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Fuel Poverty and the Net Zero Goal in Norwich

2022 Working Paper 3

ESMATULLAH KHYBER
UNIVERSITY OF EAST ANGLIA

The Norwich Climate Commission is an independent advisory body set up to bring actors from the public, private and third sectors together to support, guide and track the impact of ambitious climate change and sustainability actions across Norwich. We are a partnership of Norwich City Council and the Tyndall Centre for Climate Change Research at the University of East Anglia.



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Fuel Poverty and Net-Zero Goal by 2040: A Case in Norwich City

Development Work Placement Analytical Report

M.Sc. Climate Change and International Development

School of International Development

University of East Anglia

Supervisor: Dr Oliver Springate-Baginski

Esmatullah Khyber (100339647)

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Summery

Global greenhouse gas emissions have been steadily growing, with the decade 2010 to 2019 having the greatest anthropogenic emissions. Cities, because of their enormous energy use, play an explicit role in emissions. Norwich City Council is working to reach the net-zero emission objective and address climate change on a local level through improving energy efficiency and eliminating fuel poverty. So far, emissions have decreased, but some sectors continue to contribute considerably to emissions, which must be lowered to meet the net-zero goal. Primary and secondary data have been obtained to find out the challenges toward achieving net-zero target with the consideration of current fuel poor households. The study result shows that Fuel poverty is a policy issue leading to challenges among poor households. This means a lack of clarity and a clear direction in policy and plans to achieve the net-zero goal with the current numbers of fuel-poor households. Moreover, poor households' lack of financial options may lead to unsuccessful energy efficiency and decarbonization efforts. Likewise, physical barriers such as old UK houses and buildings might challenge fuel-poor households in considering the net-zero agenda. Furthermore, a lack of public awareness about fuel poverty, energy efficiency, and climate goals might be an issue. This may lead to a lack of public participation and engagement in government projects and activities. Also, a lack of coordination and partnership between local organizations, such as charity organizations working with the community, might be a gap.

To address the current issue of fuel poverty and achieve the net-zero target of 2050, local authorities, particularly the Norwich city council, are considered the main decision-maker body in implementing governmental policies at the local level. Based on our discussion with relevant organizations and experts, the following recommendation has been prioritized for the relevant local authorities to be carried out:

1. Setting short-term and long-term clear and feasible goals in alleviating fuel poverty and providing energy efficiency for poor households.
2. Governmental policies might work through different schemes for poor households. This may provide specific schemes and social tariffs to fuel-poor households in providing energy efficiency tools, renewable energy options such as solar PV with covering upfront costs, and EPC tools.

3. Lowering the cost of heating homes for vulnerable and poor households.
4. Extending partnership with the charity organizations due to their link and community empowerment projects with different social groups such as recent refugees.
5. Prioritizing investing public funds in energy efficiency results in household cost savings, primarily in economically depressed areas.
6. Awareness and community engagement in energy and climate change activities.
7. Research and development are required in fuel-poor households' identification and property renovation with the latest energy system.
8. Upgrading council houses and buildings with access to the latest energy efficiency tools and renewable options.

1. Introduction

Global greenhouse gases have been increasing significantly, where the decade 2010 to 2019 had the highest anthropogenic emissions (IPCC, 2022). Explicitly, cities play a primary role in GHGs emissions due to their high level of energy consumption. Meanwhile, cities could also contribute to emission reduction to achieve the net-zero goal by 2050. However, cities are considered for 2/3 of global energy consumption and more than 70% of annual carbon emissions. By 2050 around 70% of the global population will live in cities, increasing the demand for energy system infrastructure (IEA, 2021).

Energy efficiency is an essential tool to achieve the net-zero goal, where over 90% of UK homes use fossil fuel for home heating, covering a third of the UK's total gas consumption. Meanwhile, households are facing the high price of energy bills. On the other hand, energy efficiency in the heating system can decline energy bills by around 20% and reduce dependency on gas imports. British Energy Security Strategy advances energy efficiency through energy use reduction, which households and businesses need to build. The strategy aims to provide cheaper and more comfortable home energy systems. Currently, the UK government is investing around £6 million in homes and building decarbonization across the UK (DBEIS, 2022). Thus, the UK's net-zero target would not be possible to be achieved without energy demand reduction (University of Oxford, 2021).

Norwich is a small historic city in Norfolk County, East of England. Norwich City Council is putting effort into meeting the net-zero emission agenda and combating climate change locally through energy efficiency and reducing fuel poverty (Norwich City Council, 2022). So far, emissions have shown a reduction, but some sectors still contribute to emissions significantly, which must be reduced to achieve the net-zero goal. Most emissions in Norwich city come from residential buildings (32%) and on-road emissions (27%) (Norwich City Council, 2022).

Most of the households in Norwich do not have enough income to afford their energy bills, and few are getting opportunities for better living standards. According to the Affordable Warmth Strategy (2021), around 12.3% of Norwich households face fuel poverty. The Council is working to reduce fuel poverty; however, there has been no increase since 2011, but 2015-2016 has shown a significant increase due to higher energy prices and decreasing governmental

support in energy efficiency development. This will have worsened due to the current crisis in the cost of gas, electricity, fuel, and inflation across all sectors in the UK.

I have started my Development Work Placement DWP on June 01 until August 10 under the professional supervision of Asher Minns, the executive director of Tyndall Centre for Climate Change Research and Co-Chair of the Norwich Climate Commission, and the academic supervision of Dr. Oliver Springate-Baginski from the school of international development UEA. My main task was researching fuel poverty and achieving net-zero target in Norwich city, where I was able to find out the challenges and recommend some key action for local authorities.

Objectives

The main objectives of this placement are as below:

- To identify current climate change and energy-related socio-economic policy challenges in the UK relevant to Norwich.
- To identify opportunities and challenges of the links between fuel poverty and achieving Norwich's net-zero goal 2040.
- To recommend possible policy options for Norwich City Council and related local organizations for Norwich city households to contribute to a net-zero goal by 2040 while alleviating fuel poverty.

2. Literature Review

Cities have been considered the most significant contributor to emissions due to massive energy consumption from population intensity and increased demand for energy. IEA (2016) reported that cities consume 2/3 of energy and produce over 70% of global carbon dioxide emissions. Also, cities can be the center of decarbonization (IEA, 2016). Globally, most cities recognize their capacity to help climate mitigation achieve a net zero. In December 2020, over 800 cities worldwide committed to achieving the net-zero goal (UNFCCC, 2020). Achieving the net-zero goal requires enormous efforts, where it might be a profound decarbonization goal with a systemic change. Low-emission plans focus on compact development options to reduce the travel demand, energy-efficient building design, vehicles with fuel economy, waste-to-energy innovation, and social behavior change (Seto *et al.*, 2021).

What is fuel poverty? Fuel poverty refers to a lack of sufficient income to heat a home appropriately, including hot water, cleaning, and a source of heat to cook (Norwich Environmental Strategy, 2020). Humans must stay warm at home during the winter and power their homes. Due to higher energy prices, low income, and lack of energy efficiency, people are restricted from paying their rent and other expenses. Approximately 6.5 million households across the UK face fuel poverty, where they cannot pay the bill and heat their homes (NEA, 2022).

Energy/fuel poverty may cause different health problems among households, such as the impact on mental health, heart attacks, strokes, bronchitis, and asthma (NEA, 2022). Fuel poverty concern has been raised mainly during the Covid-19 pandemic, where domestic energy consumption increased; however, the energy bill fell in 2020, but the pandemic caused a global financial hardship (HC Library, 2022).

Fuel poverty in the UK has various levels in the last two decades, decreasing in the late 1990s and increasing from 2003-to 2010 (DECC, 2015). The UK statistic shows that fuel poverty declined from 2010 to 2011 due to energy efficiency standards and a fall in energy costs (DECC, 2014). Still, this issue remains as constant as most households remain fuel poor, whereas the UK keeps policy targets regarding fuel poverty as a significant concern

(Bouzarovski *et al*, 2012). Limited evidence shows that fuel poverty varies between rural and urban areas (Thomas, 2013).

Most of the households in Norwich do not have enough income to afford their energy bills, and few are getting opportunities for better living standards. According to Norwich City Council, around 12.3% of Norwich households face fuel poverty. In Norwich, the cost of gas and electricity increased by 40% compared to ten years and twenty years ago, when the household could not afford to pay the bills (DECC, 2016). The Eastern Daily Press (2022) concluded that fuel poverty in Norwich reached 19.6% in 2020 (Tab. 1) from 9.9% in 2015.

Table 1. The percentage of households in fuel poverty 2020. Source: DBEIS, 2022

	Area names	Number of households	Fuel-poor households	The proportion of fuel poor-Households (%)
Norfolk		405,406	63,174	15.6
	Breckland	59,461	8,664	14.6
	Broadland	58,117	6,748	11.6
	Great Yarmouth	45,868	7,863	17.1
	King's Lynn and West Norfolk	68,509	11,380	16.6
	North Norfolk	50,307	8,206	16.3
	Norwich	65,541	12,827	19.6
	South Norfolk	57,603	7,486	13.0

Energy Decarbonization: Transport, domestic heating, and commercial activities are cities' most significant sources of emissions. However, a growing technological solution has been implemented in various places. For instance, the idea of green hydrogen for energy purposes might be a sustainable way to combat climate change and reduce emissions. According to Latvia's National Energy and Climate Plan, hydrogen could be a long-term solution to replacing fossil fuels in the transportation sector (Oliveira, Sousa and Kotoviča, 2022).

Some decarbonization methods, such as bioenergy for heating in Europe, are effective alternatives to reduce the emission, where the storage of biomass for late consumption can also sequester carbon from the atmosphere. Moreover, other renewable energy sources, such as solar-thermal systems, are sustainable solutions to the energy system. This system can help in water and space heating and is a suitable option for low-temperature applications in domestic usage (Madurai *et al.*, 2022). The market capacity for thermal energy systems can reach 47% of low-temperature needs by 2050, supported by European policy mechanisms (Solar Heat Europe, 2021). Moreover, the geothermal energy system as an appropriate low-emission technology in Europe is increasing significantly, which is applicable in residential, agriculture, and industrial sectors (Dalla *et al.*, 2020).

Some practical ways to consume fossil fuel with less emission are combined heat and power systems. This energy system works in a cogeneration approach, which provides higher energy efficiency and emission reduction, where this system produces heat and power simultaneously (Madurai *et al.*, 2022).

However, some countries, such as Poland, developed technical energy services to control energy consumption with intelligent remote management that reduces energy consumption in homes, constant monitoring systems, weather forecasting, and low-emission results (BES, 2021). Furthermore, this technology also provides a reliable and efficient system for its substation, where this service has been offered in an area that was 90% relied on fossil fuel for its heat production (Makiela *et al.*, 2022). Many countries, including the UK, are committed to reaching net-zero emissions by 2050, and to achieve this, action from all sectors is required. Mainly housing is the fifth greater emitter of the UK's total emissions in 2020 (DBEIS, 2020).

Energy Efficiency: Home heating and energy efficiency play a significant role in achieving a net zero; for instance, the escape of heated air inside the house might be counted as the primary

source of energy loss and lack of efficiency (HM Government, 2021). The main objective of energy efficiency is to reduce unintended ventilation. In 2019, the UK was considered the first to set goals to achieve net-zero greenhouse gas emissions by 2050 (UK Government, 2019). One of the main steps to achieve the net-zero goal is energy efficiency, where the UK put effort into new homes with higher energy efficiency standards. These standards are such as thermal efficiency and airtightness, and a fabric first practice will be considered for the current existing houses, which are considered below the government standards (HM Government, 2021). More than 85% of the existing house will be energy efficient by 2050 (IEA, 2021).

According to Gaterell and McEvoy (2005), the UK government has been putting effort since 2003 into releasing policies about energy. The Energy White Paper policy in 2003 set some goals such as:

- Emission reduction and mitigation of climate change by cutting anthropogenic emissions.
- Supporting the UK becoming a net importer of energy.
- Updating the current UK energy infrastructure could affect response to the energy efficiency from import, renewable sources, and relevant clean energy systems.

On the other hand, the UK's efforts toward emission reduction policies are already visible. Still, it does not seem practical in practice as in theory, where the UK's heating decarbonization practice has been limited, in which energy efficiency installation declined in 2013 instead of increasing (Committee on Climate Change, 2018).

3. Methodology

The Development Work Placement DWP started on June 01 until August 10 under the professional supervision of Asher Minns, the executive director of Tyndall Centre for Climate Change Research and Co-Chair of the Norwich Climate Commission, and the academic supervision of Dr. Oliver Springate-Baginski from the school of international development UEA. The study area is Norwich city, as Norwich City council announced to achieve the net-zero target by 2040.

Norwich City Vision reported that as a dynamic city, Norwich must be a liveable city with social justice. This means everyone should access energy with the highest efficiency and achieve the net-zero goal by 2040. To address this, the below question should be answered:

1. Does fuel poverty affect achieving the net-zero goal?
2. What actions should local authorities take to help net-zero with the current fuel poverty consideration?

Data sources: Overall, the secondary data was collected as a literature review from different sources such as policies, reports, research papers, implemented projects, and case studies regarding energy and climate change in the UK. The data has been sorted from the national to local level.

Some primary data have been obtained, such as open discussion interviews with some energy and climate change experts such as UEA lecturers, Norwich council colleagues, and some NGOs working in the energy sector based in Norwich. The information has been used for challenges and opportunities identification of net-zero goal and fuel poverty in Norwich. Furthermore, an ethical approval has been received before conducting interviews and discussions.

Data Analysis: The secondary data is critically analysed by assessing and content analysis of policy and practice gaps in the UK. The interview summary has been compared to the secondary data to sort findings from the national to a local level.

DWP organization and role

The development work placement was completed with Tyndall centre for climate change research headquarters based in UEA. The Tyndall Centre was established in 2000 to conduct cutting-edge, multidisciplinary research and serve as a link between scientists and policymakers. The Tyndall Centre comprises a significant body of the UK's climate change education from across the scientific, social, and economic areas, with almost 200 individuals ranging from post-graduate researchers to Professors. The Tyndall Centre vision is to bring together multidisciplinary and engineering researchers to create long-term solutions to climate change. It collaborates with public and commercial sector leaders to support informed climate change mitigation and adaptation decisions.

In the last 22 years, the Tyndall Centre has made significant contributions to the fundamental analysis of emission reductions from all majors, such as energy sectors, climate change impacts, risks, adaptation, public awareness of climate change, and the governance of climate negotiations and policymaking.

Placement Activities

The prominent placement activity was conducting a study on fuel poverty and achieving the net-zero goal in Norwich city, where the study's findings, with some recommendations to the Norwich Climate Commission, were considered the primary outcome of the work placement.

The first month of work placement was allocated to the literature review, such as UK's energy and climate change policies and strategies, content analysis, and research articles published regarding fuel poverty and decarbonization. The second month is dedicated to the open discussion with the energy and relevant sector organization working as community empowerment, alleviating fuel poverty, and supporting poor households in Norwich. Likewise, some open discussions and interviews have been conducted with the professors, experts, and officials regarding energy efficiency, energy poverty, decarbonization, and climate change policies challenge and opportunities. The discussion and interview added to the study findings, such as the main challenges toward achieving the net-zero goal with the current number of fuels, and what local authorities might do to address this issue.

4. Result and Discussion

Fuel Poverty and Energy Prices

Fuel poverty is associated with health issues, particularly in winter. Beyond physical health, low temperature and poor mental health are linked as well (Hills, 2012). Approximately 4.2 million poor households were identified in Great Britain in 2018, where 3.5 million were based in England. The number of households in fuel poverty is supposed to increase from 2 to 4 million because of energy and gas sales and price rises (CCC, 2022). The number of poor fuel households in England in 2012 was around 2.28 million, reaching 2.55 million by 2016 (DBEIS, 2018). Below is the regional fuel poverty of households in England. The East of England Region does not have the highest fuel poverty, though it still has a considerable percentage of fuel-poor households. Meanwhile, energy bills and prices, particularly electricity, rose significantly (Fig.2).

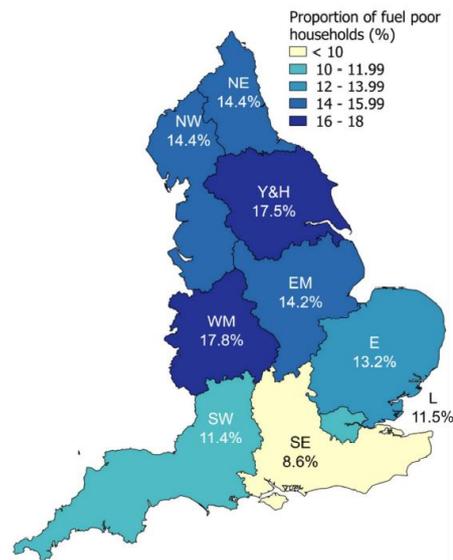


Figure 1. The regional proportion of households in fuel poverty, data from 2020. Source: DBEIS, 2022

According to the Norwich affordable warmth strategy (2021), 7,804 households are considered fuel poor, approximately 12.3% of the total population in Norwich.

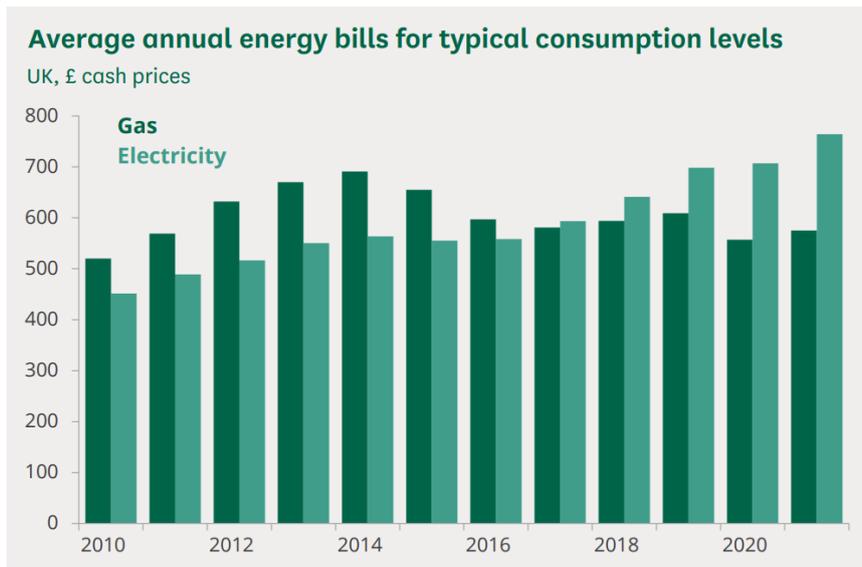


Figure 2. The UK's energy bills and prices from 2010-2020. Source: (House of Commons, 2022).

The level of households' income can vary in terms of spending on energy. When income increases, energy consumption increases as well (left chart, fig. 3). For poor households, the total expenditure on energy is much higher than any other spending category (right chart, fig. 3).

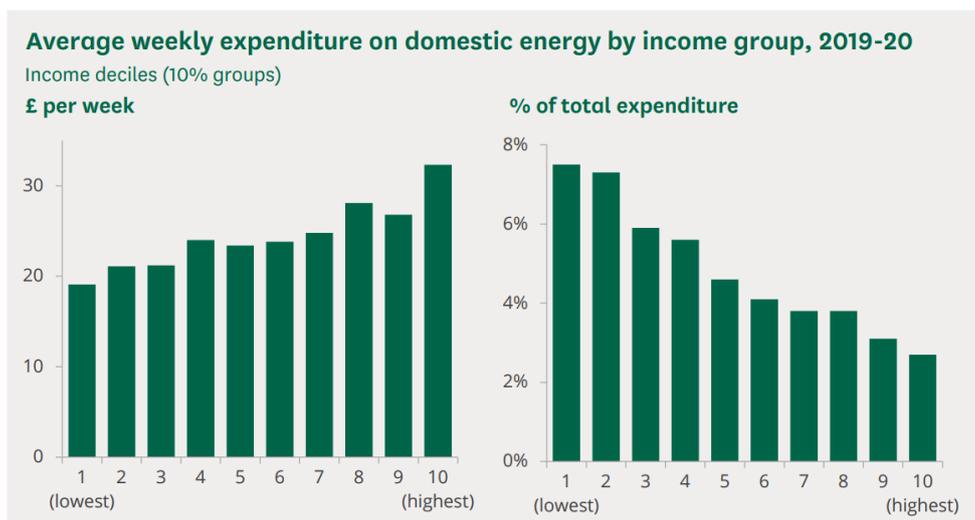


Figure 3. Energy spending based on income level and total expenditure in the UK. (HC, 2022).

The energy price has increased significantly from 2019-20 and March 2022. Ofgem's projections, the National Energy Regulator, show a further increase in October 2022, which could reach 130% higher energy price compared to 2019-20. For most of the decade, the electricity bill rate has risen. The average electricity price increased by 36%, approximately from £450 in 2020 to £760 in 2021, only from over 20 pence per liter at the early lockdown to nearly 60 pence per liter in mid-October 2021. The average price of heating oil increased. (House of Commons, 2022).

Energy prices and Affordability: According to the interview findings, some energy experts and economists say that the rising energy prices in the UK have led to different economic challenges. The energy price directly affects poor households due to their vulnerabilities. Most of these households are poor due to the current general poverty; the energy price will further increase their vulnerability. According to Deller (2022), for approximately 22 million people in the UK, energy prices rose from £693 to £708 from April 01, 2022. Affordability is the primary fuel poverty challenge among poor households.

The energy price increase may lead to three options: energy consumption reduction by households, decrease of other product consumption due to higher energy expenditure, and continuing energy service and consumption maintained by households by bringing down savings (Deller, 2022).

The level of energy services in every society varies by their lifestyles. Still, due to general poverty and higher energy prices, a community might agree on the lowest level of energy services which can be reasonable. When the minimum level of energy services is unaffordable, it is called fuel poverty (Deller, 2022).

Based on a study (Deller, 2022), there are a few factors that directly influence energy affordability and explain the complexity of fuel poverty:

1. Energy efficiency is the main tool for improving energy affordability by increasing the number of energy services with the same energy expenditures.
2. Income level plays a significant role in energy affordability, and lower income will increase the challenges of energy affordability.
3. High and low energy expenditure levels can indicate energy affordability challenges.

4. How households get to adjust their energy consumption through an energy price shock would rely on their own choice of energy services and products.

Taxes vs. Bills

Consumer bills already cover a sizeable share of the expenses associated with the decarbonization of the energy system, amounting to £11.4 billion in 2019/20. It is generally accepted that paying for policies through bill charges rather than taxes is unfair because people in lower income deciles pay a larger share of the total spending. The Energy and Climate Change Committee stated in the Prices, Poverty, and Profits report 2013 that: The use of levies on bills to fund social and environmental policies and programmes will increase the burden imposed by energy price consumers, particularly in low-income households. In this regard, public spending is less regressive than levies (Citizen advice, 2021).

Fuel Poverty and Financial Barriers

For home decarbonization, fuel-poor households require additional cost assistance to pay the upfront expenditures connected with the process. High "hidden" costs are related to home renovations, such as updating their electricity system to utilize electric forms of heating, which are expensive for fuel-poor people. Current funding programmes do not cover them. If policy costs on bills remained higher, switching from a gas boiler to a low-carbon heating system might result in higher bills. Homes with fuel-poor heating systems that are behind on their energy bills cannot transfer to a tariff that would be more suited for various low-carbon heating systems Fuel poverty monitor (2021).

Fuel Poverty and Community

Below are some factors which drive fuel poverty among households (Hills, 2012):

- Property characteristics such as wall type (non-cavity wall), detached properties, age of the property
- Rurality: rural households increase the fuel poverty
- On and off the gas grid: it causes high cost
- Heating system

- Low-income

According to the interview findings, several charity organizations are working to combat fuel poverty through different community empowerment programs in Norfolk County and Norwich City. Due to energy prices, the poor fuel household cannot afford to pay their bills. Hence, they are more vulnerable in the winter due to extreme cold weather. In particular, elder ages people and kids are considered the most vulnerable community group among fuel-poor households. Usually, the relevant organization work focuses on financial support to support their physical and mental health issue by supporting them in paying their bills in the short term. These projects work mostly on social aspects and short-term financial support, where lack of sustainability, energy efficiency, and net-zero goal are the significant points that have not been considered.

Moreover, a lack of coordination between charity organizations and relevant local authorities and a lack of knowledge of the government's energy and climate change strategy and plan might bring more challenges in tackling the fuel poverty issue in the region.

Awareness Barriers

While energy advice is very up to date, there is a vacuum in guidance, especially for helping homeowners decarbonize their houses. There is not enough information on which technologies are acceptable for different households. Even general energy advice that deals with residential decarbonization receive minimal central financing. When this advice is available, it is frequently available only online or is only available in a small region, leading to postcode lotteries. There are some challenges in consumer protection for energy-efficient and clean heating technology, which results in a bad buying experience and no recourse in the event of a problem Fuel poverty monitor (2021).

Fuel Poverty Policies

The interview result outlines that fuel poverty is a policy issue. Some energy experts and economists believe that a lack of clarity on policies, strategies, and action plans will make it challenging to achieve the net-zero goal with the current number of fuel-poor households. Fuel-poor households are becoming more vulnerable in winter due to shallow temperatures, where cooling in summer might also be an issue for poor households. For example, the heat waves in

the summer of 2022 might affect some vulnerable groups of the community due to extremely high temperatures. Meanwhile, fuel poverty refers to the affordability of heating homes, which varies in England, Scotland, and Wales.

Policy Barriers

Although there are programmes to aid fuel-poor households in decarbonizing their houses in each of the UK's nations, the cash they get and how they are constructed is frequently inadequate. Simply put, there is not enough money or a long-term strategy to support all fuel-insecure families in timely decarbonization. When finance for a plan was available, it was usually for a minimal period, and even longer-term schemes, like the Energy Company Obligation, were susceptible to adjustments during various "phases" of the programme. This short-term financing cycle has weakened the supply chain and homeowners' confidence. Regarding decarbonizing heating, the policy environment has been unclear. There are still challenges in policy, notably regarding the continued price of electricity and the future of the gas network, even though new net zero and residential heating initiatives in the UK resolve this. Problems in the private rental housing sector led vulnerable individuals to live in unsuitable homes. Some houses continue to come short of the technically required standard due to a lack of enforcement of minimum efficiency standards (MEES) in the private leased sector. The affordable warmth strategy significantly provides a pathway for alleviating fuel poverty at the local level. The Norwich Switch and Save community scheme is an example of the extensive work Norwich City Council has done to assist people in overcoming fuel poverty. More than 9,000 Norwich residents have benefited from this scheme by switching and saving money. There are additional possibilities to pay off fuel debt through charitable trusts and access to financial counseling. A maintenance programme that upgrades the stock of council homes is also in place Fuel poverty monitor (2021).

The Norwich city council implements energy-saving techniques through their Cosy City scheme and modest upgrades through the Winter Well-being initiative. External funding is also one of the main council efforts in investing in energy efficiency for poor households. The Council has obtained external financing to implement our Warm and Well and Fuelling Connections projects. In addition to council Affordable Warmth initiatives, continue to explore suitable external financing sources. The strategy covers most of the energy-relevant issues,

where the lack of net-zero goals and a clear strategic target remains the main issue of this strategy at the local level. Coordination with the charity organization and other local NGOs might be another challenge the city council might face in reducing fuel poverty in Norwich. At the same time, the majority of the organization have different strategies for fuel poverty.

Likewise, the UK government is rich in having different policies for climate change and energy sectors, where lack of enforcement in implementation is the main issue toward the net-zero target.

UK's Energy Policies:

Some existing policies and strategies regarding heating and energy consumption in UK homes and buildings exist. Most of these policies focus on achieving the net-zero target in the energy sector with low-cost, efficient, and sustainable energy systems in home heating.

The Heat and Building strategy: This strategy addresses the most vulnerable households in society. This strategy ensures reaching the net-zero target in the next thirty years and meeting the fuel poverty target in the short term. Reaching these goals is possible in two ways: improving building energy efficiency and replacing the high-carbon sources with low-carbon alternatives.

Furthermore, the UK energy-relevant policies cover a different aspect of the energy transition, where some more examples of the UK efforts in making policies and plans such as Heat in UK building Today, UK hydrogen strategy, and Clean Growth and Transforming Heating play the main role in the UK targets by 2050.

Fuel poverty and Net-zero target

Based on interview findings with relevant experts, fuel-poor households contribute more to climate change due to the home heating system's lack of access to energy efficiency. Besides, differences between poor and rich households might be evident in their residential areas. Usually, rich people have access to high living standards, including recreational areas with trees around their houses. Tree and green spaces are essential in emission control and climate change mitigation. According to some experts, general poverty is the main issue that needs to be overcome first, as poor households cannot afford the cost of living. Choosing the heat or eat

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option might lead to an increase in another cost of living, such as health expenses for the elder ages.

The current political and economic instability will increase the poverty and energy crises around Europe, particularly in the UK, which relies heavily on gas imports from Russia. The war between Russia and Ukraine recently increased energy pressure and prices. Unlike other European nations, the UK is not at all reliant on Russian gas supplies. The UK Continental Shelf is by far the main supply of gas, and the great bulk of our imports come from reputable countries like Norway. No gas pipelines linked the UK and Russia; less than 4% of the UK's gas supply was supplied from Russia in 2021. The UK government claimed that the UK is currently dealing with high gas prices set by international markets rather than a secure gas supply.

Poor households are at the forefront of vulnerability due to a lack of affordability in paying energy bills. Achieving the net-zero goal depends on government actions toward decarbonization and replacing fossil fuels with renewable energy. On the other hand, general poverty will make it more challenging to achieve them due to higher energy consumption, higher bills for poor households, and a lack of clarity for changing to energy efficiency in their houses.

Moreover, renewable energy takes time and is costly, especially for poor households, where alleviating general poverty might be an initial step to achieving both net-zero goals and fuel poverty.

Fuel Poverty and Energy Efficiency

Fuel poverty and carbon perspective is the main concern considering the climate change issue. Regarding carbon reduction, climate change mitigation policies play a vital role in fuel poverty reduction; when talking about climate change adaptation, energy efficiency improvement is the main concern in supporting low-income households to meet the national objectives (Hills, 2012).

The study findings indicate that energy efficiency among poor households might be challenging to achieve the net-zero target. Energy-efficient tools might be more expensive for

poor people than their monthly income. However, government actions addressing poor households might help, but there are always gaps in the practical implantation of the policies. There are three significant rules of energy efficiency (1: reducing energy usage, (2: reducing heat transfer, (3: and reducing air leakage (Willand, 2015). Energy consumption reduction can decrease emission and fuel costs (Barret, 2015).

Moreover, heat transfer reduction will help increase indoor temperature and decrease relative humidity and the risk of mould (Wilkinson, 2007), whereas reduced air leakage will raise relative humidity and the risk of mould (Peat, 1998; Wang, Wang and Norbäck, 2022). Most of these efforts are a challenge for poor households due to a lack of knowledge and affordability. Energy efficiency tools, for instance, insulation, is helpful for poor households due to their protection against heat mortality.

Meanwhile, more than 90% of UK homes are heated using fossil fuels, where the market price of gas is increasing, and some households cannot afford to pay upwards of £2,000. Meanwhile, energy efficiency could help reduce the energy bill by 20% and decrease reliance on foreign energy sources such as gas imports (DBEIS, 2022). For instance, the current political issue of the Ukraine and Russia war directly affects the global gas price. Usually, some energy efficiency measures are standard in practice, such as double glazing, cavity wall, and insulation for efficient light bulbs. The UK government aims to upgrade 700K home energy efficient and low carbon heating energy systems by 2025 and all buildings by 2050. This will help the household reduce energy prices through different governmental schemes, including boiler upgrade schemes and heat pump systems (DBEIS, 2022).

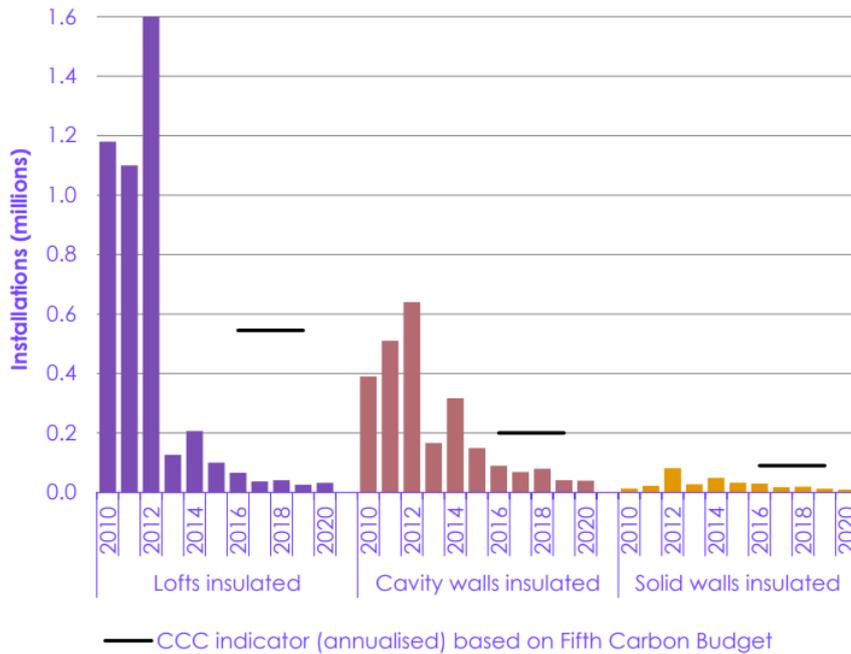


Figure 4. Installation of home efficiency practices in the UK. Source: CCC (2022)

Still, the UK's building and housing stock are the oldest and worst insulated in Europe, with only 15% of the building constructed in the 1990s. Most homes are expected to be still utilized by 2050 (Heat in UK buildings today, CCC, 2017). Energy efficiency policies helped households in energy saving and reduce energy bills. For instance, cavity wall insulation can save around 10% of annual gas consumption, whereas 3% for loft insulation. Likewise, households with solid wall insulation can save almost 4.7MWh per year. This means insulation installation might help consumers to save £25 - £270 on their annual energy heating bills (DECC, 2013).

Physical Barriers

Homes with low fuel consumption are less likely to meet energy efficiency regulations. This indicates that additional funds are required to make their homes "net zero ready." Switching fuel sources may increase operating expenses if dwellings are not energy efficient enough. The required investment may be significantly more significant for the lowest-performing rural properties. Low incomes; connectivity challenges (digitalization, transportation, and social aspect); limited access to essential services; vulnerability of older populations; and the greater

frequency of more extreme weather events are additional challenges rural residents face. Additionally, they are frequently forced to use expensive, unregulated, high-carbon fuels. There are not enough installers of low-carbon technology and energy efficiency measures to handle the enormous task of decarbonizing the four million fuel-insecure households in the UK Fuel poverty monitor (2021).

Addressing Fuel Poverty and Achieving Net-Zero

For fuel-poor households, decarbonizing the heat is crucial. It is necessary to combat climate change and lower the climate impact for households with limited access to fuel. Direct opportunities for poor people may also be significant. Households will have substantial financial savings if decarbonization is carried out in practice.

Households will need to cut their energy consumption to decarbonize dwellings, mainly through improved thermal efficiency of structures. If residents of the worst-performing homes with an EPC of F or G could improve the thermal efficiency of their structures and obtain an EPC of level C or higher, they will be able to save their money on energy bills. According to the experts, energy efficiency offers greater security during sharp energy price increases, providing fuel-poor households protection against price increases. For fuel-poor households, a lower cost of heating homes can also result in improved thermal comfort. This can improve health and wellbeing and save NHS expenses annually. Spending public funds on energy efficiency results in cost savings for homeowners, primarily in economically depressed areas, as a foremost step toward fossil fuel alternatives. To achieve these goals, a more comprehensive partnership and coordination between responsible agencies are required to be carried out.

Norwich is a small city, where it can be the green city toward achieving net-zero with the current fuel-poor households' considerations. Some economists explained that empowering Norwich city by enhancing people's economy and income will help the government achieve climate goals. This is possible through building the local economy and financial options such as advancing local food and production, which can reduce transportation and carbon footprint. At the same time, transportation decarbonization must also be considered for achieving climate goals, where there is a link between transportation and emissions. Higher fuel prices for private

transportation will help achieve net zero, while public transportation availability and prices must be in priority for the public. Public transportation with the latest green energy technology is a clean option, where prices and affordability must be considered for the poorest people. Recently, electric vehicles have been in the market, positively contributing to climate goals. Meanwhile, a higher cost and affordability are a challenge.

Social tariffs and energy schemes are helpful tools for poor households and achieving net-zero government goals, said energy relevant organizations and economic experts. So far, the Norwich city council has provided some support to fuel-poor households. One of the main works of the city council is the affordable warmth strategy 2018-2021, which is currently in the process of upgrading into a new version called Sustainable Warmth Strategy 2022-2025. The strategy aims to help poor households with energy efficiency. The UK government set the Energy Performance Certificate EPC band C by 2030 for poor households as much as possible to be EPC band C by 2035 as practicable, cost-effective, and affordable. This might bring more positive changes in achieving the net-zero target and helping fuel-poor households.

Energy Performance Certificate EPC: These EPCs, or efficiency bands, demonstrate how much energy the building will consume, how much it will cost to operate, and how much carbon it will produce annually. The energy performance certificate will also offer suggestions on how to increase the efficiency of buildings. It will emphasize the strategies to do so practically and affordably. For instance, you might insulate your home or switch out your old gas boiler for a heat pump or a contemporary condensing boiler model. According to research conducted by the Energy Saving Trust, replacing your outdated boiler with a new one might help you save up to £340 annually and 1,500 kg of carbon emissions. EPC plays a significant role in achieving the net-zero goal. However, it might be difficult for poor households, but it needs to be considered for all properties, mainly for new buildings. Consideration of EPC and relevant standards for new buildings are the key options where this might be applicable for rich people. Governmental policies might work through different schemes for poor households. However, it is still a comprehensive effort by all regional stakeholders. Figure 5. describes the energy efficiency rating in Norwich homes, where still around 35% of the total houses are under EPC rating, C.

Renewable energy, mainly solar PV installation for houses and properties, could save cost and support the net-zero target, where the front cost of solar PV installation for poor households kept them from consuming gas and fossil fuel. Government schemes play an essential role in helping poor households. However, there are already some schemes from the government in [providing Solar PV installation, such as Save Money on Solar from Norwich city council for council houses only, where still, lack of access to the scheme for poor people living in rented homes might be a gap.

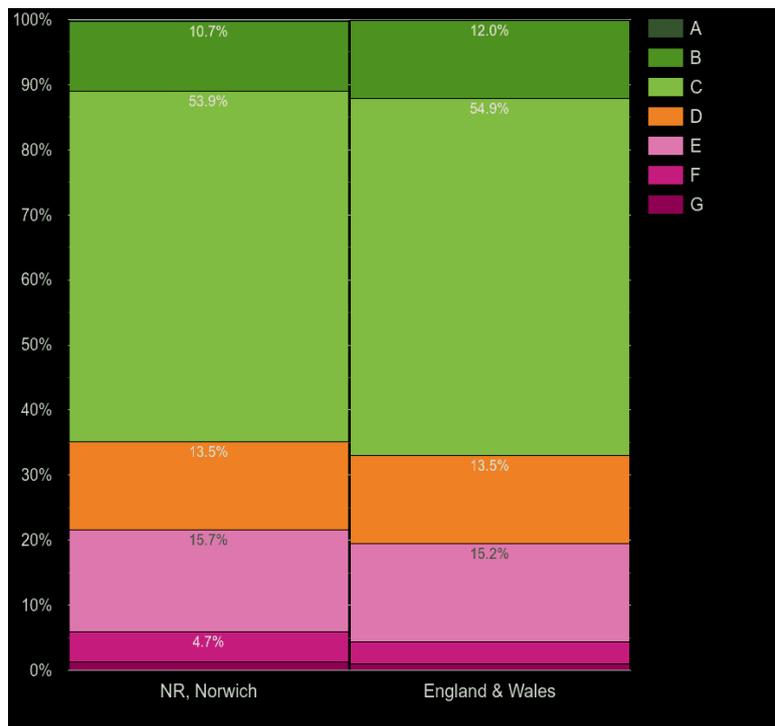


Figure 5. Energy rating in Norwich homes. Source: Plumplot, 2021

Addressing Financial Barriers

Fuel poverty monitor (2021) stated addressing financial issues towards achieving the net-zero target with the considering of current fuel-poor households as below:

1. By 2025, substantial progress must be made on decarbonizing the houses of fuel-insecure households through energy-efficiency improvements.

2. Governments should restrict contributions to the Energy Company Obligation and any other decarbonization programme that targets fuel-insecure homes, along with Ofgem. Grants should also cover all expenditures associated with improvements, even auxiliary ones like rewiring.
3. The UK government should try to lower the price of electricity by including policy expenses like the Feed in Tariff and Renewable Obligation into regular taxation. Any effort to boost Treasury revenue to cover these expenses should not increase the price of petrol for low-income families until at least 2030.
4. Ofgem should develop a dependable and consistent method to let low-income homes upgrade their link to the electrical network when installing low-emission heating without any up-front costs.
5. Ofgem has to develop a group of energy providers, energy networks, and consumer advocacy organizations to create the best practices manual on cap gas connections if a home has stopped using gas for cooking or heating. It must consider how fees could be paid back, eliminated, or distributed when low-income families stop using the gas network.

Moreover, the financial burden on the poorest households could be minimized by putting policy costs on businesses or paying them through general taxes. The general taxation method would lower expenses for 70% of UK consumers and better align energy demand with policy costs. The wealthiest households would pay an additional £410 per year (less than £8 per week), while the poorest households would pay nothing, saving them £102 annually (Citizen advice, 2021).

Addressing Physical Barriers

Fuel poverty monitor (2021) stated addressing Physical issues towards achieving the net-zero target with the consideration of current fuel-poor households as below:

1. To guarantee that a high energy efficiency standard is attained before or while low-emission heating is implemented, all policies targeted at decarbonizing heat in houses must be tied to a "fabric first" attitude. This will guarantee that the heating system can operate more effectively, offering homeowners the best chance to achieve financial savings. Additionally, it would save £6 billion annually on the cost of decarbonizing heat in the UK.

2. Grant programmes for energy-inefficient homeowners must have high enough cost ceilings to allow even the poorest residences to be renovated to a better Energy Performance Certificate rating.
3. Governments should support decarbonization initiatives over the long term (five to ten years), allowing for good corporate expansion to address the gaps in expanding the supply chain to meet the needs.
4. Local authorities must offer rural households greater assistance, such as higher cost ceilings for grant programmes and more accessibility alternatives, to guarantee that the highest disadvantaged families living in the least energy-efficient rural dwellings have appropriate access to assistance.

Three main points, such as low income, energy inefficiency, and energy price, could be the reason for fuel poverty among households. Energy and climate change policies directly affect fuel poverty, such as using smart meters to reduce the energy demand and fuel subsidies for eligible households might be the appropriate policies for fuel poverty reduction and achieving the climate targets (Hills, 2012)

Addressing Awareness Barriers

Fuel poverty monitor (2021) stated addressing public awareness's issues towards achieving the net-zero target with the considering of current fuel-poor households as below:

1. Governments should consider how they will pay for helpful guidance for homes not connected to the internet.
2. Energy-related issues must be covered in more comprehensive national or local authority numeracy and digital inclusion programmes.
3. Governments should look for methods to enhance and incorporate national skills programmes, especially for decarbonizing houses.
4. Advice and good-quality installation regulation go hand in hand. The highest retrofit standards must be applied when working on projects funded by government programmes.
5. A targeted campaign should be launched to encourage beneficiaries of the Discretionary Coal Allowance to embrace cleaner alternative energy sources.

6. The Discretionary Coal Allowance users should be encouraged to switch to greener options by introducing a targeted campaign. Additionally, their payment should not be halted when they install alternative heating systems.

Addressing Policy Barriers

Fuel poverty monitor (2021), stated addressing policy issues towards achieving the net-zero target with the consideration of current fuel-poor households as below:

1. Ofgem has to make the Fuel Poverty Network Extension Scheme's future clear. Networks should be permitted to utilize the comparable money to provide additional heat cost reductions for families qualifying for the scheme if it is determined that the programme is inconsistent with broader policy goals regarding future gas and electricity.
2. Governments need to increase the minimum energy efficiency criteria for the private leased sector so that all private landlords update their houses to EPC grade C by 2028.
3. Governments should ensure that private house-owners with tenants in fuel poverty or at risk of falling into it have access to financial mechanisms for decarbonizing dwellings, at least in part.
4. To clarify the financial implications of the switch to decarbonized heating, the UK government should keep reporting how policy expenses affect customer bills.
5. A long-term price protection mechanism is needed, regardless of the Default Tariff price cap's long-term viability, to guarantee that policy costs are passed through on bills fairly and transparently.

As Fuel poverty is the main policy issue, the common problem is the low-income households and high required fuel spending. Energy efficiency must be improved in housing stock, while people in low-income living in the worst housing cannot afford the investment needed for a better and more efficient energy system (Hills, 2012). To tackle fuel poverty, different policy implementations might achieve this goal. One of the policies that can reduce fuel poverty is the price-based policies for vulnerable households that provide a discount for energy bills, such as Warm Home Discount. Likewise, energy efficiency-based policies could be essential in fueling poverty reduction plans. For example, the Carbon Emission Reduction Target CERT can provide an energy efficiency improvement policy for households requiring efficiency in their

energy systems. Moreover, the efficiency policy might be implemented into different pathways, such as thermal efficiency for poor households. This will help households with low income to receive a grant for heating and insulation installments, such as the Warm Front Scheme (Hills, 2012).

Public Engagement

Decarbonization and low-emission alternatives need long-term and systematic changes with the meaningful community and public engagement. According to Chilvers (2022), Public participation is now recognized as essential to implementing low-carbon policies and technology, changing to more sustainable behaviors and practices, and guaranteeing that these necessary transitions are fair, democratic, and open to the public.

There are two major conceptions of how the public might engage with energy, climate change, or any other public matter. Initially, it used to be assumed that the public has a knowledge gap that has to be filled with better communication or avoided entirely (Irwin, 1996). While knowledge and awareness are essential, the conventional focus on public interaction has shown ineffective and constrained in enabling societal transitions.

Second, it is now more commonly acknowledged that involving society through more active and participatory forms of public participation and engagement is essential to combating climate change and achieving net zero. This has hastened efforts to gather public opinion on crucial choices through survey research, collaborative methods like citizens' assemblies, and ultimately by encouraging citizens to act through programmes that change behavior or society projects. While significant in and of themselves, these mainstream initiatives frequently begin with the premise that the general "public" is not sufficiently interested in energy and climate change and needs to be asked to participate in specific, frequent one-time engagement procedures (Chilvers, 2016).

5. Conclusion and Recommendations

Fuel poverty refers to insufficient income to heat a home appropriately, including hot water, cleaning, cooking, and heat. According to the Norwich Affordable Warmth Strategy (2021), 7,804 households are considered fuel-poor, approximately 12.3% of the total population in Norwich. The energy price directly affects poor households due to their vulnerabilities and lack of affordability.

Fuel poverty is a policy issue leading to challenges among poor households. This means a lack of clarity and a clear direction in policy and plans to achieve the net-zero goal with the current numbers of fuel-poor households. The affordable warmth strategy was one of the main outcomes of the city council, where it needs to be upgraded to achieve sustainable energy efficiency among poor households. Moreover, poor households' lack of financial options may lead to unsuccessful energy efficiency and decarbonization efforts. Likewise, physical barriers such as old UK houses and buildings might challenge fuel-poor households in considering the net-zero agenda.

Furthermore, a lack of public awareness about fuel poverty, energy efficiency, and climate goals might be an issue. This may lead to a lack of public participation and engagement in government projects and activities. Also, a lack of coordination and partnership between local organizations, such as charity organizations working with the community, might be a gap. Due to a lack of knowledge and awareness, they have not set any climate and energy sustainability targets in their community empowerment projects.

To address the current issue of fuel poverty and achieve the net-zero target of 2050, local authorities, particularly the Norwich city council, are considered the main decision-maker body in implementing governmental policies at the local level. However, the city council has energy poverty and decarbonization policies for households. Still, a lack of policy enforcement and a comprehensive strategic plan with a clear goal are the main challenge in the current policies. Based on our discussion with relevant organizations and experts, the following recommendation has been prioritized for the relevant local authorities to be carried out:

9. Setting short-term and long-term clear and feasible goals in alleviating fuel poverty and providing energy efficiency for poor households. The current affordable warmth strategy

might work in the short term, where there is a need for a clear direction linking to a long-term net-zero goal.

10. Governmental policies might work through different schemes for poor households. This may provide specific schemes and social tariffs to fuel-poor households in providing energy efficiency tools, renewable energy options such as solar PV with covering upfront costs, and EPC tools. Local authorities may work on community empowerment by alleviating general poverty and advancing the local economy through job creation and social development projects for residents.
11. Lowering the cost of heating homes for vulnerable and poor households. This option might be based on each household's income level, as higher energy bills for wealthier people and lower energy prices for poor households. However, it may not be an option for a net-zero target. Still, resilient communities play a significant role in achieving climate goals.
12. Extending partnership with the charity organizations due to their link and community empowerment projects with different social groups such as recent refugees from Ukraine and Afghanistan (who can be considered vulnerable due to recent resettlement).
13. Prioritizing investing public funds in energy efficiency results in household cost savings, primarily in economically depressed areas.
14. Awareness and community engagement in energy and climate change activities, such as running climate campaigns with the current energy price crises, will lead people to perceive shifting the energy system to clean and renewable. Furthermore, organizing energy and climate change conferences with relevant stakeholders, including universities, research centres, charity organizations, local and national NGOs, and public participation will positively add to the community's knowledge.
15. Research and development are required in fuel-poor households' identification and property renovation with the latest energy system. The city council may provide some internship programmes for university students researching fuel poverty in each region of Norwich city. This will add to their experiences and improve people's awareness of fuel poverty, energy efficiency, and climate goals. Likewise, the outcome of their work might be published online through the council website and social media.
16. Upgrading council houses and buildings with access to the latest energy efficiency tools and renewable options. Local authorities might work with donors and enhance fundraising

for renovating old council buildings and shifting them to the latest building and energy standards.

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Appendix

Ethical Approval

Ethics ETH2122-2096: Mr Esmatullah Khyber

Date Created	31 May 2022
Date Submitted	31 May 2022
Date of last resubmission	04 Jul 2022
Date forwarded to committee	29 Jun 2022
Researcher	Mr Esmatullah Khyber
Category	PGT
Supervisor	Dr Oliver Springate-Baginski
Faculty	Faculty of Social Sciences
Current status	Approved after amendments made

Ethics application

Applicant and research team

Principal Applicant

Name of Principal Applicant

Mr Esmatullah Khyber

UEA account

cer21geu@uea.ac.uk

School/Department

School of International Development

Category

PGT

Primary Supervisor

Name of Primary Supervisor

[Dr Oliver Springate-Baginski](#)

Primary Supervisor's school/department

School of International Development

Course/Programme Details

Provide the name of your course or programme of study.

Climate Change and International Development

If the project is to be undertaken as part of a module, provide the Module Title and Module Identifier.

Work Development Placement

If the project is to be undertaken as part of a module, provide the name of the Module Leader.

[Dr Brendan Whitty](#)

Project details

Project title

Energy Poverty and Net-Zero Goal by 2040: A Case in Norwich City

Project start date

05 Jul 2022

Project end date

10 Aug 2022

Describe the scope and aims of the project in language understandable by a non-technical audience. Include any other relevant background which will allow the reviewers to contextualise the research.

This project aims for a low-emission energy consumption system with cost-effectiveness for the local households of Norwich

Provide a brief explanation of the research design (e.g. interview, experimental, observational, survey), questions, methodology, and data gathered/analysis. If relevant, include what the participants will be expected to do/experience.

Few relevant stakeholders will be interviewed for their opinion about energy transition and energy poverty in Norwich.

The literature review will be done and the findings will help policymakers to identify the challenges toward energy transition.

Detail how any adverse events arising in the course of the project will be reported in a timely manner.

A regular reporting line will be with my supervisor

Will you also be applying for Health Research Authority approval (HRA)?

No

Indicate if you are applying for approval for an experiment to be conducted in the School of Economics' Laboratory for Economic and Decision Research (LEDR).

No

Is the project?:

in connection with a DEV Work Placement (DWP) Module

Does the project have external funding administered through the University's Research and Innovation Services (RIN)?

No

Will the research take place outside of the UK?

No

Will any part of the project be carried out under the auspices of an external organisation, or involve collaboration between institutions?

No

Do you require or have you already gained approval from an ethics review body external to UEA?

No

Does this new project relate to a project which already has ethics approval from UEA?

No

Research categories

Will the project involve human participants?

Yes

Will the project involve the use of live animals?

No

Will the project have the potential to affect the environment?

No

Will the project have the potential to affect culturally valuable, significant or sensitive objects or practices?

No

Will the project involve security sensitive research?

No

Human participants - selection and recruitment

How many Participant Groups are there who will receive tailored participant information?:

One

Name of Participant Group 1.

Stakeholders such as norwich council colleagues

How will the participants be selected/recruited?

around 10 participants from the national and international organizations will be asked for their opinion of the energy transition with consideration of their consent. however, I will keep the data secure, and the interviewee is not part of community vulnerable groups.

Will you be advertising the opportunity to take part in this project to?:

None of the above (i.e. UEA's Student Insight Review Group (SIRG) does not need to be informed)

What are the characteristics of the participants?

Relevant stakeholders such as Norwich Council

Will the project require the cooperation of a gatekeeper for initial access to the individuals/groups to be recruited?

No

Is there any sense in which participants might be 'obliged' to participate?

No

Will the project involve vulnerable groups?

No

Will payment or any other incentive be made to any participant?

No

Human participants - consent options

By which method(s) will consent to participate in the research be obtained?:

Verbal

Human participants - information and consent

Participant Information and Consent

When will participants receive the participant information and consent request?

During meetings

How will you record a participant's decision to take part in the research?

However, this will be an open discussion, but the participant will be contacted through official email before the discussion and will be asked if there are interested to be part of this study.

Human participants - method

Which data collection methods will be used in the research?:

Interview

If your research involves any of the methods (including Other) listed above, upload supporting materials.

How have your characteristics, or those of the participants influenced the design of the study or how the research is experienced by participants?

My interview will not affect any gender, as it is generally only focused on climate change and energy dimensions. still, this interview will be a small part of my work. most of the data will be secondary data

Will the project involve transcripts?

Yes

Select ONE option below:

By hand

If yes provide details.

I will take some notes regarding important points of discussion.

Provide an explanation if you are not offering the participant the opportunity to review their transcripts.

However, participants will be asked for consent, still, if they are willing to check the notes before finalizing the study, they will have right to do so.

Will you be capturing photographs or video footage (digital assets) of individuals taken for University business?

No

Is this research using visual/vocal methods where respondents may be identified?

No

Will it be necessary for participants to take part in the study without their knowledge and consent at the time?

No

Will deception or incomplete disclosure be used?

No

Will the participants be debriefed?

Yes

If yes, how will they be debriefed and what information will be provided?

Verbally, however, all of the participants are already part of the project

If yes, upload a copy of the debrief information.

Will substances be administered to the participants?

No

Will involvement in the project result in, or the risk of, discomfort, physical harm, psychological harm or intrusive procedures?

No

Will the project involve prolonged or repetitive testing?

No

Will the project involve potentially sensitive topics?

Yes

If yes, provide details.

participants/organizations will know the purpose of the study and predicted outcome, and they will also be asked for their consent to data privacy and usage. Any sensitive information affecting the organization/project's reputation will be avoided, kept as conditional information, and will not be part of the script/notes.

This will be an academic study, and confidential and sensitive topics will not be covered. also, this study will focus more on the objective/goals of the government to achieve the net-zero goal and reduce fuel poverty

Will the project involve elite interviews?

No

Will the project involve any incitement to, encouragement of, or participation, in an illegal act (by participant or researcher)?

No

Will the research involve an investigation of people engaged in or supporting activities that compromise computer security or other activities that may normally be considered harmful or unlawful?

No

Does the research involve members of the public in participatory research where they are actively involved in undertaking research tasks?

No

Does the research offer advice or guidance to people?

No

Is the research intended to benefit the participants, third parties or the local community?

No

Provide an explanation.

na

What procedures are in place for monitoring the research with respect to ethical compliance?

Supervisor

Does the study involve the use of a clinical or non-clinical scale, questionnaire or inventory which has specific copyright permissions, reproduction or distribution restrictions or training requirements?

No

Health and safety - participants

Is there a possibility that the health and safety of any of the participants in this project including a support person (e.g. a care giver, school teaching assistant) may be in question?

No

Health and safety - researcher(s)

Is there a possibility that the health and safety of any of the researcher(s) and that of any other people (as distinct from any participants) impacted by this project including research assistants/translators may be in question?

No

Risk assessment

Are there hazards associated with undertaking this project where a formal risk assessment will be required?

No

Data management

Will the project involve personal data (including pseudonymised data) not in the public domain?

Yes

If yes, will the personal data collected be?:

Pseudonymised

If using anonymised or pseudonymised data, describe the measures that will be implemented to prevent de-anonymisation.

the participants/organization's views (professional and academic opinions not personal beliefs) will be analyzed as a result of the interview, where their personal information including, name and organization name and address will not be mentioned in the script.

the study findings will summarize their view as presenting in some different graphs, and tables, where some achievements of the organization will be cited as part of their implemented projects.

If not using anonymised or pseudonymised data, how will you maintain participant confidentiality and comply with data protection requirements?

Will you be using secondary personal data not in the public domain?

No

Will any personal data collected be processed by another organisation(s)?

No

Will the project rely on data supplied by others (internal or external sources)?

No

Will the project involve access to records of sensitive/confidential information?

No

Will the project involve access to confidential business data?

No

Will the project involve secure data that requires permission from the appropriate authorities before use?

No

Will you be using publicly available data from the internet for your study?

No

Will the research data collected in this study be deposited in a repository to allow it to be made available for scholarly and educational purposes?

No

Provide details.

na

Who will have access to the data during and after the project?

The data will be used in the final analytical report as a summary of the research, where no sensitive information would be used in the report. the data will not be shared as raw. the final analytical report (with no sensitive information) will be shared with the placement organization and the university. The interview notes and script will be destroyed after the study. non of the data will be shared after the study, where it can be used in the research report only.

Where/how do you intend to store the data during and after the project?

In my personal computer storage

How will you ensure the secure storage of the data during and after the project?

The data could be kept under password security with name separate from data

How long will research data be stored after the study has ended?

Data will be destroyed after end of studies

How long will research data be accessible after the study has ended?

Data will be erased/destroyed after study

How are you intending to destroy the project data when it is no longer required?

Deleting