soft landing conversation and education



