

Thurrock Council
**Thurrock Climate Change Scoping
Study**
Report

Final Issue | 29 April 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Introduction

1.1 Climate commitments in Thurrock

In October 2019, Thurrock Council carried a Motion resolving to:

- Declare a Climate Emergency that requires urgent action
- Request that the Council's activities become net-zero carbon by 2030
- Request that the Council embed this work in all areas and take responsibility for reducing, as rapidly as possible, the carbon emissions resulting from the Council's activities
- Request that the relevant Portfolio Holder with responsibility for Climate Change convenes a Citizens' Assembly on Climate Change and a Climate Change Partnership group, involving Councillors, residents, young citizens, climate science and solutions experts, businesses and other relevant parties. Request that all reports in preparation for the 2020/21 budget cycle and investment strategy will take into account the actions the council will take to address this emergency
- Request that the Leader write to the UK Government asking them to provide the powers, resources and help with funding to make this possible, and ask local MPs to do likewise.

A Climate Change Partnership Group is in the process of being appointed. This group will be tasked with investigating how and when the Council can achieve net zero carbon emissions. It will also consider how best to maximise the benefits that climate action can engender for other socio-economic objectives, leading to the development of targets, pathways and an action plan for Thurrock to reduce its greenhouse gas emissions in line with a net zero goal for the UK.

In parallel with this emerging work programme on climate change, Thurrock is at an early stage in developing the Local Plan. This is viewed as a key opportunity to build principles of low-carbon, climate resilient planning and development into the Local Planning process.

1.2 The imperative for UK local authorities

The significant role and responsibility that local authorities have in mitigating and adapting to climate change is clearly stated in paragraph 8 of the National Planning and Policy Framework (2019). In addition, chapter 14 of the Framework is dedicated to 'Meeting the challenge of climate change, flooding and coastal change', where Paragraph 148 states "*The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change*", and Paragraph 149 states "*Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures*". The independent Committee on Climate Change (2012:10) also

states that “*local authorities’ planning functions are a key lever in reducing emissions and adapting localities to a changing climate*”.

The power that local authorities have to prioritise the climate change agenda motivated the ‘Climate Emergency’ movement, in which councils are being called upon to make climate change a top priority in all future strategic and policy decisions. As of April 2020, 274 (or 67%) of the UK’s district, county, unitary and metropolitan councils had declared a Climate Emergency¹.

In September 2019, 100 local authorities – including Thurrock Council – were contacted and advised that legal action would be taken against them if they do not integrate climate change into their planning policy.

1.3 Scope of Study

Arup was commissioned to undertake a scoping study to:

- provide a baseline assessment of Thurrock’s current climate impact (emissions) and risks (hazards);
- synthesise existing legislation, policy and other requirements around climate change that apply to Thurrock, and determine necessary responses;
- review existing corporate documents, local planning processes, policy and operations to identify opportunities for Thurrock to integrate climate change objectives;
- outline initiatives to focus on in the Local Plan, recognising Thurrock as a growth area and the desire to achieve growth without increasing emissions or climate risk; and
- define what the requirements should be if a climate change strategy were to be developed for the borough, including alignment with wider plans/processes and engagement with stakeholders.

The above points will be addressed whilst considering Thurrock both as an organisation and as a borough more broadly. This study could potentially align with and feed into any work a Climate Change Partnership Group within Thurrock undertakes if and when it is appointed. The study will also support the Infrastructure Delivery Plan (IDP) and Sustainability Appraisal for Thurrock and contribute to the evidence base for the Local Plan.

1.4 Structure of this report

The report comprises the following sections:

- [2] Thurrock in context
- [3] Baseline assessment
- [4] Current policy and operations

¹ <https://www.climateemergency.uk/blog/list-of-councils/>

- [5] Recommendations
- [6] Route map

1.5 Limitations

This scoping study draws on the best available published data about Thurrock's emissions and climate risks at the time of writing (March 2020). In preparing this work, Arup has uncovered a number of challenges related to data availability, age and granularity, which would need to be addressed in order to develop a full evidence-based climate change strategy. The recommendations presented here are based on the currently available data only and should be developed in detail as further evidence is prepared.

2 Thurrock in context

Thurrock is a unitary authority area in South Essex, spanning 165 sq. kilometres and home to 172,500 people (Office of National Statistics, ONS, 2018). The ONS predicts that by the time of the next national census in 2021, the population will have increased by a further 5,000 people. Thurrock benefits from good transport and connectivity to the wider Essex region, Kent, east and central London, and international destinations via the Port of Tilbury. In addition to the M25 and A13 - two of the country's busiest major roads, which intersect in the borough (Figure 1) - Thurrock is served by regular rail services to London.

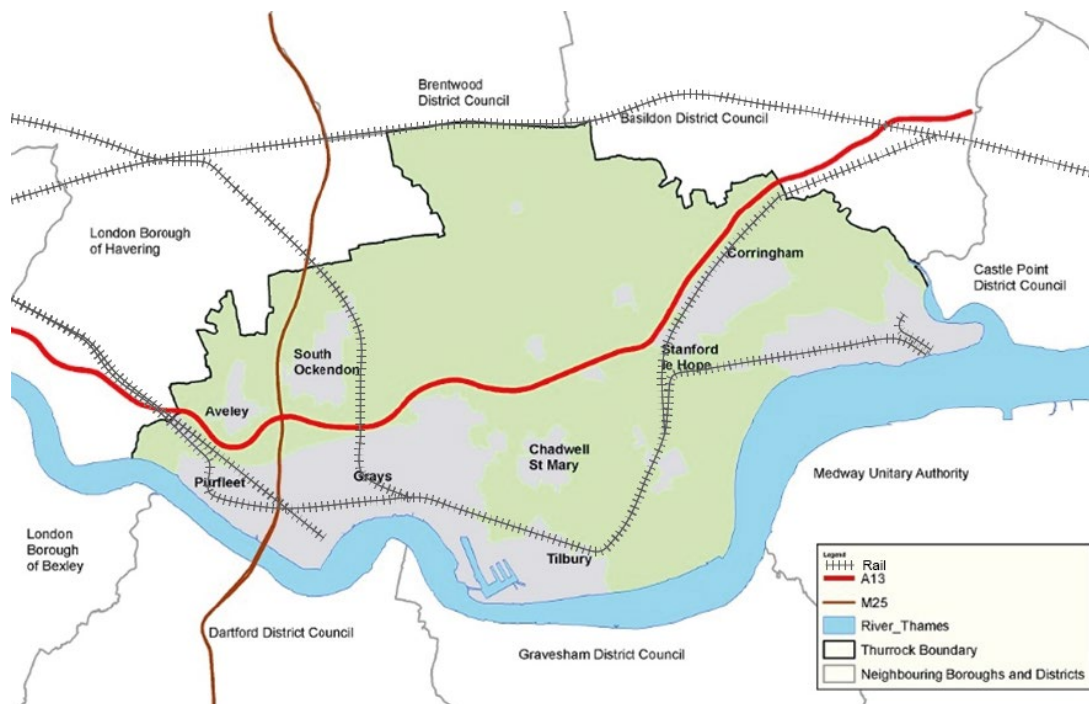


Figure 1 Thurrock context

The borough shares eighteen miles of riverfront with the River Thames, a characteristic which has facilitated its global position in international trade and logistics as a deep-water port hub. Beyond trade, logistics and port functions, other dominant employment sectors are retail and transport. While these sectors deliver large numbers of jobs, they are often low paid with limited opportunities for progression. The Thurrock Economic Growth Strategy (2016–2021) acknowledges the continued importance of these existing sectors, while pursuing economic diversification and higher-skilled jobs with improved wages.

Approximately two-thirds of the borough is designated as Green Belt, including locally, nationally and internationally recognised sites of wildlife importance. Thurrock's most populated towns are Grays, Stanford-le-Hope, South Ockendon and Tilbury. Much residential and industrial development is adjacent to the River Thames, resulting in a riverside that is highly urbanised. This puts significant economic, infrastructural and housing assets at risk of tidal flooding. The River Mardyke and the Stanford Brook both pose a fluvial flood risk. Additionally, the

Environment Agency has identified surface water flood risk ‘hotspots’ arising from heavy rainfall, elevated groundwater, and drainage systems.

As a unitary authority, Thurrock Council is responsible for all local government functions within its area. This positions the Council well to integrate climate priorities in its plans for the borough, as well as across its wide-ranging operations. However, emissions and climate risk are transboundary challenges. It will be critical for Thurrock to cooperate with partners across the public, private and civil society sectors in order to meet its goals and secure stakeholder buy-in. Thurrock’s membership in the Association of South Essex Local Authorities (ASELA) is one route through which a strategic regional approach may be delivered, while coordination will also be critical across south-east England and nationally to find optimal solutions to move the UK collectively towards net zero emissions by 2050.

3 Baseline Assessment

3.1 Emissions Sources

A simple assessment of Thurrock's current emissions has been developed using currently available data. Emissions have been reviewed in terms of both corporate (organisational) emissions from Council operations, and the wider territorial emissions of Thurrock as a borough. This assessment is presented to highlight the current trajectory of emissions across sectors in Thurrock, and the key areas in which emissions reduction efforts may be focused.

3.1.1 Territorial Emissions

Thurrock's Emissions by Sector

The SCATTER inventory, compiled by Thurrock Council, is the most up-to-date source of the borough's emissions and is thus considered as the primary dataset for this baseline.² It provides a breakdown of the borough's territorial emissions for the year 2018. It includes scope 1, 2 and 3 emissions (Table 1).³

² SCATTER is a free-to-use emissions inventory aimed at local authorities in the UK. It allows authorities to standardise their GHG reporting and align with international frameworks such as the Paris Agreement (SCATTER Cities, 2020. <https://scattercities.com/>)

³ The Greenhouse Gas Protocol (2014) categorises emissions into three scopes (https://ghgprotocol.org/sites/default/files/standards/GHGP_GPC_0.pdf):

Scope 1 – Emissions from a source within the district boundary

Scope 2 - Emissions resulting from the consumption of grid-supplied energy within the district boundary

Scope 3 – All other GHG emissions occurring outside the district boundary that are a direct result of activities within the district.

Table 1 Thurrock's CO₂e emissions by sector and sub-sector taken from Thurrock's 2018 SCATTER inventory.

Sector	Sub-sector	Total tCO ₂ e	%
Stationary energy	Residential buildings	270,891.4	23.5%
	Commercial buildings & facilities	63,026.0	5.5%
	Institutional buildings & facilities	211,028.6	18.3%
	Industrial buildings & facilities	134,407.0	11.7%
	Agriculture	1,928.3	0.2%
	Fugitive emissions	-	0.0%
	Total	681,281	59.1%
Transportation	On-road	364,836.7	31.7%
	Rail	729.0	0.1%
	Waterborne navigation	17.2	0.0%
	Aviation	90,008.2	7.8%
	Off-road	-	0.0%
	Total	455,591	39.5%
Waste	Solid waste disposal	4,791.3	0.4%
	Biological treatment	-	0.0%
	Incineration and open burning	-	0.0%
	Wastewater	10,618.6	0.9%
	Total	15,410	1.3%
IPPU ¹	Industrial process	0.02	0.0%
	Industrial product use	0.00	0.0%
	Total	0.02	0.0%
Agriculture, Forestry and Other Land Uses (AFOLU) ⁴	Livestock	330.9	0.0%
	Land use	-0.01	0.0%
	Other AFOLU	-	0.0%
	Total	330.8	0.0%
Generation of grid-supplied energy	Electricity-only generation	0.1	0.0%
	CHP generation	-	0.0%
	Heat/cold generation	-	0.0%
	Local renewable generation	0	0.0%
	Total	0.1	0.0%
Grand Total		1,623,945	100%

Thurrock's total emissions in 2018 were 1,623,945t CO₂e. Almost all (98.6%) of the borough's emissions are from **Stationary Energy (59.1%) and Transportation (39.5%)**.

Transportation accounted for 455,591t CO₂e (39.5%), 80% of which came from **On-Road transportation** (31.7% of total emissions). As demonstrated by Figure 2, when emissions are broken down into sub-sectors, this represents the largest single source of emissions in the borough. This is attributable to the significant road transport networks within the borough, such as the M25 Dartford Crossing

⁴ Note suspected data gaps.

and the A13, in addition to commercial traffic generated by the port and logistics industries in the area.

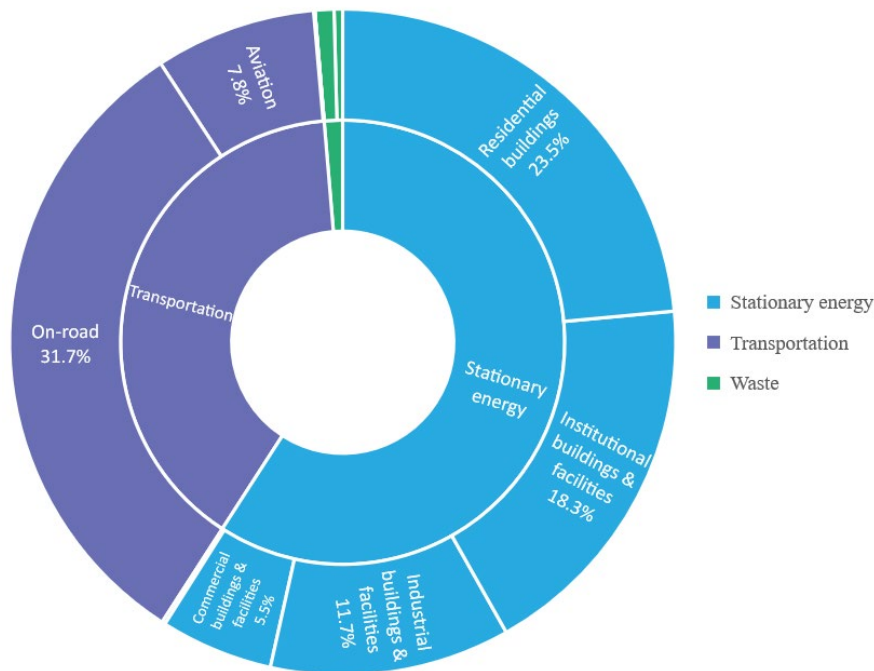


Figure 2 Thurrock's emissions by sub-sector (all variables >0%)

Waste accounted for 15,409t CO₂e (1.3%), 10,619t (0.9%) being from Wastewater and 4,791t (0.4%) from Solid Waste Disposal. Although a small proportion of the total, these emissions may be connected to Thurrock importing waste for landfill from London boroughs.

The remaining sectors (IPPU – Industrial Processes and Product Use, AFOLU – Agriculture, Forestry and Other Land Uses, and Generation of grid-supplied energy) accounted for small quantities of emissions that are not considered significant, although it is possible that these low figures are attributable to gaps in data and may require further investigation.

Thurrock's Emissions - Temporal and Regional Trends

The Local Authority Emissions breakdown produced by the Department for Business, Energy, and Industrial Strategy (BEIS), provides an annual inventory of carbon dioxide emissions for each local authority in the country from 2005 to 2017. This has been included here as a supplementary dataset to help understand how Thurrock's emissions have changed over time.

Thurrock's CO₂ emissions in 2017 were 48% lower than the base year of 2005. Per capita emissions have reduced from 12.8t per person in 2005, to 5.7t in 2017, despite the borough's population increasing by 10% in this period from 148,600 to 170,400.

The large decrease of total CO₂ emissions can be attributed to the fall in industrial and commercial emissions (Figure 3), which dropped from 1,098,100t CO₂e (58%

of total emissions) in 2005 to 301,900t (31%) in 2017. Based on available data, this is likely attributable to the decline in heavy industry and the closure of Tilbury Power Station.

Transport emissions have increased slightly, from 474,900t in 2005 to 477,400t in 2017. Absolute domestic emissions have decreased since 2005, falling from 333,000t CO₂ to 207,500t in 2017. However, due to the fall in industrial and commercial emissions, both transport and domestic emissions now represent a larger percentage of Thurrock's total emissions (transport – 25% in 2005 to 49% in 2017; domestic - 18% in 2005 to 21% in 2017).

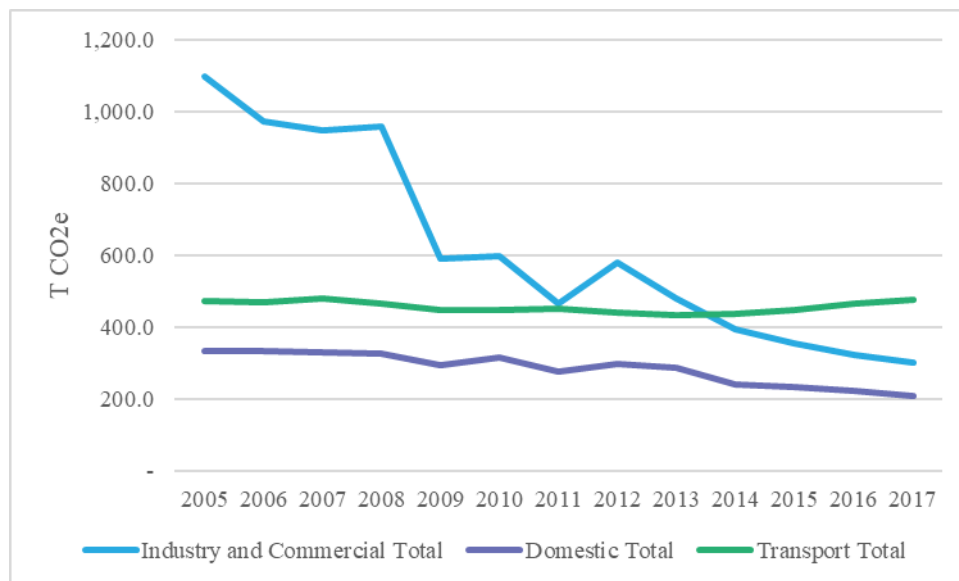


Figure 3 Thurrock's sectoral CO₂ emissions

3.1.2 Corporate Emissions

The Thurrock Council Greenhouse Gas Report 2018/19 is the most up-to-date source of the Council's corporate emissions. Emissions are reported as Scope 1 (Direct Emissions) and Scope 2 emissions (Energy Indirect) (Scope 3 is included in the scope of the study, but results are not reported).⁵

In 2018-2019, Thurrock Council's total corporate emissions were 6,150t CO₂ - a decrease of 26% from 2017/2018 and 30% from the base year 2013/2014 (Table 2). This is largely attributable to a significant reduction in scope 2 emissions, falling by 33% from 2017/2018, and 62% over 2013/2014 levels.

The trend in emissions by scope is difficult to establish – based on available data 2018/2019 Scope 1 emissions (absolute) have fallen from 2017/2018 levels, however, they are now higher than for the 2013/2014 baseline year. Based on available data, they now represent a larger proportion of the authority's total

⁵ **Scope 1** - Activities carried out by the organisation that releases emissions into the atmosphere. E.g. emissions from heating boilers owned/controlled by the council, or emissions from owned/controlled vehicles.

Scope 2 - Emissions associated with purchased electricity, heat, steam or cooling. Indirect emissions resulting from council activities but from sources out of council control. E.g. energy purchased from the National Grid.

emissions than before, rising from 22% in 2013/2014, to 39% in 2017/2018, to 45% in 2018/2019 (Table 2). However, it's important to note that council-held figures for transportation begin in 2016, and as such figures for the baseline year 2013/14 do not include transport emissions. The collection of this data was outsourced by the council and returned in-house in 2016 and 2017. It is considered that 2018/19 is the first year when all emissions data was captured.

Table 2 Thurrock Borough Council's corporate emissions split into scope 1 and scope 2

Year	2018/2019		2017/2018		Base Year 2013/2014	
	Emissions (T CO2)	% Total	Emissions (T CO2)	% Total	Emissions (T CO2)	% Total
Scope 1	2,541	45%	2,980	39%	1,727	22%
Scope 2	3,609	55%	4,586	61%	6,278	78%
Total	6,150	100%	7,566	100%	8,005	1.00

The reduction in scope 2 emissions over baseline levels may be due to energy efficiency measures leading to a decrease in energy consumption (such as installing LED street lights), in addition to the decrease of fossil fuel mix in the energy system resulting in less CO₂e per kilowatt-hour (Kwh). Other factors may include the closure of council facilities such as the Culver Centre or the Curzon Drive Depot.

The Thurrock Carbon Management Plan (CMP), published in 2009, quantifies the authority's emissions under sectors and sub-sectors. Although not recently published, the data is included here as a secondary dataset as it provides a more granular breakdown of likely emissions sources. According to the CMP, operational activities account for 75% of the authority's emissions, stationary sources were 12%, and waste from council buildings 11% (Figure 4).



Figure 4 Thurrock Council's Corporate Emissions split by sector and sub-sector (Thurrock Council Carbon Management Plan, 2009)

3.2 Climate Risks and Hazards

Thurrock's current risks from climate change have been compiled based on published data about the borough, and further illustrated with anecdotal examples of recent extreme weather events. This assessment demonstrates the likely environmental changes that Thurrock will need to prepare for through its Local Plan and related policy/plan-making processes.

3.2.1 Flooding

Thurrock, due to its location on the northern foreshore of the Thames Estuary, is particularly susceptible to fluvial and coastal flooding, storm surges, and sea level rise.⁶ The River Thames poses the most significant flood risk to Thurrock. Tributaries, such as the River Mardyke, which discharges into the Thames at Purfleet, and Stanford Brook also represent a flooding risk (Figure 5).

⁶ This section uses information obtained from the Infrastructure Development Plan (2020)

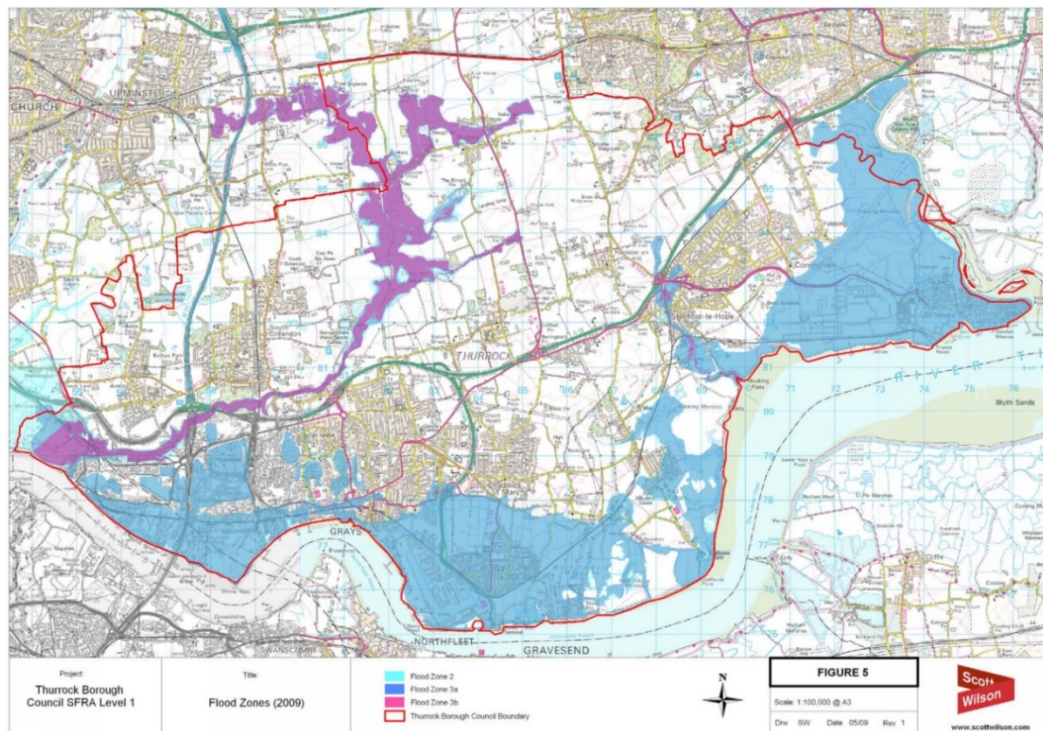


Figure 5 Thurrock Flood Zones (Source - SFRA Level 1)

Areas of note that are vulnerable to flooding include:

- Approx. 11,000 properties at risk;
- Areas of Tilbury, Purfleet and West Thurrock;
- Commercial and industrial assets – e.g. Port of Tilbury and DP World London Gateway ports, Lakeside Retail Park; and
- Transport assets – e.g. c2c mainline, A13, Thames crossing.

There is a range of flood defences already in situ, including the Thames barrier 7km upstream from Thurrock, and concrete seawalls protecting Thurrock itself up to a 1 in 1000-year tidal flood event. According to the Environment Agency, the current defence height along the Thurrock foreshore ranges from 6.9m AOD (above ordinance datum) and 7.2m AOD. This provision corresponds closely to the range of 1 in 1000-year peak tides for the year 2109.

Climate change induced sea-level rise is likely to increase Thurrock's vulnerability to **coastal and fluvial flooding**, and this may require enhanced flood protection to ensure risks are adequately mitigated.

3.2.2 Other Climate Risks

Thurrock is also vulnerable to some less localised climate impacts. At the time of writing, little data is available covering these risks specific to Thurrock. However the Essex County Council Adapting to Climate Change Plan (2011) details potential climate risks and how they may impact council operations, covering an

area close enough geographically to be of some relevance to Thurrock. It considers the following climate hazards:

- Climate & weather events;
- Flooding and Coastal Flooding;
- Snow, Ice & Frost;
- Extreme Weather; and
- Hotter Summers.

Impacts on council services were rated based on their severity. Some significant impacts of relevance to Thurrock include:

- Risk to delivery of care and provisions to vulnerable or hard to reach people during flooding and extreme weather;
- Disruption to public transport, roads or rail during snowy, icy or extreme weather conditions, including increased demand on road salt provisions and salting routes;
- Impacts on waste collection, opening of civic centres or public facilities, or shortage of staff to fulfil frontline duties during extreme weather or snow and ice;
- School closures during extreme weather or snow and ice;
- Disruption to phone or utility provision during extreme weather; and
- Vulnerable groups at risk to heat exposure during heat waves may put a strain on health and social care.

As recently as February 2020, flood alerts were issued for large parts of Essex, including Thurrock. Heavy rainfall brought in by Storms Dennis and Ciara caused rivers to overflow, disrupting residents, motorists and shoppers. The Met Office has also issued heatwave alerts for Essex for the last five consecutive summers. Extreme heat brings risk to life, as well as damaging infrastructure, including railway lines and tarmacked roads (Figure 6).

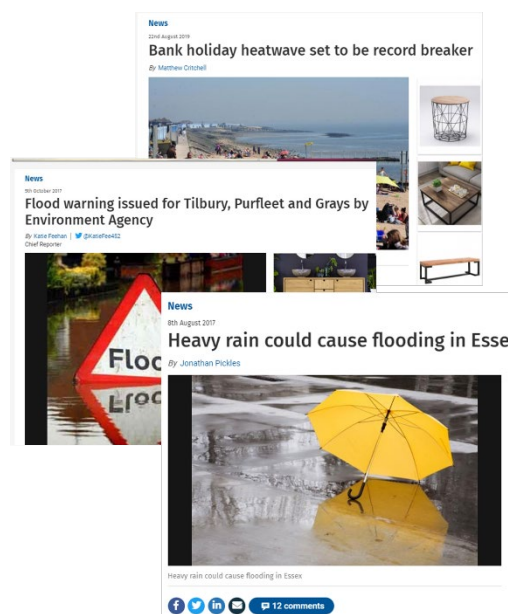


Figure 6 Recent reports of extreme weather in the local press (Thurrock Gazette, 2020)

4 Current Policy and Operations

4.1 International and national commitments relating to climate change

This section outlines key legislation, policy, and strategy documents which directly or heavily influence action on climate change. All of these documents outline policy, measures, and targets at the international or national level. The implications of existing climate change and environmental policy on Thurrock's development of a climate change strategy are also discussed in this section.

4.1.1 Summary of key commitments and policy documents

Please refer to Appendix A for detailed information about international and national climate change commitments.

There is a number of key legal commitments and obligations the UK government must meet which relate to climate change

The most important legal documents relating to the UK's obligations with regard to climate change are the Paris Agreement (2016) and the UK Climate Change Act (2008). The Paris Agreement requires the UK to meet 'Intended Nationally Determined Contributions': at least 40% domestic reduction in GHG emissions by 2030 compared to 1990. In addition, the 2019 update to the Climate Change Act set a target for the UK to be **net-zero carbon emissions by 2050**. Emissions of greenhouse gases from international aviation or international shipping do not currently count as emissions from sources in the United Kingdom for the 2050 net-zero target.

There is a series of more focused national policy documents which respond to Government commitments and legislation relating to climate change and the environment

The Environment Bill of 2020 sets out priority areas for maintaining and enhancing the natural environment and identifies responsible parties, key procedures for setting targets and specific policies, and powers for ensuring environmental protection and resource efficiency. It requires the Secretary of State to set long-term targets (at least over a 15-year period) in respect of each identified priority area: air quality; water; biodiversity; resource efficiency and waste. 'A Greener Future – Our 25 Year Plan to Improve the Environment' sets aspirational goals and actions for improving and protecting elements of the natural environment in the UK over a period of 25 years.

The National Planning Policy Framework sets principles and identifies key objectives and considerations for planning infrastructure and development, planning processes, and how decision-making and roles should be aligned and positioned to achieve specified priorities for growth and development in the UK. It requires the planning system to support the transition to a low carbon future and recognise climate change and to fully consider flood risk and coastal change. The

framework requires the planning system to help ‘shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.’ The National Planning Policy Framework also calls for local planning authorities to ‘support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies.’

These documents have a strong focus on sustainability, references to climate change, and note the need for integration of policies and roles to enhance benefits of environment-focused measures and minimise contradictory approaches.

A number of documents seek to report and monitor the UK’s progress towards climate change mitigation targets, as well as risks posed to the UK due to climate change

The UK Five-Year Carbon Budget final statements record performance against the five-year carbon budgets set under the procedures outlined in the Climate Change Act. Emissions between 2013 – 2017 were on track to satisfying carbon budget requirements for this period – on average were 40% lower than 1990 base year emissions. Targeted action by all local authorities and regions will become increasingly important to meet the carbon budgets as easier to implement measures are exhausted and further reductions in emissions are required.

The UK Climate Change Risk Assessment provides information on the key risks posed specifically to the UK due to climate change in order to inform investment and action towards mitigation and adaptation. All of the top six areas of interrelated climate change risks identified for the UK are risks for Thurrock to consider in the development of its climate change strategy:

- Flooding and coastal change
- Risks to health and well-being due to high temperatures
- Risks of shortages in public water supply
- Risks to natural capital
- Risks to domestic and international food production and trade
- New and emerging pests, invasive non-native species, viruses and the diseases they cause, all of which affect people, plants and animals

A series of national strategy documents outline measures addressing different environmental priorities, which relate to actions on climate change

The Committee on Climate Change publishes several reports on climate change and the UK; ‘The UK’s contribution to stopping global warming’ sets out scenarios, priorities, and key considerations for achieving the net-zero target. The report notes ‘cities and local authorities... have important roles on transport planning, including providing high-quality infrastructure for walking and cycling, provision of charging infrastructure for electric vehicles, and ensuring that new

housing developments are designed for access to public transport. They can improve health outcomes for people who live and work in the area by implementing clean-air zones that discourage use of polluting vehicles and other technologies.’ The report notes that most sectors of the UK economy need to be able to ‘reduce emissions close to zero without offsetting; the target cannot be met by simply adding mass removal of CO₂ onto existing plans for even the 80% carbon reduction target.’ The report notes that afforestation targets for 20,000 hectares/year across the UK nations (due to increase to 27,000 by 2025) have not been met, and less than 10,000 hectares have been planted on average over the last five years.

The Clean Air Strategy focuses on providing an overview of the issue of air pollution in the UK and measures to achieve compliance against air quality targets. The report refers to the importance of aligning air quality driven initiatives with climate change mitigation to eliminate discrepancies in desired outcomes. The Clean Growth Strategy responds to the Climate Change Act and aims to integrate aspirations for economic growth with a ‘low-carbon’ future, including the provision of funding and investment to enable this. The document outlines the approach, incentives, and investment government will put in place to enable a reduction in carbon emissions (the report does not currently reflect the updated target of achieving net-zero by 2050). The investments promised within the Clean Growth Strategy include around £3.6bn of investment to upgrade 1 million homes and extend support for home energy efficiency improvements until 2028 at the current level of ECO funding, £1bn in spending to support uptake of ultra-low emissions vehicles; and invest £1.2bn to make cycling and walking the natural choice for shorter journeys.

4.1.2 Implications for Thurrock

Most of the documents summarised above are largely centred on identifying approach and guidelines at the national level, with some discussion on how local authorities can and should play a role in progressing the recommended measures. These documents as a whole provide guidance on the measures and principles national government is prioritising for reducing carbon emissions. These priorities centre around integrated land use and transport planning, promoting active travel, shifting goods and freight onto rail, promoting clean energy, seeking opportunities to link investments in carbon reductions with economic growth and value, and linking different environmental initiatives so that the policies are in sync with each other.

An effective climate change strategy for Thurrock should consider the borough’s local as well as regional, national, and international role – particularly as a transport and logistics hub. Targets and proposed measures for carbon reduction should be coordinated regionally and nationally to ensure the higher-level outcome of net-zero carbon is achieved and wider benefits are maximised for the public and the country.

4.2 Local plans and policy

This section presents the summary findings of a desk-based review of regional and local plans, procedures and policy documents which are particularly relevant for climate change. Results are divided into relevance for greenhouse gas emissions and relevance for climate change resilience. They are further categorised into ‘Key Policy Areas’, which signpost possible intervention areas for a Climate Strategy. The Key Policy Areas are: **Energy, Transport and Infrastructure, Flood, Green Infrastructure, Sustainable Development, Design, Housing, Economy and Waste.**

Appendix B presents two tables which document specific policies / actions / plans. For each policy, the possible implications for net emissions changes in Thurrock are given. Furthermore, a level of priority is assigned informed by the baseline assessment of emissions and climate risk, and strengths or weakness of existing policy. Priority is signalled through traffic light colour categorisation, where red means “More ambitious policy needed”, amber “Good but requires more detail”, and green “Strong policy”. In these tables high-level comments are left where opportunities exist to improve plans, actions or policies.

4.2.1 Policy relating to emissions

Energy

Thurrock Council’s Core Strategy (as amended in 2015) includes a suite of policies relating to energy. The Council will actively encourage energy generation from low-carbon and renewable sources. From 2020, new developments are required to secure a minimum of 20% of their predicted energy from decentralised and renewable/low-carbon sources. Furthermore, new development is required to be carbon neutral, utilising energy efficiency measures wherever possible and offsetting any increases in carbon dioxide emissions, potentially via mechanisms such as the Thurrock Carbon Offset Fund. The Carbon Offset Fund is yet to be implemented but holds potential significance for Thurrock Council with regard to a climate change strategy. Furthermore, energy efficiency measures should also simultaneously be encouraged in the existing building stock.

Transport and Infrastructure

Thurrock Council’s Core Strategy contains policies that should result in a net decrease in transport-related emissions, if widely taken up. Policies focus on encouraging modal shift towards low-carbon forms of travel, including through delivering a network of cycle- and foot-paths and implementing widespread 20mph zones in urban areas. However, given the strategic location of the borough, it receives large quantities of port-related freight traffic. Plans largely beyond the remit of the Council to expand port operations will likely exacerbate this traffic and related vehicular emissions. The proposed Lower Thames Crossing is also likely to increase vehicular emissions in Thurrock – a project which otherwise poses direct benefits to neighbouring boroughs. Regional management of emissions and benefits needs to take place in order to balance the distribution of

benefits and impact. The Council should consider the opportunity to address these emissions in collaboration with neighbouring authorities.

Green Infrastructure

The Council has committed in its Core Strategy to a number of ambitious green infrastructure-related policies. By requiring a net gain in green infrastructure for new developments, a decrease in greenhouse gas emissions via sequestration should result, depending on the amount of emissions emitted by other forms of development. Throughout the network of green and open spaces being enhanced and developed, the Council has the opportunity to consider optimal use of this land for both sequestration and climate change adaptation purposes.

Sustainable Development

At a regional level, as seen in the South Essex Joint Strategic Plan Statement of Common Ground (2018), there is a shared ambition that all new development be located in the most sustainable locations. These locations will be well-connected by a fully integrated transport system and a network of green spaces. While elaboration is needed through local planning authorities' site selection procedures on exactly what constitutes a 'sustainable location', this ambition should decrease emissions associated with private car use if it aims to minimise urban sprawl and encourage mixed-use development which can be flexibly adapted based on variation in industry and demand over time. A network of green spaces could also bolster sequestration of emissions, assuming that there is no net loss of green space due to the construction of new development. At the borough level, Thurrock's Core Strategy promotes sustainable development through the judicious use of water and other natural resources, as well as through sustainable design, construction methods, and materials.

Design

Both the Thurrock Core Strategy (2015) and the Thurrock Design Strategy Supplementary Planning Document (2017) set out a number of policies relating to sustainable design that should decrease greenhouse gas emissions. Measures to be implemented include identifying opportunities to minimise the consumption of energy to heat, cool, ventilate and light buildings. Future schemes, potentially such as the Thurrock Carbon Offset Fund (to be defined) should be utilised as a method to mitigate unavoidable emissions.

Housing

According to the emerging Local Plan Issues & Options Stage 2 study from 2018, the housing need for Thurrock according to the standardised methodology set out in national planning practice guidance (NPPG) is 1,173 homes per year. Accordingly, Thurrock will need to construct this number of homes per year during the Local Plan Period from 2023 to 2038, in order to meet the assessed housing need for the borough. However, it should be noted that the standard methodology fails to consider whether any adjustments need to be made to the housing requirement to ensure that the provision of new homes addresses any imbalance between the available labour supply and the projected rate of job

growth in Thurrock. Noting Thurrock's projected scale of employment growth, the final housing need figure is likely to be higher than 1,173.

Housebuilding is likely to increase emissions associated with: the construction of homes, loss of carbon-sequestering green space, and those arising from providing infrastructure and services to serve the increased population. The extent to which housebuilding will result in a net increase or decrease in greenhouse gas emissions is largely dependent on whether Thurrock Council successfully implements its policy on net-zero carbon development. The Council's stated aim of concentrating housing growth on previously developed land, rather than greenfield, will support the continued sequestration role of greenfield land.

Economy

The wider Essex Region, including Thurrock, is pursuing economic growth. The Draft South Essex Productivity Strategy (2019) sets out a programme to deliver significant economic activity, yet no mitigation actions are suggested to offset the emissions that will likely accompany this economic growth. Conversely, the regional Draft Local Industrial Strategy (2020) focuses on the need for clean, environmentally sustainable growth that heads towards a net-zero economy. This transformation will require extensive collaboration between all stakeholders.

Waste

The Thurrock Core Strategy states that the design and layout of residential and commercial development should facilitate sustainable waste disposal, with due consideration given to recycling and composting. A shift towards recycling and composting should result in a net decrease in emissions, if the total amount of waste produced were to remain static (which is unlikely, given projected increases in housing). Yet this policy has the potential to be more ambitious, focusing more on the need to reduce consumption and promote re-use.

4.2.2 Policy relating to resilience

Flood

Regional and local policies and plans recognise the importance of taking action to enhance resilience against flooding. In both the Thurrock Level 1 Strategic Flood Risk Assessment (2018) and the Thurrock Core Strategy (2015), the need for future development to be located in areas of lower flood risk is identified. The Council will seek to reduce the risk of flooding through regulating the location, layout and design of new development. Additionally, commitments are made to invest in infrastructure to mitigate the effects of coastal, fluvial and surface water flooding for existing and future development and infrastructure. Overlapping with Green Infrastructure, the Council states in its Core Strategy that it will provide land for flood risk management, including new and relocated habitats.

Green Infrastructure

Thurrock's Core Strategy (2015) commits the Council to seeking to mitigate for habitat lost due to climate change, requires a net gain in green infrastructure for

new developments, and proposes an enhanced green grid network across the borough. In promoting green space, all of these policies have the potential to provide natural flood defences, as well as decrease localised heat risks.

Housing

The Housing Strategy for Thurrock (2015) states that house building will be focused in existing urban areas, with higher density in locations accessible to existing and planned public transport and other non-car modes of transport. Concentrating housing within existing urban areas, as opposed to greenfield or coastal land, could reduce the risk of fluvial or coastal flooding. There is some risk that concentrating housing in one area could exacerbate the risks posed by flooding and heat, however other benefits of higher-density housing likely outweigh this concern (particularly through the provision of adequate flood protection for this housing); higher-density housing supports more sustainable forms of transport and reduced sprawl – allowing for uninterrupted green and blue networks.

Sustainable Development

As stated above, there is a regionally shared ambition that all new development be located in the most sustainable locations. If an assessment of what counts as ‘sustainable locations’ includes resilience against the impacts of climate change, this should decrease the risk facing new development. The Thurrock Core Strategy (2015) goes further, stating that the Council will require developers to consider the location and layout of new buildings to minimise vulnerability to climate change. Developers must consider the potential effects of climate change on their development, including: water conservation and drainage, summer cooling, subsidence risk and flood risk. Building adaptation in from the beginning should enhance resilience against climate-related hazards.

Design

The Thurrock Design Strategy Supplementary Planning Document (2017) requires that climate change adaptation measures be considered in design. If implemented, these should decrease vulnerability to climate change hazards. Exemplar design measures include: incorporating sustainable drainage, utilising green infrastructure (appropriate landscaping, rain gardens, permeable pavements, etc.), and employing ventilation technology and techniques.

Economy

The regional ambition to grow port operations puts greater economic assets at risk of coastal flooding. To mediate this risk, measures must be put in place. This is largely the remit of the Environment Agency and private port authorities, although collaboration could bring shared benefits.

4.2.3 Implications for Thurrock

As evidenced in Section 3 Baseline Assessment, Thurrock's baseline emissions arise from a range of sources. Appropriately then, a wide range of policies touch

on climate change mitigation, whether expressly or implicitly. Policies have been grouped into the following Action Areas: energy, transport and infrastructure, green infrastructure, sustainable development, design, housing, economy and waste. The Action Area with the strongest policies is considered to be Green Infrastructure, where Thurrock Council's Core Strategy makes ambitious commitments to enhance and expand green spaces of all sizes, promoting the sequestration of carbon dioxide while simultaneously contributing to other societal agendas; most notably, health. Conversely, the Action Area where policy is considered to be as yet the least ambitious in terms of addressing climate change is Economy. Thurrock and the South Essex region are pursuing economic growth opportunities. Economic growth need not be at odds with climate change mitigation; however, for growth to be sustainable, major transformations in business approach and workforce skills will be required. Further areas to be prioritised for climate change mitigation across the borough are highlighted in Section 5.2 Core focus areas and priorities.

The geography of Thurrock makes it particularly vulnerable to flooding hazards, including coastal, fluvial and surface water. Fittingly, a number of local and regional policies and plans set out to mitigate flooding risk, recognising that the severity and frequency of flooding is likely to increase with climate change. As with emissions reduction, Thurrock Council's Core Strategy contains strong policies on Green Infrastructure, which, when implemented in appropriate locations, enhance resilience against flooding. Flood-specific policies and actions do, however, warrant greater collaboration between Thurrock Council, developers and the Environment Agency. Specifying adaptive building measures for new developments, as well as pursuing resilient retrofits of existing buildings, is a key mechanism through which the Council can promote resilient communities.

5 Recommendations

This section outlines core elements of a framework for designing an effective climate change strategy for Thurrock. The points underscored in this section are informed by the baseline review and an understanding of existing plans, policy, constraints and aspirations for Thurrock and its surrounding region. These points are also closely aligned with feedback from developers on a potential climate change strategy for Thurrock.

5.1 Key considerations for developing a climate change strategy for Thurrock

1 Identify key stakeholders and involve them early

Why?

A successful climate change strategy for Thurrock will require stakeholder support to:

- Help with preparing the evidence base, supplying data and information to fully assess the borough's emissions and likely physical, social and economic risks of climate change.
- Co-create responses to the borough's emissions challenges and climate risks, drawing on cross-sectoral expertise and ensuring buy-in from all those with a role in delivering action.
- Ensure long-term collaboration and buy-in to implement the borough's climate action plan, realise wide benefits, and monitor and report progress.

Involving key stakeholders from the beginning of the strategy development process would ultimately secure support for the strategy, ensure a consistent, informed, and agreed set of objectives, and streamline decision making and implementation of measures resulting from the strategy.

Specific considerations

The Council should ensure that partnerships are made not just between environment and sustainability-related groups, but that there are core representatives involved from all sectors and activities which significantly impact carbon emissions or experience climate risks. Existing regional planning, infrastructure, and development initiatives and partnerships such as the Association of South Essex Local Authorities (ASELA) should be engaged. The Local Plan will be a key means for establishing the policy and outcomes for climate action and should be fully integrated/linked with the development of the climate change strategy. An initial stakeholder list is presented below, based on the scoping work completed to date.

Initial stakeholder list**External stakeholders**

- Association of South Essex Local Authorities
- c2c
- Civil society groups
- Developer forum
- Essex and Suffolk Water
- Essex County Council
- Environment Agency
- Highways England
- Homes England
- House Builders Federation
- Intu Lakeside Shopping Centre
- Infrastructure Commission
- Kent County Council
- London Councils
- London Gateway
- Port of Tilbury (Forth Ports)
- Port of London Authority
- RSPB
- South East Local Enterprise Partnership

Council stakeholders

- Planning
- Waste
- Water and drainage, flood defence, climate change adaptation
- Transport
- Open space and green infrastructure

2 Strategy should reflect understanding of emissions sources and probable climate risks, and be designed to respond to monitored performance over time

Why?

The climate change strategy for Thurrock should be driven by an accurate understanding of primary sources of emissions - in absolute terms, as well as in terms of trends, i.e. activities and sectors with fastest recorded growth in emissions over time. In terms of adaptation, the strategy should be underpinned by a full climate risk assessment, covering both physical and transitional risks. The strategy should consider embedding an element of flexibility, so that intensity or priority of measures reflects changes in monitored performance over time or changes/disruptions in important external factors.

Specific considerations

From the initial baseline data review presented in this document, it is apparent that **transport** and **residential buildings** are major sources of carbon emissions. The climate change strategy for Thurrock should identify and address the *driving factors* that influence emissions from these sectors, including financial incentives, planning and regulatory requirements, consumer awareness, practically available alternatives, etc. Transport and housing are particular priorities for the future in light of the borough's growth agenda – there is therefore a challenge both to reduce emissions and mitigate risk associated with existing activities/assets, *and* to change the course of future development towards lower carbon and more resilient solutions.

The emissions data also demonstrates that Thurrock’s emissions have declined over recent years in relation to a changing economic profile; a reduction in heavy industry and the closure of Tilbury power station. **Clean economic growth** will be a priority to maintain this trend into the future.

Evidence-based initiatives should be developed with these priorities in mind.

3 Demonstrate how strategy is designed to respond to national and regional policy *and* can achieve local objectives beyond climate change mitigation and adaptation

Why?

The climate change strategy should have clear alignment with national and regional policy (especially the commitment to net zero emissions by 2050), and identify the benefits of action holistically; for example, articulating the benefits for long-term economic prosperity, wider environmental quality, and community health and well-being in Thurrock and its surrounding regions. This is key to building support for action, developing an investment case for action, allocating budgets efficiently, and to effectively address climate change whilst delivering on other critical agendas.

Specific considerations

As an example, the National Planning Policy Framework clearly outlines the need for integrated sustainable transport provision for new development⁷, and encourages development to be mixed-use in order to enhance community and a sense of place⁸. The provision of balanced jobs, housing, and the matching of local resident skills to local jobs are key for reducing the impact of transport. Thurrock’s climate change strategy (and the Local Plan itself) should prioritise efforts to reduce carbon emissions from new developments and transport through integrated solutions that maximise wider benefits.

Successfully demonstrating alignment across policies and sectors requires strong communication. From strategy development through to implementation, it is crucial to communicate strategically in engaging with stakeholders and the public in order to build advocacy, agreement, and to ultimately enable action. The case for a climate change strategy should be made compellingly by recognising the wider benefits of climate action for all key parties and presenting the costs of inaction (increased risk due to extreme weather events, etc.).

⁷ ‘Planning policies should: ...support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities...’ National Planning Framework, 2019.

⁸ ‘Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes.’ National Planning Framework, 2019.

4 Highlight the routes to action for each measure in the strategy and mechanisms for overcoming barriers

Why?

The climate change strategy should be clear about how the proposed interventions can be translated into action. The strategy should acknowledge known barriers or shortcomings in resources, recognise necessary sequencing of actions or timelines for funding, assign lead delivery agents (and supporting agents), and identify clear paths and/or key actions to move towards implementation. This is essential to ensure the climate change strategy is successful in initiating action towards mitigation and does not function as an abstract document with limited direction.

Specific considerations

Working groups should be established to take on difficult topics or develop ideas further. The Council should:

- Review existing work programmes to identify how they might be adjusted to better address emissions reduction or adaptation goals. Programmes that are already approved/funded are a useful entry point to begin implementing climate action.
- Review funding streams to understand the process and timeline for securing funding. How does this influence programming of actions?
- Review interdependencies between actions – what needs to happen first?
- Mobilise cross-departmental working groups to ensure an integrated response and mutually supportive agenda. Action in one sector should not undermine another (e.g. ensure co-location of housing and employment to reduce transport needs), and action in one borough should not undermine another (e.g. export of landfill waste from London to Thurrock, transport of heavy goods by road through Thurrock), etc.

5 Establish clear timescales and accountability

Why?

The strategy should identify roles and responsibilities for critical stakeholders to ensure actions have owners; and identify any gaps and needs in required powers for Thurrock and its partners to be able to deliver the identified measures. The Council will be central in enabling and collating actions, even if all the powers and resources needed for full implementation may not be directly in the Council's current set of powers.

Timelines for decision making and implementation should be made clear as part of the strategy to ensure the climate change strategy leads to timely implementation of measures.

Specific considerations

The Council is the primary sponsor of the Thurrock climate change strategy and therefore would have the responsibility for coordinating the strategy development, agreement, and implementation process with other neighbouring local authorities,

regional discussions and partnerships, as well as other identified important stakeholders. Many local authorities are identifying “asks” of central government in terms of devolved powers for climate action; Thurrock should seek to find opportunities to collaborate and put forward a joined-up proposition.

As a unitary authority, Thurrock is well-positioned to instigate change due to its control over the full range of public services. As part of developing its climate change strategy and the Local Plan, the Council should take the lead in establishing forums for engagement or actively participating in existing forums to build and strengthen partnerships and momentum for action on climate change. Timelines should be aligned with national targets, with interim milestones.

5.2 Core focus areas and priorities

Based on the data and information gathered for this study, the core focus areas identified below are key for Thurrock’s climate change strategy. Directing Thurrock’s climate change strategy towards these focus areas will allow the strategy to be more targeted and effective in identifying opportunities to address the primary *causes* and *sources* of emissions and climate risk, adaptation and overcoming operational barriers. It should be recognised that Thurrock’s Local Plan heavily influences these core focus areas and will act as a central delivery vehicle to progress action on climate change in the priority areas discussed below.

Land-use and access

Much of Thurrock’s existing policies around land-use and access are captured within the Local Development Plan across the ‘Housing, ‘Employment and Retail’, ‘Socially Inclusive Communities’, ‘Transport and Access’, and ‘Built Environment’ sections. A climate change strategy for Thurrock should focus on accessibility and the integration of land-use and transport.

Due to emissions reductions in other economic sectors, transport is now a key area for reducing carbon emissions in Thurrock. While the need to provide electric vehicle (EV) infrastructure and enable its uptake is a well-known measure for managing transport emissions, a focus on aligning land use policies to reduce the demand for travel, and prioritising public and active transport locally and regionally is likely to be a critical part of decreasing life cycle emissions from transport. Shifting more freight on to rail would relieve capacity on the road network and decrease air pollution. Setting mode-shift and active travel as outcomes of the climate change strategy would further improve a variety of other policy objectives and agendas relating to economic productivity, sustainable growth, and reducing air pollution.

Supporting mixed-use development, the location of local businesses in central areas that are accessible by walking, cycling, and public transport would improve health and well-being, boost local productivity and diversify local economy, and make Thurrock a more attractive place to live and work, while helping significantly to cut down carbon emissions – from personal travel, as well as freight.

An initial review of existing transport infrastructure and recent investment indicate that much of the focus on transport improvements in Thurrock and its surrounding region has been on expanding the capacity of the strategic network and major roads in order to relieve congestion. Such an approach likely compromises local transport networks and enables future congestion due to lack of investment in alternatives. The Council should seek to collaborate with neighbouring authorities to establish stronger and more sustainable regional connections (including freight rail) and to better manage emissions from through-traffic. Thurrock's climate change strategy should seek to identify opportunities to cut down carbon emissions and meet transport needs by shifting local and regional traffic on to alternative and more sustainable modes and using released capacity for regional road-dependent freight and for prioritising regional bus services.

Buildings

Buildings are the largest source of carbon emissions in Thurrock based on the SCATTER inventory – with residential building having the largest share of emissions. Much of Thurrock's existing policies around buildings are captured within its Local Development Plan across the 'Housing', 'Built Environment', and 'Employment and Retail' sections. Current policies aimed at managing resources and impact on the natural environment include the need for developers to minimise the consumption of energy to heat, cool, ventilate and light buildings and spaces, and to undertake sustainable energy generation. Passive strategies in building architecture which maximise natural light and ventilation should be utilised to a great extent to conserve energy in buildings. Refurbishment of existing buildings should be encouraged to minimise the use of energy and generation of waste associated with demolition.

The climate change strategy development process should actively engage with Council departments who set policy, minimum standards, manage coordination with developers, and carry responsibility for granting planning permission and inspecting buildings. It is important to establish an understanding of the significance of reducing carbon emissions and building in areas with low climate risk and high resilience, and to clarify the level of priority these points carry in comparison with other development planning objectives.

Many current policies relate solely to 'new development'; it is crucial that the climate change strategy considers how to address existing stock of housing as well. This is being addressed to some extent through the Council's retrofit programme for social housing, although the criteria for this programme may need reviewing for consistency with a net zero carbon target and potential future climate conditions (e.g. overheating).

In many cases, whether a policy / plan / action leads to a net increase or net decrease in emissions is tightly linked with the Council implementing its net zero carbon development plan; this should be a key feature of a future climate change strategy. Furthermore, the potential to create a Carbon Offsetting Fund could help to facilitate wider projects across the borough and beyond. If carefully defined such a fund could yield benefits for both carbon sequestration and climate change adaptation.

Retail and Industry

Thurrock's Five Key Strategic Economic Hubs are at Purfleet, Grays, Lakeside/West Thurrock, London Gateway and Tilbury. Port-related activities play a significant role across core industry sectors including decisions on supporting infrastructure, retail, logistics and transport, and freight transport.

Much of Thurrock's existing policies around retail and industry are captured within its Local Development Plan in the 'Employment and Retail' section. Thurrock currently has a policy 'to enable clean growth principles to secure the shift to a net zero economy.' Thurrock's climate change strategy should aim to progress this policy by considering opportunities to cut down emissions which simultaneously progress the broader vision for economic growth and diversification of industry, employment opportunities, and services as part of a clean growth strategy for the borough and wider region.

Thurrock should seek opportunities to decrease emissions from port and industrial activities through active engagement with businesses. Measures to influence emissions from retail and industry should consider factors along the full supply chain – pricing incentives, consumer choice (online, just-in-time or door-to-door deliveries), management of freight, location of facilities locations, accessibility of retail for deliveries and customers, etc.

The risk posed to Thurrock's key industries due to climate change is significant due to the location of port and retail areas in high flood risk zones. The need to build in and enhance resilience will be a key aspect of climate change action planning for retail and industry in Thurrock. The climate change strategy should be informed by a risk assessment undertaken to understand physical and transitional risks of future climate change in critical industries within Thurrock.

Infrastructure

The design of infrastructure sets the framework for consumption, emissions, and the level of resilience relating to all operations and services within an area. Much of Thurrock's existing policies around infrastructure are captured within the Local Development Plan across the 'Built Environment', 'Transport and Access' and 'Infrastructure' sections. Current policy requires a 'net gain in green infrastructure' for new developments and for demonstrable efforts to be made to build in sustainability, including climate change adaptation measures, such as sustainable drainage measures, green infrastructure techniques, etc. The Council plans to invest in infrastructure to mitigate the effects of flooding and coastal erosion. These policies should be supported through more specific actions and measures within the climate change strategy. Also, requirements to promote green infrastructure should be extended to all developments, instead of exclusively focusing on new residential developments.

More broadly, Thurrock's climate change strategy should consider outlining a basis for decision-making relating to infrastructure investment. New infrastructure projects should be evaluated based on how efficiently they enable the use and distribution of resources (e.g. energy, water, transport, food, etc.), their ability to respond to emerging technology (e.g. clean energy sources, such as hydrogen),

and their ability to progress sustainable development visions (e.g. dense growth in accessible areas).

Environment and natural resources

The climate change strategy for Thurrock should complement existing environmental policies and protection laws. Much of Thurrock's existing policies around environment and natural resources are captured within its Local Development Plan across the 'Environment', 'Minerals and Waste', 'Water', and 'Riverside and Coastal' sections. The Council policy currently aims to promote sustainable development in Thurrock through 'the prudent use of water and other natural resources, sustainable design, methods and materials, and integration of land-use with maximum re-use of land.' The climate change strategy for Thurrock should support this policy by identifying more tangible actions such as the imposition of design guidance and planning requirements, and specific targets. The climate change strategy should consider the Council's influence over the use of the green belt land, particularly for the purposes of enhancing sequestration potential and biodiversity through planting and habitat creation. Restoring wetlands would strengthen natural habitats whilst serving as an effective means to manage flooding. Feedback from the Developer Forum highlighted the government's direction on 'biodiversity net gain'; if this approach is carefully planned, sequestration and adaptation benefits may be delivered at the same time.

Policies and decision-making processes should be aligned to ensure cohesion and eliminate any contradicting measures. Air quality along road networks, water quality near the ports, loss of agricultural land and biodiversity are all environmental concerns for Thurrock. Policies to manage these networks, industries and land have a direct impact on the quality of the environment. Measures to protect the environment and manage emissions from resource extraction, processing and use should be aligned with planning and policies for retail, industry, infrastructure and the interfaces through which these resources are distributed or via which the environment is accessed or protected. Decision-making should be cognisant of the potential trade-offs between environmental outcomes; for example, the optimal solution for reducing greenhouse gas emissions may not be the optimal for improving local air quality.

Waste

Much of Thurrock's existing policies around waste are captured within its Local Development Plan in the 'Minerals and Waste' section. Current policy requires the design and layout of residential and commercial development to encourage sustainable waste disposal, with due consideration given to recycling and composting. The climate change strategy should seek to manage emissions from waste not just through recycling but also through reduced consumption and greater re-use. To generate effective solutions, the climate change strategy development process should identify the key sources of waste emissions (breakdown by construction, industrial waste, domestic, etc.), including contribution made by imported waste from neighbouring authorities.

The climate change strategy should consider existing activities and policies which influence waste generation across sectors and identify primary opportunities for increasing efficiency in use of materials and products and managing waste. Again, policies across preceding focus areas of the climate change strategy should be aligned to minimise the production of waste and landfill material, and optimise disposal, collection, sorting, and processing of waste. Synergies with the concept of the circular economy and ways to engage businesses, manufacturers, and industry in Thurrock to adopt methods which minimise waste should be reviewed as part of the strategy development process. Opportunities to generate energy from waste processing should also be considered and explored as part of the climate change strategy development.

6 Route Map

Figure 7 illustrates a route map for delivering and implementing a climate change strategy between now and 2030, and how the series of activities relating to the climate change strategy relates to broader policy at the national, regional, and local levels. Interdependencies between environmental, sustainability, and climate change related components of Thurrock's Local Plan need to be addressed as part of the development of the climate change strategy. Much of the activity that will help deliver climate change action will come through the emerging Local Plan, and it is therefore essential for the Climate Change Strategy and the work of its Partnership Group(s) to be fully integrated with actions deliverable through the Local Plan.

Indicative time frames for key milestones in the climate change strategy development and implementation process are shown in this route map to enable discussion, planning, and preparation of key activities.

As the climate change strategy for Thurrock develops, the implementation bar shown in Figure 7 could be broken down by the series of core policy, infrastructure, and services proposed to cut down carbon emissions. This section concludes with a summary of the key near-term actions associated with the route map.

Thurrock Route Map to Climate Action

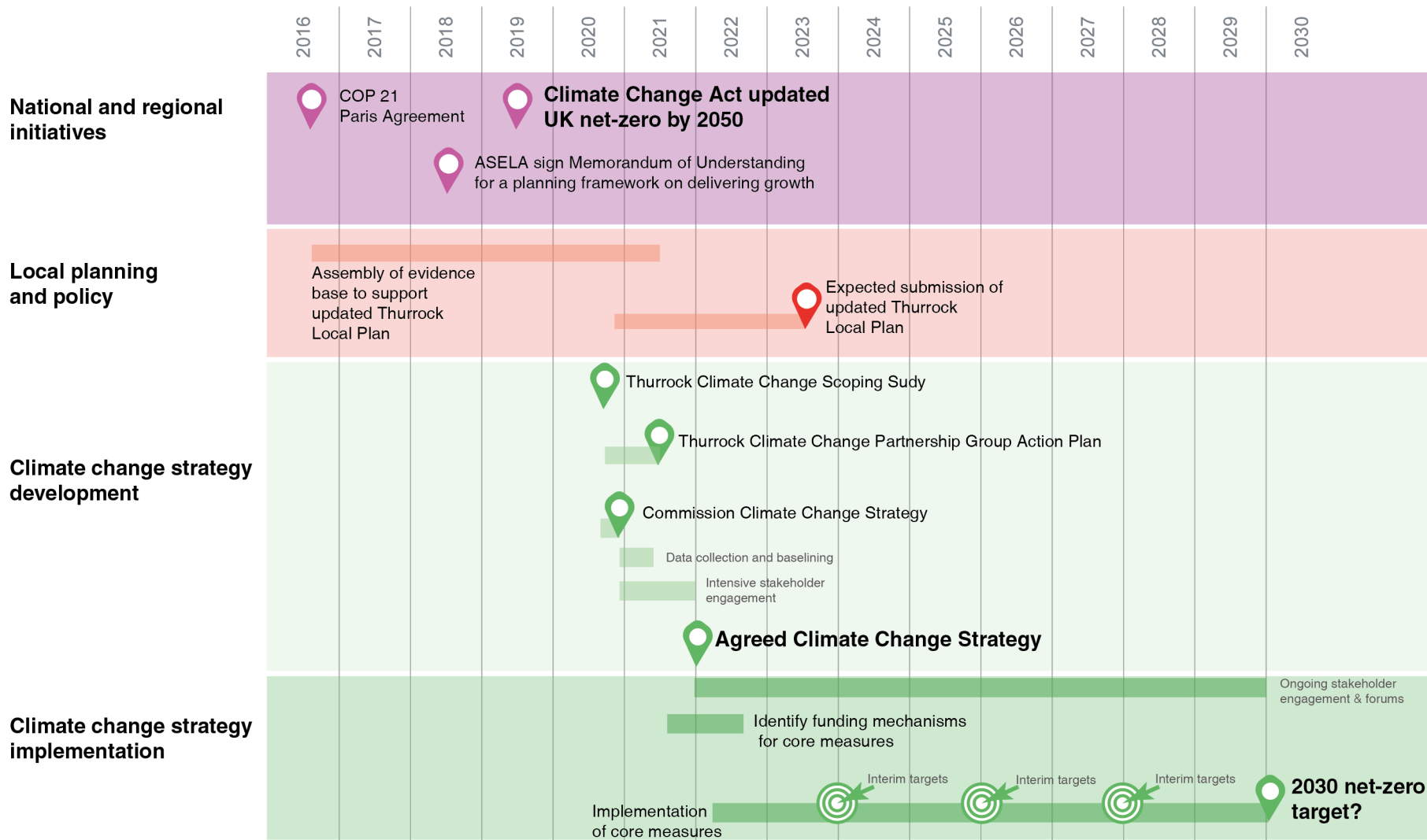


Figure 7 Thurrock climate action route map

6.1 Examples of local government climate action

This section summarises examples of local governments in the UK which have successfully developed climate change strategies and initiated climate action planning.

Nottingham City Council

Nottingham City Council is a leader among local authorities on climate action. The Council has been working together with a diverse range of stakeholders across the city to reduce emissions, act on climate change and enhance resilience. The Council introduced a levy for workplace parking to discourage driving to work where possible. The levy has generated £44m over five years, after an initial £4m set-up cost, which has been used to finance sustainable public transport options. Other initiatives include undertaking energy efficiency retrofits in over 40,000 local homes and establishing a 100% renewable not-for-profit energy company. The City Council is now pursuing an ambitious target to become the UK's first carbon neutral city by 2028.

Manchester City Council

In 2010 Manchester City Council published their decade-long Climate Change Delivery Plan. Actions fell primarily into two categories: internal actions to transform the Council into a low-carbon authority and external actions to lead and influence citizens and business to act on climate change. The Plan has seen the Council undertake extensive building retrofit, replace streetlights with LED bulbs, and promote environmental education among citizens. Green infrastructure lies at the heart of the Plan, with commitments to enhance existing green spaces, in addition to establishing new ones.

Reading Borough Council

Reading Borough Council has been actively progressing the climate change agenda for a number of years. Their strategy 'Reading Means Business on Climate Change 2013 - 2020' sets out strategic priorities for developing a low-carbon and resilient Reading. Central to the plan are the responsibilities of and implications for businesses in the borough, motivated by a recognition that businesses will be at the forefront of developing solutions to climate change. Accomplishments to date include insulating thousands of homes, implementing strict standards for insulation and ventilation in new developments, installing solar panels on schools and corporate buildings, and earmarking development sites for energy schemes. With Reading located at the confluence of the rivers Thames and Kennet, the Borough Council is actively considering boosting hydro-power energy generation.

Kingston-upon-Hull City/Unitary Authority

Kingston-upon-Hull is a city and unitary authority, holding similar powers to Thurrock. Councillors declared a Climate Emergency in March 2019, voting unanimously to ensure Hull will be carbon neutral by 2030. The Hull 2030

Carbon Neutral Strategy⁹ has since been published, supported by a Challenges and Actions document. The Strategy is built around eight key themes for focused action: Power; Heat; Mobility; Consumption; Carbon Sequestration; Fair Transition; Jobs and Skills; and Innovation. These themes are considered to represent the key areas in which action needs to be taken by the Council together with the city's institutions, businesses, community & voluntary sector, and residents. The Strategy also recognises the role of central government in supporting the city's action through timely and effective legislation and funding. A 12-month 'conversation' is underway to invite businesses, organisations and residents to engage with the actions proposed by the Strategy, and suggest what else will be needed to make the transition to carbon neutral.

6.2 Immediate next steps for Thurrock

This scoping study has compiled and reviewed some of the publicly available information about Thurrock's existing conditions and commitments related to climate change, as well as potential focus areas and key considerations for the development of a climate change strategy. It represents a starting point to direct further data collection and analysis, stakeholder engagement, and the development of an evidence-based climate change strategy. On this basis, it should be viewed as an interim report to guide ongoing work.

Immediate next steps include:

[1] Leadership buy-in

The climate change strategy will only be successful with the full support and strategic leadership of the Council Leader and Chief Executive. Leadership will be needed to ensure appropriate allocation of resources across departmental siloes, to take a joined-up approach ensuring a mutually supportive response through all operational, planning and policy decision-making.

[2] Data

The baseline assessment has revealed potential gaps in the available data for both corporate and territorial emissions, and concerns about the age and logic of some data sets (e.g. corporate emissions breakdown). It will be critical to reach a reliable data set, to underpin all future work on climate action planning.

Thurrock has not yet determined its emissions reduction targets consistent with the UK's net zero by 2050 commitment. Targets (and interim targets) should be modelled to provide a benchmark against which to measure all proposed climate action, and to determine viable pathways to net zero.

A comprehensive assessment of climate risk should be undertaken to determine with greater accuracy and completeness the physical, social and economic (incl. transitional) risks to Thurrock under anticipated climate change scenarios.

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<http://www.hull.gov.uk/sites/hull/files/media/Hull%202030%20Carbon%20Neutral%20Strategy.pdf>

[3] Stakeholder engagement and powers analysis

This study has touched upon some of the powers that Thurrock, as a unitary authority, may have to take direct action on climate change. As noted in this study, there are also specific areas in which wider collaboration and partnerships will be needed to deliver the scale of change that is required. A full review and analysis of powers in the borough will help to identify the levers through which the Council can implement change, and help to identify the key actors who will be needed to support action.

This document can be used to inform wide engagement with Thurrock's key stakeholders around the challenges and opportunities of climate change in the borough. A stakeholder mapping exercise should be completed to ensure all relevant stakeholders are identified, including their roles and contributions to Thurrock's climate change strategy, and a plan should be prepared to guide engagement activities over the course of developing a full climate change strategy.

[4] Initial agreed programme for strategy development and action

Thurrock Council should use the route map proposed in this document as a starting point for planning near term activities to commission and plot key activities and outcomes of a climate change strategy for Thurrock. This can help identify funding and staff needs, as well as key drivers for strategy development and completion.

Appendix A: International and National Commitments – Key Policy Documents

Key legal agreements & targets	Description	Key relevant points for Thurrock climate change strategy
COP 21: Paris Agreement (2016)	International agreement (eventually by up to 125 countries) on strengthening the global response to climate change by aiming to reduce emissions and keep a global temperature rise this century ‘well below 2 degrees Celsius above pre-industrial levels’ and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.	The Paris Agreement establishes binding commitments by all Parties to prepare, communicate and maintain a nationally determined contribution (NDC) and to pursue domestic measures to achieve them. UK NDC: at least 40% domestic reduction in GHG emissions by 2030 compared to 1990.
UK Climate Change Act 2008	The basis for the UK’s approach to reducing greenhouse gas emissions and responding to climate change. The act sets legally binding targets for emissions reduction.	The net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline. - A “carbon budget” is set for each succeeding period of five years beginning with the period 2008-2012 (“budgetary periods”) - The budgetary period including the year 2020, must be such that the annual equivalent of the carbon budget for the period is at least 34% lower than the 1990 baseline; - Emissions of greenhouse gases from international aviation or international shipping do not count as emissions from sources in the United Kingdom, except as provided by regulations made by the Secretary of State.

Relevant National Policy	Description	Key relevant points for Thurrock climate change strategy
UK Environment Bill (2019, <i>awaiting approval 2020</i>)	A bill to make provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; about waste and resource efficiency; about water; about nature and biodiversity, etc. The	The Secretary of State must set long-term targets (at least over 15-year period) in respect of each identified priority area: air quality; water; biodiversity; resource efficiency and waste.

Relevant National Policy	Description	Key relevant points for Thurrock climate change strategy
	Bill is currently under consideration by a Public Bill Committee, which will report back to the House of Commons by 5 May 2020.	These targets must specify (a) a standard to be achieved, which must be capable of being objectively measured, and (b) a date by which it is to be achieved.
A Greener Future – Our 25 Year Plan to Improve the Environment (2018)	A plan aiming to deliver cleaner air and water in UK cities and rural landscapes, protect threatened species and provide richer wildlife habitats. An environment-first approach to agriculture, forestry, land use and fishing that puts the environment first. The UK Environment Bill refers to this document as the UK’s Environment Improvement Plan – aiming to give the plan a statutory foundation.	<p>All of the following policies of the plan are directly or indirectly relevant to a climate change strategy for Thurrock:</p> <ol style="list-style-type: none"> 1. Embedding an ‘environmental net gain’ principle for development, including housing and infrastructure 2. Improving land management 3. Improving soil health and restoring and protecting peatlands 4. Focusing on woodland to maximise its many benefits 5. Reducing risks from flooding and coastal erosion 6. Supporting zero-deforestation supply chains 7. Minimising the risk of chemical contamination in water 8. Achieving zero avoidable plastic waste by the end of 2042 9. Reducing the impact of wastewater 10. Increasing water supply and incentivising greater water efficiency and less personal use 11. Introducing new farming rules for water 12. Working with farmers to use fertilisers efficiently 13. Protecting crops while reducing the environmental impact of pesticides <p>The plan aims to cut by one fifth the greenhouse gas intensity of food and drink consumed in the UK, and also per capita UK food waste by 2025.</p>
National Planning Policy Framework (2019)	Sets out the government’s planning policies for England and how these are expected to be applied.	With regard to climate change, the document states: the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places

Relevant National Policy	Description	Key relevant points for Thurrock climate change strategy
		<p>in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.</p> <p>Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.</p>

National Monitoring & Reports	Description	Key relevant points for Thurrock climate change strategy
UK Five-Year Carbon Budget Period Final Statements (2019)	Under the Climate Change Act (2008), the Government must set five-yearly carbon budgets, twelve years in advance, from 2008 to 2050.	<p>The aim of setting budgets is to meet the 2008 Act's target of reducing GHG emissions by 100% by 2050 compared to 1990 levels. The budgetary period including the year 2020, must be such that the annual equivalent of the carbon budget for the period is at least 34% lower than the 1990 baseline;</p> <p>Current performance: Emissions between 2013 – 2017 on average were 40% lower than 1990 base year emissions over the second carbon budget period.</p>
UK Climate Change Risk Assessment (2017)	A five-yearly assessment of risks for the UK of the current and predicted impacts of climate change (as required by UK Climate Change Act of 2008).	<p>All of the top six areas of interrelated climate change risks identified for the UK are risks for Thurrock to consider in the development of its climate change strategy:</p> <ul style="list-style-type: none"> - Flooding and coastal change - Risks to health and well-being due to high temperatures - Risks of shortages in public water supply

National Monitoring & Reports	Description	Key relevant points for Thurrock climate change strategy
		<ul style="list-style-type: none"> - Risks to natural capital - Risks to domestic and international food production and trade - New and emerging pests and diseases and invasive non-native species, affecting people, plants and animals.

National Strategy Documents	Description	Key relevant points for Thurrock climate change strategy
<p>CCC Net Zero: The UK's contribution to stopping global warming (2019)</p>	<p>A report presenting scenarios for the UK to reduce greenhouse gas emissions (GHGs) to 'net-zero' by 2050, ending the UK's contribution to global warming within 30 years.</p>	<p>The following points from the report are particularly relevant for the development of a climate change strategy for Thurrock:</p> <ul style="list-style-type: none"> - Cities and local authorities are well placed to understand the needs and opportunities in their local area... They have important roles on transport planning, including providing high-quality infrastructure for walking and cycling, provision of charging infrastructure for electric vehicles, and ensuring that new housing developments are designed for access to public transport. They can improve health outcomes for people who live and work in the area by implementing clean-air zones that discourage use of polluting vehicles and other technologies. - 2040 is too late for the phase-out of petrol and diesel cars and vans, and current plans for delivering this are too vague. <i>(nb. this target year has since been moved forward to 2035)</i> - Emissions reduction cannot be left to the energy and environment departments or to the Treasury. It must be vital to the whole of government and to every level of government in the UK.

National Strategy Documents	Description	Key relevant points for Thurrock climate change strategy
		<ul style="list-style-type: none"> - Most sectors will need to reduce emissions close to zero without offsetting; the target cannot be met by simply adding mass removal of CO2 onto existing plans for the 80% target. - Afforestation targets for 20,000 hectares/year across the UK nations (due to increase to 27,000 by 2025), are not being delivered, with less than 10,000 hectares planted on average over the last five years. The voluntary approach that has been pursued so far for agriculture is not delivering reductions in emissions.
Clean Air Strategy (2019)	This document outlines how the UK will tackle sources of air pollution and achieve healthy air quality levels.	<p>The following points from the report are particularly relevant for the development of a climate change strategy for Thurrock:</p> <ul style="list-style-type: none"> - The strategy defines one of its aims as 'securing clean growth and driving innovation' - clean growth means growing our national income whilst tackling air pollution, protecting the natural environment, and cutting greenhouse gas emissions. - Ensure industrial sector roadmaps for reducing air pollution are well aligned with those for decarbonisation. Ensure that a balanced approach is taken which supports clean growth as a whole. This means integrating both air quality and climate change considerations into government policies such as energy and agriculture. - Government is committed to phasing out GHG emissions from shipping as soon as possible in this century and by at least 50% by 2050.
Clean Growth Strategy (2018)	This document sets out the "possible pathway" for meeting the fifth carbon budget (2028-2032) as required under the Climate Change Act.	<p>The strategy proposes the following funds to support reduction of GHG emissions:</p> <ul style="list-style-type: none"> - Providing up to £20m to support a new clean technology early stage investment fund, etc.

National Strategy Documents	Description	Key relevant points for Thurrock climate change strategy
		<ul style="list-style-type: none"> - Develop a package of measures to support businesses to improve their energy productivity, by at least 20 per cent by 2030 - Proposes to invest up to £100m in carbon capture usage and storage (CCUS) R&D, with the aim of deploying this technology at scale and maximising its industrial opportunity. - Support around £3.6bn of investment to upgrade 1 million homes and extend support for home energy efficiency improvements until 2028 at the current level of ECO funding; - Spend £1bn supporting uptake of ultra-low emissions vehicles; invest £1.2bn to make cycling and walking the natural choice for shorter journeys - Enable cost-effective options for shifting more freight from road to rail, including using low emission rail freight for deliveries into urban areas, with zero emission last mile deliveries. - Support peatland through a £10m capital grant scheme for peat restoration.

Appendix B: Local Plans and Policy

Policy relating to emissions

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Energy	Local	Thurrock Council Core Strategy	2015	The Council will encourage opportunities to generate energy from non-fossil fuel and low-carbon sources. It will promote the delivery of renewable and low-carbon energy developments utilising technology such as solar panels, biomass heating, small-scale wind turbines, and other methods.	Net decrease in energy-related emissions over time.	Any future climate strategy should include some practical actions for "promoting the delivering of..."	
Energy	Local	Thurrock Council Core Strategy	2015	The Council will require new development to be carbon neutral. All viable energy efficiency measures and renewable or low-carbon technology opportunities must be utilised; any net increases must be offset by contributing to a potential Thurrock Carbon Offset Fund.	No net change in emissions.	Note that this policy applies only to new development. A strong policy that needs to be enacted in order to meet emissions targets. The Carbon Offset Fund has not yet been implemented. This should be a priority.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Energy	Local	Thurrock Council Core Strategy	2015	From 2020, new developments must secure a minimum of 20% of their predicted energy from decentralised and renewable or low-carbon sources.	Possible net increase in emissions because of the option to obtain 80% of energy from traditional fossil-fuel sources.	Low-carbon / renewable percentage requirements should be increased. Note that this policy applies only to new development.	
Transport and Infrastructure	Regional	South Essex Joint Strategic Plan Statement of Common Ground	2018	The Lower Thames Crossing proposal is noted to offer significant opportunities to enhance industrial and port related activity in Thurrock, as well as provide strategic housing locations.	Likely to increase net emissions due to: - enabling expanded port and industrial activities - increased vehicular traffic entering the borough via the Lower Thames Crossing	The LTC route proposal is still under review. Thurrock should consider its role in influencing emissions from port and industrial activities through business engagement, etc. Likewise, the Council should consider its role in managing emissions from through-traffic in collaboration with neighbouring authorities.	
Transport and Infrastructure	Regional			Thurrock Council has on-going (not yet implemented) plans to widen the carriageway of the A13.	Likely to increase net emissions due to increased vehicular traffic.	Given plans to reduce vehicular traffic, is there an option to use the land adjacent to the A13 for sequestration/adaptation purposes, rather than widening the road?	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Transport and Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will provide a safe transport system that manages the need to travel and encourages the use of more environmentally friendly modes of transport, such as cycling, walking and public transport.	A net decrease in emissions if modal shift encouragement is successful.	Specific plans and measures to achieve greater shift towards sustainable transport modes should be outlined and agreed by Thurrock Borough Council.	
Transport and Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will work to deliver at least a 10% reduction in car traffic from forecast 2026 levels. Measures will include delivering a network of walking and cycling core routes, cycle parking, implementing widespread 20mph zones in urban areas, improving public transport infrastructure and reducing maximum car parking standards where appropriate.	Depending on the uptake of non-fossil fuel modes of transport, a net decrease in transport-related emissions relative to forecast emissions.	It is also important to consider reducing demand for travel and encouraging low-carbon fuels.	
Green Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will develop the greengrid network of biodiversity sites, green infrastructure and open spaces linking existing and new communities.	Increased provision of green space could result in a net decrease in emissions through sequestration, depending on levels of emissions emitted by other forms of development. Green space will also contribute to mitigation of flood and heat risk.	The Council should consider optimal use of greenfield land for sequestration purposes and adaptation.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Green Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will require a net gain in green infrastructure for new developments. Opportunities to increase green infrastructure will be pursued in new developments through the incorporation of features such as green roofs, green wall and other habitat/wildlife creation.	<p>A requirement for net gain in green infrastructure could result in a net decrease in emissions through sequestration, depending on the levels of emissions emitted by other forms of development.</p> <p>Also potential to increase energy efficiency and utilise sustainable construction materials through building in green walls and roofs.</p>	Note that this policy applies only to new development.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Sustainable Development	Regional	South Essex Joint Strategic Plan Statement of Common Ground	2018	A shared ambition that all new development be located in the most sustainable locations. These locations will be well-connected by a fully integrated transport system and network of green spaces.	<p>Likely to decrease emissions associated with private car use.</p> <p>A network of green spaces could result in a net decrease in emissions, assuming that there is no net loss of green space due to the construction of new development.</p> <p>Determining whether new development will overall cause a net increase or decrease in emissions will depend on factors including the quantity of emissions released during construction, the energy-efficiency of buildings and whether the energy used to power development is low-carbon or renewable. Note that the Council's commitment to ensuring that all new development is net zero carbon is highly relevant.</p>	Elaboration needed on what counts as a 'sustainable location' through local planning authorities' site selection procedures.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Sustainable Development	Local	Thurrock Council Core Strategy	2015	The Council will promote sustainable development in Thurrock through the prudent use of water and other natural resources, sustainable design, methods and materials, and integration of land-use with maximum re-use of land.	Likely net decrease in emissions.	The policy needs to be supported by tangible action, imposition of design guidance, and planning requirements, for example.	
Design	Local	Thurrock Council Core Strategy	2015	The Council will require new and existing development and associated activities to adhere to local, regional and national targets for reducing carbon emissions. The Council will employ innovative methods of reducing and mitigating emissions, including the potential introduction of a Carbon Offset Fund.	No net change in emissions, with national targets requiring net zero GHG emissions by 2050.	The Carbon Offset Fund has not yet been implemented. This should be a priority.	
Design	Local	Thurrock Design Strategy Supplementary Planning Document	2017	Efforts must be made to build in sustainability, including: - Identifying opportunities to minimise the consumption of energy to heat, cool, ventilate and light buildings and spaces - Identifying opportunities for sustainable energy generation, e.g. permitted development rights now covering micro-generation renewable projects.	Likely to decrease emissions associated with the construction and operation of buildings. Whether this results in a net decrease will depend on factors including the success of these measures.		

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Housing	Regional			Greater Essex authorities are required to accommodate on average 8,980 houses per year up to 2036 (compared to an average of 4,630 per year from 2004 - 2015).	Likely to increase net emissions associated with: <ul style="list-style-type: none"> - construction of houses - loss of any green space reducing sequestration - consumption emissions associated with increased population - emissions arising from providing infrastructure and services to serve increased population 	Due to the duty to cooperate, neighbouring boroughs' housing requirements may impact on Thurrock's house building requirements. However, if the Council successfully implements net-zero carbon development, then there should be no net increase.	
Housing	Local	Housing Strategy for Thurrock	2015	Thurrock will need to build 1,030 homes per year from 2015 to 2031, totalling 20,600.	Likely to increase net emissions associated with: <ul style="list-style-type: none"> - construction of houses - loss of any green space reducing sequestration - consumption emissions associated with increased population - emissions arising from providing infrastructure and services to serve increased population 	If the Council successfully implements net-zero carbon development, then there should be no net increase.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Housing	Local	Thurrock Council Core Strategy	2015	Housing growth will be achieved through the managed regeneration and renewal of previously developed land and if necessary through greenfield release.	The presumption in favour of redeveloping previously used land should limit loss of greenfield land, allowing this land to continue sequestering carbon dioxide. However, unless housing construction and operation is net zero, housing growth will likely result in a net increase in emissions regardless. Note that the Council's commitment to ensuring that all new development is net zero carbon is highly relevant.	The Council should consider optimal use of greenfield land for sequestration purposes and adaptation.	
Economy	Regional	Draft Local Industrial Strategy	2020	Enable clean growth principles to secure the shift to a net zero economy.	Net decrease in emissions if existing economic activities transform to become net zero emissions.	Elaboration needed on clean growth principles.	
Economy	Regional			Programme to deliver significant economic activity in South Essex. Including retain highly skilled workers, deliver innovation and development, leverage connectivity; deliver new inward investment to transform highstreets.	Could lead to increased emissions - economic growth with no mitigations suggested.	Specific ways to delivery economic growth which eliminate emissions should be prioritised; for example, greater proximity of jobs and housing and positively transforming high streets and decreased reliance on out of town retail parks.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Economy	Local			<p>Greater partnership between the Council and businesses, and finding ways for the Council to be self-sustaining. Each growth hub will have an established senior officer programme board to lead the council's activities and coordinate resources.</p> <p>Reviewing how the Council's land holdings can best contribute to the regeneration of the town centre. The Council is working with other public sector partners to identify proposals for facilities which would help to kick start the wider regeneration of the Civic Square. A Council housing company Gloriana is progressing plans for housing development on two vacant sites in Tilbury.</p>	<p>Opportunities to neutralise/mitigate likely impacts through sensitive design and green mitigations. This includes utilising Council previously developed land and green infrastructure initiatives.</p>	<p>Few drivers given in the document for sustainable growth. These need to be elaborated on.</p>	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for GHG Emissions	Comments	Priority for Thurrock
Waste	Local	Thurrock Council Core Strategy	2015	The design and layout of residential and commercial development should facilitate sustainable waste disposal, with due consideration given to recycling and composting.	If the amount of waste produced were to remain static, a shift towards recycling and composting would result in a net decrease in emissions. However, as the population of the borough grows, the total amount of waste produced is likely to rise. This may cause an overall net increase in emissions, despite sustainable waste measures.	This should be more ambitious, giving greater emphasis to reduced consumption and re-use, instead of 'just' recycling.	

Policy relating to resilience

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Flood	Regional			The Framework states that “further action” is required to reduce the moderate to high flood risk in Thurrock.	Assuming appropriate flood risk measures are taken, this should increase Thurrock’s resilience to flooding.	It does not define what “further action” is to be taken.	
Flood	Local	Thurrock Council Core Strategy	2015	The Council will invest in infrastructure to mitigate the effects of flooding and coastal erosion.	Resilience to coastal flooding should be enhanced.		

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Flood	Local	Thurrock Level 1 Strategic Flood Risk Assessment	2018	Thurrock Council follows all NPPF requirements relating to flood risk and the Sequential Test to be applied to planning applications.	Development is prioritised in areas of lower flood risk.		
Flood	Local	Thurrock Council Core Strategy	2015	The Council will reduce and manage the risk of flooding to and from development through its location, layout and design.	Reduced risk of flooding hazards.	Potential for the Council to increasingly utilise S106 or CIL to require developers to contribute to appropriate flood defences.	
Flood	Local	Thurrock Council Core Strategy	2015	The Council will provide land for flood risk management, including new/relocated habitats across the borough.	Reduced risk of flooding hazards.	Allocation for flood risk management should be coordinated with wider development and transport planning.	
Flood	Regional	Thames Estuary 2100 Plan	2012	Sets out high-level Action Plans to reduce flood risk throughout the Thames Estuary, including Thurrock.	Increased resilience to flooding and therefore decreased risk.	While coastal flood defence largely falls under the remit of the EA, the TE2100 says that the EA should work together with local authorities to develop flood-resilient land use plans.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Green Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will seek to mitigate for habitat loss due to climate change. It supports the identification, through the TE2100 Plan, of potential inter-tidal habitat creation sites and fresh water habitat creation sites.	These habitats would provide natural flood barriers to protect coastal development.		
Green Infrastructure	Local	Thurrock Council Core Strategy	2015	A Greengrid network of biodiversity sites, green infrastructure and open spaces linking new and existing communities will be sustained and enhanced.	Enhancing green spaces could decrease flood risk (depending on the location of these spaces). Enhancing green spaces could also decrease local heat risks.		
Green Infrastructure	Local	Thurrock Council Core Strategy	2015	The Council will require a net gain in green infrastructure for new developments. Opportunities to increase green infrastructure will be pursued in new developments through the incorporation of features such as green roofs, green wall and other habitat/wildlife creation.	Requirements for net gains in green infrastructure could decrease the risk of surface and groundwater flooding, as well as fluvial or coastal flooding depending on where GI and new development are located. GI could reduce the urban heat island effect, lessening the health risks posed during extended periods of warm weather.		

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Housing	Local			House building will be focused in existing urban areas, with higher density in locations accessible to existing and planned public transport and other non-car modes of transport.	Concentrating housing within existing urban areas and not on greenfield or coastal land could reduce the risk of fluvial or coastal flooding.		
Housing	Local			Thurrock will need to build a minimum of 1,173 homes per year over the Local Plan Period.	Housing should be located in sustainably accessible areas (close to public transport and supported with good active travel facilities). Adequate protection should be provided against flood risks.	Housing needs to be planned in conjunction with public transport. Housing should be higher-density and located in mixed-use areas.	

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Sustainable Development	Regional	South Essex Joint Strategic Plan Statement of Common Ground	2018	A shared ambition that all new development be located in the most sustainable locations.	If an assessment of what counts as a 'sustainable location' includes resilience against the impacts of climate change - e.g. flooding - this should increase resilience of new builds.	Elaboration needed on what counts as a 'sustainable location' through local planning authorities' site selection procedures. Note that this policy applies only to new development.	
Sustainable Development	Local	Thurrock Council Core Strategy	2015	Promote sustainable development through the prudent use of water and other natural resources.	This implies decreased water use, which will mitigate risks arising from water shortages / drought.		
Sustainable Development	Local	Thurrock Council Core Strategy	2015	The Council will require developers to consider the location and layout of new buildings to minimise vulnerability to climate change. Developers must consider the potential effects of climate change on their development, including: <ul style="list-style-type: none"> - water conservation and drainage - need for summer cooling - risk of subsidence - flood risk 	Requirements to reduce vulnerability and build adaptation into development will decrease risk to development from hazards.		

Key Policy Area	Scale	Title	Year	Policy / Action / Plan	Implications for Climate Risk and/or Resilience	Comments	Priority for Thurrock
Design	Local	Thurrock Design Strategy Supplementary Planning Document	2017	Efforts must be made to build in sustainability, including climate change adaptation measures, such as: - incorporating sustainable drainage measures - green infrastructure techniques - ventilation to prevent overheating into design and layout.	Likely decrease in vulnerability to climate change hazards.		
Economy	Regional	Economic Growth Strategy for South Essex	2016	Growth of port operations.	Greater economic assets at risk of coastal flooding. Risk will be mediated depending on what resilience measures are simultaneously implemented.	Resilience planning predominantly the responsibility of the EA and private port authorities.	