

A Fabian Society Essay on 5GDHC and Passivhaus Retrofits

Authored: Alfred Mayaki

Client: Fabian Society

Published: November 2024

Permalink: <https://sites.google.com/view/alfredmayaki/research/policy-papers>

Contents

| | |
|---|---|
| 1. Title Page | 1 |
| 2. Contents | 2 |
| 3. Executive Summary | 3 |
| 4. Sustainable Development in Southwark | 6 |
| 5. The Autumn Budget 2024 | 6 |
| 6. 5GDHC Networks | 7 |
| 7. A Final Word | 7 |
| 8. References | 8 |

Executive Summary

I wrote this essay by means of a foreword I wrote for a non-academic transcript to a 1-on-1 formatted Q&A interview with the London-based award-winning Passivhaus architect and engineer, Christian Dimbleby, of Architype Studios in July 2023, a transcript that uncovered a high degree of local and nationwide impact that Passivhaus methods have had on the field of construction design, with specific concentration on what has come to the fore through specific terminology commonly known as *modern methods of construction* (MMC) both in the academic discourse on retrofit adoption by local government and the academic discourse on EnerPHit certification.

Passivhaus and EnerPHit, its performance-based, energy standard for retrofitting buildings to become more energy efficient were enacted by the PassiveHaus Institute (PHI) to develop a solution as to the question of how frameworks can best streamline the decarbonisation of construction and retrofitting. Since a humble detached rural self-build in Wales was completed in 2009 to Passivhaus standard, hundreds more residential, commercial, mixed-use and purpose-built (including for schools, offices, and universities) have been developed to the required EnerPHit standard.

Given the success of the 1-on-1 personalised interview with Passivhaus architect, Christian Dimbleby on the topic of MMC, and sustainable modes of architecture, a further opportunity has emerged to explore how MMC, Passivhaus and EnerPHit may coincide with the conceptual re-design of a legacy stock of Southwark Council properties in and around the Southeast of London. Such a re-design has been heralded in the literature as an emergent theme known formally as the 5th Generation of District Heating and Cooling (5GDHC) and its associated and planned architectural concepts. This essay shall aim to uncover the relevance of 5GDHC as an emergent concept (Gillich *et al*, 2022) which may be able to solve several long-standing problems faced by Council residents in Southwark.



Alfred Mayaki

Vice-Chair of Peckham Branch



Sustainable Development in Southwark

As a long-time advocate for social housing, I acknowledge that a loosely articulated but nonetheless politically empowering guiding principle of this great society is its overarching and often understated loyalty to *sustainable development*. Having experienced this loyalty firsthand through conversations with Labour Party Councillors in Southwark, it has become apparent that there ought to be a precursor essay setting out that which defends the socialist ideal or rather that which we value and that which we feel associates closely with a loyalty to *sustainable* energy and sustainable construction of social housing, energy efficiency in new and existing residential buildings, and of course 5GDHC. I am told that one of the brightest advocates in this regard – who upon becoming known to the Labour Party in Southwark has since been a shining beacon of wisdom, passion and insight – is one Mr. Max Templar of the Gloucester Grove Estate (GGE) Leaseholders Group (Magill, 2024). The protest being advocated by Mr. Templar and the GGE Leaseholders Group concerns the Council service charge for heating, gas boiler maintenance, insurance and general service provision in Camberwell and Peckham. Indeed, the extortionate level of the Council's service charge is of importance to tenants for numerous reasons. Typically, there is no cap on charges levied by Southwark Council, however, according to an online leaseholder's advisory bureau, resolution in favour of tenants may be achieved through a Tribunal arbitration procedure¹. This is all possible once avenues for dispute resolution have been pursued and exhausted.

Having been in discussion with Fellows of the World Energy Forum and senior leaders from SE4ALL (a UN agency), the latter of whom are pioneers of the **tripartite definition of sustainable development** and who outline its allegiance to such an encompassing endeavour, consistently. Similarly, having become privy to the wisdom of many of our 2030 goals (SDGs) particularly three core areas which are: in the first instance, affordable and clean energy (SDG7), and in the second instance; industry, innovation and infrastructure (SDG9); and a third goal of relevance; sustainable cities and communities (SDG11), I have become convinced that us as Fabians must encourage policymakers to avoid duplicitous meaning, and to remain processual when encountering new forms of knowledge, and relevant information to append and ultimately resolve concerns with national consumer energy policy with positive and practical action.

The Autumn Budget 2024

Now, the objection formed by Max Templar and several representatives of the GGE Leaseholders Group to what can only be described as a form of long-term surcharge is one characterised by heating inefficiency due to the fundamental lack of decentralised control tenants retain within a district heating network which is communal (previous to 4th Generation) resulting in an extortionate service charge. Some tenants from lobby groups such as GGE Leaseholder's Group are being charged in the region of £5,000+ per annum, including Mr. Templar himself. **What relationship do such instances of consumer energy surcharge have with sustainable development?** The only adequate place to begin is with the Chancellor's Autumn Budget, which was announced in November 2024. There have been several provisions for energy consumers, including:

- A National Mission for Clean Power which will develop a plan to achieve clean power by 2030
- A warm home discount scheme of over £1 billion
- Heat decarbonisation and household energy efficiency investment of an initial £3.4 billion between 2025-26 and 2027-28
- A scheme apparently intended for households to convert existing heating arrangements to low carbon technologies (LCT) and new funding to help heat pump manufacturers meet consumer energy demand

From a November edition of Energy Savers Trust in a recent article, the key provisions of Chancellor Rachael Reeve's Autumn Budget were explained as being '*an initial £3.4 billion investment over the next three years to improve home energy efficiency and switch to low carbon technologies (LCT). £1.8 billion of this will go towards fuel poverty schemes. This should help over 225,000 low-income households to lower their annual energy bills by over £200.*' With respect, I would point specifically to Heclo and Wildavsky (1981) study of Labour's 1970's Public Expenditure Survey Committee (PESC) approach to managing inflation effects, involving several advances such as volume planning and cash budgeting (Fisher, 1998: 34).

¹ See <https://www.lease-advice.org/files/2021/12/Service-Charges-Dispute-Resolution-Flowchart.pdf>

5GDHC Networks

Observably, although there are some flawed and some adequate provisions in this year's Autumn Budget for LCTs and what the World Economic Forum refers to as advanced energy solutions i.e. heat pumps, I refer us back to the service charge issue faced by GGE Leaseholders Group in Southwark. Debate in the literature surrounding effective and perfect substitution of gas boilers and heat pumps is very much a matter of industrial organization (Price, 1994). 5GDHC performance simulations and new secondary data regarding innovative solutions demonstrate the problem is efficiency², it is also at least partly clear that the issue concerns concept as much as efficiency (please be aware, as Gillich (2022) highlights, London as a city has a heavy energy reliance on gas boilers and the natural gas grid). There is finally an idea that the **Coefficient of Performance** (CoP)³ is the most common energy performance measure available.

Can a relatively mediocre CoP measure (Altermatt *et al*, 2023: 4), and a single installation per household roll-out effectively combat the issues faced by lobby groups such as GGE Leaseholder Group and other 4GHDC or communal heating estates in the Southwark area? Perhaps a brilliant answer to this question is found in a 5GHDC study where results correlate to the ventilation capabilities of Passivhaus standard retrofits (Gjoka, Crawford and Rismanchi, 2024; Dang *et al*, 2024).

A Final Word

It is widely understood that most installations of domestic heat pumps rely on government grant incentives, currently the Boiler Upgrade Scheme (BUS) in England and Wales offering £5,000 (now, £7,500⁴) towards an air source heat pump (UK Government Report, 2023a). Although policy frameworks which characterise the increasing use of heat pumps in the UK are largely evidence-based and designed with the encouragement of affordability for energy consumers, according to Price (1994) and other commentators regarding the legacy scenario of Transco⁵ – the popular arm of British Gas that was once 'responsible for storage and transmission of gas' – wholesale privatisation, *per se*, as a single concern was indeed seen ironically as a success (Fisher, 1998: 160). In agreement with some commentators, I perceive and view parts of the Budget as more or less 'performative', though evidence based.

END

² ICAX Ltd is a UK-based leading energy sustainability company which pioneers the Air Source Heat Pump (ASHP). According to their website: 'In spite of the first law of thermodynamics, which tells us that energy can neither be created nor destroyed, an ASHP in a good installation can transfer up to three units of heat for each unit of electricity consumed.'

³ According to ICAX Ltd 'The CoP will vary with each installation, but the lower the output temperature to the heat distribution system the higher the CoP will be.'

⁴ See <https://www.insidehousing.co.uk/comment/will-increasing-the-boiler-upgrade-scheme-boost-heat-pump-installations-83823>

⁵ See <https://www.marketingweek.com/british-gas-plc-renamed-transco-international-for-flotation/>

References

1. Altermatt, P. P., Clausen, J., Brendel, H., Breyer, C., Gerhards, C., Kemfert, C., ... and Wright, M. (2023). Replacing gas boilers with heat pumps is the fastest way to cut German gas consumption. *Communications Earth & Environment*, 4(1), 56.
2. Barr, A. (2023) "Behind the Facade: Learnings from King Charles' Poundbury and Nansledan developments go beyond aesthetics", RSA Journal, 169(1), pp. 40-43
3. Bastian, Z., Schnieders, J., Conner, W., Kaufmann, B., Lepp, L., Norwood, Z., Simmonds, A., and Theoboldt, I. (2022) "Retrofit with Passive House components", Energy Efficiency, 15(10)
4. Crawford, P. (2010) "Getting to know....Hadlow", The Horticulturalist, 19(3), pp. 16-19
5. Dang, L. M., Nguyen, L. Q., Nam, J., Nguyen, T. N., Lee, S., Song, H. K., and Moon, H. (2024). Fifth generation district heating and cooling: A comprehensive survey. *Energy Reports*, 11, 1723-1741
6. Field, M. (2020) 'Models and Practice', Chapter in 'Creating Community-Led and Self-Build Homes: A Guide to Collaborative Practice in the UK', pp. 21-106
7. Fisher, C. M. (1998) '*Resource Allocation in the Public Sector: Values, priorities and markets of public services*', London: Routledge
8. Gallent, N., Hamiduddin, I., Sterling, P., and Wu, M. (2023) 'Self-build and custom housebuilding. Off-grid and council-led development: the future', Chapter in 'Village housing: Constraints and opportunities in rural England', UCL Press
9. Gillich, A., Godefroy, J., Ford, A., Hewitt, M., and L'Hostis, J. (2022). Performance analysis for the UK's first 5th generation heat network—The BEN case study at LSBU. *Energy*, 243, 122843
10. Gjoka, K., Crawford, R. H., and Rismanchi, B. (2024). A comparative life cycle assessment of fifth-generation district heating and cooling systems. *Energy and Buildings*, 323, 114776.
11. Hecllo, H. and Wildavsky, A. (1981). The Nuclear Family: The Treasury. In *The Private Government of Public Money: Community and Policy inside British Politics* (pp. 37-75). London: Palgrave Macmillan UK
12. Lu, Z., and Ziviani, D. (2022). Operating cost comparison of state-of-the-art heat pumps in residential buildings across the United States. *Energy and Buildings*, 277, 112553.
13. Magill, T. (2024) 'Even if I use no heating, I'll be charged anyway', BBC News, Available at: <https://www.bbc.co.uk/news/articles/cvg74903457o> (Accessed on 09 November 2024)
14. Moffitt, L. (2023) 'Climate control', Chapter in 'Architecture's model environments' UCL Press
15. Price, C. (1994) 'Gas regulation and competition: substitutes or complements', in Bishop, M., Kay, J. and Mayer, C. (eds) *Privatisation and Economic Performance*, Oxford: Oxford University Press
16. UK Government Report (2023a) 'Review of Air Source Heat Pump Noise Emissions, Permitted Development Guidance and Regulations', DESNZ Research Paper Number 2023/046