Tackling emissions in Hastings & Rye

Like all urban areas since the Industrial Revolution, Hastings has modernised through the burning of fossil fuels. This has generated a higher standard of living than previous generations experienced, yet the emissions produced in doing so are warming our planet. This warming is melting the ice caps and changing our climate[1]. Being on the coast and at one of the lowest points in the country, the Rother, Hastings, Bexhill and Eastbourne area is greatly exposed to the effects of climate change. The main problems for East Sussex will be increased flooding, exposure to more intense storms in the winter and more severe heatwaves in the Summer[2]. Although some of the most severe effects won't materialise for a long time, damaging consequences could materialise as little as 30 years from now.

Some projections show that small parts of the town would be at risk of repeated flooding, with some roads near waterways potentially being lost. Indeed, Hastings town centre would be under threat from rising tide levels and severe weather events that would be more likely to produce flooding[3]. If no action is taken, sea levels in the South East could rise by as much as 2.2m (7 feet) by 2100, something which would result in significant land losses within coastal communities like Hastings. More severe projections would show most of Hastings underwater by 2300[4]. The town could also experience major land loss due to rising sea levels and repeated flooding because of more severe cliff erosion. Hastings Old Town is protected from rising tides through the cliffs that stretch from Fairlight to the town. Yet, if these cliffs are eroded then rising tides will start to filter into Hastings Old Town. This part of the town will first experience repeated flooding, with it later being submerged entirely[5]. Fairlight would also suffer housing loss, with potentially hundreds of people being displaced as their homes crumble into the sea. As Rye is placed next to the river Rother, it would be exposed to consistent flooding as more water would flow into the river. Therefore, large parts of the constituency would be damaged by repeated flooding or lost to cliff erosion and rising sea levels if no action is taken.

Rising temperatures are also predicted. Initially, this might sound like an advantage for a coastal town reliant on tourism for its economic growth. Yet, temperatures in the summer may rise to extreme temperatures, with 40c days being predicted in future summers. Such temperatures will mean government agencies will advise people not to travel, with public transport systems potentially being advised not to run. People may also be told to stay inside and not venture out unless it is essential to do so[6]. If days like this became a frequent feature of summer, it would limit tourism flows to coastal communities, devastating coastal communities' economies. Such temperatures would also negatively affect the wider Rother area as it would be harder to farm. This would damage Rother's rural economies. Additionally, the dry hills between the old town and Fairlight would be more susceptible to natural fires. Due to the county park being dense in plant matter, trees and grassy hills, such fires could spread dangerously close to the villages and the Old Town. Again, such events would not be

conducive to attracting tourism, potentially reducing the economic gains the town benefits from when holidaymakers pile in during the warm summer months.

Therefore, the decision not to reduce the emissions that we have inherited is simply not an option for coastal communities like Hastings. Whilst emission reduction is of course global, we can't expect other countries to take action if we do not. For the UK to take action, urban coastal communities like Hastings will need to play their part if the UK is to successfully reduce emissions and reach its ambitious targets.

Current energy usage and their emissions:

As in any modern town, a pollution problem has been inherited and it must be overcome. In Hastings, it is estimated that total yearly emissions reach 249.4 Kilotons of CO_2 (Carbon Dioxide)[7]. This was generated from a total energy consumption of approximately 1,157 Gigawatt hours (GWh). This is equivalent to 1,157,000 megawatt hours (MWh). This unit of energy measures the amount of energy produced or consumed with a power of one megawatt over the course of one hour. It's a large unit of energy and is usually used to measure how much energy power stations generate.

Gas & electricity account for nearly 70% of this energy usage, making gas the main source of pollutants[8]. Further, out of the fuel that is used in the town, the largest proportion consumed was gas (46%), with electricity and petroleum accounting for 26% and 23% respectively[9]. This is problematic in terms of reducing pollution because converting gas into renewable electricity is immensely difficult. Additionally, pollutants from transport account for around 25% of emissions[10], again making it hard to reduce emissions due to the limited ability to replace such gasses with electric power. With limited electric car development, few car charging points and many feeling electric cars will not provide the answer, such emissions will be hard to reduce.

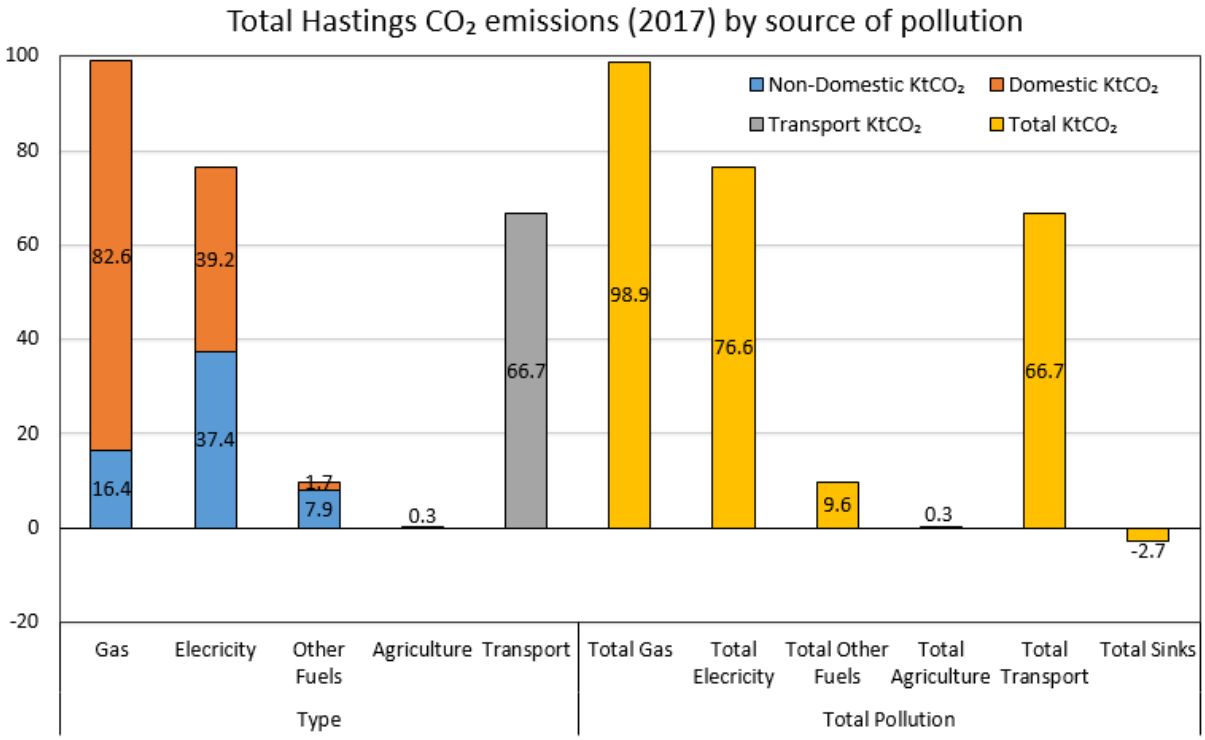

Figure 1.x Co_2 emissions in Hastings (2017). Note: Total sinks = Land use changes, forestry and other natural landmarks that take in Co_2 (this reducing emissions). This measure also takes into account the loss of trees, which would add Co_2 into the atmosphere. Source: Hastings Low Carbon Energy Study (page1).

The progress that has been made:

Progress has been made so far, but it is essential to go further. In the early 2000s political support finally gathered around the need to drastically cut emissions. Across the country, emissions were slashed by 43% (50% when compared to 1990 data)[11]. In Hastings, since 2005, this saw emissions cut by 40%[12]. Yet, this was largely due to a move towards greater energy efficiency and efforts to decarbonise the national grid that supplies the town's energy. This decarbonisation has mostly come from using less harmful pollutants and phasing out coal, see Figure 1. Crucially, very little of this reduction in pollution was created from the increase in renewable energy. This means that cutting the remaining emissions is very challenging as pollution within the constituency is mostly caused by transportation and other gas-powered technology, which are very hard to replace with low-carbon technologies.

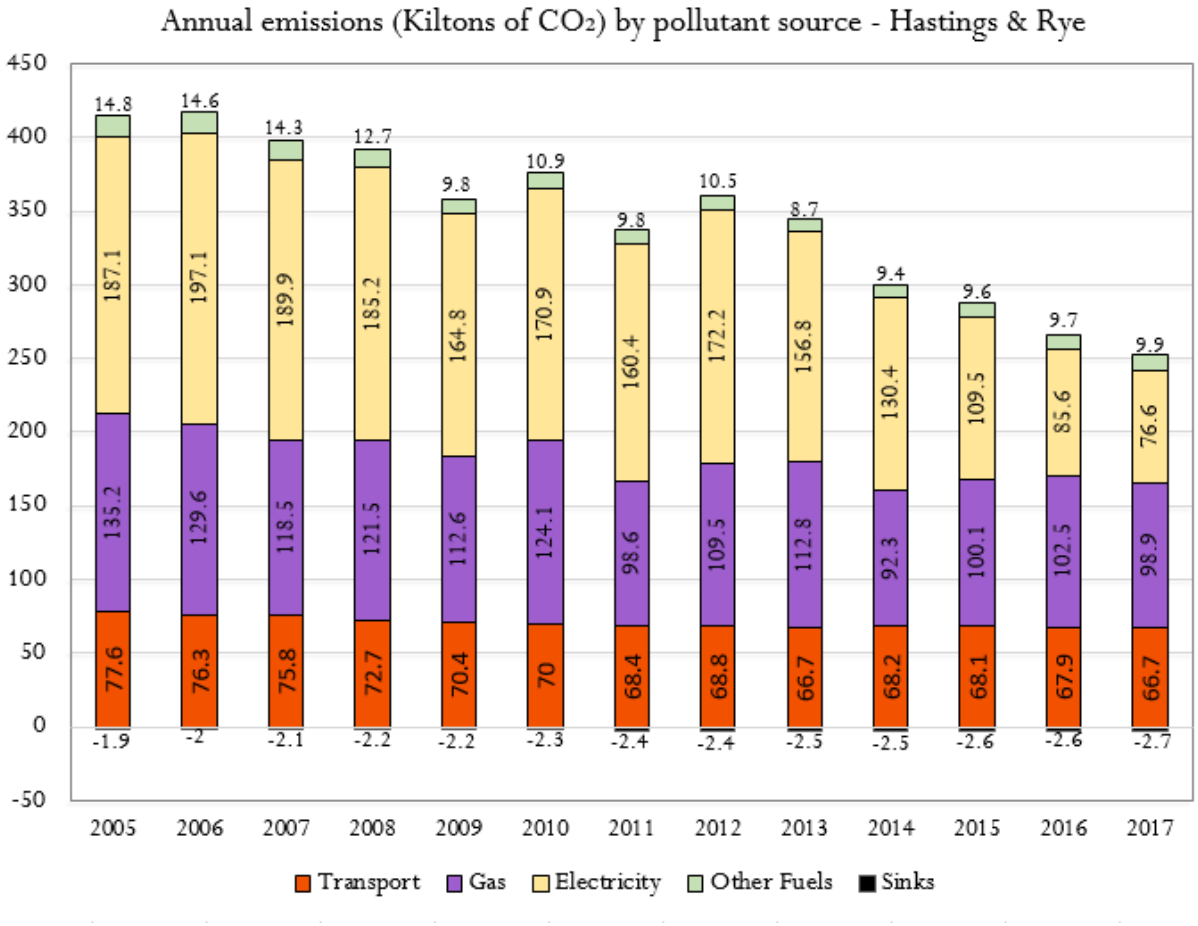

Figure 2. Historic CO^2 emissions in Hastings. 2005-2017. BEIS data was used to track historical trends for emissions in Hastings for the specified time period. Source: Hastings Low Carbon Energy Study (page17).

Replacing gas is particularly problematic within Hastings due to the large volumes of old energy-inefficient homes that are reliant on gas heating. Out of the 50,600 households in the Constituency of Hastings and Rye, there are 26,100 homes (49%) with an EPC rating lower than C (A rating lower than C is considered to be inefficient)[13]. In addition, 1,366 (2.7%) homes in Hastings and Rye are rated F or G.

This represents over 50% of homes. Therefore, over 50% of homes require energy efficiency upgrading to limit energy waste. Yet, progress in achieving this has been slow, with only 6% of households in the last 10 years having been upgraded[14]. At this rate of improvement, decades will have passed before emissions can be effectively reduced.

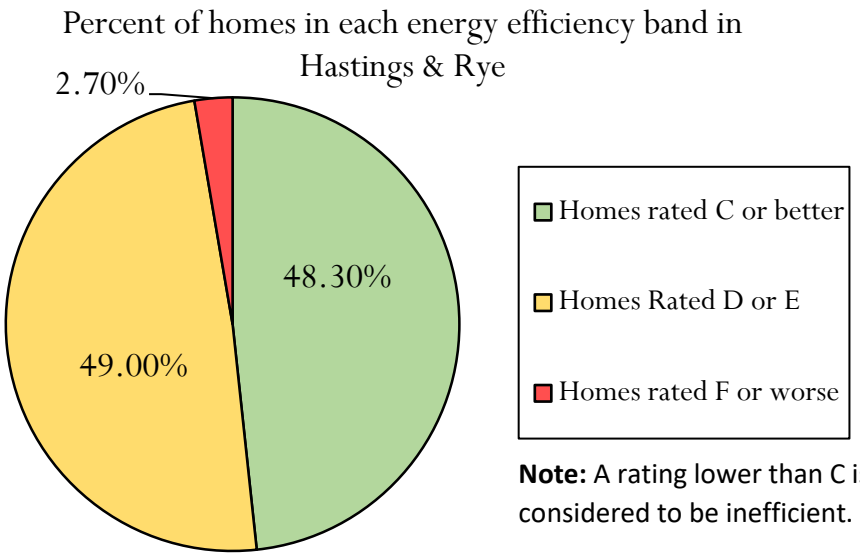

Figure 3. Proportion of households in Hastings & Rye that are energy efficient and not efficient. Source: UK housing efficiency data according to the Energy Efficiency Infrastructure Group (EEIG)

Another concern is the large number of households estimated to be in fuel poverty. 14.9% of all households in Hastings are estimated to be in fuel poverty, meaning they are left below the poverty line after spending the money needed to adequately heat and run their home[15]. Due to this reality, many people in such households often cut back on energy to pay for essentials, like food. Poor energy efficiency means some of these people estimated to be in fuel poverty will partly be so because of the additional expenditure incurred to adequately heat their homes. More starkly, there were 230 excess winter deaths in the last 5 years in Hastings & Rye, of which 69 can be attributed to cold housing conditions – with some being linked to the coldest homes[16]. Therefore, it is not a dramatic statement to say that some of these excess deaths will be directly attributed to fuel poverty. This places Hastings far worse than the national average, with it being one of the constituencies with the highest proportion of winter-related deaths[17].

As energy inefficiency is occurring in some of the poorest households that are unable to pay for their energy needs, this highlights why it is so problematic to reduce energy emissions in the constituency. Many homes that need to become more energy efficient and reduce their emissions are occupied or owned by people who cannot afford to make them more energy efficient. Worse yet, the cost of making homes more energy efficient can be quite high. A cavity wall insulation will cost around £500 and a loft insulation will cost £300[18]. Indeed, the cost savings will only be around £170 per year, meaning they will take time to materialise[19]. Clearly, many individuals who are on the lowest incomes and in a state of fuel poverty can't afford to make their homes more energy efficient, even if it will reduce their energy payments over the course of the next decade. Further, due to the cost of living crisis and increased mortgage costs, these costs will likely be too high even for those on average to

high incomes. Worse still, only 3,188 households had received assistance with energy efficiency measures by the end of 2022, 6% of all households (lower than the UK average of 9%[20].) This means that the vast majority of people needing this assistance to upgrade their energy inefficient homes simply haven't been able to secure help.

As it has long not been clear how it is best to reduce these emissions, Hastings Borough Council produced a report that investigated the best ways to reduce these harmful gas pollutants.

Ways to reduce emissions:

According to the analysis conducted by AECOM on behalf of Hastings Borough Council in 2018, continuing with current environmental policy would steadily increase emissions leading up to 2030[21]. Therefore, in order to reduce emissions some form of action must be taken. Reducing energy demand would only take emissions down to 190 kilotons of CO_2 per year by 2030 while seeking further energy efficiency savings on the technology the town uses would still keep emissions above 200 kilotons of CO_2 per year[22]. The forms of energy reduction that have the greatest impact are switching to electric forms of heating, sustainable transport and renewables. Electric heating would take the town below 120 kilotons of CO_2 pollution per year. The latter two options would take Hastings to only 50 kilotons of CO_2 pollution per year by 2030 (if successfully implemented)[23]. However, it should be noted that installing renewables without connecting them to the national grid would produce limited returns. Yet, decarbonising the national grid by connecting it to large-scale renewable projects could reduce pollution by as much as 77%[24]. As a result, such technology would need to be installed on-mass and connected to the national grid to produce the effective returns demonstrated in figure 4.

Therefore, action can be taken to get Hastings close to net zero by 2030, providing the right measures are taken. Consequently, switching from gas to electric heating, improving public transport networks and implementing large-scale renewable projects would most quickly and effectively reduce pollution.

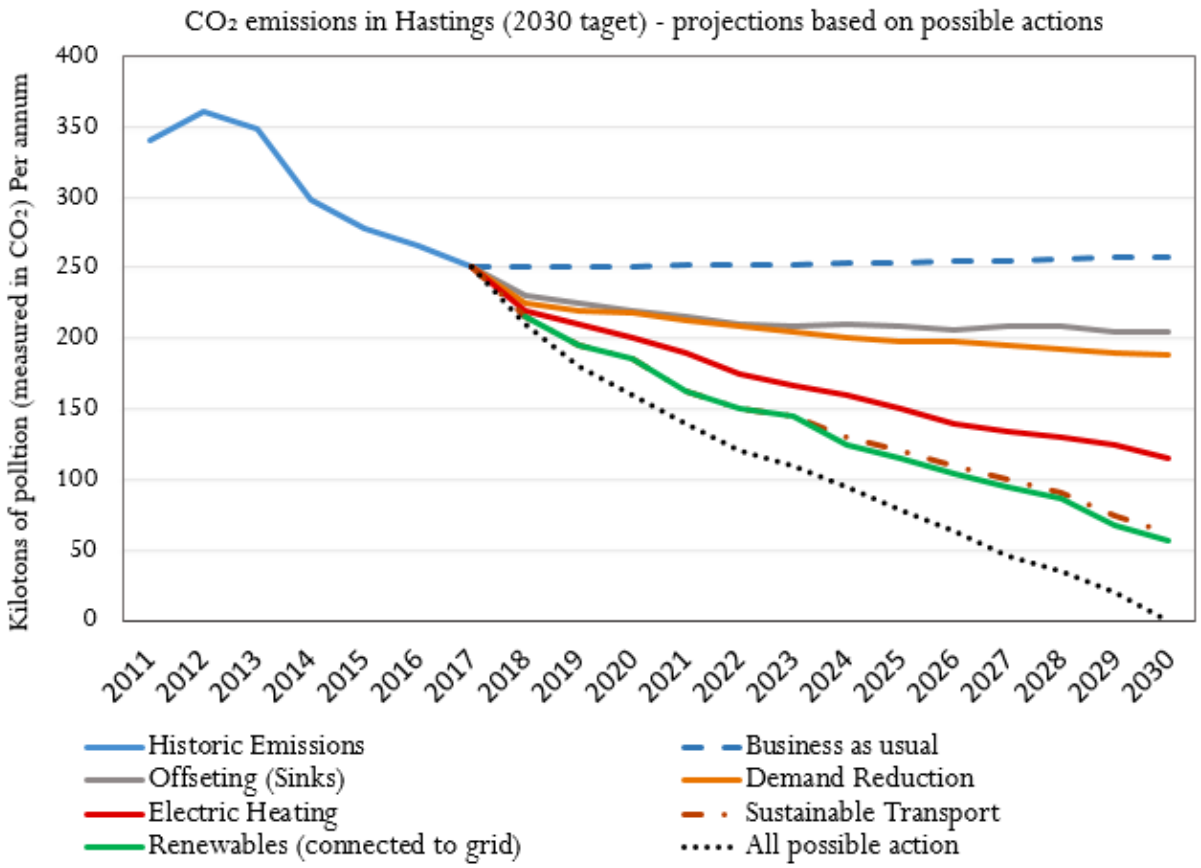

Figure 4. CO_2 emission projections based on possible actions – up to 2030. Source: Hastings Low Carbon Energy Study (page 4). It assumes that renewables will be delivered by large-scale projects being connected to the national grid.

Note: 1. If current policy is kept to then emissions will stay roughly where they are (blue dotted line). 2. If carbon capture is installed – such as planting trees - this will result in a slight cut in emissions (Grey line). 3. If further energy efficiency can be found then a slight reduction in emissions is possible (Orange line). 4. If homes can be more energy efficient then emissions can be halved (red line). 5. If sustainable transport projects are successfully delivered across the town, emissions are significantly reduced. 6. If large-scale renewable sources of energy can be connected to the national grid then emissions can be reduced to almost zero (Green line). All possible action being completed would bring Hastings close to net-zero overtime, if not reaching it (dotted line).

1. Renewables without connecting it to the national grid.

<u>The current state of renewable energy:</u>

According to a survey conducted by AECOM in 2018, there were only 767 renewable energy sites within Hastings, of which generate 3,446 (MWh) per annum. This mostly comes from 42 sites that have their own renewable energy sources (primarily consisting of solar panels and heat pumps)[25]. The majority of the clean solar panel energy comes from building-mounted solar panel systems placed on large buildings, including the Priory Meadow shopping centre and the School in Filsham Valley. There

are two additional sites that convert natural gas to energy (thus limiting pollution by burning fewer fossil fuels). The main site is the Pebsham landfill site which converts wasted gas into energy. These two sites generate 16,000 (MWh) per annum. In total, with other sources of clean energy, it was estimated that a total of 19,500 (MWh) of electricity per annum was generated from renewable sources within the Hastings Borough[26]. This sounds like a lot of energy, but it is only 6% of electricity usage in Hastings (as of 2018), meaning that relatively speaking renewable energy production in Hastings is very limited[27]. This means that to meet demand and reduce pollution from electric usage to net zero the town will need to generate another 305,000 (MWh) from low and Zero Carbon Technologies (LCZ's). Consequently, to reduce emissions through renewables (one of the most effective methods) such technology will need to be installed on a large scale. **Note:** This only refers to electric usage (23% of all energy demand) and does not include the 77% of other demand (Gas 46%, 23% Petroleum and 8% Other)[28].

	Solar Panels	Sewage Gas	Landfill Gas
Number of sites	767	1	1
Capacity (Megawatts - MW)	3.582	0.772	3.071
Generation (MWh p.a.)	3,446	5,854	10,126
Table x – Low and Zero Carbon Technologies (LZC) installations in Hastings as of 2018.			

Increasing non-carbon forms of energy:

Clearly, there is a need to produce more low-carbon technology to reduce pollution. Yet, there are multiple methods of doing this, raising the question of what is the best way to reduce emissions. According to the exploratory research conducted by AECOM on behalf of Hastings Borough Council, there are potentially enough LCZ projects in Hastings to generate just under 55,000 (MWh) per annum, meaning the town would be able to get 23% of its electricity usage from LCZ's[29].

1. Large-scale sources of **mounted solar panels.**

Building-mounted: The report found that removing emissions with renewable sources of energy was most effectively achieved by building-mounted solar panel technology. This is because there are more viable renewable energy projects of this type than any other method, meaning it can generate more electricity than other approaches. Further, this method was found to be one of the more cost-efficient ways to reduce emissions, with some building types only costing just under £1,000 per megawatt generation[30]. This means that potentially a large amount of energy can be generated at a much more affordable rate. These panels connect to buildings, giving direct access to sunlight. They have the added benefit of reducing land usage that other forms of solar need to generate clean energy. Mounted solar panels work best on large buildings as it permits the delivery of large-scale projects without developing on land, minimising the objections that clean energy projects often face. Such

large-scale projects are needed as it maximises efficiency and lowers costs over time, making it easier to afford the difficult transition to renewables. This helps to make the transition to net zero more affordable. Not including the current 3,500 (MWh) generated by such technology, if all viable projects were completed building-mounted solar panel technology could generate roughly 30,000 (MWh) per annum, an additional 9% of all Hastings' energy demand[31]. Completing these projects will probably be the easiest due to such work usually facing fewer objections. Yet, it must be noted some may refuse solar panels to be installed on some buildings due to the building work required to mount them. Therefore, fears over potential damage or inconvenience can stop such projects. Also, concerns around the need to maintain and upgrade panels can create a lack of perceived incentive to use this technology.

Project examples:

Investigations into potential sites have found that several large buildings throughout the borough could provide useful locations (such as long rows of housing with connected roofs, warehouses, schools and large offices). Hastings College, Hastings train station and the NHS walk-in-centre was one group of buildings identified. Another possible site was large NHS doctor surgeries, such as the one at the junction of Bexhill and Filsham Road. Additionally, large housing blocks could be used, such as the Four Court Towers in the Wishingtree area. Yet, it should be noted the report found that not all locations investigated were deemed viable as some could not have enough solar panels mounted to them for the project to be cost-effective.

Ground-mounted solar panels:

The next technology that can generate the most amount of clean energy is ground-mounted solar panels. If all these possible projects were completed this could meet 5% of the town's energy demands[32]. This technology uses spare land to install masses of solar panels and then connects it directly to households or the national grid. Also, this technology can be cost-efficient, with each megawatt costing just over £1,000 to produce[33]. Therefore, a decent amount of power can be generated with relatively low costs. Yet, such projects are the most likely to face strong opposition due to it often having to be built on green land people cherish. For example, a proposed ground-mounted solar panel site near Hasting's county park produced large opposition. This opposition intertwining with local party politics resulted in the Green Party opposing the development. As a result, Hastings still has no ground-mounted solar panel technology contributing to Hasting's total energy usage. Further, even if it can be placed on brownfield sites, this will still face opposition due to much-required housing needing to be built on such sites. Also, the lack of available land in the town means that the amount of energy that can be produced by this method is limited. Therefore, as other

projects will be prioritised, renewable energy will unlikely be approved. This means this potential 15,000 (MWh) of clean energy is unlikely to materialise.

Project examples:

Disused agricultural and contaminated land could be used for ground solar panel installations. One possible site that was identified in the report was the Pebsham Landfill site. It was also noted that a project was planned for the County Park in Hastings (but never went ahead due to local objections). However, the project was again deemed to be viable so it could be implemented providing it had cross-party support. Another potential site could be contaminated land at the old Ore Valley power station. This is because it might be better to install solar panels rather than build new housing on this site due to the costs of decontaminating the land (if it were to be used for housing).

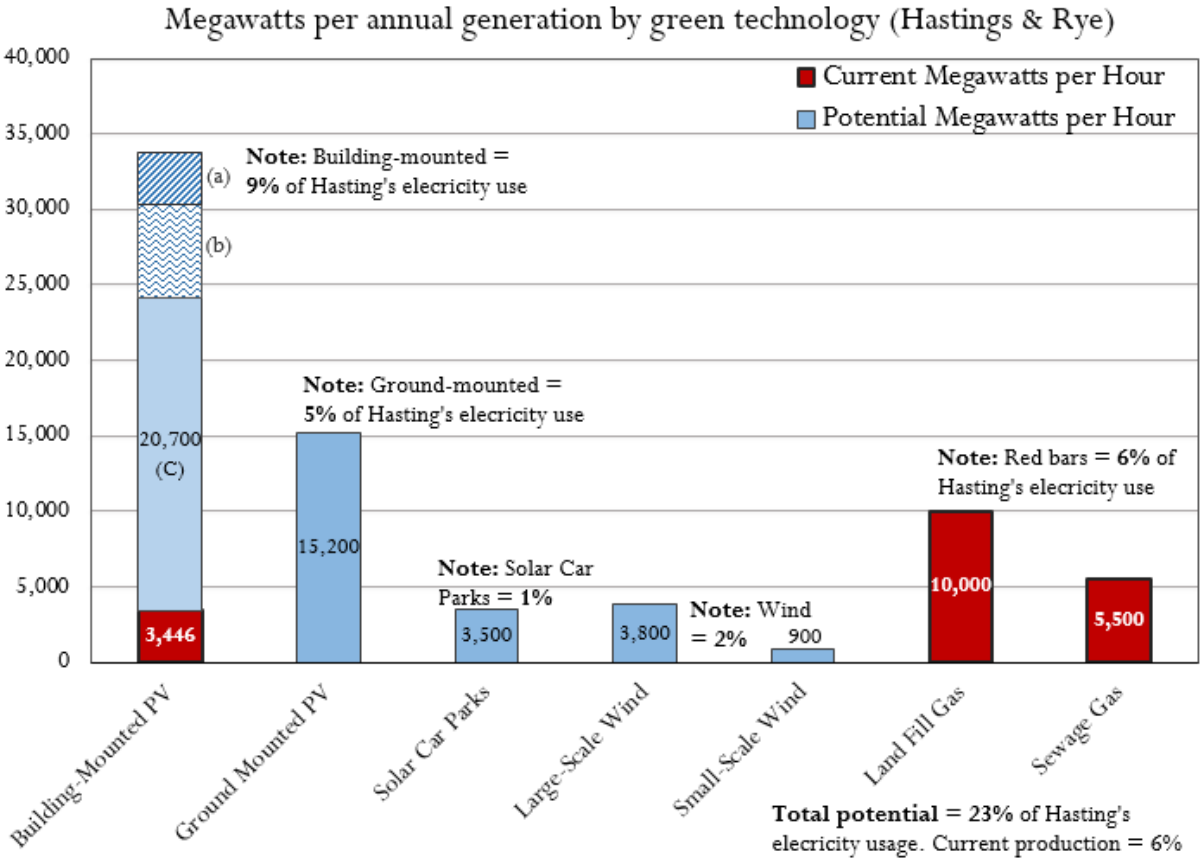

Figure 5.Estimated energy generation from potential clean energy projects within Hastings & Rye. Source: Hastings Low Carbon Energy Study (page 4).

Note: The red bars indicate current low-carbon energy production in Hastings. The blue bars indicate how much energy can be produced if all the recommendations are implemented. Building-mounted solar panels is split between (a) industrial (b) other non-domestic and (c) domestic roofs.

2. Wind power

Currently, there are no wind turbine renewable energy sources within the Hastings and Rye constituency. There is a wind farm not too far away from Rye that will generate some clean energy for the villages in the constituency, but this will be limited as such energy will likely mostly serve Kent. If potential sites for large and small-scale wind turbine projects are completed, this would generate just under 5,000 (MWh) of power per annum[34]. This would only produce 2% of Hastings' electricity needs. Not only would this produce relatively smaller levels of clean energy, but small-scale win turbine projects were assessed to be very costly. Each megawatt of power was estimated to cost just over £1,200 to produce. Larger-scale projects were deemed to be more cost-effective, with each megawatt only costing around £400 to produce[35]. Yet, there were limited viable sites identified in assessments conducted, meaning that large-scale renewable wind projects did not produce more than 4,000 (MWh)[36].

Project examples:

Wind Turbines on the Upper Wilting farm site could be possible and may be accepted as it is away from residential areas. This small-scale project can be placed in a location good for capturing wind currents and would be economically viable. A larger-scale site in the County Park was proposed by researchers, but they noted the likely local objection. However, if this project could be secured, a good source of cost-efficient renewable energy could be created. Yet, it must be noted that offshore wind farms were assessed to be not that viable in Hastings, or at least not as viable as other projects. This means that government investment in this type of renewable development would likely go elsewhere. Additionally, many large-scale land sites were also identified to be areas of natural beauty or were in some way environmentally protected. Consequently, the planning permission needed for such projects will likely be rejected due to local opposition and political tensions.

3. Sinks, also known as **offsetting.**

Sinks involve using natural resources and technologies to absorb or use the pollution emitted from our energy needs. This can involve planting more trees to suck in carbon, stopping it from entering the atmosphere or converting naturally forming gas from waste to electricity. This type of approach tends to have little resistance as it helps to increase greenery and limits wastage. Yet, it must be noted that little carbon is stopped from entering the atmosphere from such methods, especially when done on a small scale. Due to the urbanised nature of Hastings and the lack of land and potential sites, only small-scale projects in Hastings are possible, meaning Hastings can stop limited amounts of its pollutants from entering the atmosphere. Currently, sinks within Hastings captures less than 1% of all pollutants the town emits, showing this approaches limitations[37]. Yet, larger-scale tree-planting

programmes could take place in Rye and the surrounding villages, which could also help improve biodiversity within the constituency and slightly reduce the pollution that we place into the atmosphere.

Project examples:

This could involve planting more trees in urban centres, capturing more gas from sewers and better capturing gas from waste landfill sites. It could also involve better protecting the greenery that exists within the town. In terms of Rye and the surrounding villages, farmland and other land not being used could become protected biodiversity sites, with trees planted to help absorb pollutants.

The need to go further than renewables:

Yet, even if all these renewable energy projects are completed, this would still mean that 250,000 (MWh) of clean energy each year would need to be generated to meet all of Hastings' electricity demands. This would mean that 77% of current emissions generated from our electricity usage would be left, which need to be eliminated if Hastings ever hopes to reach net zero. Once taking all other forms of energy usage into account (such as gas), 95% of current emissions generated from our energy usage would remain. Therefore, there is a need to go further than just installing renewables to reduce emissions, which can be done by tackling gas pollutants.

Eliminating forms of gas energy:

In 2017, In Hastings, it was recorded that there were 99 kilotons of CO_2 that were caused by producing energy from gas pollutants. As gas is the most common form of energy usage (46%), it is the biggest contributor towards total pollution levels within Hastings[38]. As stated earlier, much of this gas usage comes from household energy demands, with most of it being needed to power and heat our homes. As explained before, ways to reduce such energy demands could come from reducing energy wastage through better insulating homes. It could also be reduced by converting gas energy sources to electricity. Additionally, gas-powered cars could be converted to electric. As of 2019, there were 135 registered Ultra Low Emission Vehicles (ULEVs), with there only being 7 charging points in the town. Whilst this represents a 10-fold increase since 2011, it is only a fraction of the more than 47,000 vehicles registered in the town[39]. Therefore, replacing gas with electric cars is unlikely, whilst meeting the electricity demands and installing the infrastructure to charge a large number of cars is also unrealistic. Further, the estimated cost of converting gas to electricity in both homes and transport is colossal and as just explained, increasing renewable sources of electricity won't get close to meeting a majority of Hastings' energy demands. Therefore, other technologies must be explored to reduce the town's gas consumption.

In terms of replacing the gas used to heat our homes, heat pump networks to reduce the consumption of gas was one option the report recommended to HBC. Such projects that have been recommended to the council include the Conquest Hospital and Summerfield Sports Centre. This was because a large network of heat pumps could be installed on these sites, meaning a good amount of energy could be generated at a cost-effective price. The council was advised to ensure that heat pump projects should only be implemented on large buildings or multiple connected units that can be used to develop heat pump networks, as this is better for cost efficiency. Therefore, this could also involve heat pump networks for a large group of connected homes (such as flat blocks) as well as large buildings. Yet, it should be noted that this technology is still relatively new and expensive, meaning limited locations are suitable for such methods.

As renewables and heat pumps can only go so far in reducing gas consumption, the national government will be required to invest in other technologies that can generate clean electricity on a large scale. This is because a large proportion of Hastings' energy needs will still be generated by gas pollutants even if other technologies are successfully implemented. To do this, the national government could invest in nuclear energy as it is capable of generating large amounts of clean energy that can be connected to the national grid and be used to power homes. This would enable more households that use gas heating to convert to electricity, thus reducing pollution in the town caused by gas. One possible location for such a nuclear power station could be to reuse the old Dungeness station. As the cost of building a new nuclear power station is high, national government investment is required for such a solution to be feasible. Yet, it must be noted that rising sea levels threaten the viability of this site so flood defences may be needed to ensure long-term usage.

In terms of powering cars, replacing petroleum (23% of all pollutants) is not that viable. This is because generating enough clean electricity to power our homes will be incredibly challenging. Therefore, generating the electricity and infrastructure to fuel the thousands of cars on our roads with electricity is not likely to happen anytime soon. In the future, developing Hydrogen-powered cars to replace gas is possible, but the technology is not there yet. Consequently, investing in this form of nuclear technology is probably the best way to reduce Hastings' heavy reliance on gas pollutants. Additionally, investing in nuclear may put the country in a better place in the future. This is because if nuclear fusion is successfully developed a new generation of nuclear power stations could be generated much more quickly if we invest in nuclear technology now. Nuclear fusion is where two light atomic nuclei combine to form a single heavier one, a process that releases a massive amount of energy. Crucially, this generates almost unlimited forms of clean energy at an incredibly low cost without incurring the nuclear waste problem[40]. This would enable the full transition to electric forms of energy usage for

both home and transportation use. Yet, although breakthroughs have occurred recently, the UK is still a long way off from implementing such technology.

Finally, it should be noted that converting to cleaner forms of energy has a cost-of-living benefit. This is because renewables are becoming cheaper than fossil fuels, meaning moving to this form of energy development will help to reduce energy bills. Additionally, creating more energy within the UK will enable us to control prices more as we will not be reliant on gas coming from other countries, something which means we have a limited control over the price we pay for energy. Therefore, implementing cleaner forms of technology we own and control will help address the cost of living crisis by lowering energy bills. This is essential for deprived towns like Hastings where many find themselves either in fuel poverty or feel their incomes and quality of life are being eroded through ever-increasing energy bills.

Car transport needs to be altered:

As removing gas pollutants from the vehicles the town uses is very difficult, the most effective way to reduce transport emissions in the town is to reduce the number of journeys taken. The best way to do this would be a move towards increased public transport use and non-carbon forms of access (such as cycling and walking)[41]. Moving towards a low-carbon local transport system isn't simple and requires significant action to be taken. But, without enough clean energy to power cars, this must be done to reduce transport gas emissions. The possible ways to do this are covered in much more detail within the transport and infrastructure chapter, but in summary, this can be achieved by:

- Asking transport officers to design a better local transport system.
- Applying for funding to create new and improved walking, cycling and bus routes in Hastings.
- Creating safer and better-signposted walking routes between desirable places.
- Prioritising the maintenance and repair of road paving to encourage more walking.
- Improving enforcement on illegal parking to deter poor parking practices.
- Making public realm improvements like bus-only roads and widened pavements.
- Creating safer residential neighbourhoods and breaking up the long open roads.
- Trialling a hub for parking and car hire where there are already too few parking spaces.
- Trialling park and ride schemes in the town.
- Improving public transport standards to increase its uptake.

<u>The really big problem</u>.

In terms of taking action at a localised level, there is one really big problem. The cost of implementing these technologies is huge and local councils, in this case Hastings Borough Council and East Sussex County Council, can't be expected to pay for projects. For example, the cost of making homes more energy efficient and reducing pollution in the town is estimated to be vast. For example, getting all homes up to an EPC C rating is estimated to require an investment of £171.5 million by 2030[42]. Additionally, even the most efficient measures of reaching net zero are very expensive. Yet, even if these costs can be covered and these homes can be made more energy efficient, there is still the cost of replacing gas heating systems with less carbon-intensive forms of energy. Heat pumps are one potential solution, but this could cost each household over £14,000[43], again presenting the affordability problem. Further, the 55GWh of potential renewable energy (that will only provide 23% of Hastings' electricity needs, 5% of all energy demand and will only cut emissions by 6%)[44], would also be incredibly expensive to implement. Indeed, I have spoken to local professional environmental scientists who argue that HBC's report discovered these relatively small emission cuts would cost an estimated £90m to fully implement. HBC's yearly spend is only £17m and is shrinking due to budget overspends forcing further cuts to be made[45]. Equally, the County Council are having to make cuts due to an estimated £57m deficit, with even essential services like adult social care facing cuts of almost £4m[46]. Therefore, councils with poor resources that have no authority (and therefore no budget) for tackling climate change cannot be expected to pay vast sums only to make relatively small cuts in emissions.

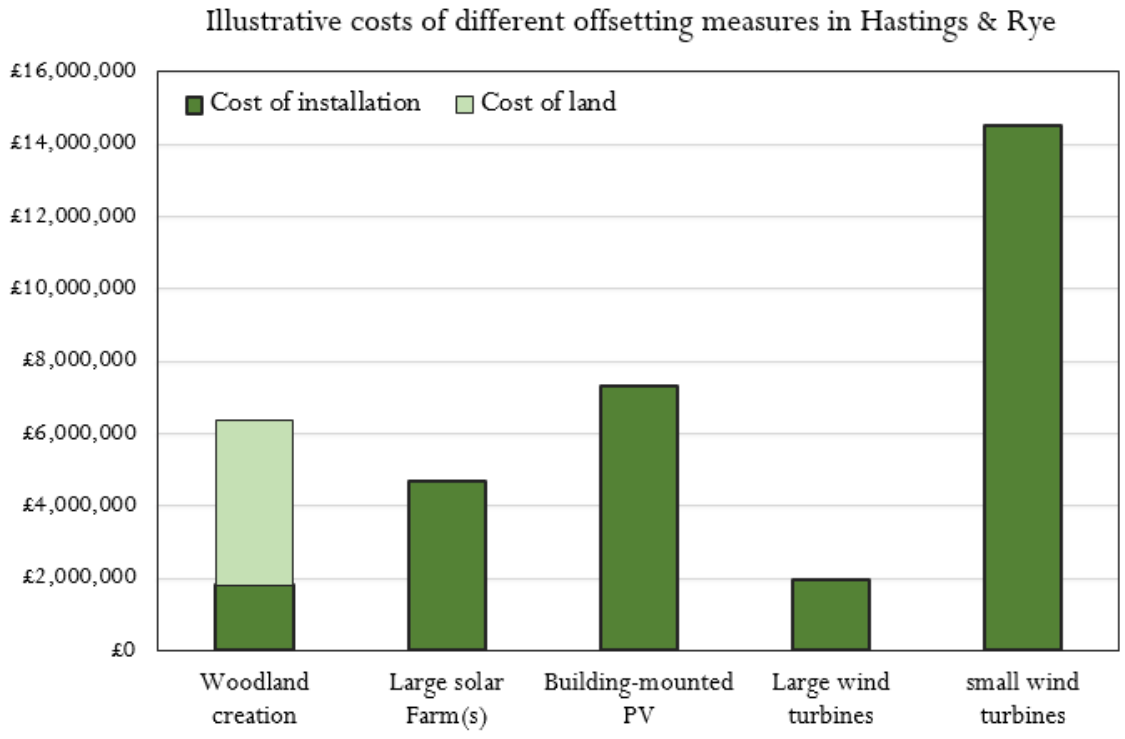

Figure 6: The price indicates what offsetting 1 Kiloton of carbon would cost. Note: All methods are expensive. Source: Hastings Low Carbon Energy Study (page 26).

Specifically, local scientists I have spoken to have told me that based on the report submitted to HBC the costs to reduce 1 kiloton of carbon through renewable development will run into millions[47]. For example, Figure 6 demonstrates that producing and installing small-scale turbine projects would cost £14m by the time they had eliminated 1 kiloton of carbon pollution per year in the town[48]. The most effective method of producing energy, large-scale solar panel technologies would cost on average around £6m to reduce 1 kiloton of carbon (with costs varying depending on if they are mounted on land or buildings)[49]. Considering that such costly action eliminates a relatively small amount of the 200+ kilotons of carbon we need to reach net zero in Hastings, a more cost-effective method must be pursued.

Possible national government solutions:

The national government could help Hastings to reduce emissions much more quickly and cost-effectively. Here, cost-effectiveness is key as large-scale projects connected to the national grid will enable much more effective emission reductions at more affordable prices. As these large-scale projects have great costs attached to them, this is why the national government is essential as it is the only government body with the finances able to afford such work.

Such large-scale projects could involve:

- Large-scale solar farms. This could be mass projects where panels are mounted onto buildings or are placed on land. In terms of connecting Hastings to such sources, large-scale solar farms could be placed on disused farming land or on fields in the rural areas surrounding Hastings within the Rother and Wealden area. Such large-scale projects could be connected to the national grid.
- Large-scale wind turbine projects, both onshore and offshore (where possible). Such sites could be based around Upper Wilting farm and the County Park hills between Hastings & Fairlight. Also, open unused land in the rural area surrounding Hastings where wind currents are strong (such as the wind farm near rye-village) could be explored as potential sites.
- Mass Woodland creation (planting trees) to mitigate pollution in the town. Such projects could be placed on disused farming land and fields in more rural areas within Rother and Wealden. This may also have the added benefit of increasing biodiversity within the area, possibly making such projects popular. Yet, it must be noted this method can only go so far and can't supply homes with renewable sources of electricity.
- A nuclear power station in East Sussex. One possible site that could be explored could be the former power station at Dungeness.

- Mitigation work could be developed in advance to limit the changes that will likely be produced from the pollution already emitted. This could include securing funding to develop stronger sea defences to help limit cliff erosion and prevent flooding. This could involve:
    - Installing large rocks in key beach locations to limit water reaching the cliffs and spreading inland, as was done on the Bultherhythe beach in West St Leonards. This could be done near the Hastings Town Centre or towards the Old Town.
    - Improving drainage systems in the Hastings town centre area, as discussed in the water pollution chapter.
    - Using flood defences to protect the Dungeness nuclear power station (if it is to be reused).

Pushing the national government to develop such large-scale renewable energy projects within East Sussex is the most effective way to reduce emissions and address the energy cost of living crisis. Doing this as quickly as possible will be the most effective way to reduce emissions, address the growing fuel poverty problems and ease intense cost of living pressures within Hastings and Rye.

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