Climate Change Risk and Impact Assessment for Kent and Medway

Part 2:

Industry Sector Summary

June 2020

I. Industry

I.1 Key Characteristics

As with the United Kingdom, Kent's economy is predominantly driven by small and medium enterprises (SMEs). Approximately 90% of companies in Kent and Medway are micro-businesses (less than 10 employees), with 54,955 (89.72%) in Kent and 7,580 (90.13%) in Medway. The majority of the other 10% are small businesses with less than 50 employees, with 5,195 (8.48%) in Kent and 680 (8.09%) in Medway. Medium and large businesses make up less than 2% of all businesses within Kent and Medway, with Kent consisting of 905 (1.48%) medium businesses and 195 (0.32%) large businesses, and Medway consisting of 120 (1.43%) medium businesses and 30 (0.36%) large businesses.

In comparison with the UK, the economy of Kent and Medway comprises of more micro businesses (89.77% vs 89.34%) and fewer small (8.43% vs 8.73%), medium (1.47% vs 1.55%) and large businesses (0.32% vs 0.38%).

Professional, scientific and technical services are the biggest sector in Kent and Medway's regional economy, with companies engaged in these activities representing over 17.5% of the total number of enterprises[1]. This is followed by the construction sector at just under 17% and business administration and support services, making up around 9% of Kent and Medway's economy. 28.5% of all those in employment who live in Kent are employed in public administration, education and health, just below the national average of 29.4%[2]. The key sectors for Kent and Medway are reflective of those for the UK. However, Kent, and Medway in particular, have more construction businesses than the UK average. A full breakdown of the number of businesses by industry sector is shown below in Table 1-1.

Table I-1: Business distribution by sector: UK, Kent & Medway[3]

Sector	Kent	Medway	Kent & Medway	UK
	No (%)	No (%)	No (%)	No (%)
Agriculture, forestry & fishing	2,280 (3.72)	75 (0.89)	2,355 (3.38)	149,165 (5.59)
Production	3,375 (5.51)	490 (5.83)	3,865 (5.55)	150,435 (5.64)
Construction	9,990 (16.31)	1,780 (21.17)	11,770 (16.90)	331,560 (12.42)
Motor trades	1,835 (3.00)	275 (3.27)	2,110 (3.03)	75,755 (2.84)
Wholesale	2,520 (4.11)	320 (3.80)	2,840 (4.08)	102,560 (3.84)
Retail	4,035 (6.59)	615 (7.31)	4,650 (6.67)	201,915 (7.56)
Transport & Storage (inc. postal)	2,295 (3.75)	505 (6.00)	2,800 (4.02)	108,985 (4.08)
Accommodation	3,500 (5.71)	475 (5.65)	3,975 (5.71)	153,105 (5.74)

[1] Kent County Council. 2019. UK Business Counts 2019: Information on businesses in Kent. https://www.kent.gov.uk/__data/assets/pdf_file/0011/87428/UK-business-counts-statistics.pdf
[2] Kent County Council. 2019. Labour Force Bulletin. https://www.kent.gov.uk/__data/assets/pdf_file/0008/8189/Labour-force-profile.pdf
[3] Kent Business School. 2018. Kent Business Summit 2018: Summary and Actions. https://www.kent.ac.uk/kbs/documents/reports/Summit_2018_Summary_and_Actions.pdf

& food services				
Information & communication	4,515 (7.37)	575 (6.84)	5,090 (7.31)	219,150 (8.21)
Finance & insurance	1,320 (2.15)	110 (1.31)	1,430 (2.05)	58,410 (2.19)
Property	1,915 (3.13)	210 (2.50)	2,125 (3.05)	96,410 (3.61)
Professional, scientific & technical	10,800 (17.63)	1,255 (14.92)	12,055 (17.30)	468,160 (17.54)
Business administration & support services	5,380 (8.78)	685 (8.15)	6,065 (8.71)	223,570 (8.38)
Public administration & defence	260 (0.42)	10 (0.12)	270 (0.39)	7,300 (0.27)
Education	1,095 (1.79)	170 (2.02)	1,265 (1.82)	43,960 (1.65)
Health	2,480 (4.05)	410 (4.88)	2,890 (4.15)	108,425 (4.06)
Arts, entertainment, recreation & other services	3,660 (5.98)	450 (5.35)	4,110 (5.90)	170,575 (6.39)
Total	61,255 (100)	8,410 (100)	69,665 (100)	2,669,440 (100)

A study found that just over a third of the companies located in Kent & Medway reported some engagement in export-oriented activity[4]. 36% of companies surveyed stated that export activities contributed 50% or more of their turnover. 10% said that exports made up over 90% of turnover. These firms tended to come from the manufacturing, professional, science, and information and technology sectors.

Accounting for 76,828 jobs, tourism is a key economic driver for Kent and Medway, and its value is increasing. Kent is the third most visited destination outside of London for foreign visitors[5]. In 2015, Kent welcomed a record number of tourists – with more than 60 million people visiting Kent in 2015, the visitor economy topped £3.6 billion[6]. However, with almost 65 million visitors to the county throughout 2017, the visitor economy value rose by 7% to £3.8 billion in 2017, as record numbers of European visitors took advantage of the weak pound[7]. 47% of visitors indicated the countryside was their main reason for visiting[8] (see 'Natural Environment' sector summary*).* According to Natural England's Monitoring Engagement with the Natural Environment (MENE) data, average spend when visiting the countryside is £6.44 per

[4] Kent Business School. 2017. Kent SME Internationalisation Study. https://www.kentinvictachamber.co.uk/wp-content/uploads/2018/11/Final-Kent-SIE-Internationalisation-Study-Print-Version.pdf
[5] Kent Online. 2016. Kent welcomes record number of visitors: https://www.kentonline.co.uk/kent/news/kents-visitor-figures-have-sky-116492/
[6] Kent Online. 2016. Kent welcomes record number of visitors: https://www.kentonline.co.uk/kent/news/kents-visitor-figures-have-sky-116492/
[7] Visit Kent. 2019. Kent's Visitor Economy. https://www.visitkentbusiness.co.uk/library/Cambridge_Model_2018/Kents_Visitor_Economy.pdf
[8] Kent County Council. 2017. Kent Environment Strategy Impact Report 2017: https://www.kent.gov.uk/__data/assets/pdf_file/0011/77906/impact-report-2017.pdf

visit[9]. Consequently, issues which impact on the environment and agriculture can have a significant economic impact as well. The closure of all Public Rights of Way as a result of the foot and mouth outbreak in 2001 had a significant impact on tourism as well as agriculture, costing between £1.6bn - £6.3bn[10].

I.2 Key projected changes to Kent's climate

The UK Climate Projections from UKCP18 model identifies these potential changes for Kent:

- **Hotter summers** with an increase in average summer temperature of 2 – 3°C by 2040 and 5 – 6°C by 2080.
- **Warmer winters** with an increase in average winter temperature of 1 – 2°C by 2040 and 3 – 4°C by 2080.
- **Drier summers** with a reduction in average precipitation of 20 – 30% by 2040 and 30 – 50% by 2080.
- **Wetter winters** with an increase in average precipitation of 10 – 20% by 2040 and 20 – 30% by 2080.
- **Increases in sea-level rise** by up to 0.3m by 2040 and 0.8m by 2080.

More details on the projected climate impacts for Kent can be found in Part 1 of the CCRIA.

I.3 Climate risks and impacts for industry in Kent

Although businesses in Kent and Medway are known to be impacted by climate change and severe weather, as most of those businesses are SMEs, impacts are not centrally recorded, and are likely to be much greater than reported in this area. The impacts described below are general, or those relating to specific industries. Further details can be found in the Agriculture, People and the Built Environment, Transport, and Utilities sector summaries of the CCRIA.

The main relevant climate risks for industry identified by the 2017 UK Climate Change Risk Assessment (CCRA) are:

- Flooding and coastal change to communities, businesses and infrastructure;
- Risks to health, well-being and productivity from high temperatures;
- Risk of shortages in the public water supply, and for agriculture, energy generation and industry.

I.3.1 Increasing temperatures and drought

[9] Kent County Council. 2018. Right of Way Improvement Plan 2018-2028: https://consultations.kent.gov.uk/consult.ti/rightsofWayImprovementPlan2017/consultationHome

[10] Kent County Council. Countryside Access Improvement Plan. 2007 – 2017. https://kccconsultations.inconsult.uk/consult.ti/rightsofWayImprovementPlan2017/consultationHome

Increasing temperatures could provide several economic benefits to Kent and Medway through increased tourism; improved viability of vineyards and other crops requiring warmer temperatures; and provision of goods and services. Recent heatwaves have seen sales of products associated with warm weather like ice cream, BBQs and sun cream increase significantly, while pubs and leisure facilities have also seen increases in sales. In addition, Kent's vineyards have experienced record-breaking years for crop yields and have gained international recognition.

In previous heatwaves, such as the one in 2006, tourism increased by 42.8% in Kent as more people made use of the natural environment for outdoor activities[11]. With warmer temperatures, local tourism may increase, along with tourism from other parts of the UK. Higher temperatures may also lead to increases in the number of cruise ships and passengers and increased participation in water sports.

In addition to the direct impacts of higher temperatures, there may be a greater demand for cooling of homes and buildings. This could boost the local economy through increased work for construction and electrical businesses but will have negative impacts on energy demand and supply, altering annual demand patterns.

Increased temperatures and heatwaves also have the potential to be counter-productive to Kent's economy. With increases in visitor numbers, congestion in coastal towns will become more frequent, and increased traffic load on main roads may decrease air quality and lead to increases in road repairs. Increased congestion may not be limited to coastal towns in periods of increased temperatures and heatwaves, main connection routes to coastal areas, such as the M2, may also become congested and cause further delays, impacting on air quality. Workforce productivity may also be affected as non-domestic buildings could overheat for 11 additional days a year by the 2020s; 27 extra days by the 2050s and a further 48 days by the 2080s. While there is no legal maximum working temperature, impacts on productivity from high temperatures may mean that adaptation of non-domestic buildings is required.

Kent and Medway are already areas of water scarcity and significant investment will be needed to balance future supply and demand in Kent. This has the potential to become much more severe with projected increases in temperatures and reductions in rainfall. Increases in water stress may negatively impact a wide range of water intensive industries and commercial operations, including the leisure industry, agriculture, horticulture, energy, utilities, and manufacturing. Alcohol production across Kent and Medway and the paper manufacturing industries, such as Kimberly-Clark in Northfleet and DS Smith in Sittingbourne, may also be affected. ICT and other industries with high water demands for cooling, including the Dungeness B nuclear power station, will also be heavily impacted by increased water scarcity.

I.3.2 Increased storminess, flooding and sea-level rise

Businesses in Kent and Medway are expected to be impacted by storms, sea-level rise and flooding much sooner than those in other parts of the UK due to their reliance on Kent's transport links, particularly the ports of Folkestone, Dover and Ramsgate, and proximity to rivers and coasts.

[11] Kent County Council. 2009. A Local Climate Impacts Profile for Kent. https://www.kent.gov.uk/__data/assets/pdf_file/0007/24595/LCLIP-summary-report-1996-2010.pdf

In very stormy conditions, such as those experienced on 29th July 2018, The Port of Dover can be forced to run a reduced service or in extreme conditions close altogether. This in turn leads to a loss of revenue and could affect the Port's ability to function as a robust transport node[12]. In addition to direct impacts on shipping, closure of the port causes long delays along the M20 and M2 motorways and impacts air quality and quality of life for residents.

Sea-level rise may cause significant disruption to Kent's ports that could impact the local and UK economy due to delays in shipping and result in delays to haulage throughout the country. These delays may have additional effects on agriculture and retail as goods may not reach their destination on time and spoil while in transit, leading to retail shortages and increased pressure on farmers. Furthermore, animal welfare may be compromised due to longer transport periods.

Industrial areas that are located close to the coast, such as Discovery Park in Sandwich, the CEMEX quarry in Romney Marsh and P&O ferry terminal in Dover could be under threat in the future if sea-level rise continues and begins to regularly breach defences. There is also significant risk to Dungeness B nuclear power station from sea-level rise due to its location on the largest area of open shingle in Europe. This shingle is constantly undergoing replenishment to maintain the area around it. Increased storms and sea-level rise could exacerbate the rate at which the shingle is degraded and increase the amount and rate required for replenishment. The value of agricultural land can also be lost in areas such as Romney Marsh due to sea-level rise and saline intrusion.

In many coastal tourist areas, flood defences are protecting critical infrastructure at the expense of intertidal areas, meaning tourist amenities on beaches in places such as Margate and Ramsgate may disappear in the next 50-100 years. In addition, the shingle on Romney Marsh provides additional defences to railway lines for the Romney, Hythe and Dymchurch Steam Railway, an important leisure facility and tourist attraction within the area.

Kent has one of the highest surface water flood risks of any Lead Local Flood Authority in England. In 2011, it was estimated that over 16,000 non-residential properties were at risk from surface water flooding in Kent[13]. The cost of flooding to businesses and residents may increase as flood events become more frequent and severe. With increased rainfall intensity, the flood profile of rivers could be altered. Rivers may flood more regularly, quicker and more severely, affecting many businesses located in industrial parks on floodplains in Sittingbourne, Dartford and Gravesend.

Changes in rainfall patterns may impact soil retention and erosion rates across the High Weald and Kent Downs, degrading key chalk grassland habitats that draw eco-tourists. The Medway Estuary may experience more frequent flooding as a result of the need to protect the towns of Sittingbourne and Faversham, which could change

[12] Port of Dover. Climate Change Adaptation Report. 2015. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/488087/climate-adrep-dover-port.pdf

[13] Kent County Council. 2015. Kent State of the Environment Report 2015: https://www.kent.gov.uk/__data/assets/pdf_file/0020/63812/Kent-State-of-the-Environment-Report-Evidence-base-supporting-the-strategy.pdf

the physical characteristics of this internationally important habitat and key tourism destination.

Notably, changes to flooding and increasing sea-level rise may have a positive impact on the construction industry within Kent as new or improved defences are required to protect key areas, to develop and build property level resilience measures and to install air conditioning units in domestic and non-domestic buildings.

I.4 Management of climate risks and impacts

There is currently limited information on the management of climate risks and the impacts on Kent's industry in general. However, some actions have been taken by stakeholders in the Agriculture, Natural Environment, Transport, and Utilities sectors as described in the other sector summaries of the CCRIA. These actions are summarised below, along with suggestions from stakeholders consulted for this assessment.

Working hours may need to be adapted in order to combat the increase in temperatures as excessive temperatures can lead to a lack of productivity. A change of working hours to mirror those on mainland Europe could prove to be beneficial as the time of day where the temperatures are highest would be when workers took a break; leading to a lesser impact upon productivity.

The horticulture industry within Kent has already managed reductions in water availability by increasing water storage areas to minimise the impacts of water scarcity and drought within the industry.

Hard engineering structures to combat sea-level rise and flooding have historically protected industrial areas. These, and a 'Hold the Line' policy along much of Kent's coast will protect industrial and agricultural land in many areas for the next 100 years. However, managed retreat of sections of the coastline could have impact on industrial sites located in these areas, such as the CEMEX quarry in Romney Marsh and industrial parks in Sittingbourne.

Port authorities are planning to adapt berths for sea-level rise and improve their flood resilience. The Port of Dover have created digital terrain models to allow the production of updated inundation maps to provide improved height accuracy from previous data allowing inundation events to be better forecasted[14].

In 2011, following the Fukushima Daiichi nuclear accident, Dungeness B Nuclear Power Station undertook stress testing focused on the adequacy of design basis protection for infrequent external hazards. Infrequent external hazards were assessed as those with an AEP of 0.01%. The stress testing focused on risks to the Power Station from earthquakes, flooding, droughts and extreme weather.

Although the stress test and subsequent report found no significant shortfalls in the safety case for the Power Station, flooding studies to cover the period until 2035

[14] Port of Dover. 2015. Climate Change Adaptation Report 2015. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/488087/climate-adrep-dover-port.pdf

were initiated to re-evaluate the design basis flooding scenarios using the most recent data and taking account of climate change[15]. As a result of this, the Power Station committed to boosting its flood protection by upgrading its flood defence from protecting against a 0.1% AEP weather event to protecting against a 0.01% AEP event[16].

I.5 Urgency scoring and recommendations

Using available evidence, urgency scoring was undertaken based on risk magnitude, interdependencies, and adaptation shortfall. This urgency scoring can be used to help prioritise and manage the climate risks and opportunities to Kent and Medway. Further information on the methodology can be found in the CCRIA Part 1.

[15] EDF Energy Nuclear Generation Ltd. 2011. EU Stress Test – Dungeness B https://www.edfenergy.com/sites/default/files/jer-srt-stt-pub-fin-001_dnb_stress_test_v1.1.pdf

[16] Kent County Council. 2014. Shingle recycling for the purpose of flood defence at Dungeness Borrow Pit, Dungeness, Romney Marsh, Kent, TN29 9NA - KCC/SH/0381/2011. https://democracy.kent.gov.uk/documents/s44781/Item%20C1%20-%20Dungeness.pdf

Table I-3: Urgency Scoring for Industry Sector

Risk	Magnitude	Explanation	Adaptation Shortfall	Explanation	Inter-dependencies	Explanation	Urgency Score	Recommendation
Negative impacts of flooding and sea-level rise on industry	High	Sea-level rise will impact the ports of Dover, Folkestone and Ramsgate. Some important industrial areas such as Dungeness B Power Station, CEMEX quarry, P&O in Dover, and industrial parks in Sittingbourne, Dartford, and Gravesend could be under threat from flooding and sea-level rise.	High	Small businesses, which make up a high proportion of businesses in Kent, are often not as resilient to climate change. Sea-level rise could compromise the defence protecting important industrial areas.	Medium	Flooding of businesses could impact people's health and well-being due to the stress of being out of work, for example.	High	More action is needed to develop better defences to protect important industrial areas.
Higher temperatures and water scarcity could impact the horticultural sector	Medium	In areas where horticulture is a big industry, tertiary education levels tend to be low, so if horticulture becomes less profitable, this may lead to unemployment. Increased temperatures will impact the welfare of workers within polytunnel, cravo-greenhouse and other undercover horticulture cropping systems.	Medium	Research is being undertaken in the horticultural sector by NIAB EMR to assist growers to cope with a variable and changing climate.	Low	This risk is predominantly linked with the agriculture sector and cross cutting theme of international aspects. A decrease in production of horticultural products may lead to a decline in profitability and reduction in exports of Kent goods to the rest of the world.	Medium	More research is needed on the impacts of high temperature and water scarcity on the horticulture industry and innovative adaptation.
Higher temperatures and water scarcity could impact the manufacturing, energy and utilities sectors	Medium	A decrease in productivity in the manufacturing, energy and utilities sectors may lead to loss of jobs. In areas dominated by these industries, this may have a significant impact on the local economy.	High	Although research is being undertaken to manage the effects of higher temperatures and water scarcity further research will be needed to protect the sectors from negative impacts into the future.	Medium	The risk has interdependencies linked with the People and the built environment sector and the cross-cutting theme of International aspects. Higher	Medium	More research is needed on the effects of higher temperatures and water scarcity on manufacturing, energy and utilities industries.

Risk	Magnitude	Explanation	Adaptation Shortfall	Explanation	Inter-dependencies	Explanation	Urgency Score	Recommendation
						temperatures and water scarcity may inhibit production in water intensive manufacturing industries and impact exportation of goods to the rest of the world.		
Higher temperatures impact on tourism	Medium	Potential for health and safety risks and increased costs from the need to cool buildings. Positive impacts to tourism as the higher temperatures / heatwaves encourage people to visit outdoor attractions.	Medium	Small businesses tend to be less resilient to extreme weather and climate change.	High	The increase in people using outdoor space could improve people's mental health and well-being, but there could also be negative impacts on health from higher temperatures. 47% of visitors to Kent come for the natural environment. Increases in visitors could cause increasing congestion on transport links in the county.	Medium	More research is needed into the impacts on tourism.
Higher temperatures leading to overheating buildings	Medium	By 2020, non-domestic buildings could overheat for 11 extra days a year and 27 days by 2050, leading to a loss of productivity for businesses.	Medium	Many buildings are not equipped to deal with extreme high temperatures (see built environment sector summary).	Medium	Overheating could affect health and well-being of workers.	Medium	More action is needed to ensure buildings are sufficiently cooled in high temperatures.